

A Report on the  
“Assessment of Blood Banks in  
Dadra and Nagar Haveli, India”

**National AIDS Control Organization (NACO) and  
National Blood Transfusion Council (NBTC),  
Ministry of Health and Family Welfare, Government of India  
in collaboration with  
U.S Centers for Disease Control and Prevention (HHS/CDC)  
Division of Global HIV and TB (DGHT), India  
Christian Medical College, Vellore  
&  
Christian Medical Association of India (CMAI), New Delhi**



## Abbreviations

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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
DNH	- Dadra and Nagar Haveli
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
UT	- Union Territory
VNRBD	- Voluntary, Non-Remunerated Blood Donation
VBD	- Voluntary Blood Donor/Donation
WHO	- World Health Organization



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# **Assessment of Blood Banks in Dadra and Nagar Haveli**

## **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 UT during the reporting period – January to December 2015. In order to create a comprehensive and accurate list of functional blood banks in the UT, 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
<b>TOTAL</b>	<b>100</b>	<b>100</b>

The scoring pattern was different based on the category of blood banks that are: 1. Blood banks with component separation facility (n=1) and 2. Blood banks without component separation facility (n=0). 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; 36 to 70 and above 70.

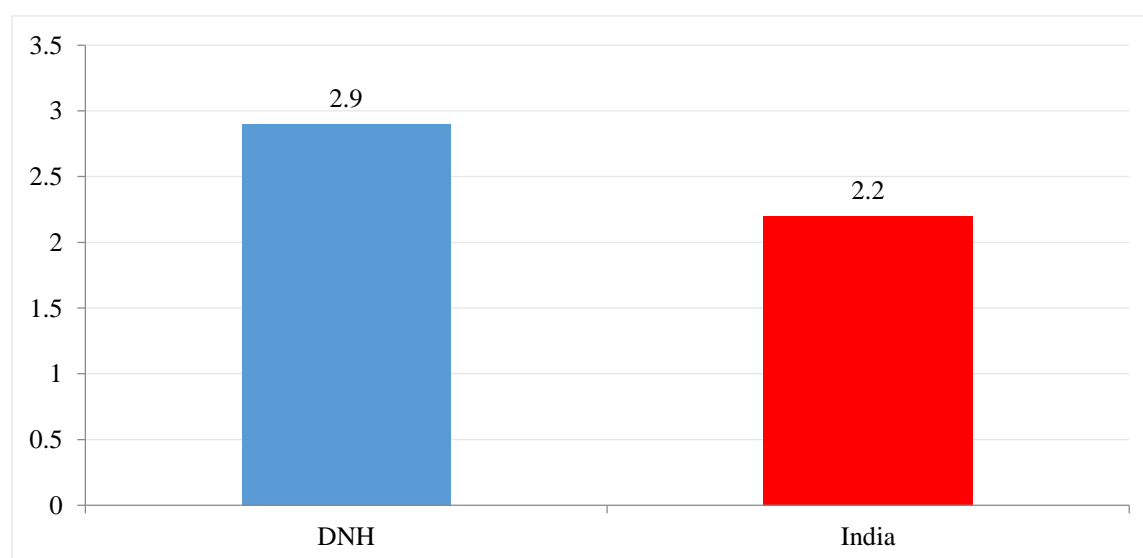
## 4. Key Findings

According to CDSCO, there was one blood bank in the Union Territory (UT) of Dadra and Nagar Haveli (DNH) in 2015 (CDSCO, 2015). The assessment exercise also identified one functional blood bank across the UT. This blood bank was NACO supported and had submitted the assessment form in complete so as to be included in the analysis.

DNH covers an area of 487 km<sup>2</sup> and consists of two talukas – 1. Dadra, and 2. Nagar Haveli. The blood bank was located in Silvassa which is the headquarters of the Nagar Haveli taluka, comprising Silvassa town and 68 other villages. This NACO supported blood bank is the only blood bank in the UT and is owned by the not-for-profit sector which comprises NGOs/Trusts/Charitable Associations. The blood bank is run by the Indian Red Cross Society (IRCS) and is a stand-alone blood bank with a Blood Component Separation Unit. This blood bank had reported as having a valid and current license.

