A Report on the

"Assessment of Blood Banks in Uttar Pradesh, India"

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National Blood Transfusion Council (NBTC),
Ministry of Health and Family Welfare, Government of India
in collaboration with
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Abbreviations

BB	- Blood Bank
BCSU	- Blood Component Separation Units
BTS	- Blood Transfusion Service
CDSCO	- Central Drug Standard Control Organisation
CHEMI	- Chemiluminescence
DAT	- Direct Antiglobulin Test
DCT	- Direct Coombs Test
ELISA	- Enzyme Linked Immuno Sorbent Assay
EQAS	- External Quality Assessment Scheme
FFP	- Fresh Frozen Plasma
HIV	- Human Immunodeficiency Virus
HBV	- Hepatitis B virus
HCV	- Hepatitis C virus
HVPI	- Haemovigilance Program of India
IAT	- Indirect Antiglobulin Test
ICT	- Indirect Coombs Test
IH	- Immunohematology
IQC	- Internal Quality Control
IQR	- Interquartile Range
MoHFW	- Ministry of Health and Family Welfare
NACO	- National AIDS Control Organisation
NAT	- Nucleic Acid Testing
NBTC	- National Blood Transfusion Council
NGO	- Non Governmental Organisation
NHP	- National Health Portal
PSU	- Public Sector Undertaking
QC	- Quality Control
QM	- Quality Manager
QMS	- Quality Management Systems
RPR	- Rapid Plasma Reagin
SACS	- State AIDS Control Societies
SBTC	- State Blood Transfusion Council
SD	- Standard Deviation
SIMS	- Strategic Information Management System
SOPs	- Standard Operating Procedures
TTI	- Transfusion Transmitted Infection
TM	- Technical Manager
TPHA	- Treponema Pallidum Hemagglutination Assay
VNRBD	- Voluntary, Non-Remunerated Blood Donation
VBD	- Voluntary Blood Donor/Donation
WHO	- World Health Organization

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Executive Summary

Blood Banks in Uttar Pradesh

According to Central Drugs Standard Control Organization (CDSCO), there were 240 blood banks in Uttar Pradesh in 2015. The assessment exercise identified 248 functional blood banks across the state. Of the 248 blood banks, 89(35.8 %) were supported by National AIDS Control Organization, Ministry of Health and Family Welfare, Government of India and the remaining 159 (64.1 %) were Non-NACO blood banks.

Lucknow (27) had the highest number of blood banks followed by Agra (14), Kanpur Nagar (14), GB Nagar (13), Ghaziabad (13), and Meerut (10). In terms of NACO supported blood banks, Lucknow (5), Allahabad (4), Varanasi (4) and Kanpur Nagar (3) had the highest number of blood banks in the state.

There are 75 districts in the state of Uttar Pradesh out which three districts which are Auraiya, Mohaba and Shrawasti did not have any blood banks. Around 47% of all the blood banks (n=248) in the state were in 9 districts that are, Lucknow(27), Agra (14), Kanpur Nagar (14), GB Nagar (13), Ghaziabad (13), Meerut (10), Varanasi (9), Gorakhpur (8) and Moradabad (8).

Considering the number of blood banks per one million populations, Amethi scored the highest with 73.9, due to the fact that the population of the district is 13,530 with only one blood bank. This is followed by Shamli (18.6), Hapur (11.4), G B Nagar (7.9) and Lucknow (5.9). 22 districts recorded higher than the State average of 1.2 blood banks per 1,000,000 (one million) population.
For the assessment 247 blood banks (89 NACO supported- 36 % and 158 Non –NACO-64 %) that submitted the assessment forms in complete were included in the analysis.

Description of blood banks

- Around 57% of the blood banks in the state had component separation facility.
- The public sector owned 36.4% of the blood banks, followed by 34.4% of private owned blood banks and the not-for-profit sector owned 29.1% of the blood banks in the state.
- The majority (84; 94.4%) of NACO supported blood banks were owned by public such as NGOs, charitable trusts, societies, foundations etc and the remaining 5(5.6%) were owned by non-profit/not-for-profit sector.
- The private sector had higher proportion (40%) of blood component separation facility than the public (26.4%) and not-for-profit (33.6%).

- The majority of the blood banks (198; 80.2%) were attached to hospitals, (4; 1.6%) were attached to laboratories and the remaining (45; 18.2%) were standalone blood banks.
- The majority of the blood banks (158; 64%) had a valid and current license, and the remaining (89; 36%) had applied for renewal. Around 45% of NACO supported and 74.7% (118) of Non-NACO blood banks had a valid and active license.

Annual Collection and Voluntary Blood Donation

- During January 2015 to December 2015, the annual blood collection from all the blood banks that reported was 1,077,196 of which 38.7% units were through voluntary blood donations and the remaining were from replacement donations.
- The average annual collection of blood units of all the blood banks in the state was 4,564 units. The average annual collection of NACO supported blood banks was found to be higher (5,890 units) than the Non-NACO blood banks (3,762 units).
- The blood banks with component separation units recorded a higher annual collection of 896,693units compared to blood banks without blood component separation units which was 180,503 units.
- The NACO supported blood banks collected 48.5% (524,188 units) of the total collection, of which 56.6% (296,938) units were through voluntary blood donation. The Non-NACO blood banks collected 553,008 (51.3%) units of which 21.7% (120,027) units were through voluntary blood donation.

Transfusion Transmitted Infections

- HIV seroreactivity/positivity was found to be 0.10%, Hepatitis-C was 0.49%, Hepatitis-B 0.90%, Syphilis 0.17% and Malaria 0.04%. However, there is a huge variation between districts.

Component Separation

- Around 63% of blood units collected by blood banks with component separation facilities were used for component separation in state.
- The percentage of component separation was higher (66.5%) in Non-NACO blood banks compared to NACO supported blood banks (60.3%).

Quality Management Systems

- Availability of document control system was reported by 48.2% of the blood banks in the state. Around 35% NACO supported blood banks and 56% Non-NACO blood banks reported they had a document control system.
- More than 98% of blood banks reported to have standard operating procedures (SOPs) for technical processes.

- Practice of internal quality control (IQC) for Immunohematology was reported by 68.8% of the blood banks and IQC for TTIs was reported by 51.4% of all the blood banks, with slight variation between NACO supported and Non-NACO blood banks.
- Around 81% of the blood banks reported carrying out quality control for kits, reagents and blood bags.
- Only 5.3% and 6.1% of the blood banks in state have enrolled themselves in External Quality Control Systems (EQAS) by recognized providers for immunohematology and TTIs respectively.
- Only 2 blood banks that participated in the assessment were accredited by National Accreditation Board for Hospitals & Healthcare Providers (NABH).
- Designated and trained Quality Managers and Trained Technical managers were available only in 37.7% and 51.8% of the blood banks respectively.
- More than 80% of the blood banks reported that they had a regular equipment maintenance programme and around 96% reported that they calibrate the equipment as per requirement.

Reporting and Documentation

- Majority of the blood banks (86.2%) reported to be compliant with NBTC guidelines. Around, 91% of Blood Banks reported that they were recovering processing charges within NBTC/SBTC norms. 81% of the blood banks reported that they were displaying stock position in their Blood bank Premises.
- Around 83% of the blood banks submitted regular reports to state drug controller, 87% of blood banks regularly reported in national strategic information management systems (SIMS). 40.5% of the blood banks regularly reported in E-blood banking either at national or state level and only 7.7% of blood banks were members of National Haemovigilance Program.

Human Resources

- Around 92% of blood banks reported to have medical officers, 96.4% and 86.2% of the blood banks had technical staff and nursing staff respectively. However, only 54.7% recorded to have counsellors and 32% had PRO/Donor motivators.
- Around 33% of the blood banks reported that they had at least one medical officer trained by NACO/NBTC; 53.4% blood banks reported they had trained technical staff, 17.8% had trained counsellors and only 11.3% and 1.6% blood banks reported having trained nursing staff and PRO/donor motivators respectively.

The current status of blood banks based on the assessment

- The mean assessment score of blood banks in the state was 56.49 (SD: 11.49). The Non-NACO supported blood banks scored slightly higher (58.74; SD: 10.45) than the NACO blood banks (52.49; SD: 12.19).
- At the state level, the majority of blood banks (213; 86%) scored between 35 to 70, followed by (21; 9%) which scored above 70, and 13 blood bank scored less than or equal to 35.

- Around 82% of NACO supported and 89% Non-NACO blood banks scored between 35 and 70. Around, 7% of NACO supported blood banks and 2% of Non-NACO blood banks scored more than 70%.
- Among the 72 districts, Hardoli (77) scored the highest and Jalaun (22) scored the least.
- Of the 21 blood banks that scored more than 70 score, 15 (71.4%) were Non-NACO blood banks. The majority of blood banks that scored above 70 were from G B Nagar (5) followed by Bareilly with three blood banks, Ghaziabad, Lucknow and Moradabad with two blood banks each. These 5 districts constitute around 66% of the total blood banks that scored more than 70.
- The mean score of blood banks with component facilities (58.91; SD: 11.27) was found to be slightly higher than the mean score of those without component facilities (53.32; SD: 11.03).
- The mean assessment score of private owned blood banks (59.88; SD: 10.81) was found to be slightly higher than the not-for-profit (59.28, SD: 8.83) and public (51.06 SD: 12.04).
- However, NACO supported blood banks run by not-for-profit sector had scored higher (65.30;SD:11.39) compared to Non-NACO blood banks NGO/Trust/Charitable blood banks (58.83; SD: 8.55).
- The mean assessment score of blood banks that collected more than 5000 blood units (61.42; SD: 10.56) was found to be higher than those which collected between 3001 to 5000 (60.13; SD: 10.23) and less than 3000 blood units (53.95; SD: 11.31).
- The mean score was found to be higher among the blood banks that were part of EQAS for immunohematology (77.19; SD: 4.36) as compared to those who were not enrolled (55.34 SD: 10.63). Similar situation was found among those blood banks that were part of EQAS for Transfusion-Transmitted Infections (77.43; SD: 4.19) as compared to those who were not enrolled (55.13; SD: 10.45).

It is evident from the assessment that blood banks that focussed on quality improvement systems performed better than others. Considering the deleterious effect of poor quality practices on patient care, it is imperative that specific programmes and strategies to improve quality systems in blood transfusion services are developed and implemented across the state.

Assessment of Blood Banks in Uttar Pradesh

1. Background

Blood Transfusion Service (BTS) is an essential part of modern health care system without which medical care is impossible (Pal, Kar, Zaman, & Pal, 2011). Adequate measures to ensure blood safety play a major role in preventing the transmission of HIV, Hepatitis and other bloodborne pathogens in health care settings. The blood and its products must not only be safe but must be clinically effective, and of appropriate and consistent quality (WHO, 2012). Ensuring the safety and availability of blood and blood products is an essential public health responsibility which is primarily the responsibility of the government or the appropriate national health authority of each country (Ramani, Mavalankar, & Govil, 2007). Therefore, it is important to establish a sustainable national blood system that should be supported by a national blood policy, strategic plan, and appropriate legal instruments (WHO, 2011). The Twenty-eighth World Health Assembly resolution number WHA 28.72 of 1975 urged member countries to promote the development of national blood services based on voluntary non-remunerated blood donation (VNRBD); to enact effective legislation governing the operation of blood services and to take other actions necessary to protect and promote the health of blood donors and of recipients of blood and blood products (WHO, 1975).

However, provision of safe and quality blood for a country like India involves a highly complex operation involving various stakeholders, and the magnitude and complexity of issues raise several challenges (GOI, 2003). This requires a holistic and comprehensive approach to planning, designing and operationalizing the BTS. It is important to ensure coordination between blood transfusion services, health services and hospitals, educational institutes, religious, social and industrial organizations, mass media, and other stakeholders including the general public. The system should ensure adequate resources and inputs into the legislative, regulatory, technical, social, and cultural aspects of making this life-saving product accessible and safe.

The need for blood is paramount and universal. However, millions of patients requiring transfusion do not have timely access to safe blood, and there is a major imbalance between developing and industrialized countries in access to safe blood (WHO, 2009). There is a huge inequity in the availability of blood within countries, with the urban areas having more access to the majority of blood available. Even if sufficient blood is available, many are exposed to avoidable, life-threatening risks through the transfusion of unsafe blood. In order to ensure universal access to safe and quality blood, achieve 100% voluntary blood donation and quality-assured testing of donated blood, strengthening the blood transfusion services with evidence-based, innovative and result-oriented strategies are essential. It is also imperative to optimize blood usage, develop quality systems in the transfusion chain, strengthen the workforce, adopt new developments, and build effective partnerships(WHO, 2008).

The National AIDS Control Organization(NACO), under the Ministry of Health and Family Welfare, and the National Blood Transfusion Council (NBTC), which is the apex policy making body, are the prime bodies responsible for the functioning of blood transfusion services and blood safety in India at the national level. At the state level, the respective state AIDS Control societies(SACS) and State Blood Transfusion Councils(SBTCs) are responsible for the smooth functioning of blood transfusion services. As blood and blood products are considered as drugs, the Central Drug Standard Control Organisation(CDSCO) and State Drug Control Organisations play a vital role in key aspects such as, approval of licenses, and enforcement of standard transfusion practices to ensure safe, quality and efficacious blood and blood components in clinical practices.

Several directions, guidelines, and legal measures during the last two decades facilitated the significant improvement of blood transfusion services in the country. The Supreme Court verdict in 1996 directed the government to improve the blood transfusion services that resulted in establishing the National and State Blood Transfusion Councils. The Drugs and Cosmetics Rules, 1945, framed under the Drugs and Cosmetics Act, 1940 were amended in 1993, as a result of which the licensing of blood banks was brought under the dual authority of the state and central government (MoHFW, 2013). The state licensing authority issues the license, while the Drug Controller General (India) is the central license approving authority. In 2002, the WHO Guidelines on the Clinical Use of Blood was adopted by NACO. In the same year, the Government of India framed and adopted the National Blood Policy (NBP) (NACO, 2007a).

In 2007, the National AIDS Control Organization developed standards for blood banks and blood transfusion services. This clearly spelled out the need for mandatory licensing and compliance to all regulatory norms; compliance to policies/ guidelines of NBTC; donor selection/ recruitment/ retention/ counseling based on voluntary non-remunerated regular repeat blood donors; appropriate blood collection procedures; mandatory testing of all donated Blood units for HIV, HBV, HCV, Syphilis and Malaria; transportation of blood and blood components ensuring cold chain maintenance; manpower requirements; maintenance of quality assurance system; regular maintenance and calibration of equipment; biosafety; waste disposal mechanisms; documentation, record keeping and regular reporting under the national programme(NACO, 2007b).

Since the inception of the National AIDS Control programme in 1992, the blood safety programme in India under the National AIDS Control Organization has been making significant strides towards ensuring access to safe, and quality blood and blood products to all those who are in need of a transfusion. The goals and objectives of the programme are to ensure provision of safe and quality blood even to the most remote areas of the country. NACO has been taking continuous steps to strengthen the blood banks across the country by providing equipment, consumables, manpower and capacity building. The efforts to modernizing blood-banks, establishing model blood banks, and setting up blood storage centres in rural areas have improved the quality of blood transfusion services in the country.

The current phase of the NACP IV (2012 -2017) focuses on blood safety that aims to support 1,300 blood banks, and achieve 90,00,000 blood units from NACO supported Blood Banks and 95% Voluntary Blood Donation in 2016-17. The key strategies under NACP IV are strengthening management structures of blood transfusion services, streamlining the coordination and management of blood banks and blood transfusion services, and developing new initiatives such as the establishment of Metro Blood Banks and Plasma Fractionation Centre (NACO, 2014).

Due to the continuous efforts in India, the availability of safe blood increased from 44 lakh units in 2007 to 100 lakh units by 2014-15; during this time HIV Seroreactivity also declined from 1.2% to 0.2%, and Voluntary Blood Donation increased substantially (NACO, 2016). NACO has been providing technical and operational support to improve the efficiency and effectiveness of these blood banks, thereby, increasing the availability and accessibility of safe and quality blood and blood products to those who are in need. Though there has been a substantial improvement in BTS in India over a period of time, there are still gaps in ensuring access to quality blood and blood products that needs to be addressed at the district, state and regional levels through an evidence-based approach.

In order to have evidence-based programmes, and policies, accurate and updated information at the district, state and national level is an essential prerequisite. Lack of updated information is one of the key barriers affecting the planning and implementation of blood transfusion services across the country. Though current programmes emphasize Quality Management Systems (QMS) including EQAS and accreditation in blood banks, not much information is available related to this area. In particular, information on the existing practices of blood banks, their potential, and willingness to get involved in the programmes on QMS are critical factors that will facilitate developing appropriate strategies and programmes related to QMS at the National level.

Therefore, facility-wise updated information on structural and programmatic components, the gaps, and challenges are required which will not only facilitate in developing better programmes and policies in BTS, but also serve as a baseline for specific programmes that are being, and will be implemented at the district, state, regional, and national levels. Considering the above factors, a nationwide assessment of all the Blood Banks was conducted.

2. Objectives

The overall purpose of this assessment was to understand the current situation of blood banks, in terms of facilities, services, practices, performance, gaps, and challenges.

The specific objectives were:

- To review the existing situation in blood banks in terms of collection of blood, voluntary blood donation, quality management systems, and other programme areas.
- To categorize and grade the blood banks using a scoring system, for implementation of phased quality improvement systems.
- To provide evidence for the formulation of evidence-based policies and programs for blood transfusion services in India.
- To develop an updated database with basic essential details of blood banks in the country.

3. Methodology

This assessment was a cross-sectional survey that captured the current situation of all the blood banks that are owned by the government, private, non-profit and not-for-profit organizations in the state during the reporting period - January to December 2015. In order to create a comprehensive and accurate list of functional blood banks in the state, data (list of blood banks) from multiple sources were obtained which included NACO, NBTC, CDSCO, state drugs control organizations, SACS, and SBTCs. These were further reviewed for duplication, errors in name and other necessary details, and triangulated to arrive at a comprehensive list of district wise functional blood banks.

Following this, an assessment tool was designed as a web-based survey tool in REDCap Software - Version 6.11.2 which was developed by an informatics core at Vanderbilt University with support from National Center for Research Resources (NCRR) and National Institute of Health (NIH) grants. An exclusive online survey link for each blood bank, generated from REDCap, was sent to all the blood banks. This online link was linked to the email ID of the blood bank and Unique IDs created for each blood bank. Since many blood banks did not have adequate internet facility, a paper format was also developed which was sent to all the blood banks by post with a pre-stamped and self-addressed envelope. The data from the completed paper forms were then entered into REDCap.

Tool: A self-assessment questionnaire that included all the below-mentioned components was developed in consultation with programme officials and experts from the areas of public health, epidemiology, bio-statistics, and transfusion medicine.

The review focused on the following components:

Table 1- Details of technical areas included in the assessment

S No	Component	Description
1	General	Basic details, Ownership, Category, License, etc.
2	Collection and VBD	Annual Collection, VNRBD and donor management
3	Technical – IH, TTIs, components	Methods, Performances
4	Quality Management System	Check for compliance to guidelines and standards
5	HR, Training, and Equipment	Availability and Participation

Data Management and Analysis: The database for this study was developed and maintained by Clinical Data Management Centre (CDMC), Department of Biostatistics, Christian Medical College, and Vellore, India. In-built validation checks were incorporated in the system to confirm that all study related parameters are captured completely and accurately.

Data were analyzed using SPSS Version 21 for Windows. The data were screened for outliers and extreme values using histograms, frequency distribution and Box plots. To summarize the whole data, frequency distributions and bar/pie charts were done for qualitative (categorical) variables such as ownership, type of blood banks etc., and descriptive statistics like mean, standard deviation (SD), median, minimum, and maximum were done for quantitative variables such as annual collection, voluntary blood donation, etc.

Categorisation of blood banks and scoring: In order to study variables that impact quality, the blood banks have been categorized into two groups based on the availability of component separation facility. The first category comprises of blood banks with component separation facility that includes Model Blood Banks and Blood Component Separation Units (BCSU) in NACO supported blood banks. Model blood banks collect more than 10,000 units and BCSUs collect between 5,000 to 10,000 units of blood annually. The second category includes blood banks without component separation facility that covers major blood banks and District Level blood banks (DLBB) in NACO supported blood banks. Major blood banks collect between 3,000 and 5,000 units and district level blood banks collect up to 3,000 units annually.

Each component of the tool was given a weight based on the programmatic and quality priorities. The maximum achievable sum of all weighted scores under each component totaled 100 marks.

Table 2 - Scoring details and weight

Details	With Components	Without Components
Licence	3	3
Annual Collection, VBD, Repeat donation and Counselling	11	16
Technical - IH, TTI and Component separation	43	38
Quality Management Systems	35	35
Reporting	8	8
TOTAL	**100**	**100**

The scoring pattern was different based on the category of blood banks that are: 1. Blood banks with component separation facility (n=140) and 2. Blood banks without component separation facility (n=107). Scores were allocated to each indicator under specific components based on the expected level of performance by these two categories of blood banks.

The blood banks were categorized based on the scores obtained by each blood bank that are, less than and equal to 35 (Red); 36 to 70 (Yellow) and above 70 (Green).

4. Key Findings

According to CDSCO, there were 240 blood banks in the state of Uttar Pradesh in 2015 (CDSCO, 2015). However, the assessment exercise identified 248 functional blood banks across the state. Of the total functional blood banks, 247 blood banks (89 NACO supported – 36% and 158 Non-NACO-64%) which have submitted the assessment forms in complete were included in the analysis.

Table 3-District Wise Descriptions of Blood Banks

District	NACO Supported	Non-NACO	Total
Agra	2	12	14
Aligarh	2	5	7
Allahabad	4	-	4
Ambedkar nagar	1	1	2
Amethi	-	1	1
Amroha	1	1	2
Azamgarh	1	2	3
Baghpat	1	1	2
Bahraich	1	-	1
Ballia	1	-	1
Balrampur	1	-	1
Banda	1	-	1
Barabanki	1	2	3
Bareilly	2	5	7
Basti	2	1	3
Bhadohi	1	1	2
Bijnor	1	1	2
Budaun	1	-	1
Buland shahr	1	2	3
Chandauli	1	-	1
Chitrakoot	1	-	1
Deoria	1	-	1
Etah	1	-	1
Etawah	2	1	3
Faizabad	1	-	1
Farrukhabad	1	1	2
Fatehpur	1	1	2
Firozabad	1	4	5
G.B.Nagar	1	12	13
Ghaziabad	1	12	13
Ghazipur	1	-	1
Gonda	1	-	1

Gorakhpur	2	6	8
Hamirpur	1	-	1
Hapur	-	3	3
Hardoi	1	-	1
Hathras	1	-	1
Jalaun	1	-	1
Jaunpur	1	2	3
Jhansi	2	5	7
Kannauj	2	0	2
Kanpur nagar	3	11	14
Kanpur Dehat	-	1	1
Kasganj	1	-	1
Kaushambi	1	-	1
Kheri	1	-	1
Kushinagar	1	-	1
Lalitpur	1	-	1
Lucknow	5	22	27
Maharajganj	1	-	1
Mainpuri	1	-	1
Mathura	1	6	7
Mau	1	1	2
Meerut	2	8	10
Mirzapur	1	-	1
Moradabad	2	6	8
Muzaffarnagar	1	2	3
Pilibhit	1	1	2
Pratapgarh	1	-	1
Raebareli	1	-	1
Rampur	1	1	2
Saharanpur	1	3	4
Sambhal	-	1	1
Sant kabir nagar	1	-	1
Shahjahanpur	1	3	4
Shamli	-	2	2
Siddharth nagar	1	-	1
Sitapur	1	2	3
Sonbhadra	1	1	2
Sultanpur	1	-	1
Unnao	1	1	2
Varanasi	4	5	9
Uttar Pradesh	**89**	**159**	**248**

Table - 3 indicates the district wise details of all the blood banks in the state, including the description of NACO supported and Non-NACO blood banks. Lucknow (27) had the highest number of blood banks followed by Agra and Kanpur Nagar with both having 14 blood banks and G B Nagar (13), Ghaziabad (13), Meerut (10), Varanasi (9), Moradabad (8), Gorakhpur (8), Jhansi (7), Aligarh (7) and Bareilly (7). In terms of Non-NACO blood banks, Lucknow had the highest with 22 blood banks followed by Ghaziabad (12), G B Nagar (12), Agra (12), Kanpur Nagar (11), Meerut (8), Moradabad (6), Gorakhpur (6), Varanasi (5), Aligarh (5), Jhansi (5) and Bareilly (5).

Considering the number of blood banks per one million populations Amethi scored the highest with 73.9, due to the fact that the population of the district is 13,530 with only one blood bank. This is followed by Shamli (18.6), Hapur (11.4), G B Nagar (7.9) and Lucknow (5.9). (Refer Fig-1(a)). There were 22 districts recorded higher than the State average of 1.2 blood banks per 1,000,000 (one million) population. Three districts which are Auraiya, Mahoba and Shrawasti did not have any blood banks.

