

# STATUS OF BLOOD SAFETY IN THE WHO AFRICAN REGION

REPORT OF THE 2006 SURVEY

J.B. Tapko, Paul Mainuka and A.J. Diarra-Nama

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## Acronyms

|        |                                            |
|--------|--------------------------------------------|
| ADB    | African Development Bank                   |
| AIDS   | Acquired Immunodeficiency Syndrome         |
| BSS    | Blood Safety Strategy                      |
| BTS    | Blood Transfusion Service(s)               |
| DFID   | Department for International Development   |
| DRC    | Democratic Republic of Congo               |
| ELISA  | Enzyme-Linked Immunosorbent Assay          |
| EQAS   | External Quality Assessment Scheme         |
| EU     | European Union                             |
| GDBS   | Global Database on Blood Safety            |
| Hb     | Haemoglobin                                |
| HBV    | Hepatitis B Virus                          |
| HCV    | Hepatitis C Virus                          |
| HIS    | Health Information System                  |
| HIV    | Human Immunodeficiency Virus               |
| KAP    | Knowledge, Attitudes and Practices         |
| MDGs   | Millennium Development Goals               |
| MSBOS  | Maximum Surgical Blood Ordering Schedule   |
| PEPFAR | President's Emergency Plan for AIDS Relief |
| QA     | Quality Assurance                          |
| QMP    | Quality Management Programme               |
| SOP    | Standard Operating Procedure               |
| TB     | Tuberculosis                               |
| TTI    | Transfusion Transmissible Infection        |
| UNDP   | United Nations Development program         |
| UNICEF | United Nations Children's Educational Fund |
| VNRBD  | Voluntary, non-remunerated blood donor     |
| WHO    | World Health Organization                  |

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## Foreword

A safe and adequate supply of blood for transfusion is an essential component of any health system. For many countries, however, blood is either not available in the required quantities or is not safe enough for transfusion. The demand for blood is always increasing in the world due to the highly sophisticated health systems as well as longer post-transfusion life expectancy. The demand profile in Africa and indeed the developing world is different, but these nations are no less dependent on safe supplies. Women and children are the most in need. The highest proportion of blood transfusions in Africa is given to children followed by women with post-partum and other pregnancy-related bleeding. The high maternal mortality rates per 100 000 annual deaths in this group, partly attributed to this complication, are evidence of the scale of the unmet need.

A lot of progress has been made in the WHO African Region since the adoption of the regional strategy on blood safety in 2001. Many countries have since developed policies as well as implementation plans to ensure clear strategic directions for provision of a safe blood supply. Consequently, progress has been realized in the areas of blood donor recruitment, testing of blood, appropriate clinical use of blood and establishment of quality systems.

Improvement of blood transfusion services requires concerted effort by all involved in the value chain from the blood donor's vein to the recipient's vein. Raising awareness of the need for more regular donors should be given due attention to ensure availability of blood in a sustainable way by blood transfusion services. Screening of blood against infections known to be transmitted through blood is an indispensable component of the service. Clinicians too have a part to play in using blood more responsibly, not only to minimize unnecessary blood transfusions but also to ensure optimal use of a precious and scarce commodity.

Effective planning to achieve universal access to a safe blood supply in the African Region, however, requires adequate data and information. This report on the global database on blood safety therefore indicates where the Region stands in the area of blood safety as of 2006. It highlights the areas which need improvement, denotes the Member States that require urgent attention and assists with the design of appropriate interventions. I wish to congratulate the blood safety team at the Regional Office for compiling this report and urge all to address the issues and challenges highlighted in this report with due diligence.

*Dr Luis G Sambo,  
Regional director for WHO African Region*

## Preface

Blood transfusion therapy is an essential component in the practice of modern medicine. Safe and adequate supplies of blood are needed to save lives because blood is often the only means of survival. It has been known for centuries that blood transfusion can have serious and fatal consequences if it is not practiced within set norms and standards. Cognizant of this fact, WHO has adopted a number of resolutions to urge Member States to organize their blood services in a manner that will minimize the occurrence of these untoward effects while ensuring adequate safe blood supply for their populations.

All the 46 Member States in the WHO African Region are signatories to World Health Assembly Resolution WHA28.72 of May 1975 in which Member countries commit themselves to promoting the establishment of a safe, efficient, cost effective and sustainable nationally-coordinated blood transfusion service based on the principles of voluntary non-remunerated blood donation. Furthermore, the countries of the WHO African Region endorsed Regional Committee Resolution AFR/RC44/R12 in 1994, urging Member States to take urgent action to enact blood policies and mobilize the requisite resources for development of blood services in central and district hospitals. At its fifty-first session, the Regional Committee adopted a strategy on blood safety with three main objectives: to enhance collection of blood from voluntary blood donors; to improve the safety of blood and blood products; and to promote appropriate clinical use of blood and blood products.

It is now 33 years since the first WHA resolution on blood safety and 7 years since the adoption of the strategy for the Region. Significant success has been registered in the African Region. However, a lot still remains to be done in all aspects of blood transfusion services. There are also considerable challenges to attainment of the health-related millennium development goals (MDGs), to which efforts a safe blood supply would contribute immensely. There is thus need in the health sector to pull resources together and consolidate efforts to transform resolutions into practical interventions so as to enhance provision of this important aspect of health care in order to improve the quality of the services delivered to all people.

*Dr JB Tapko,  
Regional Adviser Blood Safety, WHO African Region*

## Executive summary

Blood transfusion service has been recognized as an essential component of health care infrastructure for a long time. A lot of progress has been made in strengthening blood transfusion services in Africa, a move that will greatly improve the quality of health care delivery on the continent. Although life saving, blood transfusion is not without risks and often leads to severe untoward effects if not practised according to standards that ensure quality in the whole process from blood procurement to transfusion as well as follow-up of transfused patients.

The WHO Regional Office for Africa developed a strategy with the objective of supporting Member States to enhance the collection of blood from voluntary non-remunerated blood donors and the testing of blood against transfusion-transmissible infections (TTIs) and other mandatory tests, including blood grouping and compatibility testing. It also set targets to be achieved by the year 2012, in the areas of organization and management, blood donor recruitment and collection, testing of donor blood as well as appropriate clinical use of blood. Furthermore, a quality management system was introduced in 2000 to ensure that blood transfusion services were providing quality products and services.

A survey to establish the status of blood availability and safety in the African Region was conducted in 2004. To monitor progress, another survey was conducted in 2006. Although a lot has been achieved since the adoption of the strategy, there still remain important gaps in attainment of the targets set in the regional strategy. The requirement of blood for a population of over 773 million people is estimated at about 8 million units (10/1000 population), but currently a total of 3 191 784 units (about 41.5% of the demand) is being realized.

The regional target for voluntary blood collection (80%VNRBD) has been attained by 19 of the 46 countries, four countries may be said to be in transition, but 21 are yet to collect 50% of their total blood supply from VNRBDs. The collection ratio per 1000 population is still at 4.15 ranging from 0.39 to 34.77. This serves as a proxy indicator of how much countries' needs in blood transfusion are being met. Five countries are collecting more than 10 units per 1000 population and thus considerably meet their country requirements.

Many countries are testing blood against the four WHO recommended disease markers: HIV, HBV, HCV and syphilis. Additionally, two countries test for HTLV and three for malaria. Although four countries did not report on all these parameters, only 40 countries test 100% of their blood supply against HIV, 34 countries test against HBV and 23 against HCV. The situation has greatly improved since the adoption of the strategy, but again the remaining gaps are not inconsiderable.

Forty countries have developed guidelines on appropriate clinical use of blood. On average, 74% of the total units of blood are still transfused as whole blood. This may in part relate to training on appropriate clinical use of blood but also to the capacity to process blood into components by the blood services. The Quality Management Programme developed in the year 2000 has seen the training of more than 200 individuals in quality as well as appointment of designated quality managers in 32 countries.

The External Quality Assessment Scheme (EQAS) in blood group serology and testing for TTIs are practised in 17 and 16 countries, respectively, while training programmes are available in 27 countries.

These findings show that a lot of improvement has been made in scaling up the quality of blood transfusion services in the Region, but a lot still needs to be done in many areas.



# 1. BACKGROUND

The practice of modern blood transfusion in sub-Saharan Africa dates as far back as the 1940s although it may have only been available to privileged individuals such as colonial masters and special African patients at that time.<sup>7</sup> Evidence shows that there was rapid progress in the 1940s, and by 1950, 12 countries had blood transfusion services; this number rapidly rose to 19 by 1955. The post independence period saw a rapid increase in the service reaching transfusion rates of 718 to 1372 transfusions per 100 000 by 1964.<sup>7</sup>

The civil strife and political turmoil that characterized post independence Africa resulted in progressive decadence of social services including blood transfusion as part of health service infrastructure in the late 1970s. The blood services therefore continued to decline both in adequacy of the blood supplies and quality of the service. There was also a dearth of information on blood transfusion during the 1980s.

In the early 1980s, there was the realization that HIV could be transmitted by blood transfusion and that the epidemic was widespread in sub-Saharan Africa. However, there was urgent attention by the international community under the auspices of the WHO to support countries to set up blood services in order to safeguard the blood supply against contamination by HIV and other infections transmissible by blood transfusion. The WHO estimated at that time that 5% to 10% of HIV transmission resulted from transfusion with contaminated blood.<sup>17,18</sup>

In September 1994, the WHO Regional Committee for Africa noted with concern that only 10 of the 46 countries could guarantee the safety of blood transfusion in their health care settings. This led to the adoption of Resolution AFR/RC44/R12 which urged Member States to “take urgent steps to enact blood safety policies and mobilize resources for the development of the infrastructure of blood services in central and district hospitals”.<sup>2</sup>

In 2001, the Regional Committee for Africa adopted the regional strategy for blood safety. This resolution was based on a strategy with four objectives: to assist Member countries to set up effective systems of recruitment of low-risk donors; to improve the safety of blood and blood products by implementing quality assurance programmes; to map out effective strategies for the screening of blood for all transfusion-transmissible infections; and to promote the appropriate use of blood and blood products by clinicians. It set four targets to be achieved by 2012, that (i) all Member States will have carried out a situational analysis of blood transfusion safety; (ii) at least 75% of all countries will have drawn up, adopted or implemented their national blood policy; (iii) 100% of blood units transfused will be screened beforehand for HIV and other transfusion-transmissible infections; and (iv) at least 80% of all donations in all countries of the Region will be voluntary and non-remunerated.<sup>4</sup>

Blood safety, however, remains a challenge to many countries in sub-Saharan Africa due to unstable economies, civil strife, natural and manmade disasters, and failure to translate government commitment to practical interventions that would lead to further improvement. Moreover, the

African Region does not only have 10% of the world's disease burden (World Health Report) but also the highest rates of infectious diseases transmissible through blood transfusion, high HIV prevalence (about 60% of the world's total prevalence and 60% of the total transmissions in 2006).<sup>9,15</sup> It has a prevalence of more than 8% of the hepatitis B surface antigen (HBsAg) which is a marker of infective carrier state<sup>10</sup> and a prevalence of HCV as high as 2.5% to 10% in some areas.<sup>11</sup>

Africa has the highest maternal mortality in the world with ratios estimated at an average of 1000 per 100 000 live births and accounted for 247 000 of the 500 000 maternal deaths in the world in 2000;<sup>16</sup> up to 40% of maternal deaths are attributable to haemorrhage.<sup>6</sup> Malaria has an even higher death toll in Africa. Of the estimated annual one million deaths due to malaria in the world, 90% occur in Africa south of the Sahara (WHO RBM report 2005). Mortality due to severe malarial anaemia is considerable in the Region.<sup>8</sup>

## 2. INTRODUCTION

### 2.1 Blood Safety

Blood safety can broadly be defined as adequate and timely provision of safe blood and blood products to all in need of transfusion as part of their treatment. The product must be of the right efficacy and adequate quantity to correct the homeostatic defect in the normal physiology of the blood for the patient; the blood must be free of infections transmissible by blood transfusion. Only that product required by the patient should be appropriately and judiciously transfused. Furthermore, efforts should be made to ensure that safe hospital and bedside practices such as compatibility as well as patient and sample identification are done in a manner that ensures the ultimate safety of the patient. All these require a well coordinated blood service with quality systems in all areas.<sup>5</sup>

Since 1971, when the notion of human blood transfusion was transformed into social policy and community responsibility,<sup>14</sup> it has been recognized that voluntary repeating non-remunerated blood donors are the best source to ensure maximum safety as well as an adequate and sustainable blood supply for the community.<sup>5</sup> Member countries therefore ought to phase out family and other types of donors to further minimize the risk of disease transmission through contaminated blood and also ensure blood supplies in a sustainable way.

### 2.2 The demand for safe blood in the African Region

The WHO African Region with 46 Member States and a population of 773 292 000 requires an estimated 8 million units of blood per annum (WHO estimate). There has hitherto been a dearth of information on annual blood collections and patterns of blood usage in the Region to allow for

a more accurate determination of need. The WHO recommended estimation of 10 units per 1000 population was thus used. Africa has the highest maternal mortality in the world, high infant mortality and high prevalence of malaria, all of which require blood as part of their management. Additionally, other causes of the need for blood transfusion abound. These include anaemia as a result of sickle-cell disease, malnutrition, road traffic accidents as well as other forms and causes of injury. Moreover, the Region is fraught with manmade as well as natural disasters which impinge considerably on the demand for blood.

## 2.3 Challenges in obtaining adequate safe blood

Inadequate translation of government commitment enshrined in blood policies into realistic interventions on the ground coupled with low expenditure on health as a result of unstable economies in Member States exacerbated by competing priorities hampers reasonable progress to the development of blood transfusion services. The Region also has high prevalence of infections transmissible by blood transfusion; these infections not only require blood products as part of their management<sup>13</sup> but also pose difficulties to selecting donors at reduced risk of infection.<sup>5,12</sup> Testing of blood against these infections is seldom universal and often lacking in quality.<sup>12</sup> Anecdotal evidence shows that clinical blood usage in the Region is usually emergency driven and ad hoc in nature, while unnecessary transfusions are not uncommon.

WHO in its concerted efforts with Member States and partners has been addressing this situation over the years. To monitor trends and design appropriate interventions, it was necessary to develop some mechanism for getting the required data and generating relevant information from Member States necessary for a sound evidence-based approach. The Global Database on Blood Safety (GDBS) was thus founded in 1998 by the WHO blood safety team at WHO/HQ in collaboration with the regional offices. Other than some reports produced at global level, only one report has been produced specifically looking into the unique blood safety situation in the WHO African Region in 2004.

This particular report covers the year 2006 using data collected and collated in 2007. The WHO African Region report produced in 2004 will be referred to from time to time for comparison purposes.

## 3. AIMS AND OBJECTIVES

The main aim of producing this report is to give an update on the blood safety situation in the Member States of the WHO African Region using data collated in a survey conducted in 2006. It also aims at determining the level of attainment of the four targets that were set for the Region enshrined in the regional strategy for blood safety for the WHO African Region<sup>3</sup> as well as the



status of the Quality Management Programme developed in 2000. This is to identify successes, gaps and constraining factors as well as make recommendations to Member States and other stakeholders so as to consolidate the achievements made, devise mechanisms to bridge the gaps and minimize the constraining factors.

