Comprehensive Haemotherapy Programme for Developing Countries

Pages with reference to book, From 186 To 195

F.A.Ala (National Blood Transfusions Service, West Midlands Region, Birmingham,U.K.)

In the developing countries, the introduction of modern medicine and surgery patterned after European models, and frequently irrelevant to the main indigenous problems, gradually occurred in the course of this century, but these clinical services developed in haphazard fashion and were usually driven by monetary gain. Curative or symptomatic medicine predominated and were delivered by a few prestigious doctors whilst public health or primary health care were neither taught not catered for.

It is only latterly that government planning and the investment of substantial financial resources in health care have become prevalent. Initially, the implementation of these plans took the form of hospital building programmes; and the creation of increasingly large, complex medical centres. This is where Blood Transfusion Services ought to have come in, yet it is commonly seen that the creation of a sophisticated medical super structure has not been supported by the development of laboratory and transfusional disciplines which must serve and sustain it.

It is often asked what degree of priority Blood Transfusion should enjoy in the overall health care planning of developing countries. The question should really be re-phased to read: what is the priority of hospital health services? Blood Transfusion does not, after all, exist to serve itself and cannot be considered in isolation from its medical, scientific and social context.

There has been a considerable evolution in the way in which transfer of biomedical technology and health planning for developing countries has been perceived over the past two decades. An increasing awareness has recently developed of the failure of strategies which only foster expensive hospital based health care, curative medicine and the formation of an elite of specialized medical practitioners. More thought has been devoted to a community based, holistic approach and to the greater allocation of resources to Primary Health Care at the grass roots, to improved nutrition, mother/child services; immunoprophylaxis; environmental sanitation occupational health and so on; rather than the creation of prestigious hospital centered health services where the patient comes as a supplicant. Perhaps the most notable example of this philosophy is the ‘Blue Nile’ project fOr water-borne disease in Sudan which really illustrates inter sectorial multi- disciplinary planning at its best, and involves the cooperation of sanitation engineers, irrigation experts; parasitologists and even icthyologists. This environment also serves as a ‘laboratory’ withoat walls and a university campus for a new breed of medical students.

Even though one must fully endorse this approach to planning for the Health Sector, yet it cannot be denied that hospital services are inescapably required to provide diagnostic and curative skills and to provide a back-up to the Primary Health Care system. The whole thrust of change in developing countries is towards greater urbanisation and, industrialisation; more accidents, more sophisticated surgery and cancer therapy. Medical insurance schemes are bringing modern medical care within reach of everyone whilst the expectations of the people are ever increasing. lt is illusory to expect that the paternalistic state can confine its support to planned priorities and the clamour of patients for the latest diagnostic surgical and medical techniques cannot easily be denied.

All this inexorably leads to the absolute need for underlying support services such as Clinical Pathology and Blood Transfusion, which are all too often ignored and clearly there is a genuine place for both developmental approaches -both primary health care and hospital based services.

Having established that Blood Transfusion Services deserve priority rating in developing countries, what are the desirable features which should be fostered from the outset?

Blood Transfusion Services should be based upon voluntary, altruistic blood donation. Even though there are those in Western countries who hold that moralizing in this regard is inappropriate and

exaggerated, pointing to the failings and inefficiencies of some non-profit organisations in order to justify the purchase of blood from professional donors, that is probably because they are not aware of the prevalence of degrading poverty, sickness and anaemia amongst the donors who may sell their blood up to four or five times week, or of the capacity of the 'agents' who manage them in some developing countries. Voluntary donation, indeed, in the parlance of the World Health Organisation and Primary Health Care planners, is an admirable model of community motivation; of community participation in health care provision which cannot be achieved by money legislation or by browbeating.