Figure 1 (a) Availability of BBs per 1,000,000 (1 million) Population

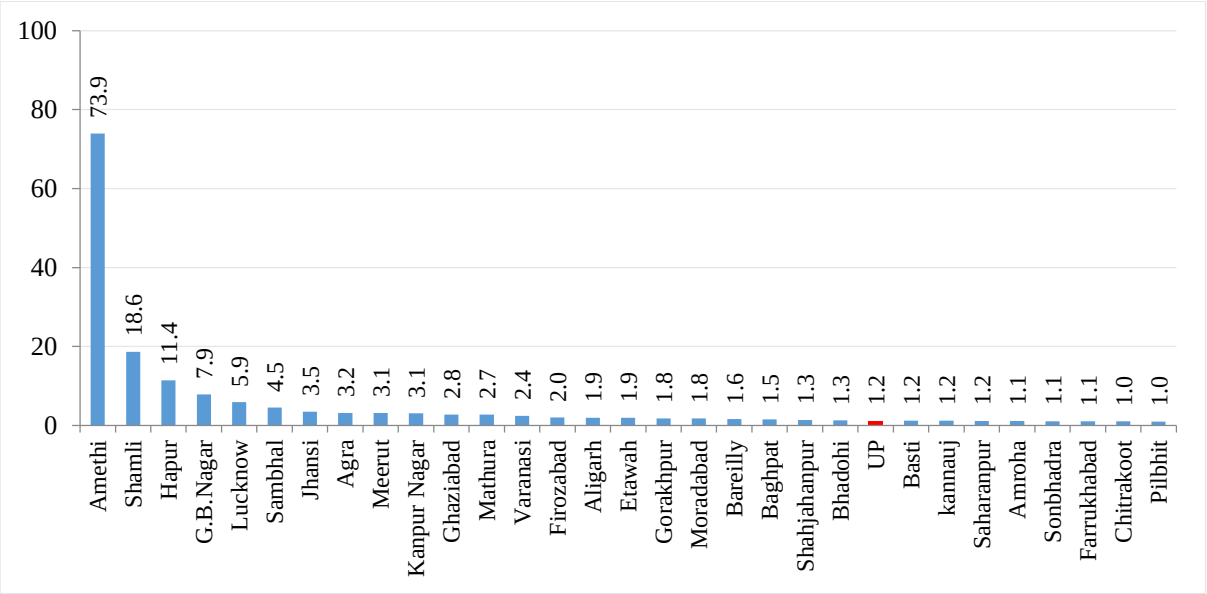
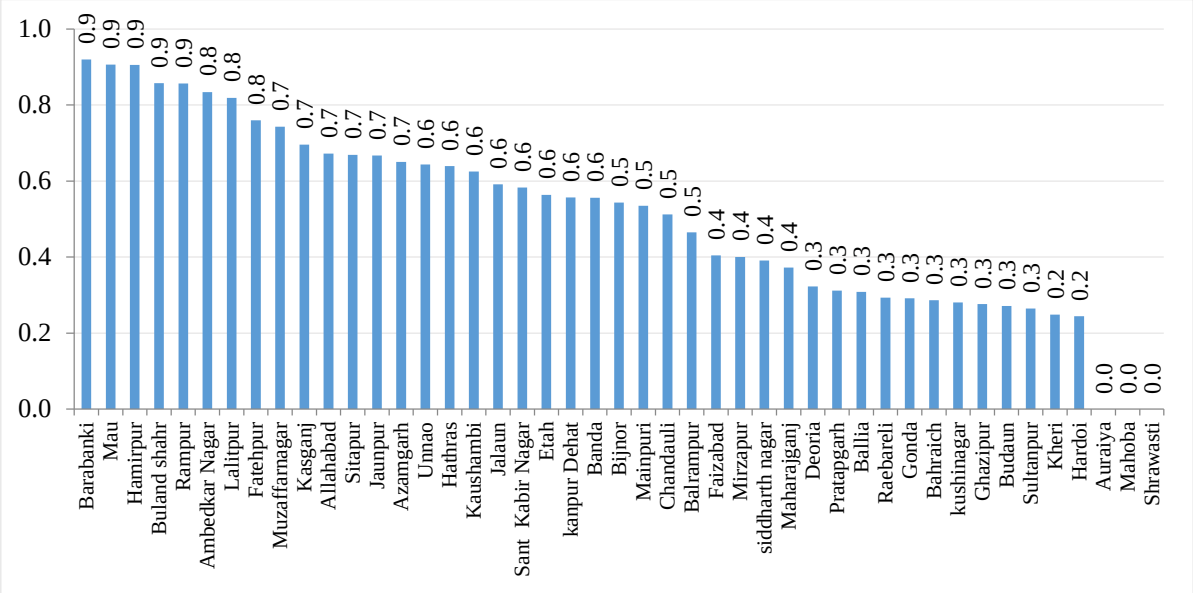


Fig -1(b) Availability of BBs per 1,000,000 (1 million) Population



4.1 Basic details of blood banks (n=247)

As indicated earlier, 247 blood banks (86 NACO supported and 158 Non-NACO) that submitted the assessment forms were included in the analysis.

4.1.1 Category of Blood Banks: Out of 86 NACO supported blood banks 44.9% (40) of the blood banks had component separation facility. Out of 158 Non-NACO blood banks 63.3% (100) had component separation facility.

Table 4-Basic details of blood banks

Specifics	Description	NACO Supported	Non-NACO	Total
Type of BB	With components	40 (44.9%)	100 (63.3%)	140 (56.7%)
	Without components	49 (55.1%)	58 (36.7%)	107 (43.3%)
Ownership	NGO/Trust/Charitable	5 (5.6%)	67 (42.4%)	72 (29.1%)
	Private	-	85 (53.8%)	85 (34.4%)
	Public	84 (94.4%)	6 (3.8%)	90 (36.4%)
Licence	Valid	40 (44.9%)	118 (74.7%)	158 (64%)
	Under Renewal	49 (55.1%)	40 (25.3%)	89 (36%)
Attachment	Attached to Hospital	86 (96.6%)	112 (70.9%)	198 (80.2%)
	Attached to lab	-	4 (2.5%)	4 (1.6%)
	Stand alone	3 (3.4%)	42 (26.6%)	45 (18.2%)

At the District level, Lucknow (20) had the highest number of BCSUs followed by Agra (12), G B Nagar (12), Ghaziabad (11), Meerut (10), Kanpur (8), Varanasi (7) and Bareilly (7).

4.1.2 Ownership: As depicted in Table:-4, around 36% (90) are owned by public sector followed by private (85, 34.4%) and Not-for-Profit sector (72, 29.1%). The majority (84, 94.4%) of NACO supported blood banks were owned by public sector and the remaining 5 (5.6%) were owned by Not-for–profit sector.

The private sector had a higher proportion (40%) of blood component separation facility than the not for profit (33.6%) and public sector (26.4%). Among the NACO supported blood banks, the public sector had a higher (90%) proportion of component separation facilities compared to the Not-for profit sector (10%).

In the Public sector blood banks (n=90), 40% of the blood banks are in Lucknow (5), Allahabad (3), Kanpur (3), Varanasi (3), Aligarh (2), Ambedkar Nagar (2), Azamgarh (2), Basti (2), Bulandshahr (2), Etawah (2), Gorakhpur (2), Jhansi (2), Kannauj (2), Meerut (2) and Saharanpur (2). 74.1% of the private sector blood banks (n=85) are clustered in Lucknow (11), G B Nagar (11), Kanpur (9), Ghaziabad (8), Meerut (6), Aligarh (5), Varanasi (5), Agra (4) and Moradabad (4).

Around 50% of all the not-for-profit blood banks (n=72) were clustered in districts which are Lucknow (10), Agra (9), Bareilly (6), Ghaziabad (4), Gorakhpur (3), Mathura (3) and Moradabad (3). (Refer Table - 5)

Table 5-District wise list of blood banks by Ownership

District	Public	%	Not-for-profit	%	Private	%	Total
Agra	1	7.1	9	64.3	4	28.6	14
Aligarh	2	28.6	-	-	5	71.4	7
Allahabad	3	75	1	25	-	-	4
Ambedkar Nagar	2	100	-	-	-	-	2
Amethi	-	-	1	100	-	-	1
Amroha	1	50	1	50	-	-	2
Azamgarh	2	66.7	-	-	1	33.3	3
Baghpat	1	50	-	-	1	50	2
Bahraich	1	100	-	-	-	-	1
Ballia	1	100	-	-	-	-	1
Balrampur	1	100	-	-	-	-	1
Banda	1	100	-	-	-	-	1
Barabanki	1	33.3	2	66.7	-	-	3
Bareilly	1	14.3	6	85.7	-	-	7
Basti	2	66.7	1	33.3	-	-	3

Bhadohi	1	50	-	-	1	50	2
Bijnor	1	50	1	50	-	-	2
Budaun	1	100	-	-	-	-	1
Bulandshahr	2	66.7	-	-	1	33.3	3
Chandauli	1	100	-	-	-	-	1
Chitrakoot	1	100	-	-	-	-	1
Deoria	1	100	-	-	-	-	1
Etah	1	100	-	-	-	-	1
Etawah	2	66.7	1	33.3	-	-	3
Faizabad	1	100	-	-	-	-	1
Farrukhabad	1	50	1	50	-	-	2
Fatehpur	1	50	-	-	1	50	2
Firozabad	1	20	2	40.0	2	40	5
G B Nagar	1	7.7	1	7.7	11	84.6	13
Ghaziabad	1	7.7	4	30.8	8	61.5	13
Ghazipur	1	100	-	-	-	-	1
Gonda	1	100	-	-	-	-	1
Gorakhpur	2	25	3	37.5	3	37.5	8
Hamirpur	1	100	-	-	-	-	1
Hapur	0	0	2	66.7	1	33.3	3
Hardoi	1	100	-	-	-	-	1
Hathras	1	100	-	-	-	-	1
Jalaun	1	100	-	-	-	-	1
Jaunpur	1	33.3	-	-	2	66.7	3
Jhansi	2	28.6	2	28.6	3	42.9	7
Kannauj	2	100	-	-	-	-	2
Kanpur	3	21.4	2	14.3	9	64.3	14
Kanpur Dehat	1	100	-	-	-	-	1
Kasganj	1	100	-	-	-	-	1
Kaushambi	1	100	-	-	-	-	1
Kushinagar	1	100	-	-	-	-	1
Lakhimpur Kheri	1	100	-	-	-	-	1
Lalitpur	1	100	-	-	-	-	1
Lucknow	5	19.2	10	38.5	11	42.3	26
Maharajganj	1	100	-	-	-	-	1
Mainpuri	1	100	-	-	-	-	1
Mathura	1	14.3	3	42.9	3	42.9	7
Mau	1	50	1	50	-	-	2
Meerut	2	20	2	20	6	60	10
Mirzapur	1	100	-	-	-	-	1
Moradabad	1	12.5	3	37.5	4	50	8
Muzaffarnagar	1	33.3	2	66.7	-	-	3
Pilibhit	1	50	1	50	-	-	2
Pratapgarh	1	100	-	-	-	-	1

Raebareli	1	100	-	-	-	-	1
Rampur	1	50	1	50	-	-	2
Saharanpur	2	50	1	25	1	25	4
Sambhal	1	100	-	-	-	-	1
Sant Kabir Nagar	1	100	-	-	-	-	1
Shahjahanpur	1	25	2	50	1	25	4
Shamli	-	-	2	100.0	-	-	2
Siddharthnagar	1	100	-	-	-	-	1
Sitapur	1	33.3	2	66.7	-	-	3
Sonbhadra	1	50	-	-	1	50	2
Sultanpur	1	100	-	-	-	-	1
Unnao	1	50	1	50	-	-	2
Varanasi	3	33.3	1	11.1	5	55.6	9
Uttar Pradesh	**90**	**36.4**	**72**	**29.1**	**85**	**34.4**	**247**

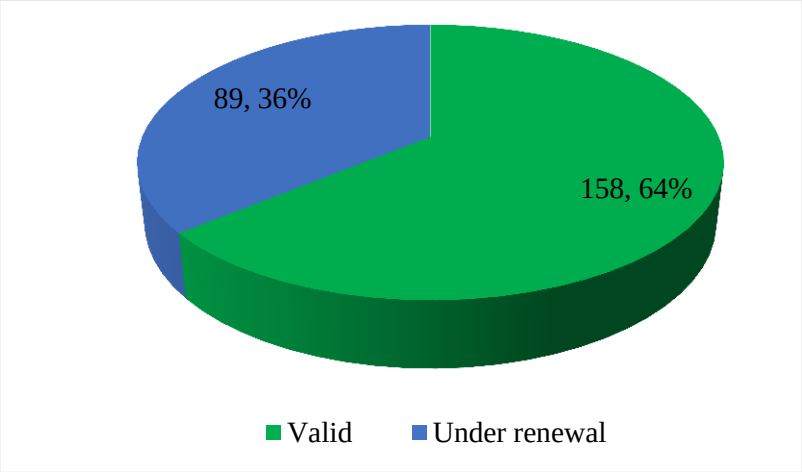
4.1.3 Organizational Attachment: The majority of the blood banks (198; 80.2%) were attached to hospitals, (45; 18.2%) were standalone and only 4 of blood banks were attached to laboratories. The majority of the NACO supported blood banks (86; 96.6%) were attached to hospitals, and 3 blood banks were standalone.

Further analysis indicated that all blood banks in the public sector (90; 100%), 77.6% (66) of private sector blood banks, and 58.3% (42) of the blood banks in the not-for-profit sector were attached to hospitals. In the not-for-profit sector, 40.3% (29) blood banks and 18.8% (16) of private sector blood banks were standalone.

4.1.4 License details of blood banks: The license status was categorized as "valid" which means that the blood bank has current and active license; and "deemed renewal" which means that the blood bank had applied for renewal which is pending. The majority of the blood banks (158; 64%) had a valid and current license, and the remaining (89; 36%) had applied for renewal.

Around 45% of NACO supported and 74.7% (118) of Non-NACO blood banks had a valid and active license. Similarly, 80.6% (58) of the not-for-profit blood banks, 69.4% (59) of Private blood banks and 45.6% (41) of public sector blood banks has a valid and active license.

Figure 2-License Status (n=247)



The majority of those blood banks (n=89) which have reported as "deemed renewal" had their last inspection by licencing authority during the last one year (64; 71.9%); 14.6% (13) had their inspection between the last 1 to 2 years, 4 blood banks had their inspection between 2 to 3 years and 5 blood bank had their inspection 4 years before.

4.2 Annual Blood Collection and Voluntary Blood Donation

According to WHO, it is estimated that blood donation by 1% of the population can meet a nation's most basic requirements for blood (WHO, 2016b), which means that the state with a population of 199,812,341, currently needs around 1,998,123 units of blood. Currently Uttar Pradesh is collecting only around 54% of the units which is required.

4.2.1 Annual Collection of Blood: During January 2015 to December 2015, the annual blood collection from all the blood banks that reported was 1,077,196 of which 38.7% units were through voluntary blood donations and the remaining were from replacement donations.

Figure 3-Annual Collections and Voluntary Donation

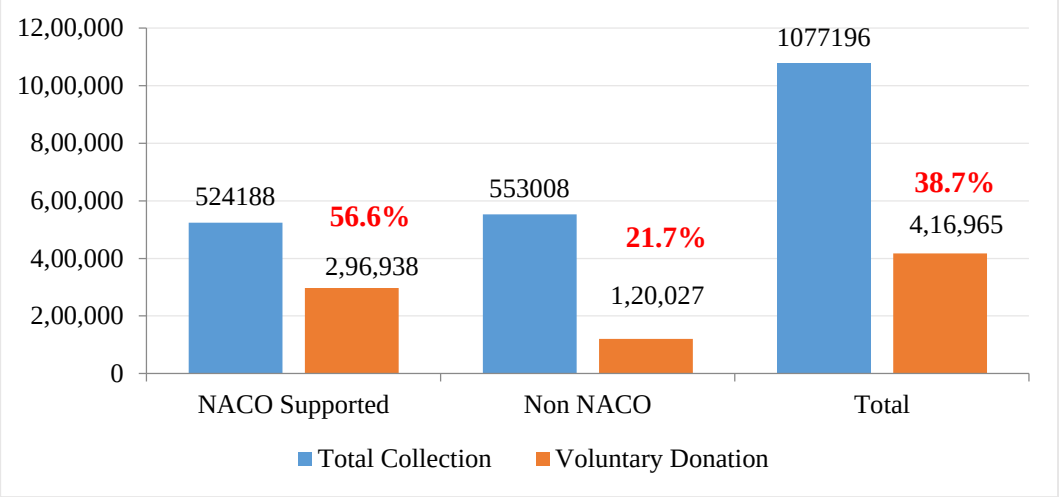
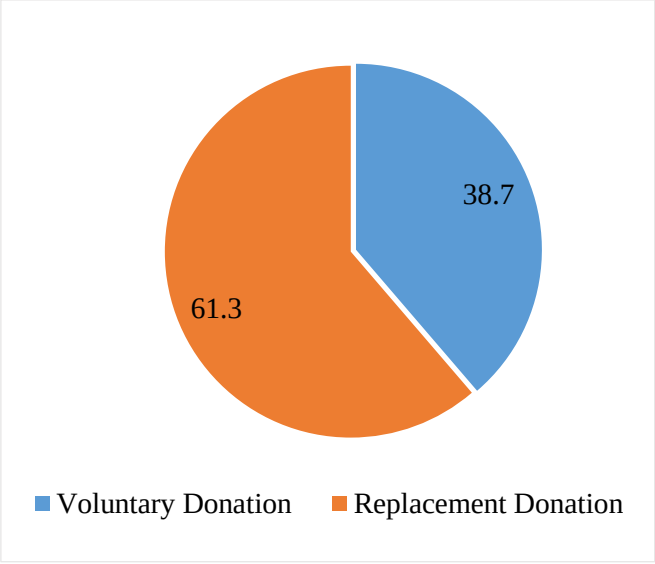


Figure 4- Type of Blood Donation (Voluntary vs Replacement Donation %)



The average annual collection of blood units of all the blood banks in the state was 4,564 units. The average annual collection of NACO supported blood banks was found to be higher (5,890 units) than the Non-NACO blood banks (3,762 units).

Table 6-Average Annual collection

Districts	NACO supported	Non-NACO	All BB
Agra	3176	7402	6799
Aligarh	12889	1651	4862
Allahabad	16715	-	16715
Ambedkar Nagar	774	646	710
Amethi	-	711	711
Amroha	435	15	225
Azamgarh	8671	61	4366
Baghpat	793	2652	1723
Bahraich	4712	-	4712
Ballia	2443	-	2443
Balrampur	1131	-	1131
Banda	722	-	722
Barabanki	2203	3568	3113
Bareilly	18049	3705	7804
Basti	930	2300	1386
Bhadohi	274	813	544
Bijnor	4491	2042	3267
Budaun	1632	-	1632
Bulandshahr	2205	1114	1478
Chandauli	1200	-	1200
Chitrakoot	23	-	23
Deoria	1925	-	1925
Etah	285	-	285
Etawah	4955	-	4955
Faizabad	7507	-	7507
Farrukhabad	5118	282	2700
Fatehpur	612	752	682
Firozabad	1448	1771	1706
G B Nagar	2136	4498	4316
Ghaziabad	4449	1683	1896
Ghazipur	1051	-	1051
Gonda	4544	-	4544
Gorakhpur	4683	7091	6403
Hamirpur	519	-	519
Hapur		2441	2441
Hardoi	3378	-	3378
Hathras	1148	-	1148
Jalaun	298	-	298

Jaunpur	5083	4348	4716
Jhansi	4502	3502	3788
Kannauj	159	-	159
Kanpur	9228	3429	4672
Kanpur Dehat	-	204	204
Kasganj	35	-	35
Kaushambi	370	-	370
Kushinagar	872	-	872
Lakhimpur Kheri	4137	-	4137
Lalitpur	2984	-	2984
Lucknow	27993	2831	7670
Maharajganj	316	-	316
Mainpuri	1127	-	1127
Mathura	3330	2202	2428
Mau	250	-	250
Meerut	7594	7775	7735
Mirzapur	5018	-	5018
Moradabad	3429	5376	4890
Muzaffarnagar	13919	2436	6264
Pilibhit	1886	7379	4633
Pratapgarh	1440	-	1440
Raebareli	5728	-	5728
Rampur	1265	4469	2867
Saharanpur	3126	3600	3442
Sambhal	-	1253	1253
Sant Kabir Nagar	609	-	609
Shahjahanpur	5038	1685	2523
Shamli	-	1421	1421
Siddharthnagar	1528	-	1528
Sitapur	1847	770	1129
Sonbhadra	3801	1316	2559
Sultanpur	7338	-	7338
Unnao	624	-	624
Varanasi	7789	8900	8406
Uttar Pradesh	**5890**	**3762**	**4564**

Similarly, the blood banks with component separation units recorded a higher average collection of 6,593 units compared to blood banks without blood component separation units which was 1,805 units. However, the variation in the collection was found to be very high across and within districts.

The NACO supported blood banks collected 48.7% (524,188 units) of the total collection, of which 56.6% (296,938 units) were through voluntary blood donation. The Non-NACO blood banks collected 553,008 units (51.3%), of which 21.7% (120,027) units were through voluntary blood donation.

Blood banks with component separation facility collected around 83% of blood units (896,693) and the remaining 17% (180,503) were collected by blood banks without the component facility. Similarly, blood banks owned by public sector collected around 40% (433,888) of the total collection followed by the not-for-profit sector 33.7% (363,119) and private sector blood banks 26% (280,189).

Table-7 indicates the district-wise details of the total annual collection, voluntary and replacement donation in the state of Uttar Pradesh. Blood banks reported a huge varying proportion of voluntary blood donation ranging from 2.2% in Kushinagar district to 100% in Chitrakoot district.

