Donor Availability in the Low Resource Environment: How Can we Deal with the Challenges

Smid, MW; Ansah, JK; Tayou Tagny, C; Edirisinghe, L; Gunasekera, A; Owusu-Ofori, S; Duits, A

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www.afsbt.org | Private Bag X9043, Pinetown, 3600, South Africa | Email: africa.sanguine@afsbt.org

Donor Availability in the Low Resource Environment: How Can we Deal with the Challenges?

Meeting report of the session organized by the ISBT Working party Global Blood Safety Session on World Blood Donor Day during the ISBT In Focus online congress, June 14th, 2021.

Disponibilité des donateurs dans un environnement à faibles ressources : comment pouvons-nous relever les défis ?

Compte rendu de la session organisée par le groupe de travail ISBT Global Blood Safety Session à l'occasion de la Journée mondiale du donneur de sang lors du congrès en ligne ISBT In Focus, le 14 juin 2021.

Smid MW[1], Ansah JK[2], TayouTagny C[3], Edirisinghe L[4], Gunasekera A[5], Owusu-Ofori S[6], Duits A[7]

1. Chair ISBT WP Global Blood Safety, Sanquin Consulting Services, Amsterdam, Academic Institute IDTM, Groningen, The Netherlands
2. Chair ISBT WP Blood Supply Management, National Blood Service, Ghana, Ghana
3. Faculty of medicine and University Teaching Hospital, Yaoundé, Cameroon
4. Director National Blood Transfusion Service, Colombo, Sri Lanka
5. General Secretary Asian Association of Transfusion Medicine, Kandy, Sri Lanka.
6. Regional Director International Society of Blood Transfusion, Komfo Anokye Teaching Hospital and Zonal Blood Center, Kumasi, Ghana
7. Red Cross Blood Bank Foundation, Willemstad, Curacao

Corresponding author:
Smid MW
Chair ISBT WP Global Blood Safety
Sanquin Consulting Services
Amsterdam,
Academic Institute IDTM
Groningen,
The Netherlands
Email: Msmid@sanguin.nl

INTRODUCTION

According to the World Health Organization (WHO) 2016 Global Status Report on Blood Safety and Availability, sufficient safe blood is not guaranteed in the low resource environment. The Global Blood Safety Working Party (WP GBS) of the International Society for Blood Transfusion (ISBT), that aims to strengthen blood systems in low resources settings, organized a session during the ISBT online InFocus congress a session on World Blood Day on donor availability. Two presentations, the first a description of the challenges faced in Africa and the second, the experience of Sri Lanka as an example of success, described the present situation. This was followed by a panel discussion with members representing low resource regions, Africa, South East Asia, and the Caribbean, reflecting on local solutions for improving voluntary non-remunerated blood donation (VNRBD) in the low resource environment.

Challenges in donor availability in low resource settings: the African context."

Presenter: Prof. Claude Tayou Tagny. Cameroon.

In his presentation, Prof Tayou Tagny pointed out the weaknesses of the whole system and their inevitable consequences for patients. Many countries are not able to achieve the 1-2% donation per 1000 inhabitants as indicated by WHO as the minimum. As a consequence, patients who are in need of blood risk death because of these shortages. Children with severe anaemia due to malaria, sickle cell disease, and postpartum haemorrhage have been identified as groups at high risk of mortality due to blood shortages. Recently, the COVID-19 pandemic has worsened the situation, with up to 44% reduction in the number of donations for some African Blood Services.

Several factors have been identified to explain the low availability of blood on the African continent (fig 1). We can divide them into 3 groups: low donor availability and supply, inappropriate use of blood and overconsumption, and a high rate of discarded blood components.

The following are key factors that are commonly reported and that merit our discussion today:

1: Inappropriate use of blood and blood products

A high proportion of discarded blood components is mostly due to a high proportion of infected blood units that may reach 20% in some blood services. The overconsumption of blood and blood components is well demonstrated on the continent, where up to 50% of blood is prescribed inappropriately. A high volume of blood is unnecessarily transfused, and that limits the availability of blood for several other patients in need. Enough evidence is now available for defining appropriate transfusion indications and amount of blood to transfuse to avoid overconsumption and unnecessary transfusion.

