

## 1. INTRODUCTION

- Blood transfusion saves millions of lives annually across the globe.
- Window-period transfusion transmissible infections (TTIs) → still a huge risk in India. [1]
- TTIs cause an economic burden.
- Nucleic acid testing (NAT) – reduces the window-period of detection [2]
- NAT mandatory in 55 countries [3]

## 2. AIMS AND OBJECTIVES

1. To map out the economic impacts of transfusion transmissible viral infections (HIV, HBV and HCV).
2. To perform a costing of outcome pathways with and without NAT
3. To project the long-term economic outcome by implementing NAT

## 3. MATERIALS AND METHODS

- Economic Modelling study
- Data from January 2019 to July 2024
- IEC obtained

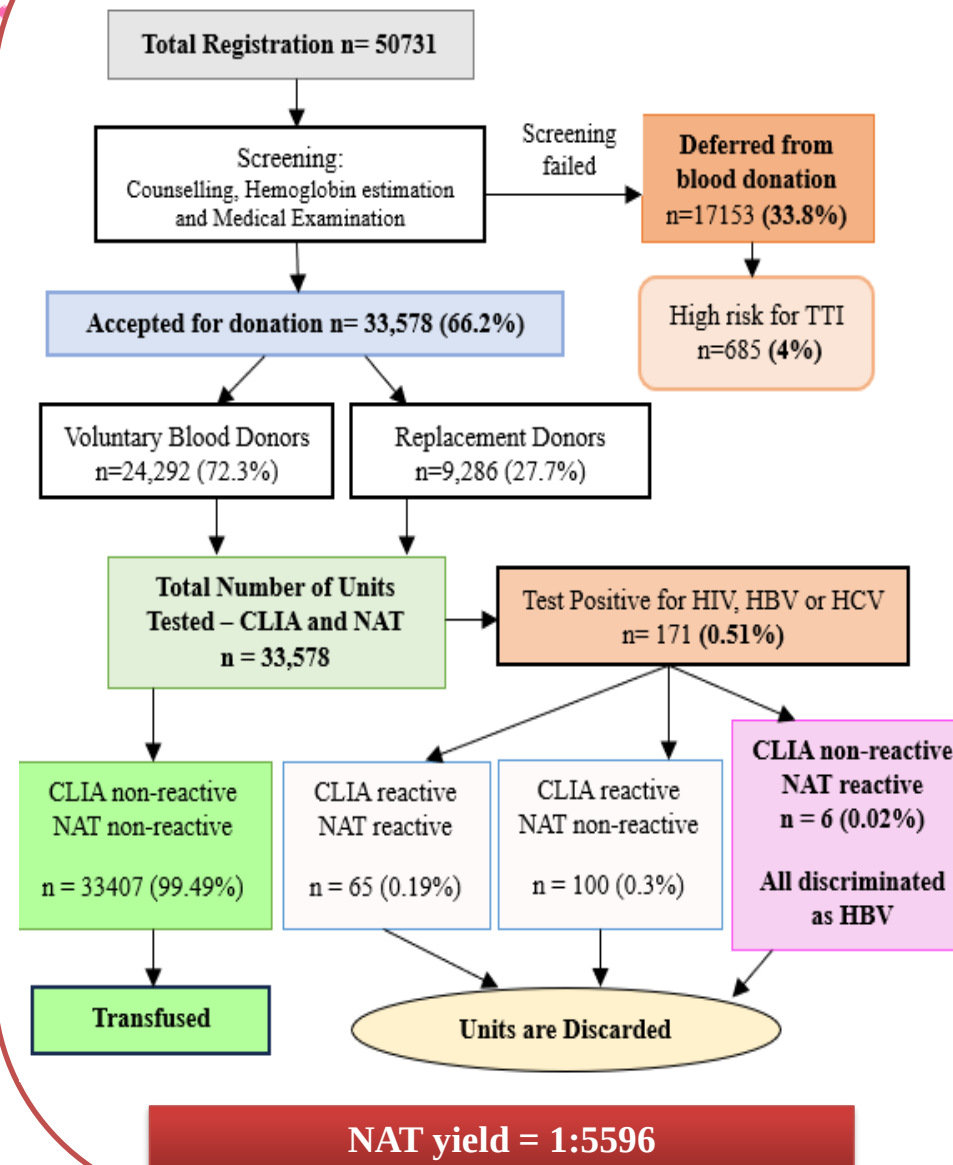
### Data sources:

- Blood Centre software and registers
- Costs from Indian literature, Supreme Court verdict, Purchase Department of Institute