Table 7-Annual blood collection and percentage of VBD

Districts	Total Voluntary Donation	Replacement Donation	Annual Collection	VBD%
Agra	14327	80852	95179	15.1
Aligarh	29790	4245	34035	87.5
Allahabad	35541	31318	66859	53.2
Ambedkar Nagar	121	1299	1420	8.5
Amethi	75	636	711	10.5
Amroha	203	247	450	45.1
Azamgarh	7724	1008	8732	88.5
Baghpat	305	3140	3445	8.9
Bahraich	3968	744	4712	84.2
Ballia	1853	590	2443	75.8
Balrampur	228	903	1131	20.2
Banda	670	52	722	92.8
Barabanki	967	8372	9339	10.4
Bareilly	11742	42883	54625	21.5
Basti	712	3447	4159	17.1
Bhadohi	212	875	1087	19.5
Bijnor	4080	2453	6533	62.5
Budaun	1463	169	1632	89.6
Bulandshahr	2257	2176	4433	50.9
Chandauli	74	1126	1200	6.2
Chitrakoot	23	0	23	100.0
Deoria	494	1431	1925	25.7
Etah	157	128	285	55.1
Etawah	7366	2543	9909	74.3
Faizabad	6660	847	7507	88.7
Farrukhabad	4855	545	5400	89.9
Fatehpur	745	619	1364	54.6
Firozabad	1184	7347	8531	13.9
G B Nagar	26492	29621	56113	47.2
Ghaziabad	5986	18661	24647	24.3

Ghazipur	226	825	1051	21.5
Gonda	3742	802	4544	82.4
Gorakhpur	14674	30145	44819	32.7
Hamirpur	457	62	519	88.1
Hapur	683	6639	7322	9.3
Hardoi	3204	174	3378	94.8
Hathras	1086	62	1148	94.6
Jalaun	204	94	298	68.5
Jaunpur	2595	6836	9431	27.5
Jhansi	11322	15191	26513	42.7
Kannauj	185	133	318	58.2
Kanpur	26594	38810	65404	40.7
Kanpur Dehat	31	173	204	15.2
Kasganj	34	1	35	97.1
Kaushambi	34	336	370	9.2
Kushinagar	19	853	872	2.2
Lakhimpur Kheri	354	3783	4137	8.6
Lalitpur	2420	564	2984	81.1
Lucknow	67432	131981	199413	33.8
Maharajganj	218	98	316	69.0
Mainpuri	367	760	1127	32.6
Mathura	2936	9203	12139	24.2
Mau	31	219	250	12.4
Meerut	21144	48469	69613	30.4
Mirzapur	4234	784	5018	84.4
Moradabad	15043	24073	39116	38.5
Muzaffarnagar	12322	6469	18791	65.6
Pilibhit	5370	3895	9265	58.0
Pratapgarh	870	570	1440	60.4
Raebareli	5631	97	5728	98.3
Rampur	208	5526	5734	3.6
Saharanpur	2398	7927	10325	23.2
Sambhal	81	1172	1253	6.5
Sant Kabir Nagar	145	464	609	23.8
Shahjahanpur	4349	5744	10093	43.1
Shamli	779	642	1421	54.8
Siddharthnagar	1212	316	1528	79.3
Sitapur	1725	1661	3386	50.9
Sonbhadra	487	4630	5117	9.5
Sultanpur	5107	2231	7338	69.6
Unnao	146	478	624	23.4
Varanasi	26592	49062	75654	35.1
Uttar Pradesh	**416965**	**660231**	**1077196**	**38.7**

Figure 5 (a) - Annual Collection per 100 population- District wise

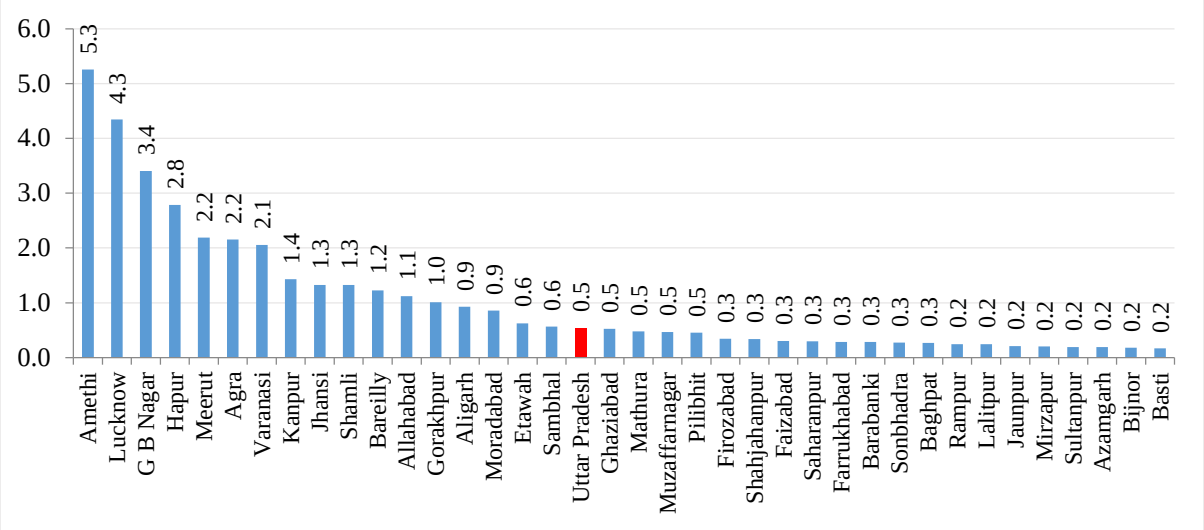
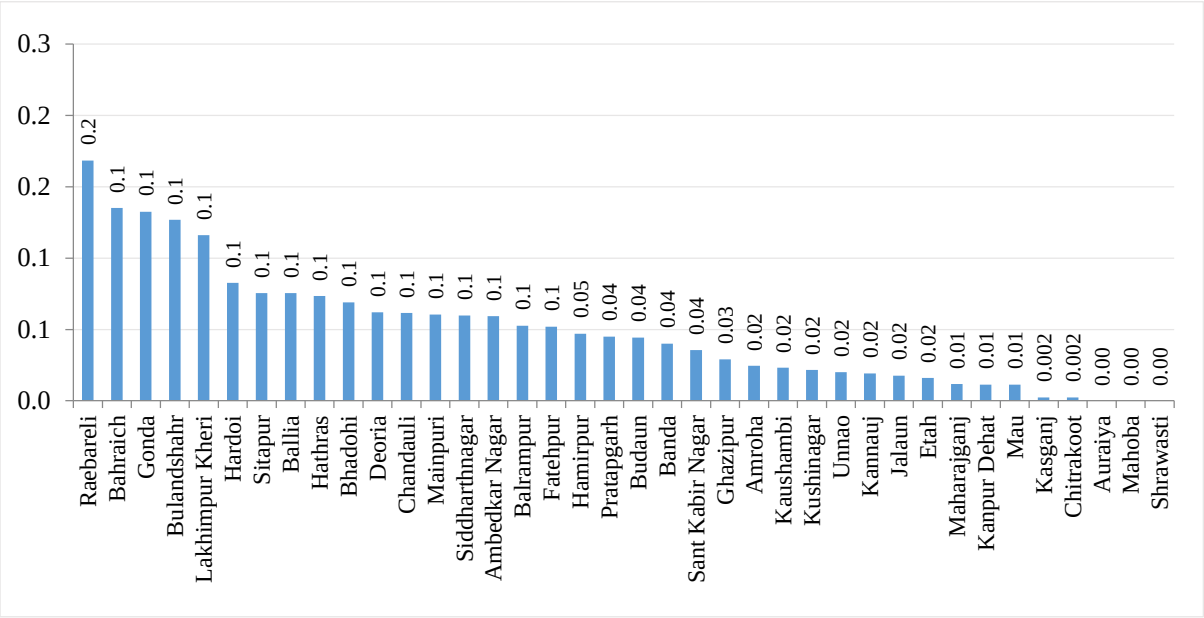


Fig -5 (b) - Annual Collection per 100 population- District wise



The annual collection of blood units per 100 individuals was found to be 0.5% in the state, which is lower than WHO suggested requirement that 1% of the population can meet a nation's (populations) most basic requirements for blood. However, there is a huge disparity in the collection of blood between districts. 17 districts in the state recorded more than the state average of 0.5 per 100 populations. (Refer Fig- 5 (a)). Amethi districts had reported the highest with 5.3, followed by Lucknow (4.3), GB Nagar (3.4), Hapur (2.8), Meerut (2.2), Agra (2.2) and Varanasi (2.1).

Figure 6 illustrates the district wise comparative information of annual collection per 100 population and number of blood banks per one million populations. This indicates that the

state had 1.2 blood banks per million population that collected 0.5 units per 100 population at the ratio of 1.2 BB: 0.5 blood unit.

Figure 6 (a) -Annual Collection Per 100 Population vs BBs Per 1 Million- District Wise

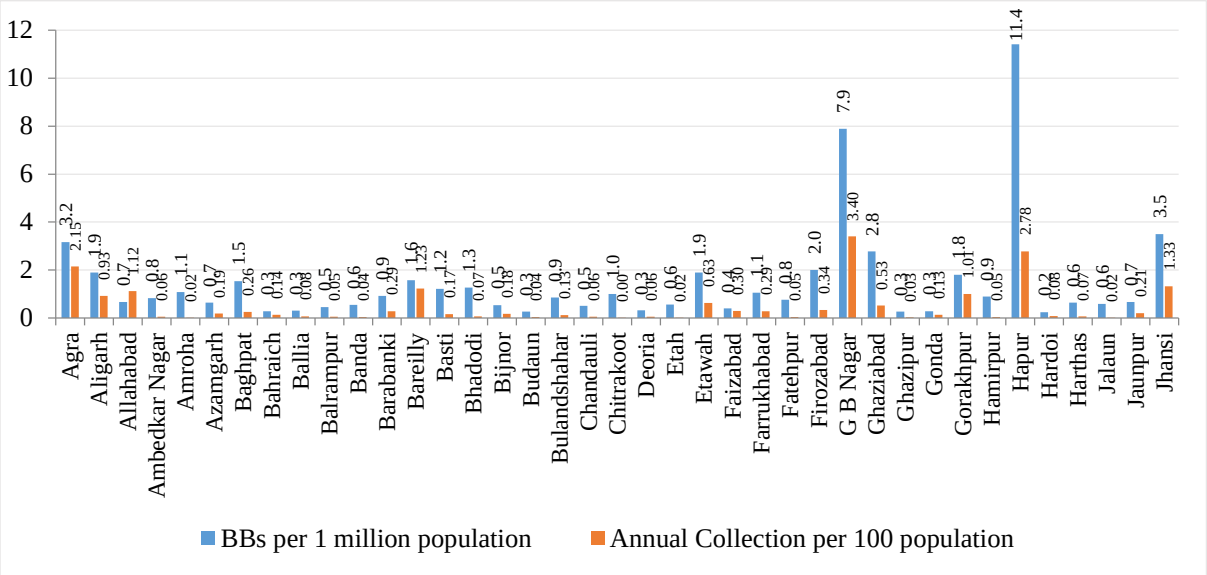
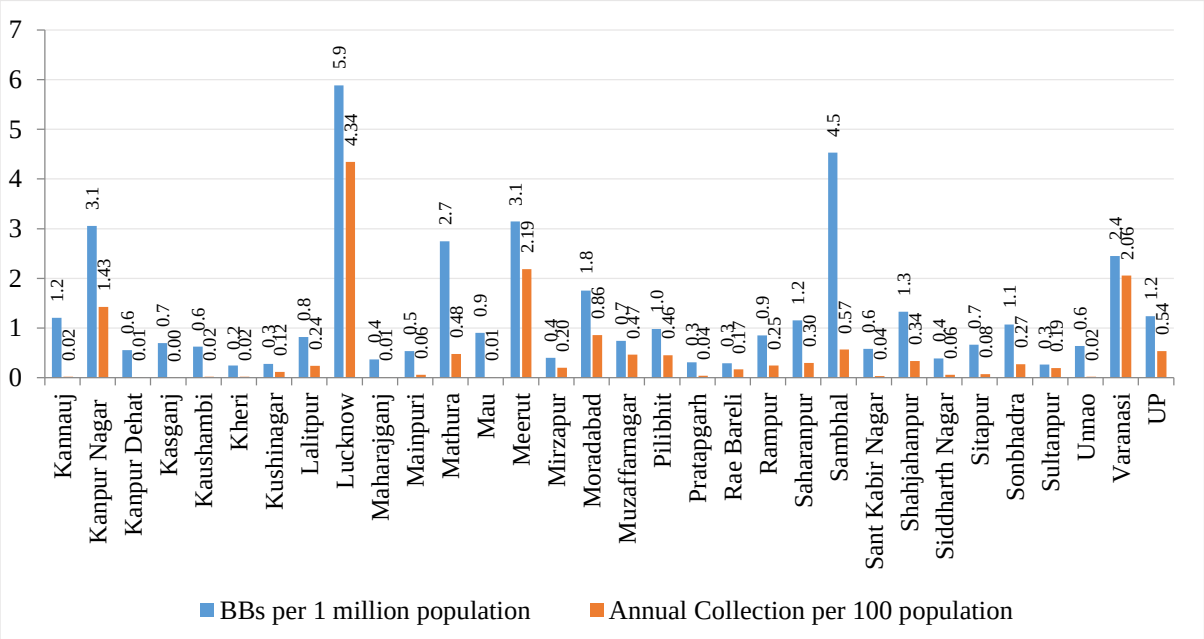


Fig -6 (b) Annual Collection per 100 population Vs BBs per 1 million- District wise



4.2.2 Voluntary blood donation: As depicted in Figure-7 (a) and (b), 38 districts out of 72 districts in the state have recorded more than the state average of 38.7%. Chitrakoot districts had 100% voluntary blood donation and other districts such as Raebareli, Kasganj, Hardoi,

Hathras and Banda reported more than 90% voluntary blood donation. Kushinagar district recorded the lowest percentage of VBD with 2.2%.

Figure 7(a) Percentage of Voluntary Blood Donation by District (Overall) - VBD% >50

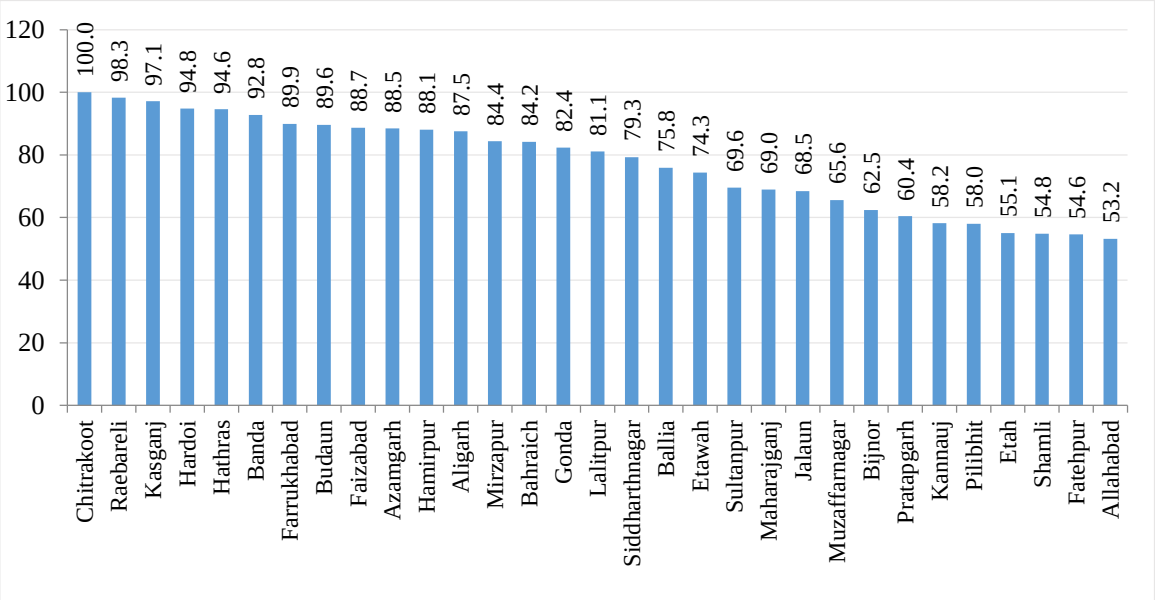
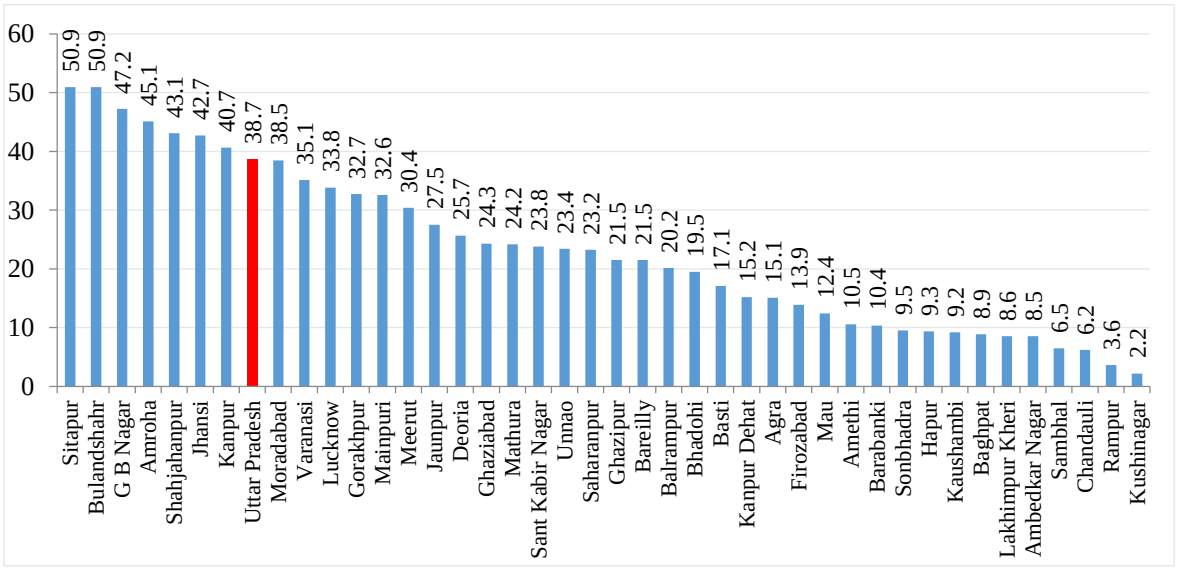


Fig -7 (b) Percentage of Voluntary Blood Donation by District (Overall) - VBD% <=50



Among NACO supported blood banks, two districts that are, Bulandshahr and Chitrakoot recorded 100% voluntary donation. 12 districts which are Raebareli, Gorakhpur, Kasganj, Hardoi, Hathras, Fatehpur, Aligarh, Farrukhabad, Banda, Bijnor, Sitapur, and G B Nagar recorded more than 90%. Overall, there are 41 districts which had scored above the state average of 56.6% of voluntary donation during January to December 2015.

Figure 8 (a) - Percentage of Voluntary Blood Donation by District (NACO Supported) - VBD% >50

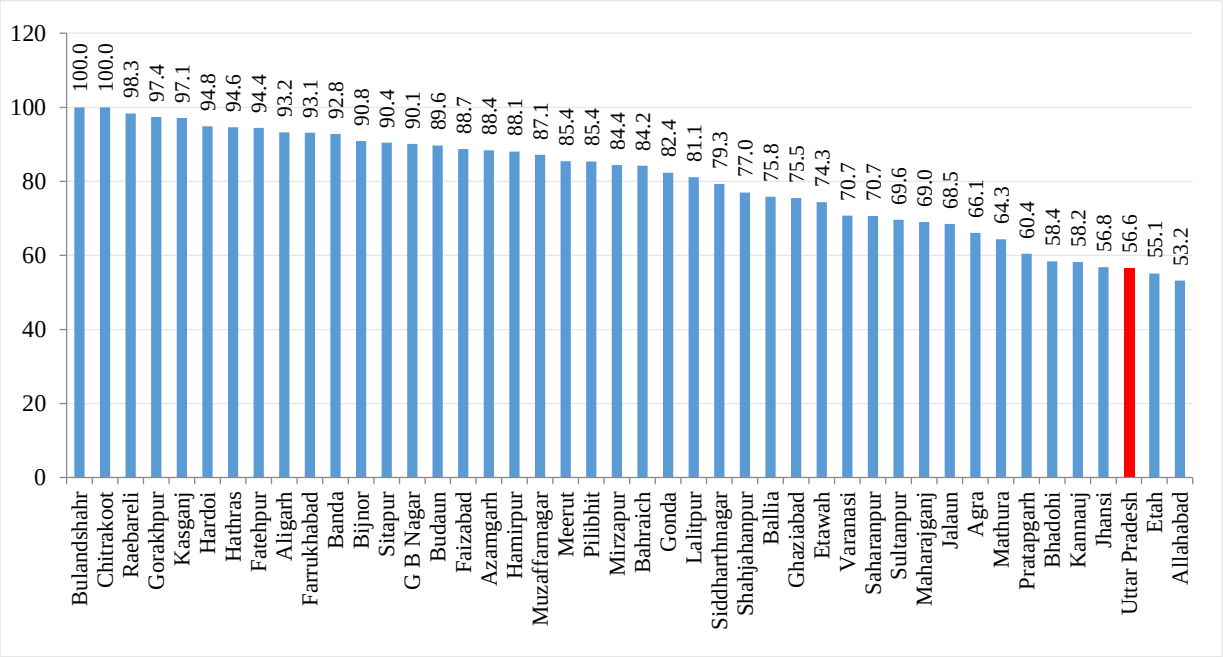
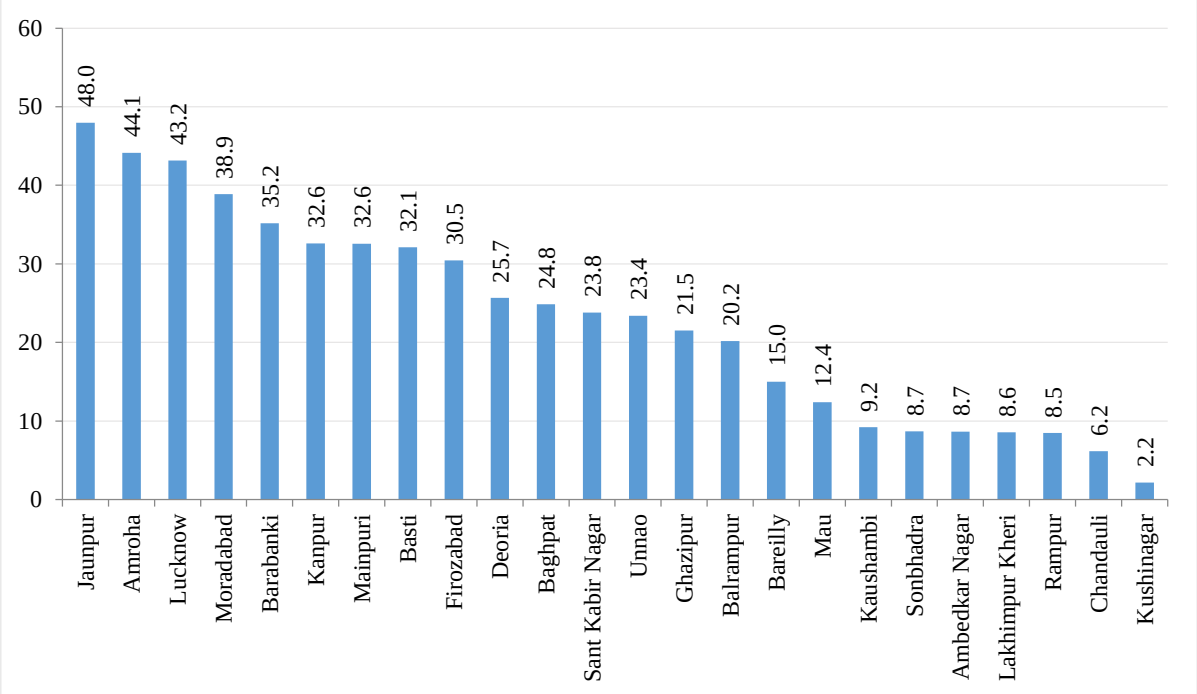
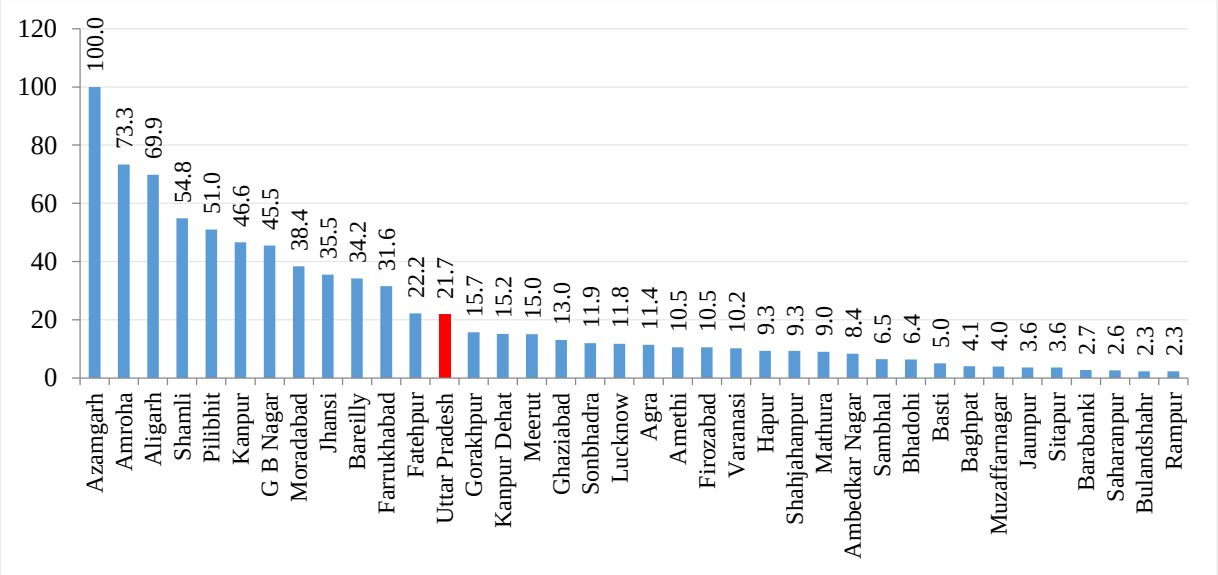


Fig -8 (b) Percentage of Voluntary Blood Donation by District (NACO Supported) - VBD% <=50



Among Non-NACO blood banks, 12 districts recorded more than state average of 21.7%. Rampur district recorded the lowest VBD percentage (2.3%) in the state among Non-NACO blood banks.

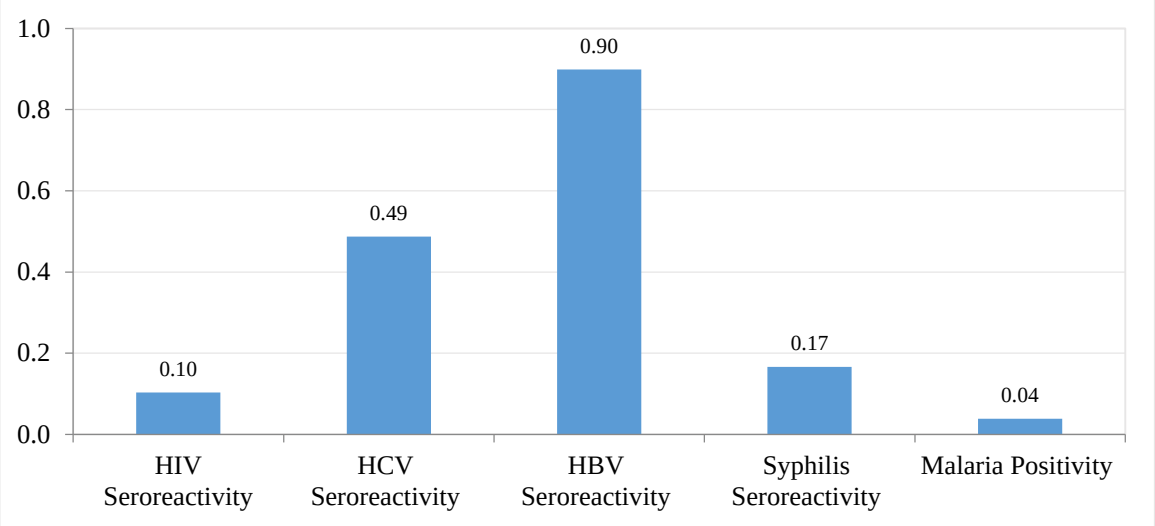
Figure 9-Percentage of Voluntary Blood Donation by District (Non-NACO)



4.3 Transfusion Transmitted Infections(TTIs)

Transfusion-Transmitted Infections (TTIs) are major problems associated with blood transfusion (Chandra, Rizvi, & Agarwal, 2014; Gupta, Singh, Singh, & Chugh, 2011). Screening for TTIs such as HIV 1, HIV 2, Hepatitis B, Hepatitis C, Malaria, and Syphilis is mandatory in India. Due to the concerted and active efforts, the Seroreactivity percentage of TTIs has come down significantly over the years.

