Management of National Blood Programmes
Management of National Blood Programmes


Organized by

Blood Services Group/Health Sciences Authority
WHO Headquarters
WHO Regional Office for South-East Asia
WHO Regional Office for the Western Pacific
with support from the Singapore Government
# Table of Contents

Acknowledgements vi

Abbreviations 1

Preface 3

1. Introduction 4

2. Effective Leadership 6
   2.1 Our Role as Leaders 6

3. Organization and Planning 8
   3.1 Organizational Models for Blood Transfusion Services (BTS’s) 8
   3.2 Partnership Models 9
   3.3 Strategic Planning and Implementation 11
   3.4 Performance Indicators and Targets 13
   3.5 Managing Projects Successfully Through Effective Planning 14
   3.6 Emergency Support from Regional Networks 16

4. Ensuring Financial Sustainability 18
   4.1 Principles of Financial Planning 18
   4.2 Budget Management 20
   4.3 Budgeting for Blood Programmes 22
   4.4 Principles of Costing in Blood Services 23
   4.5 Financial Models for Blood Services 26

5. Building and Managing Human Resource Capacity 27
   5.1 Principles of Human Resource Management 27
   5.2 Recruiting and Retaining the Right People 29
   5.3 Job Descriptions and Job Sizing 30
   5.4 Appraising Employee Performance 31
   5.5 Competency Assessment 35
   5.6 Effective Succession Planning 36

6. Developing Transfusion Medicine as a Career 38
   6.1 Building Transfusion Medicine Capacity 38
   6.2 Identifying Training Needs 39
   6.3 Developing Effective Training Programmes 40
   6.4 Initiating Education Programmes in Transfusion Medicine 43
   6.5 Career Development in Transfusion Medicine 44
   6.6 People Developer and On-the-Job Training Programs in the Health Sciences Authority 45
<table>
<thead>
<tr>
<th>Section Number</th>
<th>Section Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td><strong>Effective Communication</strong></td>
<td>49</td>
</tr>
<tr>
<td>7.1</td>
<td>Principles of Communication - 7 Sins and 7 Virtues</td>
<td>49</td>
</tr>
<tr>
<td>7.2</td>
<td>Managing Communication</td>
<td>49</td>
</tr>
<tr>
<td>7.3</td>
<td>Methods of Communication</td>
<td>51</td>
</tr>
<tr>
<td>7.4</td>
<td>Social Marketing and Developing Effective Communication Strategies</td>
<td>52</td>
</tr>
<tr>
<td>7.5</td>
<td>Developing Communications Plans</td>
<td>53</td>
</tr>
<tr>
<td>8.</td>
<td><strong>Managing Risk</strong></td>
<td>56</td>
</tr>
<tr>
<td>8.1</td>
<td>Approach to Risk Management</td>
<td>56</td>
</tr>
<tr>
<td>8.2</td>
<td>Crisis Management</td>
<td>60</td>
</tr>
<tr>
<td>8.3</td>
<td>Risk communication</td>
<td>64</td>
</tr>
<tr>
<td>8.4</td>
<td>Disaster preparedness and planning</td>
<td>72</td>
</tr>
<tr>
<td>8.5</td>
<td>Preparing for an influenza pandemic</td>
<td>73</td>
</tr>
<tr>
<td>8.6</td>
<td>Contingency planning</td>
<td>75</td>
</tr>
<tr>
<td>8.7</td>
<td>Evaluating new technologies</td>
<td>76</td>
</tr>
<tr>
<td>9.</td>
<td><strong>Achieving Safe and Sustainable Blood Donor Management Programmes</strong></td>
<td>79</td>
</tr>
<tr>
<td>9.1</td>
<td>Managing Sustainable Blood Donor Recruitment and Retention Programmes</td>
<td>79</td>
</tr>
<tr>
<td>9.2</td>
<td>Developing Appropriate Donor Selection Criteria for Donor / Recipient Safety</td>
<td>81</td>
</tr>
<tr>
<td>9.3</td>
<td>Organizing a Safe Blood Donation Programme for Donor and Public Health Protection</td>
<td>84</td>
</tr>
<tr>
<td>10.</td>
<td><strong>Efficient Inventory Management and Procurement</strong></td>
<td>88</td>
</tr>
<tr>
<td>10.1</td>
<td>Blood Distribution and Management Systems</td>
<td>88</td>
</tr>
<tr>
<td>10.2</td>
<td>Managing an Efficient Blood Inventory</td>
<td>90</td>
</tr>
<tr>
<td>10.3</td>
<td>Managing A Good Procurement System</td>
<td>92</td>
</tr>
<tr>
<td>10.4</td>
<td>Selecting Appropriate Equipment and Reagents</td>
<td>96</td>
</tr>
<tr>
<td>11.</td>
<td><strong>Effective Management of Data</strong></td>
<td>99</td>
</tr>
<tr>
<td>11.1</td>
<td>Management of Data</td>
<td>99</td>
</tr>
<tr>
<td>11.2</td>
<td>Data Collection Tools</td>
<td>100</td>
</tr>
<tr>
<td>11.3</td>
<td>Appropriate Use of Data in Decision-Making</td>
<td>101</td>
</tr>
<tr>
<td>11.4</td>
<td>Blood Bank Computer Systems</td>
<td>105</td>
</tr>
<tr>
<td>12.</td>
<td><strong>Strengthening the Clinical Interface</strong></td>
<td>109</td>
</tr>
<tr>
<td>12.1</td>
<td>Strengthening the Clinical Interface at the National Blood Service</td>
<td>109</td>
</tr>
<tr>
<td>12.2</td>
<td>Strengthening the Clinical Interface at the Hospital Blood Bank</td>
<td>110</td>
</tr>
<tr>
<td>12.3</td>
<td>Developing National Clinical Guidelines</td>
<td>111</td>
</tr>
<tr>
<td>13.</td>
<td><strong>Achieving Quality</strong></td>
<td>114</td>
</tr>
<tr>
<td>13.1</td>
<td>Standards: Why Do We Need Standards, Who Should Develop Standards and How Do We Develop and Enforce Standards?</td>
<td>114</td>
</tr>
<tr>
<td>13.2</td>
<td>External Quality Assurance Schemes (EQAS)</td>
<td>117</td>
</tr>
<tr>
<td>13.3</td>
<td>Setting up National External Quality Assessment Schemes (NEQAS)</td>
<td>119</td>
</tr>
<tr>
<td>13.4</td>
<td>Internal Quality Control Systems</td>
<td>121</td>
</tr>
<tr>
<td>13.5</td>
<td>Managing Quality Assurance Data</td>
<td>123</td>
</tr>
<tr>
<td>13.6</td>
<td>Regulatory Philosophy and the Role of Regulation in Protecting Public Health</td>
<td>126</td>
</tr>
<tr>
<td>Chapter 14: Effective Programme Management</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>14.1 Project Planning</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td>14.2 Resource Mobilization and Proposal Writing</td>
<td>129</td>
<td></td>
</tr>
<tr>
<td>14.3 Project Implementation</td>
<td>131</td>
<td></td>
</tr>
<tr>
<td>14.4 Monitoring and Evaluation</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>14.5 Performance and Outcome Assessment</td>
<td>135</td>
<td></td>
</tr>
<tr>
<td>14.6 Managing Change</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>14.7 Communicating change</td>
<td>143</td>
<td></td>
</tr>
<tr>
<td>14.8 The Singapore International Foundation Overseas Programme</td>
<td>146</td>
<td></td>
</tr>
</tbody>
</table>

Appendix 1: List of WHO secretariat /advisors, speakers and participants 149

Appendix 2: Keynote Address 157

Appendix 3: Speech by the Regional Director for the Western Pacific, WHO 160
The World Health Organization wishes to express its appreciation to the Government of Singapore for its support in organizing the three workshops (2007–2009). A total of 24 invited speakers, six WHO Advisors and 55 participants (Appendix 1), including government regulators, industry leaders and academic advisors with experience and expertise, spanning multiple Asian countries, attended the three annual workshops on the Management of National Blood Programmes. The participants were from a total of 18 Member States in the Western Pacific and South-East Asia Regions.

We thank all the presenters and participants for the ideas and facts generated in the workshop, and their contributions throughout the three annual workshops. Ideas have not been attributed to specific individuals, but rather to the entire group in the collaborative spirit of this workshop for learning purposes.

We acknowledge the contribution of Dr Diana Teo, Group Director, Blood Services Group, Health Sciences Authority, Singapore and her team, in particular, Ms Hozanna Ngoh, Ms Erin Pung and Ms Leou Kwee Kim who painstakingly compiled all the presentations and prepared the draft of this publication.
## Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APBN</td>
<td>Asia Pacific Blood Network</td>
</tr>
<tr>
<td>BDRP</td>
<td>Blood Donor Recruitment Programmes</td>
</tr>
<tr>
<td>BSG</td>
<td>Blood Services Group</td>
</tr>
<tr>
<td>BTS</td>
<td>Blood Transfusion Service</td>
</tr>
<tr>
<td>CEO</td>
<td>Chief Executive Officer</td>
</tr>
<tr>
<td>COJTC</td>
<td>certified on-the-job training centre</td>
</tr>
<tr>
<td>CPD</td>
<td>continuing professional development</td>
</tr>
<tr>
<td>CTM</td>
<td>Centre for Transfusion Medicine</td>
</tr>
<tr>
<td>CUE</td>
<td>confidential unit exclusion</td>
</tr>
<tr>
<td>DCF</td>
<td>discounted cash flow</td>
</tr>
<tr>
<td>DIC</td>
<td>disseminated intravascular coagulation</td>
</tr>
<tr>
<td>DPB</td>
<td>discounted payback</td>
</tr>
<tr>
<td>EMWA</td>
<td>exponentially weighted moving average</td>
</tr>
<tr>
<td>EQAS</td>
<td>external quality assurance scheme</td>
</tr>
<tr>
<td>EWA</td>
<td>economic value added</td>
</tr>
<tr>
<td>FAQ</td>
<td>frequently asked questions</td>
</tr>
<tr>
<td>GAP</td>
<td>Global Advisory Panel</td>
</tr>
<tr>
<td>GDBS</td>
<td>Global Database on Blood Safety (WHO)</td>
</tr>
<tr>
<td>Hb</td>
<td>haemoglobin</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>HLA</td>
<td>human leukocyte antigen</td>
</tr>
<tr>
<td>HR</td>
<td>human resource</td>
</tr>
<tr>
<td>HRM</td>
<td>human resource management</td>
</tr>
<tr>
<td>HSA</td>
<td>Health Sciences Authority</td>
</tr>
<tr>
<td>ICU</td>
<td>intensive care unit</td>
</tr>
<tr>
<td>ID</td>
<td>infectious disease</td>
</tr>
<tr>
<td>IEC</td>
<td>information, education and communication</td>
</tr>
<tr>
<td>IFRCRCS</td>
<td>International Federation of Red Cross and Red Crescent Societies</td>
</tr>
<tr>
<td>IQAS</td>
<td>internal quality control system</td>
</tr>
<tr>
<td>IRR</td>
<td>internal rate of return</td>
</tr>
<tr>
<td>IT</td>
<td>information technology</td>
</tr>
<tr>
<td>ITE</td>
<td>Institute of Technical Education</td>
</tr>
<tr>
<td>KPI</td>
<td>key performance indicator</td>
</tr>
<tr>
<td>LJ</td>
<td>Levey–Jennings (chart)</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MOU</td>
<td>memorandum of understanding</td>
</tr>
<tr>
<td>NAT</td>
<td>nucleic acid amplification technology</td>
</tr>
<tr>
<td>NEQAS</td>
<td>national external quality assessment scheme</td>
</tr>
<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>NPV</td>
<td>net present value</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>NZBS</td>
<td>New Zealand Blood Service</td>
</tr>
<tr>
<td>OH&amp;S</td>
<td>Occupational Health and Safety</td>
</tr>
<tr>
<td>P/S</td>
<td>product/service</td>
</tr>
<tr>
<td>PDS</td>
<td>People Developer Standard</td>
</tr>
<tr>
<td>QAP</td>
<td>quality assurance programme</td>
</tr>
<tr>
<td>QAS</td>
<td>quality assurance system</td>
</tr>
<tr>
<td>QC</td>
<td>quality control</td>
</tr>
<tr>
<td>QMP</td>
<td>quality management programme</td>
</tr>
<tr>
<td>QMS</td>
<td>quality management system</td>
</tr>
<tr>
<td>QMT</td>
<td>quality management training</td>
</tr>
<tr>
<td>SARS</td>
<td>severe acute respiratory syndrome</td>
</tr>
<tr>
<td>SCP</td>
<td>Singapore Cooperation Programme</td>
</tr>
<tr>
<td>SEARO</td>
<td>WHO Regional Office for South-East Asia</td>
</tr>
<tr>
<td>SGH</td>
<td>Singapore General Hospital</td>
</tr>
<tr>
<td>SIF</td>
<td>Singapore International Foundation</td>
</tr>
<tr>
<td>SMS</td>
<td>short message service</td>
</tr>
<tr>
<td>SOP</td>
<td>standard operating procedure</td>
</tr>
<tr>
<td>SRC</td>
<td>Singapore Red Cross</td>
</tr>
<tr>
<td>SVO</td>
<td>Singapore Volunteers Overseas</td>
</tr>
<tr>
<td>TRAG</td>
<td>Tsunami Regional Advisory Group</td>
</tr>
<tr>
<td>TTI</td>
<td>transfusion-transmissible infection</td>
</tr>
<tr>
<td>UAT</td>
<td>user acceptability testing</td>
</tr>
<tr>
<td>UKBTS</td>
<td>United Kingdom Blood Transfusion Services</td>
</tr>
<tr>
<td>UNITAR</td>
<td>United Nations Institute of Training and Research</td>
</tr>
<tr>
<td>VNRBD</td>
<td>voluntary non-remunerated blood donor</td>
</tr>
<tr>
<td>WBS</td>
<td>work breakdown structure</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
<tr>
<td>WPRO</td>
<td>WHO Regional Office for the Western Pacific</td>
</tr>
</tbody>
</table>
A series of three workshops on “Management of National Blood Programmes” was organized jointly by the Blood Services Group (BSG) of the Health Sciences Authority (HSA) in Singapore and the World Health Organization Regional Office for the Western Pacific (WPRO), Manila and Regional Office for South-East Asia (SEARO), New Delhi, supported by the Singapore Government through its Singapore Cooperation Programme.

The three workshops were conducted annually from 2007 to 2009: 3–7 September 2007, 21–25 July 2008 and 27–31 July 2009. Each workshop focused on key management areas that were deemed to be critical components of well-managed blood programmes. Presentations on various aspects of these management areas, interspersed with practical sessions and group discussions, combined to provide participants an overview of key learning points. Round-table discussions and sharing of different practices gave a good understanding of management practices in the region and illustrated the many ways in which different issues and challenges could be managed. A key outcome of the workshops was the forging of strong friendships and collegiate networks between the participants.

This publication collates the topics covered during the three workshops, and serves as a useful reference for public officers and professionals involved in the management of national blood services.
1. Introduction

Blood services are an essential part of the health-care delivery system. Every government has a responsibility to ensure the availability, accessibility, adequacy and safety of blood supply for its people.

However, maintaining a safe and sufficient supply of blood remains a major challenge in many developing countries. Two key problems are the gap between the supply and demand of a safe blood supply, and the serious safety concerns associated with inadequately screened blood. A major constraint to solving these problems is the lack of strong infrastructure and systems to support the management of blood programmes.

The World Health Organization (WHO), in its *Aide-Memoire for National Blood Programmes*¹, recommends the following strategies for achieving safe blood transfusion: establishment of nationally coordinated blood transfusion services; collection of blood only from voluntary, non-remunerated donors from low-risk populations; testing of all donated blood; proper and effective clinical use of donated blood; and integration of quality systems in all areas of the blood transfusion services (BTS).

Developing countries are organizing their blood programmes based on these WHO strategies, which involves significant policy changes and structural reform. In light of these changes, it is necessary to focus on the issues facing the senior management of national blood programmes and services. It is essential that directors and programme managers of national blood services are equipped with the appropriate management knowledge and skills to enable them to implement and operationalize their blood services. This includes the necessary skills in human resources, finance, administration and planning within the blood service which will allow them to manage and build capacity within their available resources for effective and efficient operations of their national blood programmes.

For this reason, a series of training workshops in Management of National Blood Programmes was planned with the purpose of strengthening the leadership and managerial capacity of those responsible for their country’s blood programme. The overall goal was to strengthen the organization and management of national blood programmes in order to continually improve the safety and availability of blood supply in the Region.

---

series comprised three training workshops held on an annual basis over three years. Participants were trained in key aspects of management, with emphasis on the application of these aspects in the management of the blood service. The workshop also provided an opportunity to further strengthen the networks among country participants and temporary advisors.

The specific objectives of the three annual workshops were:

1. To sensitize national directors/programme managers of national blood services to the current concepts and practices in planning, managing and monitoring national blood programmes;
2. To promote experience-sharing, networking and accountability among Member States in the Region; and
3. To identify gaps and challenges in areas involved in the management of blood programmes in individual countries, and the actions required to address them.

The first workshop focused on priority areas that were identified through various WHO meetings and workshops. These included strategic planning and implementation; contingency planning and disaster preparedness; developing and implementing standards for blood safety; costing and budget management; human resource development and management; managing communications and the media; and managing partnerships.

The second workshop built on the previous topics, based on areas of need identified by participants in the first workshop. These included developing safe and sustainable blood donor management programmes, building and managing human resource capacity, managing blood inventory efficiently, procuring supplies, strengthening the clinical interface and managing data effectively.

The third and concluding workshop focused on leadership. Topics included quality assurance schemes, risk management, and effective leadership and programme management.

This series of workshops on the Management of National Blood Programmes has created a rich pool of knowledge with contributions from professionals with experience and expertise in managing blood services. In addition, it was a positive platform for learning, sharing and encouragement between countries. The annual basis of the workshops also allowed for application of the knowledge learned, as well as monitoring and feedback.
2. Effective Leadership

2.1 Our Role as Leaders

In general, there are two aspects to the responsibilities of a leader: management and leadership. Management is about allocating the resources that are available to move the organization, while leadership is about motivating people and getting them to work together with the leader to reach the goal.

Leadership comprises three key concepts. The first concept is to have a vision for the organization. This can be something simple such as “to ensure safe blood supply for the community”. The leader needs to know the goal for the organization and articulate it. The people need to be engaged and motivated to work towards the vision.

The second concept is to build trust in the organization. Besides building trust in the leader, the people must have trust in the organization as a whole. Without such trust, the organization would be dysfunctional. Trust takes a long time to be built, requiring much time and effort to be invested.

Trust can be built through:

a. Setting the tone for the organization and setting an example for the people.

b. Taking responsibility in making tough decisions. There should be transparency and clear communication when taking / making tough decisions.

c. Having consistency and being consistent. Since the process of building trust takes a long time to achieve, the leader needs to be consistent. If changes are inevitable, these changes need to be communicated well to the people.

The third concept is to invest in people. It is important to know how to mobilize the whole team together, develop the people and make them feel that they are a part of the organization. This third concept can be applied at all levels of leadership; notably, it is usually the immediate supervisor who influences the people to the largest extent. When applying the concept of investing in people, the following are essential:

a. Selection of the people. Selecting the right people for the job is vital and selecting people with the right attitude is often much more important than selecting them on the basis of their skills.
b. *Listening to the people.* The people are the ones who are doing the job and they may know the processes better. Get inputs from the people as they are the ones who are the most impacted by the process.

c. *Acknowledging the people.* People will feel that they are part of the team and feel proud of the organization.

d. *Focusing on the people’s strengths and not their weaknesses.* Leaders can build on the people’s strengths but not their weaknesses.
3. Organization and Planning

3.1 Organizational Models for Blood Transfusion Services (BTS’s)

Various organizational models exist for blood services. Most blood services are either hospital-based or work out of a centralized blood collection, processing and distribution centre.

Currently, there are six types of models for blood services:

- Hospital-based
- Government-owned
- Red Cross/Red Crescent
- Red Cross/Red Crescent and the government
- Private
- A mix of the above

Hospital blood banks generally aim to meet a hospital’s need for fresh products. The advantages of hospital-based systems are: the close proximity to clinical needs; vein-to-vein activities; and, if they are in university settings, greater research orientation. Disadvantages include: duplication of services; inefficient use of resources; lack of donor focus with weak donor recruitment and retention activities; lack of national perspectives and objectives; and lack of human resources and skills. Additionally, there may be a reluctance to share blood products across institutions and the presence of a conflict of interest in blood distribution.

Where the blood service is part of a pathology department, there is an advantage in that set standards and quality assurance programmes are usually in place. However, donor recruitment and retention are poor, there is a lack of expertise, and the clinical aspects of transfusion may not be emphasized, especially for the appropriate use of blood.

Where the government is the sole provider of blood services, national needs are addressed and necessarily override local demand. However, the organization may be bureaucratic and rigid, and political aspects may dominate its activities. In some places, donors may be less willing to donate to the State, depending on the political climate.

The Red Cross and Red Crescent Societies are humanitarian organizations, and their goodwill with the public encourages donors to come forward for blood donation. These also have the ability to create national organizations, have flexible set-ups and have the advantage of international support and links.
Private or commercial blood banks tend to function efficiently as they are normally profit-driven organizations. They are often able to invest in product development and efficient marketing tools. However, because of the profit motive, marketing strategies tend to be aimed at creating a need.

A blend of these models is advantageous because it is able to maximize the strengths of different partner organizations, i.e. their authority, skills, flexibility and efficiency. Examples of some models include the one in Malaysia, where the Ministry of Education and some private organizations contribute to the blood programme run by the Ministry of Health (MOH); and Singapore, where there is a partnership between the MOH and the Singapore Red Cross (SRC).

Whichever model is used by the BTS, it should establish proper working standards, develop guidelines, policies, regulations and have relevant legislation in place. It should aim for standardization; coordination; clear structure in terms of authority, responsibility and accountability; clearly defined functions; and adequate resources.

It is also important that the government is responsible for and committed to take a lead in organizing the BTS. Although the government may delegate the management of the blood programme to an organization, it should retain responsibility for the programme. Mechanisms should therefore be developed to ensure that the government has the final accountability and authority to ensure that the national blood programme is well managed and able to meet the objectives of supplying safe and adequate blood to the population. This may be achieved by regulation, standards and policy.

### 3.2 Partnership Models

BTS partnerships are typically formed as outsourcing initiatives, supplier–customer partnerships, or capability-strengthening initiatives. Partnerships can be based on contracts, memoranda of understanding (MOU), memoranda of agreements, or service agreements. These should state plainly the specifications and details of the partnership arrangement, and the terms of the partnership.

It is always important to choose the right partner and to have clear goals and objectives, clearly defined roles and responsibilities, agreed performance indicators, and conduct regular monitoring and review. In any partnership, there must be regular dialogue, along with setting of targets and initiatives, and regular review of performance. Different arrangements may exist with different partnerships; however, all partnerships should have the common aim of strengthening capability.
Key success factors in partnerships are: common goals; a win–win situation; leadership commitment; clear responsibility and accountability; achievable and measurable performance indicators and targets; organizational buy-in and ownership; and regular dialogue.

An example of a partnership is the one between the HSA in Singapore and the SRC, which was initiated in 1997. An MOU was signed between the two organizations in 2001, illustrating the model of joint collaboration between government and nongovernmental organizations (NGOs) in managing the national blood supply. Both parties committed to maintain an adequate supply of safe blood and blood products in Singapore, provide high-quality standards of services by recruiting professional staff/volunteers, implement training programmes, and have a transparent and open administration of all operational issues.

In the MOU, the former CTM$^2$ holds clear responsibility and accountability for the national blood programme, and for ensuring the quality and safety of the blood supply. This partnership enables the CTM to focus on its strength in the professional and technical aspects of collecting, processing and distributing blood, while the SRC is able to leverage its strong community support and ability to successfully increase awareness of blood donation, donor recruitment, and training and managing volunteers. In order to accomplish its activities, the SRC is provided with an annual budget from the CTM.

Staff from both organizations have formed a joint operations committee, which meets regularly to strategize and plan donor recruitment and retention activities, while ensuring that both sides are kept updated. Through continuous communication and joint planning, both organizations are able to achieve national goals and their own key performance indicators (KPIs), as well as to develop annual operations plans and budgets. Performance and KPIs are agreed upon on an annual basis, monitored on a monthly basis, and shared with all staff during quarterly staff meetings.

The success of this partnership is attributed to the formal appointment of the SRC as the national blood donor recruiter by the government, adequate funding and support, strong governance, staff involvement, and common goals and objectives. Such collaboration effectively leverages the organizational strengths of both sides, and is able to enhance the capabilities of both organizations.

