Blood donation patterns and challenges in Southern Africa

R. Reddy
South African National Blood Service, South Africa

Introduction: Developing countries face significant challenges in collecting sufficient blood to meet the demands from patients. Southern African countries have implemented many initiatives to recruit and retain sufficient voluntary blood donors and the success has been varied in different countries.

Objective: To analyse blood donor patterns and challenges in the 14 Southern African countries and assess progress made in attaining a 100% voluntary donor base as well as collecting sufficient blood as per the WHO recommendations for developing countries.

Results: A literature review showed that between 2004 and 2008 very little progress has been made with regard to improving the number of blood donations per 1000 population and increasing the number of voluntary non-remunerated blood donors. When factors such as age, disease burden and poverty are factored in, the donor potential in these countries is low.

Discussion: Collecting sufficient, safe blood from voluntary blood donors continues to be a major challenge for many developing countries and co-ordinated efforts, with assistance from external organizations, is required.

Key words: donor potential, family replacement donors, HIV prevalence, voluntary donors.

Introduction

The Blood Transfusion infrastructure in Southern African varies quite significantly among the 14 countries that make up the Southern African Development Community. Two key success factors in ensuring sufficient safe blood is a nationally co-ordinated blood transfusion service and the recruitment and retention of sufficient voluntary, non-remunerated low-risk blood donors. The 14 countries vary significantly in progress towards achieving these goals. While countries like Namibia, Zimbabwe and South Africa have achieved a 100% voluntary donor base, many other countries in the region still rely on a mix of family replacement and voluntary donors. Among the voluntary donors, the proportion of one time donors versus repeat donors is still high.

According to a 2011 WHO report, 43 countries in the African Region reported collecting 4 million units of blood, which account for 4.3% of global donations, although these countries are home to around 12% of the global population. This highlights a clear pattern that the majority of countries collect less blood than that needed for the country.

Significant efforts have been made over the last decade, with the aid of external funding, to improve the Blood Transfusion Services in these countries. The key focus areas have been increasing the donor base of voluntary donors and moving away from family replacement donors, improved blood safety and quality systems and improved access to blood for patients. The major challenge still remains to procure sufficient whole blood to meet demand and in 2011 many of these countries still collected less than the 10 units per 1000 population recommended by WHO for developing countries. Factors such as poverty, malnutrition, unemployment and underlying disease burden severely limits the potential donor base in these countries.

Donor and donation patterns (2004–2008)

A literature review was conducted to determine patterns in the 5 year period for Southern African Countries. Data from the WHO Global Database on Blood Safety (GDBS)
2004–2005 was compared with the data from the WHO GDBS 2008 data.

With regard to donations per 1000 population per annum:
1. In the 2004–2005 GDBS report [1], 10 of the 14 countries collected less than the recommended 10 donations per 1000 population and this was broken down as follows:
   - Five countries collected less than 5 donations
   - Five countries collected 5–9 donations
   - One country collected 20–29 donations
   - Two countries more than 30 donations
   - Data was not available for one country

2. In the 2008 GDBS report [2], 11 of the 14 countries collected less than the recommended 10 donations per 1000 population and this was broken down as follows:
   - Five countries collected less than 5 donations
   - Six countries collected 5–9 donations
   - Two countries collected 10–19 donations
   - Only one country, Mauritius, collected more than 30 donations

With regard to collecting blood from voluntary, non-renumerated donors:
1. In the 2004–2005 report
   - Five countries reported having 100% voluntary donors
   - One country had between 90% and 99% voluntary donors
   - Four countries had between 50% and 89% voluntary donors
   - Two countries had between 25% and 49% voluntary donors
   - Two countries had less than 25% voluntary donors

2. In the 2008 report
   - Seven countries had 100% voluntary donors
   - One country had between 90% and 99% voluntary donors
   - Three countries had between 50% and 89% voluntary donors
   - One country had 25–49% voluntary donors
   - Two countries had less than 25% voluntary donors

When analysing the data for 2008 compared to 2004, very little has changed with regard to the number of donations collected per 1000 population and 11 countries reported collecting less than 10 donations per 1000 population, compared to 10 countries in 2004. Progress towards achieving a voluntary data base has been slow but some progress has been made in that an additional two countries managed to achieve a 100% voluntary donor base by 2008. Two countries continue to rely largely on family replacement donors (>75%) with very little progress made in increasing the number of voluntary donors between 2004 and 2008.