Figure 10-Transfusions Transmitted Infection (%)-Jan-Dec 2015



The seroreactivity of TTI among blood donors in the year 2015 is depicted in Fig-10. The seroreactivity of HIV was found to be 0.10%, Hepatitis-C was 0.49%, Hepatitis-B 0.90%, Syphilis 0.17% and Malaria 0.04%. However, there is a huge variation between districts. HIV, HCV, HBV and Syphilis seroreactivity rates were recorded higher in NACO supported blood banks. Malaria positivity was found to be identical in both NACO and Non-NACO blood banks.

Table 8-Transfusion Transmitted Infections (%)

Category of BB	Transfusion Transmitted Infections %				
	HIV	HCV	HBV	Syphilis	Malaria
NACO Supported	0.11	0.50	1.09	0.21	0.04
Non-NACO	0.10	0.48	0.75	0.13	0.04
Overall	**0.10**	**0.49**	**0.90**	**0.17**	**0.04**

4.3.1 **Transfusion Transmitted Infections by Category of blood banks**: HIV, HCV, HBV and Syphilis seroreactivity rates were found to be higher in blood banks with component facility as compared to blood banks without component separation facility. Malaria positivity was found to be higher in blood banks without component separation facility.

Table 9-Transfusion Transmitted Infections by Category of Blood Banks

Category of BB	Transfusion Transmitted Infections %				
	HIV	HCV	HBV	Syphilis	Malaria
BBs with component facility	0.11	0.54	0.96	0.18	0.03
BBs without component facility	0.05	0.25	0.62	0.09	0.06
Overall	**0.10**	**0.49**	**0.90**	**0.17**	**0.04**

Figure 11 (a) – HIV Seroreactivity- By District (%)

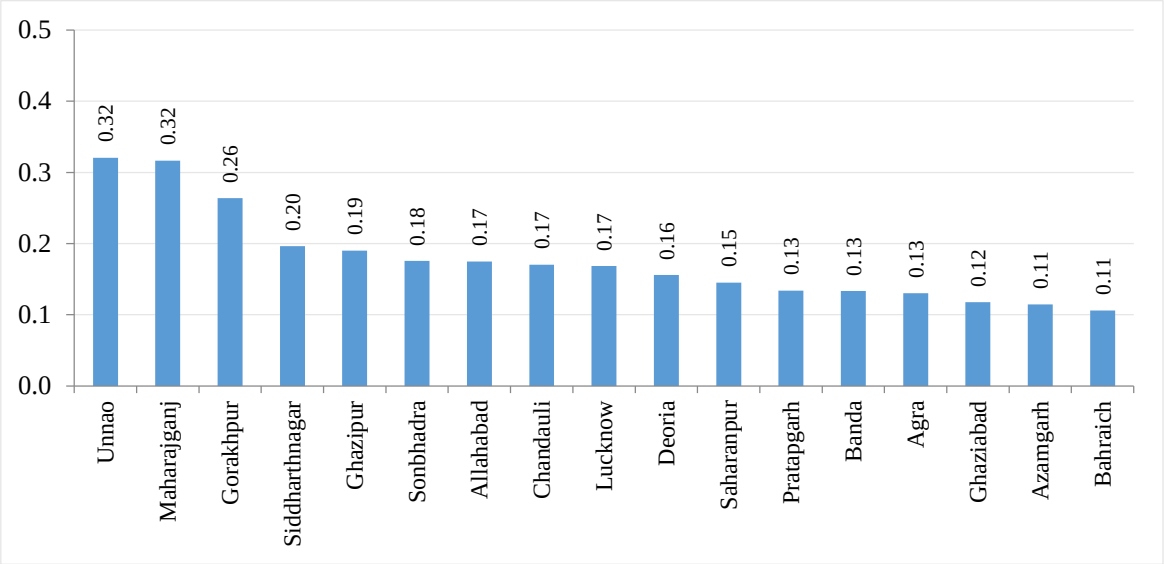
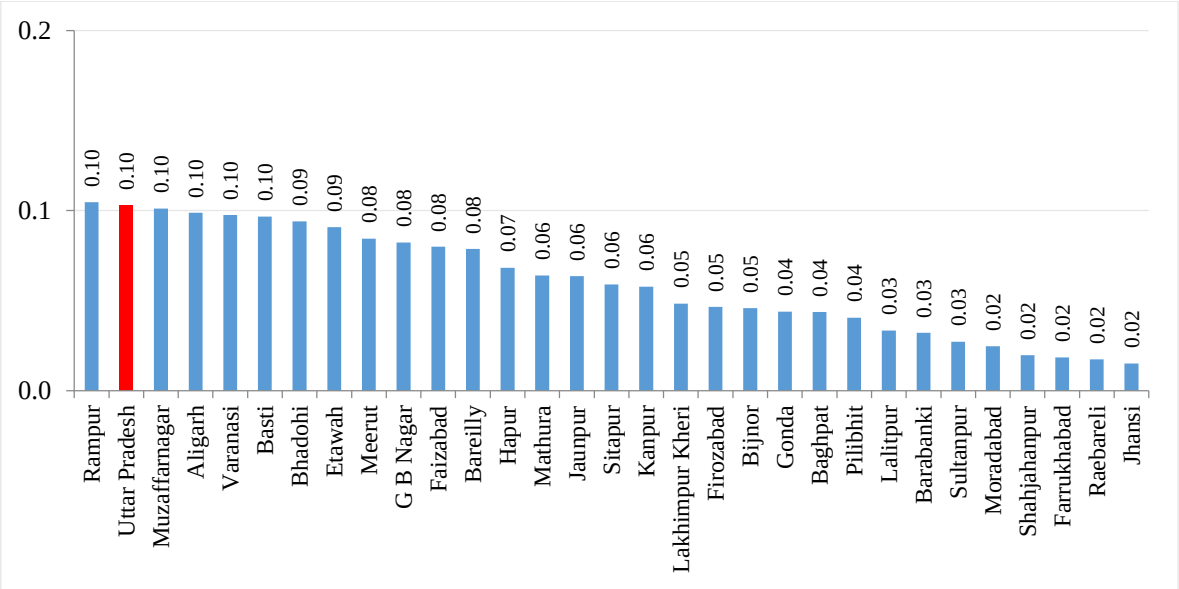


Fig -11 (b) HIV Seroreactivity- By District (%)



The most districts indicated lower HIV reactivity than the state HIV reactivity level of 0.10%. However, 18 districts where Unnao and Maharajganj recorded the highest reactivity of 0.32% followed by Gorakhpur (0.26%) and Siddharthnagar (0.20%). (Refer Fig-11 (a))

Five districts had the lowest percentage of seroreactivity which are Moradabad, Shahjahanpur, Farrukhabad, Raebareli and Jhansi at 0.02%. There were 25 districts did not report HIV reactivity amount blood donors.

Figure 12 (a) - HCV Seroreactivity- By District (%)

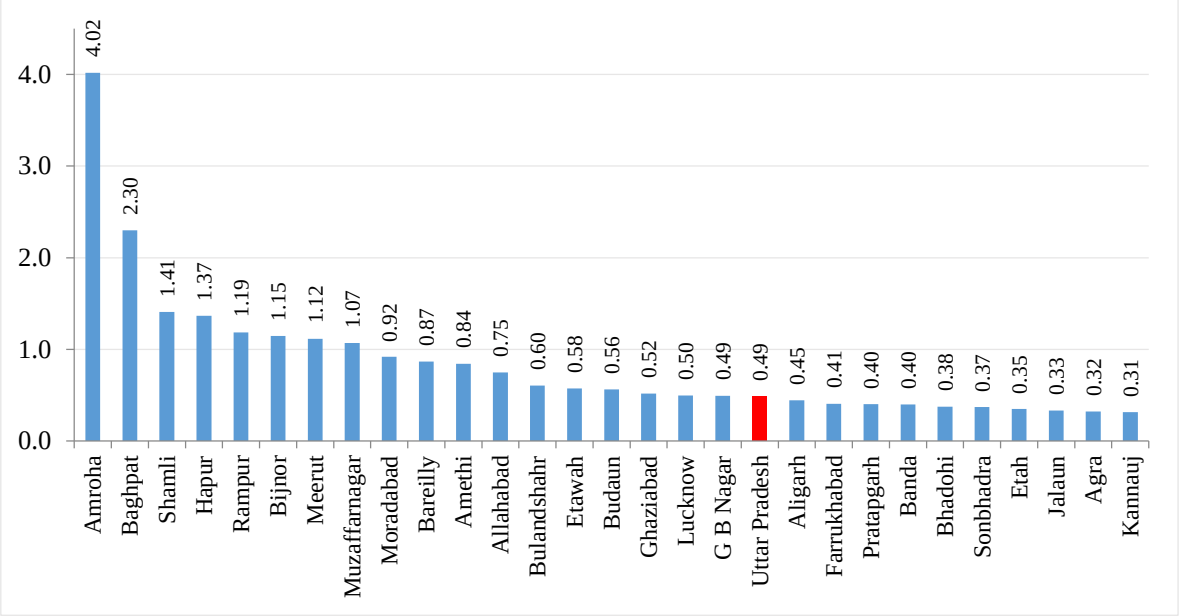
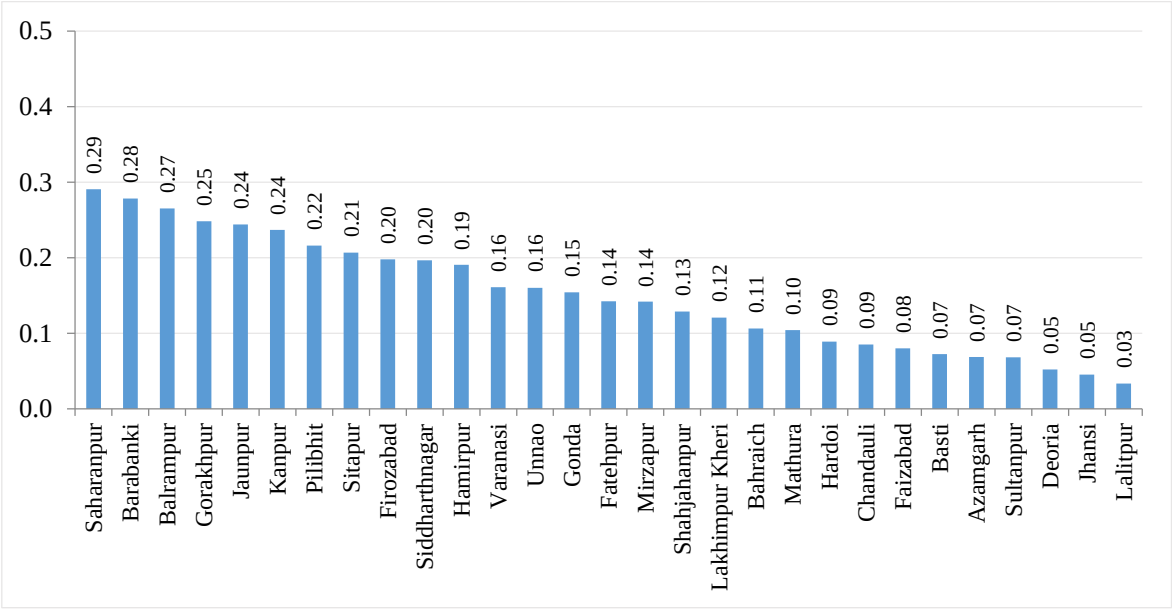


Fig -12 (b) HCV Seroreactivity- By District (%)



When considering Hepatitis C infection, 18 districts scored higher than the state average of 0.49% with Amroha district having the highest reactivity of 4.02% followed by Baghpat at 2.30%. (Refer Fig-12 (a)). Lalitpur district recorded the lowest seroreactivity of 0.03% as portrayed in Fig-12 (b).

Figure 13 (a) - HBV Seroreactivity- By District (%)

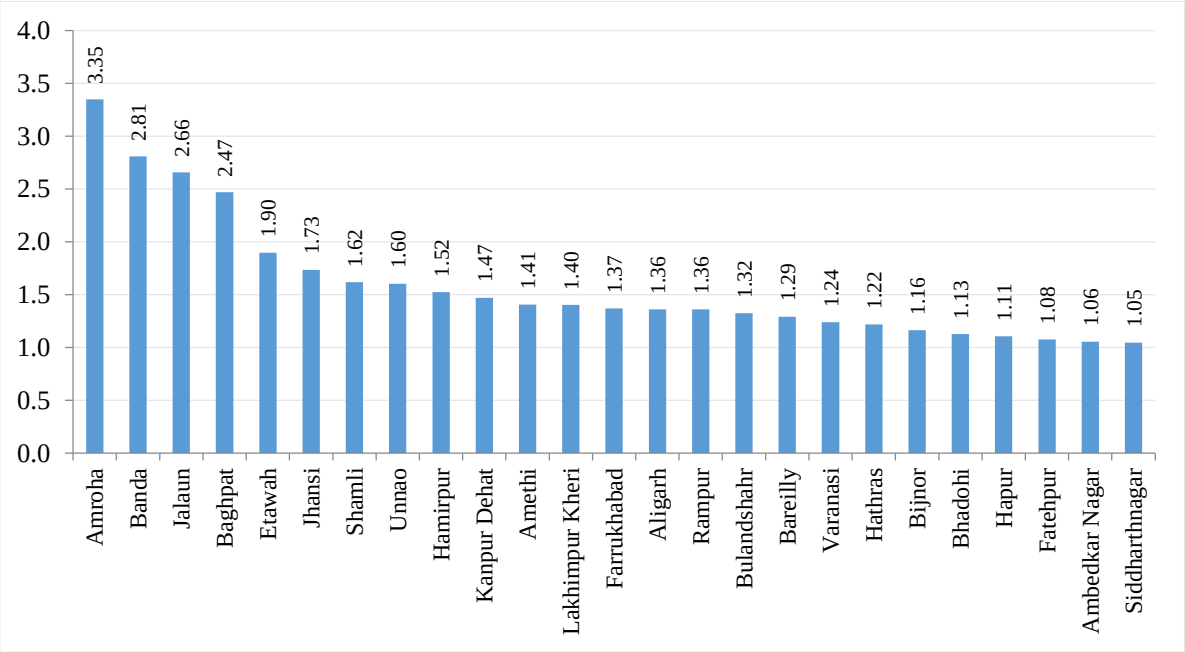
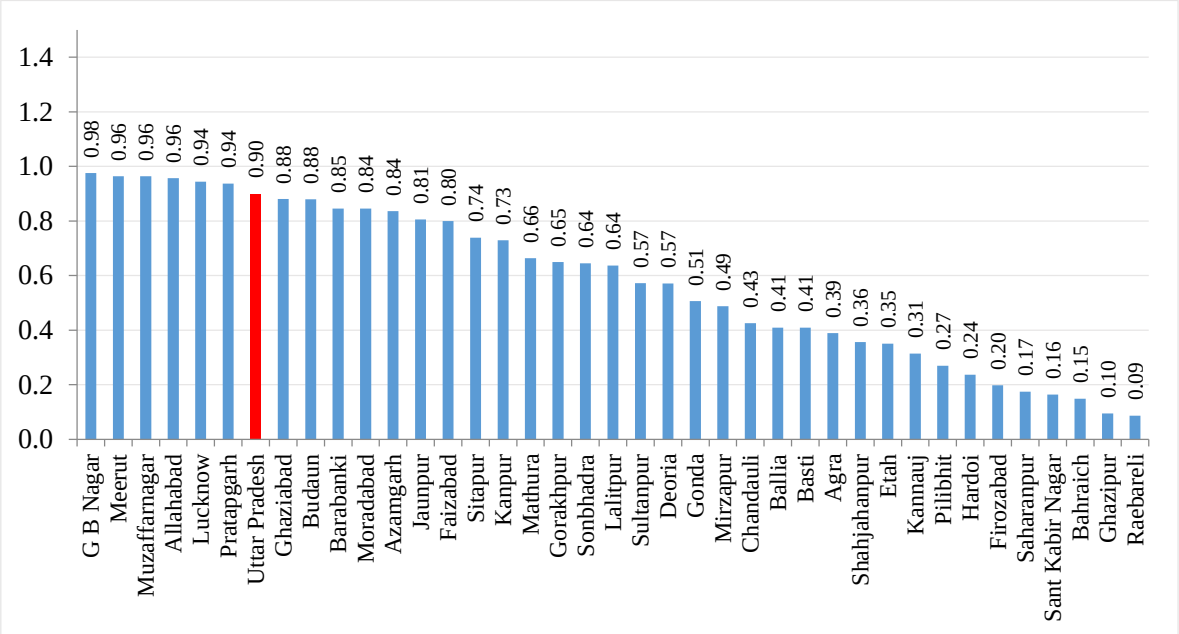


Fig-13 (b) HBV Seroreactivity- By District (%)



Hepatitis B seroreactivity was found to be higher than the state average of 0.90% in 31 districts, where Amroha recorded the highest reactivity of 3.35%. (Refer Fig-13(a)). There were 32 districts recorded less than the state average where Raebareli had the lowest reactivity of 0.09%. (Refer Fig-13(b)).

Figure 14 (a) Syphilis Seroreactivity- By District (%)

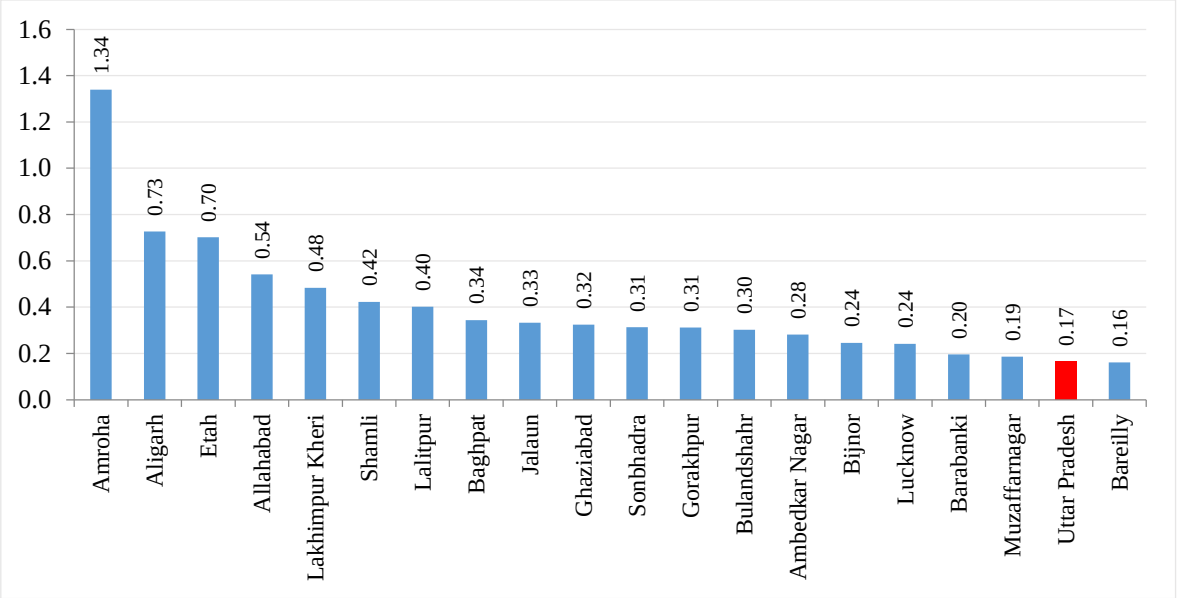
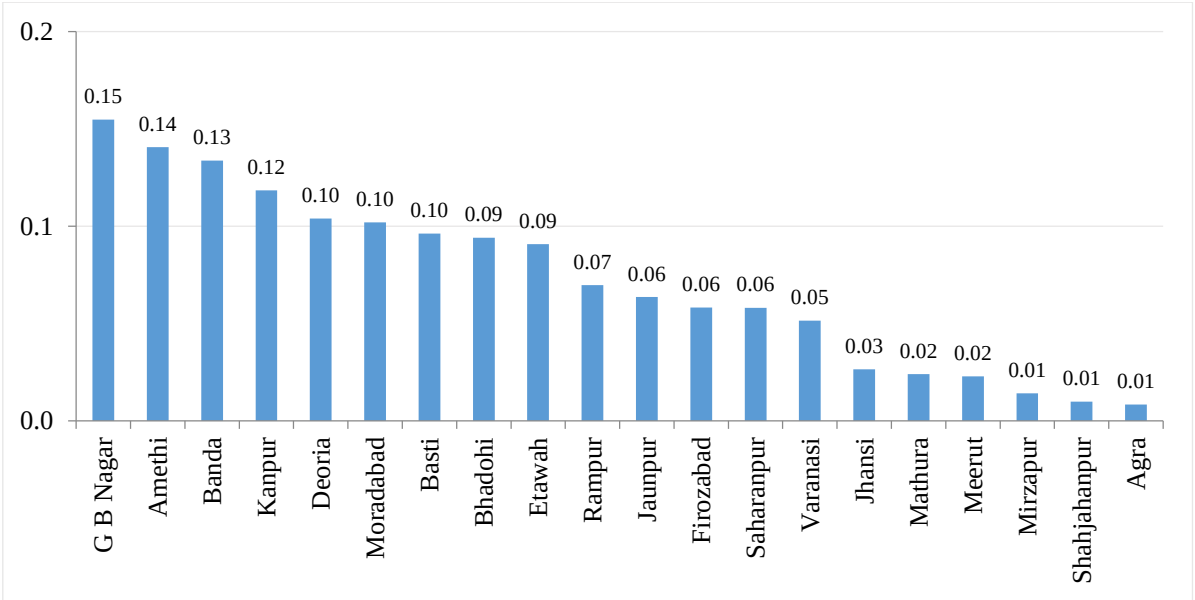
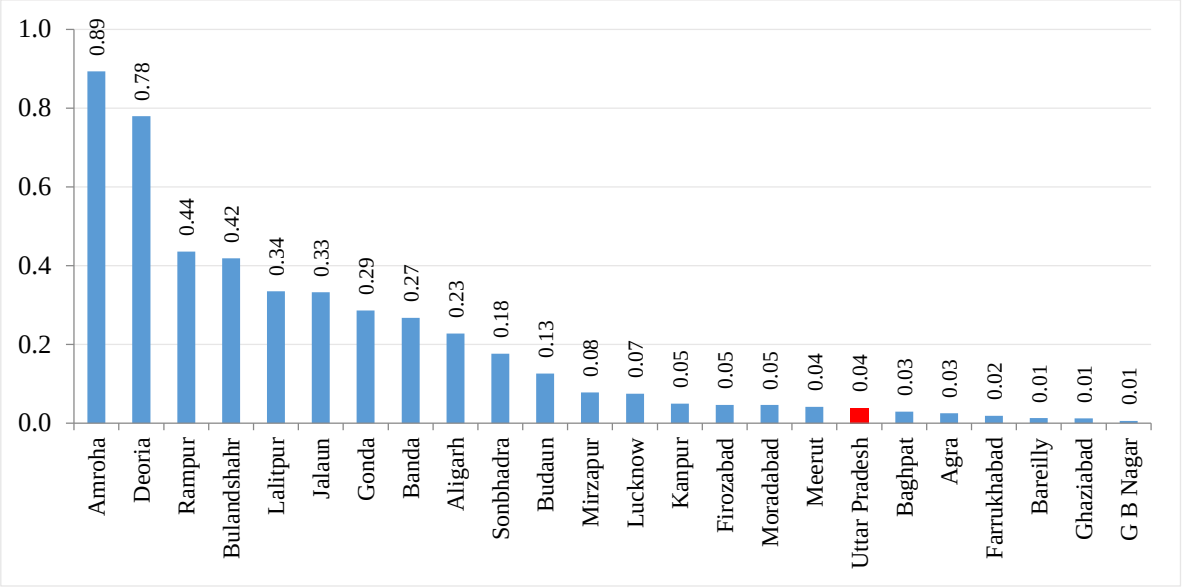


Fig -14 (b) Syphilis Seroreactivity- By District (%)



There were 18 districts in the state had recorded a higher Syphilis Seroreactivity than the state average of 0.17%. Amroha district recorded the highest reactivity of 1.34% and Agra recorded the lowest with 0.01%. 33 districts did not report syphilis reactivity amount blood donors.

Figure 15 - Malaria Positivity- By District (%)



The majority of the districts indicated a lower reactivity of Malaria than the state positivity of 0.04% whereas districts like Amroha and Deoria recorded a higher reactivity of 0.89% and 0.78% respectively. There were 49 districts did not report malaria positivity among blood donors.

4.4 Component Separation

As depicted in Figure -16, 63.4% of blood units collected by blood banks with component separation facilities, were used for component separation in state. The percentage of component separation was higher (66.5%) in Non-NACO blood banks compared to NACO supported blood banks (60.3%).