For a UT like DNH with a total population of 343,709 (according to Census, 2011), the availability of blood banks per million population is 2.9 which is more than the national average of 2.2. Hence, the IRCS, Silvassa is found successfully catering to a relatively small population as compared to the entire country.

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



#### 4.1 Basic details of blood banks (n=1)

As indicated earlier, the IRCS, Silvassa blood bank is the only blood bank in the UT of DNH which is NACO supported.

**Table 3 - Basic details of blood banks**

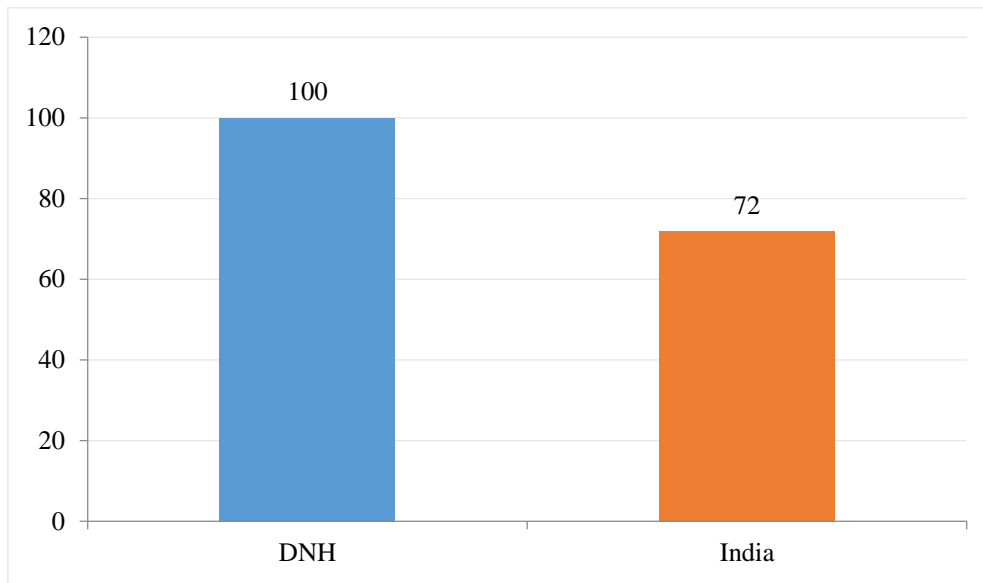
	Specifics	Description
<b>IRCS Blood Bank, Silvassa</b>	<b>Type of BB</b>	With components
	<b>Ownership</b>	NGO/Trust/Charitable
	<b>Licence</b>	Valid
	<b>Attachment</b>	Stand alone

#### 4.2 Annual Blood Collection and Voluntary Blood Donation

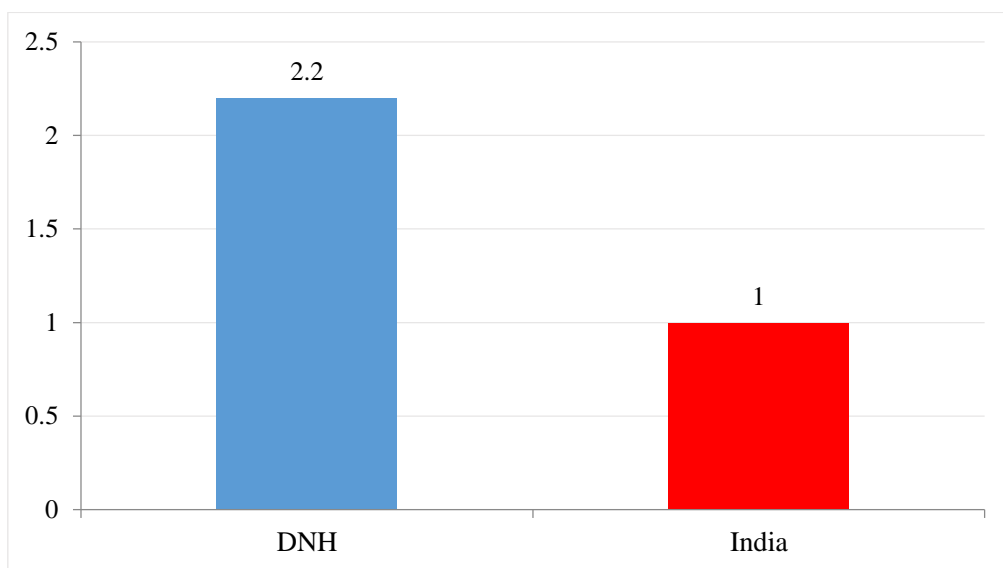
According to WHO, it is estimated that blood donation by 1% of the population can meet a nation's most basic requirements for blood (WHO, 2016b), which means that DNH with a population of 3,43,709, currently needs around 3,437 units of blood. As per this criteria, DNH is producing more than what is required.

