REGIONAL COMMITTEE

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Provisional Agenda item 15

BLOOD AND BLOOD PRODUCTS
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1. INTRODUCTION

Blood transfusion services in many countries of this region were started during the Second World War. In the immediate post-war period, however, their importance diminished to a considerable extent. Inadequate quality control, transfusion reactions and the fear of transmission of diseases through blood transfusion resulted in a lack of enthusiasm for blood transfusion. It was during the mid-1950s that interest in blood transfusion was revived.

The Twenty-eighth World Health Assembly, held in 1975, adopted a resolution on blood and blood products, which inter-alia, noted the commercialization of blood collection and plasmapheresis, especially in developing countries, and the higher risk of transmission of diseases from professional donors, and urged the development of national blood services based on voluntary blood donation.

In 1978, WHO published a Technical Report (No. 626) on "Requirement for Collection, Processing and Quality Control of Human Blood and Blood Products". Another document entitled "The Collection, Fractionation, Quality control and Uses of Blood and Blood Products" was published by WHO in 1981. In November 1983, recommendations were made by WHO on acquired immune deficiency syndrome emergencies dealing with blood and blood products. These recommendations were further modified at a meeting held in Geneva in April 1986.

The seventy-first session of the WHO Executive Board considered a memorandum on "Blood donation and transfusion", jointly submitted by the League of Red Cross Societies and the International Society of Blood Transfusion. It also considered a memorandum entitled "A code of practice for the collection (by plasmapheresis) and processing of human plasma intended for manufacturing purposes", submitted by the International Federation of Pharmaceutical Manufacturers Associations. Further, the Board decided that an assessment be made of the blood transfusion services in developing countries. Consequent to this decision, a working group of the Division of Diagnostic, Therapeutic and Rehabilitative Technology, WHO headquarters, prepared, with the assistance of consultants, a document to be considered in the planning, organization, administration and operation of integrated blood transfusion services.

In April 1984, an informal consultation was held in Geneva and a questionnaire, based on the synopsis of the report of the DTR working group, was designed. This questionnaire could both assist consultants to assess the situation in a developing country as well as provide a tool for self-assessment within the countries. The detailed questionnaire was sent to the governments of all the eleven Member Countries of the South-East Asia Region. Replies were received from seven countries while information was obtained through the visit of a consultant to three countries of the Region, namely, Bangladesh, India and Thailand.
The present document has been prepared on the basis of information made available through the questionnaire and the report of the consultant, and is presented to the Regional Committee for its consideration and comments on the present status of blood and blood products in the countries of this Region. Several issues have been highlighted in this document. Based on the comments of the Regional Committee, a global status report would be prepared for submission to the Executive Board in 1987.

2. BLOOD TRANSFUSION SERVICES - POLICIES AND PROGRAMMES

Blood donation is a unique expression of goodwill towards fellowmen. Advances in medicine and surgery increasingly require the use of blood and blood products. A national policy dealing with all aspects of blood donation is crucial for the success of the programme. Such a national policy on blood and blood products should be an integral part of the national health policy. The national policy on blood and blood products should aim at establishing a programme to meet the needs of patients with minimum cost and a high degree of safety and effectiveness. Such a policy should state how blood donation and transfusion should be organized in a country and include, amongst others, the following elements: legislation, creation of a centralized authority, a national committee of experts on transfusion, establishment of a code of ethics, statutory provision of funds, and recognition of the role of voluntary and professional societies. The establishment of a code of ethics and the involvement of voluntary and professional societies would tend to reduce commercial exploitation in blood and blood products resorted to by unscrupulous elements.

A national programme on blood and blood products should be organized as an integrated national blood transfusion service dealing with blood and its components, the donor, the recipient and those responsible for programme management. It is incumbent on the programme to provide adequate space, infrastructural facilities, services of competent, trained technical hands, adequate continuing finance, links with hospitals and voluntary organizations, and ensure that service, training and research all go together.

All countries of the Region are committed to achieving health for all by 2000 for their peoples. In this context, the Member Countries have also formulated strategies and programmes to achieve certain targets by the year 2000. However, a national policy on the use of blood and blood products has yet to be evolved by most of the governments. Even in countries where laws and regulations have been formulated, their implementation is generally rather slow. While national programmes for blood transfusion services exist in all the countries of the Region, their effectiveness needs to be augmented in many of them.