Figure 16-Total Blood Collection and Component Separation

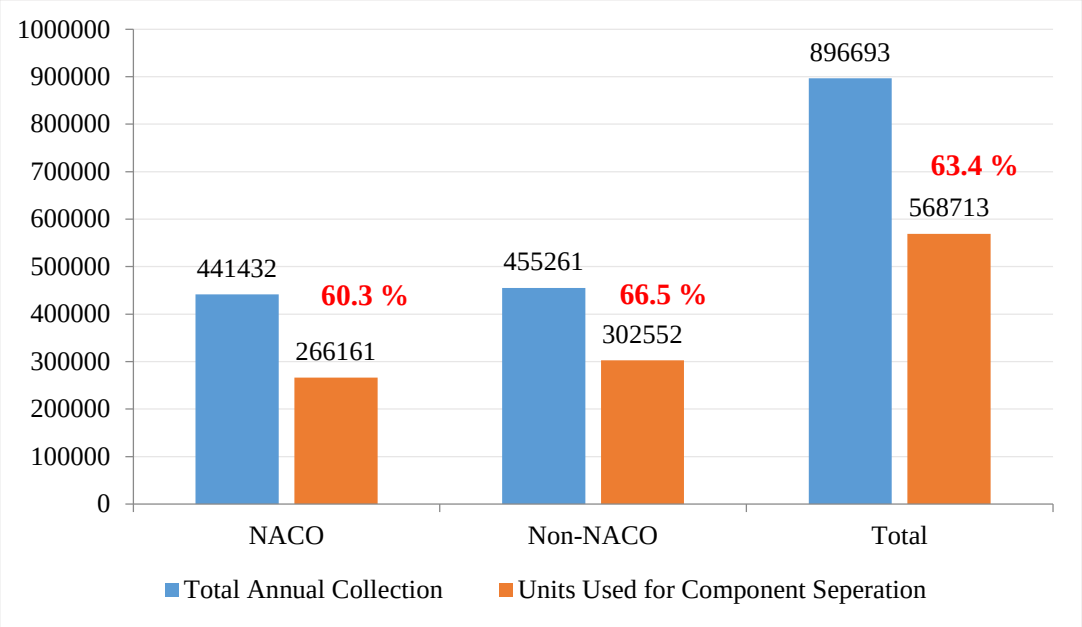


Table 10-Total Annual Collection by BCSUs and Percentage of Component Separation

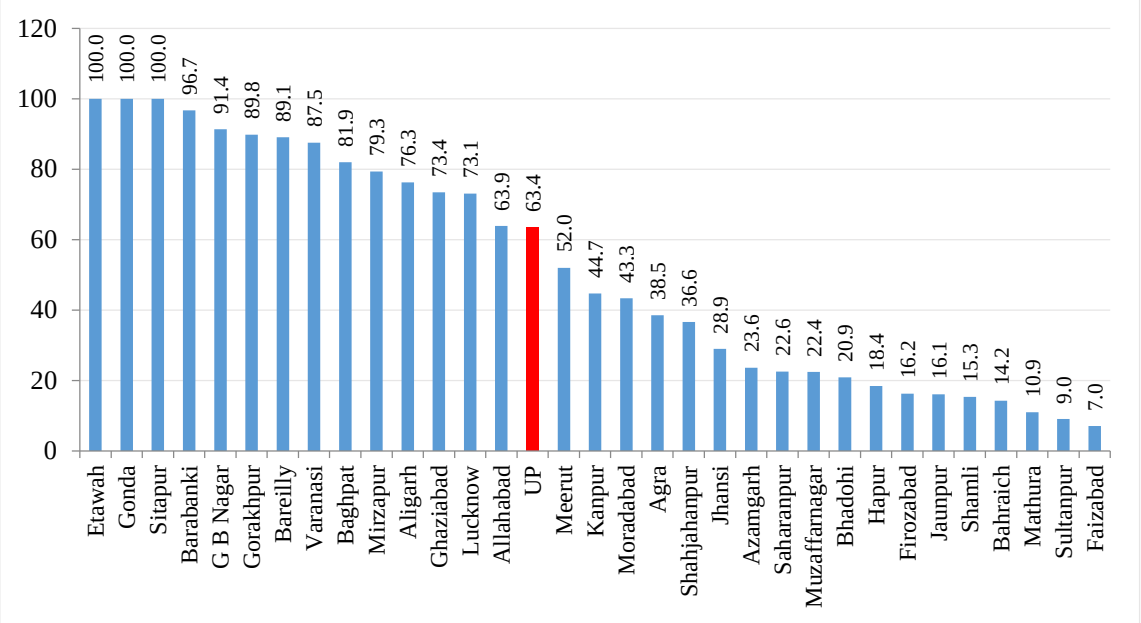
District	Total Annual Collection	Total Annual Collection By BCSUs	Percentage of Component Separation
Agra	95179	88085	38.5
Aligarh	34035	31913	76.3
Allahabad	66859	66859	63.9
Ambedkar Nagar	1420	-	-
Amethi	711	-	-
Amroha	450	-	-
Azamgarh	8732	8671	23.6
Baghpat	3445	2652	81.9
Bahraich	4712	4712	14.2
Ballia	2443	-	-
Balrampur	1131	-	-
Banda	722	-	-
Barabanki	9339	7136	96.7
Bareilly	54625	54625	89.1

Basti	4159	599	-
Bhadohi	1087	813	20.9
Bijnor	6533	-	-
Budaun	1632	-	-
Bulandshahr	4433	-	-
Chandauli	1200	-	-
Chitrakoot	23	-	-
Deoria	1925	-	-
Etah	285	-	-
Etawah	9909	6982	100.0
Faizabad	7507	7507	7.0
Farrukhabad	5400	-	-
Fatehpur	1364	-	-
Firozabad	8531	2957	16.2
G B Nagar	56113	53977	91.4
Ghaziabad	24647	23460	73.4
Ghazipur	1051	-	-
Gonda	4544	4544	100.0
Gorakhpur	44819	34174	89.8
Hamirpur	519	-	-
Hapur	7322	7322	18.4
Hardoi	3378	-	-
Hathras	1148	-	-
Jalaun	298	-	-
Jaunpur	9431	4348	16.1
Jhansi	26513	17206	28.9
Kannauj	318	-	-
Kanpur	65404	55169	44.7
Kanpur Dehat	204	-	-
Kasganj	35	-	-
Kaushambi	370	-	-
Kushinagar	872	-	-
Lakhimpur Kheri	4137	-	-
Lalitpur	2984	-	-
Lucknow	199413	191722	73.1
Maharajganj	316	-	-
Mainpuri	1127	-	-
Mathura	12139	8331	10.9
Mau	250	-	-
Meerut	69613	69613	52.0
Mirzapur	5018	5018	79.3
Moradabad	39116	28614	43.3
Muzaffarnagar	18791	15420	22.4
Pilibhit	9265	-	-
Pratapgarh	1440	-	-

Raebareli	5728	-	-
Rampur	5734	-	-
Saharanpur	10325	6780	22.6
Sambhal	1253	-	-
Sant Kabir Nagar	609	-	-
Shahjahanpur	10093	5067	36.6
Shamli	1421	1421	15.3
Siddharthnagar	1528	-	-
Sitapur	3386	94	100.0
Sonbhadra	5117	-	-
Sultanpur	7338	7338	9.0
Unnao	624	-	-
Varanasi	75654	73564	87.5
Uttar Pradesh	**1,077,196**	**896,693**	**63.4**

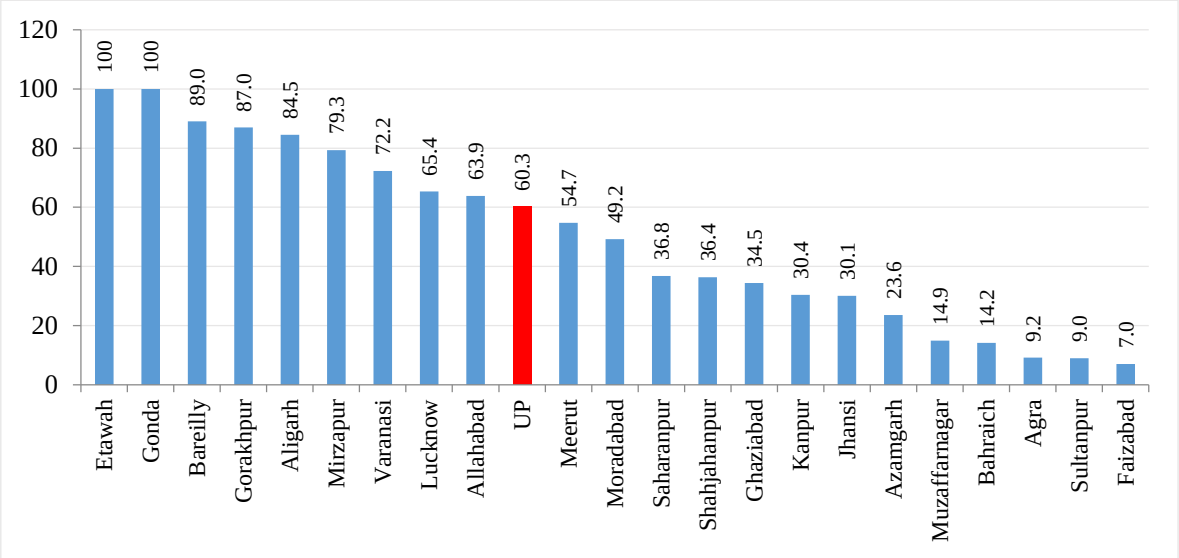
The percentage of component separation out of the total collection was 100% in three districts such as Etawah, Gonda and Sitapur. Districts such as Barabanki (96.7%), Bareilly (89.1%), G B Nagar (91.4%), Gorakhpur (89.8%) and Varanasi (87.5%) had more than 80% of component separation. There were 39 districts which didn't have any blood component separation unit facility.

Figure 17-Percentage of Component Separation- By District (All BBs)



The percentage of component separation in NACO supported blood banks is illustrated in Figure-18 which indicates nine districts recording more than the state average of 60.3 %, with two districts which are Etawah and Gonda having 100%.

Figure 18-Percentage of Component Separation- By District (NACO)



There are 49 Districts that did not have any NACO supported blood banks with component separation facility.

4.5 Quality Management Systems

Quality is defined as the totality of characteristics of an entity that bears on its ability to satisfy the stated and implied needs (Schlickman, 1998). It is a spectrum of activities and processes that shape the characteristics of a product or service. Quality systems are defined as the organizational structure, resources, processes, and procedures needed to implement quality management (ISO-8402, 1994) and Quality Management System is the sum total of all business policies, processes and procedures required for the execution of production, development or service of an organization.

Blood transfusion is a multi-step process with the risk of error in each process from selecting donors, collecting and processing donations, testing of donor and patient samples, issue of compatible blood, to transfusing the patient (WHO, 2016a). An effectively planned and implemented quality system that includes internal quality assessment, external quality assessment, and education and training of staff can significantly reduce the risk associated with blood transfusion.

The assessment captured several parameters that influence the quality of service provision. Some of the key parameters are mentioned in Table -11. Availability of document control system was reported by 48.2% of the blood banks in the state of which comprised of 34.8% of NACO supported blood banks and 55.7% of Non-NACO blood banks. In terms of Standard Operating Procedures (SOPs) for technical processes, around 98% reported that they had SOPs.

Table 11-Availability of Quality Parameters in Blood Banks

Quality Parameters	NACO/NON-NACO		All Blood Banks (n=247)
	NACO Supported (n=89)	Non-NACO (n=158)	
Compliance with NBTC guidelines	85	128	213
	95.5%	81.0%	86.2%
Availability of Documental Control System (DCS)	31	88	119
	34.8%	55.7%	48.2%
SOPs for Technical Processes	87	157	244
	97.8%	99.4%	98.8%
IQC for IH	47	123	170
	52.8%	77.8%	68.8%
IQC for TTI	48	79	127
	53.9%	50.0%	51.4%
QC for kits, reagents and blood bags	57	144	201
	64%	91%	81.4%
EQAS for IH	4	9	13
	4.5%	5.70%	5.30%
EQAS for TTI	4	11	15
	4.5%	7.0%	6.1%
NABH accreditation for blood banks	0	2	2
	0.0%	1.3%	0.8%
Availability of designated and trained Quality Manager	15	78	93
	16.90%	49.40%	37.70%
Availability of designated and trained Technical Manager	24	104	128
	27.00%	65.80%	51.80%
Programme for regular Equipment maintenance	55	150	205
	61.8%	94.9%	83.0%
Equipment calibration as per regulatory requirement	49	152	201
	55.1%	96.2%	81.4%

At the state level, Internal Quality Control (IQC) for Immunohematology was reported by around 68% of the blood banks and IQC for TTIs was reported by 51.4% of the blood banks, with slight variation of four percent between NACO supported and Non-NACO blood banks. Around 81% of the blood banks reported carrying out quality control for kits, reagents and blood bags. The percentage of blood banks enrolled in EQAS by recognized providers was found to be only 5.3% for immunohematology and 6.1% for TTIs. Only 2 blood banks out of the total 247 blood banks that participated in the assessment were accredited by National Accreditation Board for Hospitals & Healthcare Providers (NABH).

Designated and trained Quality Managers and Technical managers were available only in 37.7% and 51.8% of the blood banks respectively. 83% of the blood banks reported that they

had a regular equipment maintenance programme and around 81% reported that they calibrate the equipment as per requirement.

4.6. Reporting and Documentation

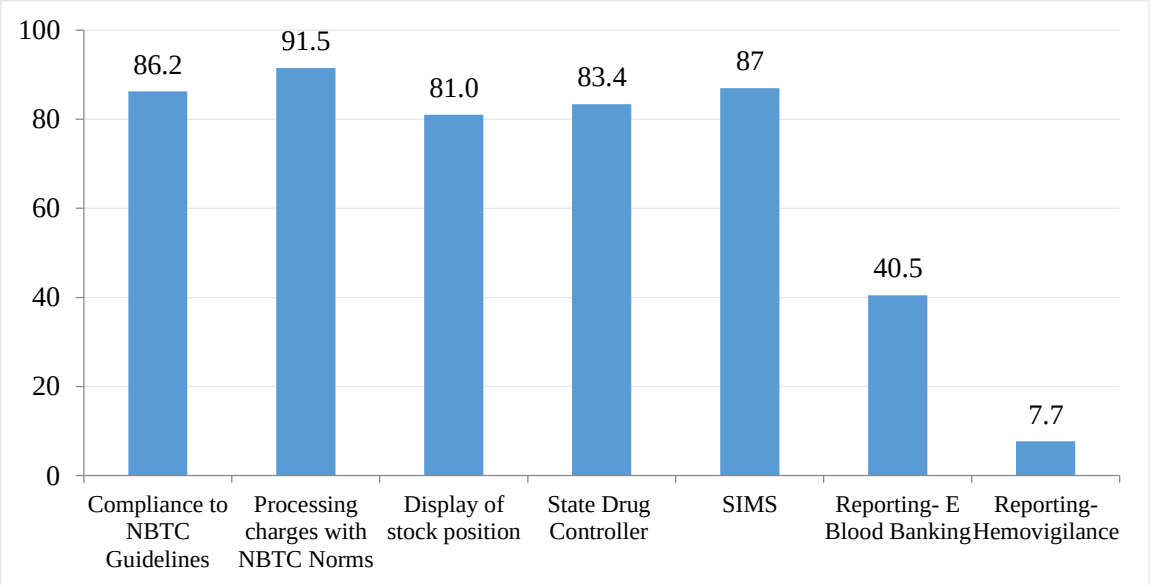
4.6.1. Compliance to NBTC guidelines

Majority of the blood banks (86.2%) reported to be compliant with NBTC guidelines. Around, 91% of Blood Banks reported that they were recovering processing charges within NBTC/SBTC norms. 81% of the blood banks reported that they were displaying stock position in their Blood bank Premises.

4.6.2. Reporting requirements

In terms of reporting requirement, around 83% of the blood banks submitted regular reports to state drug controller, 87% of blood banks regularly reported in national strategic information management systems (SIMS). 40.5% of the blood banks regularly reported in E-blood banking either at national or state level and only 7.7% of blood banks were members of National Haemovigilance Program.

Figure 19-Reporting and Documentation

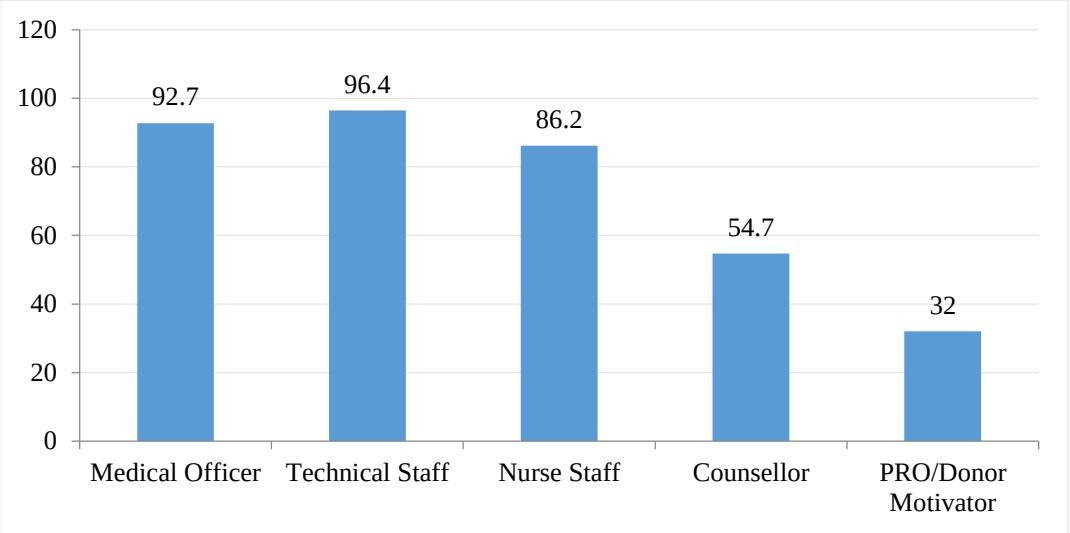


4.7. Human Resources

4.7.1. Availability of staff

The mean number of employees in the blood bank was 11.6 (SD 8.1). It ranges from one employee to 52 employees. Around 92% of blood banks reported to have medical officers, 96.4% and 86.2% of the blood banks had technical staff and nursing staff respectively. However, only 54.7% recorded to have counsellors and 32% had PRO/Donor motivators.

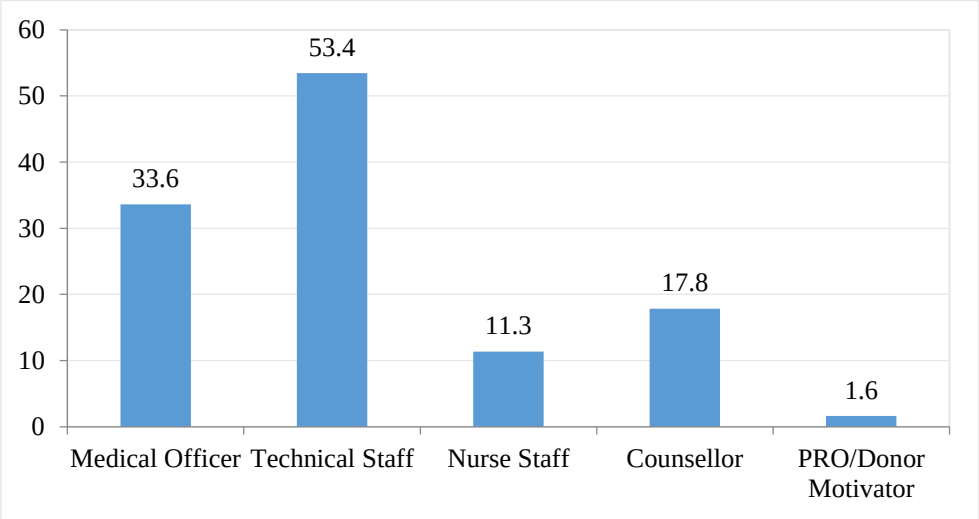
Figure 20-Percentage of BB Manpower (At least one)



4.8. Training of Blood Bank Personnel

According to the assessment, around 33% of the blood banks reported that they had at least one medical officer trained by NACO/NBTC; 53.4% blood banks reported they had trained technical staff, 17.8% had trained counsellors and only 11.3% and 1.6% blood banks reported having trained nursing staff and PRO/donor motivators respectively.

Figure 21-Percentage of BBs having at least one trained

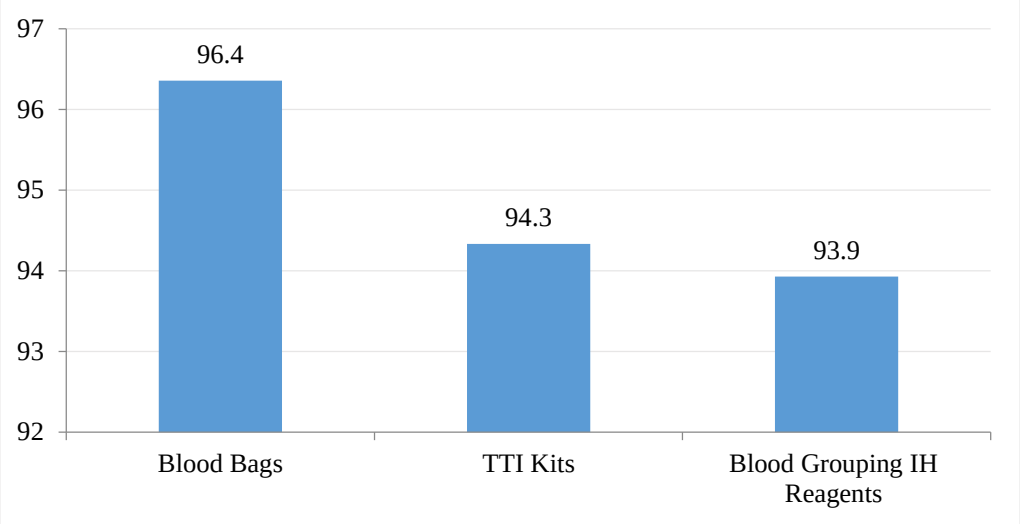


4.9. Equipment and Supplies

4.9.1. Regular supply kits/supplies

Majority of blood banks (96.4%) reported that they had regular supply of blood bags, 94.3% reported that they had regular supply of TTI kits and 93.9% reported to have regular supply of blood grouping reagents.

Figure 22-Regular Supply of Kits



4.9.2. Equipment Availability (working condition)

Table 12 indicates the percentage of blood banks that have different equipment in working condition.

Table 12-BBs having Equipment in working condition

Sl No	Equipment	% BB
1	Donor Couches	98.0
2	Instrument for Hb Estimation	92.3
3	Blood collection monitor	96.8
4	Quarantine Blood Bank Refrigerator to store untested blood	96.4
5	Container for safe disposal of sharps	92.3
6	Oxygen supply equipment	96.4
7	Computers with accessories and software	85.8
8	General lab centrifuge for samples	85.8
9	Bench top centrifuge for serological testing (Immunohaematology)	86.6
10	Blood transportation box (No. in inventory)	80.6
11	Emergency drugs box / Crash cart	96.4
12	Autoclave machine	93.9
13	Water bath	93.5
14	Blood bank refrigerator (storage of tested blood) with temperature recorder	98.0
15	Automated pipettes	89.9
16	Refrigerated centrifuge	60.3
17	Blood container weighting device	83.4
18	Serology rotator	86.6

4.10. The current status of blood banks based on the assessment

As mentioned in the methodology section, the blood banks were assessed and categorized based on the scores obtained. Though the assessment captured all aspects of blood transfusion services in blood banks, adequate importance and weightage were given to technical aspects and adherence to quality management systems.

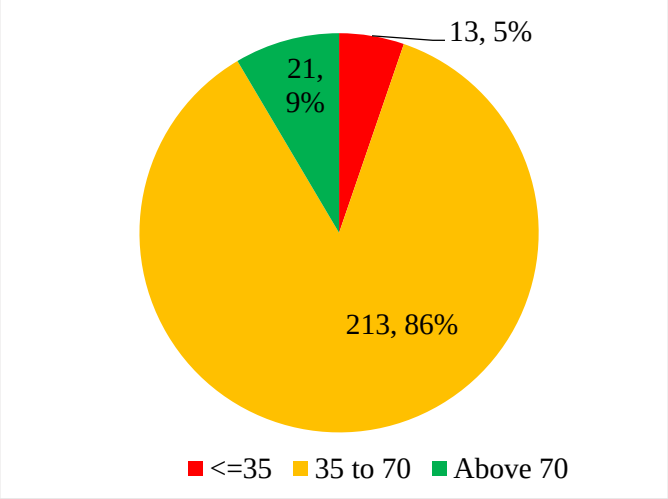
The mean assessment score of blood banks in the state was 56.49 (SD: 11.49). The Non-NACO blood banks scored slightly higher (58.74; SD: 10.45) than the NACO supported blood banks (52.49; SD: 12.19).