Another example of partnership is the outsourcing of logistics and warehousing services to SembCorp Logistics in 2001. The logistics

---

2 The Centre for Transfusion Medicine (CTM) is now known as the Blood Services Group (BSG).
specialist has qualified and experienced staff able to manage the purchasing, inventory and warehousing of supplies efficiently. It also provides logistics support to mobile blood collection sites, delivering supplies and equipment from its warehouses and collecting them after the mobile blood collection drive.

This partnership enables the blood service to focus on its core business and devolve the supplies management functions to be managed more efficiently by logistics specialists. However, a partnership does not end with choosing the right partner with appropriate expertise; governance and staff involvement from both parties ensure good management of overall goals and day-to-day duties. As with the SRC, clear targets and deliverables are established with regular monitoring of performance.

The third type of partnership is that with hospitals. This may be a more informal partnership based on the agreed common goal of providing adequate and safe blood to patients in a timely fashion. A good partnership ensures that blood and blood products issued to hospitals are properly transported, stored and managed. Regular meetings are conducted between medical and transfusion laboratory staff of both sides to update them on changes in policies or processes, and to address problems and issues. It is also helpful for the blood service and hospitals to develop performance indicators and measures; for example, the ability to meet clinical needs, and minimize outdate and wastage rates.

### 3.3 Strategic Planning and Implementation

The strategic leadership triangle consists of strategic thinking, strategic planning, and strategic implementation.

**Diagram 1: Strategic leadership triangle**

```
    Strategic Thinking
      /           \
    /             \
   /               \
  /                 \ Strategic Planning
 /                   \
/                     \ Strategic Implementation
```

**Strategic thinking** involves gathering, analyzing and synthesizing knowledge and data from many sources within and outside of the organization to find meaningful trends and observations. With the information gathered, **strategic planning** then sets out to understand, align and allocate resources to achieve the organizational vision. It sets
meaningful objectives and targets in relation to critical success factors. **Strategic implementation** ensures the execution of plans to optimally utilize all technical, structural, and systematic and human resources and decisions necessary.

It is important for organizations to conduct an assessment of the internal and external environment. One method of assessing the internal environment is the 4S model, which analyses four areas within the organization – Structures, Social, Strategy and Skills. The PEST model, which focuses on four major areas – Political, Economical, Social and Technological – can be used to assess the external environment. The SWOT model enables assessment of both the external and internal environment, by analysing the organization’s Strengths, Weaknesses, Opportunities and Threats, and developing strategies.

Organizations should also set out their mission, values and vision statements. The Balanced Scorecard concept can be used to set out and monitor strategic action plans. The scorecard (Diagram 2) encompasses Vision and Strategy in the centre, which is interconnected on four sides with the four key areas of Financials, Customers, Internal Business Process, and Learning and Growth. The Balanced Scorecard can be applied to public and non-profit organizations as well as private organizations.

**Diagram 2: Balanced Scorecard**

How the organization plans to achieve its mission and vision can be visually represented in a strategy map by means of a linked chain of continuous improvements. With the use of strategy maps and the Balanced Scorecard, the organization can develop its targets and initiatives, which should lead to the desired strategic outcomes. This approach provides a
uniform and consistent way of describing an organization’s strategy, so that objectives and measures can be established and managed.

Strategy maps provide the missing link between strategy formulation and strategy execution. Strategic outcome indicators should include satisfied donors and financers, delighted customers, efficient and effective processes, and motivated and prepared staff.

In summary, in implementing one’s strategic plans, one must conduct external and internal analyses, followed by developing the mission, values and vision statements. This is followed by setting out the Balanced Scorecard indicators, and then setting and implementing targets and initiatives, and finally identifying and obtaining sufficient resources and approvals. It is important to conduct regular monitoring and review of the plan.

3.4 Performance Indicators and Targets

Performance indicators are used as a management tool to monitor and evaluate success. As part of the planning process, they enable efficient allocation of resources, and encourage ownership and accountability for the programme or project. Regular monitoring of these indicators also allows evaluation and corrective actions to be taken to achieve targets.

It is therefore important to choose the appropriate performance indicators and targets. This can be summarized by the acronym SMART, which stands for Specific, Measureable, Achievable, Relevant and Timely. Good measures show what is actually happening and accurately indicate trends and changes early enough for actions to be taken. Apart from providing a line of sight to the organizational strategy, it encourages good behaviour and benefits the customer.

Two types of measures are used. Driver indicators are taken directly within the process and happen before the results become available. Outcome indicators (results) come at the end of the process and happen after the fact. All indicators must be regularly monitored and reviewed, and must be accompanied by timely action. Targets must be regularly evaluated and updated to be relevant.

Assigned owners of the performance indicators must be appropriately empowered, and given responsibility and accountability. Platforms for monitoring and reviewing performance indicators include strategic planning retreats, results communicated at staff meetings and stakeholder dialogue sessions.

Performance indicators and targets used in the blood services could be a global measure of overall performance (KPIs) or a measure of performance of individual departments. These measures generally fall into measures of volume, quality or efficiency.
The number of blood donations collected, number of blood components prepared, and daily blood stock levels are examples of volume measures. Indicators of mobile blood programme performance could include volume indicators such as the number of blood drives organized, or efficiency indicators such as the comparison of actual blood collection against projections. Donor satisfaction can be measured by direct indicators such as donor feedback, and indirect indicators such as waiting times for medical screening, blood donation, etc. Some useful quality indicators include failed phlebotomies, donor haemovigilance, blood supply utilization and blood component outdates.

3.5 Managing Projects Successfully Through Effective Planning

Project activities account for up to 70% of the work done in most organizations today. A project is defined as any temporary, organized effort that creates a unique product, service, process or plan. It is a venture that comprises interrelated activities with a definite beginning and end, which meets established goals within the parameters of scope, schedule and resources.

A well-managed project is likely to run smoothly and produce consistent, repeatable and predictable results. It is able to combine the talents of team members and coordinate their efforts so that they can create the right outcome at the right time for the right customer within the resource limits. Project management includes management of the scope, time, cost, quality, human resources, communications, risk and procurement, and integration with the project.

A project begins with defining the problem or opportunity, followed by identifying the project requirements, stakeholders and their needs, and then developing the project strategy. A project management strategy comprises defining and organizing the project, planning it, tracking and managing it, and finally closing and reviewing it.

In planning the project, it is important to ensure understanding of top-down goals, alignment of expectations of what has to be delivered, and clarity of roles and responsibilities. The project team ("who"), project scope ("what"), and project tasks ("how") must be defined.

Project teams usually comprise the sponsor, project manager, the core team and an extended team.

The Project Sponsor can be a senior management staff member who has official authority and resources. This person authorizes and approves the project, provides official backing, resources and strategic direction, and appoints the Project Manager and team members.
The Project Manager is then responsible for achieving the objectives of the project in terms of scope, schedule and resources. This person leads and coaches the team members, and arbitrates and resolves conflicts related to the project.

Under the leadership of the Manager, the core team members make decisions and recommendations pertaining to the project. They are directly responsible for deliverables and jointly accountable for successful completion of the project. These members must be personally committed to the project. Extended team members contribute by providing specific content expertise to the project team. They do so by carrying out assignments within an agreed schedule and resources.

After defining who is on the project team, it is important to define the project scope. This includes the project objective statement, flexibility matrix, major deliverables, completion criteria and success criteria.

A good Project Objective Statement states what the team will do (scope), by when (schedule) and with what resources (resource). It provides clarity for the team, and should be written in less than 25 words using clear and precise language. Thus, it should remove ambiguity in its three project parameters.

The use of a Flexibility Matrix (Diagram 3) helps the team to prioritize trade-offs among scope, schedule and resource. It is a forced ranking that explicitly provides the basis for decision-making in the project.

**Diagram 3: Flexibility Matrix**

<table>
<thead>
<tr>
<th></th>
<th>Least Flexible</th>
<th>Moderately Flexible</th>
<th>Most Flexible</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Schedule</strong></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Scope</strong></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td><strong>Resources</strong></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Major Deliverables are the expected outcomes of the project and usually result in something tangible. They comprise broad chunks of work, and provide scope and boundaries for the team. Defining them serves to reduce re-work cycles.

Every major deliverable is clarified through a list of “is”/ “is nots”, which further describes its scope by stating what it includes and does not include. Each major deliverable also has a list of Completion Criteria.
that describe exactly what is to be delivered, and define the factors necessary to consider the deliverable item completed and delivered.

Success Criteria provide specific measurements that are used to judge success. They should encompass completion of the high-level deliverables in the project, and support the overall Project Objective Statement. In formulating the criteria, it is helpful to answer these questions: What are the key items to be delivered? Who will judge the success of the project? How will they judge the success of the project?

Next, project tasks should be clearly defined to improve communication, minimize re-work, improve schedule predictability, and provide visualization of the project. Defining tasks involves defining the total scope of the project, estimating resources/cost/time, assigning responsibility, and measuring performance and control.

Each task should be described with a verb and a noun, have an owner assigned to it, and its duration estimated. Some elements of task scheduling include logical dependence of tasks (meaning that Task A must be 100% completed before Task B can begin, e.g. the documents must be gathered before the documents can be signed off), milestones (intermediate checkpoints during the project), logical relationships of tasks (workflow) and issue logs, which provide a means for issues to be tracked and resolved. The logs then serve as learning points for future projects.

In any project, the first meeting is always crucial for a good kick-start to the project. It should be conducted face-to-face, and the sponsor should explain the vision of the project at that time. Identifying the rules of engagement, such as meeting frequencies, reporting decision, among others, to members helps to manage expectations. Members of the project management team should attend project planning workshops to familiarize themselves with the tools and processes used for planning.

3.6 Emergency Support from Regional Networks

Regional networks are important during emergencies. Such networks allow information sharing, provide professional and technical support, increase awareness of blood supply safety, encourage joint activities, enable rapid alert, and aid effective disaster management.

Existing networks in the Asia region are the WHO, Asia Pacific Blood Network (APBN), and the International Federation of Red Cross and Red Crescent Societies (IFRCRCS). WHO works through its Western Pacific (WPRO) and South-East Asia Regional Offices (SEARO) and the IFRC through its regional offices and the Global Advisory Panel (GAP).
These regional networks are able to maintain knowledge exchange, close communication and a good transport system for blood supply to needed areas. Disasters such as tsunamis, earthquakes, floods and infectious disease outbreaks are emergency situations, which require blood banks to be on high alert.

Some of the regional alliances support shared testing, such as nucleic acid amplification technology (NAT) and malaria testing. Shared testing has several advantages including enabling review of a test before fully committing to its use, cost-effectiveness for small volumes, and using it as an interim measure while awaiting the arrival of new technology.

Knowledge exchange is another example of a regional alliance that includes areas such as emergency planning and disaster preparedness (sharing guidelines), blood donor management (sharing strategies and surveys) and risk management issues (management approaches, strategy plans, testing algorithms). Regional workshops are also a good platform for the development and strengthening of regional networks, for example, the WHO Interregional Workshop in Kuala Lumpur in March 2007.

In addition to WHO, the Red Cross GAP also works through its Tsunami Regional Advisory Group (TRAG) to provide support to participating countries. The objective of the GAP and TRAG is to advise, share knowledge, have clear policies on the availability of disaster management resources, and to check current facilities and assist in infrastructure development.

In the future, regional collaborations could include: expansion of the APBN; staff secondment between blood services for development and training; shared regional positions for suppliers; auditing; research trials; coordinated humanitarian assistance; and regional workshops. Emergency assistance between countries could take the form of resources (people, equipment, reagents, facilities, transport) or actual blood supply.
4. Ensuring Financial Sustainability

4.1 Principles of Financial Planning

To ensure the financial sustainability of the BTS, the basic principles and practices of financial planning in an organization must be understood.

Accounting is defined as the process of identifying, measuring, recording and communicating economic transactions; this measurement is normally made in monetary terms. Accounting can be subdivided into (i) financial accounting – reporting to external parties and compliance with external accounting standards such as audits and taxation; and (ii) management accounting for providing information for management. There are three key accounting reports: Profit and Loss Account; Balance Sheet; and the Cash Flow Statement.

The Profit and Loss Account is a statement of income, and forms a record in monetary terms of the activities of a business during a stated period of time, usually one year. It shows how the profit is distributed, either to owners as dividends to shareholders or retained in the business as retained profits or transfer to reserves.

The Balance Sheet is a snapshot view produced at the end of this accounting period and forms a statement of assets and liabilities, and ownership of a business at the close of business on a stated date. It provides a summary of the financial position and business net worth at a specific time period. This is represented by the equation “Assets = Liabilities + Equity”. Assets include current assets (e.g. cash in bank, inventory) and fixed assets (e.g. building, land, equipment, furniture). Liabilities include current liabilities (e.g. accounts payable to creditors, accrued expenses, short-term loans) and long-term liabilities (e.g. long-term loans, lease). Equities include shareholders’ equity and retained earnings.

The Cash Flow Statement is a statement of the sources and uses of cash, and reflects the cash position of a business. Cash flow is critical to an organization’s survival, but does not equal profit. It is determined by three components by which cash enters and leaves the organization – core operations, investing and financing.

All stakeholders need to be able to appreciate how the company is performing and this can be measured through ratio analysis. These are usually calculated by comparing two values in accounts, and must be
compared over time or against other ratios to be meaningful. Different types of ratio analyses include performance ratios, liquidity ratios, gearing ratios and shareholder ratios.

*Performance ratios* include profits, capital employed and turnover. *Liquidity ratios* are concerned with the short-term financial position of the company. *Gearing ratios* are focused on the long-term financial position of the company. *Shareholder ratios* are concerned with the return for shareholders.

When embarking on key investment projects, three questions must be considered:

1. Does the proposed investment fit the overall business strategy and, if not, why consider the investment? (strategic)
2. Have the financial implications of the proposed investment and the associated sensitivities and risks been taken into account? (financial)
3. Are there operational capabilities to manage the investment project and then successfully employ the investment within the business? (operational)

Unless the answer to every question is “yes”, it is usually not advisable to proceed with the investment.

When acquiring capital assets such as equipment, options of lease versus purchase may be available. Leasing is very common but there are issues that should be considered. A few of them include: the length of lease commitment versus business needs; impact on cash flow/available finance; cost of finance; whether leasing can be terminated part way through; what happens to the asset at the end of the lease; security requirement and what happens if there is default on payment; and type of lease including maintenance and breakdown.

Some methods for evaluating capital investments are Discounted Cash Flow (DCF), Net Present Value (NPV), Internal Rate of Return (IRR) and Discounted Payback (DPB).

DCF uses the concept of the time value of money in which all future cash flows are estimated and discounted to give them a present value. The discount rate used is generally the appropriate cost of capital. The NPV is the current value of cumulative future DCF.

The IRR is the annualized effective compounded return rate, which can be earned on the invested capital, i.e. the yield on the investment. In general, if the IRR is greater the project’s cost of capital, the project will add value for the company.
The DPB often acts as a good gauge for risk by indicating the period of time before the cumulative DCF is positive. Projects with longer payback periods are typically more risky due to their sensitivity to cost overruns and delays in realizing planned values within the analysis horizon.

The Cost of Capital is a weighted sum of the cost of equity and the cost of debt. It is also known as the “hurdle rate” or “discount rate”. Each organization sets its own “hurdle rate”, which is dependent on a mix of capital funding and shareholder requirements. Factors that need to be considered include:

- Target long-term return for equity shareholders
- Mix of equity and debt capital (debt: equity ratio)
- Tax rates
- Risk premium (industry in general, and specifically the company)

A typical cost of capital ranges from 8% to 12%.

The cost of equity is then the cost of capital which will equate the current market price of the share with the discounted value of all future dividends in perpetuity. It reflects the opportunity cost of investment for individual shareholders, which will vary from company to company because of different business, financial and gearing risks.

The cost of debt is relatively simple to calculate. It is composed of the interest paid (interest rate), including the cost of risk (the risk of default on the debt). In practice, the interest paid by the company will include the risk-free rate plus a risk component, which itself incorporates a probable rate of default (and amount of recovery, given default).

Lastly, the Economic Value Added (EVA®) is a financial performance method to calculate the true economic profit of an organization. It is the performance measure most directly linked to the creation of shareholder wealth over time. It computes the amount by which earnings exceed or fall short of the minimum required rate of return, which shareholders and lenders could get by investing in other securities of comparable risk. The formula for EVA is net profit minus an appropriate charge for the cost of all capital invested in an organization.

4.2 Budget Management

A budget is the mechanism that links an organization’s plans with its finances, and is essentially an estimate against which the actual expenditure and/or the revenue can be assessed. When used appropriately and monitored effectively, the budget will assist in ensuring the financial sustainability of an organization. It will act as an early warning system for financial problems, provide control around the way an organization spends its money, and provide a common record for managers and other
Ensuring Financial Sustainability

organizations to discuss progress towards organizational goals. The budget needs to be revisited and updated on a regular basis.

Budgeting involves the process of setting the budget; managing the budget; monitoring the budget and reviewing the budget.

**Setting a budget** is the planning process during which the organization defines where it plans to spend its money. There are two approaches that can be used:

a. The "top–down" approach whereby the senior managers apportion the funding to departments or activities based on what is available;

b. The “bottom–up” approach whereby the likely costs are assessed and introduced into the budget. This approach is a more robust process but also more time-consuming.

Whichever approach is adopted, a negotiated process will be needed to ensure that the total expenditure budget reflects the money that will be available for spending.

When setting the budget, different types of costs need to be considered. These can be broadly classified into capital costs and recurrent costs. Capital costs refer to the cost of major equipment or premises owned by the organization. Recurrent costs can be further categorized into (a) direct costs, such as the cost of staff and non-staff that contribute directly to the production of blood and blood products or hospital testing; (b) indirect costs, which include costs that contribute to the overall success of an organization but are not directly linked to outputs, e.g. training costs; and (c) overhead costs, such as the costs required to maintain the business but are not related to direct output, e.g. building lease costs.

A practical recommendation for planning the overall organizational budget is to base the budget structure on the organizational management structure. Hence, senior management will be responsible for a number of departmental budgets which can be summed up to obtain the organizational budget. Also, the senior management can monitor expenditure both by expenditure type (or cost codes) and by departments (or cost centres).

**Managing the budget** ensures control over the expenditure. Each cost centre needs to be allocated with a responsible manager for this task. The manager’s responsibilities are to place orders within the cost centre, and to receive invoices and review them before they are paid.

**Monitoring the budget** involves receiving regular budget reports to review and identify any unusual aspects or variances. If variances are present, they need to be explained and possibly justified. Furthermore, variances may also be taken into consideration as part of the budget review process.
Reviewing the budget is performed annually in most organizations. Two approaches to re-setting budgets can be identified: (a) incremental budget-setting and (b) rational budget-setting.

In the incremental budget-setting approach, the previous year’s budget is used as the basis for setting the budget for the year. A standard adjustment is used to change all cost centre budgets, such as the percentage increase due to inflation. This approach works well in a stable environment where there is good control over costs but works poorly in a rapidly changing environment.

In the rational budget-setting approach, the budget is re-set from first principles each year. This approach is more concerned with using resources to meet currently established objectives, rather than focusing on a budget basis or past expenditure. All expenditure is reviewed and adjustments are made to the budget when appropriate. While this approach will ensure that the budget more accurately reflects the anticipated expenditure, it also requires more input and time from managers.

A combination of both the incremental and rational budget-setting approaches is used by many organizations when re-setting budgets. In this mixed approach, the actual expenditure for the previous 12 months becomes the base budget for the next year. With this basis, an incremental adjustment is made and managers then make a case for a specific adjustment of a budget line.

Besides the above principles, one other important element in budget management is the identification of fixed and variable costs. Fixed costs do not change with overall activity, e.g. rental of a building. On the other hand, variable costs are directly linked to activity levels, e.g. blood collection packs and staff numbers might be incremental with increases in the number of donations. Planned initiatives should be assessed to ensure that the likely financial impact is properly understood and the budget is adjusted accordingly.

In summary, budgets are a tool for effective management of an organization. They provide a mechanism to manage and monitor expenditure, and ultimately to control activity. All managers should understand the limit of their financial authority and appropriately manage the resources for which they are responsible.

4.3 Budgeting for Blood Programmes

When budgeting for blood programmes, the total costs of the BTS should include all resources – including those with and without invoices, and those with no market price such as volunteers, facility and electricity.
Ensuring Financial Sustainability

Having a dedicated budget and budget structure provides more flexibility for the BTS. A budget works as a time-phased expenditure plan and is a cash flow profile for expenditure. Within it should be a control mechanism that authorizes expenditure.

Cost is defined as the estimated expenses from task items developed in the work breakdown structure. Managing cost requires a disciplined approach with proper estimation and control of expenditure. A budget lists all the planned activities, and the expenditure on these activities.

One should keep in mind that any budget that is developed must be consistent with cost. Variance between the budget and the actual cost will affect any activities planned.

For instance, changes such as inefficiency in productivity and introducing a new activity will increase costs. Tracking of expenditures minimizes such variations, and awareness of any changes in the budget is essential.

Costs are divided into capital and recurrent costs. Capital costs include infrastructure, such as building, vehicles, equipment, furniture and training. Recurrent costs include personnel, utilities, insurance, transport, supplies and administration.

Costs may also be divided into direct and indirect costs. Direct costs are charges that have a direct relationship to the service, while indirect costs are computed costs based on a percentage of direct costs.

One practical way to allocate costs is to do so by activity, e.g. blood donor recruitment, blood collection, blood processing, blood storage and distribution. Total costs would therefore be the sum of the cost of all these activities.

In conclusion, managing the budget depends on the accuracy of the estimated and resulting budget. Development and execution of the budget must be a disciplined process. It is also important to be aware of any changes.

4.4 Principles of Costing in Blood Services

There are various rationales for costing in the blood bank setting. Costing can be used as a tool for planning and mobilizing the resources needed to sustain blood supply; it provides information on the cost of the different activities involved in providing products and services; improves budgeting and budget allocation; enables monitoring of costs; enables realistic planning for future initiatives or expansion; evaluates the cost-effectiveness of the products/services; provides stakeholders with information on the budget required to produce the product or service; and helps to determine blood-processing fees.
In the blood bank setting, classification by activity defines a framework that allows estimation of costs and outputs of specific activities. Allocation of costs to designated cost centres ensures good capture of data without duplication. Each cost centre can be designed to cover clearly defined areas involved in specific activities, e.g. blood donor recruitment, blood collection, blood processing, etc.

When costing for blood products/services, the purpose of costing has to be defined, the organizational structure of the blood service determined, and the time frame and sample size identified for data collection. Sources of data include financial records, payroll records, output data, and time and motion studies.

Cost categories can be based on time frames or based on involvement in activity. Time frame-based costs are divided into capital and recurrent costs. Costs based on involvement in activity are divided into direct (stand-alone) costs and indirect (shared) costs.

Capital costs are one-time investment costs generally incurred during the first year of the activity. Arbitrarily, it can include any item that lasts for more than a year and costs more than US$ 100. Annualization is calculated based on the fact that a capital good typically needs to be replaced when it has reached its useful life, and assumes that an amount of money has to be saved each year to build a “capital fund” to purchase the replacement. This amount needs to be adjusted for inflation and also take into account any interest charged if the amount is to be borrowed.

Recurrent costs are those associated with operating or maintaining an activity, such as manpower costs, equipment maintenance or management costs.

Direct costs account for the supplies, equipment, manpower, etc. that are fully used in the activity being costed for. One hundred per cent of the cost is allocated to the activity, for example, blood bags, blood collection nurse in costing for blood collection.

Indirect costs, on the other hand, are those incurred on supplies, equipment, manpower, which are shared among two or more activities, and only a percentage of the cost is allocated to the activity. Examples are facilities, electricity and administrative support staff that serve different units.

The total annual cost of an activity is the sum of the average annualized capital cost (direct + indirect) and the recurrent cost (direct + indirect). The unit cost of an activity is therefore the total annual cost divided by the total activity output.
The process of costing for blood services involves the following steps:

- Determine all items contributing to the activity.
- Determine which are direct and which indirect, and compute the allocation of indirect cost to the activity.
- Determine which are capital and recurrent costs, and the annualizing factor based on the usable shelf-life for capital items.
- Determine output indicators.
- Calculate the total cost of the activity divided by the relevant output indicator.

The following example (Diagram 4) illustrates the components that comprise the cost of collecting a unit of whole blood.

**Diagram 4: Costing for blood collection activity**

- Direct costs (e.g. blood mixer, donor couch, etc)
- Indirect costs (e.g. building, computers, etc)
- Capital costs
- Annualized capital costs
- Recurrent costs
- Total collection costs
- Number of whole blood donations collected
- Cost per unit

The cost of blood components must include the portion of cost incurred on its source, that is, whole blood from which the component is derived. The formula used to determine allocation ratios differs among blood services, depending on individual practice and policy; it may be based on distribution of components, disposition of components, or blood service/MOH costing policy.