**4.2.1 Annual Collection of Blood:** During January 2015 to December 2015, the annual blood collection from the blood bank was 7,497 units of which 100% were through voluntary blood donations. DNH was the only place in India where the percentage of voluntary blood donation was 100%. Overall, India's average VBD% was 71.9%. The blood bank reported to have had 49% repeat donors.

**Figure 2 - Voluntary Blood Donation %**



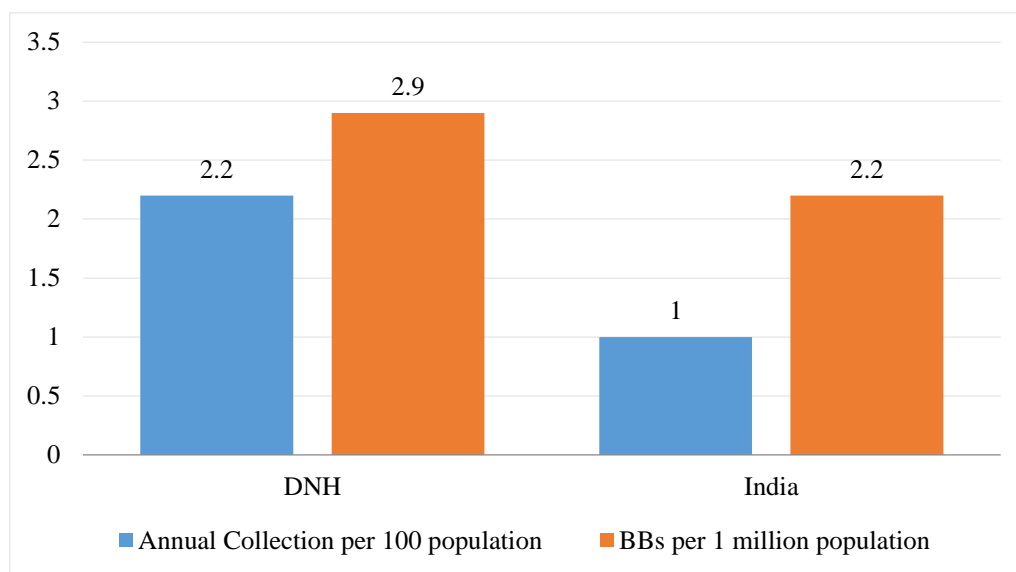
**Figure 3 - Annual Collection per 100 population**



The annual collection of blood units per 100 individuals was found to be around 2.2% in the UT, which is significantly more than the WHO suggested requirement that 1% of the population can meet a nation's most basic requirements for blood.

Figure 5 illustrates the comparative information of annual collection per 100 population and number of blood banks per one million populations between DNH and India. This indicates that the UT had around 2.9 blood banks per million population that collected around 2.2 units per 100 population at the ratio of 2.9 BB: 2.2 blood unit which is well above the national average.

