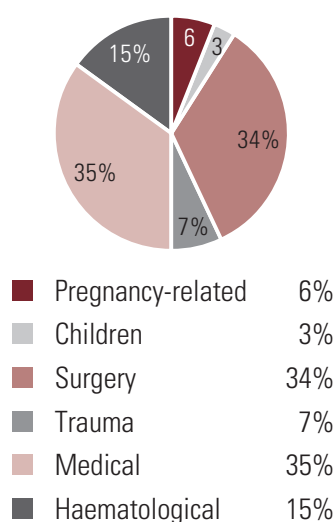
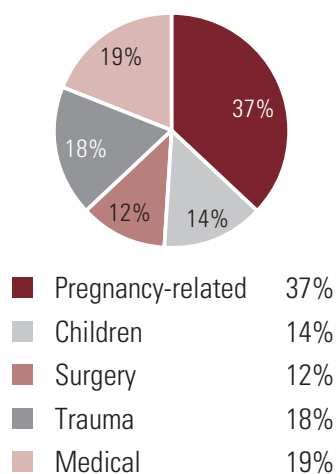


BLOOD TRANSFUSION SAFETY

Estimated use of red cell transfusion in developed countries



Estimated use of red cell transfusion in developing countries



BLOOD SAVES LIVES

Every second, someone in the world needs blood. In every country, surgery, trauma, severe anaemia and complications of pregnancy are among the clinical conditions that demand blood transfusion.

In countries with advanced medical, diagnostic and laboratory services, a large proportion of blood is used in sophisticated treatments requiring a high level of transfusion support, including chemotherapy, open heart surgery, organ transplantation and the management of haematological disorders such as leukaemia, thalassaemia and haemophilia.

The pattern of blood usage is very different in countries where diagnostic and treatment options are more limited, with a much greater proportion of transfusions being given to women with obstetric emergencies and children suffering from severe anaemia, often resulting from malaria and malnutrition.

Whatever the degree of development of the health care system, transfusion is the only option for survival for many patients.



A life saved by safe blood

Blood transfusion is a unique technology in that its collection, processing and use are scientifically based, but its availability depends on the extraordinary generosity of people who donate it as the most precious of gifts – the gift of life.

Therein lies the fundamental challenge: safe transfusion requires not only the application of science and technology to blood processing and testing. It also requires social mobilization to promote voluntary blood donation by sufficient numbers of people who have no infectious diseases that can be transmitted to the recipients of their blood.

THE PROBLEMS

Many patients do not have access to blood when they need it. Of the estimated 80 million units of blood donated annually worldwide, only 38% are collected in the developing world where 82% of the world's population live. The shortfall has a particular impact on women with complications of pregnancy, trauma victims and children with severe life-threatening anaemia. Up to 150 000 pregnancy-related deaths could be avoided each year through access to safe blood.

Even where sufficient blood is available, many people are exposed to avoidable, life-threatening risks through the transfusion of unsafe blood. The risk of acquiring HIV through the transfusion of infected blood is virtually 100%. Blood is also an effective means of transmitting hepatitis B, hepatitis C, syphilis, malaria and Chagas disease. About 5% of HIV infections are transmitted by unsafe transfusion as a result of the collection of blood from unsafe donors, irregular or inadequate supplies of materials to test blood for infections, poor laboratory testing procedures, inadequately trained staff, absence of quality systems or unnecessary transfusions.

While blood transfusion can be life-saving, many transfusions are given unnecessarily when the availability and use of simpler, less expensive treatments would provide equal or greater benefit. Not only does this expose patients needlessly to the risk of potentially fatal transfusion reactions, it also widens the gap between supply and demand and contributes to shortages of blood and blood products for patients who really need them.

THE COSTS OF UNSAFE BLOOD

Access to safe blood and blood products cannot be achieved without cost. However, an unsafe or inadequate blood supply is even more costly – in both human and economic terms.

Morbidity and mortality resulting from the non-availability of blood or the transfusion of infected blood have a direct impact on individuals and their families. The transfusion of infected blood also contributes to an ever-widening pool of infection in the general population with far-reaching consequences for society as a whole. Increased requirements for medical and social care, the loss of productive labour and higher levels of dependency place heavy burdens on overstretched health and social services and on national economies.



BLOOD SAFETY – A COST-EFFECTIVE INTERVENTION

A unit of safe blood costs an estimated US\$40 to produce, including the recruitment of low-risk blood donors, testing, blood grouping, processing into components and storage and transportation. Compare this with the cost of even only one year's antiretroviral treatment for a patient infected with HIV by transfusion.

An investment in a safe and adequate blood supply is therefore not only a responsibility of governments, but also a cost-effective investment in the health and economic wealth of every nation.

The incidence of transfusion-transmitted infection – and its associated costs – will increase in countries that do not take stringent measures to ensure blood safety. However, effective national blood transfusion services have demonstrated how the implementation of the WHO strategy for blood safety can prevent the transmission of infection and ensure access to safe blood and blood products for all patients requiring transfusion.