It is best to conceive of Blood Transfusion as a National Programme (and in this, I include the Armed Forces which so often form an insular, totally separate part of the community). There are many compelling reasons to support this concept:

i) Small, scattered centres lead to -mediocrity and poor utilization of blood and financial resources, together with duplication or even competition in donor recruitment programmes, purchase ofequipment and enlisting skilled personnel.

ii) If one subscribes, as one should, to the 1975 resolution of the International Society of Blood Transfusion that national self- sufficiency in the provision of blood and blood products, must be the ultimate goal, then, it follows that only a National Programme can promote and achieve this aim. It is only in this way that overall and changing patient needs can be perceived and met; that long-term policies can be formulated and capital investment can be planned to sustain growth.

iii) A National Service can establish one set of standards for blood donor selection; collection; processing and distribution. The responsibility and accountability to the donor and the public is by a single agency. One knows so well of countries where each hospital is running its own blood collection programme.

iv) A National Service can promulgate and, through appropriate legislation, implement a standard 'Transfusion Code', fostering good transfusion practice; control of hospital blood banks and the charges they may levy; standardisation of equipment, laboratory methodology, reagents and reference materials and ensuring the implementation of Good Manufacturing Practice, high standards and quality assurance programmes.

v) Manpower development and the establishment of an official training and accreditation programme are amongst the most vital roles of a National Service and to this must be linked the all-important development of a career structure and attractive career prospects for transfusion personnel whether they are doctors or technicians. This may well be a difficult task where blood transfusion has remained at an artisanal level or where it is entirely in commercial hands.

vi) The collection of plasma for fractionation under optimal and standard conditions can only be satisfactorily carried out by a National agency and if fractionation capacity is insufficient or poorly developed, the Service can negotiate equitable terms for contract fractionation which will protect the best interests of donors and make the best use of a precious human resource.

vii) Planning for National disasters or emergencies can be carried out in close cooperation with theArmed Forces and other appropriate services, ensuring, above all, that compatible equipment and procedures are selected for use.

viii) The Service may act as a central purchasing agency, reducing costs by bulk purchasing and ensuring uniformity of quality by batch-testing of all materials and reagents. There would also be every justification for carrying out the design, specification and creation of prototypes for simple develo pmental engineering projects such as donor beds, stands and furniture which, if they prove successful, can be éontracted out for larger scale production.

One of the problems afflicting the laboratory services of 'third World' countries is the poor maintenance and repair of electrical and electronic equipment and the dearth of spare parts. It is not always possible to obtain adequate and speedy service from the local representatives of manufacturers who are often merely salesmen and entrepreneurs with little knowledge of the equipment they sell and

are reluctant to carry an expensive inventory of spares. Here again, the National Service would be well placed to store a supply of spare parts on behalf of peripheral centres, to train technicians in 'diagnostic' and repair work and to run a reference 'flying doctor' service for major break downs of equipment. Indeed, the costs of establishing such a unit can either be divided in partnership with other organisations (university laboratories or research institutes) sharing a similar need or they can be partially defrayed by charging other users for services.

ix) Finally, a National Service is in a unique position to capture a great deal of important demographic and epidemiological information of great value to Ministry of Health or Public Health Authorities and to foster biomedical research.

It is perhaps, worth emphasizing the role which a well founded and dynamic Blood Trans. fusion Service can have in promoting developmental and pure research not only in order to leaven, to add an intellectual dimension and career attractions to its own work but to galvanize biomedical research and teaching in the countryas a whole.

Many of the problems of Blood Transfusion and indeed of Medicine and the quality of teaching and research in these disciplines cannot be addressed without reference to the broader problems, some of them cultural and philosophical which beset the development of science in 'third world' countries. Thus, it is not merely a matter of purchasing equipment and importing know-how (although some would argue that this is the easiest and cheapest option) but rather of examining the entire social fabric and context within which this microcosmic service must be embedded and incorporated so as to remain viable and creative what Charles Weiss calls the 'software' of technology (Weiss, 1979).

It is often the case that behind a cosmetic, political facade of scientific progress, there are only fragments of a scientific community which is disorganized, disunited and intellectually isolated. Science is not an industrial organization or a bureaucratic institution; it grows and lives by close interpersonal relation, collaboration, competition and criticism. This isolation and fragmentation is compounded by the conventional wisdom prevalent in many third world countries which regards science with suspicion as one of the roots of their social malady threatening to undermine traditional values, or, at best, as irrelevant to their immediate problems. Teaching is carried out by those who no longer have (or never had) a continuing involvement in scientific research so that they are divorced from the spirit of science and, above all, from the art of problemsolving. Learning is by rote, with regurgitation of knowledge at examinations and little research guidance is available to the more gifted pupis.