Donor and donation patterns 2011

A survey was conducted and 13 countries were requested to provide 2011 data with regard to:
- total population served and population between 16 and 65
- Total blood donors (voluntary, family replacement, 1st time, repeat)
- Donors greater than 25 years old and donors less than 25 years
- HIV prevalence in the population and donor base
- Major challenges in donor recruitment and donor retention

Only 5 of the 13 countries responded. These were Mauritius, Namibia, Zambia, Malawi and South Africa. The responses are in Table 1 below:

Collection of sufficient blood to meet demand remains a challenge in many Southern African countries in 2011. Countries such as Zambia (6 units/1000) and Malawi (<10 units/1000) still collect less than the WHO recommended 10 units per 1000 population while South Africa collects 19/1000 and Mauritius 38/1000 population. Namibia’s blood collected per 1000 population has increased slightly since the 2008 WHO GDBS report, while for the other four countries, the collection per 1000 population has remained similar to that of the 2008 WHO GDBS report.

The contribution of blood from voluntary non remunerated donors ranged from 55% to 100%, the remainder of blood coming from family replacement donors. In Malawi, the donor base still comprises 45% of family replacement donors while in Mauritius where there is a well established donor base and blood collections programme, family replacement donors still make up 11% of the donor base. In Mauritius (83%), Namibia (64%) and South Africa (65%) ≥ two-thirds of the donors are over 25 years old while in Malawi 77% of donors are under 25 indicating greater reliance on schools in the latter country. This also poses challenges in ensuring sufficient blood during school holidays and school examinations.

In order to enhance blood safety, it is critical to ensure that a large percentage of the donor base is regular repeat donors. The prevalence of viruses such as HIV and HBV is usually higher in 1st time and family replacement donors than in repeat donors and there is an increased risk of transmitted transfusion infections when the pool of donors are mainly 1st time donors. Additionally, it becomes easier to manage the donor base, blood group mix and blood collections when the donor base is known. In Mauritius, Zambia and Malawi, 1st time donors comprise 44–48% of the total donors. In Zambia and Malawi, the HIV prevalence in blood donors is high at 4.3% and 3.2%, respectively, and this is likely due to the high number of 1st time donors.
South Africa and Namibia, the percent of 1st time donors is 16 and 28%, respectively, and the HIV prevalence in blood donors is much lower at 0.3 and 0.2% when compared to Zambia and Malawi. This is very likely because South Africa and Namibia, who have a higher HIV prevalence in the general population than Zambia and Malawi, have well established blood programmes and a high proportion of regular repeat donors.

In four countries, the number of blood donors as a percentage of the total population is less than 1% with Malawi, the lowest at 0.3% followed by Zambia at 0.45%, Namibia at 0.6% and South Africa at 0.8%. Mauritius has the highest percentage at 3.4%. In Zambia (51%), Malawi (52%) and Namibia (53%), only slightly more than half the population is between 16 and 65 years old and eligible to donate blood while in Mauritius and South Africa, 74 and 62% of the population are between 16 and 65 years old. When additional factors such as poverty, access to donor venues and disease burden are considered in addition to age, the eligible donor population reduces significantly below 50% in most of the countries. As an example in Namibia, when the HIV prevalence of 18% is factored into calculating donor potential, the potential donor base when factoring age and HIV reduces to 38% of the population and this is one of the major challenges that developing countries face when trying to recruit sufficient suitable low risk blood donors.

### Calculating donor potential

Every blood establishment needs to understand the demographics related to how many individuals in the general population are eligible donors. This knowledge is essential in order to build business intelligence so that donor recruitment campaigns can be targeted to the right audience. In developing countries many other factors need to be considered in addition to the age qualification. In most Southern African countries, HIV prevalence in the general population is between 10 and 18% and is highest in the 16–35 year old age group. Additionally, large parts of the population live in poverty and in remote outlying areas that are not easily accessible for blood donor clinics.

An exercise was performed using the South African data to estimate the donor potential in a developing country. In this exercise, statistics pertaining to age and income levels were extracted from the Statistics South Africa website. Income levels were categorized as above the breadline (> $460/month) and below the breadline (< $460/month). Disease burden was also considered as the prevalence of HIV in the 16–65 age group is between 10 and 18% in most of these countries.