Thus, the cost of a unit of platelets would be the sum total of (1) allocated unit cost of whole blood, (2) unit cost of platelet preparation, (3) unit cost of labelling and release, (4) unit cost of bacterial testing (if bacterial testing is performed only on platelets), and (5) unit cost of storage and distribution.

Product pricing is not equivalent to costing, and depends on the financial model for the blood service and national health-care funding policies.
Where full cost recovery is expected, product pricing must include wastage and outdate rates, which are not taken into account during costing.

### 4.5 Financial Models for Blood Services

There are many different models by which blood services are funded. These include: government funding, which is either direct or indirect (through national blood authorities or through blood supply); parent organizations, e.g. Red Cross or other agencies; and recovery from the blood supply through processing fees.

Here are some examples of the different models that are in use in the Region. For example, Malaysia obtains 100% direct funding from the government, while New Zealand, Australia and Hong Kong receive 100% funding indirectly from the government through the national blood authority. In Singapore, direct government funding accounts for up to 43%, with the remainder recovered through blood processing fees. In Thailand and Indonesia, there is partial funding from all the various sources; while in China, the model of funding varies from province to province.

There are also different models of the budgeting process. One model is based on the incremental budgeting process, where the budget for each year takes as its starting position the budget for the previous year, and adds/subtracts from that base. This is practised in Hong Kong and Malaysia. The other model is based on the rational budgeting process, which is less concerned with a budget base, but more concerned with using resources to meet currently established objectives. This is practised in Singapore and Australia. Some blood services may use a mixture of both models.

Financial and budgeting models for blood services vary from country to country. Nonetheless, most involve setting annual objectives and targets, usually based on the previous year’s actual figures. In more competitive economic environments, the focus is shifting from levels of service to financial measures, such as profits and ratios of cost recovery. Knowledge of costs is therefore important in order to budget efficiently.
5. Building and Managing Human Resource Capacity

5.1 Principles of Human Resource Management

The environment in which human resource management (HRM) functions is always changing, and is faced with many challenges. These challenges come from changes related to globalization of organizations; changes caused by technology which increase competition; changes in the nature of work; prevailing shortage of talent; and diversity issues in multicultural work teams. There is therefore the need for line managers and human resource (HR) teams to work in partnership to add value to the business.

Managers represent the management process, which includes people management, and their responsibilities involve planning, organizing, leading and control. In turn, the HR team is responsible for the process of acquiring, training, appraising and compensating employees, and attending to their employment relations, health and safety issues. If human resources are not managed well, this will inevitably have an adverse impact on the organization.

To cope with changes, basic HRM practices must be in place so that people management can continue to be effective. In order to support the translation of business strategy to business results, effective processes and building blocks need to be in place (HR budget and reporting, HR policy, Performance Management System, Communication, HR Practitioner Capability), and infrastructure (illustrated in Diagram 5).

Diagram 5: Human resource infrastructure for effective basic human resources
When moving towards strategic HRM to help businesses stay competitive and relevant, the steps to be considered are as follows:

1. **Get the basics right**
   - Provide cost-effective and efficient HR; leverage on technologies.

2. **Review and align people strategy with business**
   - Understand internal customers’ expectations:
     - *HR administrative processes*: assurance that HR processes are well defined in standard operating procedures (SOPs)
     - *Staff development*: advise on and recommend development plans
     - *Change management*: prepare leaders and staff for change.
   - Be the voice of conscience to the Chief Executive Officer (CEO) and business.
   - Move from qualitative measures to quantitative measures:
     - Use quantitative measures as HR indicators, for example
       - *Staff retention*: resignation rate
       - *Staff engagement*: staff engagement index
       - *Succession planning*: number of “ready-to-roll” successors identified for key/critical positions
       - *Continuous learning*: number of staff with 60 training hours per employee per year.

3. **Develop HR competencies**
   - Build a credible HR team with the following expertise:
     - *Knowledge of business*: financial capability, strategic capability, technological capability
     - *Knowledge of HR*: staffing, development, appraisal, rewards, organizational planning, communication
     - *Management of change*: creating meaning, problem-solving, innovating and transforming, influencing relationships and roles.

4. **Empower the organization**
   - Forge a strategic alliance and establish a proactive strategic partnership:
     - Develop a relationship with the management
       - Executive management consults HR manager regularly
       - Top HR person to be involved in senior-level discussions on organizational direction and day-to-day operations
     - Learn to speak the language
       - Sell HR programmes by linking them to business objectives
     - Do not just propose ideas; develop actions
       - Be proactive in developing and communicating HR processes
- Develop partnerships with Finance and Information Technology (IT)
  - Be part of the three main administrative counsellors (HR, Finance, IT) for executive management
- Become an internal consultant
  - Build credibility as a strategic advisor.

It is essential for organizations to realize that the success of the business relies heavily on the people who possess the skills and expertise to carry out its business processes. Thus, effective people management should be part of the organizational strategies, and the capacity of the organizational workforce should be continually built up. Successful HRM not only enables people to maximize their potential, but also helps them to manage the rapid changes in business trends. Building HR competencies will strengthen organizations as a whole.

### 5.2 Recruiting and Retaining the Right People

The blood service is often perceived to be a relatively unattractive field among medical subspecialties; thus, it is important to be able to address the challenges in recruiting and retaining expertise. Good HRM should help to recruit the right person for the right job and the right position. However, the greatest challenge often lies in retaining talent.

Staff are most likely to stay on with an organization if their concerns and needs are met. Most often, these involve access to well-developed training programmes, knowing their prospective career paths, and receiving a good salary and benefits. The HR department should develop strategies for staff retention based on such staff needs and expectations.

Continuing education programmes can be drawn up to provide staff with basic training, specialized training in specific areas, and opportunities for higher education or further training at higher levels. Examples include organizing regular internal seminars, rotation of staff to different laboratories, and exchange programmes for staff with attachments in specialized fields to regional countries or beyond. Such activities help to motivate staff and encourage them to stay on with an organization.

Salaries paid to staff in the BTS should be at least as attractive as those paid to other staff holding similar positions in other branches of the health services.

While recruitment of the right talent depends on the availability of suitable applicants, HRM is still largely responsible for making the right decisions about staff selection. In addition, HRM must also focus on efforts in retaining staff.
5.3 Job Descriptions and Job Sizing

A clear job description is required for all personnel involved in critical processes and procedures that affect the quality of blood, components, tissues and services. It matches the employee with the kind of work to be performed, level of responsibility to be assumed, and job requirements to be met. This will bring the organization towards more efficient selection of job candidates and the interview processes, as well as ensuring that the right people with the right skills are matched to the right job.

At the same time, a job description should not aim to be an exhaustive list of responsibilities or duties. It should not remain static and should be periodically reviewed with each employee to ensure that it is current and accurate.

A comprehensive job description includes the following information:

- Job title
- Department
- Qualifications
- Job responsibilities and objectives
- Work aids
- Reporting relationship
- Grade/salary
- Other requirements.

As an example, the HSA undertook an HR review in 2007, which included a job-sizing exercise. Being a medical and science-based organization tasked with national responsibilities, the HR needs include: highly trained scientific, medical and pharmaceutical professionals; trained and competent teams of technical officers; experienced and capable corporate management officers to provide strong management support; and officers with minimal educational qualifications but appropriate on-the-job training.

Existing salary schemes were poorly linked to performance, and career progression and compensation. The weak link between compensation, job size and performance led to a lack of consistency in rewarding performance and difficulty in recruiting staff at mid-career level. The nature of the schemes required specialists and technical staff to take on greater managerial responsibilities as they advanced, and diluted ability to leverage on their specialist expertise at a senior level.

There was a shortage of trained staff nurses and experienced enrolled nurses. Working in the blood service requires skill sets and working hours that are different from those required for nurses in hospitals, such as high levels of service quality and irregular work shifts. These were
not taken into consideration in the compensation packages. Donor and laboratory aides, and mortuary technicians also had irregular working hours, with limited scope for career development, poor compensation for skills upgradation and job expansion, and no incentives for good performance.

To address these issues, sizing and evaluation of all the jobs in HSA was conducted. Job evaluation provides a clear and objective definition of the job requirements, job scope and expected deliverables. Job sizing allows a fair comparison between different jobs, appropriate compensation to staff, and is useful for market comparison.

Sizing of the job is done using set criteria that allow all factors of the position to be taken into consideration, such as impact of decisions, risks and skills needed. Only the job, rather than the employee, should be evaluated.

With clearer job descriptions and profiles, staff recruitment becomes easier and more objective. Ability for market comparison enables the organization to set reasonable and justifiable salary scales that can attract suitable candidates. Setting job expectations and deliverables enables fair and objective setting of well-defined and clear targets during staff performance appraisals.

In conclusion, job descriptions and job sizing are essential elements of efficient HRM. They ensure proper allocation of resources, leading to good outcomes, as well as appropriate performance rewards and compensation. There should be a regular review of job descriptions, as well as regular job evaluations.

5.4 Appraising Employee Performance

Staff are the most important and valuable resource of every organization. Their level of performance will be critical to how effective the organization is. Staff appraisal is one way of ensuring that one’s effort is in line with the BTS’ or department’s plans and objectives, as well as providing opportunities for individual development.

Staff appraisal assesses the level of performance, and identifies strengths and weaknesses. This further identifies training needs and assesses staff potential. HR should take this opportunity to provide incentives for improvement, and also reward those with excellent performance. These aspects of the appraisal serve to motivate staff to improve and excel, and focus on the organizational goals.

To ensure a smooth appraisal process, the appraiser, who is normally the direct line manager, needs to have a detailed knowledge of the job and responsibility of the staff being appraised (the appraisee), as
well as an overview of the needs and requirements of the department/BTS. It is also the responsibility of the appraisee to prepare for the meeting and reflect on his/her past performance. Both appraiser and appraisee should discuss and agree on the objectives to be met. Such two-way communication is crucial throughout the staff development review process. Finally, the appraiser should have the authority to make available the necessary resources to ensure that the agreed objectives and targets for the given period are achievable.

**Diagram 6: The appraisal process**

The appraisal process starts with the appraisal form, followed by an appraisal interview. The interview should end with actions agreed to by the appraiser and appraisee. Possible actions include job improvement plans, promotions, transfer, salary review, and training and development plans.

The appraisal form is used for the entire appraisal process. It includes key elements such as appraisal of the past year’s performance with a focus on the job or person, performance criteria and performance ratings, and the proposed objective and development plan, in light of the past year’s performance.

Performance ratings can follow various types of rating scales. The table below shows four types of rating scales and their descriptions.

**Table 1. Types of performance rating scales**

<table>
<thead>
<tr>
<th>Type of Rating Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linear / Graphic Rating Scales</td>
<td>A list of characteristics or job duties with numerical, alphabetical or other simple scale</td>
</tr>
</tbody>
</table>
Type of Rating Scale | Description
--- | ---
Behavioral Scales | A list of key job items against which are ranged a number of descriptors e.g. diligence – consistently hard worker, occasionally needs reminding, or makes no great effort
Results / Targets Set | Stating whether results / targets have been achieved
Free Written Reports | Appraiser provides essay-type answers to the questions in the appraisal form

The appraisal interview provides a formal means to achieve the following:

- Discuss and develop employee job performance.
- Ensure that employees are made aware of the work standards expected of them.
- Give direction for the coming year.
- Help match employee objectives for the coming year to the needs of the BTS/department.
- Agree on targets for activities and levels of performance for the forthcoming year.
- Agree on a personal and professional development plan for the appraisee.

Effective appraisal depends considerably on a sound and well-conducted interview. It is important that the appraisal meeting takes place in a positive atmosphere based on the recognition of contributions made by the appraisee, and constructive comments and suggestions made by the appraiser. Prior to the annual appraisal interview, it is essential that both the appraiser and the appraisee prepare and document the matters that will form the basis for discussion.

During the process, an important skill for the appraiser is to know how to ask the right questions. For instance, closed questions that require short answers like “yes” or “no” often result in ineffectual appraisals. On the other hand, open questions provide appraisees with opportunities to be open about the issues they face, resulting in more effective appraisals with relevant and timely action plans. On the part of the appraiser, open questions also demonstrate the appraiser’s genuine interest in the appraisee’s development.

There are generally three appraisal styles to the interview as described in the following table.
Table 2. Styles of appraisal

<table>
<thead>
<tr>
<th>Style of Appraisal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell &amp; Sell</td>
<td>The Manager tells the subordinate how he is doing, and endeavors to persuade him to accept what has been decided for him in terms of improvement.</td>
</tr>
<tr>
<td>Tell &amp; Listen</td>
<td>The Manager tells the subordinate how he is doing, but then sits back and listens to the individual’s point of view both about the appraisal and about any follow-up action required.</td>
</tr>
<tr>
<td>Problem-solving</td>
<td>The Manager effectively puts aside the role of a judge in order to join the subordinate in mutual reflection on the progress and mutual discussion about the required action.</td>
</tr>
</tbody>
</table>

Appraisals do not end with the interview. There should be agreed actions in response to the matters identified during the appraisal. Important issues to be considered are the future performance objectives and development plan of the appraisee. All of these should be recorded in the appraisal form as well.

As far as possible, agreement concerning the outcomes of the meeting should be reached and recorded. If not, both the appraiser and appraisee should be given sufficient time outside of the interview to consider the issues.

An effective approach to staff appraisal is to seek a 360-degree feedback. This approach seeks feedback from subordinates, peers and managers in the organizational hierarchy, as well as self-assessment and, in some cases, external sources, such as customers and suppliers or other interested stakeholders.

Some benefits of a 360-degree feedback are:

- It encourages open feedback.
- Individuals get a broader perspective of how they are perceived by others than previously possible.
- Perception of feedback is more valid and objective, leading to acceptance of results and actions required.
- It increases the awareness of senior management that they too have development needs.
- It identifies strengths that can be used to the best advantage of the business.
- It supports a climate of continuous improvement.
The performance appraisal process is often not well received by appraisers as well as appraisees. The process can be hindered by an appraiser’s reluctance to conduct appraisals, carry out face-to-face interviews and give ratings to their staff when performance is low. When given a low rating, appraisees tend to challenge the fairness and accuracy of the appraisal. Proper follow up is often lacking. These issues should be anticipated by the HR team and measures taken to ensure that appraisals are properly conducted, and that appraisers have been adequately trained in completing an appraisal.

A successful employee appraisal not only helps to develop individuals, but is also an important means by which managers and their staff can discuss key work issues in a systematic manner. Furthermore, if the process can be tackled collaboratively, it can be a good opportunity for a joint problem-solving exercise, which will tend to be more productive than other approaches.

5.5 Competency Assessment

“Education” is defined as the acquisition of knowledge and understanding to improve the ability to make appropriate decisions and carry out tasks. “Professional development” means improving knowledge, skills and being up to date in a professional area. “Training” is the acquisition of skills and understanding needed to carry out tasks or processes. What, then, is “competency”? It involves a standards-based assessment.

A formal definition of “competence” is the ability to DO, KNOW and UNDERSTAND all that is required, as identified in the industry standard. Competency is more than the ability to perform tasks.

Competence cannot be achieved by accident; it requires thorough training and assessment. In assessing competency, three elements are involved: competence, performance criteria and assessment. Competence refers to all activity and behaviour relating to the occupational area as described in the industry’s written standards. Assessment is a process of making judgements about an individual’s occupational competence by matching the evidence collected to the appropriate nationally agreed standards.

A performance criterion acts as a yardstick against which performance can be measured in relation to a single element of competence. As such, the criteria should be comprehensive and comprehensible.

Standard tasks are defined in occupational terms and in a standardized form. They contain: a title; a precise description of the task including, as appropriate, objectives, conditions, available equipment, etc.; and a precise statement of the criteria for successful performance of the task. These are presented as far as possible in the form of outputs that can be
easily recognized by the trainee’s supervisor/tutor. All criteria must be met if the trainee is to be credited in that task.

Ultimately, competency-based approaches should increase the likelihood of activities being undertaken properly and meeting organizational requirements in a consistent manner. Competency-based training and assessment require significant investment in people. Trainers are needed to support trainees in conducting the assessment. Competency assessment also provides individual staff with a clear idea of what is expected of them and the tools to meet those expectations. Essentially, competency training and assessment are an integral part of an effective quality system of an organization.

5.6 Effective Succession Planning

Succession planning in the blood service is essential for continuity, sustainability and development, in line with the development of other health delivery systems. It not only refers to top leadership but also other key personnel across all levels. The aim is to ensure that development is on track and in accordance with the long-term plans of the organization. Effective succession planning has evolved to a process by which successors are identified for key positions, and their career development and associated activities are planned accordingly.

Key steps in developing effective succession planning include deciding on the depth of the succession plan; whether to focus on the most senior jobs (key positions) or more broad-based positions in the organization. It includes looking for specific qualities desired in the candidates (e.g. knowledge, capabilities, skill and personality), which are suitable for the positions identified, and identifying candidates with the highest potential while working to retain them.

Character and good interpersonal skills are essential qualities for key senior positions. People in these roles must be able to make decisions for the good of the organization rather than their own personal agenda, have the ability to treat others with respect, keep their word, be open and transparent, possess initiative-taking and problem-solving skills, and collaborate and build strong teams rather than a competitive environment. It is important to have a good foundation of knowledge, as well as a positive attitude towards continuous learning.

When developing successors, candidates with high potential can be identified from incumbents and this may be good for continuity. Retaining suitable candidates is important and can be done through various methods, including measuring performance improvement, using reward and recognition programmes, and then reviewing the entire process from identifying the candidate to the eventual succession.
Tips and benefits for successful succession planning include the following:

- Anticipate that some people may leave.
- The ability to develop others is an asset to the organization.
- Have a casual chat with those whom you do not know.
- Do not force people if they do not want to take up the position.
- It forces you to take a hard look at your team.
- It allows you to see who you have.
- It allows you to evaluate your strengths and deficiencies
- It allows you determine what to do after your evaluation.
6. Developing Transfusion Medicine as a Career

6.1 Building Transfusion Medicine Capacity

Capacity building in an organization is the process of developing and strengthening the skills, instincts, abilities, processes and resources that it needs in order to survive, adapt and think in the fast-developing world. It relates to almost all aspects of work – governance, leadership, mission and strategy, administration, human resources, financial management, legal matters, programme development and implementation, funding, partnership, collaboration, evaluation, advocacy and policy change.

Capacity building is also about providing services as well as products in a more effective manner. Specific to transfusion medicine, capacity building aims to enable adequate safe blood supply and effective transfusion. These includes a safe donor pool, safe processes and procedures, appropriate equipment and resources, safe blood, appropriate components, safe transfusion process and trained personnel.

The responsibility for capacity building lies with the leaders in the BTS. They must develop the organization and the people within it to ensure organizational effectiveness, sustainability and continuity. Furthermore, leaders must anticipate changes, such as expansion in terms of volume of activities; added tasks/activities, whether planned or unplanned; and staff attrition.

Capacity building involves improving the human capital. To enable the blood service to achieve its objectives, there are staff of various categories and with varied expertise such as donor organizers, doctors, nurses, medical laboratory technologists and scientists. Leaders need to provide an environment that is conducive to developing themselves and those under their responsibility. Within this environment, leaders play a facilitative role.

Creating a favourable climate for capacity building in staff will tap staff potential and spur them towards higher levels of performance. Conversely, a top–down approach or efforts that come from one person only will not be helpful in creating such an environment and should be avoided.

Training and staff development includes workshops, seminars and annual training programmes. The assistance of consultants/coaches,
support from the management, and other similar organizations and/or universities are often required as well.

Capacity building and organizational effectiveness are not the same but they are related. Organizational effectiveness relates to the capacity of the organization to sustain the people, strategies, learning, infrastructure and resources it needs to continue to achieve its mission. Other elements of organizational effectiveness include: organization structure, culture, leadership, governance, strategy, human resources, etc. The various framework models for measuring organizational effectiveness can be helpful in defining indicators for the success of capacity-building initiatives.

Capacity building is an ongoing process. Organizations should identify areas for improvement, prioritize these if necessary, identify people to be developed, decide on how to develop these individuals or group of individuals to meet the needs of the organization, and look for partners/assistance.

6.2 Identifying Training Needs

The quality of the final product from a blood service depends on the quality of the employee’s performance in donor selection, blood and plasma collection, and in handling the processes. Therefore, identifying the right training needs is an essential component of a good blood programme. Having qualified staff is either the result of a ready-made programme or a tailor-made training programme. “Ready-made” means that well-trained, experienced staff are recruited from outside the organization through attractive recruitment packages. To have a tailor-made programme means that the organization will need to build up their staff through accurately identified training that meets their needs.

For the development of an organization, training needs should be identified for both talented staff as well as less talented staff. These could be determined through competency testing and proficiency testing.

Talented staff are selected from employees with high competency levels and a track record of high performance. These staff should be groomed as potential leaders or successors within a succession planning framework. Part of the grooming process of staff can include assigning them as professional trainers for new trainees or visiting trainees, or as job specialists within the organization.

Less talented staff are often viewed as problematic, but they may also be key to the success of the organization if given the chance. These staff can be provided with training to build capacity for running quality routine work, support for team work and other organizational support work.
Planning for staff development requires identifying training needs for and deficits in each role, developing effective training programmes, and initiating education programmes within the relevant specific areas in transfusion medicine. Key positions that need to be evaluated for training needs include the donor organizer, nurses, statistician, medical technologist, professional manager, semi-skilled workers and quality manager. These jobs cover the tasks that impact the final product of the blood bank, such as donor management, blood collection, statistical analysis, laboratory examination, blood processing, administration of the programme, blood cold chain and quality control issues.

### 6.3 Developing Effective Training Programmes

Once training needs have been identified, the next step is to develop an effective training programme. These may be grouped into the categories of Education, Training and Development.

- **Education**: basic instruction in knowledge and skills designed to enable people to make the most of life in general; it is personal and broad-based.
- **Training**: implies preparation for an occupation or for specific skills, narrower in conception than either education or development; job oriented rather than personal.
- **Development**: suggests a broader view of knowledge and skills acquisition than training; less job oriented than career oriented; concerned more with the employee’s potential than with immediate skills; and sees employees as adaptable resources.

The aim of training and development is ultimately to improve the human capital within an organization through nurturing of and investment in human resources. This not only ensures that employees have the skills and knowledge to do their present and future jobs, but also plays an important role in improving attitudes and the manner in which employees approach tasks.

The benefit of systematic training is that it provides a pool of skilled manpower for the organization. Existing skills and service to customers can be improved through such training. These will facilitate an increase in the knowledge and experience of employees which, in turn, foster motivation. When staff are motivated, there is greater commitment, as personal growth opportunities open up for employees.

The role of a trainer is to plan and organize training, determine training needs, manage training functions, provide direct training activities, and provide consultancy and advisory services.

When identifying training needs, the gap between the desired levels of knowledge, skills and competencies and the actual current levels of these
should be assessed. This involves the use of job descriptions, employee appraisal records and other data. The overall company trajectory and future plans of the department need to be considered as these will have implications on individual training needs.

Training objectives should be established based on the key training needs identified. State clearly what capabilities a trainee will be able to acquire following completion of the training. The resulting list of objectives will form the outline guide to the training content. Training programmes must be planned to not only meet the objectives, but also encompass setting budgets, timetables, and the content and methods of training.

The actual choice of method will be shaped by the kind of learning to be provided, for example, practical how-to-do capabilities versus knowledge based on the understanding of underlying principles. Decisions have to be made as to whether training will be on- or off-the-job, and the mix of activities that the trainee should undertake.

Encouraging participation is one of the ways to improve the effectiveness of training. It is also more effective if training activities have measurable objectives and specified outcomes, coupled with relevance to the skills the trainee is expected to attain. Trainees must know that the training is their responsibility and should be taken seriously.

The training and development cycle includes five steps as illustrated in the chart below (Diagram 7). Evaluation is an integral, final part of the cycle, and should be aimed at obtaining feedback about the results or outputs of training. The feedback obtained is then used to assess the value of the training with a view to make improvements in the future.

Diagram 7: Training and Development Cycle

1. Identify Training & Development Needs
2. Establish Training Objectives
3. Design & Plan Training Programmes
4. Carry Out Training
5. Evaluate Training
There are several points to bear in mind when developing measures to improve the effectiveness of training. These include: providing training that is relevant to the skill that the trainee is expected to attain; supplying pre-training assignments; training supervisors and managers first or simultaneously so that they know and understand the skills and information provided in the training sessions; informing trainees what the training will involve prior to the activity; creating a context for the training and making sure that trainees are clear that the training opportunity is their responsibility and should be taken seriously.

There are many types of training methods that can be employed, such as on-the-job instruction, coaching and counselling, off-the-job training, lectures/talks, group discussions, courses, consultation and through the use of other training organizations to fill in gaps.