2. Donor availability and supply

With respect to the low blood donor availability and supply, the first key factor is cultural resistance and lack of education. Various studies in different countries show that the low level of knowledge, misconceptions, and cultural beliefs are major deterrents to blood donation. Lucy Asamoah et al. did an excellent review on the perceptions, motivators, and deterrents. The outcome confirms that the main deterrents are associated with lack of knowledge, negative perceptions, and misconceptions, but also with ineffective communications and incentive strategies. This highlights the need for better education and communication programs. Education, recruitment, and motivation programs have shown some evidence of benefit in increasing blood supply, but such programs need a lot of resources and sustainable funding.

3. Cost of transfusion

Among the activities conducted in hospital blood services, the blood supply activities are the most expensive as reported in a typical African country like Malawi. The cost of the blood unit may be four to six times more expensive in a centralized system, suggesting that the blood supply programs based on VNRBD are more expensive than those based on family replacement donors (FRD). Thus, without sufficient and sustainable resources, a blood service may hardly get enough VNRBD to cover its needs, especially in a centralised system. Most countries are dependent on government funding, which has limited resources. According to WHO, the funding available per collection of blood in Low and Middle Income Countries (LMIC) is low and may be consistent with the lower donation rate. This may suggest that more funding for the VNRB donor recruitment program might increase the rate of that type of donation. The subject of supplying the blood services from VNRB donors or FRD is another issue that is considered in the panel discussion

4: Donor deferrals

The high donor deferral rate during donor health screening also contributes to the low blood availability. In Francophone Africa, up to 13% of blood donors are excluded. We have some evidence now that, reduction in unnecessary donor deferral, reduction in the proportion of discarded blood, effective patient blood management (PBM), effective prevention of severe anemia in children, and effective donor recruitment programs could all contribute to a lower need-to-supply ratio.

5. Donor recruitment strategies

Some innovative approaches have demonstrated their efficacy in donor recruitment, such as using radio or messages through SMS. The Club 25 pledge is definitely a successful approach to building a generation of blood donors who have a positive attitude towards voluntary blood donation and who can positively influence the population around them. Some other innovative approaches have been tested and are still to be confirmed; for example, converting FRD into regular VNRDB using donor recall and a convenient environment.

6. Other strategies

Despite the previous facts, questions associated with this topic still need further discussion. How can we develop a culture of blood donation? What is the most appropriate strategy for a sustainable financing system? What innovative strategies can be used for blood donor recruitment and retention? Should we encourage family replacement donations in some circumstances? Should we keep blood collection in some hospital-based blood services?

Achievement of Voluntary Non-Remunerated Blood Donations (VNRDB): the Sri Lanka experience.

Presenter: Dr Lakshman Edirisinghe, director of the National Blood Center, Colombo, Sri Lanka**.**

Sri Lanka is an island nation located near the southern tip of the Indian sub-continent with a population of 21.8 million. Sri Lanka's economy is relatively small, with an annual turnover of USD 84 billion and a GDP per capita of USD 3853 in 2019. Health expenditure as a percentage of GDP is around 3.8%.

The Sri Lankan health care model is unique in comparison to many other health care systems in the developed and developing world due to its organisational structure in the health care delivery model and its linkage with the financial model. It is considered as a free health care delivery system with services provided through governmental institutional network, free of charge at the point of delivery. Almost 90% of the inpatient care and 50% of the outpatient care is provided through this system, while the rest of the portion is catered for by the private institutions located in the main cities. Total expenditure allocated to health care is 5.63% of the total annual budget, which is 1300 million U$ in year 2019.

The National Blood Transfusion Service (NBTS) Sri Lanka is a centrally coordinated organisation within the national health system with 108 blood banks administratively grouped into 24 clusters operating throughout the country. Each cluster is headed by a board-certified consultant transfusion physician to maintain the highest clinical quality standards in the system on an equitable basis. Overarching governance of the NBTS is provided by the National Blood Policy, which is made effective through regulations and instructions delegated to the Director NBTS by the Director General of Health Services.

NBTS collects 400,000 to 450,000 units of blood annually, which is entirely (100%) dependent on VNRBD to maintain the national requirement of the country at a daily collection average of 1 100 units. The total collection is tested for five (5) transfused transmissible infections (TTI) and separated into components before clinical use, maintaining equal quality standards in the system. Collection is in par with the WHO collection standard of 2% of the population.