WHO strategy for blood safety

- **A well-organized, nationally-coordinated blood transfusion service that can provide adequate and timely supplies of safe blood for all patients in need**
- **The collection of blood only from voluntary non-remunerated blood donors from low-risk populations**
- **Testing of all donated blood for transfusion-transmissible infections, blood grouping and compatibility testing**
- **The appropriate clinical use of blood, including the use of alternatives to transfusion wherever possible, and the safe administration of blood and blood products**
- **Quality system covering all stages of the transfusion process.**

THE BASIC OPERATIONAL FRAMEWORK FOR BLOOD TRANSFUSION SAFETY

The WHO Department of Essential Health Technologies assists countries to achieve a safe and reliable level of health services in a variety of health technologies through its Basic Operational Frameworks. Below is a summary of the basic requirements for blood transfusion safety and some of the products and services available from WHO in support of this goal.¹

An efficient national blood programme is an essential component of an effective health system. The critical requirement is access to safe and clinically effective blood and blood products for all patients requiring transfusion and their safe and appropriate use.

Blood safety depends on the recruitment and retention of blood donors who are at low risk of transmitting infection, safe blood collection procedures, correct testing for transfusion-transmissible infections, blood grouping and compatibility testing and the appropriate use and safe administration of blood.

¹ The full Basic Operational Framework is accessible on the internet at www.who.int/bloodsafety

Policy

REQUIREMENTS

Consistent quality and safety in the provision, prescription and administration of blood and blood products cannot be achieved where services are fragmented and uncoordinated. National coordination of the blood programme is required to ensure uniform standards at all levels and facilitate economies of scale in testing and processing. Key elements include:

- National blood policy and plan
- Legislation and regulation
- Well-structured blood transfusion service (BTS)
- Specific budget allocation
- Standards for blood transfusion services.

WHO PRODUCTS AND SERVICES

- Strategy for blood transfusion safety
- Guidelines and recommendations
- Technical cooperation
- Collaborations and partnerships in global blood safety
- Guidelines and software on costing BTSs
- Promotion of World Blood Donor Day
- Global Database on Blood Safety
- National needs assessment tool
- Tools for evidence-based practice.

Quality and safety

REQUIREMENTS

The quality and safety of blood provided for patients depends not only on a national quality system for blood transfusion services, but quality in every activity. An effective national quality system requires:

- National quality policy and plan
- Quality officers at national and local levels
- Quality standards
- Documentation system
- Training of all staff
- Assessment of the quality system.

Regular, voluntary non-remunerated blood donors from low-risk populations are the foundation of a safe blood supply. Requirements include:

- National blood donor programme
- Identification of low-risk donor populations
- National criteria for donor selection
- Safe blood collection procedures
- Donor notification and referral for counselling
- Donor records.

All donated blood should be blood grouped and tested for transfusion-transmissible infections (TTI). This requires:

- National strategy for TTI testing and blood grouping
- Evaluation and reliable supply of test kits and reagents.

The preparation of high quality blood components requires:

- Sustainable programme that responds to clinical demands
- Application of good manufacturing practice.

All blood and blood products must be stored and transported correctly to prevent bacterial contamination and maintain viability. This requires:

- Specialized storage and transportation equipment
- Regular monitoring and maintenance of equipment.

WHO PRODUCTS AND SERVICES

- Advocacy documents, recommendations and learning materials
- Training courses
- Regional quality networks
- External Quality Assessment Schemes
- Guidelines, screening strategies, selection criteria and evaluation of test kits.

Access

The provision of safe blood and blood products requires an appropriate infrastructure and an adequate and reliable supply of reagents and test kits. Trained staff and continuing professional development are a prerequisite.

Provision should be made for a rapid response to emerging infections, emergency situations and post-disaster reconstruction.

WHO PRODUCTS AND SERVICES

- Advocacy documents, recommendations and learning materials
- Test kit bulk procurement schemes.

Use

Blood and blood products should be prescribed only to treat serious or life-threatening conditions that cannot be prevented or managed effectively by other means. The appropriate clinical use of blood requires:

- National policy and guidelines on transfusion
- Training of all staff involved in transfusion
- Availability of alternatives to transfusion
- Hospital transfusion committees
- Blood request form
- Blood ordering schedule
- System for monitoring transfusion practice.

The safe administration of blood and blood products prevents avoidable transfusion reactions. This requires:

- Standard operating procedures for bedside transfusion
- Training in bedside transfusion
- Haemovigilance system for monitoring, reporting and investigating adverse events associated with transfusion.

WHO PRODUCTS AND SERVICES

- Advocacy documents, recommendations and learning materials
- Training courses.

Blood Transfusion Safety

*Department of Essential
Health Technologies
Geneva 27, Switzerland
Fax: +41 22 791 4836*

*www.who.int/bloodsafety
E-mail: bloodsafety@who.int*

© World Health Organization 2006