Training newly hired employees and providing continuing education keeps staff updated on the various procedures and concepts involved in their jobs. Training should not just be aimed at improving career prospects, but also for developing individuals through continuing education and providing opportunities for management development training. Management development is often seen as a vital device in engineering change in the organizational culture. It may also be a tool for the pursuit of quality and customer services, as it helps to shape and structure attitudes and skills within the leadership team.

In summary, key points for developing effective training programmes include having a training policy, identifying training needs, planning and executing training, and evaluating the training. It requires trainers to undertake activities such as planning and organization of training, determining training needs, managing the training function, providing direct training activities, and providing consultancy and advisory services. A training need is the shortfall – in terms of knowledge, understanding, skills and attitudes – between what the organization requires of its employees and what the employees are able to supply. Training plans follow on from the analysis of needs and are intended to make clear what training is to be provided, and how, when, by whom, where and at what cost. Evaluation of training activities is the final important piece of the training puzzle.

### 6.4 Initiating Education Programmes in Transfusion Medicine

Transfusion medicine is defined as a multidisciplinary branch of medicine that focuses on all the available medical, scientific and technical information applicable for the benefit of patients receiving blood products or related materials, produced by molecular biology and/or biotechnology techniques. Developing human capacity in transfusion medicine remains an essential focus of managing blood programmes if the correct talent and skills are to exist within the organization.
The major constraint in blood services is human resources, as it is often not attractive for doctors to go into the field of transfusion medicine. To address this constraint requires networking and lobbying for help in training specialists in transfusion medicine. Historically, a doctor who works in the laboratory has very little clinical involvement and focus on donor management and donor recruitment/mobilization.

In most countries, doctors are not trained in transfusion medicine. Donor-care nurses and blood donor organizers or recruiters undergo no preparation during their formal education programmes. Medical laboratory technologists are partially trained and have some skills, but need people to lead them. Scientists also have no specific training in areas such as transfusion microbiology or immunohaematology. Thus, on-the-job training has become very important, as has the use of the distance learning materials such as those provided by WHO.

Nurses may have good training in nursing skills, but the nursing school curriculum does not include specific areas such as donor care and management of blood collection. Scientists need specialized training in transfusion science, supplemented with short courses and regular updates. Doctors with a Master’s degree in Pathology or Haematology are not well equipped to look after blood banks and are often not effective in providing clinical transfusion services. Programmes to fill these gaps in formal training will therefore have to be developed in collaboration with universities.

Specifically, post-basic training should be developed and made available for nurses and medical laboratory technologists as part of their career development programmes. Such training for nurses should include clinical transfusion practices in addition to donor management. Similarly, postgraduate courses for doctors and scientists should also be made available. Programmes to fill these gaps in formal training may have to be developed in collaboration with universities.

It is essential to identify training needs and prioritize these if resources are limited. Training must be in line with the development of the service, and top management can be convinced to support programmes if there is an emphasis on needs. Networking with local colleagues in universities and colleges is very important if training programmes are to be developed.

### 6.5 Career Development in Transfusion Medicine

The focus of career development in transfusion medicine is to educate physicians about the specialty. Transfusion medicine can be considered as a distinct specialty or it may be considered as a part of haematology or another specialty. As a discipline, it is broad based. A transfusion specialist must know about donor care and selection, blood group serology, virus testing, component manufacture, human leukocyte
Management of National Blood Programmes

antigen (HLA) and platelet immunology, clinical use of blood products, haematology and haemostasis, among other subjects.

Each blood centre needs to determine the appropriate mix of specialist and non-specialist medical staff needed to run their services, which is determined by the volume and range of activities. Therefore, not all doctors working in blood centres need to be specialists in the field. A specialist in this case is considered as an independent practitioner in a field, i.e. has the ability to work unsupervised. Medical officers are able to work within a blood centre but would need to practise under the supervision of a specialist.

In general, for doctors to be able to practise medicine, they need to be medically registered and undergo a period of general professional training to gain experience. Specialist training is therefore important to enable them to undertake the tasks required. Additional experience and continuing professional development are needed to ensure that the knowledge and skills gained are maintained.

Developing specialist training programmes in transfusion medicine includes consideration of the necessary duration of the training programme, the role of the supervisor during the course of the training, the type of hospital settings included in the training, how much of the training is guided by transfusion specialists and how much by other specialists. These requirements will have to be defined within the context of each country, based on local circumstances. It is essential that any programme that is developed must give a clear idea to trainees about the type of training they will receive.

There is an international shortage of well-qualified transfusion medicine specialists, as it is not seen as an attractive or high-earning speciality. Training is expensive and time-consuming, and there is a need to develop systems to improve recruitment and retention of specialists. Postgraduate programmes should be accompanied by appropriate incentives or recognition that is on a par with other medical subspecialties.

Continuing professional development (CPD) programmes are mandatory for ongoing specialist recognition. The aim of CPD is ensure that medical specialists are aware of developments in their field. It is the responsibility of the individual doctor, but employers also have a responsibility to ensure that their employees participate. CPD should not just involve attending overseas meetings, but also requires access to appropriate medical journals.

The availability of well-trained and supported transfusion medicine specialists is an essential component of a modern transfusion service. Investment in structured training programmes and human resource planning is needed to ensure the availability of such specialists.
Developing Transfusion Medicine as a Career

requires collaboration with universities or similar institutions. Identifying and developing suitable individuals is necessary to ensure the right skills mix. Qualification as a specialist is the beginning of a pathway of ongoing training and education.

6.6 People Developer and On-the-Job Training Programs in the Health Sciences Authority

The People Developer Framework

The National People Developer Framework in Singapore has three main dimensions: commitment, implementation and follow up. The chart below illustrates each of the components within these dimensions.

Diagram 8: Components of the National People Developer Framework

Through its vision, mission and core values, the business plan and objectives of the organization are set. These two components help to shape and influence its HR strategy. HR sets the key measures and indicators of performance based on its ability to implement this strategy. The HR strategy and KPIs are reviewed and approved by the organizational HR Committee.

In recent years, the term “training” has been changed to “learning” in many organizations, in recognition that this is a two-way process.
Learning needs should be aligned with the organization’s business plan. Core training programmes are identified based on the organization’s goals and included in the training plan. Staff and supervisors conduct post-course evaluations on completion of the training programme. Trainees evaluate and recommend if the course should be continued. The effectiveness of training is determined at the individual programme level, and then the correlation between training results and desired outcome of the training programme is analysed.

The career development process begins at the time candidates are shortlisted. Shortlisting and recruitment are based on the job requirements set out in the job description. From the start of employment, each individual creates a learning plan with their supervisor and then has a work review mid-year, and performance appraisal at the end of the year to track their progress. Performance and estimated potential will be used by the ranking and promotion committee for promotion purposes. Internal job openings and lateral transfer of staff are also seen as career development opportunities for staff.

In succession planning, the estimated potential of staff is evaluated through the performance appraisal system. Feedback will be given to HR so that appropriate talent management programmes can be provided to groom potential successors for critical positions.

All newly employed staff should undergo an orientation programme. The HR Department organizes a general orientation programme which covers the corporate policies, organizational structure and employee benefits within the organization. The professional centres are responsible for internal job orientation to train the officer in the technical and professional aspects of the job. A “buddy” will also be assigned to help the new staff to settle in.

The blood service in Singapore is nationally certified as a certified on-the-job training centre (COJTC). The definition of the OJT programme is the systematic coaching of employees by direct supervisors or certified trainers in the workplace through actual work. The objective of the national system for COJTC is to institutionalize structured OJT and to accord recognition to skills acquired through OJT.

The benefits for organizations such as HSA in having an COJTC status include national recognition for commitment to training. This is in line with the People Developer Standard (PDS) process, and enhances HSA’s image among existing and potential employees. The Institute of Technical Education (ITE) oversees the awarding of COJTC status. The joint ITE–HSA certificate that is issued on completion of OJT provides a reward and motivation for employees who upgrade their skills. It also develops the senior staff’s potential as they are trained and certified as OJT Programme Developers and OJT Instructors. The OJT certificates
recognized by ITE can be used for entry into relevant National Trade Certificate 3 courses (higher-level training for candidates) and also enables the organization to tap financial support from a national Skills Development Fund (supportive mechanism).

The benefits of implementing the PDS in the organization are that it links training to career development, evaluates the impact of training on business, uses feedback to continuously improve, and requires HR and line managers to gain experience as process consultants.

Challenges continue to exist in the area of staff development. Examples include: aligning staff needs with organizational needs, sustaining training efforts, monitoring improvements (behavioural changes), and long-term efforts and continuity. Some ways to overcome these obstacles include having focus group sessions, seeking employees’ opinions, innovative working arrangements, encouraging opportunities for communication, targeted team-building and culture programmes as core programmes, and collaborating with the local union. The effects of such efforts on employees are a boosting of their morale, thereby helping staff to feel valued, and expanding their capability and capacity.
7. Effective Communication

7.1 Principles of Communication - 7 Sins and 7 Virtues

For communication to be effective, it is important to keep the message short and simple. The basic principles of communication can be described as seven sins and seven virtues.

The seven sins are:
- Lust: we want, but we do not connect.
- Gluttony: we get what we want, but it is never enough.
- Greed: we have our goals, but no values.
- Sloth: we show and tell, but we do not know enough.
- Wrath: we do not like, so we hit out without thinking.
- Envy: we see, we sigh, but we do not really see what people are about.
- Pride: we know our stuff, but we do not know how to connect.

The seven virtues are:
- Faith: connect with our cause/mission.
- Hope: get across our wish to connect.
- Charity: get it across that we care.
- Fortitude: get across our integrity; it takes courage to tell the truth.
- Justice: commit to balance and fairness.
- Temperance: practice self-restraint in stating the relevant and maintaining perspective.
- Prudence: this means good sense, which means good taste. This is how we connect.

In all communication, it is important to understand the other person’s needs, desires, fears and aspirations. In the context of the blood service, content is equally important in communications, for example, understanding the different components of blood. Good communication should have relevance, accuracy and clarity. Making communication content fun can be effective too, but only when used appropriately and in the correct context.

7.2 Managing Communication

Managing communication through the media, through outreach programmes, and during a crisis is a burgeoning issue for blood service centres. The media is used as a way of communicating to the masses and
can be done through various mediums such as print media (magazines, newspaper), broadcast media (television and radio), and digital media/new media (web sites, blogs, online forums).

Relating to the media provides opportunities to raise awareness, mobilize the public around events or causes, and improve the organization’s image. It can be used to present or challenge a particular point of view, or the way the organization’s issues are covered. It can also assist in the effort to recruit people or volunteers, raise funds and donations or enhance services.

The relationship with the media is a two-way relationship, and the media can be a friend or foe. It is vital that organizations harness the skills to handle the media, especially in difficult situations. It is important to work with the media in a relationship of trust and confidence as it enables the media to report facts reliably.

Because the media has a commitment and accountability to the public, media content often relates to what the public would like to hear. This can be in the form of hard news (events happening now, serious information) or soft news (follows hard news, how the hard news has affected people).

Organizational spokespersons should be trained to deliver the needed messages effectively. For example, do not use terms such as “No comment”, “Off the record”, jargon and acronyms. It is also advisable to avoid the following: repeating questions and phrases, lying and confusing the media, making demands and playing a blame game. Messages provided to the media must be more than a “spin”, and must reflect the genuine action, practices, commitment and ethics of the organization.

Tools of communication include press releases, media advisories, interviews, “op-ed pieces”, news or press conferences, briefings, seminars, news features, etc. Organizations can prepare to handle queries through the use of holding statements and frequently asked questions (FAQs). Press releases should have catchy and concise titles. The lead paragraph should contain important information and the objective of the release, and the body of the release should include one or two paragraphs to explain the issue. The release should close with the organization’s position statement and who to contact for further information.

In managing print interviews, the angle of the story must be developed in advance. It is useful to adopt the practice of using no more than three key messages. Objectives must be stated at the beginning and, if unrelated questions are asked, the answers should bridge back to the key messages. Most of the time, interviews are not live, and there is time to summarize one’s thoughts.
In television and radio interviews, it is important to know the audience and the interviewer, initiate conversation rather than give a speech, and keep to the point. Try to adapt and control behaviours such as fidgeting during a television interview. In radio interviews, appearance is not an issue but the voice must be able to deliver the message effectively. Varying the tone of voice is useful.

Press conferences are difficult and it is important to consider the relevance of a press conference carefully. Communication during a press conference should include the objectives of the conference, the current situation, facts and figures to support what is being communicated, any repercussions of the situation, the direction that is being taken, and the call for action if any. If there is a call for blood donors, the target audience and eligibility criteria should be stated clearly.

During a crisis, there is an even greater need to manage the media well. It is important to be prepared in advance, and the organization’s disaster management plan should include details about communication and media activities during a crisis. During a crisis or disaster, assess the situation and gather the facts. Information should be provided through one central information source and a proactive approach adopted to external communications. Holding statements can be used until more information is received to enable specific statements. Events should be recorded as the crisis evolves, and communication plans regularly updated.

7.3 Methods of Communication

It is important to recognize the different methods of communication and their appropriateness based on the reason for the communication and the target audience.

A non-exhaustive list of communication methods that can be employed is as follows: press release; television; radio; web site; newspaper; newsletter; music; party; teleconference; lecture; seminar; press conference; text messaging; e-mail; fax; bulletin; and road show.

The various communication methods may be used in different ways: formal versus informal, individual versus group, internal versus external, and lateral versus vertical methods. In communicating with donors, one-to-one approaches such as writing to the donor or sending them a text message are effective methods. For example, sending an invitation letter to donors two weeks before they are due for their next donation has proven to be a useful way by which to encourage them to make an appointment to donate.

Using online tools such as a web site to provide information is another good method of communication that can extend the reach to the public.
Communication with stakeholders such as hospitals may involve methods such as the use of electronic links or a fax that enables the hospital transfusion laboratory to provide updates on their blood stock levels.

### 7.4 Social Marketing and Developing Effective Communication Strategies

Blood programmes depend on effective social marketing strategies for success. Social marketing is the application of generic marketing to a specific class of problems. Its objective is to change social behaviour for the sake of the target audience and general society. The goal of social marketing is not to market products and services, but rather to influence social behaviour, e.g. stop smoking, encourage blood donation.

Different types of programmes to change social behaviour exist, with varying levels of difficulty – one-time behaviour versus continuing behaviour, individual decision versus group decision, and low involvement versus high involvement. In blood donation behaviour, it is common to begin with one-time behaviour and aim for continuous behaviour as the goal. High involvement and continuing behaviour change are the most difficult.

Influencing behaviour is primarily a matter of communication. Communication involves informing the target audience about alternatives for action, positive consequences of choosing a particular one, and motivations for acting in a particular way. Everything about an organization – products/employees/facilities/actions – communicates something.

Organizations must therefore examine their communication styles, needs and opportunities, and develop a communication plan that is influential and cost-effective. Communication plans should take into consideration parties other than the target audience; this includes external parties (e.g. press, government agencies) and internal parties (e.g. board members, middle management, employees and volunteers).

For effective communication to occur, communication objectives need to be in place before generating potential messages. Messages could be rational, emotional or moral in nature, and should work at overcoming selective attention and perceptual distortion in the target audience. Careful evaluation and selection are required to select one message that is the most desirable, exclusive and believable. Message execution is also important, e.g. the difference between “Give blood, save life”, “Be a lifesaver, give blood”, and “Give blood, give life”.

Social marketing is often conducted under intense public scrutiny so it must meet high expectations (example: 100% voluntary non-remunerated blood donations), influence non-existing demand
(example: contraception in some countries), or influence negative demand (example: putting on seatbelts).

It is often required to target the less literate audience, and may involve the need to understand highly sensitive issues. It can focus on many benefits, of which most are invisible (good feeling after donating blood), or a tangible benefit to third parties. A long-term view is central to planning, and limited resources are a reality that must be taken into consideration.

Good social marketing begins with a philosophy that is deeply rooted in the target audience, and involves many factors. Information exchange is central, and marketing management is about influencing that exchange. Consumers make decisions based on choices among alternative behaviours that vary in benefits and costs. There must be willingness by the marketer to change the product being offered, i.e. behaviour being promoted. Customers may not always agree (e.g. because blood donation is painful), and different strategies (e.g. how to make it less painful) may have to be considered.

Market research is important to determine customer needs and wants, and should be conducted at the start of strategy development and constantly reassessed. Experiment with alternative strategies to determine the most effective marketing methods. There is usually diversity in the target audience’s needs, wants, lifestyle, perceptions, preferences, and strategies should be fine-tuned to the needs and wants of each subpopulation.

Bottom-line orientation is important and marketers need to be mindful of limited resources. This requires them to keep evaluating the cost-effectiveness of the marketing plan, with constant attention paid to the efficiency and effectiveness of everything that they do. There must be commitment to planning and to thinking systematically through the major steps to be undertaken. There must also be a willingness to take “reasonable risks”, which incorporates formal calculation of inherent risk into decision-making processes.

Sustainability and institutionalization are important considerations, as many social marketing programmes may be temporary in nature, and may be subsidized by “outside” organizations. Steps must always be taken to train local staff in critical marketing skills.

### 7.5 Developing Communications Plans

The main elements in the process of communication include the source (communicator), the message (set of symbols), the medium (channel), the receiver (target audience) and the response (feedback).
The message developed must have clear content, and channels could include the mass media, pamphlets, posters or newspapers. Other means of facilitating communication could be the use of effective promotion programmes, advertising and leveraging on networks. Depending on the need, one could use mass (able to reach large number of people) or interpersonal (persuasive, stronger impact) communications.

While developing a message, it is important to know the target audience and the environment, such as the characteristics of the people in the community and cultural factors. The objective of the message should also be kept in mind, for example, to get more regular blood donors. Messages could be connotative (essentially feeling and relationship) or denotative (primarily literal and factual) in form, or rational versus emotional. In planning the delivery of the message, the promotional component (what to promote) and specific activity (how to promote) must be determined.

Some key issues surrounding communication on blood donation are health and social aspects, building relationships, the image of the BTS as a receiver and giver, as well as donor management.

Developing communication plans starts with analysing the situation and environment, and then setting the promotional objective and defining the target audience. The message must be well defined, appropriate channels selected, budget prepared, and the promotional mix chosen. Following implementation of the plan, the results should be evaluated for effectiveness.

Communications involving blood programmes usually involve the following target audiences:

- Public, e.g. to encourage blood donation
- Government, e.g. to establish a national blood programme
- Media, e.g. tainted blood, transmission of disease through transfusion
- Blood donor, e.g. reactive for transfusion-transmissible infection (TTI) screening
- Patient, e.g. transfusion of possibly tainted blood.

When dealing with the public and community, facts and accurate information must be provided and appropriately delivered in both language and form. The appeal to the target audience could be either rational or emotional, e.g. we need blood to replenish our stock versus a bleeding patient needs blood. The response should be monitored and the effectiveness of the plan evaluated.
When communicating with blood donors, it is crucial to tell the truth, give the facts, gauge response, evaluate understanding of the facts given, encourage questions, and not adopt a judgemental attitude.

In the case of the media, inform them that certain things cannot be compromised (e.g. safe blood donors, public trust), be conscious of public sensitivities and be clear about roles and responsibilities. It is useful to engage the media as partners and to bring them on your side.

With the government, it is useful to have a clear objective, to present clear facts with local data, and to provide an assessment of the situation if the proposed intervention is not carried out.
8. Managing Risk

8.1 Approach to Risk Management

Every organization should build itself up to become a risk-intelligent enterprise.

There are nine principles for building a risk-intelligent enterprise, and these can be categorized into three broad areas: Risk Governance, Risk Infrastructure and Oversight, and Risk Ownership (Diagram 9a, b).

Diagram 9: Building a risk-intelligent enterprise

a)
At the top of the pyramid is Risk Governance. The second level is Risk Infrastructure and Oversight, which focuses on the processes, people and systems in place. The foundation of the pyramid deals with ownership, which involves whoever is responsible for managing risk.

**Principle # 1: In a risk-intelligent enterprise, a common definition of risk, which addresses both value preservation and value creation, is used consistently throughout the organization.**

Is risk a threat or an opportunity? Defining risk is very important and finding the best way to do so can be considered an art rather than a science. Other than using the terms threat or opportunity, risk can also be described in a neutral way to prevent misunderstandings and conflicts among stakeholders. For instance, “blood contamination” can be phrased in a neutral way, such as “safeguarding blood supply”.

Regardless of whether risk is described in a positive, negative or neutral manner, the definition must fit well with the organization and capture the essence of where the risk lies. This is important when formulating plans, wherein the appropriate stages can be targeted and managed.
Principle # 2: In a risk-intelligent enterprise, a common risk framework supported by appropriate standards is used throughout the organization to manage risks.

Having a standard will help to ensure that established processes are being put in place. Standards used will have to be adapted to the organization’s requirement and resource constraints.

Principle # 3: In a risk-intelligent enterprise, key roles, responsibilities and authority relating to risk management are clearly defined within the organization.

In this respect, proper communication and awareness are important factors for relating these definitions to all staff. In particular, frontline staff can then recognize their critical position in the risk situation of the organization, and carry out their roles and responsibilities better.

Principle # 4: In a risk-intelligent enterprise, a common risk management infrastructure is used to support the business units and functions in the performance of their risk responsibilities.

After defining what risks exist within the organization, a common language or medium should be used to define the level of risk, i.e. high or low. This prevents confusion and misunderstandings that can arise from the lack of a common infrastructure.

Principle # 5: In a risk-intelligent enterprise, governing bodies (e.g. boards, audit committees, etc.) have appropriate transparency and visibility into the organization’s risk management practices to discharge their responsibilities.

Transparency and visibility into the organization’s risk management strategy allows stakeholders to know the risks at all levels. This enables informed decision-making for effective risk management, as opposed to instilling more control and procedures.

By knowing the risks, stakeholders will already have the same understanding whenever risks are to be taken. Furthermore, if a certain risk is not perceived as being easy to manage, it can be shared with the partners involved. In particular instances, risk can also be transferred, by way of insurance, to lessen the impact. Otherwise, if the risk is too high and there are too many uncertainties, it can be avoided.

Principle # 6: In a risk-intelligent enterprise, executive management is assigned with the primary responsibility of
designing, implementing and maintaining an effective risk management programme.

Risk management begins from the top of the organizational hierarchy; this is the key success factor. A risk management programme will fail if there is no support and appreciation from the top management level.

**Principle #7: In a risk-intelligent enterprise, business units (departments, agencies, etc.) are responsible for the performance of their business and the management of the risks they take within the risk framework established by executive management.**

This principle addresses risk ownership. If ownership is not clearly established, problems will emerge. Roles and responsibilities must be clearly defined and communicated.

**Principle #8: In a risk-intelligent enterprise, certain functions (e.g. finance, legal, IT, HR, etc.) have a widespread impact on the business and provide support to the business units as they relate to the organization’s risk programme.**

In relation to the organization’s risk programme, these functions play the role of the risk support team. Thus, it is important to identify critical functions and establish support infrastructures. In some cases such as IT support, the infrastructure does not necessarily need to be sophisticated; for example, a spreadsheet or access database will be sufficient. The extent of contribution of each critical function to risk management should be defined as well.

**Principle #9: In a risk-intelligent enterprise, certain functions (e.g. internal audit, risk management, compliance, etc.) provide objective assurance as well as monitor and report on the effectiveness of an organization’s risk programme to governing bodies and the executive management.**

Having a risk observer is useful and is becoming more of a requirement in an organization. People at the supervisory level can be assured of proper risk management with regular checks and balances in place.

**Additional considerations**
First, in managing risk, the focus should be on ensuring minimal loss, rather than on maximizing returns. Second, risks are often interrelated and hence they cannot be considered in isolation. Finally, organizations should not forget to consider low-frequency, high-impact risks. Though rare, such events can cause huge losses that are detrimental to organizations. Preparations against such risks include building up strategic flexibility to handle these specific situations, as well as “stress-testing” to ensure that business processes can withstand the impact.
### 8.2 Crisis Management

The possible sources of crisis in a BTS are endless. Generally, crises can be categorized into “external” and “internal” crises. Examples are listed in the table below. Effort should be invested to consider the possible consequences of these, and implement measures to ensure that services and excellence in quality are maintained even amid crisis situations.

**Table 3. Examples of external and internal crises in BTS**

<table>
<thead>
<tr>
<th>External</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product defect</td>
<td>Relocation / plant closures</td>
</tr>
<tr>
<td>Sabotage, terrorist attack</td>
<td>Labor disputes</td>
</tr>
<tr>
<td>Plant or site incidents</td>
<td>Financial crises</td>
</tr>
<tr>
<td>Natural disasters (e.g. hurricanes, floods)</td>
<td>Fraud</td>
</tr>
<tr>
<td>Widespread disease (e.g. epidemics)</td>
<td>Company mismanagement</td>
</tr>
<tr>
<td>Pressure groups</td>
<td>Executive dismissals</td>
</tr>
<tr>
<td>Consumer boycott</td>
<td>Sexual harassment</td>
</tr>
<tr>
<td>Hostile takeovers</td>
<td>Bacterial contamination of blood</td>
</tr>
<tr>
<td>Class Action Lawsuits (e.g.</td>
<td></td>
</tr>
<tr>
<td>wrong procedures used in blood collection)</td>
<td></td>
</tr>
</tbody>
</table>

It should be noted that crisis management is different from risk management, in that there is essentially no scoring system in assessing crisis. A scoring system is used in risk assessment to determine whether a risk is high or low.