South Africa has a population of 49.9 million people. When age was used as the first filter, 62% or 31.2 million qualified to donate blood. When income levels and HIV prevalence were factored in the potential donor base in South Africa is only 4.5 million or 9% of the population. South Africa has nine provinces and there were also significant differences between the provinces highlighting the need for a national blood programme to ensure access to sufficient safe blood nationally.

## Challenges in donor recruitment and retention

Challenges related to donor recruitment and retention include:

- Widely spread population where in some countries over 60% of the population are “rural” making it difficult to access these individuals
- Many potential donors do not have transport to reach donor clinics

<table>
<thead>
<tr>
<th>Country</th>
<th>Mauritius</th>
<th>Namibia</th>
<th>Zambia</th>
<th>South Africa</th>
<th>Malawi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population in the country</td>
<td>1.2 Million</td>
<td>2.1 Million</td>
<td>13.1 Million</td>
<td>49.9 Million</td>
<td>15.9 Million</td>
</tr>
<tr>
<td>Population between 16 and 65 years</td>
<td>74%</td>
<td>53%</td>
<td>51%</td>
<td>62%</td>
<td>52%</td>
</tr>
<tr>
<td>Number of blood donors in 2011</td>
<td>40,197</td>
<td>11,903</td>
<td>58,344</td>
<td>421,277</td>
<td>40,000 (Est)</td>
</tr>
<tr>
<td>Total whole blood collections in 2011</td>
<td>45,547</td>
<td>23,056</td>
<td>78,756</td>
<td>926,986</td>
<td>49,698</td>
</tr>
<tr>
<td>Whole blood donations per 1000 population</td>
<td>38</td>
<td>11</td>
<td>6</td>
<td>19</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Percent voluntary donors</td>
<td>89%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>55% (Estimate)</td>
</tr>
<tr>
<td>Percent family replacement</td>
<td>11%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>45% (Estimate)</td>
</tr>
<tr>
<td>Percent 1st time donors</td>
<td>44.3%</td>
<td>28%</td>
<td>48.2%</td>
<td>16%</td>
<td>47% in Voluntary donors</td>
</tr>
<tr>
<td>Percent repeat donors</td>
<td>55.7%</td>
<td>72%</td>
<td>51.8%</td>
<td>84%</td>
<td>53% in Voluntary donors</td>
</tr>
<tr>
<td>Percent donors under 25</td>
<td>17%</td>
<td>36%</td>
<td>57%</td>
<td>35%</td>
<td>77%</td>
</tr>
<tr>
<td>Percent donors over 25</td>
<td>83%</td>
<td>64%</td>
<td>43%</td>
<td>65%</td>
<td>23%</td>
</tr>
<tr>
<td>HIV Prevalence in population</td>
<td>0.97%</td>
<td>17.8%</td>
<td>14.3%</td>
<td>15.5%</td>
<td>11.2%</td>
</tr>
<tr>
<td>HIV prevalence in blood donors</td>
<td>0.02%</td>
<td>0.3%</td>
<td>4.3%</td>
<td>0.2%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>
• Poor communication system, particularly in rural areas
• High prevalence of HIV and HBV in the population
• Myths and misconceptions on blood donation and poor public attitude
• Staff shortages and lack of well trained staff
• Insufficient budgets for donor recruitment activity
• Lack of suitable customer relations management systems to communicate with donors

The Blood Services have implemented many programmes to improve blood collection and these include:
• Peer promoter programme in schools
• Donor awards to regular donors
• Special commitment campaigns
• Active tele-recruiting and SMS recruiting programmes
• Extensive use of media to promote blood donation
• Conducting motivational talks in various communities
• Conducting youth blood donation days and other open blood donation days in various towns/cities across the country.

Developing countries continue to face a multitude of obstacles and challenges in ensuring a sustainable and safe blood supply and sustained efforts are required to ensure self-sufficiency.

Acknowledgements

We would like to acknowledge Rob Wilkinson, Namibia BTS; Dr Janaki Sookoo, Mauritius BTS; Dr Gabriel Muyinda, Zambia BTS; and Dr Bridon Mbaya, Malawi BTS.

Disclosure

The author declares no potential conflict of interest.

References

1 WHO Global Database on Blood Safety Report 2004–2005
2 WHO Blood Safety Fact Sheet, 2011
3 Loubser M, Reddy R: Estimating potential donor population in a developing country, AABB 2012, Poster Presentation