Sri Lanka achieved 100% VNRBD in 2014 through a rigorous nation -wide campaign implemented through the preceding nine years of highest-level commitment blended with a fully pledged lower-level operational effort based on a well-articulated plan. Implementation of the plan was monitored at various levels of management at frequent intervals until gradual ascendance to the target as depicted in the graphs (figure 2 and 3).

A social mobilisation program was conducted to the maximum effectiveness with an analysis of crucial external and internal factors leading to the ultimate achievement. The awareness program was strategically divided into two broad segments.

General awareness

- Media support at national level- electronic/ print media
- Promotional campaigns (e.g., walks, art exhibitions)

Targeting special groups

- Recruitment of young donors (e.g., School leavers)
- Pledge form
- Special groups (e.g., universities, religious organizations, factory workers, office workers)

Advertising materials were developed while giving meticulous attention to sensitivities of the target population in focus. (e.g., language, ethnicity, gender, age, religion, regional attitudes and contemporary relevance).

The following internal and external factors were analysed, manipulated and monitored from the planning stage through execution until the achievement in 2014.

Internal factors

- Policy
- Well-established organizational structure
- Skilled staff
- National health education programs
- National donor database and information management system
- Donor felicitations (World Blood Donor Day)

External factors

- High literacy rate
- Culture
- Health infrastructure
- Media
- Accessibility
- Civil conflict
- Well-connected community network

The sustainability of the voluntary non-remunerated donation achievement remains a challenging task for NBTS in the face of changing dynamics in many frontiers in Sri Lanka**.**

Panel discussion.

Panelists: Prof Claude Tayou, Dr Lakshman Edirisinge, Dr Shirley Owusu-Ofori, Dr Ananda Gunasekera, Prof Ashley Duits.

The outcome of the answers by the audience on the poll questions were discussed:

1. 66% of the audience agreed that VNRBD are the safest donors, even in low resource environment
2. 80% of audience agreed that we cannot do without replacement donors

The questions for the panel were:

1. How to approach VNRDB in the low resource environment?
2. What is the way forward to solve the challenges of the low resource environment?

Dr Shirley Owusu-Ofori, ISBT regional director Africa, Head of Transfusion Medicine Unit of the Komfo Anokye Teaching Hospital and Acting Director of Central Zonal Blood Center, National Blood Service, Ghana in Kumasi, Ghana:

From the WHO survey of 2004; 26 out of 41 (63%) countries have less than 80% voluntary donors. Replacement donors are the main source (60-90%) of blood in sub-Saharan Africa, Recruitment and retention of VNRBD requires a well-funded blood service. Most voluntary donors are secondary school based, and promoting repeat donations requires cost and effort in many sub-Saharan African (SSA) countries.

The objective of repeat donors appears remote. However, the success story of 'African Club 25 Society' now in 15 countries with 62 000 active youths, promotes repeat donations albeit at significant cost.

The biggest hurdle is getting blood donors to donate for the first time. Then there is a need to work hard to retain them and make them regular donors. Therefore, specific training and regular re-training in donor recruitment should be provided.

Improving donor retention through the development of professional donor recruitment, technical and administrative infrastructures – Global Blood Fund (GBF) have free resources online to professionally train donor recruiters:
Donor selection and recruitment can be guided and influenced by

1. GBF's new Blood Donor Recruiter Education and Certification program provides a distance learning opportunity for recruitment professionals around the world,
2. It is written by expert practitioners in Africa. The narrated educational series provides over six hours of original content across 12 themed modules.

motivators and deterrents to blood donation in local settings, including the impact of socio-psychological and behavioural factors.

Why do the public's perceptions of blood transfusion matter? Acceptance of blood donation is based on the individual's perceptions rather than facts. Knowledge of facts, on the other hand can influence perceptions.

Blood services in SSA need to have evolving strategies to encourage repeat blood donations by first time voluntary and replacement blood donors; taking into consideration locally home-grown evidence which considers motivators, deterrents, and perceptions of donor populations.