## 4. METHODOLOGY

### 4.1 Tools used in the Survey

The Global Database on Blood safety (GDBS) questionnaire developed in 1998 which was used for data collection and compiling the global report in 1999 was the tool used after two modifications in 2004 and 2006 (Annex 1). The current GDBS questionnaire consists of eight sections:

- 1 Administrative information
- 2 Organization and management
- 3 Blood donors and blood collection
- 4 Screening for transfusion-transmissible infections
- 5 Blood group serology and compatibility testing
- 6 Blood component preparation, storage and transportation
- 7 The clinical use of blood and blood components
- 8 Fractioned plasma products

These sections provide information on the vital and logical stages of the blood transfusion chain. Each section consists of questions which seek to determine the status of the key elements of the services offered at that stage. The data therefore provide, in qualitative and quantitative forms, an assessment of human and infrastructural resources, as well as process and outcome indicators of national blood programmes in the Member States.

### 4.2 Data collection and sample size

The questionnaire was sent to all 46 countries that make up the WHO African Region through their respective WHO Country Offices. The head of the National Blood Transfusion Service or designated senior staff of the Ministry of Health was requested to complete the form with national data of blood transfusion services. The selection of the personnel was so designed to ensure collection of quality data from the countries. Data was collected for the period 1 January to 31 December 2006, and all the forms were duly returned to the WHO Regional Office for Africa.

### 4.3 Data quality

Telephone calls and emails were used to clarify certain data with some countries. Following data clean-up, some countries were also consulted concerning missing or doubtful values. There however still remained missing values in completed forms from a number of countries. This fact is clearly illustrated in the analysis of various parameters in which the total number of countries responding is less than 46.

### 4.4 Data analysis

The questionnaires were examined for errors, appropriateness and quality of data by the Blood Safety Team at the Regional Office. Data entry was performed using Microsoft Office Access 2003 and cross-checked by two individuals. Completion of data entry was followed by comprehensive data cleaning. Tables and charts were prepared using Microsoft Excel worksheets and Microsoft Word.

### 4.5 Limitations of the survey and analysis

Some of the major constraints encountered during the survey include delay in returning completed forms and numerous missing values in many sections.

In the Region, there was marked variation in size, population and capacities among the countries and this affected data collection and management. The marked variations in the prevalence of transfusion-transmissible infections among countries in the Region have led to difficulties in interpreting some results.

The large size and population of some of the countries, with their different semi-autonomous political and administrative arrangements has affected the structure of the health systems. Moreover there was marked heterogeneity in the level of development of the blood centres within some of the countries. This led to difficulties in interpretation of questions where the situation was asked in terms of “percentage of centres”. This might also have resulted in potential under-reporting of national data.

The number of blood units reported as collected in each country per 1000 of the population per annum was used to assess the level of availability of blood for the population. This however does not take into account the type of donors from whom the blood was collected.

## 5. RESULTS

The response rate was 100% and the completed GDBS forms were thus received from all 46 Member States of the WHO African Region at the WHO Regional Office for Africa in Brazzaville, Republic of Congo. Two countries notably, Equatorial Guinea and Liberia, did not provide data on most of the parameters and were thus excluded in analysis of various sections of this report.

### 5.1 Blood Donation and Blood Availability

#### Total Blood Units Collected

A total of 44 countries reported both their total blood units collected in the year and percentages of voluntary blood donors and were analysed based on the three voluntary blood donor groups depending on the level of attainment of the regional strategy on voluntary blood donation, (Table 1).

The total number of units of blood collected from the 44 countries during 2006 is 3 191 808 excluding the two countries, Equatorial Guinea and Liberia. The total population living in these 44 countries is 769 717 000 which represents 99.5% of the population in the WHO African Region.

The annual total collection ranged from 633 units in Sao Tome and Principe with a population of 155 000 to 716 189 units in South Africa with a population of 48 282 000. The average annual blood collection rate in the Region in 2006 is 4.15 units per 1000 population, ranging from 0.39/1000 in Ethiopia to 34.77/1000 in Mauritius. Five countries have reached the level of more than 10 units/1000 of the population (Figure 1).

**Figure 1 :Total Blood Collected per 1000 Population**

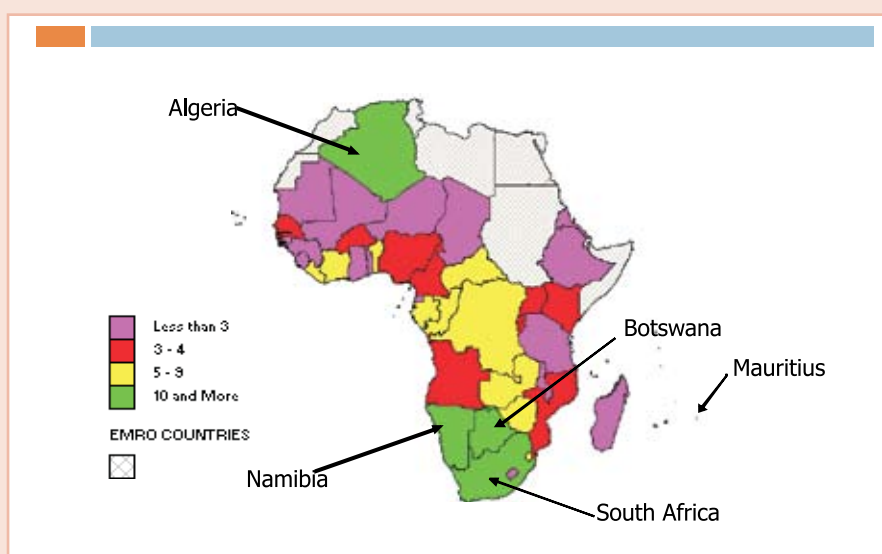
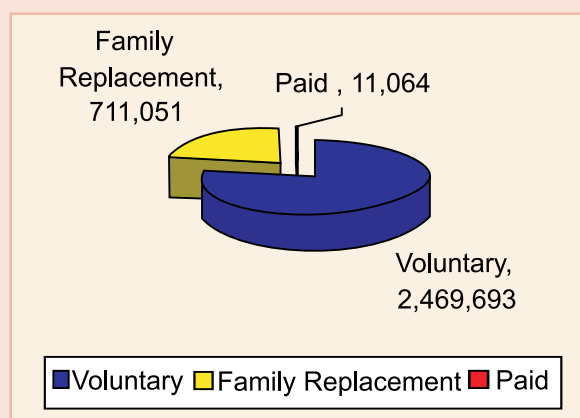


Table 1 : Voluntary non-remunerated blood donations and rates in 46 countries in the African Region, 2006

| Category                                           | A<br>(80 - 100%)<br>VNRBD | B<br>(50 - 79%)<br>VNRBD | C<br>(< 50%)<br>VNRBD  | TOTAL                  |
|----------------------------------------------------|---------------------------|--------------------------|------------------------|------------------------|
| Number of countries                                | 19                        | 4                        | 21                     | 44                     |
| Units collected annually                           | 1 566 889                 | 121 097                  | 1 503 822              | 3 191 808              |
| Population (000)                                   | 282 139                   | 27 001                   | 460 577                | 769 717                |
| Annual units collected per 1000 population (Range) | 5.55<br>(1.45 - 14.83)    | 4.48<br>(1.28 - 34.77)   | 3.27<br>(0.39 - 10.19) | 4.15<br>(0.39 - 34.77) |

Figure 2: Proportion of blood donors by type



### Types of blood donors

A total of 44 countries reported on the percentage of blood collected from voluntary non-remunerated blood donors, family replacement blood donors and paid blood donors seen during 2006 (Figure 2). The countries were divided into three groups based on the attainment of the regional strategy on voluntary blood donation. A total of 19 countries had already attained the target and were thus classified as Group A (80-100% voluntary blood donors), four countries could be said to be in transition and were classified as Group B (50-79% voluntary blood donors), and 21 countries were in Group C (<50% voluntary blood donors) as shown in Table 2. Values of percentage of voluntary blood donors were not received from two countries, Equatorial Guinea and Liberia. It was thus difficult to place these countries in any of the three categories (Table 2).

Table 2: Percentage of voluntary blood donors by country

| Group A ( 80-100%) n=19 |                          |      | Group B ( 50 - 79%)n=4 |            |      | Group C ( < 50%)n=21 |                       |    |
|-------------------------|--------------------------|------|------------------------|------------|------|----------------------|-----------------------|----|
| S/No                    | Country                  | %    | S/No                   | Country    | %    | S/No                 | Country               | %  |
| 1                       | Burkina Faso             | 80   | 1                      | Mozambique | 50   | 1                    | Angola                | 4  |
| 2                       | Tanzania                 | 81   | 2                      | Seychelles | 66   | 2                    | Nigeria               | 5  |
| 3                       | Kenya                    | 90   | 3                      | Eritrea    | 71.2 | 3                    | Sierra Leone          | 11 |
| 4                       | Benin                    | 93.9 | 4                      | Mauritius  | 78   | 4                    | Comoros               | 14 |
| 5                       | Senegal                  | 98   |                        |            |      | 5                    | Chad                  | 15 |
| 6                       | Zambia                   | 98   |                        |            |      | 6                    | Mauritania            | 16 |
| 7                       | Lesotho                  | 99   |                        |            |      | 7                    | Gambia                | 21 |
| 8                       | South Africa             | 100  |                        |            |      | 8                    | Ethiopia              | 22 |
| 9                       | Cote d'Ivoire            | 100  |                        |            |      | 9                    | Guinea                | 22 |
| 10                      | Botswana                 | 100  |                        |            |      | 10                   | Mali                  | 24 |
| 11                      | Burundi                  | 100  |                        |            |      | 11                   | Cameroon              | 25 |
| 12                      | Central African Republic | 100  |                        |            |      | 12                   | Madagascar            | 25 |
| 13                      | Malawi                   | 100  |                        |            |      | 13                   | Guinea Bissau         | 26 |
| 14                      | Namibia                  | 100  |                        |            |      | 14                   | Congo                 | 28 |
| 15                      | Rwanda                   | 100  |                        |            |      | 15                   | DRC                   | 30 |
| 16                      | Swaziland                | 100  |                        |            |      | 16                   | Gabon                 | 30 |
| 17                      | Togo                     | 100  |                        |            |      | 17                   | Sao Tome and Principe | 31 |
| 18                      | Uganda                   | 100  |                        |            |      | 18                   | Niger                 | 33 |
| 19                      | Zimbabwe                 | 100  |                        |            |      | 19                   | Cape Verde            | 35 |
|                         |                          |      |                        |            |      | 20                   | Algeria               | 40 |
|                         |                          |      |                        |            |      | 21                   | Ghana                 | 43 |

(Equatorial Guinea, Liberia had no data on blood donors)

## Blood Donor Programmes

Out of 44 countries, the presence of a specific donor recruitment department was reported by 32 (73%) countries, including two countries which reported this to be in progress (Table 3). However, there was a positive correlation between the presence of a specific donor department and percentage of voluntary donors, as 89.5% of Group A countries while only 52.4% of Group C countries reported having the department. This positive correlation is also seen in respect of countries reporting having donor recruitment officers and funded donor recruitment programmes; 88.4% of all countries reported availability of educational materials for donor education and there were no significant differences between the groups. Monitoring of TTIs in blood donors was reported by all Group A countries compared to 17 out of 21 (85%) Group C countries.

**Table 3: Characteristics of the blood donor programmes in 44 countries of the WHO African Region**

|                                       | A<br>(80 - 100%) VNRBD |         |    | B<br>(50 - 79%) VNRBD |         |    | C<br>(< 50%) VNRBD |         |    |
|---------------------------------------|------------------------|---------|----|-----------------------|---------|----|--------------------|---------|----|
|                                       | Yes                    | Partial | No | Yes                   | Partial | No | Yes                | Partial | No |
| Specific donor recruitment department | 17                     | -       | 2  | 2                     | -       | 2  | 11                 | 1       | 9  |
| Blood donor recruitment officer       | 10                     | 1       | 8  | 3                     | -       | 1  | 9                  | -       | 12 |
| Funded donor recruitment programme    | 9                      | -       | 10 | 1                     | -       | 3  | 4                  | -       | 17 |
| Educational materials                 | 15                     | 3       | 1  | 4                     | -       | -  | 17                 | 3       | -  |
| Monitoring of TTIs in donors          | 19                     | -       | -  | 1                     | -       | 3  | 16                 | 1       | 3  |

## Post Donation Counselling

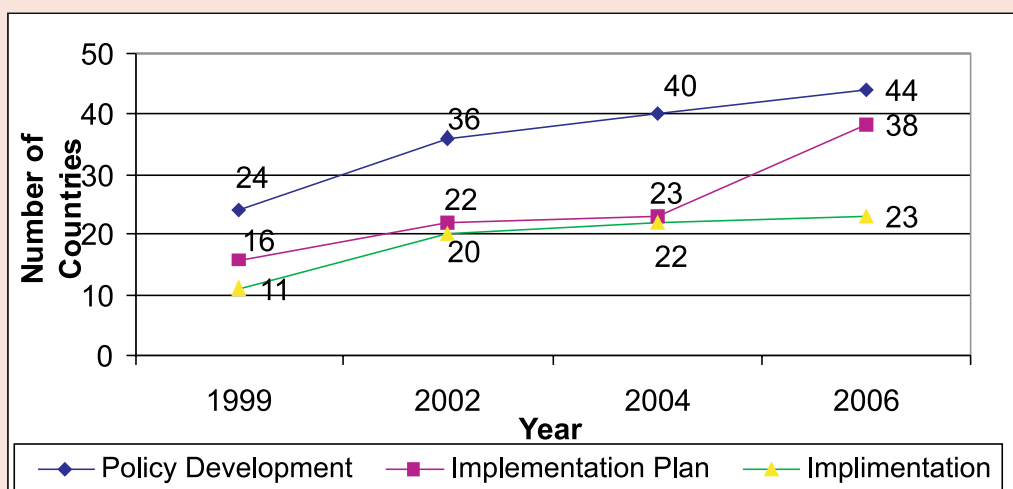
A total of 25 countries reported that 100% of their centres do post donation counselling, four countries range from 50-80%, and nine countries reported that 1% to 20% of their centres do post donation counselling. There was no question to determine method or effectiveness of post donation counselling. It was also not clear what is done with reactive or even positive blood donors.

## 5.2 Organization and management

Presence of a national blood transfusion service was reported by 42 countries, including four that were in the process of establishing a service, while four did not have any national blood transfusion service. National coordination of the service by government was reported in 36 (78%) of the 46 countries. National blood policies have been fully or partially developed in 44 (96%) out of 46 countries, 38 (83%) countries have developed plans to operationalize their policies while such policies are only being implemented in 23 (50%) of the countries (Figure 3). Only 33 (72%) countries have enacted or are in the process of enacting legislation for their national blood

services. In addition, 21 (46%) countries had set up or are in the process of setting up national advisory or expert committees. Only 8 (17%) out of 46 countries in the Region reported that they were not receiving international technical support or funding for their BTS. Budget lines and cost recovery systems for BTS were reported for 35 and 17 countries, respectively, while bulk procurement of supplies was practised in 40 countries. Out of 45 countries which responded, 22 (48%) countries (including eight in progress) reported the existence of a national blood authority or commission, (Table 4a).