Table 13-Mean Assessment score

Types of BB	N	Mean	SD
NACO Supported	89	52.49	12.19
Non-NACO	158	58.74	10.45
Total	**247**	**56.49**	**11.49**

At the state level, the majority of blood banks (213; 86%) scored between 35 to 70, followed by (21; 9%) which scored above 70, and 5 % (13) of blood banks scored less than or equal to 35.

Figure 23-Categorisation of Blood banks (n=247)



Around 82% of NACO supported and 89% Non-NACO blood banks scored between 35 and 70. Around, 7% of NACO supported blood banks and 9% of Non-NACO blood banks scored more than 70%. (Refer Figure 24; Figure 25). Only three Non-NACO blood bank and 10 NACO supported blood banks scored below 35.

Figure 24 - Categorisation of NACO Supported BBs (n=89)

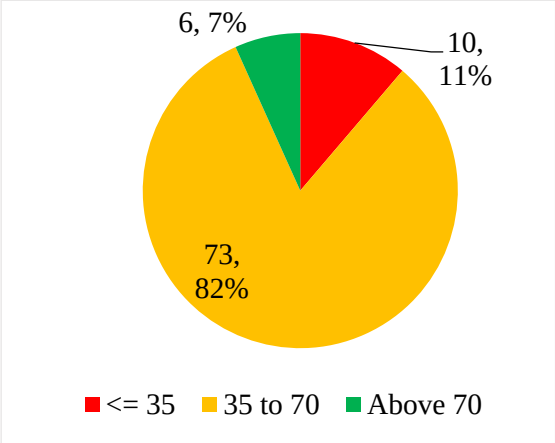
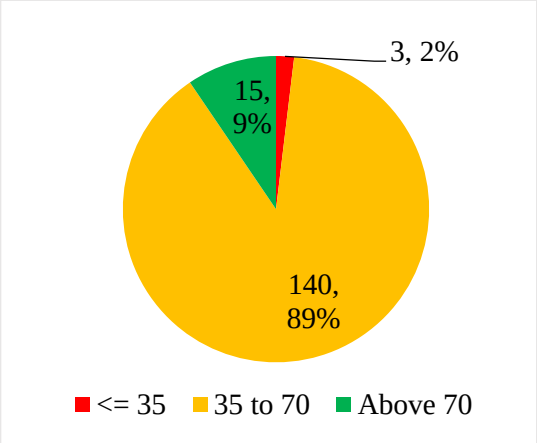
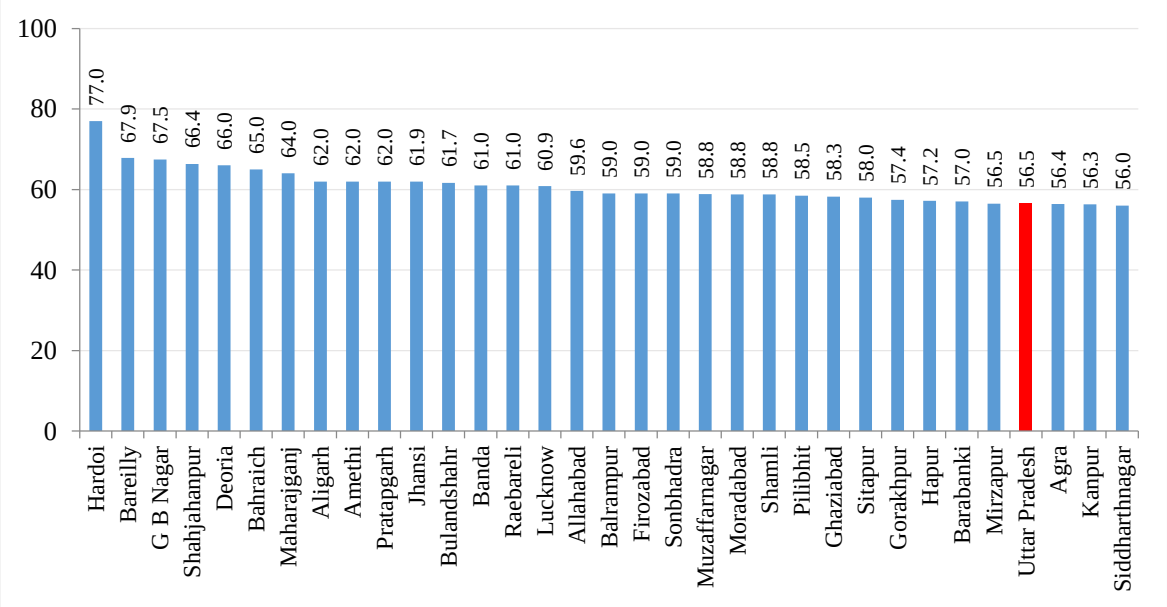


Figure 25 - Categorisation of Non-NACO BBs (n=158)



Among the districts, Hardoi (77) scored the highest and Jalaun (22) scored the least. 29 districts scored above the state average of 56.5. (Refer-26 (a)). More than half of the blood banks (53.8%) were located in these districts.

Fig-26 (a) Mean Assessment Score > 55– By Districts (All BBs)



The mean scores of NACO supported blood banks were higher than the Non-NACO blood banks in 10 districts. The difference in the score was more than 5 in NACO supported blood banks in seven districts which are Aligarh, Azamgarh, Bhadohi, Farrukhabad, Jaunpur, Lucknow and Mathura.

Fig-26 (b) Mean Assessment Score <= 55– By Districts (All BBs)

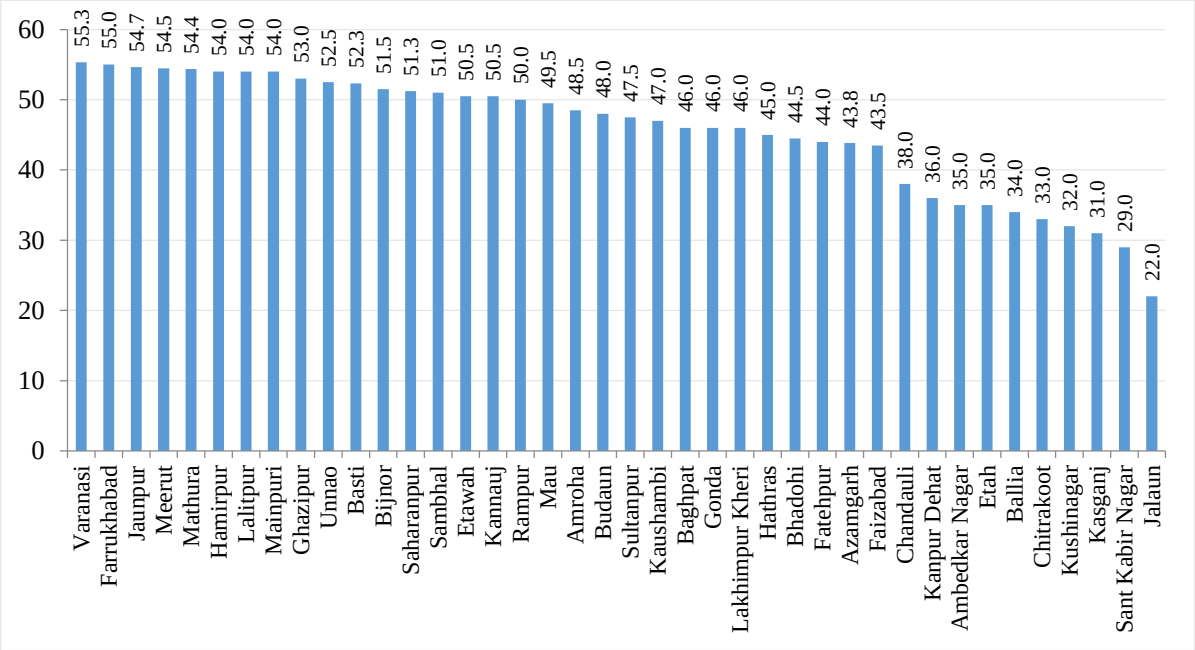


Table 14-Mean assessment score - By District (NACO supported Vs. Non-NACO)

District	NACO Supported	Non-NACO	Total
Agra	52.0	57.2	56.4
Aligarh	67.3	59.9	62.0
Allahabad	59.6	-	59.6
Ambedkar Nagar	30.0	40.0	35.0
Amethi	-	62.0	62.0
Amroha	36.0	61.0	48.5
Azamgarh	49.5	41.0	43.8
Baghpat	38.0	54.0	46.0
Bahraich	65.0	-	65.0
Ballia	34.0	-	34.0
Balrampur	59.0	-	59.0
Banda	61.0	-	61.0
Barabanki	48.0	61.5	57.0
Bareilly	62.3	70.1	67.9
Basti	52.5	52.0	52.3
Bhadohi	51.0	38.0	44.5
Bijnor	47.0	56.0	51.5
Budaun	48.0	-	48.0
Bulandshahr	64.0	60.5	61.7
Chandauli	38.0	-	38.0
Chitrakoot	33.0	-	33.0
Deoria	66.0	-	66.0

Etah	35.0	-	35.0
Etawah	49.3	53.0	50.5
Faizabad	43.5	-	43.5
Farrukhabad	64.0	46.0	55.0
Fatehpur	35.0	53.0	44.0
Firozabad	56.0	59.8	59.0
G B Nagar	63.0	67.8	67.5
Ghaziabad	43.0	59.5	58.3
Ghazipur	53.0	-	53.0
Gonda	46.0	-	46.0
Gorakhpur	58.0	57.3	57.4
Hamirpur	54.0	-	54.0
Hapur	-	57.2	57.2
Hardoi	77.0	-	77.0
Hathras	45.0	-	45.0
Jalaun	22.0	-	22.0
Jaunpur	61.0	51.5	54.7
Jhansi	61.0	62.3	61.9
Kannauj	50.5	-	50.5
Kanpur	56.5	56.3	56.3
Kanpur Dehat	-	36.0	36.0
Kasganj	31.0	-	31.0
Kaushambi	47.0	-	47.0
Kushinagar	32.0	-	32.0
Lakhimpur Kheri	46.0	-	46.0
Lalitpur	54.0	-	54.0
Lucknow	66.0	59.7	60.9
Maharajganj	64.0	-	64.0
Mainpuri	54.0	-	54.0
Mathura	64.0	52.8	54.4
Mau	48.0	51.0	49.5
Meerut	45.5	56.7	54.5
Mirzapur	56.5	-	56.5
Moradabad	50.5	61.6	58.8
Muzaffarnagar	53.0	61.8	58.8
Pilibhit	49.0	68.0	58.5
Pratapgarh	62.0	-	62.0
Raebareli	61.0	-	61.0
Rampur	43.0	57.0	50.0
Saharanpur	47.0	52.7	51.3
Sambhal	-	51.0	51.0
Sant Kabir Nagar	29.0	-	29.0
Shahjahanpur	63.5	67.3	66.4
Shamli	-	58.8	58.8

Siddharthnagar	56.0	-	56.0
Sitapur	55.0	59.5	58.0
Sonbhadra	46.0	72.0	59.0
Sultanpur	47.5	-	47.5
Unnao	53.0	52.0	52.5
Varanasi	52.4	57.7	55.3
Uttar Pradesh	**52.5**	**58.7**	**56.5**

There were 13 blood banks in the state scored less than or equal to 35 out of which 10 were NACO supported blood banks and 3 were Non NACO blood banks.

Table 15-Number of Blood Banks Scored <=35 - by District

District	NACO Supported	Non-NACO	Total
Ambedkar Nagar	1	-	1
Azamgarh	-	1	1
Ballia	1	-	1
Chitrakoot	1	-	1
Etah	1	-	1
Fatehpur	1	-	1
Ghaziabad	-	2	2
Jalaun	1	-	1
Kasganj	1	-	1
Kushinagar	1	-	1
Sant Kabir Nagar	1	-	1
Varanasi	1	-	1
Uttar Pradesh	**10**	**3**	**13**

The number of blood banks (by district) that scored more than 70 is mentioned in Table-16. Of the 21 blood banks that scored more than 70 score, 15 (71.4%) were Non-NACO blood banks. The majority of blood banks that scored above 70 were from G B Nagar (5) followed by Bareilly with three blood banks, Ghaziabad, Lucknow and Moradabad with two blood banks each. These 5 districts constitute around 66% of the total blood banks that scored more than 70.

Table 16- Number of Blood Banks Scored above 70- by District

District	NACO Supported	Non-NACO	Total
Aligarh	1	-	1
Allahabad	1	-	1
Bareilly	1	2	3
G B Nagar	-	5	5
Ghaziabad	-	2	2
Hardoi	1	-	1
Jhansi		1	1
Lucknow	2	-	2
Moradabad	-	2	2
Shahjahanpur	-	1	1
Sonbhadra	-	1	1
Varanasi	-	1	1
Uttar Pradesh	6	15	21

4.10.1 Assessment score by Category of blood banks: The mean score of blood banks with component facilities (58.91; SD: 11.27) was found to be higher than the mean score of those without component facilities (53.32; SD: 11.03).

Table 17-Mean assessment score by category of blood banks

Type of Blood Bank	NACO Supported			Non-NACO			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
BCSUs	40	55.94	11.45	100	60.10	11.03	140	58.91	11.27
Without BCSU	49	49.67	12.16	58	56.40	8.98	107	53.32	11.03

Among the blood banks that scored <=35, there were only 3 (2%) blood banks with component separation facility and 10 (9%) blood banks without component separation facility. (Refer Figure 27 and 28). Around 13% of blood banks with component preparation facility scored more than 70, as compared to 3% of blood banks without component facility.

Fig -27 BBs with Component-Score (n=140)

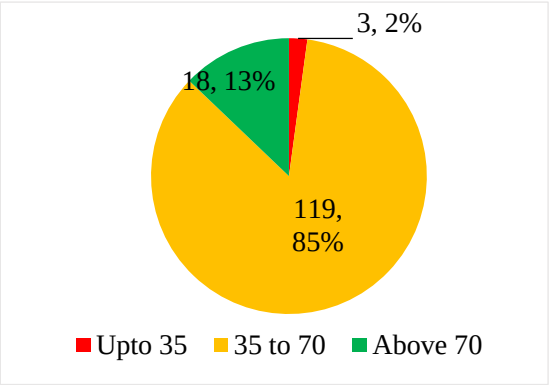
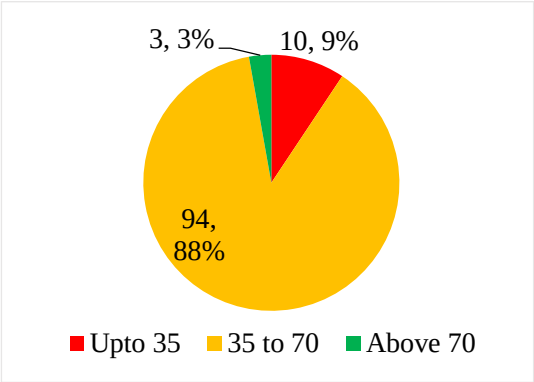


Fig -28 BBs without Component-Score (n=107)



4.10.2 Assessment score by Ownership: The mean assessment score of private owned blood banks (59.88; SD: 10.81) was found to be slightly higher than the not-for-profit (59.28, SD: 8.83) and public (51.06 SD: 12.04) (Refer Table 18).

However, NACO supported blood banks run by not-for-profit sector had scored higher (65.30; SD: 11.39) compared to Non-NACO blood banks NGO/Trust/Charitable blood banks (58.83; SD: 8.55).

Table 18-Mean assessment score by Ownership

Ownership	NACO Supported			Non-NACO			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
NGO/Trust/ charitable	5	65.30	11.39	67	58.83	8.55	72	59.28	8.83
Private	0	-	-	85	59.88	10.81	85	59.88	10.81
Public	84	51.73	11.87	6	41.67	11.33	90	51.06	12.04

Table 19-Mean Assessment Scores Categories by Ownership

Ownership	<=35	36 to 70	Above 70	Total
Public	11	75	4	90
	12.2%	83.3%	4.4%	100
NGO/Trust/Charitable	1	64	7	72
	1.4%	88.9%	9.7%	100
Private	1	74	10	85
	1.2%	87.1%	11.8%	100
Overall	**13**	**213**	**21**	**247**
	5.3%	**86.2%**	**8.5%**	**100.0**

4.10.3 Assessment score of Private Sector Blood Banks: Irrespective of the NACO support status, 63.6% (157) blood banks were owned by private sector, of which, 72 (45.9%) were owned by not-for-profit sector such as, NGO, Trust, and charitable organizations. The mean score of private sector owned blood banks including not-for-profit sector was 59.60 (SD: 9.93) and the mean score of public owned blood banks was 51.06 (SD 12.04). Among the private sector, private sector (59.88 SD: 10.81) scored slightly higher than not-for-profit sector (59.28; SD: 8.83).

Nevertheless, it is also important to note that the average annual collection was slightly higher in public owned blood banks (4,930 units) compared to private blood banks (4,346 Units). Similarly, the percentage of voluntary blood donation was higher in public owned blood banks (62.3%) compared to the private blood banks (22.8%). Of the total private blood banks, 65.6% (103) had component separation facility whereas 41.1% (37) of public blood banks had component separation facility.

4.10.4 Assessment score by Annual Collection: The mean assessment score of blood banks that collected more than 5000 blood units (61.42; SD: 10.56) was found to be higher than those which collected between 3001 to 5000 (60.13; SD: 10.23) and less than 3000 blood units (53.95; SD: 11.31).

Table 20-Mean Assessment Score by Annual Collection

Annual Collection	NACO supported		Non-NACO		Total	
	Mean	SD	Mean	SD	Mean	SD
Up to 3000	47.82	11.22	57.30	9.93	53.95	11.31
3001 to 5000	53.38	10.32	63.37	8.60	60.13	10.23
Above 5000	60.07	10.93	62.59	10.26	61.42	10.56

4.10.5 Assessment score by Voluntary Blood Donation: Table -21 provides the mean assessment score of blood banks that have been categorized by percentage of voluntary blood donation which does not indicate any pattern.

Table 21-Mean Assessment Score by Voluntary Blood Donation

% VBD	NACO supported		Non-NACO		Total	
	Mean	SD	Mean	SD	Mean	SD
Less than 25	49.45	13.86	58.64	11.13	56.97	12.14
25 to 49	57.30	15.36	60.40	8.50	59.54	10.69
50 to 74	50.19	11.62	61.37	7.71	55.60	11.29
75 to 90	52.14	8.42	64.00	3.08	54.68	9.03
Above 90	55.50	12.36	62.10	8.25	56.82	11.81

4.10.6 Assessment score by participation in External Quality Assessment Scheme (EQAS) for Immunohematology and Transfusion Transmitted Infections (TTI): The mean score was found to be higher among the blood banks that were part of EQAS for immunohematology (77.19; SD: 4.36) as compared to those who were not enrolled (55.34 SD: 10.63). Similar situation was found among those blood banks that were part of EQAS for Transfusion-Transmitted Infections (77.43; SD: 4.19) as compared to those who were not enrolled (55.13; SD: 10.45).

Although more number of Non-NACO blood banks were enrolled in IH and TTI-EQAS, NACO supported blood banks had higher scores under IH-EQAS (79.50; SD: 3.11) and TTI-EQAS (79.50; SD: 3.11).

Table 22-Mean Assessment Score by EQAS Enrolment

IH-EQAS	NACO supported			Non-NACO			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
YES	4	79.50	3.11	9	76.17	4.58	13	77.19	4.36
NO	85	51.22	10.91	149	57.69	9.75	234	55.34	10.63
TTI-EQAS									
YES	4	79.50	3.11	11	76.68	4.40	15	77.43	4.19
NO	85	51.22	10.91	147	57.40	9.49	232	55.13	10.45

4.10.7 Assessment score by Accreditation status: Uttar Pradesh has only two blood banks accredited by National Accreditation Board of Hospitals and Health care Providers (NABH). The mean assessment score was found to be higher among blood banks that were accredited by NABH (82.75; SD:1.77) in comparison to those that were not accredited (56.27; SD:11.28)

Table 23-Mean Assessment Score by Accreditation

NABH Accreditation	NACO supported			Non-NACO			Total		
	N	Mean	SD	N	Mean	SD	N	Mean	SD
YES	0	-	-	2	82.75	1.77	2	82.75	1.77
NO	89	52.49	12.19	156	58.43	10.15	245	56.27	11.28

The list of blood banks under different categories of score is given in Tables 24 and 25

Table 24-Distribution of Blood Banks by Districts and Mean Assessment Score Categories

	Score Category			
District	Up to 35	35 to 70	Above 70	Total
Agra	-	14	-	14
Aligarh	-	6	1	7
Allahabad	-	3	1	4
Ambedkar Nagar	1	1	-	2
Amethi	-	1	-	1
Amroha	-	2	-	2
Azamgarh	1	2	-	3
Baghpat	-	2	-	2
Bahraich	-	1	-	1
Ballia	1	-	-	1
Balrampur	-	1	-	1
Banda	-	1	-	1
Barabanki	-	3	-	3
Bareilly	-	4	3	7
Basti	-	3	-	3
Bhadohi	-	2	-	2
Bijnor	-	2	-	2
Budaun	-	1	-	1
Bulandshahr	-	3	-	3
Chandauli	-	1	-	1
Chitrakoot	1	-	-	1
Deoria	-	1	-	1
Etah	1	-	-	1

Etawah	-	3	-	3
Faizabad	-	1	-	1
Farrukhabad	-	2	-	2
Fatehpur	1	1	-	2
Firozabad	-	5	-	5
G B Nagar	-	8	5	13
Ghaziabad	2	9	2	13
Ghazipur	-	1	-	1
Gonda	-	1	-	1
Gorakhpur	-	8	-	8
Hamirpur	-	1	-	1
Hapur	-	3	-	3
Hardoi	-	-	1	1
Hathras	-	1	-	1
Jalaun	1	-	-	1
Jaunpur	-	3	-	3
Jhansi	-	6	1	7
Kannauj	-	2	-	2
Kanpur	-	14	-	14
Kanpur Dehat	-	1	-	1
Kasganj	1		-	1
Kaushambi	-	1	-	1
Kushinagar	1	-	-	1
Lakhimpur Kheri	-	1	-	1
Lalitpur	-	1	-	1
Lucknow	-	24	2	26
Maharajganj	-	1	-	1
Mainpuri	-	1	-	1
Mathura	-	7	-	7
Mau	-	2	-	2
Meerut	-	10	-	10
Mirzapur	-	1	-	1
Moradabad	-	6	2	8
Muzaffarnagar	-	3	-	3
Pilibhit	-	2	-	2
Pratapgarh	-	1	-	1
Raebareli	-	1	-	1
Rampur	-	2	-	2
Saharanpur	-	4	-	4
Sambhal	-	1	-	1
Sant Kabir Nagar	1	-	-	1
Shahjahanpur	-	3	1	4
Shamli	-	2	-	2
Siddharthnagar	-	1	-	1

Sitapur	-	3	-	3
Sonbhadra	-	1	1	2
Sultanpur	-	1	-	1
Unnao	-	2	-	2
Varanasi	1	7	1	9
Uttar Pradesh	**13**	**213**	**21**	**247**

Table 25-Distribution of Blood Banks by Districts and Mean Assessment Score Categories

District	NACO Supported			Non-NACO		
	Up to 35	35 to 70	Above 70	Up to 35	35 to 70	Above 70
Agra	-	2	-	-	12	-
Aligarh	-	1	1	-	5	-
Allahabad	-	3	1	-	-	-
Ambedkar Nagar	1	-	-	-	1	-
Amethi	-	-	-	-	1	-
Amroha	-	1	-	-	1	-
Azamgarh	-	1	-	1	1	-
Baghpat	-	1	-	-	1	-
Bahraich	-	1	-	-	-	-
Ballia	1	-	-	-	-	-
Balrampur	-	1	-	-	-	-
Banda	-	1	-	-	-	-
Barabanki	-	1	-	-	2	-
Bareilly	-	1	1	-	3	2
Basti	-	2	-	-	1	-
Bhadohi	-	1	-	-	1	-
Bijnor	-	1	-	-	1	-
Budaun	-	1	-	-	-	-
Bulandshahr	-	1	-	-	2	-
Chandauli	-	1	-	-	-	-
Chitrakoot	1	-	-	-	-	-
Deoria	-	1	-	-	-	-
Etah	1	-	-	-	-	-
Etawah	-	2	-	-	1	-
Faizabad	-	1	-	-	-	-
Farrukhabad	-	1	-	-	1	-
Fatehpur	1	-	-	-	1	-
Firozabad	-	1	-	-	4	-
G B Nagar	-	1	-	-	7	5
Ghaziabad	-	1	-	2	8	2
Ghazipur	-	1	-	-	-	-
Gonda	-	1	-	-	-	-
Gorakhpur	-	2	-	-	6	-

Hamirpur	-	1	-	-	-	-
Hapur	-	-	-	-	3	-
Hardoi	-	-	1	-	-	-
Hathras	-	1	-	-	-	-
Jalaun	1	-	-	-	-	-
Jaunpur	-	1	-	-	2	-
Jhansi	-	2	-	-	4	1
Kannauj	-	2	-	-	-	-
Kanpur	-	3	-	-	11	-
Kanpur Dehat	-	-	-	-	1	-
Kasganj	1	-	-	-	-	-
Kaushambi	-	1	-	-	-	-
Kushinagar	1	-	-	-	-	-
Lakhimpur Kheri	-	1	-	-	-	-
Lalitpur	-	1	-	-	-	-
Lucknow	-	3	2	-	21	-
Maharajganj	-	1	-	-	-	-
Mainpuri	-	1	-	-	-	-
Mathura	-	1	-	-	6	-
Mau	-	1	-	-	1	-
Meerut	-	2	-	-	8	-
Mirzapur	-	1	-	-	-	-
Moradabad	-	2	-	-	4	2
Muzaffarnagar	-	1	-	-	2	-
Pilibhit	-	1	-	-	1	-
Pratapgarh	-	1	-	-	-	-
Raebareli	-	1	-	-	-	-
Rampur	-	1	-	-	1	-
Saharanpur	-	1	-	-	3	-
Sambhal	-	-	-	-	1	-
Sant Kabir Nagar	1	-	-	-	-	-
Shahjahanpur	-	1	-	-	2	-
Shamli	-	-	-	-	2	-
Siddharthnagar	-	1	-	-	-	-
Sitapur	-	1	-	-	2	-
Sonbhadra	-	1	-	-	-	1
Sultanpur	-	1	-	-	-	-
Unnao	-	1	-	-	1	-
Varanasi	1	3	-	-	4	1
Uttar Pradesh	**10**	**73**	**6**	**3**	**140**	**15**

5. Conclusion

Considering the importance of blood transfusion services in the provision of medical care, ensuring quality systems and standards in blood banks are vital, as the blood and its products must not only be safe but also clinically effective and of appropriate and consistent quality. From the programmatic perspective, adequate, accurate and updated information at the district, state and national level is essential for planning and implementation of quality management systems in blood transfusion services across the country. Generation of accurate and essential data from blood banks at regular intervals is imperative to effectively monitor the progress, gaps and challenges in the service provision which would not only facilitate appropriate corrective measures but also facilitate the development of evidence-based policies and programmes.

