

Gap Analysis in Notification and Follow-Up Counseling of TTI Reactive Blood DonorsSreedevi R¹, Chitra M², Anbarasi A³, Sivaranjani V⁴¹Associate Professor, Dept of Transfusion Medicine, Tamilnadu Govt Multi Superspeciality Hospital, Chennai, Tamilnadu, India²Associate Professor, Dept of Transfusion Medicine, Kalaignar Centenary Superspeciality Hospital, Chennai, Tamilnadu, India³Associate Professor, Dept of Transfusion Medicine, Government Royapettah Hospital, Chennai, Tamilnadu, India⁴Senior Assistant Professor, Dept of Transfusion Medicine, Tamilnadu Govt Multi Superspeciality Hospital, Chennai, Tamilnadu, India

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Abstract:**Objective:** A very important and efficient method of curtailing transfusion transmitted infections (TTIs) is notifying and counseling the TTI reactive donors. Donor notification and counseling protects the health of the donor and also helps in preventing secondary transmission of infectious diseases.**Methods:** A total of 13,972 donations were screened for TTI, namely human immunodeficiency virus (HIV), hepatitis B virus (HBV), hepatitis C virus (HCV) and syphilis by serology. All TTI reactive donors were notified of their status by telephone or letter and called for follow-up counseling in person and referral for treatment.**Results:** Out of 13,972 blood donors who were screened for TTI, 151 (1.08%) blood donors had reactive screening tests. The prevalence of HIV, HBV, HCV, Syphilis were 0.07% (9), 0.64 % (90), 0.15% (21), 0.22% (31) respectively. The overall response rate of donors with reactive screening tests was comparatively high i.e. 80.1%. (131 out of 151 reactive donors). Around 61 (50.4%) of counseled reactive donors revealed history of high-risk behavior/factors which were not disclosed during donor registration and screening.**Conclusion:** Donors conceal their high-risk behaviors and continue to donate blood being not aware of the consequences of their blood donation. Detailed predonation education and counseling should be a part of the process of donor selection and privacy should be maintained to gain donor confidence. Notification of positive results should be made mandatory and uniform national guidelines for the notification of reactive blood donors should be formulated. Proper follow-up counseling of reactive donors should be done and TTI response rate should be monitored.**Keywords:** Blood donor, counseling, high-risk behaviors, notification, transfusion - transmitted infections, TTI Response rate.

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Introduction

Blood & blood products transfusion is an efficacious treatment that saves millions of lives annually. Blood products safety & efficacy are essential considerations for transfusion medicine professionals as well as blood collection centers globally. [1]

Transfusion Transmitted Infections remain a significant concern for patients, physicians, as well as policymakers advocating for a risk-free blood supply. The primary reasons include the test's inability in identifying disease during the pre-seroconversion or 'window' phase of infection, high screening costs, insufficient funding along with trained personnel, immunologically diverse viruses,

inadvertent laboratory testing errors, along with non-seroconverting chronic or immunosilent carriers. Blood & blood products transfusions are major source of human immunodeficiency virus (HIV), hepatitis C virus (HCV), & hepatitis B virus (HBV) infections in developing countries. An asymptomatic infectious period in donor & capacity for enduring processing & storage are two characteristics of TTIs that present greatest risk to blood safety. [2]

Even though the main step in mitigating the TTI risk is by proper donor selection and screening of the donated blood using sensitive screening tests,

another important step in reducing TTI is by informing donors about their reactive status and counseling them for further treatment and follow-up. Creating awareness in the public and donor population about blood donation importance & about risks for recipients from transfusing infected blood are the main factors to ensure safe blood supply.

Until December 2004, in our nation disclosing viral TTI reactivity to blood donors was not permitted. National Blood Transfusion Council of India then developed an approach that addressed this issue and encouraged blood centres to inform blood donors about their TTI results. [3]

All blood banks are required to get written consent from blood or blood products donors on donor questionnaire, whether donor intends to be notified of a reactive test result or not. For counseling & follow-up at blood bank, blood donors with reactive screening test results will be notified by phone, text, letter, & email.

The very essential link connecting the donor with safe blood includes counseling, testing, & notification.[4] Donor selection process should include pre-donation counseling, & donor confidence should be earned by maintaining donor privacy.