**Figure 3: Blood policy development, implementation plan and actual implementation**



**Table 4a : Elements of Organization and Management of Blood Transfusion Services in 46 countries, 2006**

| Element                                          | Yes | In Progress | No | No response | Total |
|--------------------------------------------------|-----|-------------|----|-------------|-------|
| National coordination of BTS                     | 35  | 1           | 10 | -           | 46    |
| Existence of national Blood Authority/Commission | 14  | 8           | 23 | 1           | 46    |
| National Blood Policy                            | 32  | 12          | 2  | -           | 46    |
| Policy being implemented                         | 23  | -           | 8  | 15          | 46    |
| Legislation for BTS                              | 11  | 22          | 13 | -           | 46    |
| National Advisory/Expert Committee               | 11  | 10          | 25 | -           | 46    |
| NBTS established                                 | 38  | 4           | 4  | -           | 46    |
| International technical support                  | 37  | -           | 8  | 1           | 46    |
| International financial support                  | 38  | -           | 8  | -           | 46    |
| Budget line for NBTS                             | 34  | 1           | 10 | 1           | 46    |
| National cost recovery system for BTS            | 15  | 2           | 28 | 1           | 46    |
| Bulk purchase of supplies                        | 37  | 3           | 4  | 2           | 46    |

## Cost of a Unit of Whole Blood

A total of 30 countries reported on the approximate cost of producing a unit of whole blood in their BTS. An analysis of the amounts in US dollars shows a wide variation as shown in Table 4b. The lowest cost was reported by Algeria (US\$ 10) and the highest by Gabon (US\$ 225). While seven countries reported costs of US\$ 100 and above, 16 countries gave costs within the US\$ 25-74 range, and five countries reported that they produced a unit at less than US\$ 25.

**Table 4b : Approximate cost of producing a unit of whole blood in 30 countries**

| Cost of a unit of blood (USD) | Number of countries |
|-------------------------------|---------------------|
| 100 and above                 | 7                   |
| 75 - 99                       | 2                   |
| 50 -74                        | 9                   |
| 25 - 49                       | 7                   |
| <25                           | 5                   |
| (Range 10 - 225)              |                     |

## 5.3 Laboratory Testing of Donated Blood

A total of 42 countries gave data on ABO cell group testing of donated blood, all of which reported that this was done in 100% of donations. Also, 39 countries provided data on ABO serum grouping of blood donations in their blood services. Only 28 out of 39 countries responding (71.8%) do ABO serum grouping in 100% of their blood donations. Guinea-Bissau and Sao Tome and Principe do not carry out ABO serum grouping of the donations while nine other countries carry out this testing in varying percentages of their donations (Benin 85%, Burkina-Faso 67.2%, Central African Republic 50%, Comoros 85%, Republic of Congo 50%, Democratic Republic of Congo 10%, Ghana 80%, Mali 16.7%, Niger 50%).

## Testing Capacities in BTS

The major TTIs tested for in all countries are HIV, HBV, HCV and syphilis as recommended by WHO. However, some countries are testing their donations for malaria (Cameroon 50%, Democratic Republic of Congo 80%, Malawi 100%), and others test their donations for HTLV (Gabon 100%, Seychelles 100%). The decision on which disease to test for depends on whether the disease is of public health importance in that particular region, country or locality. This in part explains the above scenario.

**Table 5 : Number of countries testing 100% for TTIs**

| Disease Marker | 100 | < 100 | Unknown | Total |
|----------------|-----|-------|---------|-------|
| HIV            | 40  | 2     | 4       | 46    |
| HBV            | 34  | 7     | 5       | 46    |
| HCV            | 23  | 16    | 7       | 46    |



## Blood units tested for TTIs

The number of countries testing 100% of collected blood for the four major TTIs and those testing less than 100% are shown in Table 5. A total of 42 countries provided data for HIV, 41 for HBV and 39 for HCV. This shows that 40 countries (95%) were testing 100% for HIV, 34 (83%) were testing 100% for HBV, and 100% testing for HCV was reported from 23 (59%) countries. Table 6 shows the total units of blood tested for the major TTIs in 2006. However, the fate of 2.2% that might not have been tested for HIV and an additional 4% for HBV as well as 15.4% for HCV is hard to determine. They may or may not have been transfused.

Table 6 : Total blood collected and tested from 44 countries in 2006.

| Tests | Total units tested |      | Total untested |      | Unknown |     | Total units |  |
|-------|--------------------|------|----------------|------|---------|-----|-------------|--|
|       | Units              | %    | Units          | %    | Units   | %   |             |  |
| HIV   | 3 121 653          | 97.8 | 6 015          | 0.2  | 64 140  | 2   | 3 191 808   |  |
| HBV   | 3 065 502          | 96.0 | 56 014         | 1.8  | 70 292  | 2.2 | 3 191 808   |  |
| HCV   | 2 701 292          | 84.6 | 336 861        | 10.6 | 153 655 | 4.8 | 3 191 808   |  |

## Prevalence of Transfusion-Transmissible Infections among Blood Donors

Data were provided by countries for the prevalence of the TTIs among their blood donors and also the percentage of blood discarded following testing for the four TTIs. Some reported discard after confirmatory testing but most following screen testing. It was also difficult to capture co-infections as data for this aspect was not available. These data are presented in Tables 7, 8 and 9.

Table 7 shows the results of testing for TTIs and the percentage of blood discarded due to TTI results in Group A countries which collected 80% or more of their blood from voluntary donors in 2006; 18 out of 19 countries in this group reported HIV prevalence in all donors, while 17 reported on the HBV and HCV prevalence in all donors. Only eight countries reported the prevalence of HIV and HBV in new donors while seven countries gave the rates for HCV. The prevalence data for HIV among regular donors were reported by eight countries while seven countries gave the rates for HBV and HCV in regular donors.

Table 8 shows the TTIs test results and the percentage of blood discarded due to TTIs results in four Group B countries which collected 50% to 79% of their blood from voluntary donors in 2006. HIV prevalence results were reported by three countries for all donors, one country for new donors and no country in this group reported HIV prevalence in regular donors. The reporting for HBV and HCV prevalence followed a similar pattern in all four countries in Group B.

Table 9 shows TTI prevalence in blood donors and the percentage of blood discarded due to TTIs; results reported by the 21 Group C countries that collected less than 50% of their blood from voluntary blood donors in 2006. HIV prevalence data was reported by 17 countries for all donors,

by three countries for new donors and five countries for regular donors. HBV data were reported by 16 countries for all donors, by four countries for new donors and five countries for regular donors. Similarly, HCV results were reported by 14 countries for all donors, by four countries for new donors and five countries for regular donors

**Table 7 : Test result for TTIs in group A countries ( 80-100% VNRBDs)**

| Country                                       | % of blood discarded for Pos TTI Results | % HIV all donors | % HIV new VNRD | % HIV regular VNRD | % HBV all donors | % HBV new VNRD | % HBV regular VNRD | % HCV all donors | % HCV new VNRD | % HCV regular VNRD |
|-----------------------------------------------|------------------------------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|
| Botswana                                      | 6.1                                      | 2.7              | -              | -                  | 2.4              | -              | -                  | 0.3              | -              | -                  |
| Burkina Faso                                  | 16                                       | 2.3              | 2.2            | 0.9                | 10.7             | 14.2           | 4.6                | 2.2              | 2.3            | 1.3                |
| Burundi                                       | -                                        | 0.44             | 0              | 0                  | 2.56             | 0              | 0                  | 2.06             | 0              | 0                  |
| CAR <small>(Central African Republic)</small> | 21                                       | 5                | 6              | 1                  | 16               | 16             | 2                  | 2                | 2              | 2                  |
| Côte d'Ivoire                                 | 10.84                                    | -                | 1.85           | 0.246              | -                | 4.043          | 1.051              | -                | 11.96          | 1.24               |
| Kenya                                         | 12.5                                     | 2.5              | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Lesotho                                       | 6.6                                      | 4.6              | -              | -                  | 1.2              | -              | -                  | 0.4              | -              | -                  |
| Malawi                                        | 13                                       | 3.5              | -              | -                  | 6.6              | -              | -                  | 2.2              | -              | -                  |
| Namibia                                       | 2                                        | 0.4              | -              | -                  | 0.8              | -              | -                  | 0.1              | -              | -                  |
| Rwanda                                        | 10.59                                    | 0.85             | 1.6            | 0.29               | 2.65             | 5.16           | 0.76               | 1.25             | 2.17           | 0.54               |
| Senegal                                       | 23                                       | 0.18             | -              | -                  | 12.7             | -              | -                  | 0.21             | -              | -                  |
| South Africa                                  | 3                                        | 0.1026           | 0.6492         | 0.0247             | 0.0695           | 0.521          | 0.0151             | 0.0144           | 0.0614         | 0.0076             |
| Swaziland                                     | 2                                        | 2                | -              | 0                  | 5                | -              | 0                  | 0.02             | -              | 0                  |
| Togo                                          | 10.91                                    | 2.07             | -              | -                  | 6.57             | -              | -                  | 2.27             | -              | -                  |
| Uganda                                        | 10                                       | 1.39             | 2.06           | 0.83               | 4.17             | -              | -                  | 2.8              | -              | -                  |
| UR of Tanzania                                | -                                        | 4                | -              | -                  | 7.9              | -              | -                  | 0.6              | -              | -                  |
| Zambia                                        | 17                                       | 5                | -              | -                  | 8                | -              | -                  | 2                | -              | -                  |
| Zimbabwe                                      | 1.9                                      | 0.69             | 1.14           | 0.24               | 1.17             | 2.33           | 0.21               | 0                | 0              | 0.001              |
| Benin                                         | 6                                        | 1.53             | -              | -                  | 6.32             | -              | -                  | 2.94             | -              | -                  |

Table 8 : Test results for TTIs in group B countries ( 51-79% VNRBDs)

| Country    | % of blood discarded | % HIV all donors | % HIV new VNRD | % HIV regular VNRD | % HBV all donors | % HBV new VNRD | % HBV regular VNRD | % HCV all donors | % HCV new VNRD | % HCV regular VNRD |
|------------|----------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|
| Mauritius  | 1.94                 | 0.05             | 0.06           | -                  | 0.24             | 0.24           | -                  | 0.74             | 0.74           | -                  |
| Mozambique | -                    | 6.4              | -              | -                  | 7.7              | -              | -                  | -                | -              | -                  |
| Seychelles | 1.3                  | -                | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Eritrea    | 7.96                 | 0.26             | -              | -                  | 2.74             | -              | -                  | 0.14             | -              | -                  |

A comparison of the values of the TTIs in Tables 7, 8 and 9 shows the prevalence rates are lowest in regular blood donors in all groups. In comparison with the prevalence rate among the adult population in the Member States (Annex 1), the prevalence rate among blood donors is generally much lower. However, one needs to exercise reasonable caution when interpreting this data as the denominator in some countries may be the donation and not the blood donor. This would then imply that for countries with high retention rate, the denominator is considerably increased hence a low frequency of a given disease marker. For countries where the denominator is the blood donor then this gives a true picture of the prevalence amongst the blood donor segment in the society. Although the GDBS did not capture adequate data on first time donors, anecdotal evidence shows that the prevalence is lower among blood donors in this group which can only be due to the role of donor selection strategies. Of particular interest are the discard rates. Sao Tome and Principe discards 21% of the 633 units collected; this translates to 133 units. Mauritania discards 26.63%, meaning that they discard 1046 of the total 3925 units. This is a considerable waste, and the reasons for discard ought to be studied further in these particular countries to design interventions so as to minimize the loss.

Table 9 : Test results for TTIs in group C countries (&lt;50% VNRBDs)

| Country               | % of blood discarded for Pos TTI Results | % HIV all donors | % HIV new VNRD | % HIV regular VNRD | % HBV all donors | % HBV new VNRD | % HBV regular VNRD | % HCV all donors | % HCV new VNRD | % HCV regular VNRD |
|-----------------------|------------------------------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|------------------|----------------|--------------------|
| Algeria               | 1.81                                     | 0.15             | -              | -                  | 0.72             | -              | -                  | 0.34             | -              | -                  |
| Angola                | -                                        | 1.2              | -              | -                  | 4.8              | -              | -                  | -                | -              | -                  |
| Cameroon              | -                                        | -                | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Cape Verde            | 5.3                                      | 0.2              | -              | -                  | 3.4              | -              | -                  | 0                | -              | -                  |
| Chad                  | -                                        | 1.89             | -              | -                  | 9.9              | -              | -                  | 0.5              | -              | -                  |
| Comoros               | 5.2                                      | 0                | -              | -                  | 3                | 0.5            | -                  | 2                | 0.1            | -                  |
| Congo                 | 13.8                                     | 3                | 1.1            | 0.7                | 8.1              | 4.7            | 1                  | 2.6              | 1.2            | 1.1                |
| DR Congo              | 10.67                                    | 4                | -              | -                  | 6                | -              | -                  | 2                | -              | -                  |
| Ethiopia              | 7.9                                      | 2.4              | 0.2            | 0.03               | 5                | 0.69           | 0.21               | 2.02             | 0.75           | 0.08               |
| Gabon                 | -                                        | 2.84             | -              | -                  | 6.92             | -              | -                  | 1.48             | -              | -                  |
| Gambia                | 0.81                                     | 1.5              | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Ghana                 | 7.4                                      | -                | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Guinea                | 14.81                                    | 2.2              | -              | -                  | 12.3             | -              | -                  | 0.14             | -              | -                  |
| Guinea-Bissau         | 10                                       | 10.2             | -              | -                  | 16.2             | -              | -                  | 0.7              | -              | -                  |
| Madagascar            | 8.68                                     | -                | -              | -                  | -                | -              | -                  | -                | -              | -                  |
| Mali                  | 21.31                                    | 3                | -              | 0.79               | 15.37            | -              | 5.12               | 2.5              | -              | 0.83               |
| Mauritania            | 26.63                                    | 0.49             | -              | -                  | 16.51            | -              | -                  | -                | -              | -                  |
| Niger                 | 20                                       | 1.75             | -              | -                  | 9.75             | -              | -                  | 0.52             | -              | -                  |
| Nigeria               | -                                        | -                | -              | 0.8                | -                | -              | 9.7                | -                | -              | 2                  |
| Sao Tome and Principe | 21                                       | 1.8              | 0              | 0                  | 23               | 0              | 0                  | 0.6              | 0              | 0                  |
| Sierra Leone          | -                                        | 3.73             | -              | -                  | 4.82             | -              | -                  | 0.48             | -              | -                  |

**Table 10 : Blood component preparation in countries of the WHO African Region, 2006(n=44)**

| Category by Percentage(VNRBD) | Response | Number of countries processing |           |                     |                 |
|-------------------------------|----------|--------------------------------|-----------|---------------------|-----------------|
|                               |          | Red Cells                      | Platelets | Fresh frozen plasma | Cryoprecipitate |
| A (80 - 100%)                 | Yes      | 17 (89.5%)                     | 13 (68%)  | 16 (84%)            | 9 (47%)         |
|                               | No       | 2                              | 6         | 3                   | 10              |
| B (50 - 79%)                  | Yes      | 4 (100%)                       | 3 (75%)   | 3 (75%)             | 1 (25%)         |
|                               | No       | -                              | 1         | 1                   | 3               |
| C (<50%)                      | Yes      | 11 (52.3%)                     | 9 (43%)   | 10 (48%)            | 5 (24%)         |
|                               | No       | 10                             | 12        | 11                  | 16              |

## 5.4 Production of blood components

Table 10 shows that red cell concentrates were being prepared in 32 countries in 2006, while platelet concentrates were available in 25 countries. Fresh frozen plasma was reported as being prepared in 29 countries and cryoprecipitate in 15 countries. Red cell concentrates were available in 17 out of 19 Group A countries (89.5%) compared to 11 out of 21 Group C countries (52.4%). Platelet concentrates were available in 13 out of 19 Group A countries (68.4%) compared to 9 out of 21 Group C countries (42.9%). Fresh frozen plasma was prepared in 84.2% of Group A countries compared to 47.6% of Group C countries while cryoprecipitate was prepared in 47.4% of Group A as against 23.8% of Group C countries.