The slow-maturing character of science and education means that the all important development of a viable national infrastructure in the sciences is a lengthy process, even when it is favoured by cultural, material and social factors.

It is impossible simply to 'import' science and technology in the absence of an indigenous scientific, technical community, and even if it were possible, it would be undesirable because of economic, political and psychological considerations.

For all these reasons and far beyond the solution of specific material problems, the development of this indigenous scientific community is even more essential for science to become firmly planted in new soil and to achieve a broad social impact.

There is much that a National Transfusion Service can do to help in cultivating the biomedical arm of this all important scientific community and in providing a 'culture medium' for its gradual development, for it is an uncommon amalgam of many things: it has an academic and university teaching cornmittment; it takes on exemplary roles, establishing and monitoring standards of practice through a national network; it has an industrial role as a manufacturer of clinical products and has its feet firmly planted in clinical medicine, blood coagulation, organ transplantation, virology, epidemiology, population genetics-With this polymath role, the Service can act as a nexus for bringing together a number of scientific disciplines, fostering interactive, cross-disciplinary research by utilizing local or regional subjects as models for problem solving, not only in order to address relevant clinical

and scientific problems, but also to offer training and career opportunities to young scientists.
On a more practical plane, the Transfusion Service can help to overcome some of the chronic deficiencies which so often materially inhibit biomedical research in developing countries by cooperating with sister scientific organisations in the establishment of modern library facilities, providing quick access to current scientific literature; in offering expertise in statistical analysis and data processing and in the creation of a good laboratory animal breeding station for common use and comprising facilities for the provision of training in the proper breeding, nutrition and care of pure bred strains.
How can these broadly stated objectives be attained and how can these policies be implemented? Generally speaking, the transfer of technology or development and training programmes always comprise three essential components:
i) The transfer of expertise of skills
ii) The imparting of knowledge, and
iii) Influencing attitudes
This last element is by far the most important one the most frequently overlooked, and the most difficult one to alter, for attitudes partake of the cultural make up of individuals and communities. Nevertheless, all three aspects must clearly, be taken into consideration.
1. The absolute precondition for the establishment of Blood Transfusion Services is a genuine sense of need, whether explicit or unspoken, shared by the medical profession, the authorities and the public. In most developing countries, the spotlight is on hospital beds, whereas Blood Transfusion has little visibility or glamour and evokes only the shady associations of back street 'dealers' and sick, anaemic donors. It is usually represented by exponents whose stature and standing perfectly reflects the lack of importanôe attributed to this service and the administrative isolation which, more than anything else, relegates it to obscurity and mediocrity, whilst other rapidly developing medical specialities such as open--heart surgery, cancer therapy or neurosurgery are well funded and eagerly over subscribed by the most promising medical graduates and scientists. Provided that the time is ripe, and that medical services have evolved to reach a stage of sophistication where the dearth of a safe, efficient and science oriented service is palpably inhibiting further progress - for, whatever its intrinsic virtues, such a service cannot come before its time and will not otherwise become rooted and integrated into the medical fabric of the country, however much money or expertise are applied - given this state of potential receptivity, two more conditions must be fulfilled before the preliminary steps towards establishing the Service can be taken. First - an appropriate, sound administrative vehicle or political 'mould' must be conceived to ensure financial security, independence, stability and future growth. The nature of this administrative base will obviously vary from nation to nation and may take the form of an affiliation with the Ministry of Health or the National red Cross (or Red Crescent) Society, although the greatest freedom to grow and develop to determine its own shape and destiny and to establish rich, unprejudiced associations with all sectors of the community can be achieved by the creation of an independent National Organisation with its own Board of Trustees.
As to the second requisite - it is only rarely that a widely respected; influential member of the medical profession can be enlisted to devote the dedication, time and effort needed to lead blood transfusion technology and practice out of the hands of commerce into the realm of science, to bring unity to a disparate artisanal activity and to spearhead the minor social revolution which is required to introduce voluntary blood donation where it did not exist before. Yet, in the early stages of development, it is absolutely crucial that such an individual be found.
2. The second phase of development may be termed Political and must involve influencing the attitudes of national leaders, politicians and governmental financing and planning authorities at the highest level focussing their attention and mobilizing their support for the establishment of Blood Transfusion Services as a national prio. rity. In these discussions between planners and clinicians, it is important for both sides to realize that they often utilize different premises and criteria in the evaluation of priorities.