It is the duty of Blood centre to provide post-donation counseling to blood donors. Donors deserve the right to be informed about the status of their test results and if their donated blood becomes unacceptable for transfusion by any reason. Reactive donors are given information about their serological status, risks of spreading their disease to others, emotional support, assistance with modifying their behaviour along with lifestyle changes along with referral for further medical care.

In this background, this study was formulated with the following aims & objectives:

1. To find out the response rate of reactive donors on notification of their test results for further counseling.
2. To elicit the missed risk factors from those donors who responded and
3. To find out the gaps in proper notification of reactive donors and to suggest some recommendations to improve the response rate.

Methods

This prospective observational study was performed at Department of Transfusion Medicine Tamil Nadu Govt. Multi Super Speciality Hospital Chennai. Period of study was from January 2020 to December 2023. All eligible blood donors were requested to fill in the blood donor questionnaire

form which was designed in accordance with the guidelines set forth by Drugs & Cosmetics Act, Ministry of Health & Family Welfare, and Government of India. [5]

Predonation counseling given to every donor as well as donors were informed about the high-risk behaviours and were asked not to donate if they had high-risk behaviours. All donors submitted their informed consent to have their blood tested for 5 mandatory TTIs and if they wanted to be notified of reactive test results.

After blood donation, all blood units were tested with fourth-generation ELISA kits for HIV third-generation ELISA kits for HCV & HBsAg, syphilis utilizing RPR (rapid plasma reagin) test & Malaria by Leishman's stain correspondingly. Donors tested positive for syphilis by RPR & reactive for HBV, HCV, & HIV by enzyme-linked immunosorbent assay (ELISA) in duplicate (one sample from the blood bag as well as one from the pilot tube) received notification of their reactive test results and contacted for counseling. When an abnormal test result occurs, blood centre counsellor notifies donor & recommends them for making an appointment for in-person counseling and to be referred to appropriate medical department for additional care.

In each instance, telephone notifications had been sent twice (second call placed at least one week apart) & once by post to those who were unable to reach them after four attempts. At every stage, we made an effort to keep things confidential. Non-responder donors are those who failed to respond to these notifications. Regarding postal communication, confidentiality was preserved by simply alerting the donor about an abnormal test result along with recommending them to contact blood center.

Reactive donors who arrived at blood centre received one-on-one counseling while their privacy was protected & referred to appropriate hospital department for additional care (HIV reactive donors referred to ICTC, HBV & HCV reactive donors referred to gastroenterologist along with RPR positive donors referred to STD clinic). Reactive donor was accompanied by hospital staff till they meet concerned person in referred department.

Results

13,972 blood donations in total screened for TTI from Jan 2020-Dec, 2023. Around 151 (1.08%) blood donors identified having reactive screening tests: HIV- 9, HBV - 90, HCV- 21, Syphilis -31 & Malaria - 0. HIV, HBV, HCV, Syphilis prevalence were 0.07% (9), 0.64 % (90), 0.15% (21), 0.22% (31) donors respectively.