**Table 11 : Availability of blood cold chain facilities in countries of the African Region in 2006**

| Criteria                                                                                        | Response     | Number of countries |
|-------------------------------------------------------------------------------------------------|--------------|---------------------|
| Percent of blood centres storing blood in temperature monitored equipment                       | 80 - 100     | 18                  |
|                                                                                                 | 50 -79       | 7                   |
|                                                                                                 | < 50         | 18                  |
|                                                                                                 | No response  | 3                   |
|                                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of blood centres transporting blood in temperature monitored cold boxes                 | 80 - 100     | 11                  |
|                                                                                                 | 50 - 79      |                     |
|                                                                                                 | < 50         | 28                  |
|                                                                                                 | No response  | 7                   |
|                                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of blood centres that store reagents in temperature monitored equipment                 | 80 - 100     | 22                  |
|                                                                                                 | 50 - 79      | 4                   |
|                                                                                                 | < 50         | 19                  |
|                                                                                                 | No response  | 1                   |
|                                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of blood centres with facilities to separate blood under quarantine and ready for issue | 80 - 100     | 17                  |
|                                                                                                 | 50 - 79      | 7                   |
|                                                                                                 | < 50         | 20                  |
|                                                                                                 | No response  | 2                   |
|                                                                                                 | <b>Total</b> | <b>46</b>           |

## 5.5 Storage and transportation of blood and reagents

Table 11 shows the percentage of blood centres in each country with adequate cold chain facilities for storage and transportation of blood and reagents as well as separate facilities for quarantine and ready-to-use blood. A total of 25 out of 43 countries reported that more than 50% of their blood centres had temperature-monitored cold chain equipment for blood storage, while only 11 out of 39 countries reported that more than 50% of their blood centres had temperature-monitored transportation system for blood. A total of 26 out of 45 countries reported that more than 50% of their blood centres had temperature-monitored storage for laboratory reagents while 24 out of 44 countries reported that more than 50% of their blood centres had facilities to separate blood under quarantine and ready for issue blood.

## 5.6 Clinical use of blood

Table 12 shows that 24 out of 39 countries that responded transfused more than 75% of their blood as whole blood in 2006; 10 of these reported that they transfused 100% of their blood as whole blood. Seven out of 39 countries transfuse less than 25% of their blood as whole blood.

**Table 12 : Use of whole blood for transfusion in the African Region, 2006 (Percentage)**

| Percentage transfused as whole blood | Number of countries |
|--------------------------------------|---------------------|
| 0 - 25                               | 7                   |
| 26 - 50                              | 3                   |
| 51 - 75                              | 5                   |
| 76 - 99                              | 14                  |
| 100                                  | 10                  |
| No response                          | 7                   |
| <b>Total</b>                         | <b>46</b>           |

As shown in Table 13, 41 countries have either adopted national guidelines on appropriate clinical use of blood or their guidelines are in the process of development. Less than 25% of hospitals have functional transfusion committees in 35 out of 36 countries that responded. Also less than 25% of hospitals were using Maximum Surgical Blood Ordering Schedule (MSBOS) in 32 out of 34 countries that responded.

Table 13 : Monitoring of blood use in the African Region in 2006

| Criteria                                                                        | Response     | Number of countries |
|---------------------------------------------------------------------------------|--------------|---------------------|
| National guidelines on appropriate use of blood                                 | Yes          | 24                  |
|                                                                                 | In progress  | 17                  |
|                                                                                 | No           | 4                   |
|                                                                                 | No response  | 1                   |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| National strategy for provision of fractionated plasma products                 | Yes          | 7                   |
|                                                                                 | In progress  | 5                   |
|                                                                                 | No           | 30                  |
|                                                                                 | No response  | 4                   |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of hospitals with functional transfusion committees (%)                 | < 25         | 35                  |
|                                                                                 | 25 - 75      | 1                   |
|                                                                                 | 75 - 100     | -                   |
|                                                                                 | No response  | 10                  |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of hospitals using MSBOS                                                | < 25         | 32                  |
|                                                                                 | 25 - 75      | 2                   |
|                                                                                 | 75 - 100     | -                   |
|                                                                                 | No response  | 12                  |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of hospitals with a system for monitoring clinical transfusion practice | < 25         | 33                  |
|                                                                                 | 25 - 75      | 1                   |
|                                                                                 | 75 - 100     | -                   |
|                                                                                 | No response  | 12                  |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of hospitals monitoring post transfusion reactions                      | < 25         | 32                  |
|                                                                                 | 25 - 75      | 2                   |
|                                                                                 | 75 - 100     | -                   |
|                                                                                 | No response  | 12                  |
|                                                                                 | <b>Total</b> | <b>46</b>           |
| Percent of hospitals with mechanism for monitoring post transfusion infections  | < 25         | 31                  |
|                                                                                 | 25 - 75      | 1                   |
|                                                                                 | 75 - 100     | -                   |
|                                                                                 | No response  | 14                  |
|                                                                                 | <b>Total</b> | <b>46</b>           |



## 5.7 Quality management and training

Table 14 shows some elements of quality management reported by the 46 countries in the Region. A total of 41 out of 46 countries reported that they had national strategies for blood screening for TTIs in their BTS, while this was in progress in one country and two countries did not have such strategies. In blood group testing, 36 had national testing strategies, while this was in progress in five countries and absent in three. A total of 27 countries reported they had a centralized system of data collection and analysis. A breakdown of this number shows that 15 out of the 19 Group A countries (78.9%) and 12 out of the 21 Group C countries (57.1%) make up the 27 countries which reported that they have centralized data collection and analysis systems in their national blood services. None of the four Group B countries reported having such a system.

**Table 14 : Elements of Quality Management in BTS in 46 countries**

| Element                                            | Yes | In Progress | No | No response | Total |
|----------------------------------------------------|-----|-------------|----|-------------|-------|
| National strategy for blood screening for TTIs     | 41  | 1           | 2  | 2           | 46    |
| National strategy for blood group testing          | 36  | 5           | 3  | 2           | 46    |
| Centralized system of data collection and analysis | 27  | 11          | 6  | 2           | 46    |
| National standards for BTS                         | 24  | 13          | 9  | -           | 46    |
| Presence of designated national quality manager    | 26  | 6           | 13 | 1           | 46    |
| National EQAS for BGS                              | 17  | 5           | 23 | 1           | 46    |
| National EQAS for TTIs                             | 16  | 9           | 20 | 1           | 46    |
| Regular training for all staff                     | 27  | 4           | 15 | -           | 46    |

A total of 26 countries reported the presence of a designated national quality manager while six countries reported that this was in progress; 13 countries had no national quality manager and one country did not respond. External quality assurance schemes in blood group serology and testing for TTIs were in place in 17 and 16 countries, respectively. In the area of training, only 27 countries (58.7%) had any form of regular training programme for staff of the BTS, including laboratory staff.

## 6. DISCUSSION

### 6.1 The GDBS questionnaire used in the 2006 survey

The current Global Database on Blood Safety (GDBS) questionnaire was used by WHO in previous surveys in 1999 and 2002, and it was last revised in 2004. Many of the forms, such as that from Liberia, had a lot of missing data. Some of the data filled by countries are inconsistent. One example is Malawi, where the responder had an answer for the percentage of whole blood units separated into components (6.3) but could not give information on the blood centres that prepare components (6.1). This may be due to the nature of the question asked or a misunderstanding of the question.

Some of the answers in the forms did not reflect the situation on the ground when compared to data obtained during WHO missions to those countries. It may therefore be necessary to ascertain the accuracy of data reported through agreed missions or country surveys. Though all 46 countries in the Region returned their forms, an improvement over the 2004 study, many of the countries did not supply data on prevalence of TTIs in various types of blood donors.

The GDBS forms, as presently structured, are too long and complex. Sometimes, questions are not arranged logically within the sections. This is most true of section 2. The current section 2 which is entitled “Organization and management” is the longest and contains too many different items that could be more appropriate in other sections such as: Policy issues including legislation; Organizational structure of the BTS; Technical assistance and financial management; and Quality management.

In revising the questionnaire, effort should be made to reduce areas of ambiguity in order to elicit the correct data from the responders. The options of “partial” or “in progress” should be reduced to a minimum. Interventions are either in place in countries or they are absent. The mere fact that a structure is under consideration or development does not imply that it will be completed or realized. For more effective evaluation, data requested should be clear both qualitatively or quantitatively. For instance, a country has international technical or financial support for their BTS or they do not have such support. There should be no option of “in process”. It is suggested that the WHO Regional Office organize a seminar for all directors of national BTS to get their inputs before finalizing the revised forms. Educating the users on how to fill the questionnaire ensures that everybody has the same understanding of the questions asked. This exercise could also be conducted in other Regions before any further surveys are conducted. This could also be included in the NBTS directors’ meeting at an appropriate time.

## 6.2 Blood donation

### Total blood units collected

A total of 3 191 808 units of blood were reported to have been collected in 44 countries of the WHO African Region in 2006. However, in terms of donation rates, the annual blood collection rate in the Region has fallen from 5.14 to 4.15 units per 1000 of the population. Compared with results of the 2004 survey, the number of countries in Group C had increased from 17 to 21, those in Group B decreased from 9 to 4, while those in Group A increased from 15 to 19. The increase in the number of countries in group C in 2006 is largely due to three (Niger, Nigeria, and Sao Tome and Principe) out of five countries that could not provide responses in 2004. The other two that did not participate in the 2004 survey (Liberia and Equatorial Guinea) also did not provide data in the 2006 survey on total annual blood collection and percentage of blood collected from voluntary blood donors. The reasons for continued lack of data from these two countries in two survey years needs to be explored so as to ensure that data are obtained in subsequent years.

### Types of blood donors and availability of blood

Four countries significantly improved their percentage of voluntary blood donors between 2004 and 2006, resulting in attainment of the regional strategy and hence change of category. These are Tanzania, which moved from 20% voluntary blood donors in 2004 to 81% in 2006, while Zambia, Kenya and Burkina Faso with 72%, 55% and 52%, respectively, and in Group B in 2004 moved to Group A in 2006 with 98%, 90% and 80% voluntary blood donors, respectively. Conversely, two countries, Gambia and Algeria, moved from Group B in 2004 to Group C in 2006 as their percentage of voluntary blood donors fell from 58% and 50% in 2004, respectively, to 21% and 40%, respectively, in 2006. The causes of this decrease need to be analysed and addressed. Two countries, Angola and Nigeria, had the lowest percentages of voluntary blood donors in the 2006 survey with 4% and 5%, respectively, as against Mauritania and Comoros with 1% and 7%, respectively, in the 2004 survey.

The average annual blood collection rate in Group A countries in 2006 is 5.55 units per 1000, as compared to 4.48 and 3.27 units in Groups B and C, respectively. Compared to the findings of the 2004 survey, the donation rates have decreased in groups A and B. While striving to achieve 100% voluntary blood donor target, all countries of the Region need to do more so as to rapidly increase the number of blood donors, particularly regular blood donors, to improve their annual collection rates and not just the proportion of voluntary blood donors.

### Blood donor programmes

As seen in the 2006 survey, the employment of donor recruitment officers within a specific donor department by countries correlates well with their percentages of voluntary blood donors.

This survey also shows the importance of countries ensuring that their donor recruitment programmes are well funded to be effective in translating to increased percentages of voluntary donors. The number of countries reporting the presence of specific donor departments in their national blood services has also increased from 29 in 2004 to 40 in 2006. Member States of the WHO African Region will therefore do better if they establish and sustain viable and well funded donor recruitment programmes as a strategy to achieve adequate blood supplies.

### 6.3 Organization and management of blood transfusion services

Since the last report of 2004, a lot of positive developments have taken place in the areas of organization and management of national blood programmes in the WHO African Region. The adoption of national blood policies was one of the requests of the Regional Committee for Africa at its forty-fourth session in 1994, conveyed through its Resolution AFR/RC44/R12. In the 2004 survey, the number of countries reported to have national policies was 40; this rose to 44 in the 2006 survey. The concept of implementation of national blood policies may not have been fully understood by all the responders in both the 2004 and 2006 surveys. Implementation of a policy is a continuous process and there should be no such situation in which a country will be said to have fully implemented its blood policy. So in the present report, analysis of data from countries is on the basis of national blood “policy being implemented” or not. There is therefore no need for the option of “partial” or “in progress”. In this context the number of countries implementing their policies has remained constant during the two surveys (23 countries in 2004 and 2006).

Although 44 countries in the Region have developed a national blood policy as reported in the 2006 survey, only 11 have enacted the appropriate legislation to make provisions of the policies enforceable under the law. In 22 other countries, enactment of legislation is in progress while 13 countries do not have any legislation in respect of blood services. In many countries, enabling laws are often required to strengthen compliance with key aspects of national blood policies, especially those relating to safety. More advocacy is needed to encourage national governments to pass relevant laws which will enhance the implementation of their blood policies.

It is interesting to note that 38 out of the 46 countries in the Region (82.6%) reported that they have established national blood transfusion services but only 11 countries have backed these structures up with national advisory or expert committees. The absence of this technical input to the leadership of national blood services is likely to impair effectiveness. This is even more worrisome when it is realized that the number of countries reporting the existence of these advisory expert committees has decreased from 13 in 2004 to 11 in 2006. This may imply that more countries in the Region are failing to utilize the intellectual and technical expertise available within their borders to improve the quality and effectiveness of their national blood services.

### Financial resources and international support

Provision of specific budget lines for blood services was reported by 35 (76%) countries, including one country reporting “in progress”; ten countries had no specific budget lines while one country

did not respond. This shows a marginal improvement over the figures for 2004 in which 29 (71%) countries had budget lines (including “partial”). As many as 38 countries (83%) in the Region reported that they were receiving international financial support for their national blood transfusion services. Further analysis shows that the major international donors are WHO (13 countries); US President’s Emergency Plan for AIDS Relief (PEPFAR) (12 countries); Global Fund to Fight AIDS, Tuberculosis and Malaria (seven countries); EU (five countries); World Bank (four countries); UNICEF and Swiss Red Cross (two countries each). Other donors reported to be supporting blood services including UNDP, French Co, DFID, ADB, ADCZ, Lux Development and Rotary Club. In some countries several agencies or organizations are providing technical and financial support; in fact, 14 countries reported receiving financial support from two or more donors in the period of the survey. Because of the overlap, totals from the development partners are 44 compared to the 38 countries that reported financial and technical support.

A total of 37 countries reported receiving international technical assistance for blood services, which usually came along with international financial support. This international participation in national blood programmes in Member States of the WHO African Region has been due largely to the global response to the AIDS pandemic, led by WHO, UNAIDS, PEPFAR and the Global Fund. It may be useful to confirm the duration of this assistance and to what extent these interventions could be sustained by the government at the end of the project phase.

There is a wide variation in the cost of producing one unit of whole blood among the 30 countries that responded from US\$ 10 in Algeria to US\$ 225 in Gabon with an average of US\$ 62.83. It will be necessary therefore to identify the parameters that individual countries have used to arrive at their cost of production. It is important also to ensure that some respondents did not confuse cost at which blood is made available to recipients with the full cost of production. Workshops organized at the regional level on costing in the blood service could be used to produce uniform guidelines on costing. Calculation of the cost of a unit of blood may also not have been uniform. Some countries may not have factored in the contributions from development partners. In some cases, countries depend heavily on family replacement donations; the cost of obtaining such a unit of blood is much lower than those who rely mainly on voluntary blood donations. In a few countries the high cost was a reflection of the sophistication of the service as is the case of South Africa where 100% of the blood is tested using NAT technology. In some of the countries, the cost is a reflection of the level of organization; for example, while some countries do bulk procurement and test in fewer centres thus benefiting from economies of scale, others do not have such conducive procurement systems. The discard rates in some countries due to either TTI prevalence in the background populations or inappropriate technologies, cause the cost of a unit of blood to be proportionately higher. It is thus difficult to generalize on the implication of such factors in securing a safe blood supply.