The judgement of clinicians is usually made in terms of benefit to the individual patient. Policy makers face questions of a different sort: are there net benefits to the health of a large number of patients from the use of a particular technology? Are these benefits sufficiently worth having at some particular scale of provision if this means not providing other health services or providing them on a smaller scale? At this macro-level, a judgement is made in terms of a wider set of advantages and disadvantages, and their very diversity raises questions of how to make them commensurate (by using money measures?) and how to judge their value to different types of persons (e.g. patients, patients families, the public at large, city dwellers or rural populations and so on).

There are very few, if any, evaluative issues that can be resolved without approaching them from the disciplinary view points of medicine, ot epidemiology and economics. The greatest commonality of interest between the three disciplines lies in considerations of cost- effectiveness, and in this regard, powerful arguments favouring the early establishment of Transfusion Services can be advanced. In comparison, let us say, with a 500 bed hospital building programme (at a cost of some $ 60-100,000 phase 1 per bed), the financial resources required for the establishment of Transfusion Services are quite small, particularly in consideration of the profound and wide ranging impact they can have upon all the various branches of medicine.

3. The third is a Social or Cultural phase -that is, obtaining the participation of the people, all the people, including the armed fofces and religious communities in helping to establish decent blood transfusion services for themselves by voluntarily donating blood.

The public in developing countries wifi have had many apparently worthy, progressive projects foisted upon it which are not necessarily dependent upon their direct support and participation, such as the establishment of atomic energy centres, petrochemical industries, national airlines etc. Even though one knows that a man who has planted trees with his own hands will nurture them tenderly and defend them with his life-blood yet when the state wishes to create a ‘green belt’ or an aforestation programme, it is met with public indifference; branches are broken and the trees are neglected because the people have not taken part in the process of establishing them. This process of participation is, of course, central to blood transfusion which is absolutely dependent upon public support. Legislation, intimidation or importing blood in tins wifi not do!

Certainly, donor recruitment is the most important, onerous and neglected aspect of the service and all too often inadequate funds are devoted to this facet in favour of purchasing costly and sometimes unnecessary laboratory equipment.

There is no magic formula for success in donor recruitment, unless it is sheer enthusiasm and perseverance. Certain principles and modes of approaching the problem are valid the world over and systematic planning together with continuous, regular campaigning are essential, if only to disabuse people ,in the commonly held belief that blood is needed only in times of emergency and disaster.

First of all, one must realize that this is an urban activity. Hospitals are urban; laboratories are urban and the needs for and applications of blood are largely confined to this environment. Rural people consider city dwellers as an alien race: predatory, egocentric and unreliable outside the inbred fabric of interdependence and atavism of the village community. To take their blood away, even were one to overcome fear and prejudice, would be like the plunder and rapine of the ‘Mongol Hordes’. It is no use talking about ‘compatriots’ or ‘co-reigionists’. To them city dwellers are like extra terrestrial beings! It is the experience and the confidence that blood, which is given in trust, is returned to the community, to a neighbour or relative in time of need which acts as the most effective motive force. Since, in most developing countries, there are few hospitals in rural areas, it is difficult to motivate people in this way and it is usually not necessary.

Broadly speaking, two basic approaches may be employed: i) This diffusion of a constant, low-key stream of background information and educational material regarding blood- donation, its innocuous nature, the increasing needs and uses for blood etc., exploiting every possible means for enhancing public awareness. Media such as public meetings, television and cinemas can be used to project 15 to

20 minute films as well as 60 to 70 second 'spot' films which can be extremely effective. Although costs for good quality films tend to be high, there are distinct advantages in staging them locally, utilizing, wherever possible, the services of public heroes, atheletes and well-loved singers, although politicians should be avoided f&r they are transient and frequently mistrusted. These films must be carefully crafted and pitched to reach every sector of society.