Some governments have a limited financial commitment to this component of the health care programme. While the Red Cross is emerging as the central agency dealing with blood transfusion services in some countries, in others, the role of this organization is yet to be clearly defined.

Blood transfusion services in the countries of this region are mostly confined to metropolitan cities or big towns and seldom reach the under-privileged and underserved segments of the community. In view of the
commitment of the governments to achieve health for all through the primary health care approach, such services have to extend to provincial/district or first referral hospitals in order to give effective support to primary health care programmes.

3. ORGANIZATION AND MANAGEMENT

3.1 Bangladesh

Blood transfusion service is an independent department in the hospital and is headed by a professor/assistant professor of pathology. There is an advisory council for blood transfusion at the national level. However, it has no authority to inspect the working of blood banks. The Red Cross and voluntary agencies are active, especially in Dhaka, but to a limited extent. While the Government recognizes the importance of a blood transfusion programme, there is no central organization responsible for blood transfusion services at national, regional or local levels. There is as yet no legislation for blood transfusion services.

Priority for the development of a blood transfusion service is low. Its budget is a part of the hospital budget. There is little encouragement for voluntary blood donation. Patients replace the blood or pay Tks. 100 for one unit of blood purchased from the hospital blood bank, which generally obtains blood from professional donors. In the absence of legislation or a national regulatory authority, a private blood bank could be set up easily.

3.2 Bhutan

The blood transfusion service is hospital-based and functions as a part of the health laboratory services. Funding for the transfusion service is made through the hospital budget. Voluntary or social organizations have not so far been involved in these efforts. There is no legislation as yet for a blood programme.

3.3 India

A national health policy has been formulated and the programme of "Health for All by the Year 2000" is in operation. However, a national policy on blood and blood products is yet to be formulated. A central advisory committee for blood transfusion functions within the Ministry of Health and Family Welfare, Government of India. Being an advisory body, the implementation of its decisions is slow. The committee reviews the situation every year. The Red Cross blood programmes, government blood transfusion services, hospital blood banks, non-profit voluntary agencies and commercial establishments - all the five types of blood transfusion services function simultaneously.

There are over 600 blood banks spread over the country. They function either as independent departments at some places or are integral parts of the laboratory services.

Health care in India is provided both by the Government and by the private sector and, therefore, blood transfusion services are also organized on the same pattern. The Central and state Drugs Controllers have
the responsibility for maintaining standards and the quality of blood and blood products since these are covered by the Drugs and Cosmetics Act. There are, however, no effective mechanisms for inspection of the transfusion services, their procedures and techniques and the recording system.

3.4 Indonesia

Since 1980, the Indonesian Red Cross is the central authority created by the Government and responsible for blood transfusion services in the country, including recruitment of donors, collection of blood and laboratory control. Its executive committee meets four times during the year. All policies with regard to blood transfusion are made by the executive committee. Supervision and monitoring is done throughout the country. Paid blood donation is forbidden by law.

The Indonesian programme on blood and blood products has a high national priority. Funds are made available through government grants and levies on patients. A code of practices and guidelines has been prescribed and effectively enforced.

3.5 Nepal

The Nepal Red Cross Society is solely responsible for blood transfusion services in the country and has developed policies with regard to blood transfusion that are followed throughout the country. There is an advisory committee with members from all walks of life, including the Department of Health and the Red Cross. A technical committee with members from the Red Cross, the Department of Health and the university hospitals helps to maintain the quality and standards through visits to various blood banks. Funds are raised by levying a fee for laboratory investigations.

3.6 Sri Lanka

The National Blood Transfusion Service, set up in 1965, functions under the Director of Health and is a part of the laboratory services. It is funded by the Ministry of Health.

There is a Central Blood Bank and 38 regional blood banks. The Central Blood Bank meets the requirements of all the 2,718 hospital beds. It is also a reference laboratory for all blood banks and offers training for medical and technical personnel. There is a Human Tissue Act and blood is included in this Act.