- Serious consideration should be made in each country on pursuing the conversion of family/replacement blood donors into becoming regular VNRBD.
- There is an over reliance on school donors thus blood services need to seek other low risk populations and move away from a total reliance on school donors who may not be available when emergency mass restrictions are declared as in the COVID-19 pandemic. A promising development is the engagement of young VNRBD at tertiary institutions. For instance student bodies of medical students, form clubs and associations of blood donors to aid in procuring blood for the hospital-based blood banks. These blood donor associations may have the capacity to form the nucleus for an increasing voluntary donor population.
- Raising public awareness and motivation for blood donation.
- Efforts to improve training of all staff include customer service training should be undertaken emphasising the importance of dealing with donors with respect and high standards of care.
- Significant investment in blood collection infrastructure and facilities should also be undertaken.

Measures that will Support Donor Recruitment and Retention Strategies of VNRDB in low resource settings:

Donor sites

- Increase number of blood collection sessions
- Increase number of blood collection sites
- Formation of multiple mobile collection teams

Donor type

- Collect from volunteers as much as possible
- Convert replacement donors into volunteer blood donors
- Increasing the number of repeat donors by providing institutions (schools, corporations, and religious organisations) with the opportunity to donate blood at least twice a year.
- Seek alternatives to secondary school donors during recess

Community engagement

- Recruitment of community-based voluntary donor organisers
- Intensive community education

Media partnerships

Donor retention

- Focus on the whole donor experience from pre-donation through recruitment and with donor care offered post donation.
- Formation of blood donor clubs.
- Awards and recognition of donors.

For blood services the way forward is also to invest in quality systems in addition to recruitment and retention strategies:

In regions with limited resources, establishing a quality management system in transfusion medicine is essential. This will help to reduce wastage and costly errors, which further restrain the available resources.

Some authors propose a hybrid transfusion service that combines a centralised system with a hospital-based service. While the centralised system ensures the quality of the blood product, hospital-based blood banks will ensure their availability when needed. Such an approach may be promising, although it can only be adopted to the regional requirements and circumstances, while the quality of the blood product is maintained.

Regardless of which structure is chosen, definition of the standards that should be reached requires careful considerations of availability of resources, rather than copying models that work in resource-rich countries. These standards have to be defined by the national experts in transfusion medicine who understand the culture and needs of their country. It is clear that donor recruitment and donation processes that work well in HIC cannot simply be 'transferred' or 'adopted' by LMIC.

Mobilising and recruiting low risk target groups and converting the large populations of FRD into VNRBD can work. It may also be considered to develop strategies to increase the safety of replacement donor blood. Safety lies on repeat donation by either type of donors.

Additional Key Performance Areas for Strengthening the Blood System include:

- Advocacy for Regular Voluntary Donation (communication strategy)
- Blood Service Infrastructure
- Collaboration with Key Stakeholders (societal organizations)

Dr. Ananda Gunasekera, secretary general AATM, former director NBTS, Sri Lanka.

Opinion and Discussion:

Many may think that the main requirement for achieving 100% VNRBD in a successful blood transfusion service is nothing but the availability of resources. Although this is true, monetary allocations and availability of modern infrastructure play a vital part in achieving the above status in the blood transfusion system of a country.

However, if one analyses the developing countries like Sri Lanka, Bhutan and Cuba, they have achieved 100% VNRBD in spite of relatively low GDPs. The main reason behind this success is the way they have designed the blood transfusion system within the health care system in those countries. All these countries have centrally coordinated systems managed and monitored under the blood policies adopted in their countries.

There are many countries in Asia with very high GDPs but the percentage in VNRBD is fairly low. This indicates very clearly that high level resource allocation alone is not the solution to achieving the best results in a BTSs. Once the proper political commitment is established in setting up the regulations and policies, the rest fall in line as what happened in Sri Lanka and other countries mentioned above.

Addressing the results of two poll questions, it is true that the non-paid replacement donations may be allowed for a given period until the system is well established but it has to be periodically and strictly monitored to achieve a gradual downward pattern. As we all know spending lavishly in modern technologies and infrastructure is a difficult task for low-income countries. At the same time, we must be aware that the trained manpower is available in all these countries in health sector including BTS's and this is an opportunity. Therefore, developing a quality mindset among the blood bank workers would definitely be beneficial, in order to make the safe products and deliver the best services to the patients.

Practicing quality development Programs based on **Fundamental Standards** would be an affordable approach for low-income settings. When there is a quality manpower, system development is always easier.

Prof Ashley Duits, director Red Cross Blood Bank Curacao, Curacao and Pan American Health Organisation (PAHO) advisor.