Where religion is a powerful social force, as it is in Islamic countries, religious leaders should be persuaded to assist in lending dignity and legitimacy to the act of blood donation by giving blood themselves, providing appropriate quotations from holy writs for posters and allowing filming in sacred places. It is often possible to exploit local, age old customs with benefit, and in Iran, for instance, where scarification and cupping or blood-letting especially just before the onset of spring is an ancient tradition which is said to purify the blood and purge evil humours, has deliberately been linked to the modern practice of giving blood, with the suggestion (emphasized by sayings from Emam Ja'afare-Sadeq) that there is a dual virtue in donation cleansing the body and spirit, and helping to save a fellow Moslem (Enfagh).

Prizes for the best posters may be offered at schools and universities and every opportunity must be seized for putting up stands and exhibitions wherever large numbers of people are gathered such as industrial or agricultural shows; stations; atheletic meetings etc., where pamphlets and other publicity material may be distributed. The young are impressionable and they are the blood donors of tomorrow. They also serve as a convenient conduit for introducing the message of the transfusion service into their homes. School field trips to the blood centre or promotional visits to the schools should therefore be encouraged and educational material concerning the functions of blood, civic responsibilities, and blood donation should be included in standard primary school textbooks.

The establishment of 'Blood Donor Organisations' which must include priests, teachers, students, representatives of different ethnic groups, can serve to great advantage in converting the agnostic (often better than transfusionists), organizing ceremonies to honour the most faithful donors, and as a source of voluntary recruiters and helpers.

Finally, it is worth considering the institution of a simple biochemical screening programme for attracting donors (Blood urea, cholesterol, uric acid, blood sugar) which will also yield valuable population based data.

ii) Superposed upon this general educational publicity is a more specific campaign which is focussed, for a few days or even a week, upon a certain quarter of the city, or a particular organisation such as a ministry, a bank, an industry, the Scouts etc. Thus it is important to be able to address oneself, in turn, to various groupings in society whose members are linked by some common bond of allegiance: a common employment, a shared sporting association etc. etc.

It is most effective to go right to the top when setting up blood donor sessions; persuading the director or the most senior officials that they must set an example by exhorting their employees and giving blood themselves. The same principle applies to the Armed Forces where officers must be urged to fulfill their leadership role and improve confidence and morale of their men by being fir st in line. The peace-time military will usually welcome this opportunity for overtly demonstrating solidarity with the civilian population. The Army, of course, is a particularly valuable source of hyperimmune plasma, for large groups of men are simultaneously immunized at induction into the forces and they must be carefully cultivated.

The various modes of blood collection will, of course, include the creation of Mobile Teams. Needless to say, the greatest care must be taken to ensure that donors are courteously and pleasantly received; that the members of the team are disciplined, enthusiastic and impeccably uniformed, and that venesections are faultless. It is crucial to convey the image of a caring, meticulously well-ordered organisation and potential donors are always impressed to fmd that numbers of volunteers are rejected for medical reasons demonstrating that integrity over-rides the desire to inflate the numbers of donors bled.