A hazard does not necessarily lead to a disaster. A disaster happens when there is a combination of a hazard and the lack of ability “to cope”; that is, undue vulnerability.

**Diagram 10: Disaster: a combination of vulnerability and hazard**

![Diagram 10: Disaster: a combination of vulnerability and hazard](image_url)
When a disaster strikes, the first half an hour or so is the most important. This crucial period of time can be handled well if the management knows the organization’s vulnerability and capacity. Vulnerability relates to an individual’s, an organization’s or a community’s capacity to cope with specific threats at a certain point in time. Capacity refers to the resources of individuals, organizations and communities to cope with a threat or resist the impact of a hazard. Identifying the strengths and weaknesses, as well as threats and resources of an organization, is important for effective disaster management.

It is important to have a reliable disaster plan. The following actions are recommended to prepare an organization for crises:

- Provide disaster management training.
- Ensure that contingency planning is available for staff deployment, logistics and blood inventory, etc.
- Establish proper communication and reporting systems.
- Provide training in resource management.
- Conduct risk assessment and mapping.
- Organize simulations, drills and exercises.
- Set up volunteer management systems.

The intention should be to reduce risk. Developing disaster response plans and training staff through simulations and drills are ways to reduce risk.

**Disaster response plan**

The goal of disaster management is to ensure that the blood supply is still adequate and not affected in the event of a local emergency. This can be achieved by having a disaster response plan in place.

**Table 4. Components of a disaster response plan**

<table>
<thead>
<tr>
<th>Disaster response plan</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear definition of a disaster situation</td>
<td>I.e. A situation that:</td>
</tr>
<tr>
<td></td>
<td>• Temporarily restricts or eliminates the ability of BTS to collect, test, process, store and distribute blood</td>
</tr>
<tr>
<td></td>
<td>• Creates a sudden influx of donors requiring accelerated drawing of blood to meet emergent needs</td>
</tr>
<tr>
<td>Disaster response plan</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| Identify and manage key processes that are critical for continuity of blood services | • Donor Recruitment  
• Blood collection  
• Donor Database  
• Post donation notification & donor call back  
• Mandatory blood testing, including NAT  
• blood component preparation  
• blood storage, distribution and transportation  
• Information system management. |

<table>
<thead>
<tr>
<th>Emergency Response Team</th>
<th>Members:</th>
</tr>
</thead>
</table>
|                        | • CEO or Director (Team Leader)  
• Department Heads & Managers  
• Public Relations Manager  
• Co-opted membership  
• Deputies |

| Command Centre | Specify location  
• Specify Mode of communication i.e. via land phone lines  
• Responsible for gathering information about the event i.e. nature of event, initial details, impact of event, public and media responses |

**Awareness**

Awareness is a key factor for preparedness. Ensure that all staff are familiar with the content of the plan for execution. Establishing general operating principles will help communicate the plan clearly to staff.

General operating principles should mainly address staff roles and responsibilities, blood processing activities and documentation. It is recommended to include the following pointers:

**Staff responsibilities**
- Exercise confidentiality with regard to contact with non-BTS staff and the public.  
- Be prepared to return to work when possible or be relocated within the site or to emergency sites or to a different role to effect the plan.

**Donor management**
- Staff should understand that donors may respond emotively.  
- Continue to adhere to established screening procedures and deferral policies.  
- Expand blood collection facilities.
- Increase the number and capacity of donation drives to accommodate a surge in blood donors.

**Blood processing**
- Ensure that normal approved methods are used despite an emergency situation.

**Documentation**
- When there are deviations from standard practices
- When blood is imported through differing Good Manufacturing Practice (GMP) standards.

**Risk assessment and emergency planning**

Risk assessment in emergency planning allows for quick assessment of the emergency situation and deciding on the appropriate and relevant responses. This includes assessing the severity of the disaster, estimating its duration and deciding if the disaster response plan should be activated and to what extent. It should also identify the impact of the disaster and estimate if there will be any increase in blood needs. During the entire disaster management process, there should be continuous reassessment and refinement of management. When the disaster is over, the disaster response plan should be deactivated. The aftermath of the event should be properly managed as well, such as handling the media and counselling the staff.

**Donor recruitment and blood collection**

- Assess the impact of the disaster on the baseline blood inventory, and estimate the demand for blood and the urgency.
- Assess potential risks to safety of blood, donor and staff.
- Establish channels and a publicity plan to call for donations.
- Assess the requirements for human resources, materials and other resources to meet the required blood collection target and plan staff mobilization.
- Establish channels to mobilize additional resources to support blood collection.
- Expand blood collection facilities if necessary.
- Establish standard and consistent communication channels to handle public and media enquiries.
- Keep hospitals, the public and donors informed of the latest situation.

**Publicity/media handling**

- **Communication network**
  - Engage the mass media – radio, television, web site, SMS and e-mail to communicate with the general public and donors;
  - Provide a clear message to the public regarding the quantity
of blood required and arrangement for blood collection such as the place and time;
  o Establish both internal and external communication to direct donors to donor centres/collection sites to avoid overcrowding at one site.

• **Media handling**
  o Prepare a press statement.
  o Identify a spokesperson.
  o Monitor and follow up on media enquiries.
  o Ensure internal communication with staff and stakeholders on the press line to ensure consistency.

### Laboratory service

- Establish baseline capacity.
- Plan for the supply of critical materials:
- Make necessary arrangements with suppliers of critical materials, such as blood bags, test reagents and accessories, for expedited delivery of these materials if deemed necessary.
- Response to crisis
  - Assess the situation (nature, location, gravity, impact on blood demand, duration, public and media responses, inventory level, etc.).
  - Prepare a detailed response plan.
  - Mobilize personnel.
  - Implement planned strategies.

### Blood inventory planning

- Liaise with the hospital to estimate the demand for various components and the necessary blood groups.
- Plan blood collection.
- Collect Rh D-negative and rare blood.
  o Solicit donor support.
  o Conduct scheduled or emergency donation.
  o Freeze and store red cells.

Essentially, no organization is safe from crisis. Being appropriately and sufficiently prepared is an absolute necessity for every organization.

### 8.3 Risk communication

The risk analysis framework includes *risk assessment* where hazards are identified and described, followed by *risk management* and *risk communication*. 
Risk communication is the process by which people are informed about potential hazards to their person, property or community. It has become a science-based approach for effective communication to stakeholders, the public or government during situations of high stress, great concern or controversy. Such situations are not uncommon in BTS today. From the risk manager’s perspective, risk communication helps residents of affected communities to understand risk assessment and management, and to form scientifically valid perceptions of the likely hazards, and participate in making decisions about how risk should be managed.

The National Research Council, in 1989, defined risk communication as “an interactive process for the exchange of information and opinions among individuals, groups and institutions. It is a dialogue in which many messages are discussed. These messages do not refer only to the nature of the risk, but also to the concerns, opinions or reactions of individuals to risk messages and to legal and institutional arrangements for risk management.”

There are myths surrounding the communication of risk to the public, such as “We don’t have enough time or resources,” “We will probably alarm the people,” “If only we could explain the risks clearly,” “We shouldn’t inform them until we have solutions,” “This is very difficult for them to understand,” etc. These preconceived ideas often hinder proper risk communication.

Risk communication is important because it provides the opportunity to communicate health risks in a planned way. At the same time, it is sensitive to the needs of the community. In addition, the community can be incorporated into the process of risk management. As a result, it can help to build trust and credibility while alleviating fear and outrage. Good risk communication makes people understand and accept the risk better and provides guidance on protective behaviour and actions. Choosing the appropriate mode of communication is also important as no message is effective if the intended audience does not listen to it.
Important elements of risk communication are the source, message, media and audience or community.

**The source** - Success is often linked closely to trustworthiness and credibility of message source (risk communicator) in the eyes of the message recipient

**The message** - Most information is more easily understood if transmitted in a simple way

**The media** - Major source of information for public perception of risks

**The audience or community** - Social group to which the message is directed, they may or may not be affected by the event but are interested in it anyway

There are generally two goals in risk communication: *instrumental* and *relational*. When communication is instrumental, the transmission of information is intended to affect the attitudes or behaviour of the receiver; e.g. if potential blood donors trust that blood donation is healthy, they will donate blood. On the other hand, communication can be relational; it builds and reinforces a climate of mutual trust and acceptance between the sender and receiver relative to the potentially threatening event or condition. The relational goal is important because it influences the likelihood of meeting the instrumental goal.

### When to communicate risk

*Preventive risk communication* is the communication of risk before it occurs. This takes place during the period between public awareness of the existence of a risk and the actual occurrence of any hazardous incident as a result of that risk.

This phase should be taken advantage of so that risk communication can be developed in a way that is geared to the state of affairs and to the target groups. The aim is to gain, promote and maintain trust, credibility and acceptance among all those who are part of the communication process. This will also be helpful in the later stages of the crisis.

Communication of risk when it occurs is known as *crisis communication*. It accompanies the incident from start to finish and depends on the type of crisis.

The goal during this stage is to gain control over the external and internal flow of information within the organization. The communication of an organization should not be cut off completely during a crisis. Cutting off the flow of information will create an information vacuum, resulting in public suspicion, loss of trust and panic among the people. Preventive communication, in the previous phase, can be used to build up trust and credibility, and hence provide a system of coordinates to work within even during a crisis.
Communication following the risk is known as *reflective communication*. The more “sensational” a crisis, the longer is its presence and the more intense its association. As the crisis fades out, crisis communication seamlessly gives way to reflective communication. This phase involves analysing the actual behaviour of the media and the public during the crisis situation with the intention of assessing and optimizing risk communication. The goal of this is to restore the image of the organization after it has been tarnished by a crisis as soon as possible, as well as to regain the public’s lasting trust and acceptance.

**The communication process**

The word “communicate” originates from the Latin word *comunicare*, which means “to transmit”. Transmitting a message implies that a message is sent out from one person, the “sender”, and received by another person, the “receiver”. In between the sender and the receiver, meaning is constructed out of the message as it passes through the factors and influences of both persons’ lives.

**Risk perception**

*Experts versus non-experts*

Experts in BTS rely on risk assessment that is objective, analytical, rational and based on the actual risk. However, the public or non-experts may base their thoughts on perceptions of risk rather than real risk, resulting in perceptions that may be subjective, hypothetical, emotional and irrational.

During the process of risk assessment, a risk may be considered a hazard by the experts, but perceived as an outrage by the public. Here, risk communication will play a vital role in establishing a common ground of understanding between the experts and the public.

*Acceptable versus non-acceptable risks*

Risk perception can be influenced by the various characteristics of hazards, resulting in two ways of perceiving risk: acceptable risks and unacceptable risks. In general, the following characteristics are seen:

**Table 5. Acceptable and unacceptable risks**

<table>
<thead>
<tr>
<th>Acceptable Risks</th>
<th>Unacceptable risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary</td>
<td>Involuntary</td>
</tr>
<tr>
<td>Under your control</td>
<td>Controlled by others</td>
</tr>
<tr>
<td>Clearly beneficial</td>
<td>Of little or no benefit</td>
</tr>
</tbody>
</table>
Managing Risk

Acceptable Risks | Unacceptable risks
--- | ---
Fairly distributed | Unfairly distributed
Natural | Man-made
Statistical | Catastrophic
From a reliable source | From unknown sources
Familiar | Unfamiliar, exotic
Those that affect adults | Those that affect children
Reversible | Permanent

Underestimation vs. Overestimation

When the public estimate the risk on their own, they may be underestimating or overestimating. Underestimation leads to optimistic bias, apathy and fatalism. Overestimation leads to emotional responses, especially fear.

Perception Bias

There are three ways by which Perception Bias is produced. *Availability bias* – Perception is developed based on the probability of how easily the event can be brought to mind. *Anchor bias* – Perception is developed based on particular information of the event. *Optimistic bias* – Perception is developed based on the belief that one is at slightly lower risk than the population at large.

Table 5. Acceptable and unacceptable risks
The matrix system attempts to classify the different “dimensions of risk perception” and the best approach to adopt in addressing the risk. Thus, “high outrage high hazards” needs crisis management, “high outrage low hazards” needs outrage management, “low outrage high hazards” needs public relations and “low outrage low hazards” probably needs little intervention.

**Determining risk perception**

Some factors which influence an individual’s risk perception include the individual’s level in Maslow’s hierarchy of needs, individual and social values, culture, experiences, level of education, outrage factors, who the person is and how they are affected, and the level of control over the event.

The following questions can be considered when determining risk perception.

- What kind of individuals is the public made up of?
- What factors determine risk perceptions/attitudes?
- How are risk perceptions and attitudes manifested?
- What can be done to soften attitudes regarding risk?
- Questioning elements of the risk:
  - How true is the risk?
  - What is the absolute risk?
  - Are you really at risk?
  - What is obtained in exchange for the risk?
  - Can you do anything about the risk?’

**Building trust**

Trust is very important because how the public reacts depends largely on their fears of actual risks. There are five key elements to building trust:

- Empathy and care
- Competence and expertise
- Honesty and openness
- Commitment
- Accountability.

**Planning risk communication**

The risk communication process should be properly planned, particularly when it involves dealing with the worries and concerns of the public.

Steps should be taken:
- to seek the sources of information;
- to form a communication team;
Risk communication tools used may be written, verbal or visual statements containing information about the risk. These statements should put a particular risk in context, advise on risk reduction behaviour, and encourage a dialogue between the sender and receiver of the message. Comparisons with other risks may be added as well. Usually, the best risk communication takes place when both parties are informed and the process is fair.

Organizations should pay attention to the seven cardinal rules of risk communication:

- Accept the public as a cooperating partner.
- Listen to the public.
- Be honest and flexible when listening to the opinions of others.
- Coordinate and cooperate with other agencies/groups that have credibility.
- Meet the needs of the media.
- Speak clearly and with empathy.
- Plan carefully and assess the activities.

The message

The response from the public will depend on how a message is composed. When composing a message, it is important to consider what the community wants to know, what the community needs to know, and also what we want the community to know. It is recommended that each message should not convey more than three key points.

Generally, there are three aspects to a message: the content (the information to be conveyed); the medium (how the information is conveyed); and the target (the person(s) to be influenced by the information). Messages are usually designed for non-experts, so complex information should be simplified.

In this context of risk management, information should include:

- nature of the risk
- benefits of reducing the risk
- available alternatives
- uncertainty of the risks and the benefits
- the aspects of risk management.

Especially in risk communication, all available information should be conveyed as soon as possible and continually updated as progress is
made. Communication should be open and honest, especially when information is lacking. The public should also be informed of the process of information gathering in order to prevent miscommunication.

**Risk comparisons**

Risk comparison can help people to compare the magnitude of risk. This is best done by comparing the same risk at two different points in time, comparing the risk against a standard, or comparing between different estimates of the same risk.

**Mass media**

The mass media exercise strong influence on the people. In order to tap the power of the mass media, one must know the different types of media, e.g. television, radio, newspapers and the Internet.

In addition, it is important to have a trained spokesperson. The spokesperson should be the first to inform the media, and be able to say the right thing in a credible manner. What is conveyed by the spokesperson must be consistent with the other messages.

**Communication during an emergency**

During a serious emergency, the people who are affected will perceive and react to information differently. The public gauges the success of the operational response by the amount of relevant information it receives and the speed with which it is delivered. The organization must not over-assure the public, but acknowledge that there is a process in place to handle the situation. Information should be clearly and confidently conveyed.

Public messages during a crisis may follow the STARCC principle: Simple, Timely, Accurate, Relevant, Credible and Consistent.

Ultimately, successful communication between the organization and the public relies on credibility and trust; that is, the credibility of those providing the information and the trust they inspire in the public. Other important factors include a good knowledge of the target audience, an effective message, proper planning as well as appropriate use of the media in conveying messages.

**8.4 Disaster preparedness and planning**

Preparing and planning for disasters is essential to ensure continuity of blood supply, and ascertain that supplies, logistics and trained staff would be available during the emergency. This is a part of risk management
and enhances stakeholder confidence in the blood service, as well as strengthens the case for assistance by government/funding agencies in providing resources.

In planning for disaster preparedness, the impact of the disaster on critical elements of the blood programme must be identified first, and appropriate action plans developed thereafter. Coordination plans must be developed with other stakeholders and agencies involved. SOPs must be written up and staff training conducted in anticipation of potential events. Supplies, facilities and logistics should be organized. Readiness must be tested, gaps identified and plans reviewed at regularly identified intervals.

Various disaster situations are likely to create different needs. Disasters resulting in physical trauma generally result in the need for large volumes of blood, and may disrupt communications/transportation and power/water supplies. Biological disasters are usually associated with a drop in donor attendance, donor deferrals and decreased blood requirements. Pandemic situations may disrupt infrastructure, result in curfews and quarantine, and lead to staff and supply shortages. Disasters involving the blood bank may result in disruption of operations, possible loss of staff and blood/blood components.

All disasters will impact the public, blood donors, blood service staff, volunteers, patients, hospitals, and blood bank processes, logistics and facilities.

The elements of disaster plans include: command and control structure; communication with the public, donors and stakeholders; HRM; blood inventory management; supplies and materials; facility integrity, adequacy, security; logistics (transportation and communications); and coordination with other units, agencies and countries.

In developing plans to manage disaster scenarios, the blood service must determine whether such scenarios may lead to a need for more blood and, if so, whether there is sufficient blood available or whether additional supply is required. If additional blood is required, then it should be made available before the immediate inventory runs out. Collection, processing, testing and distribution of additional blood must be planned for, and the supply adjusted to meet the demand.

During a disaster, the first step should be to identify how much blood is actually needed and whether there will be a sufficient supply. Based on this information, appropriate and accurate messages should be provided to the public and blood donors. This ensures that the public is not alarmed unnecessarily, which would otherwise lead to long-term disillusionment and loss of confidence in the blood programme.
When developing a preparedness plan for disasters that require large amounts of blood, the BTS must consider the following:

- Determine policies for the management of emergencies.
- Identify the command and control system, roles and responsibilities.
- Manage blood donors.
- Develop communication plans.
- Have plans for scaling-up operations.
- Ensure that there is a communication and distribution network with hospitals.
- Make arrangements for additional supplies, transportation, food, water, etc.
- Include the entire organization in planning.
- Coordinate with the other organizations involved.

In scaling up operations, additional space requirements need to be identified, and crowd movement and security planned. Mobile sites that can be used during emergencies are ideally identified in advance during contingency planning to enable speedy activation. Additional staff should be trained and readied, and a recall system set up. Spare capacity, supplies, additional transport and logistics that can be made available in an emergency should be identified and arrangements made for deployment when required.

It is critical that disaster preparation plans are appropriately disseminated, regularly reviewed and updated. These include changes in donation criteria, introduction of new computer systems, new tests or technologies, and process changes. Emergency exercises are a useful way of testing and validating emergency plans.

### 8.5 Preparing for an influenza pandemic

In the Hong Kong blood service, the disaster response plan coordinates activities in the BTS, and between the BTS and hospitals or outside bodies to ensure blood supply in the event of an emergency. The plan applies to emergencies such as a general disaster where an increased supply of blood may be needed or where there may be a sudden influx of donors, or when there are disruptions of the service that temporarily restrict or eliminate the ability of the BTS to function.

During the severe acute respiratory syndrome (SARS) outbreak in 2003, several countries in the Asian region were severely affected. Infectious disease outbreaks such as SARS reveal weaknesses in the public health infrastructure. An infectious disease threat in one country is a threat to all as contagious infections do not respect national borders. These infections can only be contained with high-level government commitment and international collaboration.
During the SARS outbreak, the BTS in the countries affected experienced vulnerability of the blood supply. Donors were unable to donate due to deferrals imposed by concerns regarding transmission of the virus through the blood, or stayed away from blood donation due to the fear of contracting SARS.

The SARS experience provided many learning points for BTS worldwide. There is a need to strengthen donor programmes by broadening the donor base, and managing donor perceptions and fears. This requires the use of media and communication tools. Staff with suitable training plays an important role.

The BTS also needs to establish systems to ensure donor and blood traceability, which must include effective product recall systems, patient notification, look-back studies and patient registries. Contingency plans need to be developed to address operational issues, such as setting up blood collection sites at locations perceived to be at lower risk, and having alternative plans in the event of a disease outbreak among staff. The impact of the development of diagnostic tests and the implementation of screening tests also needs to be considered.

An influenza pandemic can potentially impact the blood supply by affecting blood safety through the collection of blood from infected individuals, resulting in a blood shortage due to donor deferral and drop in donor attendance; or a reduced blood demand from cancellation of elective surgery; spread of infection among blood donors and staff; and disruption in blood bank operations due to staff illness.

Measures should also be in place to minimize the potential contamination of blood supply, address donor loss and maintain an appropriate blood inventory. Deferring blood donations is necessary from those with a history of fever and influenza and, in the case of non-local outbreaks, those with a history of travel to high-risk areas. Testing and strict infection control measures should be implemented as well.

Communication is of vital importance to clarify deferral policies, assure the public of donor and blood safety, and retain donors after a pandemic has ceased. Building up the inventory during the early stages of a pandemic is critical, as is communication with hospital blood banks to get updates on the supply and demand situation. Stringent measures should be taken to minimize disruptions from staff illness, including measures such as monitoring the temperature, observing hygiene rules, practising work segregation and vaccinating employees.

For consistency of reporting and contingency planning purposes, it is useful to adopt the WHO system of staging alert levels. Different measures can be developed to address the impact of disease outbreaks at each stage of an influenza pandemic. One of the measures is the formation
of regional and international collaborative networks, such as the Asia Pacific Blood Network (APBN) and WHO, which enable rapid information-sharing, and development and deployment of effective strategies and measures.

8.6 Contingency planning

Contingency planning manages the “What ifs”. It is a form of risk management and provides the opportunity to plan without pressure before a critical situation arises. Contingency planning aims to identify potential problems in advance and decide how to avoid their occurrence or how to manage them if they occur.

Contingency planning should be part of the business planning process where the involvement of cross-functional teams and high-level support is essential. The response developed to the predicted problem must be proportionate to the risk and its impact. With that in mind, contingency planning begins with impact assessment; developing a plan; testing the plan; training personnel; and monitoring the plan.

Impact assessment involves the development of a list of serious incidents that might occur and have an impact on normal business operations. For each incident, the likelihood and potential should be assessed, and a matrix (Diagram 13) should be developed of the likelihood of the event (low, moderate, high) versus the severity of the impact (low, moderate, high). Factors that affect the impact of the incident include the site where it occurs, duration of the event and intensity of the event.

**Diagram 13: Impact assessment matrix**

<table>
<thead>
<tr>
<th>Low Likelihood</th>
<th>Moderate Likelihood</th>
<th>High Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Impact</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Moderate Impact</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>High Impact</td>
<td>3</td>
<td>6</td>
</tr>
</tbody>
</table>

Contingency plans must be developed for each identified risk. These include the following aspects:

- Which organizational functions are critical and must be supported
- For each function, the level of contingency support required
- Identifying the specific roles and people for each task.
The plan should be tested for its effectiveness wherever feasible, and reviewed regularly thereafter, with the level of support revised if needed. It should be resilient to staff turnover and modified as organizational capacity changes. Personnel training should include good documentation of procedures, training of staff in the activation of emergency plans, and listening to feedback. The model of testing should replicate a real incident as closely as possible.

8.7 Evaluating new technologies

In the blood banking field, many new technologies have been developed, leading to improvements in the service. New technologies may entail numerous risks, and decisions regarding their use should be made only after thorough consideration. Effort must be made to carefully evaluate, select and monitor new technologies.

In selecting any new technology, one must consider its appropriateness, the technical aspects, and the commercial and economic factors prevalent in the blood bank environment. This can be done by conducting a technology evaluation/assessment. This is a set of principles, methods and techniques/tools for effectively assessing the potential value of a technology and its contribution to an organization, region or country.

There are many approaches to technology evaluation, such as technology benchmarking, failure analysis, life-cycle analysis and cost–benefit analysis. The evaluation should address the following questions:

- Is the technology relevant?
- Is it appropriate? Is it feasible?
- Will the staff be able to handle the technical complexity of the new technology?

Besides suitability and feasibility, the new technology should also add value to the organization. It could be an entirely new product or service, or it could improve existing services or products by modifying them.