The results of the poll questions actually reflect the challenges in the approach for a sustainable program for safe and sufficient labile blood products that several low resource countries face. It is also clear that the topic still needs considerable attention from both a theoretical and practical perspective.

Firstly, considering replacement donation as being irreplaceable by the majority of the participants reflects the necessity to further invest in providing more practical support for analysing local situations and sharing of best-practices in countries that have been successful in developing a VNRBD program in low resource settings. Interestingly, attention should also be given to more clearly defining the impact of a VNRBD approach on patient safety explicitly in a

low resource environment (so not being a "luxury" attainable only in developed countries).

Certainly, the current SARS-CoV2 pandemic has clearly shown the shortcomings and vulnerability of using replacement donors for guaranteed provision of labile blood products. As the number of patients requiring hospital care increased during the COVID-19 wave non-COVID-19 related medical interventions were halted and this almost directly resulted in decreased availability of donors and blood products in a replacement donor setting.

As discussed during the session, the relevant issues for achieving such a VNRBD program relate to different areas. Some can be considered general and applicable to most countries all over the world. From a legal perspective, specific legislation should well define the necessary cadres for a safe blood program and should (could) include a VNRBD program requirement. A realistic financing scheme (based on cost-recovery) should include the necessary costs for a structural donor recruitment program. Several studies have clearly shown (and should be made available) such a program to be effective and at the end less costly than a replacement program in contrast to the belief by some participants during the session.

A practical approach for switching from replacement donor to voluntary non-remunerated donors requires, next to the above-mentioned general issues, further insight into the local constraints. These should address local perspectives for building trust in the program (by government, blood bank, and hospital professionals) as well as potential donors' intrinsic motivation to participate.

In conclusion, blood services in low-resource settings face many challenges in achieving sufficient numbers of VNRBD. The panellists agree that this calls for solutions that fit the regional environment, taking into account the specific cultural background as well as the organizational context. Voluntary blood donation is one of the pillars of the national blood system, as is the implementation of a quality management system and adequate resources.

The example of Sri Lanka shows that achieving 100% voluntary blood donations can be achieved in a national system with a national policy and using a clear communication and motivation strategy aimed at recruiting voluntary and repeat donors even in a low resource setting. In Africa, the Club 25 initiative is another example of success in a low-resource environment.

Table 1. Key factors reducing blood availability in the resource limited environment.

Low donor availability and supply	**Low performance donor recruitment program** • Cultural resistance or lack of education affecting willingness to donate • Absence of a nationally coordinated blood service • Inappropriate communication strategies • Financial constraints **High Donor deferral rate**
Inappropriate clinical use of blood	**Overconsumption**
Loss of blood products	**High proportion of discarded blood units**

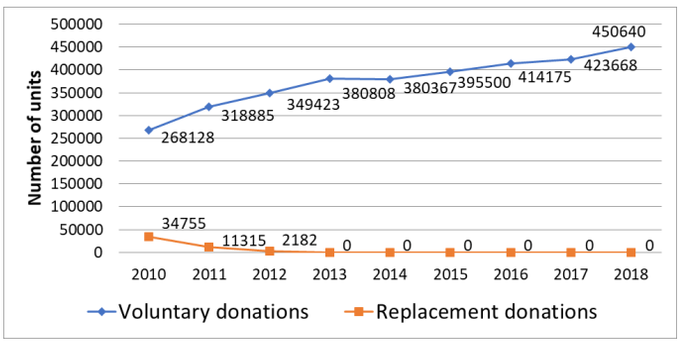

Figure 1: Achievement of voluntary non remunerated blood donors over the years in Sri Lanka.

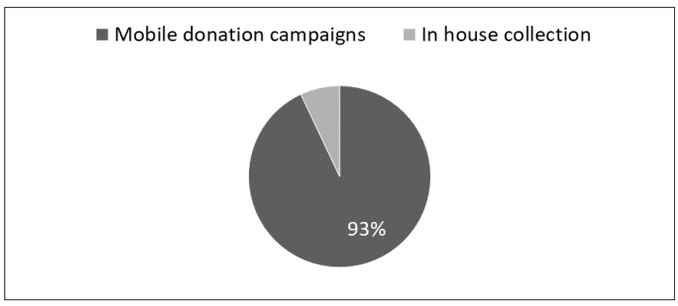

Figure 2: Composition of voluntary blood donations in Sri Lanka.

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