**Figure 4 - Annual Collection per 100 population Vs BBs per 1 million**

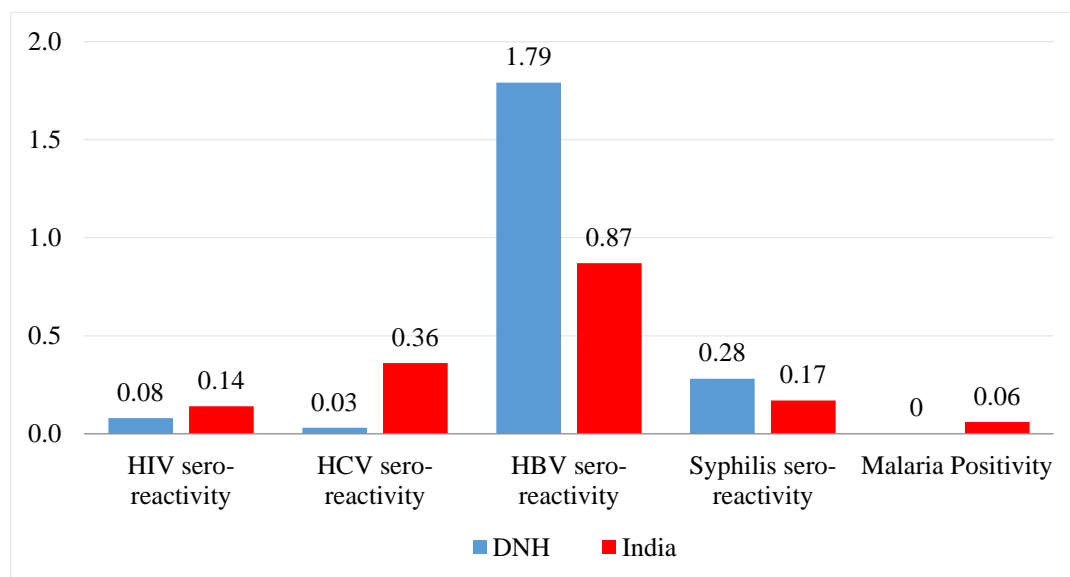


### 4.3 Transfusion Transmitted Infections(TTIs)

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.

The seroreactivity of TTI among blood donors in the year 2015 is depicted in Fig-5. HIV reactivity was found to be 0.08%, Hepatitis-C was 0.03%, Hepatitis-B 1.79% and Syphilis 0.28%. There were no donors tested positive for Malaria during the reporting period.

**Figure 5 - TTI (%) DNH vs. India**



Hepatitis B seroreactivity was found to be higher than the national average of 0.87% in DNH, which was 1.79%. The UT has recorded the second highest Hepatitis B reactivity among its donors after the UT of Puducherry. The Syphilis reactivity(0.28%) is also higher than the national average.

#### **4.4 Component Separation**

Around 59% of the blood collected by the IRCS blood bank was used for component separation in the UT. The total collection by this facility was 7,497 units of which 4,436 units were used for component separation.

#### **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 -10. The IRCS Blood Bank has reported that they adhered to the NBTC guidelines and had Standard Operating Procedures (SOPs) for technical processes. Internal Quality Control (IQC) for Immunohematology and TTI was reported 100% by the blood bank. They have also reported as carrying out quality control for kits, reagents and blood bags, and had a regular equipment maintenance programme as well as calibrated the equipment as per requirement.

**Table 4 - Availability of Quality Parameters in the Blood Bank**

<b>Quality Parameters</b>	<b>Availability</b>
<b>Compliance with NBTC guidelines</b>	100%
<b>Availability of Documental Control System (DCS)</b>	-
<b>SOPs for Technical Processes</b>	100%
<b>IQC for IH</b>	100%
<b>IQC for TTI</b>	100%
<b>QC for kits, reagents and blood bags</b>	-
<b>EQAS for IH</b>	-
<b>EQAS for TTI</b>	-
<b>NABH accreditation for blood banks</b>	-
<b>Availability of designated and trained Quality Manager</b>	-
<b>Availability of designated and trained Technical Manager</b>	-
<b>Programme for regular Equipment maintenance</b>	100%
<b>Equipment calibration as per regulatory requirement</b>	100%

On the other hand, the blood bank did not have a document control system, was not found enrolled in EQAS by recognized providers for Immunohematology and TTIs and was not accredited by National Accreditation Board for Hospitals & Healthcare Providers (NABH). Designated and trained Quality Managers and Technical Managers were not available as well.

## **4.6. Reporting and Documentation**

### **4.6.1. Compliance to NBTC guidelines and Reporting Requirements**

The blood bank reported that they were recovering processing charges within NBTC/SBTC norms but did not display stock position in their Blood Bank premises.

In terms of reporting requirements, the blood bank submitted regular reports to state drug controller and in the national strategic information management systems (SIMS). But they did not regularly reported in e-blood banking either national or state e-blood banking nor were members of the National Haemovigilance Program.