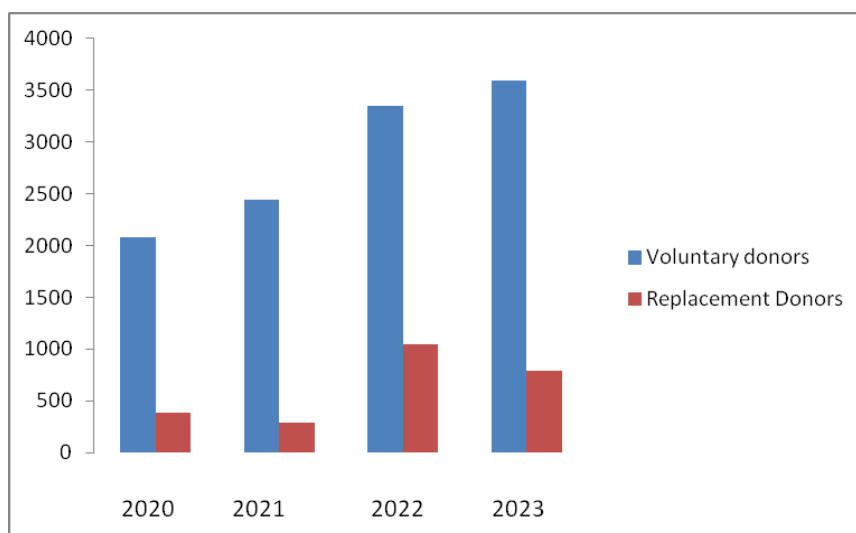


Figure 1: Yearly donor distribution

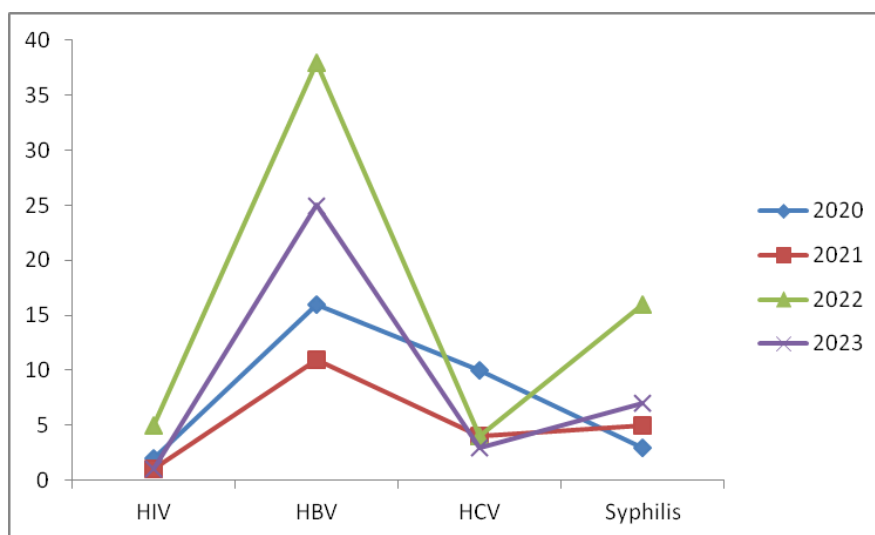


Figure 2: Trend in Sero-Prevalence of TTI – HIV, HBV, HCV and Syphilis

151 Reactive donors in total notified telephonically, 136 donors were contacted & 15 unable to be contacted (mobile switched off, not responding or not available).

100 of 136 donors contacted by telephone reported to blood center following first two calls & remaining 36 non-responders contacted again, as well as donors not initially reachable. Out of these 36 + 15 donors, only 12 reported to blood centre

for counseling. Confidential letters were posted to remaining donors and then 8 donors reported at blood centre. 1 donor came after reporting to State AIDS Control Society.

2 donors had already known information regarding their reactive status and subsequently refused to report at blood centre, stating that they would be taking treatment and follow up from private hospital (both were HBsAg positive).

Table 1: Response Rate of Reactive Donors According To Gender, Type of Donation, and First Time or Repeat Donor

Criteria	Type of donation		Number of donations		Gender	
	Voluntary	Replacement	First time	Repeat donor	Male	Female
Total reactive donors	62	89	82	69	149	2
No. of responders	57	64	72	49	119	2
Percentage	91%	72%	88%	71%	80%	100%

Out of 21 HCV reactive donors, 16 (76.2%) responded and visited the blood centre, 5 (23.8%) didn't, 75 (83.3%) responded out of 90 HBV reactive donors, & 15 (16.7%) didn't respond at all. Response rate had been

notably higher among HIV reactive donors specifically, out of 9 reactive donors, 8(88.8%) responded, whereas 1(11.2%) didn't. Response rate among VDRL reactive donors was relatively low; of 31 reactive donors, only 22 responded (70.9%), while 9 donors (29.1%) didn't respond. [Figure 3] [Table 2]

Table 2: Disease Wise Counseling Rate

	Total reactive	Contacted	Unable to contact	Came to blood centre for counseling	Did not come
HIV	9	8	1	8	0
HBsAg	90	85	5	75	10
HCV	21	18	3	16	2
VDRL	31	25	6	22	3
TOTAL	151	136	15	121	15