3.7 Thailand

The blood transfusion services at primary, intermediate and even at most of the central places are a part of the clinical laboratory services. Only at two large hospitals in Bangkok is the blood transfusion service organized as an independent department. The Red Cross has its own large blood bank in Bangkok. There are no private blood banks in the country.

The Government recognizes and supports the blood transfusion programme at all levels and provides funds through laboratory services, and also through direct funding of the Red Cross. This organization is, by and large, responsible for organizing the voluntary blood donation movement.
The Red Cross operates through advisory committees at national, provincial and district levels. These committees associate eminent persons with their work and organize blood donation camps.

The Ministry of Health has recently set up a committee to prepare blood bank laboratory manuals, standardize procedures for blood bank laboratories, take measures for quality control and organize seminars. Reports are submitted every six months to the Government. There is no legislation for a programme on blood and blood products.

4. BLOOD PROCUREMENT AND RECRUITMENT OF DONORS

An ideal blood transfusion service should be based on voluntary unpaid blood donation. Such a system would be desirable in order to make blood transfusion safe in all respects. This will also encourage social involvement of all concerned in this humanitarian work.

The situation varies in different countries of the Region.

In Bangladesh, there are 24 blood collection centres in various hospitals. There is only a limited voluntary blood donation programme. In 1980, 36,489 units of blood were collected, of which only 470 were voluntary. Over 15,000 were replacements and the rest were obtained from professional donors. The Red Cross, especially in Dhaka, collects about 4,000 units of blood from voluntary donors. Other voluntary organizations are yet to emerge.

In Bhutan, most of the blood is obtained from professional donors at three centres making a total collection of 500 units of blood per year. The few voluntary donors are rewarded through holidays and testimonials.

In India, there are over 600 blood banks together collecting over half a million units of blood each year. Twenty-two per cent of the blood is collected from professional donors. Relatives provide 44 per cent and only 34 per cent are voluntary donations. The situation varies in different parts of the country. Five states in India do not collect any blood from professional donors. In seven states, the trend is changing in favour of voluntary donations. In nine states, professional donors continue to operate. Large hospitals tend to have an increased proportion of professional donors. While voluntary organizations for promoting voluntary blood donations operate mostly in larger cities, a new wave of voluntary donations collected through camps, backed, at times, by political groups, is sweeping the country.

In Indonesia, paid blood donation is forbidden by law. In 1984, over 385,000 units of blood were collected, 80 per cent of which were voluntary and the remaining 20 per cent replacements.

In Nepal, there are no professional donors. Of 4,087 units of blood collected, 2,564 were voluntary (1,376 through mobile teams) and 1,623 as replacement. Ten districts alone provided 3,700 units of blood.

In Sri Lanka, of the 65,683 units of blood collected from voluntary donors, 1,849 were collected by mobile teams. Nearly 90 per cent of the donation was to replace blood in hospitals. Propaganda through posters, pictures and cinemas for the recruitment of donors is effective.
In Thailand, all blood donations are voluntary. Over 1,100 mobile teams are responsible for nearly two-thirds of all donations. Repeated donations, indicating a high degree of motivation, are as high as 68 percent of all donations. Rewards are given to persons who have repeatedly donated blood. A Donors Day is celebrated each year.

Effective use is made of posters, cinema and other forms of publicity in Sri Lanka and Thailand. In India, the use of mass media in promoting voluntary donations is yet to be fully exploited although posters and films are utilized for this purpose.

While donors are well taken care of in some countries, such as in Thailand, in others, even the haemoglobin content is not checked; venepunctures are not sealed and the interval between two donations is disregarded. In some countries, voluntary donors are given preference in medical examination and treatment.

5. TRAINING OF PERSONNEL AND CAREER DEVELOPMENT

Training of personnel should be part of a manpower development plan, which should include proposals for training, use and motivation of manpower. Forecasting of manpower requirements is crucial to manpower planning. It is worth noting that in advanced countries, 60-80 percent of any given health budget is spent on manpower. In developing countries, on the other hand, costs are less but the jobs equally unattractive. The absence of training opportunities makes the situation even more complicated.