This state-wide assessment captured most of the required information related to the structure, services, facilities, availability of human resources, equipment, quality management system and practices in blood banks across the state. All blood banks in Uttar Pradesh function subject to obtaining and maintaining a license for operations from the FDA which means compliance to basic quality standards mentioned in the Drugs and Cosmetic Act 1940 and Rules 1945 there upon. However, this assessment brings out specific gaps and possible opportunities to improve quality standards in Transfusion Services at the state.

The 89 NACO and 158 Non-NACO blood banks which were included in the review are 99.5% of the total blood banks (248) existing in the state. The annual collection of these blood banks was 1,077,196 units which is approximately 54% of the total blood requirement based on WHO's estimation that blood donation by 1% of the population can meet a nation's most basic requirements for blood (WHO, 2010). However, there is a huge variation between districts that ranges from 5.3 units to 0.002 units per 100 population. Clinical demand for blood and blood products can happen only when there is a health care facility with adequate infrastructure in proximity to a blood bank. The relatively lower collection of blood in the few districts could be due to the fact that there is lower demand for blood because of the gaps in availability, accessibility, and affordability of health care services.

The review also revealed that the majority of blood collection (83.2%) was by blood banks with the component facility compared to smaller blood banks without component facility. The percentage of voluntary blood donation over the years was recorded to be around 39% in 2015 with a huge variation between districts that ranges from 2.2% to 100%. A targeted program to increase the non-remunerated voluntary blood donors will go a long way towards ensuring a safer option for our patients.

There were 50 districts that have less than the state average of 1.2 blood banks per million population. The potential impact of this distribution of blood banks and collection of blood on other health indices may be further studied.

More than one fourth (36%) of the blood banks having their licensing status in pendency may be an indication of an opportunity to strengthen the regulatory system by modern technological modalities to ensure a standardized, timely and transparent licensing process. It is also essential to review and update the regulatory framework to keep up with recent scientific developments and modernize the transfusion practice in the state.

The provision of a blood component separation unit in the blood bank and the volume of collection apparently have a positive influence on the quality. The inequity in the distribution of component separation facilities across districts and region is very evident. However, it is important to note that in the absence of reliable laboratory support, it will not be possible to ensure rational use of blood and its components. It is difficult to sustain cost-effective component production when the volume of operations is low without compromising the quality of the blood provided to the patients who access this service. Given that the provision of safe and high-quality blood in areas where access is a challenge is still the remit of the state, it is essential to explore new cost effective innovative methods in partnership with non-governmental agencies.

For the first time, a quality score system has been created and applied to the blood banks. This review indicated a mean score of 56.49 with significant variations across the category of blood banks, ownership, voluntary blood donation, participation in proficiency testing (EQAS) and accreditation status. It is important to understand that there is a huge variation between districts on several parameters included in the assessment. This suggests the need for targeted and customized approach to address the gaps and challenges faced by the blood banks in the state. This assessment suggests that blood banks owned by trusts/charities in the private sector seemed to have performed slightly better in the quality parameters. This may be partly due to access to resources, both financial and technical, to enhance capacity and modern technology to overcome potential barriers to quality.

It is evident from the assessment that blood banks that focussed on quality improvement systems performed better than others. Considering the deleterious effect of poor quality practices on patient care, it is imperative that specific programmes and strategies to improve quality systems in blood transfusion services are developed and implemented across the state.

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7. Annexures

7.1 Individual Blood Banks Summary

District	Name Of The Blood Bank	Type	Ownership	Annual Collection	Score (Out of 100)
Agra	Samarpan Blood Bank	BCSU	NGO/Trust/ Charitable	28079	64
	Life Line Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	14931	58
	G R Hospital & Research Centre Pvt Ltd Blood Bank	BCSU	Private	8382	35.5
	Lokhitam Blood Bank	BCSU	NGO/Trust/ Charitable	8046	60.5
	Pushpa Maa Samaj Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	6018	62.5
	S. N. Medical College,Agra	BCSU	NGO/Trust/ Charitable	5211	55.5
	Agra City Blood Bank	Non BCSU	Private	4977	70
	Jan Kalyan Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	4533	59
	Shri Jagdamba Charitable Blood Bank & Component	BCSU	NGO/Trust/ Charitable	4215	44
	Sanjeevani Blood Bank	BCSU	NGO/Trust/ Charitable	3036	52
	Pushpanjali Hospital& Research Centre Pvt.Ltd (Blood Bank)	BCSU	Private	2792	63
	Jan Suvidha Blood Bank (A Unit Of Jan Suvidha Charitable Society)	Non BCSU	Private	2117	62
	Manav Seva Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	1702	55.5
	Blood Bank, District Hospital Agra	BCSU	Public	1140	48.5
Aligarh	J.N. Medical College Hospital, AMU	BCSU	Public	19651	74.0
	Blood Bank, M/S District Hospital Aligarh	BCSU	Public	6127	60.5
	Jeevan Sanjeevan Blood Bank	BCSU	Private	2340	59
	Jeevan Jyoti Blood Bank(A Unit Of Jeevan Jyoti Sansthan)	BCSU	Private	2158	62
	Rusa Medical Centre Blood Bank	BCSU	Private	1637	50.5
	Dev Hospital Blood Bank	Non BCSU	Private	1120	63
	Har Prasad Blood Bank	Non BCSU	Private	1002	65

Allahabad	Allahabad Medical Association Blood Bank	BCSU	NGO/Trust/ Charitable	45826	77
	Tej Bahadur Sapru Hospital Allahabad Blood Bank	BCSU	Public	8139	50.5
	M.L.N. Medical College	BCSU	Public	7738	59.5
	Motilal Nehru District Hospital	BCSU	Public	5156	51.5
Ambedkar Nagar	M/S Mahamaya Rajkiya Alopathic Medical College	Non BCSU	Public	774	30
	Blood Bank Combined District Hospital ABN	Non BCSU	Public	646	40
Amethi	Sanjay Gandhi Hospital (Blood Bank)	Non BCSU	NGO/Trust/ Charitable	711	62
Amroha	District Combined Hospital Jyotibaphulenagar	Non BCSU	Public	435	36
	Venkateshwar Institute Of Medical Science	Non BCSU	NGO/Trust/ Charitable	15	61
Azamgarh	M/S District Hospital,	BCSU	Public	8671	49.5
	Maha Mrityunjai Hospital L B Medical College	Non BCSU	Private	61	59
	Government Medical College And Superspeciality Hospital	BCSU	Public	0	23
Baghpat	Astha Blood Bank & Components	BCSU	Private	2652	54
	District Combined Hospital (Blood Bank)	Non BCSU	Public	793	38
Bahraich	Blood Bank, District Hospital	BCSU	Public	4712	65
Ballia	Blood Bank District Hospital	Non BCSU	Public	2443	34
Balrampur	Combined District Hospital	Non BCSU	Public	1131	59
Banda	District Hospital Banda	Non BCSU	Public	722	61
Barabanki	Hind Blood Bank	BCSU	NGO/Trust/ Charitable	4563	68
	Mayo Institute Of Medical Science Blood Bank	BCSU	NGO/Trust/ Charitable	2573	55
	Government Blood Bank District Hospital	Non BCSU	Public	2203	48
Bareilly	Radhey Shyam Gupta IMA Blood Bank	BCSU	NGO/Trust/ Charitable	34952	78
	Shri Ram Murti Smark,Institute Of Medical Sciences And Hospital	BCSU	NGO/Trust/ Charitable	6353	75.5
	Ganga Sheel Charitable Trust Blood Bank	BCSU	NGO/Trust/ Charitable	4878	70
	Clara Swain Mission Hospital	BCSU	NGO/Trust/ Charitable	3807	74
	Rohilkh and Medical College & Hospital Blood Bank	BCSU	NGO/Trust/ Charitable	3346	70
	Maharana Pratap District Combined Hospital	BCSU	Public	1146	46.5

	Rajshree Medical Research Institute Blood Bank	BCSU	NGO/Trust/ Charitable	143	61
Basti	Sewa Blood Bank	Non BCSU	NGO/Trust/ Charitable	2300	52
	District Hospital	Non BCSU	Public	1260	63
	Blood Bank,OPEC Hospital	BCSU	Public	599	42
Bhadohi	Jeevandeep Hospital Blood Bank & Component Center	BCSU	Private	813	38
	Maharaja Chet Singh District Hospitai	Non BCSU	Public	274	51
Bijnor	District Hospital	Non BCSU	Public	4491	47
	Saryodya Jan Kalyan Samiti Blood Bank	Non BCSU	NGO/Trust/ Charitable	2042	56
Budaun	Budaun Blood Bank	Non BCSU	Public	1632	48
Bulandshahr	Wadhwa Blood Bank	Non BCSU	Private	2218	67
	B.B.D. Government Hospital	Non BCSU	Public	2205	64
	Narora Atomic Power Station Hospital Blood Bank	Non BCSU	Public	10	54
Chandauli	Pandit Kamlapati Tripathi District Combined Hospital Blood Bank	Non BCSU	Public	1200	38
Chitrakoot	Combined District Hospital	Non BCSU	Public	23	33
Deoria	Blood Bank District Hospital	Non BCSU	Public	1925	66
Etah	Blood Bank District Hospital	Non BCSU	Public	285	35
Etawah	Rural Institute Of Medical Sciences &	BCSU	Public	6982	56.5
	Dr.B.R.Ambedkar Combind Hospital	Non BCSU	Public	2927	42
	Achintya Blood Bank	Non BCSU	NGO/Trust/ Charitable	0	53
Faizabad	Distric Hospital Blood Bank	BCSU	Public	7507	43.5
Farrukhabad	Dr Ram Manohar Lohiya Joint Hospital & Blood Bank	Non BCSU	Public	5118	64
	Major Sd Singh Medical College &Hospital	Non BCSU	NGO/Trust/ Charitable	282	46
Fatehpur	Shyam Nursing Home & Blood Bank	Non BCSU	Private	752	53
	Blood Bank, District Hospital Fatehpur,U.P	Non BCSU	Public	612	35
Firozabad	Jeevan Dhara Blood Bank	Non BCSU	NGO/Trust/ Charitable	3972	56
	Sevarth Sansthan Blood Bank	BCSU	NGO/Trust/ Charitable	2200	67
	District Blood	Non	Public	1448	56

	Bank,Firozabad	BCSU			
	F.H Hospital Blood Bank	BCSU	Private	757	59
	Dr.M.C.Agrawal Hospital & Research Centre (P) Ltd	Non BCSU	Private	154	57
Gautam Buddh Nagar	Rotary Noida Research & Social Welfare Trust	BCSU	NGO/Trust/ Charitable	21824	73
	Kailash Hospital& Heart Institute	BCSU	Private	6600	68.5
	Metro Hospital & Heart Insutitute	BCSU	Private	5881	80.5
	International Hospital Private Limited	BCSU	Private	5324	81.5
	Jaypee Hospital	BCSU	Private	4088	84
	Kailash Hospital Ltd	BCSU	Private	2738	58
	Sharda Hospital Blood Bank	BCSU	Private	2275	63
	Dr. Bheem Rao Ambedekar Multi Speciality Hospital	Non BCSU	Public	2136	63
	Prakash Hospital (P) Ltd	BCSU	Private	1688	71.5
	Yatharth Wellness Superspeciality Hospital & Heart Centre	BCSU	Private	1653	60.5
	Navin Hospital	BCSU	Private	1142	66.5
	Prayag Hospital&Research Center Pvt Ltd	BCSU	Private	575	44
	Shri Krishna Life Line Hospital	BCSU	Private	189	63
Ghaziabad	MMG District Hospital Ghaziabad	BCSU	Public	4449	43
	Max Super Speciality Hospital	BCSU	Private	3997	80
	Yashoda Hospital And Research Centre Pvt Ltd.	BCSU	Private	3829	68
	Ghaziabad Blood Bank (A Unit Of Kesar Charitable Trust Regd.)	BCSU	NGO/Trust/ Charitable	3642	57
	Lifeline Blood Bank	BCSU	NGO/Trust/ Charitable	3362	62
	Narender Mohan Hospital And Heart Centre Blood Bank	BCSU	Private	1387	77.5
	Yashoda Hospital And Research Center Ltd	BCSU	Private	859	70
	Family Health Care Hospital	BCSU	Private	747	67
	Santosh Medical Dental College And Hospital	BCSU	Private	723	13
	Modern Pathology Clinic And Blood Bank	Non BCSU	NGO/Trust/ Charitable	674	60
	Divya Jyoti Institute Of Medical Science &Research	Non BCSU	NGO/Trust/ Charitable	513	35
	Shanti Gopal Hospital	BCSU	Private	394	56

	Atlanta Mediworld Multi Speciality Hospital	BCSU	Private	71	69
Ghazipur	Blood Bank District Hospital Ghazipur	Non BCSU	Public	1051	53
Gonda	Babu Ishwar Saran District Hospital	BCSU	Public	4544	46
Gorakhpur	Guru Shri Gorakhnath Blood Bank	BCSU	NGO/Trust/ Charitable	19360	58
	Nehru Chikitsalay Blood Bank Gorakhpur	BCSU	Public	7439	60.5
	City Blood Bank	Non BCSU	Private	5650	61
	Savitri Blood Bank &Component Centre	BCSU	Private	5449	61.5
	S M Medicare Private Limited	Non BCSU	Private	2592	60
	Fathima Hospital	Non BCSU	NGO/Trust/ Charitable	2403	60
	Blood Bank, Dh,Gorakhpur	BCSU	Public	1926	55.5
	Shree Lakhan Sewa Kailashi Chairitable Blood Bank	BCSU	NGO/Trust/ Charitable	0	43
Hamirpur	Blood Bank District Hospital	Non BCSU	Public	519	54
Hapur	Dev Nandini Blood Bank	BCSU	Private	4839	62
	Rama Medical College And Research Centre	BCSU	NGO/Trust/ Charitable	1621	54.5
	Saraswathi Institute Of Medical Sciences	BCSU	NGO/Trust/ Charitable	862	55
Hardoi	Pandit Ramdayal Trivedi District Hospital	Non BCSU	Public	3378	77
Hathras	Bagla District Hospital	Non BCSU	Public	1148	45
Jalaun	Blood Bank, District Hospital	Non BCSU	Public	298	22
Jaunpur	District Hospital Jaunpur Blood Bank	Non BCSU	Public	5083	61
	Isha Hospital (Blood Bank)	BCSU	Private	4348	57
	Krishna Heart Care Blood Bank	Non BCSU	Private	0	46
Jhansi	Parakh Voluntary Blood Bank	BCSU	NGO/Trust/ Charitable	8202	76.5
	M.L.B. Medical College, Jhansi	BCSU	Public	7852	64.5
	Sant Blood Bank	Non BCSU	Private	4895	65
	United Blood Bank, Jhansi	Non BCSU	Private	2391	61
	Gaurav Diagnostic Centre & Blood Bank	Non BCSU	Private	1206	64
	Blood Bank,District Hospital	BCSU	Public	1152	57.5
	St. Judes Blood Bank	Non BCSU	NGO/Trust/ Charitable	815	45

Kannauj	Combined District Hospital Kannauj	Non BCSU	Public	259	43
	BSDBA Medical College Associated Hospital Blood Bank	Non BCSU	Public	59	58
Kanpur	Gsvm Medical College Kanpur	BCSU	Public	20654	57
	Sneh Pathology X Ray And Blood Bank	BCSU	Private	13864	54
	Mayanjali Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	6717	69.5
	Regency Hospital Limited	BCSU	Private	5818	65.5
	UHM Hospital Kanpur	BCSU	Public	5310	51.5
	Tulsi Hospitals Ltd.	Non BCSU	Private	2924	66
	Mariampur Hospital Blood Bank	Non BCSU	NGO/Trust/ Charitable	2052	54
	Universal Pathology Laboratory & Blood Bank	Non BCSU	Private	1960	43
	Blood Bank Lps Institute Of Cardiology	Non BCSU	Public	1719	61
	Krishna Superspeciality Hospital	BCSU	Private	1430	50.5
	Rama Medical College Hospital & Research Centre Blood Bank	BCSU	Private	1133	62.5
	Sai Blood Bank	Non BCSU	Private	1039	58
	Lifeline Blood Bank	Non BCSU	Private	541	37
	Madhulok Hospital	BCSU	Private	243	59
Kanpur Dehat	District Hospital Kanpur Dehat	Non BCSU	Public	204	36
Kasganj	District Hospital Blood Bank	Non BCSU	Public	35	31
Kaushambi	Combined District Hospital	Non BCSU	Public	370	47
Kushinagar	Joint District Hospital	Non BCSU	Public	872	32
Lakhimpur Kheri	Blood Bank District Hospital	Non BCSU	Public	4137	46
Lalitpur	District Hospital Blood Bank	Non BCSU	Public	2984	54
Lucknow	Transfusion Med. Dept. KGMU Lko	BCSU	Public	98472	79
	SGPGIMS Blood Bank	BCSU	Public	23627	84
	Lucknow Nursing Home Association Blood Bank	BCSU	NGO/Trust/ Charitable	14656	57
	Dr. Rml Joint Hospital Lucknow	BCSU	Public	10887	68
	Ramakrishna Mission Sevshram	BCSU	NGO/Trust/ Charitable	8943	59.5
	Blood Centre, Sahara Hospital	BCSU	Private	5272	68.5
	O.P.Chaudhary Hospital	BCSU	NGO/Trust/	4877	66

	Blood Bank		Charitable		
	Dr. S.P.M.(Civil) Hospital	BCSU	Public	4273	51
	Fehmina Hospital & Truma Center	BCSU	Private	3906	63
	Medison Hospital Pvt. Ltd.	BCSU	Private	3002	60
	Nidan Diagnostic & Blood Bank	Non BCSU	Private	2839	57
	Balrampur Hospital Blood Bank Lucknow	BCSU	Public	2707	48
	Era's Lucknow Medical College	BCSU	NGO/Trust/ Charitable	2295	63
	Nova Hospital Ltd.	BCSU	Private	2176	58
	Shekhar Blood Bank & Component Center Shekhar Hospital (P) Ltd	BCSU	Private	2152	65
	BNK Hospital Blood Bank	Non BCSU	Private	2148	52
	Charak Hospital & Research Centre Blood Bank	BCSU	Private	1704	62.5
	St .Joseph's Hospital (Blood Bank)	BCSU	NGO/Trust/ Charitable	1088	56.5
	Fatima Hospital Blood Bank	Non BCSU	NGO/Trust/ Charitable	1012	55
	Blood Bank Divine Heart Hospital & Research Centre	Non BCSU	Private	914	61
	Career Institute Of Medical Sciences & Hospital Blood Bank	BCSU	NGO/Trust/ Charitable	889	67
	Integral Institute Of Medical Sciences And Research Centre	BCSU	NGO/Trust/ Charitable	723	55
	Indra Diagnostic Centre & Blood Bank Ltd.	Non BCSU	Private	681	65
	Gcrg Memorial Hospital & Charitable Blood Bank	Non BCSU	NGO/Trust/ Charitable	97	45
	Dr. Shankuntala Misra Blood Bank	BCSU	Private	55	52
	Prasad Institute Of Medical Sciences(Blood Bank)	BCSU	NGO/Trust/ Charitable	18	65
Maharajganj	Combined District Hospital	Non BCSU	Public	316	64
Mainpuri	District Hospital Blood Bank	Non BCSU	Public	1127	54
Mathura	Sadbhawna Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	7781	58.5
	District Hospital Mathura	Non BCSU	Public	3330	64
	Ramakrishna Mission Sevashrama	Non BCSU	NGO/Trust/ Charitable	478	41
	Agarwal Lifeline Hospital & Trauma Center	BCSU	Private	324	64
	K D Medical College	BCSU	Private	226	47

	Hospital & Research Center				
	Rotary Blood Bank	Non BCSU	NGO/Trust/ Charitable	0	51
	Krishna Mohan Medical College & Hospital(Blood Bank)	Non BCSU	Private	0	55
Mau	District Hospital Mau	Non BCSU	Public	250	48
	Fatima Hospital Blood Bank	Non BCSU	NGO/Trust/ Charitable	0	51
Meerut	Anand Hospital Blood Bank	BCSU	Private	17832	56
	Jaswant Rai Speciality Hospital	BCSU	Private	9854	50.5
	Blood Bank & Components Kamna Medical Centre	BCSU	Private	8832	61.5
	Blood Bank,SVBP Hospital,LLRM Medical College ,Meerut	BCSU	Public	7849	50.5
	P.L.Sharma District Hospital Meerut	BCSU	Public	7338	40.5
	Subharati Blood Bank	BCSU	NGO/Trust/ Charitable	6766	68.5
	Lokpria Blood Bank Meerut	BCSU	Private	5945	51.5
	Sanjeevani Blood Bank	BCSU	NGO/Trust/ Charitable	5100	55.5
	Kailashi Super Specialty Hospital (Blood Bank)	BCSU	Private	97	59
	SDS Global Super Speciality Hospital (Blood Bank)	BCSU	Private	0	51
Mirzapur	District Hospital	BCSU	Public	5018	56.5
Moradabad	Cosmos Hospital Blood Bank	BCSU	Private	8827	58.5
	Teethanker Mahaveer Hospital & Research Centre (Blood Bank)	BCSU	NGO/Trust/ Charitable	6960	71.5
	Sri Sai Hospital & Blood Bank	BCSU	Private	6908	71.5
	Janta Blood Bank	Non BCSU	Private	3839	66
	Pt.D.D.U.Combind District Hospital	BCSU	Public	3802	46
	Dr Chaturvedi Central Blood Bank	Non BCSU	Private	3607	56
	IMA Blood Bank	Non BCSU	NGO/Trust/ Charitable	3056	55
	Vivekanand Hospital & Research Centre	BCSU	NGO/Trust/ Charitable	2117	46
Muzaffarnagar	District Hospital Muzaffarnagar	BCSU	Public	13919	53
	SD Medical Institute & Research Centre	Non BCSU	NGO/Trust/ Charitable	3371	64

	Muzaffarnagar Medical College & Hospital	BCSU	NGO/Trust/ Charitable	1501	59.5
Pilibhit	Jeevanrekha Charitable Blood Bank	Non BCSU	NGO/Trust/ Charitable	7379	68
	District Hospital Blood Bank	Non BCSU	Public	1886	49
Pratapgarh	Blood Bank District Hospital	Non BCSU	Public	1440	62
Raebareli	District Hospital	Non BCSU	Public	5728	61
Rampur	Maulana Mohammed Ali Jauhar Hospital	Non BCSU	NGO/Trust/ Charitable	4469	57
	District Male Hospital	Non BCSU	Public	1265	43
Saharanpur	Taarawati Nursibg Home Pvt. Ltd.	BCSU	Private	3654	54
	City Lions Blood Bank	Non BCSU	NGO/Trust/ Charitable	3545	58
	Blood Bank, District Hospital	BCSU	Public	3126	47
	SMMH Medical College Blood Bank	Non BCSU	Public	0	46
Sambhal	B.S. Hospital & Heart Center Blood Bank	Non BCSU	Public	1253	51
Sant Kabir Nagar	Blood Bank Sant Kabir Nagar	Non BCSU	Public	609	29
Shahjahanpur	District Hospital	BCSU	Public	5038	63.5
	Swami Vivekanand Charitable Blood Bank	Non BCSU	NGO/Trust/ Charitable	3860	69
	Dr B N Behl Memorial Hospital Blood Bank	Non BCSU	Private	1166	72
	Blood Bank Rohilkhand Hospital	BCSU	NGO/Trust/ Charitable	29	61
Shamli	Shamli Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	1421	63.5
	Amba Charitable Blood Bank	BCSU	NGO/Trust/ Charitable	0	54
Siddharth Nagar	District Hospital, Siddharth Nagar	Non BCSU	Public	1528	56
Sitapur	District Hospital	Non BCSU	Public	1847	55
	B.C.M Hospital (Blood Bank)	Non BCSU	NGO/Trust/ Charitable	1445	59
	Hind Blood Bank And Component Centre	BCSU	NGO/Trust/ Charitable	94	60
Sonbhadra	DCH Blood Bank Sonebhadra	Non BCSU	Public	3801	46
	Hindalco Hospital Blood Bank	Non BCSU	Private	1316	72
Sultanpur	District Hospital	BCSU	Public	7338	47.5
Unnao	Ums Shanker Dixit District Hospital (Male)	Non BCSU	Public	624	53
	Saraswati Blood Bank	Non BCSU	NGO/Trust/ Charitable	0	52
	Lion's Vishal Blood Bank	BCSU	Private	40729	41