It is important to recognize that developing countries may face significant constraints in acquiring new technology, thus missing out on potential improvements that may be brought about by the new technology. Constraints include lack of financial resources, scarcity of staff skills, underdeveloped infrastructure, inability to procure raw materials, unreliable supporting functions and difficulty in maintenance. In this respect, new technologies may be modified in order to suit the needs and acquisition abilities of developing countries. New technologies can be scaled down by redesigning or re-engineering, and reducing operational needs.
During the selection process, the new technology should be appropriate to the country and the blood bank at a macro level. Within the organization, the financial capability, technical merits as well as risk factors must meet the specifications and requirements of the technology. In addition, it is crucial to assess the supplier as well for their technical excellence, reputation and especially their experience with the BTS.

Assessing risk involves looking at the safety, reliability and quality of the technology. These can be assessed by analysing formal studies and other data on existing practices, possible risks, benefits, costs and effectiveness. This enables evidence-based decision-making.

The following four questions can help in predicting and assessing the potential impact on the organization if the technology is implemented:

- What will the technology enhance?
- What will be made obsolete if the technology is introduced?
- What will the technology bring to the organization?
- What will the technology revert to, if pushed to its limit?

For example, the British Committee for Standards in Haematology, Blood Transfusion Task Force (1995) recommends the following guidelines for the evaluation of new techniques in blood grouping, antibody screening and cross-matching.

1. Staff concerned must familiarize themselves with the new technology; the manufacturer should provide training.
2. The manufacturer’s instructions must be followed carefully; there should be no substitution or modification.
3. The new technology should be compared with the current technology – sensitivity, specificity (including freedom from false-positive reactions), reproducibility, etc.
4. All samples that give reproducible discrepant results between test systems should be investigated further. They should be referred back to the manufacturer as well as an independent reference laboratory.

In conclusion, the BTS should look out for new technology that can help to improve its performance such as turnaround times, or to cope with the increase in workload when resources do not increase. Thorough evaluation must be conducted to ensure that the new technology is better than current ones. Eventually, practical considerations such as priorities and cost-effectiveness have more weightage in the decision-making process.
9. Achieving Safe and Sustainable Blood Donor Management Programmes

9.1 Managing Sustainable Blood Donor Recruitment and Retention Programmes

Over the past ten years, there has been an increased emphasis on blood donor recruitment activities. In the year 2000, the WHO declared 14 June as World Blood Donor Day, with the slogan “Safe blood starts with me”. The aim of these activities was to increase global awareness among the public, policy-makers, politicians and health professionals regarding issues related to blood safety.

Two of the expected outcomes of World Health Day in 2000 were:

1. to increase awareness among the public that blood donation is a safe process, handled confidentially and professionally,
2. to create awareness of the need for blood and thereby encourage regular blood donations.

The WHO Strategies for Blood Safety encourage the collection of blood from voluntary non-remunerated blood donors (VNRBD) from low-risk populations only. This requires the establishment of an effective blood donor programme for education, motivation and recruitment of voluntary blood donors; the use of stringent criteria for assessing the suitability of donors; safe blood collection procedures; and high-quality donor care to promote donor retention. All these must be handled well through good BTS management.

In the WHO Aide-Memoire for National Blood Programmes, the key elements for a successful donor recruitment programme includes the establishment of:

1. a national blood donor programme officer
2. a blood donor recruitment officer
3. SOPs
4. training of staff and volunteers
5. information, education and communication (IEC) materials
6. a registry of VNRBD.

Workshops and training materials are two important tools for training national blood programme managers. Training materials have been
developed based on the existing learning materials from WHO and IFRCRCS. “Developing a voluntary blood donor programme (DONOR)” is a workshop developed by WHO and IFRCRCS using existing materials such as Safe blood donation (WHO), Recruiting and retaining safe blood donors (WHO), and Making a difference: manual and resources kit (IFRCRCS).

Applying marketing concepts to blood donation

Marketing is defined by the American Marketing Association as an organizational function and a set of processes for creating, communicating and delivering value to customers and managing customer relationships in ways that benefit the organization and stakeholders.

Just as marketing deals with identifying and meeting human and social needs, blood donor recruitment programmes (BDRP) deal with identifying and meeting the needs of blood donors and recipients. Blood donor recruitment is a process that promotes blood donation as an act of altruism or benevolence. It serves both to inform the population and to change attitudes toward blood donation so that more will subscribe to this noble cause.

For an effective BDRP, it is important to define the organization’s situational analysis, identify target groups, conduct market studies, carry out strategic and tactical planning, and develop messages and evaluations based on performance indicators.

The major objective of BDRP is to promote blood donation by increasing the individual’s awareness of the necessity for and benefits to the community, and maintaining or enhancing the intention to give blood. The preferred methods of communication are posters and standees as they contain a perfect blend of emotion and information.

For the success of operational marketing activities, it is essential to identify and understand the target group in order to meet their needs and expectations. Person-to-person communication, such as short message service (SMS), phone calls and e-mails, is helpful in generating immediate or short-term responses. Good customer relationships allow a proactive approach, and ensure the success of each collection event and the ability to take timely measures to maintain optimal levels of blood stocks.

Common perceptions about blood donation in the average individual include fear of the donation procedure, and the lack of a sense of urgency, importance and personal responsibility towards others in need. Hence, the demand strategy for blood donation focuses on changing the current perception of blood donation to a desired perception wherein blood donation is seen as a form of character building, thereby creating
a sense of identity through this altruistic act. Marketing through BDRP helps to instil the idea that blood donation allows donors to define themselves and express their individuality.

Three practical aspects of blood donation must also be considered in creating a positive blood donation experience:

1. Merchandizing
   • Ambience and décor; furnishings, signs, uniforms
   • Improving the environment

2. Blood donation operating procedure
   • Logistical efficiency
   • Waiting time management
   • Functionality
   • Ensuring that the opportunities to give blood meet the requirements of various donor segments (collection hours, proximity, access, by appointment only, without appointment)

3. Customer service
   • Training, client approach (rather than patient approach)
   • Managing client touch points
   • Service standards.

Developing customer loyalty is the cornerstone of a good donor retention programme. Recognition generates a sense of pride in donors, urging them to make multiple donations while enhancing the value of giving blood. More importantly, it emphasizes the significance of blood donation to the public.

9.2 Developing Appropriate Donor Selection Criteria for Donor / Recipient Safety

Proper donor selection criteria will help to ensure that the blood collected from VNRBD is from low-risk populations. Donor selection achieves two goals: (i) protection of recipients relies on voluntary and non-remunerated donation from donors with a low risk of TTIs; (ii) protection of donors to ensure that the donation will not place the donor at increased risk of any underlying disease or make them prone to donation-induced iron deficiency or the likelihood of other adverse effects from donating.

Safe donor selection and screening procedures should be applied at various points in the blood collection process (see description in the following table).
Table 6. Procedures at various points in the blood collection process

<table>
<thead>
<tr>
<th>Timing</th>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-donation</td>
<td>1. Exclusion of particular donor groups/or particular collection sites</td>
</tr>
<tr>
<td></td>
<td>2. Elimination of incentives</td>
</tr>
<tr>
<td></td>
<td>3. Donor education</td>
</tr>
<tr>
<td>At donation site prior to donation</td>
<td>4. Self-exclusion in response to written material</td>
</tr>
<tr>
<td></td>
<td>5. Health history interview</td>
</tr>
<tr>
<td></td>
<td>6. Donor deferral registry* (some centres)</td>
</tr>
<tr>
<td></td>
<td>7. Confidential unit exclusion (cue)</td>
</tr>
<tr>
<td>Post-donation</td>
<td>8. Telephone call-back</td>
</tr>
<tr>
<td></td>
<td>9. Donor deferral registry* (some centres)</td>
</tr>
</tbody>
</table>

* This mechanism can be used either to disqualify the donor at the collection site or to discard the collected unit prior to release.

National criteria for donor selection are needed and, where appropriate, deferral of donors based on local epidemiological data on infectious diseases, risk behaviours, local customs, and medical and surgical interventions. Variation exists even between international guidelines for essential donor selection criteria, e.g. donor age, donor haemoglobin, donor weight. There is, therefore, no absolute right or wrong decision when developing local criteria, as long as it is based on locally relevant epidemiological data and is unambiguous, comprehensible and can be clearly explained to the donor.

There are many external standards available, which can be used as resources for setting donor selection criteria. These could be used as a starting point and modified accordingly. Some materials are:

- WHO Basic requirements for blood transfusion services http://www.who.int/topics/blood_transfusion/en/ (accessed on 19 October 2010)
- New Zealand Blood Service blood collection standards http://www.traqprogram.ca/international-guide.asp (accessed on 19 October 2010)
Essential elements of donor selection include: reason for exclusion, additional questions to clarify or get more information and the action required, post-donation notification such as withdrawal of non-transfused units, notification to recipients (if transfused) or to contract plasma fractionators. Any change in the standards must be made in a controlled manner and properly documented, including the reason for the change. Appropriate training must be provided to donation centre staff to ensure effective introduction of the changed standards. Document control systems, including retrieval of the older version of standards, should be in place.

As an example, in New Zealand, the collection standards are owned by the New Zealand Blood Service (NZBS). Relevant documents are in place in the document control system as well as a system for “change requests”. The NZBS is responsible for regular review and updating of the standards, and this is managed through the Clinical Advisory Group. Any changes to the standards require formal submission to and approval by Medsafe (the national regulator in NZ). Implementation of the change is managed by the Donor Services Management team, and this includes formal training and a competency assessment of staff. Training and competency records are reviewed during internal audits.

The donor questionnaire is a critical document within the overall quality system. Care must be taken in structuring the questions, making considerations for both the donor and the blood service staff.

For donors, it is important to identify what the questionnaire intends to achieve and whether it makes sense to them. Where applicable to the country, donor questionnaires should be prepared in the local languages to ensure clear understanding of information. Before each donation, every donor should complete the donor questionnaire. If necessary, a physical medical examination should be performed by a qualified health professional.

It is also necessary to assess the level of knowledge of the staff that will be using the questionnaire and their ability to apply it consistently across all blood centres in the country. Standardization in practices is important, in that donors are managed in the same way wherever and whenever they donate blood.

In conclusion, donor selection criteria are a key component for ensuring the availability of safe blood for transfusion. Besides ensuring the safety of donors and recipients, selection criteria also prevent unnecessary deferrals, which have been clearly shown to significantly reduce the likelihood of a donor’s return. Structured processes are needed to develop, maintain and implement selection criteria, and must be managed as part of the quality system. This includes training and competency assessment.
of staff that will make the decisions on donor suitability. Easy access to blood service web sites can help in identifying international standards and assist in the development of local standards. It is, however, important to carefully evaluate the likely local impact of applying such standards before committing to comply with existing international standards.

### 9.3 Organizing a Safe Blood Donation Programme for Donor and Public Health Protection

The WHO *Aide Memoire on Blood Safety* describes the key elements of a safe blood programme: voluntary non-remunerated blood donation; sufficient donor pool; donor screening, counselling and care; safe environment and procedures for blood donation; laboratory testing of donated blood; labelling, storage and distribution of products; product tracing and haemovigilance.

The BTS needs to provide appropriate information, develop comprehensible questionnaires and suitable forms for obtaining donor informed consent. The prospective donor must understand the process of blood donation and why the various steps in the process are necessary. Donors must understand and accept their own responsibility in providing truthful information as required.

It is imperative that good communication is established between donors and the blood service, which has been demonstrated to be effective. The staff must be sensitive to and respect cultural differences, and must be proficient in the language of the general public. They should ensure comprehension of donors and provide sufficient privacy to help the donor to be comfortable in answering probing questions about their private lives. Confidentiality of personal information needs to be ensured at all times.

Blood donors should have access to adequate information about the donation process and its outcomes, such as:

- the key health requirements of a safe blood donor
- diseases that may be transmitted by blood transfusion
- lifestyles associated with a high risk for acquiring infections
- The blood donation process
- components that will be derived from the donated blood for clinical transfusion
- tests that will be performed on the donated blood
- the availability of donor counselling and care, including referral to other health-care agencies.

Selection of suitable blood donors (and deferral of unsuitable blood donors) through objective assessments based on regularly reviewed criteria is the first step in the overall process of ensuring the safety of the blood supply. Prospective donors must understand the concept of
safe blood and the relevance of their own health and lifestyle to the safety of the national blood supply.

Medical assessment of the donor should be considered as an interactive private and confidential interview that is conducted between the donor and screening personnel, and based on a health questionnaire filled out by the donor. This is followed by a simple physical health check, e.g. blood pressure. The assessment should aim to obtain accurate and truthful information related to the donor’s health history, current health status, lifestyle risks, travel history, and reason(s) for blood donation. The donor should sign a declaration to confirm their understanding of the questions and the necessity to provide information truthfully.

The donor should provide informed consent for the donation of blood or blood components, laboratory testing of the donation, and use of the blood by the transfusion service. Informed consent should be given with adequate knowledge; therefore, the donor should be advised of the risks connected with the procedure. The signed questionnaire and consent must be kept as a legal record.

Additionally, donors must be given a clear explanation if they are deferred for any reason, and advised as to the appropriate follow up that is needed. The BTS should ensure that donors who are found to have serious illnesses when they come forward to donate blood should be referred for appropriate medical care. Temporarily deferred donors should be informed of the reason for their deferral and advised when to return to donate; unclear or unsatisfactory information may result in donor loss.

A system to record donor information – donor database – is essential to contact those who have abnormal blood test results, to remind donors to donate following a suitable interval, and to screen repeat donors when they come to donate again. Collection of data on the reasons for donor deferral – deferral donor database – provides information on the major causes of deferral among donors. It also assesses whether donors understand pre-donation information, whether staff are interpreting the selection guidelines correctly, and identifies areas where improvements such as further education and training should be focused.

To ensure safe blood donation, the BTS should provide a safe environment, and deploy staff that are trained and assessed to be competent to manage donors. Any procedures relating to the administration of any substance to a donor, for example, agents aimed at increasing the concentration of specific blood components, should comply with internationally accepted standards of practice.

Adverse blood donor reactions can cause a significant negative impact on the BTS and donors. Although such reactions are often unpredictable,
there are measures that BTS can employ to reduce their occurrence as well as impact, such as training staff to provide the appropriate donor care. BTS also need to establish a system for reporting and monitoring such reactions, and identify measures that can reduce them. These help to minimize the adverse impact on donors and will improve their return rates.

Providing appropriate pre-donation advice may also be helpful in minimizing adverse reactions. For example, donors who have not eaten anything in the 3–4 hours preceding donation are thought to be more prone to fainting; therefore, it is recommended that donors should follow their normal eating patterns before donation. Donors who have eaten a very heavy meal shortly before donation may have lipaemic plasma and this may result in wastage of some components.

First-time blood donors are at increased risk for unpleasant blood donation-related symptoms, and the experience of such symptoms can contribute to a decreased likelihood of repeat donation. Recent studies suggest that water ingestion before donation produces haemodynamic effects that may be sufficient to reduce the risk of syncope and other related reactions during blood donation.

The BTS should provide verbal and written advice for donors on how to minimize the occurrence of adverse events after donation, and to ensure good care of the venepuncture site. They should also be given information about how to report additional information or illness, which may affect the quality or safety of donation. Some BTS run a system known as confidential unit exclusion (CUE) where donors are asked to indicate, either prior to or after donation, whether their blood should be transfused or whether it should be used for other purposes. This seeks to avoid embarrassment to donors who have been persuaded to donate and later find that they should not be donating according to the selection criteria.

The BTS should establish a system to capture and monitor adverse donor reactions, which will facilitate identification and assessment of improvement measures. For instance, from April 2003, the UK National Blood Service has put in place a single, national system for the identification, recording and follow up of serious adverse events associated with blood donation.

Blood donor counselling is necessary to select donors appropriately, retain healthy donors as regular donors, and refer those with health problems for appropriate medical care. Conditions that require donor counselling in the BTS setting vary, and may include:

- conditions disclosed by the donor resulting in temporary or permanent deferral
• conditions identified during the predonation health check, e.g. anaemia or hypertension, resulting in temporary or permanent deferral
• conditions observed during/after donation, e.g. fainting/syncope
• conditions identified following blood tests
• other conditions
  – motivation of donors with special or rare phenotypes who can be enrolled in an apheresis programme
  – donors who seek TTI testing and other health checks

Staff should provide post-donation counselling and notification in an area with privacy to ensure that the donor’s information is kept confidential. Donors may be notified of their positive test results either in writing or face-to-face, during which they should be informed of their positive test results and advised of deferral status. They should also be given accurate information about the meaning and significance of the test results, and about the particular infectious agent, mode of transmission, and implications for future health and treatment opportunities. Linkage should be provided with specialized clinical services, and the staff providing the counselling should seek the donor’s agreement for referral to these services.
10. Efficient Inventory Management and Procurement

10.1 Blood Distribution and Management Systems

Efficient management of blood distribution is important, especially for systems that involve different locations for blood collection and storage. Some countries have all three types of blood delivery systems, thus requiring more efficient systems that can deliver blood properly and keep an accurate inventory. Depending on the type of systems within the national blood programme, blood may also need to be moved from one hospital to another to meet demand, such as when a rare blood type is needed.

The responsibility for managing the blood inventory and distribution system usually lies with the Inventory Manager. The Inventory Manager has to forecast and plan the estimated requirements for blood supply distribution. This requires working closely with donor recruiters, component processing staff and end-users to identify distribution needs.

The amount of blood stock to be maintained depends on the number of hospitals, the number of hospital beds in each hospital, as well as the services provided at the hospitals. Different services, such as emergency departments and cancer treatment centres, have different blood supply requirements. From this information, the Inventory Manager needs to create a master distribution list in order to properly manage overall blood supply distribution.

Good management involves taking accurate inventory of blood stock. Besides making sure that the blood supply is met and then properly distributed, the process of managing outdating is important and expired blood must be removed from the inventory. One useful method of measuring the need for outdating is to determine the average weekly blood collection. As more blood is collected, more outdating of blood occurs if the blood stock cannot be optimally managed.

In particular, managing platelet inventory (with its relatively short shelf-life) calls for more stringent efforts in order to minimize wastage. The blood collection team and blood inventory management team must communicate closely with each other and anticipate patients’ need for platelets. Different types of patient needs must be considered, e.g. ABO-compatible platelets, HLA-matched platelets, cross-matched platelets.
Another responsibility of the Inventory Manager is to develop policies for blood distribution, stating clearly the responsibilities of the parties involved and procedural details for efficient management of blood delivery systems. The policy should contain at least the following points:

- Responsibilities, i.e. distribution by the blood centre and/or collection by the hospitals
- Age of the blood at the time of distribution
- Process and procedure of blood collection
- Transportation
- Mode of communication between organizations
- Documentation
- Setting indicators
- Quality management: monitoring and evaluation.

These should be described clearly and in detail. Exceptional scenarios, such as return of issued blood or managing supply during periods of blood shortage, should be addressed as well. All procedures must be described clearly along with the appropriate actions to be taken. Schedules of distribution, payment and invoices should be included in the agreement as well. Additionally, the policy should emphasize that blood requests from hospitals must be truly for medical purposes only. All organizations must reach a balanced agreement on the policies.

The transportation of blood is a crucial step in blood supply distribution. It requires trained personnel and the use of reliable equipment and materials to maintain the quality of blood during transportation. It is necessary to maintain the cold chain, validate containers used for transportation, and monitor and maintain temperature at the appropriate level.

Equipment for transporting blood safely includes blood boxes and temperature-monitoring devices. Several factors should be considered and the right equipment used: the temperature and volume of blood during storage, short lifespan of blood components, and movement of blood to and from locations. These may invariably require equipment with different specifications. In addition, the method of packing blood into the containers is also important, e.g. the blood packs should not have any direct contact with the ice packs. Equipment must be properly maintained and back-up for equipment and materials should be available to ensure a reliable and sustainable flow of blood supply.

As part of quality management, personnel involved need to be trained and be aware of the importance of keeping the blood under proper storage conditions. For instance, managers are responsible for procurement of appropriate equipment, and for establishing quality systems for various processes in blood delivery. Other staff should be trained to pack blood efficiently, monitor the temperature and be able to verify the working status of equipment.
Quality control also includes the process of data collection to help develop strategies for improving blood inventory management. Examples include collecting data on the blood unit expiry rate, number of unmet requests and periods of blood shortages.

Finally, the entire delivery process should be monitored and evaluated regularly. Areas for improvement can then be identified, as well as deficiencies such as periods of blood shortages and breakdowns in the line of communication.

10.2 Managing an Efficient Blood Inventory

An efficient blood inventory means balancing supply and demand, and collecting enough blood donations to meet the demand for blood transfusions. Blood of the right type needs to be supplied at the right time. There should also be sufficient stock for contingencies. Lastly, the cost of blood transfusion should be maintained at an affordable level for patients and the country’s health-care system.

Adequate blood supply is a matter of timing the collection to meet actual clinical needs, rather than trying to achieve a grand total number every month or every year. Actual clinical blood requirements can vary from day-to-day, week-to-week, and month-to-month, depending on the circumstances.

To adequately meet clinical needs and minimize wastage at the same time, it is important to determine actual blood needs so that the number of units to be collected and resources required can be planned. Blood needs can be estimated through collecting and analysing data from various sources, including communication with clinical users.

Some examples of relevant data that can be useful in estimating blood needs are given below:

- Status of blood supply and availability
  - Inventory levels of different blood and blood products
  - Blood collection data, including deferral data
  - Distribution of blood inventory
  - Matched and unmatched blood
  - Untested units
  - Percentage of discarded and outdated blood products
- Actual demand for blood and components
  - Number of units of blood and components transfused
  - Number of requests for blood and components
- Ability to meet demand and overcome shortfalls
  - Number of delays/cancelled surgeries
  - Number of requests met/unmet.
Management of the national blood inventory requires monitoring of the daily blood stock levels in both the blood centre and hospital blood banks. During emergencies, it will be necessary to monitor this at a higher frequency. National blood inventory reports should include the number of units in each hospital and in the blood centre according to ABO and Rh type, units tested and untested, units matched and unmatched, number of units used in each hospital and nationally in the past 24 hours, and number of units of frozen blood (if any) in the national inventory.

Blood supply management can be optimized in the following ways:

- Aim for consistent blood collection throughout the year.
- Define effective donor selection/deferral criteria, and review these regularly.
- Balance supply by blood types.
- Optimize blood collection volumes.
- Manage inventory of different components with different blood group requirements.
- Minimize process control rejects.
- Minimize unnecessary infectious disease (ID) testing discards.
- Improve distribution efficiency.
- Minimize outdates.
- Ensure appropriate clinical use.

Among the major challenges in efficient management of the blood inventory are the varying characteristics of demand; and clinical need for specific blood types and different blood components. Different blood components need to be managed taking into consideration the different storage and expiry periods, and processing requirements.

Proper management of blood requests will help ensure appropriate clinical use of donated blood. This includes several strategies, such as:

- knowledge of routine elective surgical requirements
- consultative dialogue between blood bank physicians and hospital doctors
- maximum surgical blood order schedules
- type and screen.

Daily clinical reviews help to monitor clinical blood use and address clinical issues such as patients with unusual blood needs. Medical officers on call provide daily reports for the past 24 hours on such issues as: total blood requests and issues; platelet requests and issues; stocks of rare blood types, including units near expiry; and case summaries of patients using large amounts of blood/blood products, and rare blood types with
antibodies, etc. In specific instances, medical registrars and consultants on call may follow up on these cases and provide consultation advice to attending clinicians.

Effective communication among blood service staff is important for optimizing management of the blood inventory. For example, regular meetings between the blood collection and apheresis staff, component preparation staff and medical staff are critical in ensuring optimal management of platelet inventories. Regular meetings among staff enable coordination of processes and interfaces, resolution of problems, review and revision of targets, and initiation of changes for improvement. These meetings should involve both the supervisory and the operations levels staff.

The frequent need for interaction between the blood service and hospitals also requires good communication. Regular dialogues should be held between the blood service and hospitals to review blood usage and blood needs, trouble-shoot problems, and update each other on new initiatives and changes in processes.

10.3 Managing A Good Procurement System

The objective of procurement is to obtain the best value-for-money supplies and services through an efficient and speedy system that is seen to be fair and competitive. Goods, supplies and services should be procured through competitive tendering or quotation processes based on the estimated value of the contract, or direct purchases due to emergency requirements, as appropriate.

A procurement policy should be in place, and should be aligned with the corporate strategy. The procurement department is primarily responsible for ensuring that goods and services essential for business operations are securely supplied. This should be done in a cost-effective manner.

The Procurement Manager needs to work closely with the user and the finance department, and should have knowledge of materials, their quality, prices and availability to make purchase decisions. Much of the procurement process is knowledge-based and information should be identified and recorded. These include specifications, invitations to tender, tender analysis criteria and techniques, and lists of suppliers.

What constitutes a good procurement system?