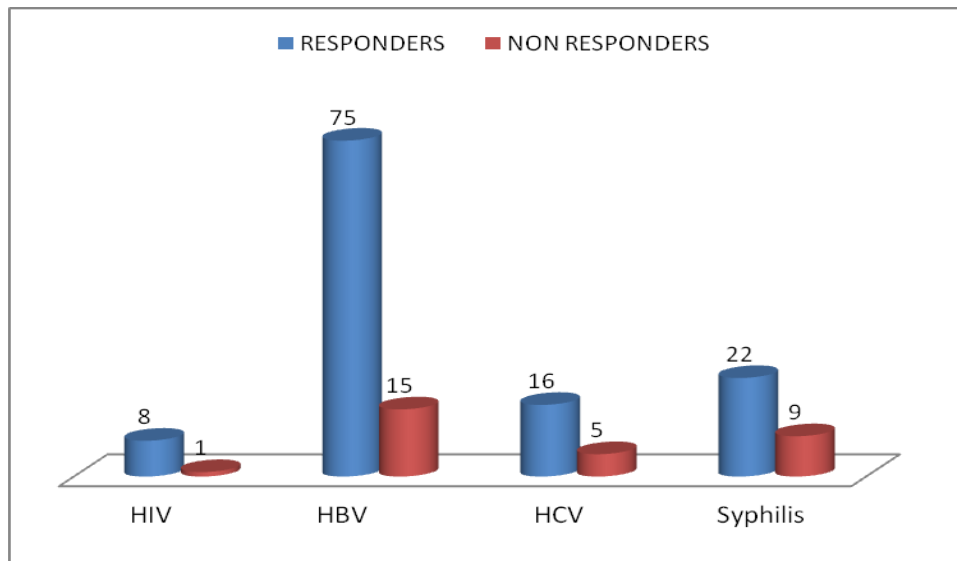


Figure 3: Response Rate According To TTI Marker Positivity

Reactive donors were divided into 5 age groups: 18-20, 21-30, 31-40, 41-50 & above 50. Comparative analysis of responders as well as non-responders ages revealed considerable disparities. 18 -20 and above 50 years age group showed full response (100%) in our study. In the 21–30 years age group, comparatively low response was seen,

39 out of 52 (75%), while 78.1% and 85.7% responded in 30-40 & 40-50 years age group, correspondingly [Figure 4]. Male reactive donors comprised about 98.7% of total of which 80% reported to blood bank. Female reactive donors had 100% response rate. We had only 2 female reactive donors in our study.

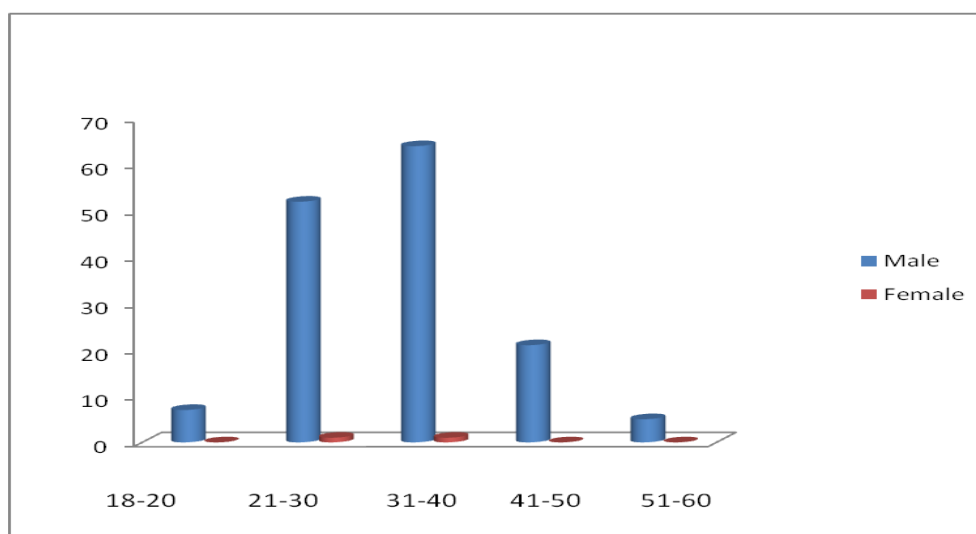


Figure 4: Age Wise Distribution of Reactive Blood Donors.

TTI reactivity was higher among replacement donors, i.e., 89 (58.9%), while response rate was higher among voluntary donors (91% vs 72%) [Table 1]. In our research, first-time donors had a greater response rate (88%) than repeat donors (71%). Response rate of reactive donors was also

analyzed by occupation, while it was discovered that students had greatest response rate (100%), followed by those employed by private companies (86%).