## 4.7. Human Resources

### 4.7.1. Availability of staff

The total number of employees in the blood bank was 10. The blood bank had one medical officer, seven technical staff and two nursing staff. However, the blood bank had no counsellors and PRO/Donor motivators. As reported by the blood bank, there were no personnel trained by NACO/NBTC.

## 4.8. Equipment and Supplies

### 4.8.1. Regular supply of kits/supplies and Equipment Availability

The IRCS blood bank reported that they had a regular supply of blood bags and TTI kits. Table 5 indicates the percentage of blood banks that have different equipment in working condition.

**Table 5 - Equipment in working condition**

Equipment in working Condition		
S No	Equipment	% BB
1	Donor Couches	100
2	Instrument for Hb Estimation	-
3	Blood collection monitor	100
4	Quarantine Blood Bank Refrigerator to store untested blood	100
5	Container for safe disposal of sharps	100
6	Oxygen supply equipment	100
7	Computers with accessories and software	100
8	General lab centrifuge for samples	100
9	Bench top centrifuge for serological testing (Immunohaematology)	100
10	Blood transportation box (No. in inventory)	100
11	Emergency drugs box / Crash cart	100
12	Autoclave machine	100
13	Water bath	100
14	Blood bank refrigerator (storage of tested blood) with temperature recorder	100
15	Automated pipettes	100
16	Refrigerated centrifuge	100
17	Blood container weighting device	100
18	Serology rotator	-

#### **4.9. The current status of the blood bank 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 assessment score of the blood bank in the UT was 62.50 which is higher than the national average of 62 as well as the national average score of NACO supported blood banks which was 61.2. However, in terms of organizational attachment and the type of blood bank it has scored below the national average of 64.18 and 64.69, respectively.

## 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 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 UT.

The NACO supported blood bank which was included in the review is the only blood bank existing in the UT. The annual collection of this blood bank was 7,497 units which is approximately 2.2% 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). 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 provision of a blood component separation unit in the blood bank and the volume of collection apparently have a positive influence on the quality. 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, 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 across the nation. This review indicated a score of 62.50 for the blood bank. 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.

## 6. Reference

- CDSCO. (2015). LIST OF LICENSED BLOOD BANKS IN INDIA \* (February, 2015). Retrieved from <http://www.cdscsco.nic.in/writereaddata/BLOOD%20BANKS%20INDIAfeb2015.pdf>
- Chandra, T., Rizvi, S. N. F., & Agarwal, D. (2014). Decreasing Prevalence of Transfusion Transmitted Infection in Indian Scenario. *The Scientific World Journal*, 2014, 4. doi:10.1155/2014/173939
- GOI. (2003). *Transfusion Medicine, Technical Manual*. New Delhi: Director General of Health Services, Government of India.
- Gupta, R., Singh, B., Singh, D. K., & Chugh, M. (2011). Prevalence and trends of transfusion transmitted infections in a regional blood transfusion centre. *Asian J Transfus Sci*, 5(2), 177-178. doi:10.4103/0973-6247.83250
- ISO-8402. (1994). *Quality Management and Quality Assurance - Vocabulary*. Retrieved from Geneva, Switzerland.:
- NACO. (2007a). *National Blood Policy (India)*. Retrieved from New Delhi: <http://upsacs.nic.in/bs%20doc/bs%20National%20Blood%20Policy.pdf>
- NACO. (2007b). *Standards For Blood Banks & Blood Transfusion Services*. Retrieved from New Delhi: [http://www.iapsmgc.org/userfiles/10\\_Standards\\_for\\_Blood\\_Banks\\_and\\_Blood\\_Transfusion\\_Services.pdf](http://www.iapsmgc.org/userfiles/10_Standards_for_Blood_Banks_and_Blood_Transfusion_Services.pdf)
- NACO. (2014). *National AIDS Control Programme Phase-IV (2012-2017) Strategy Document*. Retrieved from New Delhi: <http://www.naco.gov.in/upload/NACP%20-%20IV/NACP-IV%20Strategy%20Document%20.pdf>.
- NACO. (2016). *Annual Report 2015-16*. Retrieved from New Delhi:
- Pal, R., Kar, S., Zaman, F. A., & Pal, S. (2011). The quest for an Indian blood law as of blood transfusion services regulatory framework. *Asian J Transfus Sci*, 5(2), 171-174. doi:10.4103/0973-6247.83246
- Ramani, K. V., Mavalankar, D., & Govil, D. (2007). *Management of Blood Transfusion Services in India: An Illustrative Study of Maharashtra and Gujarat States*. Retrieved from
- Schlickman, J. J. (1998). *ISO 9000 quality management system design: optimal design rules for documentation, implementation, and system effectiveness*: ASQ Quality Press.
- WHO. (1975). *World Health Assembly resolution WHA28.72. Utilization and supply of human blood and blood products*. Retrieved from <http://www.who.int/entity/bloodsafety/en/WHA28.72.pdf>
- WHO. (2008). *Universal Access to Safe Blood Transfusion*. Retrieved from Geneva:
- WHO. (2009). *GDBS Summary Report 2009*. Retrieved from Geneva: [http://www.who.int/bloodsafety/global\\_database/GDBS\\_Summary\\_Report\\_2009.pdf](http://www.who.int/bloodsafety/global_database/GDBS_Summary_Report_2009.pdf)
- WHO. (2011). *Developing a National Blood System*. Retrieved from Geneva: [http://www.who.int/entity/bloodsafety/publications/am\\_developing\\_a\\_national\\_blood\\_system.pdf?ua=1](http://www.who.int/entity/bloodsafety/publications/am_developing_a_national_blood_system.pdf?ua=1)
- WHO. (2012). More voluntary blood donations essential [Press release]. Retrieved from [http://www.who.int/mediacentre/news/releases/2012/blood\\_donation\\_20120614/en/](http://www.who.int/mediacentre/news/releases/2012/blood_donation_20120614/en/)
- WHO. (2016a). Quality systems for blood safety. Retrieved from <http://www.who.int/bloodsafety/quality/en/>
- WHO. (2016b). World Blood Donor Day 2016: Blood connects us all. Retrieved from <http://www.who.int/campaigns/world-blood-donor-day/2016/en/>