- Objective appraisal and selection of suppliers
- Collating up-to-date information on suppliers, prices, distribution methods
• Purchasing goods and services at prices that represent the best value for the business in the long term (i.e. not necessarily the lowest prices at a given time)
• Maintaining adequate stock/inventory levels
• Establishing and maintaining effective working relationships with relevant departments (e.g. users, finance)
• Developing effective links with existing suppliers, and maintaining good relationships with potential suppliers and competitors.

The following steps should be followed through in the procurement process.

1. **Information gathering**
   - Search for suppliers who can satisfy the requirements.

2. **Supplier contact**
   - Requests for quotations, proposals, information or tenders may be advertised, or direct contact may be made with the suppliers.

3. **Background review**
   - References consulted for product/service (P/S) quality; any requirements for follow-up services including installation, maintenance and warranty investigated, samples examined, or trials undertaken

4. **Tender and negotiation**
   - Price, availability and customization possibilities established, delivery schedules negotiated, and a contract to acquire the P/S completed

5. **Fulfilment**
   - Supplier preparation, shipment, delivery and payment for the P/S completed, based on contract terms. Installation and training may also be included.

6. **Consumption, maintenance and disposal**
   - During this phase the company evaluates the performance of the P/S and any accompanying service support as they are consumed.

A procurement checklist can be used in line with the above steps.

• Identify needs.
• Obtain a requisition request from the appropriate authority.
• Draft specifications.
• Identify suppliers.
• Pre-qualify suppliers.
• Initiate the tendering process.
• Negotiate.
• Award contract, conduct supplier debriefings.
• Manage the contract.
For the purchase of material goods, the following four key elements are crucial.

- **Quantity** – finding the optimum way of balancing the costs of insufficient stock against the costs of holding stock
- **Quality** – ensuring suitability for the intended use
- **Price** – giving the best value to the organization
- **Delivery** – setting delivery schedules; defining lead time for delivery.

**Specifications**

Specifications are statements of functional and performance requirements with input on the safety aspects. These are important to determine the suitability of P/S.

For example, the procurement department should gather complete information on:

- requirements for product, procedures, processes and equipment
- requirements for qualification of personnel
- requirements for the quality management system
- criteria for test and limits, physical appearance characteristics and storage conditions
- special requirements for critical material.

**Tender**

There are two types of tenders – open tenders are open to all vendors or contractors who can guarantee performance; restricted tenders are open to only selected prequalified vendors or contractors.

In restricted tenders, there should be sufficient information gathered to identify tenders / potential suppliers for specified supplies, services or equipment. The suppliers’ qualifications should be analysed together with the products or services offered. Other methods include running credit reports, interviewing the management, testing products and touring the facilities of the vendor.

Tender specifications should, in normal circumstances, be drawn up in such a way as to be able to attract a wide range of competitive bids. In the event that only one supplier can meet the specifications for the P/S, the procurement managers may consider utilizing a “sole source” option.

Most tender processes are multi-tiered, according to the requisition value of the tender. There are generally three levels: low-value, mid-value and high-value requisitions.
- **Low-value requisitions** can be subjected to “user discretion”, permitting the requestor to choose a vendor themselves. The rationale is to save costs in processing stringent tenders. However, proper policies should be in place to prevent potential abuse of such discretion.

- **Mid-value requisitions** undergo a slightly more formal process than low-value requisitions, i.e. obtaining quotes from three separate suppliers.

- **High-value requisitions** require a formal tender with specific procedures to ensure fairness and impartiality. Vendors must comply with the procedures, or they may be disqualified. Depending on the commodity being purchased, the organization may specify a weighted evaluation criterion. Tender submissions can be evaluated by a cross-functional committee including the user.

**Acceptance sampling**

The procurement department is responsible for receiving incoming goods and evaluating them for acceptance. It can also formally accept or reject procured goods. Accepted goods should be dispatched to the requisioners.

Requisitioners are likewise responsible for evaluating goods and equipment against quality standards and requirements as stated in the contract.

**Maintenance**

Maintenance is an important part of the procurement process. It can carry on after the receipt of procured goods, and may also require service support by suppliers.

**Supplier performance monitoring**

Effective performance monitoring is a constructive way of encouraging the supplier to improve and provides a timely warning if the supplier is having difficulty in meeting the terms of the contract or the agreed performance standards. The performance indicators considered are usually quality and delivery. Suppliers who breach contractual obligations or show persistently poor performance should be removed from the approved list of tenders.

For BTS, the management should pay attention to several important points when procuring blood cold chain equipment:

- Blood cold chain equipment must meet international standards and the WHO minimum performance specifications.
• The equipment must be reviewed carefully, bearing in mind the possibility of relocation of some equipment to meet needs.
• The design and quality of the equipment should be carefully assessed to ensure that it meets the needs of the laboratory and users.
• The performance history of the equipment and market reports should be assessed before making a decision.
• A degree of standardization should be followed when procuring equipment so as to assist staff in training and equipment maintenance.
• The equipment should be ordered by following agreed procedures.
• Back-up support, spare parts and maintenance services should be available.
• Training may be necessary for users and technicians to ensure that the equipment is correctly used and maintained. This must be taken into consideration when selecting suppliers.

The procurement department should seek to procure goods, supplies and services of acceptable quality, in a timely manner and at the best obtainable value for money. To enable this, procedures should be well defined and strictly followed. Proper processes, especially for tenders, will help to ensure fairness and leverage on market capability.

10.4 Selecting Appropriate Equipment and Reagents

Materials and supplies used as inputs to a process are considered “critical” if they affect the quality and safety of the resulting products and services. Such “critical” materials must be qualified before use. The suppliers should be evaluated as well to ensure that they meet the blood service’s requirements. This requirement should similarly apply to “critical” equipment.

Two principles of the selection process should be kept in mind. First, the reagent or test should not only be of high quality but also cost-effective. Second, selection should be based on laboratory and quality requirements, and not cost alone. Cheap reagents of poor quality can turn out to be more expensive because of poor specificity and failed tests. They will also be unsafe if they yield inaccurate results.

The following aspects should be examined when evaluating reagents and test systems:

• Volume and type of specimen required
• Difficulty in obtaining specimen
• Dynamic range of test
• Sensitivity and specificity
• Accuracy and precision
• Freedom from interference
Cost considerations should include the costs of materials, instruments, services, utilities, personnel, maintenance contracts and space. Any increase or decrease in cost when implementing a new test or equipment has to be weighed with its pros and cons.

The evaluation and selection process generally includes the following steps:

1. Define specifications.
2. Collect all available relevant data.
3. Assess data against specifications, with documentation.
4. List the most suitable ones.
5. Prepare a validation protocol for laboratory assessment.
6. Validate the most suitable reagents/test systems.
7. Review the results.
8. Select the reagent/test system.

Validation ensures that the output of using a certain reagent or a test system is what it is intended to be. It provides evidence that process variables were considered and control systems evaluated before the reagent/test system was used in the live environment. The components of validation include installation qualification, operational qualification, product performance qualification and revalidation.

There should be proper documentation, which includes process description, physical description, functional description and validation protocol. The validation protocol should clearly describe the validation procedure as well as the acceptance criteria. It should be appropriately reviewed and approved before use.

**Selecting test systems**

In selecting a new test system, the following four performance characteristics should be evaluated.

1. Analytical validity   • Does it measure what it claims to measure, with sufficient reliability and accuracy?
2. Clinical validity
- Sensitivity and specificity of the new test
- Positive and negative predictive value
- Depending on the population under study, a test that is useful for patients with a specific complaint in the secondary healthcare setting will have completely different and unacceptable predictive value if applied to the general population as a screening test.

3. Clinical utility
- Does it generate benefit, outweighing financial and other costs?
- Does a better test exist?

4. Ethical, legal and social implications of the test

Other important aspects to be considered include: accuracy, sensitivity, specificity, reliability, testing supplies, sample volumes and turnaround time required, number of staff available, ease of use and maintenance, space requirements, availability of service support, support systems (utilities, environment, biohazards, waste management) and cost (both capital cost and recurrent cost).

Taking an example of selecting immunohaematology reagents, these are some considerations:

1. What will the reagent be used for?
   - Donation testing
   - Patient testing

2. How will it be used?
   - Manual/automated
   - Large/small numbers
   - Methodology: tube, slide, microtitre plate etc.

3. Who is going to use it?
   - Resources available
   - Reagents available
   - Existing systems to interface with
11. Effective Management of Data

11.1 Management of Data

The definition of data management, according to the Data Management International Data Management Body of Knowledge (DAMA DMBOK), is the development, execution and supervision of plans, policies, programmes and practices that control, protect, deliver and enhance the value of data and information assets. Records are documents that state the results achieved or provide evidence of activities performed. They help in making decisions, investigating problems, improving efficiency and improving quality.

In the Blood Transfusion Centre, data are generated throughout the whole process from recruitment, collection, testing, processing, prescribing, issuing, transportation, transfusion and follow up in the hospital blood bank. Such large amounts of data generated will require effective documentation for traceability. Reference can be made to WHO Basic requirements for blood transfusion services: http://www.who.int/topics/blood_transfusion/en/ (accessed on 19 October 2010)

The appropriate documents should be identified and developed for each process and procedure in the BTS. These include:

a. SOPs
b. Forms and labels
c. Datasheets
d. Policies and guidelines
e. Information documents.

All processes carried out by the BTS should be documented and the records kept for traceability, including identification of the donor, blood unit collected, preparation of blood components, issue and status of components, and whether the unit was transfused, discarded or returned to the BTS. The documentation system should make it possible to trace a unit of blood/component from source (donor and collecting facility) to final disposal, including all screening results and the results of any other tests performed.

Proper documentation also plays a role in haemovigilance. It allows for traceability from the blood donor to blood donation, to the recipient of the transfused blood or blood product. In addition, traceability also enables proper investigation of adverse events and reactions, and allows corrective action to be taken to minimize the potential risks associated with transfusion.
There are four strategic directions under the WHO Global Strategic Plan for universal access to safe blood transfusion (2008–2015). Strategic Direction 4 aims to strengthen systems for assessment, monitoring and evaluation for better decision-making by policy-makers and planners through the following three strategies:

1. Develop effective national systems for the collection and management of data throughout the transfusion chain.
2. Build and strengthen global, regional and national surveillance, vigilance and alert systems for blood safety and availability.

Countries are encouraged to collect data from national systems for submission to the WHO Global Database on Blood Safety (GDBS). The GDBS was established in 1997, and has been an invaluable tool for biennial assessment of the blood safety situation in Member States.

Collecting and managing data on blood safety allows for an accurate assessment of the existing situation and prioritization of needs. The best available information should be obtained at a national, regional and/or global level. The data enable identification of priority areas requiring support, better decision-making by policy-makers and planners, and formulation of strategic recommendations. Progress can be monitored and trends evaluated.

### 11.2 Data Collection Tools

Data are a collection of information, evidence or facts. Conclusions can be drawn from them, such as identifying and monitoring variations in the trend of a certain development. Data can also be used as evidence that justifies the outcomes of particular programmes. These data can be quantitative in the form of numeric information, or qualitative.

The different types of data collection methods include self-administered surveys, personal interviews, focus groups, web-based surveys, and e-mail surveys.

**Self-administered surveys** are useful in describing the characteristics of a large population and make large samples feasible. The advantages are low costs, reduction in bias error and greater anonymity. The disadvantages are that it requires simple questions and there is no opportunity for probing.

**Personal interviews** generally decrease the number of responses such as “do not know” and “no answer” as compared to self-administered surveys. Interviews also provide a guard against confusing questions.
Effective Management of Data

Advantages of using interviews are the high response rate, ability to control the interview and its flexibility. The disadvantages are higher cost, interviewer bias and lack of anonymity.

*Focus groups* are useful in obtaining specific information that would be difficult to obtain using other methodologies. A focus group can typically be defined as a group of people who possess certain characteristics and provide data of a qualitative nature in a focused discussion. The advantage is its flexibility. The outcomes are quickly known and it is not expensive to plan and conduct the sessions. Some disadvantages are that it is essential to have a skilled moderator, the results may be more difficult to analyse, and focus groups can be difficult to assemble.

*Using web-based surveys*: the use of computer-assisted interviewing is increasing, especially the use of the World Wide Web for administration of surveys. The advantages include the opportunity to have a large and diverse survey, potentially large datasets in a computer package for subsequent data analysis, and the opportunity for integration of multimedia. Some disadvantages are the underrepresentation of those from a low socioeconomic status, and the non-standardized experimental environments.

*E-mail surveys*: as a complement to online data collection, surveys may also be undertaken using electronic mail as a means of questionnaire dissemination and collection. The advantages of using e-mail surveys are that it is cheaper, faster, encourages respondents to reply, and can be construed as being environmentally friendly. The disadvantages are that there may be unsatisfactory response rates, and the possibility of biased results due to the limited reach to the population.

### 11.3 Appropriate Use of Data in Decision-Making

Data are essential for making evidence-based decisions in various areas such as making policies, formulating guidelines, establishing SOPs and developing practices. Data can be obtained from multiple sources such as research publications, the local environment and patients. The challenge is to appropriately identify useful data from the vast amounts available. Generally, the issues concerning data include the relevance of the data, their quality, analysis, interpretation and accessibility.

Data can be qualitative or quantitative, and both types are equally important for the blood service.

- *Qualitative data* encompass knowledge, attitudes, beliefs, reasons, expectations and fears, which are useful for planning activities in the blood bank such as donor recruitment, retention, prevention of high-risk behaviour and staff training. In this respect, qualitative data are key to effective implementation of programmes.
• Quantitative data pertain to evidence of test quality, procedures, blood safety, appropriate use, etc. These are useful for advising on efficacy and safety in the blood programme.

The relevance versus validity of data should be properly described. Relevance refers to whether the question asked is answered, while validity refers to the accuracy, reliability and robustness of the evidence offered by the data. In order to ensure that valid data are also relevant, data collectors or researchers need to formulate clear and focused questions.

To do so, it would be helpful for researchers to recognize the basic types of questions in the public health area and the various components or elements involved. Typical clinical public health questions can be classified into the following purposes:

- Descriptive
- Intervventional effectiveness
- Etiological
- Prognostic
- Risk factor
- Diagnostic accuracy.

A well-focused question contains certain basic elements:

- The population to be generalized to the study
- Sampling method
- Characteristics of the study sample – profile of patients, disease and setting
- Data to be collected on each patient, e.g. exposures, interventions, covariates and outcomes.

When a well-focused question is formulated, it can then be matched to an appropriate study design.

For example, the following four survey study questions can be matched to an appropriate study design:

<table>
<thead>
<tr>
<th>Study Question</th>
<th>Study Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficacy of a treatment</td>
<td>Randomized control trial</td>
</tr>
<tr>
<td>Level of risk incurred by an exposure</td>
<td>Cohort study</td>
</tr>
<tr>
<td>Cause of a disease</td>
<td>Case-control study</td>
</tr>
<tr>
<td>Quality of a diagnostic test</td>
<td>Cross-sectional study; using goal standard assay</td>
</tr>
</tbody>
</table>

It is important to develop the ability to choose appropriate study designs corresponding to the study questions. Many issues concerning study designs appear as dual concepts that are related but distinct. Both should be considered thoroughly when selecting methods for a study.

A good study design should fulfill three purposes:

- Lead to generalized conclusions so that results are relevant to the wider population
- Generate accurate data
- Generate precise data

**Generalizable conclusions – population versus sample**

The ideal process is to study a target population and apply the results to it; however, there are practical constraints in doing so such as the number of subjects and time that would be required. Thus, a smaller representative set of people called a study sample is studied instead of the entire target population. The data obtained from this study sample are used to draw conclusions about the population summary; this method is known as statistical inference.

One point to note is the difference between random sampling and non-random sampling. Random sampling of a target population enables researchers to study a smaller population size and then generate an estimate of preferences or an incident. Being a random sample, the statistical inference is drawn from the target population; the intended inference, which represents the researcher’s intention, is the same as the statistical inference. In this case, any difference between the sample statistic and the population parameter is only due to a random error or sampling error.

On the other hand, in non-random or convenience sampling, the statistical and intended inferences are drawn from different populations – statistical inference from the actual sampled population, and intended inference from the target population. Any difference here is due to random error as well as selection bias.
Accuracy and precision

Accuracy is defined as the degree of closeness to the “truth” and is the opposite of bias. It is not measurable unless a standard exists. Precision is the degree of data variability in a sample and is the opposite of random error. Precision can be measured by the width of the confidence interval or by standard deviation.

Bias and imprecision

Bias can arise from various sources: the selection of subjects; allocation of interventions; differential placebo effect; differential caregiver treatment; differential outcome assessment; incomplete follow up; faulty analysis; and selective reporting. Some types of bias to be noted are confounding bias and bias due to indirect causation.

Both bias and imprecision can occur at the twin stages of sampling the population and measurement of raw values, giving rise to random sampling errors and/or random measurement errors. Random sampling
error can be controlled by taking a sufficiently large sample size. Random measurement error can be controlled by standardizing the techniques used, instruments, reagents, condition, as well as repeating measurements.

There are many other considerations in designing a study, as listed below. For each pair of concepts, one is distinct from the other, yet both are also related; they should be considered together for appropriateness of use.

Table 7. Considerations in designing a study

<table>
<thead>
<tr>
<th>Versus</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary studies</td>
<td>Reviews</td>
</tr>
<tr>
<td>Narrative reviews</td>
<td>Systematic reviews</td>
</tr>
<tr>
<td>Systematic reviews</td>
<td>Meta-analysis</td>
</tr>
<tr>
<td>Cross-sectional study design</td>
<td>Longitudinal study design</td>
</tr>
<tr>
<td>Retrospective survey of cases</td>
<td>Prospective follow-up of cases</td>
</tr>
<tr>
<td>Closed cohort follow-up of subjects</td>
<td>Open cohort follow-up of subjects</td>
</tr>
<tr>
<td>Statistical significance</td>
<td>Clinical significance</td>
</tr>
<tr>
<td>“Non-statistically significant”</td>
<td>Clinical equivalence</td>
</tr>
<tr>
<td>Intention-to-treat (ITT) principle</td>
<td>Per Protocol (PP) analysis</td>
</tr>
<tr>
<td>Significance test (p-values)</td>
<td>Confidence interval</td>
</tr>
</tbody>
</table>

Two common approaches to reporting statistical evidence are the significance test (P-values) and confidence interval. Using significance testing, the question asked is “What is the chance of such an effect if the null were true?” The smaller the number of the P-value, the stronger the evidence is. Using the confidence interval method, the question asked is “What is the likely range of the effect?” This method is more intrusive and directly related to the measure. It can be interpreted as finding estimates in which there is a 95% confidence in finding the true value. The advantage of this method is that it helps in decision-making.

11.4 Blood Bank Computer Systems

In assessing computer systems for use in the blood service, there are four components to consider: hardware, software, data and personnel.
Table 8. Assessment of computer systems in the blood service

<table>
<thead>
<tr>
<th>Component</th>
<th>Things to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>- Stand-alone</td>
</tr>
<tr>
<td></td>
<td>- Network</td>
</tr>
<tr>
<td>Software</td>
<td>- Operating system</td>
</tr>
<tr>
<td></td>
<td>- Software programmes</td>
</tr>
<tr>
<td>Data</td>
<td>- Input: manual, instrument interface, data transfer</td>
</tr>
<tr>
<td></td>
<td>- Output: instrument interface, data transfer, reports</td>
</tr>
<tr>
<td></td>
<td>- Data storage</td>
</tr>
<tr>
<td>Personnel</td>
<td>- System Manager</td>
</tr>
<tr>
<td></td>
<td>- Programmers and analysts</td>
</tr>
<tr>
<td></td>
<td>- Operators</td>
</tr>
</tbody>
</table>

The main advantages of using computer systems are as follows:

- **Cost-effective** – There are lower personnel costs due to increased efficiency and productivity; improved turnaround time; reduced clerical errors and loss of results; better data management; and optimization of work flow processes.

- **Supporting management** – There is better personnel management, inventory control and fiscal control when good computer systems are in place.

- **Aiding decision-making processes** – Computer systems enable better data retrieval and analysis as well as derive decision algorithms. These help in making evidence-based decisions.

However, the benefits need to be balanced against the costs when choosing a computer system. Some of the questions that need to be asked during this process are as follows:

1. Is a computer system necessary?
2. What needs to be computerized and to what extent?
3. Should system development be done in-house or by a vendor?
4. Will the system interface with other computer systems, either internally or externally?
5. What guidelines exist and should be used in assessing the different options?
6. To what extent is computerization needed in terms of geographical area?
   - Size of the blood bank/blood service
   - Size of the facility
   - Entire blood bank operations or some of the units/laboratories
7. Is a single system sufficient or are several different systems needed?
   - Economic and/or practical considerations
   - With a single system, there is less redundancy in training of personnel, less supply shortage problems, and better data integration.

8. What are the resources available?
   - Proper environment?
   - Proper support personnel?
   - Proper training of blood bank personnel?
   - Adequate budget – capital and recurrent?
   - Administrative support?
   - If any of these resources are less than adequate, it is better to re-evaluate goals than to proceed.

There is also the option of using a system developed in-house or a system purchased from a vendor. The advantages and disadvantages are listed in the following table.

### Table 9. Comparison of in-house and vendor-supplied computer systems

<table>
<thead>
<tr>
<th>Type of system</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| In-house       | Flexibility and ability to modify quickly to meet changing needs | May be difficult to meet requirements
|                |            | - Need to maintain software for long periods by employees who are familiar with the system
|                |            | - Possibility of duplication of efforts |
| Vendor         | - Cost of development, maintenance and updating are distributed among many users
|                | - Groups of common users can solve common problems, advise on improvements etc. | - Restriction in choices to those dictated by vendor
|                |            | - Loss of flexibility
|                |            | - Depends on vendor’s commercial viability |
Some important points to consider in successful implementation of computer systems:

- Key elements must be in place before any blood bank system can be implemented successfully:
  - System of unique identifiers for blood donors
  - System of unique identifiers for blood units
  - Clearly defined and mapped processes
  - Critical data requirements in blood bank operations
  - Clearly defined roles of all blood bank staff in all operations and processes, security access levels.
- Interview other users of the system.
- Visit other sites where the system is installed.
- Have an on-site demonstration of the system.
- Clarify what is provided by the vendor for each level of support; review the contract with a lawyer.
- Check the viability of the vendor.
- People are the most critical elements to success:
  - The process of implementing the system requires a great deal of attention and time from all staff at all levels.
  - Implementation of a new computer system will require changes in the existing processes.

Once the decision has been made to adopt a computer system, there must be processes in place to implement this effectively. These include the pre-tender process (specifications and requirements), tender process, evaluation and selection of a system, implementation plan, post-implementation phase, security and risk management issues, and disaster recovery and contingency planning.

During implementation, user acceptance testing (UAT) is critical. This is a highly human resource-intensive process, and requires staff who are knowledgeable about the work process, so that potential pitfalls and errors can be identified. It is very important to test all possible scenarios and to resolve any problems before the system design is accepted.

Besides system validation and acceptance testing, other important areas that must be considered carefully and planned well are the management of infrastructure and facilities, system change and problems.

While computer systems can increase blood safety and improve management of the blood supply, these need to be matched with the capacity, needs and requirements of the blood service. Key elements must be in place before any blood bank computer system can be implemented successfully, including unique blood donor and donation identifiers and clearly mapped processes. Systems must be validated properly against clear objectives for the implementation of new systems.
12. Strengthening the Clinical Interface

12.1 Strengthening the Clinical Interface at the National Blood Service

The classical clinical roles in blood centres are in the areas of donor selection, infectious disease (ID) testing and interpretation, immunohaematology, and ID look-back. The latter involves “behind the scenes” pathology disciplines, requiring an ID physician/microbiologist; immunologists, among others.

Classical thinking maintains that blood centres should be behind the scenes. However, there is a need to change and re-look at how things should be done while going forward. Today, transfusion medicine needs to look into bridging the interface between the blood bank and clinical units.

Blood is generally seen as very safe by hospital clinicians. It is important for clinicians to realize that although blood is safe, there are potential side-effects, e.g. the problems of emerging IDs and immune complications of blood transfusion.

Diagram 15: Principles underlying blood safety (left) and transfusion safety (right). Compared to blood safety, transfusion safety additionally involves the clinical interface.

The principles underlying blood safety are Donor Selection, Blood Testing and Modification of Products (Diagram 15, left). Clinical input is required in all these measures, as well as in promoting the appropriate use of blood. Transfusion safety must involve the clinical interface (Diagram 15, right).
How do we define and refine this clinical interface? Different blood centres cover different areas. Some have hospitals situated fairly close by, but others will have to decide strategically on the extent to which they need to expand. Hospital clinicians should undergo training in clinical transfusion, and induction sessions should be conducted to explain blood usage management.

In strengthening the clinical transfusion interface, it is important to shift clinicians’ perception of the blood bank as a “mere supplier of products” to that of a player with an important role in the management of their patients.