Some countries (17 out of 46) reported a cost recovery system, but the extent of recovery could not be elucidated from the questionnaire. In some of these countries 100% cost recovery is known while partial recovery of the cost is done in others. Recovery would contribute to ensuring financing and sustainability of the blood services, but a number of factors including political, economic and other social realities in Member States have hampered progress in this important area that might have contributed to ensure sustainability of transfusion services.

## 6.4 Laboratory testing of donated blood

### Testing capacities in BTS

There are two forms of laboratory testing done on donated blood by BTS in all countries in the Region. These are the blood group testing and the testing for transfusion-transmissible infections (TTIs). Both are necessary and mandatory to ensure safe blood transfusion. In blood group testing, all countries reported that they did ABO cell typing in 100% of donated blood. The level of ABO serum grouping of donations is low in the Region. It is therefore necessary to ascertain what constraints are responsible for this practice so as to devise mechanisms to minimize or eliminate them.

### Blood units tested for TTIs

A total of 40 out of 42 countries (95%) who responded were testing 100% of their donations for HIV in 2006. When compared to 90% of countries (37 out of 40) reported for 2004, this is a marginal improvement. Also, 83% and 59% of countries were testing 100% of their donations for HBV and HCV, respectively, in 2006. These also show an improvement when compared to 78% and 49% of countries, respectively, in 2004. This finding still shows that in spite of improvements, testing for the hepatitis viruses, especially HCV, still lag behind HIV in the Region. Despite the fact that HIV is the TTI most tested for in BTS, the fate of up 2.2% of donations (about 70 000 units) in the Region could not be ascertained. These might or might not have been transfused without testing.

### Prevalence of TTIs among blood donors

The relatively low prevalence rates of TTIs among all blood donors compared to the general population demonstrate the effectiveness of donor education and strict donor selection and deferral criteria in countries with high proportions of voluntary donors. Despite the low responses of countries in respect of TTI rates among the various types of blood donors, there was positive agreement between the TTI prevalence rates and the blood unit discard rates due to TTI reactivity. The data also show alarming discard rates mostly due to HBV reactivity in a number of Central and West African countries such as Burkina Faso, Republic of Congo, Cote d'Ivoire, Democratic Republic of Congo, Mali, Mauritania, Sao Tome and Principe, and Togo. The reasons are beyond the scope of this survey, and countries ought to consider elucidating the tenants of the epidemiology of this disease so as to devise more effective methods of safeguarding the blood supply against HBV transmission. Additionally, Cote d'Ivoire has a considerably higher prevalence of HCV than other countries in the Region; this may also call for consideration of studying the epidemiology further if effective prevention of spread through blood transfusion is to be realized. It would also be interesting to know why these countries are seemingly isolated from the rest of the countries in the Region on the prevalence of these diseases, including HTLV in Gabon.

Some countries screen and discard without confirmation. In most of these countries donor notification is not done. In countries that do donor notification, confirmation of screen tests is mandatory. In some of these countries there are mechanisms and criteria for re-inclusion of reactive donors in the donor pool as well as use of the donation that might have been quarantined following a reactive test. Policy on management of reactive donors ought to be developed by blood transfusion services for proper donor care and management, including referral for continued counseling and support by other organizations.

## 6.5 Blood component preparation

Red cell concentrates were being prepared in 32 countries in 2006 compared to 29 countries in 2004, while 25 countries reported that they could prepare platelet concentrates in 2006 as against 29 in 2004. Fresh frozen plasma was reported as being prepared in the same number of countries in both 2004 and 2006, while the number of countries preparing cryoprecipitate sharply declined from 29 in 2004 to 15 in 2006. However, as was also seen in the 2004 survey, the proportion of countries preparing components is directly related to the percentage of voluntary donors reported by the countries.

From the results it can also be deduced that the more voluntary blood donors a country has the more likely the country is to make blood products. This cannot be truer as voluntary blood donors give adequate quantities of safe blood in a sustainable way to enable quality production procedures. Replacement and other types of donors usually provide emergency-driven ad hoc donations; in many settings, several donors are required to get the correct unit of blood. In these circumstances, preparation of quality blood products may not be practicable. Moreover, the question only relates to the ability to make blood products; it does not reflect the quantity of each product being made per country. On the other hand, attainment of a level of voluntary blood donors may reflect on the level of development of other systems within the blood transfusion service.

The ability to produce components is a reliable indicator of the level of development of any national blood programme. Blood component preparation ensures optimal use of every unit of blood collected and enables more appropriate and safe clinical use of such blood. It is intriguing to note that a number of countries in the 2006 survey reported that they had the necessary facilities (equipment and power) to prepare blood components but were not yet producing components. There is need to study the decline in the production of some components and the lack of progress in the production of other components in many countries in the Region.

It is doubtful whether the decline in production is due to lack of clinical demand; it may, instead, be due to issues of leadership or lack of appropriately trained staff. However, the heavy reliance on family replacement donations, most likely through collections organized at hospital level, in many countries may in part explain this shortfall. Replacement donations are usually demand-driven, ad hoc arrangements by relatives and patients to secure an urgently needed unit of blood. This may not allow for quality processing procedures.

## 6.6. Storage and transportation of blood and reagents

Data on temperature-monitored cold chain facilities for storage and transportation of blood and test reagents was requested from countries on the basis of the percentage of blood centres that had such facilities. This is different from the data obtained in the 2004 report and therefore the two survey results are not comparable. A total of 25 out of 43 countries (58%) reported that more than half of their blood centres had optimum blood storage conditions, while 11 out of 39 responding countries (28%) reported that more than half of their blood centres had appropriate blood transportation conditions. Also, 26 out of 45 countries (58%) reported that more than half of their blood centres had optimum storage conditions for their laboratory reagents while 55% of countries reported that more than half of their blood centres had separate facilities for storage of blood under quarantine and ready to use.

As was noted in the 2004 survey, there is need to assist countries to improve their capacities in blood cold chain management, especially in transportation of blood where facilities seem to be poor. This will reduce the risk of contamination and deterioration of blood units, major hazards due to climate and the long distances blood units often travel. The set standard is the ability of cold chain equipment to hold blood temperatures at a maximum of 10° C at the point of delivery, at ambient temperatures of 43°C.

## 6.7 Clinical use of blood

This survey shows that use of whole blood for transfusion remains widespread in the Region. Only 10 out of 39 responding countries (26%) in 2006 compared to 8 out of 36 responding countries (22%) in 2004 transfused less than 50% of their blood as whole blood. In the present survey as many as 10 out of 39 countries (26%) transfused 100% of their blood as whole blood, while 24 countries (62%) transfuse more than 75% of their blood as whole blood. There are only a few indications for transfusion of whole blood in modern transfusion practice. To discourage the use of whole blood, more needs to be done to ensure that countries prepare blood components and procure plasma substitutes which will be used for the appropriate clinical indications.

Compared to 2004 when 30 countries reported they had adopted or were developing national guidelines on appropriate clinical use of blood, the number has risen to 41 countries in the present survey. However, the increase in the number of countries with national guidelines was not translated into commensurate decrease in the use of whole blood for transfusions in the 2006 survey. This may partly be due to lack of awareness or non availability of national guidelines for prescribers who are meant to implement them. Poor communication or collaboration between BTS and hospital clinical staff may also explain this situation. The poor clinical interface of national blood services in the Region is partly demonstrated by the low percentage of hospitals with functional transfusion committees, using Maximum Surgical Blood Ordering Schedules (MSOBS) or those with a system for monitoring of clinical transfusion practice. Additionally, the limited quantity and diversity of blood components may explain this situation.



## 6.8 Quality management

Many countries have reported the presence of national strategies, standards and guidelines in the various aspects of BTS which are designed to guarantee standardization and accuracy. These also ensure safety from blood collection through testing, processing, storage, transportation and transfusion to monitoring of possible post-transfusion events. It may be necessary to find out if these documents meet the required standards and elicit compliance. A system for collecting and analysing data centrally is an important part of quality management in the BTS. A total of 15 out of the 19 Group A countries (79%) reported they had a centralized system for data collection and analysis as against 12 out of 21 Group C countries (57%). Centralized data systems and records could be useful in the management of donor services, testing, distribution and use of blood thus improving efficiency and quality.

There has been very little change in the number of countries with designated national quality officers from 25 in 2004 to 26 countries in 2006. Also, the number of countries involved in national external quality assurance schemes in laboratory testing has not increased since 2004. In the present survey, only 17 and 16 countries reported that they had national external quality assurance schemes in blood group serology and testing for TTIs, respectively. Data were reported by countries on the use of standard operating procedures and records in the various aspects of the BTS, but these were expressed as percentages of blood centres which were difficult to analyse and interpret.

Training is an important aspect of quality management in the BTS. It is a vital strategy for rapidly building up the human resource capacity that is needed in all sections of the BTS. Adequately trained and motivated staff are the most important assets of a BTS; they are the mandatory element of a quality management programme. In the survey, only 27 countries (58.7%) had any type of regular training programme for BTS staff, four countries reported that this was in progress, and as many as 15 countries (32.6%) in the Region did not report any training programme. Government and other stakeholders are expected to do more in the area of training, as was identified in the 2004 report, in order to meet the 2012 targets of the regional strategy as well as derive maximum benefit of the financial resources that are being provided for blood safety. In selecting persons for training and appointment to key positions in the BTS, priority should be given to those who have already received core training in the relevant fields.

## 7. CONCLUSIONS

The following conclusions can be made from the survey.

1. There has been an increase in the number of countries that have developed a national blood policy from 40 in 2004 to 44. However, enacting enabling legislation is still lagging behind in many countries. Although implementation is still low, more countries have developed implementation plans. There is need to explore the reasons for the low implementation rate so as to devise mechanisms for improvement.
2. Most of the NBTs in the Region have no national advisory or expert committee. These committees could help to technically improve the quality and effectiveness of their blood services. Exploration to fully utilize the expertise in-country needs to be done in order to maximize expert input for improvement of blood services.
3. Most countries in the Region are currently receiving international technical and funding support for their blood services, but poor coordination and leadership negatively impact on the utilization of this support.
4. The Region is still falling short of meeting its blood needs. Attaining 100% voluntary donations needs to be followed up with intensive blood donor recruitment programmes to increase the absolute number of regular voluntary donors as the best strategy to meet the blood needs of the Region.
5. There is an alarmingly high blood discard rate in a number of Central and West African countries due to HBsAg reactivity. Strategies need to be evolved to safeguard the blood supply so as to minimize the loss.
6. Blood component preparation in the Region remains very low in spite of huge resources expended in the provision of facilities needed for this purpose.
7. As was noted in the 2004 survey, there is still a need to assist countries to improve their capacities in blood cold chain maintenance and management, especially in transportation of blood.
8. There is need to strengthen the clinical interface of blood transfusion services in Member countries so as to promote further appropriate clinical use of blood.
9. Quality management practices have not improved much or expanded in countries since the last survey in 2004. This calls for sound evaluation of the national quality systems, followed by specific interventions to ensure safety and quality of the Region's blood supply.
10. The precise determination of the status of blood safety in the WHO African Region depends greatly on improvement of collection of quality data.

## 8. RECOMMENDATIONS

### WHO should:

- Provide feedback on the GDBS responses to countries so that they can get an idea of the level of performance and what kind of interventions are recommended by the WHO in a number of aspects that may have been identified by the survey.
- Revise the GDBS questionnaire, taking into account the unique blood safety situation in the African Region. Comments from the WHO Regional Office should thus be incorporated at the global level.
- During the next available opportunity for a meeting with the NBTS directors in the African Region, dedicate ample time for discussion of the GDBS questionnaire.
- Consider supporting Member countries to develop or adopt appropriate technologies for day-to-day data and information management in blood centres and blood banks. This will not only help to generate data at facility level for local planning, but will also ensure collection of more accurate, analyzable and useful data at national and regional level.
- Organize independent surveys and missions to selected countries to cross-check the accuracy of the data reported

### Countries should:

- Provide the necessary wherewithal to accelerate the rate of policy implementation.
- Explore sustainability options for blood transfusion services and minimize, where possible, reliance on donor funding.
- Support blood policies with the requisite legislation to enact them into national laws.

### National Blood Transfusion Services should:

- Strive to increase the number of units collected per 1000 population in order to meet the national demand for blood.
- Make all efforts to phase out family replacement and other types of donors to improve the quality of the blood being collected.
- Emphasize the use of existing time-tested strategies and propose innovative ones to improve voluntary blood donation and enhance greater community participation.

- Ensure universal testing of all donor blood against HIV I & II, HBV, HCV and syphilis as well as enhance the quality of testing for these TTIs.
- Emphasize the introduction and implementation of all quality elements in the BTS through the appointed quality managers.
- Avail suitable technologies for day-to-day data management and analysis and, where possible, develop a research and development plan or programme.
- Identify training gaps and enhance the training and re-training of appropriate personnel with the core competencies for leadership and service roles in the BTS. This will optimize the benefits of the present international technical and financial support.

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**ANNEX 1: HIV Prevalence in Adult Population in Africa (UNAIDS 2007 estimates)**