## 7. Annexures

### 7.1 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					

	<i>medical officer can be directly contacted). This is apart from the blood bank email ID provided above.</i>		
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	<b>License Information</b>		
1.	<b>BB License Number</b> <i>(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-</i>		

	<i>renewal etc. (You will have to submit a self-attested photocopy of the currently displayed license along with this form.)</i>			
<b>2</b>	Status of Current License	Valid		
		Under renewal		
<b>3</b>	Date of issue of current licence DD/MM/YYYY			
<b>4</b>	Last Inspection by licensing authority	< 1 year		
		1-2 years		
		2-3 years		
		3-4 years		
		>4 years		
<b>A3</b>	<b>Basic Statistics (Date of reporting from Jan-2015- Dec-2015)</b>			
<b>1</b>	Number of voluntary donations			
<b>2</b>	Number of replacement donations			
<b>3</b>	Number of autologous deposits			
<b>4</b>	Total Annual collection for reporting period (Jan - Dec 2015) Total Annual collections (sum of A3.1+A3.2+A3.3)			
<b>5. Transfusion Transmissible Infections - Annual statistics</b>		<b>Number tested</b>	<b>Number positive</b>	
	<b>HIV</b> (Anti-HIV I & II)			
	<b>HCV</b> (Anti-HCV)			
	<b>HBV</b> (HBs Ag)			
	<b>Syphilis</b> (RPR/TPHA/ELISA)			
	<b>Positive for Malaria</b> (Any method)			
<b>A4.</b>	<b>Reporting Summary</b>			
<b>1</b>	Are you in compliance with NBTC guidelines?	Yes		
		No		
<b>2</b>	Are you recovering processing charges for blood/components within NBTC/SBTC norms?	Yes		
		No		
<b>3</b>	Are you displaying stock position in the blood bank premises?	Yes		
		No		
<b>4</b>	Are you submitting statistics to the State Drugs controller?	Regular		
		Occasional		
		No		
<b>5</b>	Are you reporting in SIMS (strategic Information Management System- NACO)?	Regular		
		Occasional		
		No		
<b>6</b>	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 ( <i>more than one can be selected</i> )	State	
		National (NHP)	
		Other(Specify	
10	Please provide E Blood banking user ID ( <i>State</i> )		
11	Please provide E Blood banking user ID ( <i>National</i> )		
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)		
<b>Definition of VBD = Close relatives should NOT be counted as VBD</b>			
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? ( <i>Provide numbers of VBD camps conducted during the period January - December 2015.</i> )		
8	Does the blood bank have dedicated staff for the promotion of Voluntary blood donors? ( <i>If your blood bank has dedicated staff for camps, answer yes.</i> )	Yes	
		No	
8 a.	if Yes to 8, select as applicable ( <i>More than one may be selected</i> )	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 ( <i>Donor database is essential to contact donors to remind them or to call during an emergency?</i> )	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? ( <i>Answer yes if your Blood bank has a mobile facility (bus or van with donor couches)</i> )	Yes		
		No		
15	Source of funds for the mobile blood collection ( <i>Indicate the source of funding for the purchase of the mobile blood donor van.</i> )	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.			
<b>Section C</b>				
<b>Technical – Immunohematology</b>				
C1.	Which of the following tests are performed for determination of ABO and Rh (D) groups and what techniques are followed?	<b>Blood Group</b> (Tick as applicable)		<b>Rh Type</b> (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 participant in	Inter-lab	
		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	
<b>Section D</b>			
<b>Technical - Screening For Transfusion Transmissible Infections (TTI)</b>			
<b>Does the blood bank screen the following TTIs?</b>			
<b>Type of Test</b>		<b>Platform (please tick appropriate)</b>	
<b>Method (please tick appropriate)</b>			
1	<b>HIV I &amp; II</b>	Rapid	
		ELISA	
		CHEMI	
		NAT	
1.1	Specify % of donors tested by Rapid Test?		
2	<b>Hepatitis B</b>	Rapid	
		ELISA	
		EM	
		NAT	
2.1	Specify % of donors tested by Rapid Test?		
3	<b>Hepatitis C</b>	Rapid	
		ELISA	