Varanasi	Sir Sundarlal Hospital, Institute Of Medical Science	BCSU	Public	24187	64
	Apex Welcare Trust (Apex Hospital Component Blood Bank)	BCSU	NGO/Trust/ Charitable	3368	61
	S.S.P.G Divisional District Hospital	BCSU	Public	2329	33
	Heritage Hospitals Ltd.	Non BCSU	Private	1799	63
	Banaras Heart Hospital Component Blood Bank	BCSU	Private	1578	73.5
	Pt.Deen Dayal Upadhyay Government Hospital(Blood Bank)	BCSU	Public	1271	51.5
	Santushti Hospital Pvt Ltd & Blood Bank	Non BCSU	Private	291	58
	Heritage Institute Of Medical Sciences Blood Bank	BCSU	Private	102	53

7.2 NACO/NBTC – Questionnaire for Blood Banks

NACO/NBTC - Questionnaire for Blood Banks								
Data Filled by								
Mobile Phone *Number* ***(Person filled the data)***								
Section A – GENERAL								
A1	**Basic Information**							
1	Name of the Blood Bank (as mentioned in the licence)							
2	Address 1 (Institution name)							
3	Address 2 (Door number & Street name – if applicable)							
4	Address 3 (Important land mark - if applicable)							
5	City/Town							
6	District							
7	State							
8	Pin code							
9	Blood Bank Phone number (Land line including area code)							
10	Blood bank Email ID							
11	Do you have internet facility?					Yes		
						No		
12	Name of the Blood Bank In-charge *(This should be the name of the current Medical Officer in charge)*							
13	Is the name of the Medical officer mentioned in the Licence, the current medical officer?					Yes		
						No		
14	Designation *(Please enter designation of the Medical Officer in the blood bank (e.g. Civil surgeon, or academic like Asst. Prof etc.)*							
15	Highest Qualification *(Tick only one)*					MBBS		
						MD		
						MS		
						Diploma		
16	Specify branch/Broad speciality							
17	Email ID: *(Official/Personal Email where*							

	the medical officer can be directly contacted). This is apart from the blood bank email ID provided above.		
18	Fax number		
19	Telephone number 1 – Medical Officer *(Mobile)*		
20	Telephone number 2 – Medical Officer *(Landline including STD code)*		
21	Type of blood bank as per NACO category	Model blood Bank	
		Blood Component Separation Units	
		Major Blood Bank	
		District level blood bank	
		Others	
22	Who is the blood bank owned by?	Public (Central/State/Local government)	
		Public (Other than ministry of health e.g. PSU, Army etc.)	
		NGO/Trust/Charitable – NACO Supported	
		NGO/Trust/Charitable	
		Private - Others	
23	Is the Blood Bank attached to any of the following?	Hospital	
		Lab	
		Stand alone	
24	If attached to Private Hospital, specify level of hospital	Medical College Hospital	
		Tertiary care hospital (other than medical college)	
		Secondary care hospital	
25	If attached to public/govt. hospital, specify the level of the hospital	Sub-District hospital	
		District level hospital	
		Medical College hospital	
		Tertiary care hospital (other than Medical College)	
26	If the blood bank is attached to a hospital, please specify the number of inpatient beds available		
27	Are you permitted to conduct Blood donation camp?	Yes	
		No	
28	How many Blood storage centres are linked to your blood bank?		
29	BB working hours *(Specify hours per day*)		
A2	**License Information**		
1.	**BB License Number** *(Enter your license number. This should be exactly as is displayed in your license issued by the Drugs Controller Office and will be used for verification purposes. This is a mandatory field and should be entered regardless of the status of license - under-*		

	renewal etc. (**You will have to submit a self-attested photocopy of the currently displayed license along with this form**.)		
2	Status of Current License	Valid	
		Under renewal	
3	Date of issue of current licence DD/MM/YYYY		
4	Last Inspection by licensing authority	< 1 year	
		1-2 years	
		2-3 years	
		3-4 years	
		>4 years	
A3	**Basic Statistics (Date of reporting from Jan-2015- Dec-2015)**		
1	Number of voluntary donations		
2	Number of replacement donations		
3	Number of autologous deposits		
4	Total Annual collection for reporting period (Jan - Dec 2015) Total Annual collections (sum of A3.1+A3.2+A3.3)		
5. Transfusion Transmissible Infections - Annual statistics		**Number tested**	**Number positive**
	HIV(Anti-HIV I & II)		
	HCV (Anti-HCV)		
	HBV (HBs Ag)		
	Syphilis (RPR/TPHA/ELISA)		
	Positive for Malaria (Any method)		
A4.	**Reporting Summary**		
1	Are you in compliance with NBTC guidelines?	Yes	
		No	
2	Are you recovering processing charges for blood/components within NBTC/SBTC norms?	Yes	
		No	
3	Are you displaying stock position in the blood bank premises?	Yes	
		No	
4	Are you submitting statistics to the State Drugs controller?	Regular	
		Occasional	
		No	
5	Are you reporting in SIMS (strategic Information Management System- NACO)?	Regular	
		Occasional	
		No	
6	If yes to Q5, please provide your SIMS ID		

7	If you are not reporting to SIMS, would you be willing to report in the future?	Yes	
		No	
8	Are you reporting in the E-blood banking?	Regular	
		Occasional	
		No	
9	If Regular/ Occasional to 8, specify *(more than one can be selected)*	State	
		National (NHP)	
		Other(Specify	
10	Please provide E Blood banking user ID *(State)*		
11	Please provide E Blood banking user ID *(National)*		
12	If not part of e-blood banking, would you be willing to participate in future?	Yes	
		No	

SECTION B			
B1	**Blood Donor(Reporting from Jan 2015- Dec 2015)**		
Definition of VBD = Close relatives should NOT be counted as VBD			
1	Are you recruiting voluntary blood donors?	Yes	
		No	
2	Is donor selection performed as per regulatory norms?	Yes	
		No	
3	Do you maintain records of donor deferral?	Yes	
		No	
4	Is pre-donation counselling being performed for blood donors?	Regular	
		Occasional	
		No	
5	Is post donation counselling being performed for blood donors?	Regular	
		Occasional	
		No	
6	Are you conducting Blood donor drives/Blood collection camps?	Regular	
		Occasional	
		No	
7	If you conduct camps, how many have been conducted in the reporting period? *(Provide numbers of VBD camps conducted during the period January - December 2015.)*		
8	Does the blood bank have dedicated staff for the promotion of Voluntary blood donors? *(If your blood bank has dedicated staff for camps, answer yes.)*	Yes	
		No	
8 a.	if Yes to 8, select as applicable *(More than one may be selected)*	Donor Motivator	
		Public relations officer (PRO)	
		Social Worker	
9	Is there a specific budget for donor program?	Yes	
		No	
10	If Yes, Specify budget source	Central	

		State	
		Others (Specify)	
11	Is there a donor database in the blood bank *(Donor database is essential to contact donors to remind them or to call during an emergency?)*	Yes	
		No	
12	If yes to Q 11, is it in electronic format or paper based?	Electronic	
		Paper	
		Both	
13	What percentage of the voluntary blood donors are repeat blood donors? (%)		
14	Does your blood bank have a mobile blood collection facility? *(Answer yes if your Blood bank has a mobile facility (bus or van with donor couches)*	Yes	
		No	
15	Source of funds for the mobile blood collection *(Indicate the source of funding for the purchase of the mobile blood donor van.)*	State	
		Central	
		Donor	
		Others	
16	Specify, other source of funds		
17	Is there a record for donor adverse reactions?	Yes	
		No	
18	Is there a referral system for HIV sero-reactive blood donors?	Yes	
		No	
19	If yes to Q 18, please specify what is the process adopted.		

Section C
Technical – Immunohematology

C1.	Which of the following tests are performed for determination of ABO and Rh (D) groups and what techniques are followed?	**Blood Group (Tick as applicable)**		**Rh Type** (Tick as applicable**)**
		Forward	Reverse	
C1.1.	Slide			
C1.2	Tube			
C1.3	Micro plate			
C1.4	Column agglutination Gel/Microparticle)			
C1.5	Solid phase			
C1.6	Other Specify			

1	How do you perform RhD typing?	Monoclonal reagent	
		Polyclonal reagent	
		Both	

2	Do you perform irregular antibodies screening on blood donations and patient sample?		Yes	
			No	
3	Do you perform direct antiglobulin test (DAT/DCT)? *(If you are performing Direct Antiglobulin test (DAT) - earlier called as Direct Coombs Test (DCT), answer yes.)*		Yes	
			No	
4	If yes to previous question, please specify method	Tube		
		Column agglutination		
		Solid phase		
5	Do you perform indirect antiglobulin test (IAT/ICT)?		Yes	
			No	
6	If yes, to previous question please specify method	Tube		
		Column agglutination		
		Solid phase		
7	Number of group and type tests performed in reporting period (Jan - Dec 2015*) (Specify the number of group and type tests performed - Total of all patient and donor tests in the reporting period - January to December 2015.)*			
8	Number of compatibility testing performed in reporting period. *(Specify number of compatibility tests performed in the reporting period January to December 2015)*			
9	Total Number of DAT/DCT tests performed in the reporting period *(Specify number of DAT/DCT tests performed in the reporting period (January to December 2015)*			
10	Total Number of IAT/ICT tests performed in the reporting period *(Specify number of DAT/DCT tests performed in the reporting period (January to December 2015)*			
11	Total Number of antibody screening performed in reporting period *(If you answered YES to Q2, Specify number of antibody screening tests performed in the reporting period (January to December 2015).*			
12	Do you have automation for Immunohematology testing? *(If you have implemented any kind of automation, please indicate so.)*		Yes	
			No	
13	Do you perform Internal QC for all immunohematology tests (blood group/DAT/IAT etc.)? *(Please answer yes if you are performing internal quality control (IQC) for the immunohematology tests listed above. They include daily QC on reagents and cells.)*		Yes	
			No	
14	Do you participate in an external quality assessment program or scheme (EQAS) for Immunohematology tests usually performed in your laboratory?		Yes	
			No	
15	If yes to 14, Specify name of program/provider			
16	If yes to 14, EQAS Membership ID number/ PIN#.			
17	If yes 14, specify Highest level of EQAS program		Inter-lab	

	participant in	National	
		International	
18	If you are not participating in EQAS for immunohematology, will you be willing to do so in the future?	Yes	
		No	
19	If Yes to above question, will your blood bank be able to allocate financial resources (about Rs.2500 per year)?	Yes	
		No	
20	If your answer to Q 19 is NO, when do you think you will be ready for EQAS participation? (immunohematology)	Next 6 months	
		Later than 6 month	
21	Are you a member of National Haemovigilance Program of India (HVPI)?	Yes	
		No	
22	If yes, provide HVPI ID Number		
23	If not, would you be willing to participate in HVPI in the near future?	Yes	
		No	
24	Are you reporting all adverse events to the National Haemovigilance Program of India?	Yes	
		No	
25	Number of adverse reactions recorded in the reporting period		
26	Does your hospital have regular transfusion committee meetings?	Yes	
		No	
27	What is the frequency of Transfusion committee meetings?	Annual	
		Half-yearly	
		Quarterly	
		Occasional	

Section D
Technical - Screening For Transfusion Transmissible Infections (TTI)

Does the blood bank screen the following TTIs?

	Type of Test	Platform (please tick appropriate)		Method (please tick appropriate)
1	**HIV I & II**	Rapid		
		ELISA		Manual ☐ Automated ☐
		CHEMI		Manual ☐ Automated ☐
		NAT		Manual ☐ Automated ☐
1.1	Specify % of donors tested by Rapid Test?			
2	**Hepatitis B**	Rapid		
		ELISA		Manual ☐ Automated ☐
		EM		Manual ☐ Automated ☐
		NAT		Manual ☐ Automated ☐
2.1	Specify % of donors tested by Rapid Test?			

3	**Hepatitis C**	Rapid			
		ELISA		Manual ☐ Automated ☐	
		CHEM		Manual ☐ Automated ☐	
		NAT		Manual ☐ Automated ☐	
3.1	Specify % of donors tested by Rapid Test?				
4	**Syphilis**	RPR		Manual ☐ Automated ☐	
		TPHA		Manual ☐ Automated ☐	
		ELISA		Manual ☐ Automated ☐	
5	**Malaria**	Rapid			
		Fluorescent		Manual ☐ Automated ☐	
		Slide microscopy			
		ELISA		Manual ☐ Automated ☐	
6	Does the blood bank have an algorithm for units that test POSITIVE in initial screening? *(If you have a method of verifying a sample that has tested positive on the screening test please answer yes.)*			Yes	
				No	
7	If yes to Q6 , Repeat testing with same test/ technique			Yes	
				No	
8	If Yes to Q6, Repeat testing with different test/technique			Yes	
				No	
9	If yes to Q6, Recalling donor for repeat sample			Yes	
				No	
10	Do you perform independent internal QC (Third party controls) with TTI testing?			Yes	
				No	
11	Do you participate in an external quality assessment program or scheme (EQAS) for TTI *(Viral Markers, Malaria, and Syphilis) testing?*			Yes	
				No	
12	If yes, Specify program/provider				
13	Membership ID number (PIN)				
14	Level of EQAS			Inter-lab	
				National	
				International	
15	If you are not participating in EQAS for TTI screening, will			Yes	

	you be willing to participate in future?	No	
16	If Yes to Q15, will your blood bank be able to provide financial support (about Rs. 2500 per year)	Yes	
		No	
17	If your answer to Q 15 is NO, when do you think you will be ready for EQAS (TTI screening) participation?	Next 6 months	
		Later than 6 months	

Section E
Technical - Component Preparation (Applicable only to BCSU)

1	Does your blood bank prepare components?	Yes	
		No	

If your answer to Q1 is NO, SKIP TO SECTION F

If Yes, List the components and number prepared and issued in the period Jan to December 2015

2	Number of donated blood that was used for component preparation during the period Jan- December 2015.	

		Number prepared	No. issued (utilized)
3	Packed red cells IP (With or without Additive)		
4	Platelet concentrate IP		
5	Fresh frozen plasma (FFP)		
6	Cryoprecipitated antihaemophilic factor IP		
7	Human plasma IP		
8	Other (specify)		

9	Do you perform apheresis for components?	Yes	
		No	
	If yes to above question, Specify the following details		

		Number prepared	No. issued (utilized)
10	Platelet concentrate IP		
11	Fresh frozen plasma (FFP)		
12	Granulocytes concentrates		
13	Other (specify)		

14	Do you perform QC for the components prepared? *(If you perform quality control for all components, answer yes.)*	Yes	
		No	
15	If yes to above, Are the Factor assays on Fresh Frozen plasma/Cryoprecipitate performed at your Blood Bank?	Yes	
		No	
16	If yes for above question, do you participate in external quality assessment scheme (EQAS)?	Yes	
		No	
17	If yes, to above question, Specify agency		

SECTION F
Quality Management Systems

F 1	Are you aware of quality management systems for Blood bank	Yes	
		No	
1	Is the blood bank accredited?	Yes	
		No	

2	If yes, provide Name of Accrediting Body			
3	Do you have a document control system - other than mandatory registers as D&C act?		Yes	
			No	
4	Do you have Standard Operating Procedures (SOPs) for all technical processes?		Yes	
			No	
5	Do you have written responsibilities for all levels of staff?		Yes	
			No	

How many staff are currently employed in each of the following categories and how many of them have been trained during the reporting period Jan 2015 - Dec 2015? (Questions 6 - 15)

	Staff Details	Total number of staff	Number on contract	NACO/NBTC Supported in-service training	Other National Training
6	Professor				
7	Associate Professor				
8	Assistant Professor				
9	Senior Resident/Tutor				
10	Medical Officer *(include senior/Junior)*				
11	Technical Staff				
12	Nursing staff				
13	Counsellor				
14	PRO/Donor motivator				
15	Administrative staff				
16	Support staff				
	If other staff, please specify				

Total number of staff			
17	In your opinion, does the BB have adequate staff to function optimally (24x7)? This may be decided based on the volume and duration of work hours.	Yes	
		No	
18	Do you monitor Quality indicators or Key Performance indicators?	Yes	
		No	
19	If yes to above question, please specify names of indicators		
20	Do you have a designated and trained Quality manager?	Yes	
		No	
21	Do you have a designated and trained Technical Manager?	Yes	
		No	
22	If you do not have either a trained Quality manager or Technical Manager please state reasons?		

23	Please specify if you have a plan for recruitment in the future?

F2. EQUIPMENT AND SUPPLIES			
1	Does the blood bank have adequate equipment to meet regulatory requirements? *(If your blood bank has adequate equipment in working condition to meet expected workload, please answer yes.)*	Yes	
		No	
2	How is equipment purchase funded?	Local bodies	
		Central or upper (state) level agencies	
		Donors	
		Others (specify)	
3	Does the blood bank have a program for regular equipment maintenance?	Yes	
		No	
4	Are all the equipment calibrated regularly as per regulatory requirement?	Yes	
		No	
5	How are consumables purchased?	Local bodies	
		Central or state level agencies	
		Donors	
		Others (specify)	
6	Do you evaluate kits at your facility prior to procurement*? (Are kits evaluated locally (at your blood bank) prior to purchase (e.g. Titre and avidity for blood group Anti Sera?))*	Yes	
		No	
7	Is quality control for kits, reagents and blood bags carried out at your blood bank? *(Is quality control for kits performed locally (at your blood bank) Prior to use (e.g. Titre and avidity for blood group Anti Sera?))*	Yes	
		No	
8	Did you have a regular supply of the following items? (Jan to Dec 2015)		
8.1	Blood Bags	Yes	
		No	
8.2	TTI Screening Kits	Yes	
		No	
8.3	Blood grouping / IH reagents	Yes	
		No	
9	Number of staff vaccinated for Hepatitis B?		

EQUIPMENT LIST (Below is a summary equipment list (a subset of D&C list). Please specify the number in inventory and number in working condition? If you are using shared resources of hospital, you can mention that as well

		Number in inventory	**Number in working condition**
10	Donor beds/couches		
11	Any instrument for Hb Estimation *(other than CuS04 method)*		

12	Blood collection monitor (Blood agitator)		
13	Quarantine Blood bank refrigerator to store untested units with temperature recorder		
14	Container for safe disposal of sharps		
15	Oxygen supply equipment		
16	Computer with accessories and software		
17	General lab centrifuge for samples		
18	Bench top centrifuge for serological testing		
19	Blood transportation box		
20	Emergency drugs box/Crash card		
21	Autoclave machine (shared resource should be specified)		
22	Water bath		
23	Blood bank refrigerator (storage of tested blood) with temperature recorder		
24	Automated pipettes		
25	Refrigerated centrifuge (BCSU)		
26	Blood container weighting device		
27	Serology rotator		

7.3 Scoring sheet

Individual Scoring Sheet - Blood Component Separation Units			
GENERAL	**GENERAL SUMMARY**	**WEIGHTAGE**	**TOTAL**
Licence	Under renewal	1	
	Valid	3	
Subtotal			**3**
Annual collection	Below 1000	0	
	1000 to 2000	0.5	
	2000 to 5000	1	
	5000 to 10000	1.5	
	Above 10,000	2	
Subtotal			**2**
VNRBD	BB by VNRBD (%)	0	
	<25%	0	
	25-49%	1	
	50 - 74%	3	
	75-90%	4	
	Above 90	5	
Repeat DON	Repeat donation >25%	2	
Counselling	Pre and post donation counselling - Regular	2	
Subtotal			**9**
TECH-IH	BB performing only slide grouping (forward typing)	0	
	BB using tube method for forward typing	2	
	BB performing reverse grouping (Serum group)	2	
	BB performing tube method for compatibility testing	3	
	BB performing IQC for IH	3	
	BB Participating in EQAS for IH	3	
	Direct antiglobulin test (DAT/DCT)- Direct Coombs Test (DCT)	2	
	Indirect antiglobulin test (IAT/ICT)	2	
	Automation for Immunohematology testing	1	
Subtotal			**18**
TECH - TTI	BB performing IQC for TTI	3	
	BB Participating in EQAS for TTI	3	
	BB with follow up program for HIV Sero-positive donors	3	
HIV Testing	Rapid	1	
	Elisa	2	
	Advanced	3	
Hep B	Rapid	1	
	Elisa	2	
	Advanced	3	
Hep C	Rapid	1	

	Elisa	2	
	Advanced	3	
Syphilis	RPR	1	
Malaria	Slide/Rapid	1	
Subtotal			**20**
COMP			
	Component separation < 25	0	
	Component separation < 25-50%	1	
	Component separation 51 to 80%	2	
	Component separation > 80%	3	
	BB that performs component QC	2	
Subtotal			**5**
QMS	BB MO with relevant PG Qualification	3	
	Staff Nurse with NACO/NBTC Training	3	
	Technician with NACO/NBTC training	3	
	BB with designated and trained QM	2	
	BB with designated and trained TM	2	
	BB with Document control system	4	
	BB with calibration of equipment	4	
	BB with AMC for equipment	4	
	Quality control for kits, reagents and blood bags carried out at blood bank with regular bags supply	2	
	Quarantine Blood bank refrigerator to store untested units with temperature recorder	3	
	Blood bank accredited	5	
Subtotal			**35**
GEN	BB reporting regularly on SIMS under National AIDS Control Programme	3	
	BB Participating in Haemovigilance Program of India	1	
	E blood banking participation NBTC/NHP	1	
	E blood banking participation – State level	1	
	More than 50% of the staff are vaccinated for Hep B	1	
	Compliance with NBTC norms	1	
Subtotal			**8**
SCORES	**TOTAL**		**100**

Individual Scoring Sheet - Without Blood Component Separation Units			
GENERAL	**GENERAL SUMMARY**	**WEIGHTAGE**	**TOTAL**
Licence	Under renewal	2	
	Valid	3	
Subtotal			**3**
Annual collection			
	500 - 1000	1	
	1001 to 2000	2	
	2001 to 3000	3	
	3001 - 5000	4	
	>5000	5	
Subtotal			**5**
VNRBD	BB by VNRBD (%)		
	25-49%	1	
	50 - 74%	3	
	75-90%	4	
	Above 90	5	
Repeat DON	Repeat donation >25%	2	
	pre donation counselling - regular	2	
Counselling	post donation counselling - regular	2	
Subtotal			**11**
TECH-IH	BB performing slide ONLY for forward grouping	1	
	BB performing TUBE for forward grouping	2	
	BB performing reverse grouping (Serum group)	2	
	Compatibility testing with tube	3	
	BB performing IQC for IH	3	
	BB Participating in EQAS for IH	3	
	Direct antiglobulin test (DAT/DCT)- Direct Coombs Test (DCT)	2	
	Indirect antiglobulin test (IAT/ICT)	2	
	Automation for Immunohematology testing	1	
Subtotal			**18**
TECH - TTI	BB performing IQC for TTI	3	
	BB Participating in EQAS for TTI	3	
	BB with follow up program for HIV Sero-positive donors	3	
HIV Testing	Rapid	1	
	ELISA	3	
Hep B	Rapid	1	

	ELISA	3	
Hep C	Rapid	1	
	ELISA	3	
Syphilis	RPR	1	
Malaria	Slide/Rapid	1	
Subtotal			**20**
COMP	*Not applicable*		
QMS	BB MO with relevant PG Qualification	3	
	Staff Nurse with NACO/NBTC Training	3	
	Lab technician with NACO/NBTC training	3	
	BB with designated TM/QM	2	
	BB with SOPs	2	
	BB with Document control system	2	
	BB with more than 75% equipment functional	2	
	BB with calibration of equipment	4	
	BB with AMC for equipment	4	
	Quality control for kits, reagents and blood bags carried out at blood bank with regular supply	2	
	Quarantine Blood bank refrigerator to store untested units with temperature recorder	3	
	Blood bank accredited by NABH	5	
Subtotal			**35**
GEN	BB reporting regularly on SIMS under National AIDS Control Programme	3	
	BB Participating in Haemovigilance Program of India	1	
	E blood banking participation NBTC/NHP	1	
	E blood banking participation – State level	1	
	Compliance with NBTC norms	1	
	More than 50% of the staff are vaccinated for Hep B	1	
Subtotal			**8**
SCORES	**TOTAL**		**100**