Where accommodation is difficult to obtain, Mobile Trailers (with 6 couches, doctors' examination cubicle, refrigerators etc.), accompanied by a good team of recruiters and placed in a busy part of town, can be extremely cost-effective, serving also as an eye-catching, ambulant advertisement.
Many hospitals or transfusion centres in developing countries institute a 'blood replacement programme' in an effort to overcome blood shortages and to avoid the difficulties of recruiting by putting the onus of finding donors upon the patients. In the long run, this kind of inflexible, coercive approach tends to be self-defeating, causes resentment and favours perpetuation of the professional donor system.
4. Developing skills and the necessary knowledge form the next phase of development and clearly, as mentioned before, manpower development programmes, both short and long term, together with career structure planning cannot be dissociated from this phase.
In countries where there is a dearth of skilled technicians and no national structure or statutes governing the conditions of pay, advancement and benefits which are linked with recognized qualifications and experience, technician 'rustling raids' are often carried out by more recently established institutes and research centres which can seriously disrupt plans for development. The establishment of a technical college with a nationally recognized qualification is essential and in doing so, it would be preferable to design an internationally compatible curriculum to allow for the future possibility of further training and qualification - of the ablest candidates abroad.
It is worth interjecting, at this stage, that there are dangers inherent in sending doctors and scientists abroad the most talented workers may remain there. On the other hand, those who have been impelled to go abroad merely to win a degree and have not learned problem solving, may return to find that their skills, which appeared to be of rivetting importance in the U.S.A. or Europe, are not relevant to their own country, or else, cannot be utilized for lack of funds, equipment or reagents. This inevitably leads to frUstration. The happiest case is where an already mature scientist with the requisite drive and intellectual curiosity, travels abroad to a specific place and for a specific and relevant purpose which, once it is achieved, can immediately be put to use upon returning home.
Perhaps the most significant contribution to manpower development and the maturation of the newly established technical college already alluded to, can be made by developing a political, administrative and fiscal device that can open up a wide range of temporary teaching and scientific appointments and make them attractive to relatively young western doctors, scientists and technicians. The prestige visits by Nobel laureates who deliver two lectures and dine with the Minister of Health and the University Rector before flying on, are worse than useless.
5. Fostering the creation of that state of mind and that consciousness of quality assurance which is, more than anything else, an attitudinal and cultural concept, is possibly one of the most difficult and important phases of development
Although a Blood Transfusion Service should partake of the nature of a university department, where developmental research and teaching co-exist with service - it must also be perceived as an industrial activity rather than merely as a laboratory function and, like the pharmaceutical industry, it must and concerned with the principles of Good Manufacturing Practice Quality Assurance, both of which are forms of accountability.
Accountability has many facets in the context of Blood Transfusion - in connection with:
i) Costing and budgeting the cost-effectiveness of expenditure and determining whether financial targets and priorities are being met.
ii) The demonstrable safety and efficacy of laboratory procedures and manufacturing processes by objective scientific evidence.
iii) Accountability to the patient through the capability for tracing errors and identifying trends ordeviations from established norms; objectively and continuously
demonstrating the standards and safety of processing and laboratory procedures; the efficacy and purity of reagents and materials utilized.

iv) Accountability to the staff is manifested by good design of the work environment and equipment, utilising working habits which will ensure the safety of procedures by planned training programmes; defining staff responsibilities clearly.
v) Finally, blood transfusion services are answerable to the public who donate the blood and ultimately provide the funds for the best use of both blood and money.
In brief, this is a concept which ideally, engenders confidence in the efficacy, safety and economy of the manufacturing process vis-a-vis the government or funding agency; the staff and the public, whether taken as donor, blood recipient or merely tax-payer. One of the important steps towards establishing this confidence, is the detailed documentation of Standard Operating Procedures which become a management tool for legitimizing or validating the process of manufacture and which are every bit as telling as the results of conventional end-product testing. They become a means for minimizing the arbitrary, subjective aspects of management, providing a framework for systematic, controlled change, whilst still allowing for the cultivation of initiative in order to avoid stultified regimentation. The familiar 'chinese whispering game' distortion of laboratory procedures which can gradually occur in repetitive work or as one technician passes techniques on to another, illustrates the importance of rigorous documentation and adherence minimal blood banking standards.
Cross reference should be made in all Operating Procedures to calibration, maintenance and cleaning of equipment; methods for monitoring and controlling the laboratory environment; methods for quality control of all laboratory materials and reagents employed; storage and transport conditions; safety measures; quality control of final products; methods of documentation etc.
Certainly the exhaustive definition of Standard Operating Procedures covering the entire spectrum of blood procurement, testing, processing and issue is a tedious time consuming business and it is difficult to ensure that, having defined procedures, they are really followed and not merely retained as a cosmetic exercise.
6. Finally, one of the most crucial aspects of establishing a Blood Transfusion Service in the developing countries, is the 'downstream' work which is so necessary amongst the medical community and its subpopulations of nurses, hospital blood bank technicians and doctors, who order and utilize blood and blood products.
A blood centre cannot confine itself to behaving like a supermarket, merely putting products, however wonderful, on the shop counter. The aim must be to exert integral control over the entire continuum of transfusion practice, ranging from donor recruitment, all the way to hpspital practice and preparation of blood for the individual patient, without fragmentation. The transfusionist must influence medical users and tactfully educate them in the proper utilization of blood and, having won their confidence, ensure their active participation in the delivery of, a high quality service to the patient - gaining influence by fostering a sense of need and cultivating this dependence, in turn, by providing a good service. This takes one back to the need for impeccable quality assurance and the confidence this inspires in the medical user and, ultimately, in the public which must, after all, supply the blood donors.
Where a commercial contract supplier is employed, blood is frequently delivered at the back door of hospitals, rather as the laundry or kitchen supplies are bought in and reliable com patibility and matching tests for the individual patient are often not carried out. It is this isolation and dissociation which must be overcome by deliberately involving the physicians, the surgeons and the hospital pathology laboratory in the whole process of judiciously selecting blood products, and preparing and transfusing them with safety.
A consultation or referral service for cross matching problems and antibody identification must be offered, but the pressure to carry out routine matching for hospitals must be resisted, so far as possible - they cannot be absolved from this token of a shared responsibility without lapsing into indifference.
Vested with the authority of the national health regulating agencies, the Transfusion Service must initiate and administer a formal system of accreditation for hospital blood bank personnel, premises, equipment such as storage refrigerators, their alarms and recording devices, minimal testing procedures