Blood transfusion, as a discipline, is the converging point for a number of specialities, viz., pathology, haematology, biochemistry, genetics, immunology, protein structure, cell biology, cryobiology, bioengineering, statistics, anthropology, sociology, psychology, storage, transport and marketing. Immuno-haematology and blood banking are recognized as subspecialities in countries with well-established transfusion services.

Training facilities are available for officers of the blood transfusion services in some countries of the Region. In Bangladesh, the Institute of Post-graduate Medicine and Research at Dhaka offers a two-year course on blood banking. India offers institutional advanced training courses and degrees to medical graduates at Bombay and Chandigarh. Indonesia arranges short training courses for its officers. In the absence of trained officers, pathologists, clinical pathologists, haematologists and clinicians manage the blood banks. In general, there is a shortage of medical men taking up blood transfusion as a career, as is noticeable in Thailand.

Training facilities are generally available for laboratory technicians of blood transfusion services in many countries of this region. Training courses in medical laboratory technology are available in Bangladesh, India, Indonesia, Nepal, Sri Lanka and Thailand. This includes training in blood transfusion and blood banking for different periods. Separate or advanced training courses in blood technologies for medical laboratory technicians are generally not available in these countries. In Sri Lanka, a short course is offered to nurses and public health inspectors employed for donor recruitment.
There are no training facilities for blood donor organizers, social workers and managers of blood transfusion services.

Career planning for blood transfusion services has not been done in most of the countries of the Region. Prospects of promotion for blood transfusion personnel are indeed meagre. This, along with the limited facilities for postgraduate training, creates an acute shortage of medical officers for manning blood transfusion services. Transfers and private practice further complicate the situation and the blood transfusion service is at times managed only by technicians. The laboratory personnel face a similar situation. Promotion is generally on the basis of seniority alone. Performance is rarely taken into account except in a few countries. Technicians' jobs in blood transfusion services are often transferable with the result that trained hands are not always available.

6. EQUIPMENT, REAGENTS AND CONSUMABLES

A blood transfusion service requires adequate and properly located floor space, machinery and instruments. Any equipment with a mechanical or thermal function is a machine, viz., centrifuge, refrigerator, cold room, oven, autoclave, transport. Instruments such as spectrophotometer, pH meter, thermometer, etc., are used for testing materials or machines. In addition, a blood transfusion centre requires an adequate supply of clean water, sewerage system, electric supply and communication. Emergency back-up systems such as a generator, reserve compressors, water pump, etc., are also acquired. Sterile conditions, cabinets/rooms and air-conditioning are essential for the clean operation of a blood bank. The revised recommendations of WHO contain details of these requirements.

Countries such as India manufacture many of the heavy equipment required by blood transfusion centres. However, most of the countries have to import these items.

The source of supply of equipment, availability of spare parts, workload and life of the machine/instrument, maintenance and engineering staff and safety aspects are some of the factors to be taken into consideration.

In Bangladesh, sophisticated equipment for blood transfusion service is not available. In India, refrigeration equipment is generally properly maintained. However, at places, cleanliness of the equipment leaves much to be desired. Sri Lanka and Thailand service their equipment through maintenance engineers.

Another problem is proper maintenance and full use of the sophisticated equipment. In Sri Lanka, all the equipment for blood bank service is imported. The supplier keeps a stock of spare parts in order to ensure repairs and maintenance.

Disposable plastic bags and needles are considered ideal for blood transfusion. They are safe, economical and can be easily transported. However, transfusion glass bottles and reusable needles are still in use in most of the countries. In India, plastic bags are in use only at a few places. Indonesia is now setting up facilities for the manufacture of
plastic bags. In Bhutan and Nepal, disposable equipment is imported. In Sri Lanka, imported sets are used. In Thailand, over two-thirds of the transfusions are through plastic bags. Most of the countries have yet to establish facilities for the manufacture of disposable bags and sets utilizing an appropriate type of plastic material.

Blood banks in most of the countries of the Region prepare their own anticoagulant solutions. There is variation in composition. The quality is not properly checked. These solutions should preferably be prepared centrally so that their quality can be monitored properly.

7. USE OF BLOOD AND BLOOD PRODUCTS

Blood should be used only when there are well-defined medical indications and other forms of therapy cannot replace it. An ideal blood transfusion programme should use only blood components and not whole blood, as and when required. The countries of the Region are yet to plan towards this objective.