Lowest response was seen among the drivers (68%) and labourers (73%) [Table 3]

Table 3: Response Rate of Reactive Donors According To Their Occupation

Occupation	Reactive Donors	No. Of Responders
Private Job	49	42 (86%)
Business	23	18 (78.2%)
Govt Job	19	16 (84.2%)
Driver	28	19 (68%)
Labourer	16	12 (75%)
Students	10	10 (100%)
Farmer	6	4 (67%)

121 donors of 136 notified donors reported in blood centre for counseling & status confirmation. 60 (50.6%) of total donors who received counseling had history of high-risk behaviour or factor. Some of those reported several risk behaviours, while 61

donors (50.4%) refused to disclose any high-risk behaviours. Most prevalent high-risk indicators were sharing razors in saloon shops & hostel rooms 8 (6.6%) and promiscuous conduct (14, 11.5%) [Table 4]

Table 4: Evaluation of High-Risk Behaviors/High-Risk Factor among Counseled Reactive Donors

High-Risk Behaviour	No. Of Donors	Percentage Of Donors
Tattoo	4	3.3 %
Transfusion history	3	2.5 %
Surgery done before	3	2.5 %
Promiscuous behaviour	14	11.5%
Homosexual	5	4.1 %
Paid sex	2	1.7 %
Iv drug abuse	2	1.7 %
History of jaundice	3	2.5 %
Family history of jaundice	3	2.5%
Intravenous drugs and fluid infusion for medical/surgical cause	4	3.3%
Saloon shop	8	6.6%
Sharing of razors in hostel room	8	6.6%
Already had VDRL and became negative after treatment	1	0.8%
Not revealed any risky behaviour	61	50.4%

Discussion

Post donation counseling involving revealing a blood donor of abnormal screening test results is an extremely sensitive issue.

This has psychological and social impacts in which an asymptomatic individual who came with altruistic intentions to donate blood is notified regarding abnormal test results. [6]

It is crucial to notify donors about abnormal test results because

- If the donor is actually infected, they might require therapeutic intervention, while all of their contacts must be protected & examined as well.
- It is crucial to comprehend donor's specific risk to understand how donor selection procedure failed to recognize donor as high-risk

along with deferring them if they are, in fact, infected. [7]

Steps in post-donation counseling of blood donors with confirmed TTI by healthcare personnel

- Inform the result simply & clearly to the donor.
- Give donor time for considering information.
- Ensure that donor is able to understand result.
- Allow donors to make queries.
- Assist donor in coping with emotions arising from test result.
- Discuss any immediate concerns, then assist donor by suggesting person among their close family & friends that may be available and acceptable to offer immediate support.
- Describe follow-up services that are available in health facilities & in community, with spe-

- cial attention to available services for treatment, care & support.
8. Provide information on how to prevent further transmission of infection.
 9. Provide information on other relevant preventive health measures, such as healthy lifestyles & good nutrition.
 10. Discuss possible disclosure of result, encompassing when & how this may happen & to whom.
 11. Encourage & offer referrals for testing & counseling of partners as well as children
 12. Arrange a specific date & time for a follow-up visit or referral for treatment, care, counseling, support, as well as other services, as appropriate. [8]

In current investigation, overall response rate of donors with reactive screening tests was 80.1%. In our research, counseling response rates had been 83.3%, 76.2%, 88.9% & 70.9 % for HBsAg, anti-HCV, anti-HIV & syphilis, correspondingly. Patel et al. found response rate of 64.2% for HBsAg, 39.29% for anti-HCV, 52.24% for HIV I & II, as well as 63.28% for syphilis.[9]

Counseling success rate documented by Dontula et al. had been 48.17%, 16.22% & 14.63% for HBsAg, anti-HIV & anti-HCV, correspondingly.[10] Roshan et al. observed response rate of 70.7% for HCV, 58.9% for HBsAg, 54% for HIV I & II, as well as 32.9% for syphilis, with an overall response rate of 63.5%. [11]