| Country                  | People living with HIV/AIDS | Adult (15-49) rate % | Women HIV/AIDS    | Children with HIV/AIDS | AIDS deaths    | Orphans due to AIDS |
|--------------------------|-----------------------------|----------------------|-------------------|------------------------|----------------|---------------------|
| Angola                   | 190 000                     | 2.1                  | 110 000           | 17 000                 | 11 000         | 50 000              |
| Benin                    | 64 000                      | 1.2                  | 37 000            | 5400                   | 3300           | 29 000              |
| Botswana                 | 300 000                     | 23.9                 | 170 000           | 15 000                 | 11 000         | 95 000              |
| Burkina Faso             | 130 000                     | 1.6                  | 61 000            | 10 000                 | 9200           | 100 000             |
| Burundi                  | 110 000                     | 2.0                  | 53 000            | 15 000                 | 11 000         | 120 000             |
| Cameroon                 | 540 000                     | 5.1                  | 300 000           | 45 000                 | 39 000         | 300 000             |
| Central African Republic | 160 000                     | 6.3                  | 91 000            | 14 000                 | 11 000         | 72 000              |
| Chad                     | 200,000                     | 3.5                  | 110 000           | 19 000                 | 14 000         | 85 000              |
| Comoros                  | <200                        | <0.1                 | <100              | <100                   | <100           | <100                |
| Congo                    | 120 000                     | 3.5                  | 43 000            | 6600                   | 6400           | 69 000              |
| Côte d'Ivoire            | 480 000                     | 3.9                  | 250 000           | 52 000                 | 38 000         | 420 000             |
| Dem. Republic of Congo   | 400 000–500 000             | 1.2–1.5              | 210 000–270 000   | 37 000–52 000          | 24 000–34 000  | 270 000–380 000     |
| Djibouti                 | 16 000                      | 3.1                  | 8700              | 1100                   | 1100           | 5200                |
| Equatorial Guinea        | 11 000                      | 3.4                  | 5900              | <1000                  | <1000          | 4800                |
| Eritrea                  | 38 000                      | 1.3                  | 21 000            | 3100                   | 2600           | 18 000              |
| Ethiopia                 | 980 000                     | 2.1                  | 530 000           | 92 000                 | 67 000         | 650 000             |
| Gabon                    | 49 000                      | 5.9                  | 27 000            | 2300                   | 2300           | 18 000              |
| Gambia                   | 8200                        | 0.9                  | 4500              | <1000                  | <1000          | 2700                |
| Ghana                    | 260 000                     | 1.9                  | 150 000           | 17 000                 | 21 000         | 160 000             |
| Guinea                   | 87 000                      | 1.6                  | 48 000            | 6300                   | 4500           | 25 000              |
| Guinea-Bissau            | 16 000                      | 1.8                  | 8700              | 1500                   | 1100           | 6200                |
| Kenya                    | 1 500 000–2 000 000         | 7.1–8.5              | 800 000–1 100 000 | 130 000–180 000        | 85 000–130 000 | 990 000–1 400 000   |
| Lesotho                  | 270 000                     | 23.2                 | 150 000           | 12000                  | 18 000         | 110 000             |
| Liberia                  | 35 000                      | 1.7                  | 19 000            | 3100                   | 2300           | 15 000              |
| Madagascar               | 14 000                      | 0.1                  | 3400              | <500                   | <1000          | 3400                |
| Malawi                   | 930 000                     | 11.9                 | 490 000           | 91 000                 | 68 000         | 560 000             |
| Mali                     | 100 000                     | 1.5                  | 56 000            | 9 400                  | 5800           | 44 000              |
| Mauritania               | 14 000                      | 0.8                  | 3900              | <500                   | <1000          | 3000                |
| Mauritius                | 13 000                      | 1.7                  | 3800              | <100                   | <1000          | <500                |
| Mozambique               | 1 500 000                   | 12.5                 | 810 000           | 100 000                | 81 000         | 400 000             |
| Namibia                  | 200 000                     | 15.3                 | 110 000           | 14 000                 | 5100           | 66 000              |
| Niger                    | 60 000                      | 0.8                  | 17 000            | 3200                   | 4000           | 25 000              |
| Nigeria                  | 2 600 000                   | 3.1                  | 1 400 000         | 220 000                | 170 000        | 1 200 000           |
| Rwanda                   | 150 000                     | 2.8                  | 78 000            | 19 000                 | 7800           | 220 000             |
| Senegal                  | 67 000                      | 1.0                  | 38 000            | 3100                   | 1800           | 8400                |
| Sierra Leone             | 55 000                      | 1.7                  | 30 000            | 4000                   | 3300           | 16 000              |
| Somalia                  | 24 000                      | 0.5                  | 6700              | <1000                  | 1600           | 8800                |
| South Africa             | 5 700 000                   | 18.1                 | 3 200 000         | 280 000                | 350 000        | 1 400 000           |
| Swaziland                | 190 000                     | 26.1                 | 100 000           | 15 000                 | 10 000         | 56 000              |
| Togo                     | 130 000                     | 3.3                  | 69 000            | 10 000                 | 9100           | 68 000              |
| Uganda                   | 1 000 000                   | 6.7                  | 520 000           | 110 000                | 91 000         | 1 000 000           |
| United Rep. Of Tanzania  | 940 000                     | 5.4                  | 480 000           | 130 000                | 77 000         | 1 200 000           |
| Zambia                   | 1 100 000                   | 15.2                 | 560 000           | 95 000                 | 56 000         | 600 000             |
| Zimbabwe                 | 1 300 000                   | 15.3                 | 680 000           | 120 000                | 140 000        | 1 000 000           |
| Total sub-Saharan Africa | 22 000 000                  | 5.0                  | 12 000 000        | 1 800 000              | 1 500 000      | 11 600 000          |

## ANNEX 2: Global Database on Blood Safety (GDBS) 2006



20, AVENUE APPIA – CH-1211 GENEVA 27 – SWITZERLAND  
TEL +41 22 791 3644 – FAX +41 22 791 4836 – WWW.WHO.INT/BLOODSAFETY

### GLOBAL DATABASE ON BLOOD SAFETY (GDBS) 2006

DATA COLLECTION FOR THE PERIOD JANUARY 2006– DECEMBER 2006

The World Health Organization (WHO) programme on Blood Transfusion Safety would appreciate your kind cooperation in completing this questionnaire which has been designed to obtain information for the WHO Global Database on Blood Safety (GDBS).

The GDBS was established by WHO to address global concerns about the safety and availability of blood for transfusion. It covers the four major components of the integrated strategy for blood safety advocated by WHO:

- The establishment of well-organized, nationally-coordinated blood transfusion services with quality systems in all areas
- The collection of blood only from voluntary non-remunerated blood donors from low-risk populations
- The screening of all donated blood for transfusion-transmissible infections, including HIV, hepatitis B and C, syphilis and other infectious agents, blood grouping and compatibility testing
- A reduction in unnecessary transfusions through the effective clinical use of blood.

The objective of the GDBS is to collect and analyse data from all 192 Member States of WHO in order to enable the Organization to:

- Obtain the best available information on blood transfusion services in each Member State
- Assess the global situation on blood safety
- Monitor trends and progress
- Identify priority countries for support
- Identify problems and needs in order to provide appropriate technical assistance
- Plan research and develop appropriate strategies to address specific needs.



The information provided to the GDBS for 2006 will be published on the WHO website in order to enable each country to assess its own situation and monitor its progress in relation to other countries and to regional and global trends.

This GDBS questionnaire is designed to collect data for the year 2006. The GDBS was initiated in 1998 and the first two collections of data for the GDBS covered the periods 1998–1999 and 2001–2002. GDBS reports for these two periods are available on the WHO website ([www.who.int/bloodsafety](http://www.who.int/bloodsafety)) and from WHO Headquarters and Regional Offices (see Annex 4 for addresses). Please contact WHO for further information and assistance on completing the 2006 GDBS questionnaire.

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## THE 2006 GDBS QUESTIONNAIRE

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The GDBS questionnaire should be completed by an authorized person in the Ministry of Health or an organization, such as the National Blood Transfusion Service, which has statutory responsibility for the operation of blood transfusion services in your country. Please provide details of the person who completes the questionnaire so that WHO can make contact, if necessary, for clarification and further information.

The GDBS questionnaire should be completed with data for the period **January to December 2006**. If data for this period are not available please use the data for 2005.

Please give information relating to your country as a whole, if possible. Where national data are not available, please indicate the level covered by the data.

The questionnaire contains both qualitative and quantitative questions. Three options are offered for responses to qualitative questions: 'Yes', 'In process' and 'No'. Please use the option 'In process' to indicate partial development or partial implementation: for example, if a unit is being created within the Ministry of Health for the national blood programme, but is not yet operational (Question 2.1), or a national blood policy is being developed, but has not yet been finalized (Question 2.4).

Some questions request data in the form of numbers and/or percentages. Where accurate data are not available, please give estimates.

**You are requested to complete the electronic version of the questionnaire, if possible.** Please note that this electronic data collection tool is a unique file which contains embedded codes that are specific to your country.

The advantage of using the electronic questionnaire is that you can keep a permanent electronic record of the responses for 2006 for use in monitoring your country's progress in the future. In addition, the special software application used for the questionnaire enables the data provided by countries to be collated, analysed and accessed electronically.

This questionnaire is easy to use because it is a specially-designed software application for Microsoft Word. In most respects it looks and behaves like a standard Word file, but it has been protected to ensure that you enter data only in the correct places. To complete the electronic questionnaire, follow the instructions below.

- 1 Copy the file onto the hard disk of your computer. While you are working on the file, save it frequently.
- 2 Enter your responses only in the grey boxes that are shown on the screen. These boxes will expand to accommodate your answer. The file has been protected to prevent responses from being entered outside these boxes.
- 3 Some questions offer a choice of answers, such as 'Yes', 'In process' and 'No'. To answer this type of question, click on the box for your preferred answer. A cross will then appear in the box (o). If you then wish to change your answer, simply click on another box.
- 4 Check each entry before moving on the next question. If you enter text when a numeric response is required, the text will automatically be converted into a number and the answer will be invalid.

## GLOSSARY

Annex 1 contains an explanation of terms in italics which are marked with a superscript number <sup>(i)</sup>.

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## RETURNING THE 2006 GDBS QUESTIONNAIRE

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When you have completed this questionnaire, please return it to the World Health Representative in your country by 28 February 2007. Please also send a copy to:

- Dr Tapko: [tapkoj@afro.who.int](mailto:tapkoj@afro.who.int); WHO Regional Office

The contact details of all World Health Representatives are available on the WHO website (<http://www.who.int/countries>). If there is no WHO Country Office in your country, please send the completed questionnaire directly to the appropriate WHO Regional Office, with a copy to WHO Headquarters at the addresses given in Annex 2.

## ANNEX 3: Global Database on Blood Safety (GDBS) 2006



World Health  
Organization

# GLOBAL DATABASE ON BLOOD SAFETY (GDBS) 2006

### SECTION 1: ADMINISTRATIVE INFORMATION

#### Information provided by:

|        |                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 1.1    | Name                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |
| 1.2    | Title                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |
| 1.3    | Position                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 1.4    | Organization                                                                                                                                                                                                                                                                                                                                                                           |  |  |  |
| 1.5    | Address                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |
| 1.6    | Country                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |
| 1.7    | Tel. no.                                                                                                                                                                                                                                                                                                                                                                               |  |  |  |
| 1.9    | E-mail                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |
| 1.10   | Date                                                                                                                                                                                                                                                                                                                                                                                   |  |  |  |
| 1.11   | Please provide data for the period <b>January 2006 to December 2006</b> . If data for this period are not available, please provide data for the period January 2005 to December 2005. Attach additional sheets, if necessary.<br>Data provided for the year (please tick <input checked="" type="checkbox"/> appropriate box): <input type="checkbox"/> 2006 <input type="checkbox"/> |  |  |  |
| 1.12   | The information given applies to blood programmes at the following level:<br><input type="checkbox"/> National level <input type="checkbox"/> State/regional/provincial level <input type="checkbox"/> Other (please specify) <input type="text"/>                                                                                                                                     |  |  |  |
| 1.12.1 | If not national, what percentage of your country's blood programme does this report cover?<br><input type="text"/> %                                                                                                                                                                                                                                                                   |  |  |  |
| 1.13   | Total number of whole blood units collected in the reporting year:                                                                                                                                                                                                                                                                                                                     |  |  |  |

### SECTION 2: ORGANIZATION AND MANAGEMENT

|       |                                                                                                                                                           | YES                      | IN PROCESS               | NO                       |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 2.1   | Is there a unit within the Ministry of Health (or other government department) with responsibility for the <i>national blood programme</i> <sup>1</sup> ? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.2   | Is there a designated national blood programme manager?                                                                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.3   | Is there a <i>national blood authority/commission</i> <sup>2</sup> (or equivalent)?                                                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4   | Is there a <i>national blood policy</i> <sup>3</sup> ?                                                                                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.4.1 | If yes, year of adoption:                                                                                                                                 |                          |                          |                          |
| 2.5   | Is there a national blood plan for the implementation of the blood policy?                                                                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.5.1 | If yes, has it been implemented?                                                                                                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.6   | Is there national legislation covering blood transfusion?                                                                                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.7   | Is there a national advisory committee/expert panel on blood transfusion?                                                                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8   | Is there a <i>national blood transfusion service</i> <sup>4</sup> (NBTS)?                                                                                 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.8.1 | If yes, in which year was the NBTS established?                                                                                                           |                          |                          |                          |

|        |                                                                                                                                                                                                        |                                                                         |                                                                                   |                                                                                  |                          |           |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------|-----------|
|        | Is there a national director/chief executive officer for the NBTS?                                                                                                                                     | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         |                          |           |
|        | Is there an NBTS management committee?                                                                                                                                                                 | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         |                          |           |
| 2.9    | Has the government delegated any responsibility for the NBTS/ <i>blood transfusion services</i> <sup>5</sup> to a nongovernmental organization?                                                        | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         |                          |           |
| 2.9.1  | If yes:<br>Name of the organization(s):<br>Role of the organization(s):                                                                                                                                |                                                                         |                                                                                   |                                                                                  |                          |           |
| 2.10   | How is the responsibility for the operation of the NBTS/ <i>blood transfusion services</i> <sup>5</sup> distributed? For each category, please indicate the number of different types of blood centre. |                                                                         |                                                                                   |                                                                                  |                          |           |
|        | Government<br><input type="checkbox"/>                                                                                                                                                                 | Non-governmental/non-profit organizations<br><input type="checkbox"/>   | Commercial (for profit) organizations<br><input type="checkbox"/>                 |                                                                                  |                          |           |
|        | <b>MANAGEMENT RESPONSIBILITY</b>                                                                                                                                                                       | <b>BLOOD CENTRES THAT COLLECT, SCREEN, PROCESS AND DISTRIBUTE BLOOD</b> | <b>HOSPITAL-BASED BLOOD CENTRES THAT COLLECT, SCREEN, PROCESS AND ISSUE BLOOD</b> | <b>HOSPITAL BLOOD BANKS THAT STORE, CHECK COMPATIBILITY AND ISSUE BLOOD ONLY</b> | <b>OTHERS</b>            |           |
|        | Government ( <b>total</b> )                                                                                                                                                                            | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Ministry of Health                                                                                                                                                                                   | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Other government department(s)                                                                                                                                                                       | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ University/teaching hospitals                                                                                                                                                                        | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | Non-governmental/non-profit organizations ( <b>total</b> )                                                                                                                                             |                                                                         | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Red Cross/Red Crescent Society                                                                                                                                                                       |                                                                         | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Other non-governmental organizations                                                                                                                                                                 | --                                                                      | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ University/teaching hospitals                                                                                                                                                                        | --                                                                      | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | Please specify the role of any non-governmental/non-profit organizations:                                                                                                                              | <input type="checkbox"/>                                                |                                                                                   |                                                                                  |                          |           |
|        | Commercial (for profit) organizations ( <b>total</b> )                                                                                                                                                 | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Commercial blood centres                                                                                                                                                                             | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Private hospitals                                                                                                                                                                                    | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        | ▪ Others (please specify their role):                                                                                                                                                                  | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
|        |                                                                                                                                                                                                        |                                                                         |                                                                                   | <b>YES</b>                                                                       | <b>IN PROCESS</b>        | <b>NO</b> |
| 2.11   | Does any international agency/organization/institution provide <b>technical</b> support to NBTS/ <i>blood transfusion services</i> ?                                                                   | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
| 2.11.1 | If yes, name of agency:                                                                                                                                                                                |                                                                         |                                                                                   |                                                                                  |                          |           |
| 2.12   | Does any international agency/organization/institution provide <b>financial</b> support to NBTS/ <i>blood transfusion services</i> ?                                                                   | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |
| 2.12.1 | If yes, name of agency:                                                                                                                                                                                |                                                                         |                                                                                   |                                                                                  |                          |           |
|        |                                                                                                                                                                                                        |                                                                         |                                                                                   | <b>YES</b>                                                                       | <b>IN PROCESS</b>        | <b>NO</b> |
| 2.13   | Is there a system of centralized data collection and analysis for the NBTS/ <i>blood transfusion services</i> ?                                                                                        | <input type="checkbox"/>                                                | <input type="checkbox"/>                                                          | <input type="checkbox"/>                                                         | <input type="checkbox"/> |           |