		CHEM		Manual	<input type="text"/>
				Automated	<input type="text"/>
		NAT		Manual	<input type="text"/>
				Automated	<input type="text"/>
3.1	Specify % of donors tested by Rapid Test?				
4	<b>Syphilis</b>	RPR		Manual	<input type="text"/>
				Automated	<input type="text"/>
		TPHA		Manual	<input type="text"/>
				Automated	<input type="text"/>
		ELISA		Manual	<input type="text"/>
				Automated	<input type="text"/>
5	<b>Malaria</b>	Rapid			
		Fluorescent		Manual	<input type="text"/>
				Automated	<input type="text"/>
		Slide microscopy			
		ELISA		Manual	<input type="text"/>
				Automated	<input type="text"/>
6	Does the blood bank have an algorithm for units that test POSITIVE in initial screening? <i>(If you have a method of verifying a sample that has tested positive on the screening test please answer yes.)</i>			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 <i>(Viral Markers, Malaria, and Syphilis)</i> 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 you be willing to participate in future?			Yes	
				No	
16	If Yes to Q15, will your blood bank be able to provide			Yes	

	financial support (about Rs. 2500 per year)	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	
<b>Section E</b>			
<b>Technical - Component Preparation (Applicable only to BCSU)</b>			
1	Does your blood bank prepare components?	Yes	
		No	
<b>If your answer to Q1 is NO, SKIP TO SECTION F</b>			
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.		
		<b>Number prepared</b>	<b>No. issued (utilized)</b>
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		
		<b>Number prepared</b>	<b>No. issued (utilized)</b>
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		

<b>SECTION F</b>			
<b>Quality Management Systems</b>			
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	Yes	

	registers as D&C act?	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	
<b>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)</b>			
<b>Staff Details</b>		<b>Total number of staff</b>	<b>Number on contract</b>
		<b>NACO/NBTC Supported in-service training</b>	<b>Other National Training</b>
6	Professor		
7	Associate Professor		
8	Assistant Professor		
9	Senior Resident/Tutor		
10	Medical Officer ( <i>include senior/Junior</i> )		
11	Technical Staff		
12	Nursing staff		
13	Counsellor		
14	PRO/Donor motivator		
15	Administrative staff		
16	Support staff		
If other staff, please specify			
<b>Total number of staff</b>			
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?		
<b>F2. EQUIPMENT AND SUPPLIES</b>			
1	Does the blood bank have adequate equipment to meet regulatory	Yes	