In contrast to our study, low response to reactive donor notifications was observed in many studies. In research by Kaur et al., response rates were 49%, 45.5%, 50%, & 17% for HBsAg, HCV, HIV, & syphilis, respectively. [6] Low response rates to notifications for reactive donors have been reported by Agarwal (59.8%) & Kotwal et al. (50.6%)[12,13], as well as in investigation conducted by Mukherjee et al. (34%) & Kumari S. (35.34%).[14, 15] Considering low response rate amongst reactive blood donors in many studies, repeated notifications are essential, as Kleinman et al. indicated that 10% of donors either neglected to open or read letters, failed in comprehending their content, or declined to accept initial correspondence. [16]

In our investigation, response rate for HIV was 88.9% highest among all TTIs. Research conducted by Kaur et al. reported higher response rate of HIV reactive donors at 50%, while Kumari S's investigation indicated response rate of 41.7%. This could be attributable to greater understanding of HIV/AIDS within general populace. In post-donation counseling, 50.6% of respondents disclosed a history of high-risk behaviours or variables, with some indicating multiple risk

behaviours. Among high-risk factors, promiscuous behaviour 14 (11.5%) was the most common while sharing razors in hostel rooms and saloon shops 8 was the next (6.6%) [Table 4]. Promiscuous behavior was the most common risk factor in many other similar studies like Kumari.S study.

In our investigation, TTI reactivity was greater among replacement donors at 58.9%, whereas response rate is elevated among voluntary donors (91% vs. 72%) & first-time donors (88%). Conversely, in research conducted by Roshan et al., response rates increased among repeat as well as voluntary donors.

Results of these investigations effectively demonstrate that adequate pre-donation counseling along with risk factor assessment should be obligatory during donor screening for improving donor awareness of numerous transfusion-transmitted diseases along with their modes of transmission. It provides chance for self-deferral to those with history of high-risk conduct whose main purpose was exclusively seeking TTI testing.

In addition to being professional & well-trained, counsellors as well as interviewers, must always maintain confidentiality and privacy. According to research by Doll et al., 20% of HIV-positive donors reported they would have provided different responses if they had been in more private setting as well as 31% of them felt loss of privacy during their health interview. [17]

Sharma et al. research reported 23% of donors donated blood to be tested for HIV. [18] Sharma et al. discovered that despite engaging in high-risk activity, many donors felt safe giving blood and were unaware of the window time.

Chaurasia et al. additionally discovered that people who engage in high-risk behaviours for TTI (including sex workers or men that are gay or bisexual & have multiple sexual partners) repeatedly donate blood to get free HIV test results without disclosing their risky behaviour, even though they are aware of potential risks of HIV transmission from blood donation. [19]

Data from numerous relevant researches indicates that different blood centres employed varied techniques for alerting reactive donors, which supports requirement for nationally approved criteria for being developed for reactive donor notification along with follow-up. Self-exclusion alternatives for qualified blood donors & pre-donation counseling sessions are essential in reducing the occurrence of TTI among blood donors.

Our Experience and Challenges

The overall response rate of donors with reactive screening tests was comparatively high (80.1%).

This was possible by detailed pre-donation counseling and proper repeated follow-up. Though difficulties were faced in counseling donors, donors were made aware of self-exclusion for risk behavior and consequences of TTI. Achieving 100% response rate in future is our goal. Proper notification of the test results helped in treatment and follow-up of the donors in a timely manner.

Challenges

- Difficulty in providing adequate information and proper pre-donation counseling in a confidential manner during large camps.
- Non notification of TTI reactive status from previously donated blood centers.
- Non- disclosure of risky behaviors before donation was the major challenge faced.
- Getting non-reactive or indeterminate test results on referral centers might be due to different TTI testing platforms with different sensitivity and specificity, window period donation, and false positivity.
- Managing Donors anxiety when informed about their reactive status.
- Difficulty in eliciting risky behavior history from young donors who came with parents.

Conclusion

- It is necessary to develop uniform national criteria for notifying reactive blood donors.
- TTI response rate should be monitored.
- Notification of the non-responders to Government health authorities should be made mandatory.
- Centralized referral centre for each zone or region should be there for referring all the TTI Reactive donors for evaluation and follow-up.
- Consolidated data system that contains information about all blood donors should be connected to national blood centers. This would allow donor who is discovered to be sero-reactive in one blood center to be deferred from another blood center during registration.
- Blood transfusion services, families, as well as the general public, are still at risk from donors who disregard therapy.
- Requirement for additional investigations regarding whether donors comprehend screening process well along with innovative methods of reaching out to reactive donors.

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