|        |                                                                                                                                                                                                 |                          |                                             |                                              |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------|----------------------------------------------|
| 2.14   | Is there a mechanism for calculating the costs of the operation of the NBTS/blood transfusion services?                                                                                         | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.15   | What is the approximate cost (in US dollars) of producing a unit of whole blood/red blood cells (including donor recruitment, blood collection, testing, processing, storage and distribution)? |                          |                                             |                                              |
| 2.16   | Is a specific national budget provided for the NBTS/blood transfusion services?                                                                                                                 | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.17   | Is there a national cost recovery system for the NBTS/blood transfusion services?                                                                                                               | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.18   | Are there national standards for the collection, storage, processing and issue of blood and blood products?                                                                                     | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.19   | Is there a designated national <i>quality manager</i> <sup>6</sup> for blood transfusion services?                                                                                              | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.20   | What percentage of blood centres use standard operating procedures <sup>7</sup> (SOPs) or local written instructions for relevant functions?                                                    |                          |                                             |                                              |
|        | ▪ Blood donor recruitment                                                                                                                                                                       |                          |                                             |                                              |
|        | ▪ Blood donor selection                                                                                                                                                                         |                          |                                             |                                              |
|        | ▪ Blood collection and donor care                                                                                                                                                               |                          |                                             |                                              |
|        | ▪ Screening for transfusion-transmissible infections                                                                                                                                            |                          |                                             |                                              |
|        | ▪ Blood group serology                                                                                                                                                                          |                          |                                             |                                              |
|        | ▪ Blood component preparation                                                                                                                                                                   |                          |                                             |                                              |
|        | ▪ Blood storage and transportation/distribution                                                                                                                                                 |                          |                                             |                                              |
|        | ▪ Compatibility testing (cross-matching)                                                                                                                                                        |                          |                                             |                                              |
|        | ▪ Issue of blood and blood components                                                                                                                                                           |                          |                                             |                                              |
|        | ▪ Administration of blood and blood components                                                                                                                                                  |                          |                                             |                                              |
| 2.21   | What percentage of blood centres maintain records of the following:                                                                                                                             | <b>MANUAL SYSTEM</b>     | <b>ELECTRONIC SYSTEM</b>                    |                                              |
|        | ▪ Blood donor recruitment                                                                                                                                                                       |                          |                                             |                                              |
|        | ▪ Blood donor selection                                                                                                                                                                         |                          |                                             |                                              |
|        | ▪ Blood collection and donor care                                                                                                                                                               |                          |                                             |                                              |
|        | ▪ Screening for transfusion-transmissible infections                                                                                                                                            |                          |                                             |                                              |
|        | ▪ Blood group serology                                                                                                                                                                          |                          |                                             |                                              |
|        | ▪ Blood component preparation                                                                                                                                                                   |                          |                                             |                                              |
|        | ▪ Blood storage and transportation/distribution                                                                                                                                                 |                          |                                             |                                              |
|        | ▪ Compatibility testing (cross-matching)                                                                                                                                                        |                          |                                             |                                              |
|        | ▪ Issue of blood                                                                                                                                                                                |                          |                                             |                                              |
|        | ▪ Patients receiving blood transfusion                                                                                                                                                          |                          |                                             |                                              |
|        | ▪ Patients with transfusion reactions                                                                                                                                                           |                          |                                             |                                              |
|        |                                                                                                                                                                                                 | <b>YES</b>               | <b>IN PROCESS</b>                           | <b>NO</b>                                    |
| 2.22   | Is there a system of <i>audit</i> <sup>8</sup> in the NBTS/blood transfusion services?                                                                                                          | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.23   | Is there a national <i>external quality assessment scheme</i> <sup>9</sup> for blood group serology?                                                                                            | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.24   | Is there a national <i>external quality assessment scheme</i> <sup>9</sup> for transfusion-transmissible infections?                                                                            | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.25   | Is there a mechanism for the bulk procurement of consumables for the NBTS/blood transfusion services?                                                                                           | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.25.1 | If yes, which of the following consumables are procured in bulk at various levels?                                                                                                              |                          |                                             |                                              |
|        | <b>TYPE OF CONSUMABLE</b>                                                                                                                                                                       | <b>NATIONAL LEVEL</b>    | <b>STATE/PROVINCIAL/<br/>REGIONAL LEVEL</b> | <b>INDIVIDUAL BLOOD CENTRE/<br/>HOSPITAL</b> |
|        | Blood bags                                                                                                                                                                                      | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
|        | Test kits                                                                                                                                                                                       | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
|        | Reagents                                                                                                                                                                                        | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
|        | Others (please specify): <input type="text"/>                                                                                                                                                   | <input type="checkbox"/> | <input type="checkbox"/>                    | <input type="checkbox"/>                     |
| 2.26   | Did stocks of any of the following consumables run out in 2006? If yes, please tick.                                                                                                            |                          |                                             |                                              |
|        | Blood bags                                                                                                                                                                                      |                          | <input type="checkbox"/>                    |                                              |

|      |                                                                                                                                       |                            |                                 |                                    |
|------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------|------------------------------------|
|      | Test kits                                                                                                                             | <input type="checkbox"/>   |                                 |                                    |
|      | Reagents                                                                                                                              | <input type="checkbox"/>   |                                 |                                    |
|      | Others (please specify): <input type="text"/>                                                                                         | <input type="checkbox"/>   |                                 |                                    |
| 2.27 | Are there national guidelines for waste management in blood transfusion services?                                                     | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
| 2.28 | Is there an educational programme in blood transfusion medicine/science leading to a nationally-recognized university degree/diploma? | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
| 2.29 | Is there a system of regular training of staff?                                                                                       | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
| 2.30 | Please indicate the types of training available for the following categories of staff.                                                |                            |                                 |                                    |
|      | <b>STAFF CATEGORY</b>                                                                                                                 | <b>IN-SERVICE TRAINING</b> | <b>SHORT COURSES/ WORKSHOPS</b> | <b>FORMAL COURSES (IN COUNTRY)</b> |
|      | Medical officers                                                                                                                      | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Administrative staff                                                                                                                  | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Quality officers                                                                                                                      | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Blood donor education/recruitment staff                                                                                               | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Blood collection/donor care staff                                                                                                     | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Blood donor counsellors                                                                                                               | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Blood component preparation staff                                                                                                     | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Laboratory technical staff                                                                                                            | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Clinicians who prescribe blood                                                                                                        | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Nurses who administer blood                                                                                                           | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      |                                                                                                                                       |                            | <b>YES</b>                      | <b>IN PROCESS</b>                  |
| 2.31 | Is there a national <i>haemovigilance</i> <sup>10</sup> system?                                                                       | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
| 2.32 | Is there a mechanism for the regulation of the NBTS/blood transfusion services?                                                       | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | 2.32.1 If yes, is there a system of regular inspection of the NBTS/blood transfusion services?                                        | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Do the inspectors have specialized training in blood transfusion?                                                                     | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Is there a national regulatory authority?                                                                                             | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | If yes, name of regulatory authority:                                                                                                 | <input type="text"/>       |                                 |                                    |
| 2.33 | Is there a mechanism for the regulation of fractionated plasma products?                                                              | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | 2.33.1 If yes, is there a system of regular inspection of plasma fractionation facilities?                                            | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Do the inspectors have specialized training in plasma fractionation?                                                                  | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | Is there a national regulatory authority?                                                                                             | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | If yes, name of regulatory authority:                                                                                                 | <input type="text"/>       |                                 |                                    |
| 2.34 | What percentage of blood centres have direct access to:                                                                               |                            |                                 |                                    |
|      | Personal computers                                                                                                                    |                            |                                 |                                    |
|      | Internet?                                                                                                                             |                            |                                 |                                    |
|      |                                                                                                                                       |                            | <b>YES</b>                      | <b>NO</b>                          |
| 2.35 | Would the NBTS/blood transfusion services benefit from external training or technical support?                                        | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | 2.35.1 If yes, please specify areas:                                                                                                  | <input type="text"/>       |                                 |                                    |
| 2.36 | Could the NBTS/blood transfusion services in your country provide training or technical support to other countries?                   | <input type="checkbox"/>   | <input type="checkbox"/>        | <input type="checkbox"/>           |
|      | 2.36.1 If yes, please specify areas:                                                                                                  | <input type="text"/>       |                                 |                                    |

**SECTION 3: BLOOD DONORS AND BLOOD COLLECTION**

|        |                                                                                                                                        | YES                      | IN PROCESS               | NO                       |
|--------|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 3.1    | Is there a unit designated for the national blood donor recruitment programme?                                                         | <input type="checkbox"/> |                          | <input type="checkbox"/> |
| 3.2    | Is there a designated national blood donor recruitment officer?                                                                        | <input type="checkbox"/> |                          | <input type="checkbox"/> |
| 3.3    | Is a specific national budget provided for the blood donor recruitment programme?                                                      | <input type="checkbox"/> |                          | <input type="checkbox"/> |
| 3.4    | Was World Blood Donor Day 2006 celebrated in your country?                                                                             | <input type="checkbox"/> |                          | <input type="checkbox"/> |
| 3.5    | Are information and education materials available for blood donors?                                                                    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.6    | What percentage of blood centres have trained donor recruitment staff?                                                                 |                          |                          |                          |
| 3.7    | What percentage of blood centres have trained blood collection/donor care staff?                                                       |                          |                          |                          |
| 3.8    | Are there national criteria for assessing the suitability of donors for blood donation?                                                | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.8.1  | If yes, what percentage of blood centres have a system for assessing the suitability of donors based on the national criteria?         |                          |                          |                          |
| 3.8.2  | What percentage of blood centres have a system of pre-donation counselling for blood donors?                                           |                          |                          |                          |
| 3.9    | What percentage of blood donors have a haemoglobin/haematocrit estimation done before blood donation?                                  |                          |                          |                          |
| 3.10   | In 2006, what percentage of donors were deferred after being assessed as unsuitable to donate blood?                                   |                          |                          |                          |
| 3.11   | Is there a register/database of blood donors?                                                                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.11.1 | If yes, at what level is the register/database of blood donors maintained?                                                             |                          |                          |                          |
|        | ▪ National                                                                                                                             | <input type="checkbox"/> |                          |                          |
|        | ▪ State/provincial/regional                                                                                                            | <input type="checkbox"/> |                          |                          |
|        | ▪ Individual blood centre or hospital                                                                                                  | <input type="checkbox"/> |                          |                          |
| 3.12   | In 2006, how many units of whole blood were collected from the following types of <i>blood donors</i> <sup>11</sup> ?                  |                          |                          |                          |
|        |                                                                                                                                        | <b>N°</b>                | <b>%</b>                 |                          |
|        | ▪ Voluntary non-remunerated donors                                                                                                     |                          |                          |                          |
|        | ▪ Family/replacement donors                                                                                                            |                          |                          |                          |
|        | ▪ Paid donors                                                                                                                          |                          |                          |                          |
|        | ▪ Autologous donors                                                                                                                    |                          |                          |                          |
| 3.12.1 | How many units of whole blood were collected from the following types of voluntary non-remunerated <i>blood donors</i> <sup>11</sup> ? |                          |                          |                          |
|        |                                                                                                                                        | <b>N°</b>                | <b>%</b>                 |                          |
|        | ▪ New voluntary donors                                                                                                                 |                          |                          |                          |
|        | ▪ Lapsed voluntary donors                                                                                                              |                          |                          |                          |
|        | ▪ Regular voluntary donors                                                                                                             |                          |                          |                          |
| 3.12.2 | What was the approximate percentage of all donations from:                                                                             |                          |                          |                          |
|        | ▪ Male donors                                                                                                                          |                          |                          |                          |
|        | ▪ Female donors                                                                                                                        |                          |                          |                          |
| 3.13   | What percentage of blood centres collect whole blood units in sterile, disposable, plastic blood collection bags?                      |                          |                          |                          |
| 3.14   | What is the average volume of a whole blood unit?                                                                                      |                          |                          |                          |
| 3.15   | What percentage of blood centres have a system of recording adverse blood donor reactions?                                             |                          |                          |                          |
|        |                                                                                                                                        | <b>YES</b>               |                          | <b>NO</b>                |

|      |                                                                                                                                                         |                          |                          |                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 3.16 | Is the prevalence of transfusion-transmissible infections monitored in the blood donor population?                                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.17 | What percentage of blood centres have a system of post-donation counselling of blood donors who test positive for transfusion-transmissible infections? |                          |                          |                          |
| 3.18 | What percentage of blood centres have a system to maintain the confidentiality of blood donors?                                                         |                          |                          |                          |
| 3.19 | What percentage of blood centres have a system to obtain feedback and complaints from donors?                                                           |                          |                          |                          |

**SECTION 4: SCREENING FOR TRANSFUSION-TRANSMISSIBLE INFECTIONS**

|                        |                                                                                                                              | YES                      | IN PROCESS               | NO                       |                          |                           |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|
| 4.1                    | Is there a national strategy for screening donated blood units for transfusion-transmissible infections?                     | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |                          |                           |
| 4.2                    | In 2006, what percentage of donations were screened for transfusion-transmissible infections? Which assay systems were used? |                          |                          |                          |                          |                           |
| INFECTION              | MARKER(S) TESTED                                                                                                             | YES                      | DONATIONS TESTED         | EIA                      | SIMPLE/RAPID             | MOLECULAR (e.g. NAT, TMA) |
| HIV I/II               | ▪ Ab                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Ag                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Combined Ag + Ab                                                                                                           | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ DNA/RNA                                                                                                                    | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| HBV                    | ▪ HBsAg                                                                                                                      | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Anti-HBc                                                                                                                   | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Others                                                                                                                     | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| HCV                    | ▪ Ab                                                                                                                         | <input type="checkbox"/> |                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Ag                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Combined Ag + Ab                                                                                                           | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ DNA/RNA                                                                                                                    | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Syphilis               | ▪ Ab                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Others                                                                                                                     | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Chagas' disease        | ▪ Ab                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Others                                                                                                                     | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Malaria                | ▪ Ab                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Ag                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ DNA/RNA                                                                                                                    | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Others                                                                                                                     | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| HTLV I/II              | ▪ Ab                                                                                                                         | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        | ▪ Others                                                                                                                     | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Other (please specify) |                                                                                                                              | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
| Other (please specify) |                                                                                                                              | <input type="checkbox"/> | <input type="text"/> %   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>  |
|                        |                                                                                                                              |                          |                          |                          |                          | YES NO                    |
| 4.3                    | In 2006, was blood ever issued without screening due to the non-availability of test kits/reagents?                          |                          |                          | <input type="checkbox"/> | <input type="checkbox"/> |                           |



|                        |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
|------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------|--------------------------------|---------------------------------|-----------------------------------|---------------------------|--------------------------|
| 4.4                    | In 2006, what was the prevalence (in percentage) of infection in donated blood units from different types of blood donor? |                               |                             |                                |                                 |                                   |                           |                          |
| <b>INFECTION</b>       | <b>ALL DONORS</b>                                                                                                         | <b>TOTAL VOLUNTARY DONORS</b> | <b>NEW VOLUNTARY DONORS</b> | <b>LAPSED VOLUNTARY DONORS</b> | <b>REGULAR VOLUNTARY DONORS</b> | <b>FAMILY/ REPLACEMENT DONORS</b> | <b>PAID DONORS</b>        |                          |
| HIV                    |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
| HBV                    |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
| HCV                    |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
| Syphilis               | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| Chagas disease         | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| Malaria                | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| HTLV                   | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| Other (please specify) | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| <input type="text"/>   |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
| Other (please specify) | <input type="text"/> %                                                                                                    | <input type="text"/><br>%     | <input type="text"/><br>%   | <input type="text"/><br>%      | <input type="text"/><br>%       | <input type="text"/><br>%         | <input type="text"/><br>% |                          |
| <input type="text"/>   |                                                                                                                           |                               |                             |                                |                                 |                                   |                           |                          |
| 4.5                    | From which tests are prevalence data obtained?                                                                            |                               |                             |                                |                                 |                                   | <b>YES</b>                | <b>NO</b>                |
|                        | ▪ Screening tests                                                                                                         |                               |                             |                                |                                 |                                   | <input type="checkbox"/>  | <input type="checkbox"/> |
|                        | ▪ Confirmatory tests                                                                                                      |                               |                             |                                |                                 |                                   | <input type="checkbox"/>  | <input type="checkbox"/> |
| 4.6                    | What percentage of blood centres store frozen samples of donor plasma for look-back testing?                              |                               |                             |                                |                                 |                                   | <input type="text"/>      | %                        |
| 4.7                    | In 2006, what was the total percentage of blood discarded after screening for transfusion-transmissible infections?       |                               |                             |                                |                                 |                                   | <input type="text"/>      | %                        |