	requirements? <i>(If your blood bank has adequate equipment in working condition to meet expected workload, please answer yes.)</i>	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? <i>(Are kits evaluated locally (at your blood bank) prior to purchase (e.g. Titre and avidity for blood group Anti Sera?))</i>	Yes	
		No	
7	Is quality control for kits, reagents and blood bags carried out at your blood bank? <i>(Is quality control for kits performed locally (at your blood bank) Prior to use (e.g. Titre and avidity for blood group Anti Sera?))</i>	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?		
<b>EQUIPMENT LIST</b> (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			
		<b>Number in inventory</b>	<b>Number in working condition</b>
10	Donor beds/couches		
11	Any instrument for Hb Estimation <i>(other than CuSO4 method)</i>		
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		

## 7.2 Scoring sheet

Individual Scoring Sheet - Blood Component Separation Units			
GENERAL	GENERAL SUMMARY	WEIGHTAGE	TOTAL
Licence	Under renewal	1	
	Valid	3	
<b>Subtotal</b>			<b>3</b>
Annual collection	Below 1000	0	
	1000 to 2000	0.5	
	2000 to 5000	1	
	5000 to 10000	1.5	
	Above 10,000	2	
<b>Subtotal</b>			<b>2</b>
VNRBD	BB by VNRBD (%)	0	
	<25%	0	
	25-49%	1	
	50 - 74%	3	
	75-90%	4	
	Above 90	5	
<b>Repeat DON</b>	Repeat donation >25%	2	
<b>Counselling</b>	Pre and post donation counselling - Regular	2	
<b>Subtotal</b>			<b>9</b>
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	
<b>Subtotal</b>			<b>18</b>
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	

<b>Hep C</b>	Rapid	1	
	Elisa	2	
	Advanced	3	
<b>Syphilis</b>	RPR	1	
<b>Malaria</b>	Slide/Rapid	1	
<b>Subtotal</b>			<b>20</b>
<b>COMP</b>			
	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	
<b>Subtotal</b>			<b>5</b>
<b>QMS</b>	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	
<b>Subtotal</b>			<b>35</b>
<b>GEN</b>	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	
<b>Subtotal</b>			<b>8</b>
<b>SCORES</b>	<b>TOTAL</b>		<b>100</b>

Individual Scoring Sheet - Without Blood Component Separation Units			
GENERAL	GENERAL SUMMARY	WEIGHTAGE	TOTAL
Licence	Under renewal	2	
	Valid	3	
<b>Subtotal</b>			<b>3</b>
<b>Annual collection</b>			
	500 - 1000	1	
	1001 to 2000	2	
	2001 to 3000	3	
	3001 - 5000	4	
	>5000	5	
<b>Subtotal</b>			<b>5</b>
<b>VNRBD</b>	BB by VNRBD (%)		
	25-49%	1	
	50 - 74%	3	
	75-90%	4	
	Above 90	5	
<b>Repeat DON</b>	Repeat donation >25%	2	
	pre donation counselling - regular	2	
<b>Counselling</b>	post donation counselling - regular	2	
<b>Subtotal</b>			<b>11</b>
<b>TECH-IH</b>	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	
<b>Subtotal</b>			<b>18</b>
<b>TECH - TTI</b>	BB performing IQC for TTI	3	
	BB Participating in EQAS for TTI	3	
	BB with follow up program for HIV Sero-positive donors	3	
<b>HIV Testing</b>	Rapid	1	
	ELISA	3	
<b>Hep B</b>	Rapid	1	

	ELISA	3	
<b>Hep C</b>	Rapid	1	
	ELISA	3	
<b>Syphilis</b>	RPR	1	
<b>Malaria</b>	Slide/Rapid	1	
<b>Subtotal</b>			<b>20</b>
<b>COMP</b>	<i>Not applicable</i>		
<b>QMS</b>	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	
<b>Subtotal</b>			<b>35</b>
<b>GEN</b>	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	
<b>Subtotal</b>			<b>8</b>
<b>SCORES</b>	<b>TOTAL</b>		<b>100</b>