No data are available on the therapeutic use of whole blood from Bangladesh, Bhutan, India and Indonesia. In Sri Lanka, 35 per cent of the blood is utilized by surgical patients (including thoracic, neuro, ENT, orthopaedic and trauma). Medical cases utilize 29 per cent while another 25 per cent blood goes to patients in the departments of obstetrics and gynaecology. Paediatric patients utilize only 11 per cent.

Components of blood are being used only to a limited extent. Packed red blood cells are used in many countries. Facilities exist for the transfusion of platelet concentrates and cryoprecipitates to a limited extent.

A few countries such as India, Indonesia and Thailand have established facilities for the production of blood fractions. In India, Factors VIII and IX concentrates, human albumin and immunoglobulins are produced by commercial organizations by the conventional Cohn's method. In Indonesia, a plasma fractionation plant with a capacity of processing 60 litres of plasma per week has been set up. In Thailand, about 15 per cent of blood collections are used for preparing cell, platelet concentrates and whole plasma preparation. Cryoprecipitate (Factor VIII) is also produced. None of the countries is preparing specific immunoglobulins. Since Factors VIII and IX concentrates are prepared by the conventional cryoprecipitation technique, they are unlikely to be free from the risk of contamination by viral agents such as LAV/HTLV III.

8. BLOOD TRANSFUSION LABORATORY ACTIVITIES

The range of activities in the blood bank laboratory requires basic materials such as purified distilled demineralised water, standardised NaCl solution, potent quality grouping and typing sera, availability of human red cells of known phenotypes for control, proteolytic enzymes, albumin, lectins and buffers.

Referral laboratories are few in the Region. Bangladesh and India have advanced blood bank centres but have little control or supervision over regional, peripheral or commercial blood bank units. Indonesia, Nepal, Sri Lanka and Thailand have central reference laboratories for the supervision of peripheral blood banks.
Blood bank units in most of the countries of this region are using anti-A, anti-B, anti-AB and anti-D sera. A, B and AB cells are also used. Other blood group antibodies and antigens are looked for but only in a few laboratories.

Reagents, especially anti-sera, are generally imported or obtained from local commercial sources. In India, antisera are prepared locally at some centres in Bombay, Chandigarh and Delhi. In Sri Lanka, ABO reagents are produced locally by immunization and plasma phoresis.

9. QUALITY CONTROL AND SAFETY

Quality control measures in blood banking assure effectiveness and safety of blood and blood products. Adequate facilities are the initial requirements for quality control. Adequate space and premises in an appropriate environment with full infrastructural facilities constitute the first step. All instrumentation in a blood transfusion set-up should be continuously checked, standardized and monitored. A laboratory manual describing the procedures is essential. Records along with controls are essential for the quality of results.

Reagents require quality control. A manual describing test procedures, evaluation and the degree of variation is of great help. Each system in a blood programme, e.g., donation of blood, storage of blood, or the transfusion process requires periodic review of procedures, effectiveness and safety.

Blood for transfusion should be safe without any adverse reactions and free from bacterial contamination, pyrogens, HBsAg, malaria, syphilis and LAV/HTLV III and similar agents.

Blood transfusion agencies in the countries of the Region should be quite conscious of the correct procedures of quality control in general. There is an urgent need to formulate and implement quality control programmes in blood transfusion services.

Transfusion reactions are monitored by blood transfusion centres in Indonesia and Thailand while in India, only a few centres do the monitoring.

Tests for syphilis (VDRL) on blood for transfusion are universally carried out by all blood transfusion centres. Transmission of hepatitis B through blood transfusion has been recognized as an important health hazard. Several countries of the Region have a high HBsAg carrier rate, especially among professional donors.

In Bangladesh and India, blood is screened for the presence only of HBsAg in a few blood banks. In Indonesia, Nepal, Sri Lanka and Thailand, however, blood is routinely tested for HBsAg.