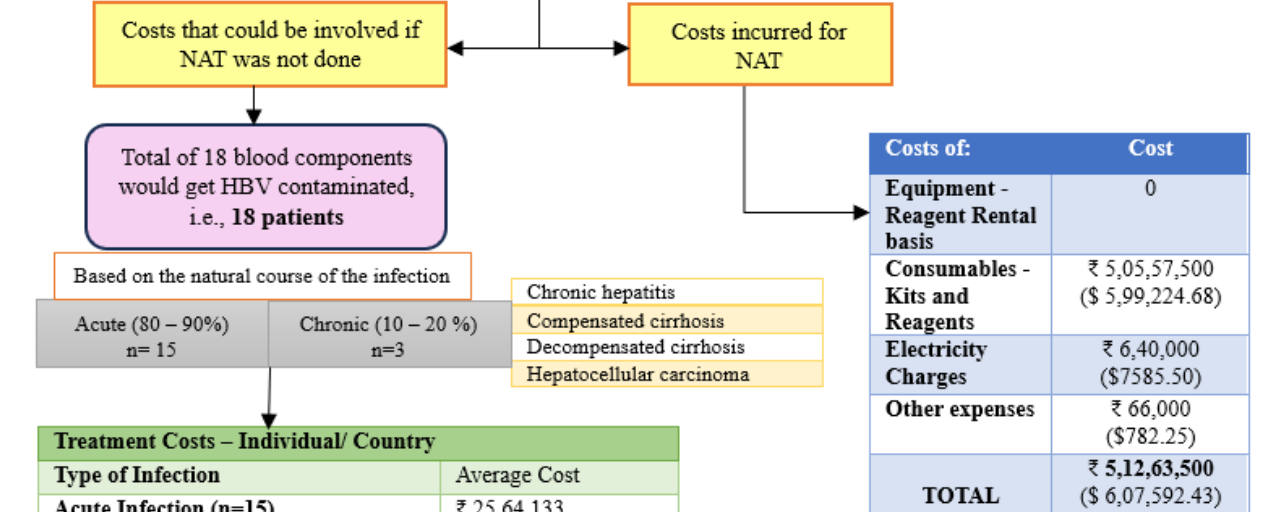
### Costing Analysis

- Mapping out economic impacts
- Applying implicated costs to our setting based on the natural course of the disease
- Comparing costing pathways with and without NAT
- 1 US\$ = 84.37 INR (ex. rate)

## 4. RESULTS



## COSTING



| Treatment Costs – Individual/ Country |                                        |
|---------------------------------------|----------------------------------------|
| Type of Infection                     | Average Cost                           |
| Acute Infection (n=15)                | ₹ 25,64,133                            |
| Chronic Infection (n=3) for 24 years* | ₹ 1,23,07,838.4                        |
| <b>Total cost</b>                     | <b>₹ 1,48,71,971.4 (\$1,76,270.8.)</b> |

| Costs to be borne by the Hospital |                            |
|-----------------------------------|----------------------------|
| Parameter                         | Average Cost               |
| Donor Look-back (n= 6)            | ₹ 1320 (₹ 220 per donor)   |
| Patient Trace-back (n=18)         | ₹ 3960 (₹ 220 per patient) |
| <b>Total</b>                      | <b>₹ 4280 (\$ 50.7)</b>    |

| Implicated Legal Costs                  |                                      |
|-----------------------------------------|--------------------------------------|
| Compensation to be paid to the patients | ₹ 1,50,00,000                        |
| Out-of-pocket expenses                  | ₹ 37,500                             |
| <b>Total</b>                            | <b>₹ 1,50,37,500 (\$ 1,78,232.8)</b> |

| Approximate Societal/Indirect costing |                                         |
|---------------------------------------|-----------------------------------------|
| Type of Infection                     | Average costs incurred                  |
| Acute Infection (n=15)                | ₹ 96,62,815.95                          |
| Chronic Infection (n=3) for 24 years* | ₹ 4,63,81,516.55                        |
| <b>Total</b>                          | <b>₹ 5,60,44,332.5 (\$ 6,64,268.49)</b> |

\* Institute for Health Metrics and Evaluation (IHME) database

### Net economic Gain by using NAT

There is a net economic gain of **₹3,46,96,124 (\$4,11,237.7) → 40% gain**

### Net economic Gain by using NAT in our Centre

|                                                                |                                      |
|----------------------------------------------------------------|--------------------------------------|
| Total Cost that could have been involved in the absence of NAT | ₹ 8,59,59,623.90 (\$ 10,18,841.1)    |
| Costs involved with NAT in our Centre                          | ₹ 5,12,63,500 (\$ 6,07,592.4)        |
| <b>Net Gain</b>                                                | <b>₹ 3,46,96,124 (\$ 4,11,237.7)</b> |

## 5. DISCUSSION

- NAT results from 11 Indian publications → NAT yield varied from 1:476 to 1:4403 [4] – lesser
- Despite increased voluntary donation and high deferral rate, NAT yield present
- Upto 1.5 crore compensation in TT HIV – 2023 [5]
- No similar study in Indian Literature

## 6. CONCLUSION

- Net economic gain with NAT of donor units
- Cost-effective and should be made as a mandatory test in India.
- Faster identification of reactive cases and prompt notification → reducing the country's economic burden.

## REFERENCES

1. Transfusion Medicine Technical Manual 2022. Ministry of Health & Family Welfare.
2. Makroo RN, Choudhury N, Jagannathan L, et al. Multicenter evaluation of individual donor nucleic acid testing (NAT) for simultaneous detection of Human immunodeficiency virus -1 & hepatitis B & C viruses in Indian blood donors. *Indian Journal of Medical Research*; 127. 2022; 1–184.
3. WHO. Global Status Report on Blood Safety and Availability 2021. 2022; 1–184.
4. Ghosh K, Mishra K. Nucleic acid amplification testing in Indian blood banks: A review with perspectives. *Indian Journal of Pathology and Microbiology*; 60. DOI: 10.4103/IJPM.IJPM\_361\_16.
5. CIVIL APPEAL NO(S). 7175 OF 2021; 26 September 2023. IN THE SUPREME COURT OF INDIA CIVIL APPELLATE JURISDICTION.