**SECTION 5: BLOOD GROUP SEROLOGY AND COMPATIBILITY TESTING**

|     |                                                                                   |                          |                          |                          |
|-----|-----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
|     |                                                                                   | <b>YES</b>               | <b>IN PROCESS</b>        | <b>NO</b>                |
| 5.1 | Is there a national strategy for testing donated blood units for blood groups?    | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.2 | What percentage of donations are tested for blood group and by which methodology? |                          |                          |                          |
|     | <b>TEST PERFORMED</b>                                                             | <b>PERCENTAGE TESTED</b> | <b>MANUAL METHOD</b>     | <b>SEMI-AUTOMATED</b>    |
|     | ABO cell grouping                                                                 |                          | <input type="checkbox"/> | <input type="checkbox"/> |
|     | ABO serum grouping                                                                |                          | <input type="checkbox"/> | <input type="checkbox"/> |
|     | RhD antigen testing                                                               |                          | <input type="checkbox"/> | <input type="checkbox"/> |
|     | Antibody screening                                                                |                          | <input type="checkbox"/> | <input type="checkbox"/> |
|     | Other blood groups                                                                |                          | <input type="checkbox"/> | <input type="checkbox"/> |
|     |                                                                                   | <b>YES</b>               | <b>IN PROCESS</b>        | <b>NO</b>                |
| 5.3 | Are there national guidelines on compatibility testing?                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

|     |                                                                                   |                        |
|-----|-----------------------------------------------------------------------------------|------------------------|
| 5.4 | What percentage of blood units are issued annually without compatibility testing? | <input type="text"/> % |
| 5.5 | What percentage of hospital blood banks use electronic cross-matching?            | <input type="text"/> % |

**SECTION 6: BLOOD COMPONENT PREPARATION, STORAGE AND TRANSPORTATION**

|                             |                                                                                                                                                       |                                           |                              |                          |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------|--------------------------|
| 6.1                         | What percentage of blood centres prepare blood components?                                                                                            | <input type="text"/> %                    |                              |                          |
| 6.2                         | What percentage of blood centres have the following equipment?                                                                                        |                                           |                              |                          |
|                             | Blood bank refrigerator with temperature monitoring system and alarm                                                                                  | <input type="text"/> %                    |                              |                          |
|                             | Plasma freezer                                                                                                                                        | <input type="text"/> %                    |                              |                          |
|                             | Platelet agitator/incubator                                                                                                                           | <input type="text"/> %                    |                              |                          |
|                             | Refrigerated centrifuge                                                                                                                               | <input type="text"/> %                    |                              |                          |
|                             | Standby generator                                                                                                                                     | <input type="text"/> %                    |                              |                          |
|                             | Blood transport boxes                                                                                                                                 | <input type="text"/> %                    |                              |                          |
| 6.3                         | In 2006, what percentage of whole blood units were separated into components?                                                                         | <input type="text"/> %                    |                              |                          |
| 6.4                         | Which blood components are prepared?                                                                                                                  |                                           |                              |                          |
|                             | <b>COMPONENT</b>                                                                                                                                      | <b>PREPARED FROM WHOLE BLOOD</b>          | <b>PREPARED BY APHERESIS</b> |                          |
|                             | Red cell preparations                                                                                                                                 | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Platelet concentrates                                                                                                                                 | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Plasma                                                                                                                                                | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Fresh frozen plasma                                                                                                                                   | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Cryoprecipitate                                                                                                                                       | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Inactivated plasma                                                                                                                                    | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Small paediatric units                                                                                                                                | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | Leucocyte-reduced units                                                                                                                               | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
| Peripheral blood stem cells | <input type="checkbox"/>                                                                                                                              | <input type="checkbox"/>                  |                              |                          |
| Others (please specify)     | <input type="text"/>                                                                                                                                  | <input type="text"/>                      |                              |                          |
| 6.5                         | What percentage of blood centres prepare blood components by apheresis?                                                                               | <input type="text"/> 0 %                  |                              |                          |
| 6.6                         | Is there a surplus of plasma in excess of national needs?                                                                                             | <b>YES</b>                                | <b>IN PROCESS</b>            | <b>NO</b>                |
|                             |                                                                                                                                                       | <input type="checkbox"/>                  | <input type="checkbox"/>     | <input type="checkbox"/> |
|                             | 6.6.1                                                                                                                                                 | If yes, how is surplus plasma utilized?   |                              |                          |
|                             |                                                                                                                                                       | ▪ Donated to another country/organization | <input type="checkbox"/>     | <input type="checkbox"/> |
|                             |                                                                                                                                                       | ▪ Sold to another country/organization    | <input type="checkbox"/>     | <input type="checkbox"/> |
|                             | ▪ Discarded                                                                                                                                           | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
|                             | ▪ Other (please specify) <input type="text"/>                                                                                                         | <input type="checkbox"/>                  | <input type="checkbox"/>     |                          |
| 6.7                         | Are there national guidelines on the storage of blood and blood components?                                                                           | <input type="checkbox"/>                  | <input type="checkbox"/>     | <input type="checkbox"/> |
| 6.8                         | Are there national guidelines on the transportation of blood and blood components?                                                                    | <input type="checkbox"/>                  | <input type="checkbox"/>     | <input type="checkbox"/> |
| 6.9                         | What percentage of blood centres store blood and blood components in temperature-monitored equipment with an appropriate alarm?                       | <input type="text"/> %                    |                              |                          |
| 6.10                        | What percentage of blood centres use domestic refrigerators for blood storage?                                                                        | <input type="text"/> %                    |                              |                          |
| 6.11                        | What percentage of blood centres transport blood and blood components in temperature-monitored equipment?                                             | <input type="text"/> %                    |                              |                          |
| 6.12                        | What percentage of blood centres store reagents in temperature-monitored equipment?                                                                   | <input type="text"/> %                    |                              |                          |
| 6.13                        | What percentage of blood centres have a system of separate blood storage areas for <i>quarantine</i> <sup>13</sup> and the issue of blood components? | <input type="text"/> %                    |                              |                          |
| 6.14                        | Is there a national system of blood stock management?                                                                                                 | <b>YES</b>                                | <b>IN PROCESS</b>            | <b>NO</b>                |
|                             |                                                                                                                                                       | <input type="checkbox"/>                  | <input type="checkbox"/>     | <input type="checkbox"/> |
| 6.15                        | In 2006, what were the number and percentage of blood units discarded due to the following causes?                                                    | <b>Nº</b>                                 | <b>%</b>                     |                          |
|                             |                                                                                                                                                       | <input type="text"/>                      | <input type="text"/>         |                          |

|                                                      |  |  |    |
|------------------------------------------------------|--|--|----|
| ▪ Faulty blood collection                            |  |  |    |
| ▪ Positive for transfusion-transmissible infection   |  |  |    |
| ▪ Date expiry                                        |  |  |    |
| ▪ Processing failure                                 |  |  | -- |
| ▪ Storage and transportation problems                |  |  | -- |
| ▪ Other causes (please specify) <input type="text"/> |  |  | -- |
| ▪ Total                                              |  |  |    |

**SECTION 7: THE CLINICAL USE OF BLOOD AND BLOOD COMPONENTS**

|     |                                                                                                                                  | YES                      | IN PROCESS               | NO                       |
|-----|----------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|
| 7.1 | Are there national guidelines on the appropriate clinical use of blood?                                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.2 | In 2006, what percentage of blood was transfused as whole blood?                                                                 |                          |                          | <input type="text"/> %   |
| 7.3 | In 2006, approximately how many patients received a transfusion of blood or blood components?                                    |                          |                          |                          |
|     | ▪ Total patients transfused                                                                                                      |                          |                          |                          |
|     | ▪ Male patients transfused                                                                                                       |                          |                          |                          |
|     | ▪ Female patients transfused                                                                                                     |                          |                          |                          |
| 7.4 | What percentage of hospitals have a functioning hospital transfusion committee?                                                  |                          |                          |                          |
| 7.5 | What percentage of hospitals follow a <i>maximum surgical blood ordering schedule</i> (MSBOS) <sup>14</sup> for routine surgery? |                          |                          |                          |
| 7.6 | What percentage of hospitals have a system for monitoring clinical transfusion practice?                                         |                          |                          | <input type="text"/> %   |
| 7.7 | What percentage of hospitals have a system for monitoring post-transfusion <b>reactions</b> ?                                    |                          |                          | <input type="text"/> %   |
| 7.8 | What percentage of hospitals have a system for monitoring post-transfusion <b>infections</b> ?                                   |                          |                          | <input type="text"/> %   |

**SECTION 8: FRACTIONATED PLASMA PRODUCTS**

|       |                                                                                                       | YES                      | IN PROCESS               | NO                          |
|-------|-------------------------------------------------------------------------------------------------------|--------------------------|--------------------------|-----------------------------|
| 8.1   | Is there a national strategy for the provision of <i>fractionated plasma products</i> <sup>15</sup> ? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
| 8.1.1 | If yes:                                                                                               |                          |                          |                             |
|       | Imported from abroad                                                                                  | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
|       | Fractionated within the country                                                                       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
|       | Public/not-for-profit sector                                                                          | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
|       | If yes, please specify the name of the organization: <input type="text"/>                             |                          |                          |                             |
|       | Private/for-profit sector                                                                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
|       | Contract fractionation:                                                                               | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/>    |
|       | If yes, please specify:                                                                               |                          |                          |                             |
|       | ▪ Name of the organization: <input type="text"/>                                                      |                          |                          |                             |
|       | ▪ Country: <input type="text"/>                                                                       |                          |                          |                             |
| 8.2   | What is the total volume of plasma designated nationally for fractionation in a year?                 |                          |                          |                             |
|       | ▪ Recovered plasma                                                                                    |                          |                          | <input type="text"/> litres |
|       | ▪ Apheresis plasma                                                                                    |                          |                          | <input type="text"/> litres |
|       | ▪ Not applicable                                                                                      |                          |                          | <input type="text"/>        |
| 8.3   | Which products are manufactured by fractionation within the country?                                  |                          |                          |                             |
|       | ▪ Albumin                                                                                             | <input type="checkbox"/> |                          |                             |
|       | ▪ Immunoglobulin                                                                                      | <input type="checkbox"/> |                          |                             |
|       | ▪ Factor VIII                                                                                         | <input type="checkbox"/> |                          |                             |
|       | ▪ Factor IX                                                                                           | <input type="checkbox"/> |                          |                             |
|       | ▪ Others (please specify): <input type="text"/>                                                       | <input type="checkbox"/> |                          |                             |
| 8.4   | Is there a surplus of fractionated plasma products in excess of national needs?                       | <input type="checkbox"/> |                          | <input type="checkbox"/>    |
| 8.4.1 | If yes, how are these products utilized?                                                              |                          |                          |                             |

|     |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | <ul style="list-style-type: none"> <li>▪ Donated to another country/organization <input type="checkbox"/> <input type="checkbox"/></li> <li>▪ Sold to another country/organization <input type="checkbox"/> <input type="checkbox"/></li> <li>▪ Discarded <input type="checkbox"/> <input type="checkbox"/></li> <li>▪ Other (please specify): <input type="text"/> <input type="checkbox"/> <input type="checkbox"/></li> </ul> |
| 8.5 | What is the percentage of different types of plasmapheresis donors?                                                                                                                                                                                                                                                                                                                                                              |
|     | <ul style="list-style-type: none"> <li>▪ Voluntary non-remunerated plasma donors <input type="text"/> %</li> <li>▪ Paid plasma donors <input type="text"/> %</li> <li>▪ Other plasma donors (please specify): <input type="text"/> <input type="text"/> %</li> </ul>                                                                                                                                                             |

**COMMENTS**

Please use the space below and attach additional pages, if necessary, to provide any further relevant information or comments on the GDBS questionnaire.

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## ANNEX 4: GLOSSARY

- 1 **National blood programme:** The government programme with overall responsibility for planning, implementation and monitoring of all activities related to blood transfusion throughout the country. Responsibility for the implementation of the blood programme may be fully or partially delegated to a governmental or non-governmental organization designated as the national blood transfusion service.
- 2 **National blood authority/commission:** The highest policy formulation and decision-making body under the national health authority for issues pertaining to blood transfusion services in the country. All major stakeholders in the blood transfusion process are usually represented in this authority.
- 3 **National blood policy:** A statement of intent by the national health authority that defines the organizational, financial and legal measures that will be taken to ensure the quality, safety, availability and accessibility of blood transfusion within the country.
- 4 **National blood transfusion service (NBTS):** The organization with statutory national responsibility for the provision of blood for transfusion and liaison with clinical services for the appropriate use of blood for patient care. The NBTS coordinates all activities concerned with blood donor recruitment and the collection, testing, processing, storage and distribution of blood and blood products, the clinical use of blood and surveillance of adverse transfusion events. Activities are carried out within a network of national/regional/provincial blood centres and hospital blood banks.
- 5 **Blood transfusion services:** Hospitals and other facilities involved in the provision of blood in countries where there is no National Blood Transfusion Service.
- 6 **Quality manager:** The appointed, responsible and authorized individual within an organization with responsibility for developing and managing the quality system.
- 7 **Standard operating procedure:** Local written instructions for the performance of a specific procedure.
- 8 **Audit:** Systematic, independent and documented examination to determine whether activities comply with a planned and agreed quality system.
- 9 **External quality assessment (EQA):** The external assessment of a laboratory's performance using samples of known, but undisclosed, content and comparison with the performance of other laboratories. An external quality assessment scheme is a recognized scheme for organizing EQA. This can be a local scheme or may be organized at national, regional or international level.

- 10 Haemovigilance:** The monitoring, reporting and investigation of adverse incidents/near-misses related to all blood transfusion activities.
- 11 Blood donors**
- **Voluntary non-remunerated blood donor:** An altruistic donor who gives blood freely and voluntarily without receiving money or any other form of payment.
    - New voluntary donor:** A voluntary non-remunerated blood donor who has never donated blood before.
    - Lapsed voluntary donor:** A voluntary non-remunerated blood donor who has given blood in the past but does not fulfil the criteria for a regular donor.
    - Regular voluntary donor:** A voluntary non-remunerated blood donor who has given blood at least three times and who continues to donate blood at least once a year.
  - **Family/replacement blood donor:** A donor who gives blood when it is required by a member of the patient's family or community. This may involve a hidden paid donation system in which the donor is paid by the patient's family.
  - **Paid donor:** A donor who gives blood for money or other form of payment.
  - **Autologous donor:** A patient who donates his/her blood to be stored and reinfused, if needed, during surgery.
- 12 NAT:** Nucleic acid testing.
- 13 Quarantine:** Non-authorization to proceed to next stage of a process until specified standards or conditions are met.
- 14 Maximum surgical blood ordering schedule (MSBOS):** A guide to expected normal blood usage for elective surgical procedures which lists the number of units of blood to be routinely crossmatched or grouped, screened and held for each procedure preoperatively.
- 15 Fractionated plasma products:** Human plasma protein products prepared under pharmaceutical manufacturing conditions. Plasma products include albumin, immunoglobulin and coagulation factors VIII and IX.

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