AIDS could be transmitted through transfusion of blood from an infected person and through some of the blood products. To limit the risk of transmission, blood needs to be screened for the presence of LAV/HTLV III antibody and the infected blood discarded. None of the countries in the Region is at present screening blood routinely for LAV/HTLV III antibody. Epidemiological studies are however being carried out in a few countries to assess the prevalence of the disease and to institute a surveillance programme.
As mentioned earlier, most of the countries import blood products such as Factors VIII and IX concentrates, and immunoglobulins from advanced countries where AIDS has been known to occur. Thus, health authorities of the importing countries may have to insist on a certificate from manufacturers that their products have been prepared from non-infectious blood and that they are free from infection.

10. SIDE EFFECTS AND HAZARDS OF BLOOD TRANSFUSION

Blood collection and transfusion of blood and blood products are not without risk. Blood collection requires adequate care and attention.

Donors of blood may suffer from vasovagal attacks, local injury due to venepuncture, and infection leading to lymphangitis and phlebitis. Rare instances of generalized reaction to local anaesthetics, tetany due to hyperventilation, air embolism and puncture of local aberrant artery have been reported.

The blood for transfusion should be free from infection. Hepatitis, malaria, syphilis, cytomegalovirus, toxoplasmosis, brucellosis and AIDS could be transmitted through transfusion of blood and blood products.

In the absence of proper precautions, blood and blood products may cause adverse reactions. Transfusion reactions commonly cause fever, with or without rigor. Oliguria or even anuria may develop, especially after a severe reaction.

Transfusion reactions are caused by haemolysed or infected blood, pyrogen in improperly prepared anticoagulant solutions and equipment, allergens in blood, accidental injection of air, overloading of the circulatory system causing pulmonary edema, and massive transfusions causing hyperkalemia, citrate toxicity and coagulopathy. Transfusion reactions also occur because of immune haemolysis due to incompatible blood or sometimes due to the presence of rare blood group antibodies. Albumin solutions could occasionally cause febrile reactions. Bacterial infection, low blood pressure due to vasoactive substances and anaphylactoid reactions have been reported.

Transfusion of Factor VIII preparations may cause immediate and long-term side effects. Immediate adverse reactions include anaphylactoid and febrile reactions and transmission of infective agents. Long-term side effects include development of antibodies to Factor VIII because of repeated transfusions. This makes the patient of haemophilia non-responsive to treatment. Replacement therapy with infected Factor VIII often transmits hepatitis B. Nearly 5 per cent of haemophiliacs show HBsAg in their blood and 50 per cent show antibodies to it. Non-A non-B hepatitis has also been transmitted. AIDS can also be transmitted through Factor VIII preparations. Blood group isoagglutinins as contaminants in Factor VIII preparations cause haemolysis in blood group A, B or AB recipients.

Immunoglobulins as contaminants in Factor VIII preparations immunize recipients against allotypic IgG antigenic determinants. Other protein contaminants also produce antibodies in recipients, and circulating antigen-antibody complexes have been detected.
Factor IX complex concentrates may transmit viral hepatitis and AIDS. Thromboembolism or disseminated intravascular coagulation may occur. Allergic reactions are rare. Specific antibodies to Factor IX may develop.

Immunoglobulins given intramuscularly do not cause immediate side effects. Some adverse reactions like pain on the local site, sometimes flushing, headache, chills and rigor and rarely anaphylactoid response may be seen. Antibodies to IgA may develop in IgA-deficient patients.

Thus it is evident that the collection and transfusion of blood and blood products are not entirely free from risk and could lead to morbidity and even mortality. Blood should be given only when there is a rational medical indication for it. Adequate precautions are necessary at each stage to prevent any mishap. A quality control programme is essential for minimizing such risks.

11. ISSUES FOR CONSIDERATION

Recommendations regarding the organization, techniques, safety and effectiveness of blood transfusion services have been made by WHO and other international organizations in this field. Data collected from the countries of the Region on the basis of the questionnaire indicate that blood transfusion services have yet to attain international standards in several countries.

In this context, the Regional Committee may like to consider several issues such as the following:

11.1 Policy

There is a need to formulate a national policy on blood and blood products as a part of the national health policy in the countries of the Region.

11.2 Organization and Management

(1) There should be a central authority to regulate blood transfusion services. This could be strengthened through legislation.