and standards for the reagents which are utilized. Great efforts must be devoted to providing hospital blood banks with some of the reagents and reference materials which they require such as screening and panel cells, antisera etc., from local sources.

Medical College curricula go into considerable details regarding chemotherapy or fluid and electrolyte replacement in various medical and surgical conditions but very little is usually taught about the indications and appropriate use of blood and blood products. The same deficiencies apply to the nurses training courses. In consequence, whole blood is over used; inappropriate demands for fresh blood are insistent; albuminoids are misused for cases of malnutrition; reserves of blood group 0 Rh negative bloond are widely employed in non-homologous cases as a transfusional panacea; miracles of hemostasis are expected, in the adult thrombocytopenic, from only one unit of platelet concentrate; blood is stored together with watermelons the catalogue of sins and misapprehensions is prolonged. It is necessary, therefore, to incorporate lectures and demonstrations of blood component therapy in courses for doctors and medical students, to hold regular seminars for nurses regarding the safe and correct use of plastic blood bags, and workshops for hospital blood bank technicians.

Finally, many of the areas of expertise at the Blood Transfusion Centre can sub serve the creation of valuable services such as a diagnostic clinical immunology service, a clinical haemostasis laboratory which may underpin the establishment of haemophilia care, or screening tests for thalassaernias and haemoglobinopathies, further enhancing the links with clinical medicine and clinical investigation which are so important.

In sum, blood transfusion is a service of fundamental significance which underpins all modern hospital practice, finding direct and immediate use at all four levels of health management susceptible to intervention, screening, prophylaxis and therapy hence its ubiquitous role and the multi levelled structure of a blood transfusion service.

Much is usually made of insufficient funds to support the establishment of a modern service in developing countries, and a good deal of ingenuity has been used to devise a simplified, compromise technology which will be less of a financial burden to them. Yet, although the term ‘developing country’ embraces many different degrees of sophistication and levels of financial capacity and service requirement, it is difficult to subscribe to the view that they cannot afford a good blood transfusion service. The spectrum of services which can be provided (red cell and platelet concentrates; pooled buffy coats, filtered le ucocy te-poor blood; fresh plasma, cryoprecipitate; cryosupernatant for blood volume expansion) with no more than multiple plastic bag assemblies, hand sealers and presses, a large capacity refrigerated centrifuge, freezer and 4 °C refrigerator with appropriate voltage stabilizers, together with a handful of disciplined, dedicated technologists this product spectrum is very.