(2) Under the direction of the central regulatory authority, a programme for setting up blood transfusion services, with all their requirements, should be formulated and funded adequately.

(3) A national blood transfusion centre should be set up in each country. It should include blood banking service to a large central hospital, a training centre for both medical officers and technicians and other ancillary personnel, a production centre for essential blood bank reagents and a reference point for sophisticated tests and other problems. A large country may require regional centres with similar functions.

(4) The national blood transfusion centre should also supervise and monitor the working of all regional and peripheral blood transfusion centres.
(5) The national blood transfusion centre should be in contact with international reference laboratories and receive international assistance wherever necessary.

11.3 Procurement and Donor Recruitment

Blood donation should be organized on a voluntary basis. This is in the interest of both the donors and the recipients. Professional blood donors should be discouraged. Voluntary blood donation could be developed as a movement based on increased social consciousness of the people. Voluntary societies, the Red Cross, philanthropic groups and other organizations, should be encouraged and supported to motivate people to enrol themselves as voluntary blood donors. Donor organizers with knowledge of public relations may be utilized for this purpose. Public recognition of voluntary blood donors, donation of blood as insurance for receiving free blood by donors and their relations, if needed, during life, award of testimonials and celebrating a National Blood Donors Day, utilization of mass media and other methods would encourage voluntary blood donations.

11.4 Manpower Development

(1) The development of manpower for blood transfusion services would require appropriate training programmes in blood banking and transfusion for medical graduates. Blood transfusion and immuno-haematology may be recognized as a separate discipline for specialization.

(2) There will be a need to organize appropriate training programmes for technicians to fulfil the requirements of an expanding blood transfusion service. An in-service training programme for updating technical skills is equally essential.

(3) Qualified nurses could be utilized for blood transfusion services after giving them a short training course in blood transfusion.

(4) Adequate promotional opportunities would have to be provided for blood transfusion services at all levels to prevent stagnation and frustration as well as for job satisfaction.

11.5 Equipment and Supplies

(1) Blood transfusion centres should be equipped with instruments, materials and supplies for processing a defined number of blood units.

(2) The effective use of machinery and instruments for a blood transfusion service requires adequate infrastructural facilities (space, premises, electricity, water supply etc.).

(3) Efficient functioning of machinery and equipment would require proper maintenance, servicing and an adequate stock of spare parts.

(4) Proper functioning of blood transfusion services requires adequate supply of reagents of assured quality. This could be
achieved either by improving procurement or through local production at the central laboratory. Supplies of rare reagents could be routed through the reference laboratory.

11.6 Use of Blood Components

Blood transfusion services should aim at using blood components depending upon the requirements of the recipients. Each country should examine this possibility and plan for a phased development of facilities for the supply of cellular and plasma components of whole blood. International assistance may be required.

11.7 Safety of Blood and Blood Products

(1) In order to make blood or its products safe, facilities would have to be provided for testing to exclude malaria, syphilis, hepatitis B, non-A non-B hepatitis and AIDS. This would require trained manpower, supply of reagents/kits and adequate funds.

(2) The use of blood and blood products should be restricted to medically established indicators. Strategies of health care that reduce the demands for blood should be encouraged.

(3) Donor evaluation programmes in the light of epidemiological profile of risk factors are of great importance to reduce the danger of transmission of diseases through blood and blood products.

(4) Commercially obtained blood products should not be given to recipients without a certificate that they are free from infectious agents.

(5) Transfusion of blood and blood products can cause adverse reactions. A high degree of consciousness with regard to proper medical indication and quality and safety of the product for transfusion is absolutely essential. In the final analysis, quality is determined by a holistic approach to the organization of a blood transfusion service.

(6) The prevalence of AIDS in the countries of the Region is low while the cost of available tests is high. Routine screening of all blood donors, though ideal, may be difficult to implement in the countries of the Region. High-risk groups, however, should be screened or advised not to donate blood. Each country may have to formulate its own policies in this regard.

(7) Immunoglobulins and albumin have not been shown to transmit AIDS. Untreated Factors VIII and IX concentrates may transmit this disease. It should be ensured that such products, when imported, carry certificates that they have been prepared from non-infectious blood and are free from infection such as LAV/HTLV III.