Part of this means gaining clinicians’ trust and cooperation in optimizing blood use. Using evidence-based medicine and working with other clinical disciplines on management pathways is a useful practice, e.g. management of post-partum haemorrhage, disseminated intravascular coagulation (DIC). Also useful are clinical guidelines, and encouraging doctors and hospital blood banks to have dialogues with transfusion specialists if in doubt.

For example, at the HSA BSG in Singapore, the clinical service provides clinical consultation to clinical colleagues on the management of patients requiring blood/component therapy. The types of clinical consultations include the management of complications (DIC, peri-surgical), pre-emptive advice versus emergency advice, and professional advice to hospitals and overseas blood banks on matters related to transfusion medicine and blood safety issues.

The BSG works closely with haematologists, hospital blood banks and hospital transfusion committees, while continuing to strengthen the clinical transfusion interface. Training is given to medical officers and haematology students, and the BSG also coordinates the national haemovigilance programme.

12.2 Strengthening the Clinical Interface at the Hospital Blood Bank

Hospital blood bank staff and clinical staff must work together to provide quality patient care. The role of the nursing staff in the hospital is crucial as it makes the interface between the clinician and blood transfusion service stronger.

Areas where both the hospital transfusion staff and hospital staff can work together to minimize adverse occurrences and overcome the problems faced during difficult situations include collection of blood for cross-matching, transportation of blood/products to wards, administration of blood/products, shortages of blood/delay in getting blood, transfusion reactions, and special situations such as emergency and mass casualties.
Both parties have the same objective of ensuring the delivery of the “right blood product to the right patient at the right time”. Clinical staff usually understand their limitation in resolving problems and often need consultation and reassurance. While it may be difficult to fully comprehend all blood bank issues, some of these issues will be present at the scene of action, so education is important for every new doctor and nurse. Doctors are taught to give a written explanation for every mistake or problem faced to enable improvement in the system.

In a hospital blood bank, both the technical and medical staff should be actively involved. The blood bank doctor has to be proactive and available for consultation 24 hours a day. Understanding the concerns of ward doctors and nurses and earning their respect are important for strengthening the interface.

Besides having regular meetings with intensive care unit (ICU) medical/nursing staff, theatre and emergency department staff, visits to the blood transfusion service further help to improve the relationship. Doctors and nurses get to understand how some blood bank procedures are carried out, e.g. ABO blood group selection for red cell and plasma transfusion, storage of the different blood products, blood request procedures for abnormal coagulation and for massive blood transfusion. In this way, some misunderstandings about blood transfusion may be clarified.

Guidelines on the use of blood products should be developed in consultation with the major users. The process for requesting blood products should be simplified in the request form.

While the priorities of clinicians may be different because of the areas they work in, their concerns and objectives are the same – to “give quality patient care and ensure patient safety”. Mutual understanding, respect and trust are needed and should be worked on. Any advice given should be seen as non-adversarial and educational.

12.3 Developing National Clinical Guidelines

The nature of transfusion medicine is changing. Historically, the focus of blood products has been on safety, efficacy and availability, but there is now an emerging focus on patients and blood transfusions as part of the overall care package.

Improving clinical transfusion practices involves promoting the appropriate use of blood components and improving the clinical blood delivery system to get blood products to patients. Underlying these actions is a culture of continuously seeking improvement in quality services.
Key steps in developing local guidelines include establishing an expert group, defining local priorities, utilizing international guidelines for reference purposes, developing draft guidelines, ensuring wide consultation with user groups, and developing a final version for implementation.

Hospital transfusion committees have the responsibility of developing and implementing clinical guidelines. The main functions of hospital-based transfusion committees are:

- to ensure effective implementation of the national guidelines within the clinical setting
  - educate, audit and review
- to train hospital staff
  - approve training tools and competency measures
  - review the outcome of training
- to establish the hospital blood ordering schedule
  - define, monitor and review
- to lay down the hospital SOPs
  - approve, monitor and review
- to monitor and evaluate at the hospital level
  - incidents (taken as learning opportunities)
  - trends
  - audits.

Hospital transfusion committees have the critical responsibility of ensuring opportunity for dialogue between the transfusion department and the rest of the hospital. To ensure effectiveness, the committee must be part of a wider clinical governance framework, and have the appropriate membership, comprising an independent chairperson and a multidisciplinary team of doctors, nurses and scientists. Quality indicators and other data or information are also crucial for effective dialogue and decision-making.

When the national clinical guidelines are developed, the following should be taken into consideration:

- The guidelines should be based on available evidence.
- They should represent a consensus by clinical specialists, the BTS, pharmacists and professional bodies.
- They should be practical, comprehensive and relevant to local conditions.
- The hospital-based transfusion committee should ensure effective implementation.
- The guidelines should be reviewed regularly, taking into account evidence of their effectiveness and acceptance by clinicians.
Evidence can be obtained from general sources (i.e. clinical trials), as well as local sources such as the environment in which the evidence will be applied (i.e. the blood bank).

Numerous sources of transfusion guidelines from the WHO, British Committee for Standards in Haematology (BCSH), Australian and New Zealand Society for Blood Transfusion (ANZSBT) are freely accessible on the Internet http://www.traqprogram.ca/international-guide.asp (accessed on 19 October 2010). One should note that the evidence base for transfusion practice is often limited; thus, guidelines are usually developed by general consensus.

WHO has a number of strategies to improve clinical transfusion practices. These include areas such as:

- prevention, early diagnosis and effective treatment of conditions that could result in a need for transfusion;
- use of good surgical and anaesthetic techniques, pharmaceuticals and medical devices to reduce blood loss;
- availability and use of simple alternatives for volume replacement, including intravenous replacement fluids (crystalloids and colloids);
- appropriate prescribing of blood and blood products in accordance with national guidelines;
- safe pre-transfusion procedures;
- safe administration of blood and blood products.

The availability of clinical guidelines for local service provision is an essential tool to help clinicians use the blood service effectively. Considerable guidance is available from WHO on what needs to be provided, such as: Developing a national policy and guidelines on the clinical use of blood; WHO principles on the clinical use of blood, Clinical standard operating procedures. http://www.who.int/bloodsafety/clinical_use/en/Handbook_EN.pdf (accessed on 19 October 2010)

It is important to start with simple steps and build the guidelines progressively.
13. Achieving Quality

13.1 Standards: Why Do We Need Standards, Who Should Develop Standards and How Do We Develop and Enforce Standards?

Quality is defined as conformance to specifications. Quality control is the measurement of parameters to demonstrate that the system is performing correctly. Quality assurance is the development of a systematic approach that will ensure that products and services meet stated requirements.

The transfusion paradigm of understanding standards mainly consists of either the medical model of clinical service provision, which is focused on patients and their needs, or the pharmaceutical manufacturing model, which is focused on products and how fit a product is for the given purpose. The regulatory paradigm, with its focus on products, examines quality (conformance to specifications or standards), safety (risk reduction and avoidance of harm) and efficacy (achieves intended purpose).

Standards are important as they provide a common goal and enable communication of the organization’s requirements to staff and stakeholders. Standards are also a first step in ensuring the production of consistent, safe and effective components.

Standards are both internal and external. The primary responsibility for internal standards lies with the blood service. Internal regulation means that a system exists within the blood service to ensure that the standards are met. This improves management confidence that the system is working as intended. A local quality system might achieve this.

External standards may be set either by a competent authority (regulator or government), purchaser (plasma fractionators or hospitals), or the blood service. External regulation is the enforcement of standards by an approved body, and designed to improve overall performance and assure quality control. External inspectors and controls would ensure compliance with the standards.

There are two complementary types of standards. The first are technical standards that identify what needs to be achieved – these include the
AABB Guidelines and Standards\(^3\), the Council of Europe Guide to the preparation, use and quality assurance of blood components\(^4\), and the Guidelines for the blood transfusion services in the UK (UKBTS) Red Book\(^5\). The second are quality standards, which identify systems that must be in place to achieve stated goals.

Standards must be clear and easily understood; measurable; realistic and achievable; appropriate to the local environment; defensible; and may be incremental in nature.

In a quality improvement cycle (Diagram 16), key questions that must be asked are, “What do I want to achieve?” “What do I need to do to achieve it?” and “How will I know if I have achieved it?”

\textbf{Diagram 16: Quality improvement cycle}

In the blood service, standards are generally comprised of the following categories:

- Donor acceptance standards
- Blood donation standards
- Blood processing standards
- Blood donation testing standards
- Blood component standards
- Service standards – donors/hospitals.


For example, the New Zealand Blood Service (NZBS) Standards use the Council of Europe Guide as the primary reference standard, as this utilizes the benefit of a larger and more experienced group (greater status) and provides useful justification for practice when challenged (defensible). The NZBS Standards were then produced based on the Council of Europe Guide. However, changes must be approved by the regulator (MedSafe) and deviations from the Guide must be justified.

Reference standards that can be used by blood services include the Council of Europe Guide to the preparation, use and quality assurance of blood components⁶, WHO guidelines⁷, AABB Guidelines and Standards⁸, FDA Code of Federal Regulations⁹, and Guidelines for the blood transfusion services in the UK (Red Book)¹⁰. It is useful to refer to more than one reference when defining internal standards as it provides for a high level of commonality and clarifies critical requirements.

Donor selection standards are critical in assuring the safety of blood donors and recipients, and should ensure a careful balance between safety and sufficiency. Standards must be relevant to the local situation as it is not always appropriate to take another country’s standards and apply it locally.

It is therefore useful to learn from sharing and understanding the reasons for differences. Common causes for differences include donor age, donor haemoglobin, volume of blood collected and frequency of donation. The key requirement is to set justifiable limits appropriate to the local situation.

Component specifications define the product intended for manufacture. Critical manufacturing requirements usually include volume and content.

---


7 http://www.who.int/bloodsafety/transfusion_services/en/ (accessed on 19 October 2010)


9 http://www.fda.gov/BiologicsBloodVaccines/GuidanceComplianceRegulatoryInformation/default.htm (accessed on 19 October 2010)

Specifications should take into account the intrinsic biological variation in the primary donation. It should also identify quality-monitoring requirements.

In assuring quality, two general approaches are used: control of product (component monitoring) and control of process (process control). Component monitoring measures the output of the manufacturing process and identifies whether the components meet the required specifications. Process control extends the quality system to include control of processes with the aim of ensuring that blood components will be manufactured to specifications. Control of processes generally provides greater control of the final product and leads to a relatively standardized product.

In conclusion, standards are an essential part of any blood programme. At a minimum, each blood service must define its own internal standards and then put systems in place to ensure that they are met. Where possible, linkages to acknowledged international standards should be considered. Regulation and external standards would need to be undertaken for blood services operating within the pharmaceutical paradigm.

13.2 External Quality Assurance Schemes (EQAS)

The EQAS available cover a range of proficiency testing programmes provided by organizations in various countries. Examples of EQAS include: United Kingdom National External Quality Assessment Service (NEQAS) in the UK, NRL and Royal College of Pathologists of Australia (RCPA) in Australia and College of American Pathologists (CAP) in the USA.

The importance of participation in an EQAS lies in its function to test the quality of the activities in the BTS. As the BTS provides blood products for patient therapy through a complex process, it is important to maintain the quality of blood products and make sure that the right test is conducted so that the right results are obtained, and ultimately a safe transfusion given to the right patient.

There is a difference between quality control and quality assurance. Quality control focuses on detecting quality problems by monitoring the outcomes of the processes. Laboratories record daily quality control data and analyse these data for trends so that any corrective action required can be taken early to maintain optimum performance of the screening programme. Quality assurance focuses on preventing uncertainty factors that may affect the quality of test results. Participation in an EQAS will help laboratories to ensure that they are performing screening assays in a quality-assured manner.
An EQAS allows comparison of performance and results, and serves as an early warning system for problems, e.g. systemic equipment or reagent defects. It provides objective evidence of laboratory quality and competence. It also serves as an indicator of where to direct improvement efforts and helps to identify training needs.

Participation in an EQAS provides clinical challenges that mimic patient samples and has the effect of checking the entire examination process, including pre- and post-examination procedures. Problems or deficiencies identified should be acted upon and records of actions retained. There must be a record of deviation from the defined procedure, and any action taken should be properly authorized.

An EQAS is usually organized and provided by an external independent agency that objectively checks the participant laboratory’s test results. The organizer distributes EQAS samples as aliquots of specimens to participant laboratories for testing by either the same testing method or different testing methods. The results of the specimens distributed would have been fully evaluated by the EQAS organizer or a reference laboratory, and these results are then used to assess the results of participant laboratories.

Most EQAS processes start by the EQAS organizer sending out challenge specimens to participant laboratories, which then analyse these specimens and return the results to the EQAS organizer. The EQAS organizer consolidates all the results of the participant laboratories, rates their performance against either the reference laboratory result or a consensus result, and issues the reports back to the participant laboratories. Participant laboratories are then expected to take appropriate corrective action with documentation.

The EQAS evaluates imprecision and testing errors, and also ensures proper procedures for tracking results, maintaining sample integrity, tracking sample data and resolving discrepancies. The process concludes with an EQAS Participant Report of Peer Group Results Comparison.

Proficiency testing is defined as a programme in which multiple samples are periodically sent to members of a group of laboratories for analysis and/or identification; whereby the results of each laboratory are compared with those of other laboratories in the group and/or with an assigned value, and reported to the participating laboratories and others.

Blind rechecking is also a form of EQA in which participants randomly select samples with test results for submission to a reference laboratory for rechecking. The reference laboratory is “blind”, i.e. does not know the participant laboratory’s identity when performing the rechecking. This method is most commonly used for visual examination, e.g. smears for tuberculosis or cytology. Considerations include a statistically acceptable
sample size, proper specimen handling, procedures to ensure blinding, and procedures to resolve discrepancies.

On-site evaluation and review is also practised in some countries as a part of EQAS. Periodic visits are made to participant laboratories to assess their practices and obtain a realistic picture of these. This is conducted by EQAS organizers or national authority organizations. Points to consider include the frequency of visits, use of checklists, and follow up to visits for monitoring corrective actions and training.

There is no excuse for not having an EQAS. Where formal inter-laboratory comparison programmes are not available, the laboratory should develop a mechanism for determining the acceptability of procedures not otherwise evaluated. Whenever possible, this mechanism should utilize externally derived challenge materials, e.g. exchange of samples with other laboratories.

Within EQAS analysis/reporting protocols, samples should be handled in the same manner as routine patient or donor samples, and should follow the routine testing strategy using routine methods. Results should be analysed by technical staff who routinely perform the test, and the test should be conducted within the normally specified time frame. Any problem should be communicated to the supervisor or EQAS organizers; inter-laboratory discussions of EQAS specimens or results are not allowed.

Non-conformities with EQAS performance may be pre-analytical where the specimen is compromised during preparation, transport, or after receipt due to mis-storage/handling; or analytical where problems with reagents, instruments, methods and calibration affect the results. Failure to detect analytical error in the internal quality control (QC), error in calculation, or lack of competence of staff can lead to non-conformity. Post-analytical factors such as the report format, interpretation, or poor data management can also lead to non-conformity with the EQAS results.

EQAS procedures should be traceable and documentation is very important. There should be established written procedures for handling samples, analysing samples, recording results on report forms, verifying clerical accuracy, using statistical tools and managing corrective and preventive actions.

The Guidelines on establishing an EQA scheme in blood group serology from WHO is recommended for further reading.

---

13.3 Setting up National External Quality Assessment Schemes (NEQAS)

Quality is a continuous process of improvement within an organization. A quality assessment scheme (QAS) is one of the tools for monitoring a quality system. An internal quality assessment done in the laboratory is a process of analysing known control samples in the same manner as test samples and comparing the results to show consistency. On the other hand, external quality assessment is based on analysing samples of known but undisclosed values, and comparing the results with those from other laboratories.

The objective of a QAS is to give participating BTS an objective impression of their accuracy and precision with reference to other BTS. It is also used to compare and monitor the performance of all the participating laboratories, and is often done to improve quality. An EQAS is usually provided by an authorized agency approved by the health authority. It is important that the performance of each laboratory is kept confidential and the assessment is based on its proficiency in performing specific tests.

The process of participating in an EQAS is to register with an agency or service provider where each laboratory is given an identity code. Samples are sent on a regular basis, usually two or four times a year. Samples should be tested “blind”, i.e. as though it is an actual patient sample. The results are sent to the agency, where they are compared with those from other laboratories using similar methods of testing. The final analysis is then communicated back to the individual laboratory.

The purpose of NEQAS is to monitor the performance of all laboratories that perform blood screening and immunohaematology testing throughout the country, to assess the integrity of the laboratory testing process, and to educate participants on quality assurance issues. Participants can compare their performance and results, and also identify systematic test kit problems between laboratories. NEQAS results can also be used to identify and rectify common errors/problems in testing, monitor whether samples are being handled correctly, results are being appropriately recorded, and whether assays are being performed in an accurate and efficient manner.

To provide a national programme, a great deal of planning is involved. The preparation of samples depends on which tests are being evaluated. The integrity of the samples must be maintained during transportation. It involves analysing results from laboratories and sending individual laboratories the results of their performance against other laboratories, and determining “outliers”. The EQAS organizers may also provide advice or technical assistance for a national blood centre.
An important area in the organization of a NEQAS is the sample preparation process. Strict validation of samples must be done to ensure stability. Distribution must be efficient to ensure that samples arrive on time.

In order to provide EQAS in TTI, dedicated funding should be available and the staff must be trained in preparing samples and analysing results. Staff should be attached to a laboratory that is well experienced in conducting EQAS. Feedback is very important and it is often advisable to start small and then expand the programme later.

In conclusion, it is suggested that reference laboratories should start to work towards setting up a national quality assurance programme (QAP) or get help from agencies already providing the service. A few samples can be sent to one centre that serves as a distribution centre to save on cost. A QAP should not focus only on TTI but also on immunohaematology.

13.4 Internal Quality Control Systems

The purpose of IQAS is to ensure reliable results from the laboratory, and that a particular procedure is performed in such a way that the day-to-day results are within the established precision for the procedure and the values represent the true condition. Results should be rejected where there is evidence that more than the permitted amount of error has occurred. Product QC is performed to determine whether that particular blood bank product or service meets its specifications.

The difference between the EQAS and IQAS is that EQAS is a way of measuring the performance of the laboratory against other laboratories, while IQAS is a measure of how reliable the results are in internal processes.

Quality control testing is performed to ensure the proper functioning of materials, equipment and methods during operations. Testing provides feedback to operational staff about the state of a process that is in progress, and whether to continue or to stop the release of the results until a problem is resolved. Some examples of quality control testing include reagent QC, clerical checks, visual inspections, temperature readings on refrigerators, cell counts performed on finished blood components.

Quality control monitoring is the responsibility of both the staff and the management. Staff should document the results of control samples and events that do not meet specified criteria as part of their routine job tasks. The management should regularly review the performance of quality indicators and compare performance to industry benchmarks.

Recorded data measurements are used in process analysis and process improvement to identify variations in the process. These include the
number, frequency, sources and causes of the variation. The types of variations and any relationship between the variations are also useful. Three types of data are measured: *variable data*, which cover a continuous scale of measurement; *attribute data*, which are obtained from counting (e.g. defective units produced) or classifying (e.g. reject/not reject); and *rank order data*, which are obtained from comparison.

Data should be collected and analysed using check sheets, which are structured forms on which to record the events or results. Descriptive data are usually analysed using scatter diagrams, Pareto analysis or histograms, while variable data analysis is done using run charts (plot of data arranged in a time sequence).

In the laboratory, QC testing is performed using standards, calibrators and blanks provided by the manufacturers in their test kits, as well as control samples which are usually not provided by the manufacturer. The control range is determined using quality control charts.

Quality control samples should be similar in composition to the unknown samples. They should be included in every batch or every run through the entire test procedure and treated in exactly the same way as the other samples. Automated procedures often require inclusion of additional standards and controls – between samples and at the end of the run. Control specimens should be independent of the calibrator or positive/negative samples provided within the test kit by the manufacturer, as the test cut-off value is often calculated based on these test kit controls.

There are many types of control samples available. Commercial control samples are convenient to use and stable but cost is a disadvantage. The quality manager should set selection criteria when obtaining commercial samples, such as qualitative characteristics, concentration, stability and cost. Control samples can also be prepared by the laboratory using its own samples following the same type of selection criteria prepared by the quality manager. Problems associated with in-house preparations include difficulty in obtaining suitable samples, preparation that is time-consuming, and sample stability and consistency.

The frequency of analysis or how often QC should be done depends on the operations within the blood services. The AABB Technical Manual and Council of Europe Guide provide guidance in this area. It is important that QC records include identification of personnel, identification of

---

12 http://www.aabb.org/Pages/Product.aspx?Product_Id=704 (accessed on 19 October 2010)

Achieving Quality

reagents (including lot numbers and expiry dates), identification of equipment, testing dates and reviews.

Quality control charts are graphic tools used to determine whether a process is in control or out of control according to defined criteria. The Levey–Jennings (LJ) chart is an example of a control chart. Within the LJ chart, fluctuation of points within the limits is usually the result of variation within the process. However, points falling outside of the limits or trends seen within limits may often indicate problems occurring in the process. It should be noted that “being in control” does not necessarily mean that the product/test meets its need but only that the process is consistent. It is possible for a process to be in control and still not meet customer needs.

Internal process control should be performed for all blood components prepared by the blood service. The Guide to the preparation, use and quality assurance of blood components, 14th ed. Council of Europe, 2008, states that there should be data-validation processes for each blood component prepared to ensure that they meet specifications.

Quality control should be carried out according to a defined sampling plan, and the results subjected to periodic review. All QC procedures should be validated before use and acceptance criteria based on a defined set of specifications for each blood unit and blood component. QC test results that do not satisfy the specified acceptance criteria should be clearly identified to ensure that blood/components of that donation remain in quarantine and the relevant samples held for further testing.

13.5 Managing Quality Assurance Data

Monitoring data is important because BTS often have a lot of data but lack the system to convert this into meaningful information. Good data management provides confidence that a system is in control, and also helps to identify problems and initiate corrective action before it impacts on overall performance.

Data to be monitored in the BTS include results of routine testing, virology testing, QC testing of blood components, performance of individual machines and haematology and biochemistry analysers, and non-conformance rates. There are two types of data: attribute data and variable data. Attribute data are the characteristics or occurrences that are counted on the basis of their having met or not met certain attributes,

e.g. male or female, pass or fail. *Variable data* are characteristics that are measured on a numerically graduated scale, e.g. weight/volume and haemoglobin (Hb). Some types of data like Hb can be either attribute data (donor Hb – pass or fail) or variable data (content of a red cell component).

There are two causes for variations in data – common causes and special causes. *Common causes* are the inherent or natural variability in a system and fundamental process changes are necessary to reduce common cause variability. *Special cause variations* are traceable or assignable to a specific event or individual. Unlike common variations, special variations are usually manageable and correctable locally. Effective management of a process requires differentiating between common and special cause variations.

*Control charts* are useful tools that can be used to monitor data. Control charts monitor the process variation over time and can differentiate between process variation resulting from common causes and variation resulting from special causes. They are also used to assess the effectiveness of changes and to communicate process performance.

A control chart consists of points representing measurements of a quality characteristic in samples taken from the process at different times. These are the raw data. The line drawn at the centre of the process characteristic is the mean which is calculated from the data. Upper and lower control limits are then defined, which indicate the threshold at which the process output is considered statistically “unlikely”. This limit is often set as +/- 3SD. The control chart may have other optional features, including upper and lower warning limits, typically two standard deviations above and below the centre line, and division into zones, with the addition of rules governing frequencies of observations in each zone.

Types of data used in the control chart (Table 10) are described as raw data, cumulative sum, moving average and exponentially weighted moving average (EWMA).

**Table 10. Types of data and their use**

<table>
<thead>
<tr>
<th>Type of Data</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw Data</td>
<td>Simple approach that will identify the level of variability in a process</td>
</tr>
<tr>
<td>Cumulative sum (deviation from mean)</td>
<td>Plots the cumulative deviation from the mean value over time. This approach will provide early evidence of a trend in the value over time (often used in Hematology analyzers to assess results of calibrator testing)</td>
</tr>
</tbody>
</table>
### Type of Data

<table>
<thead>
<tr>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Moving average</strong></td>
</tr>
<tr>
<td>Plots the weighted average value over time. Similar approach to the Cusum; this provides early evidence of trends in values over time.</td>
</tr>
<tr>
<td><strong>Exponentially weighted moving average (EWMA)</strong></td>
</tr>
<tr>
<td>Plots moving averages of successive samples. A more sophisticated form of the moving average model</td>
</tr>
</tbody>
</table>

Taking the example of infectious disease marker testing, repeat reactive rates can be used to monitor the process. Daily plate or run results are unlikely to be a good monitoring tool because they may be influenced by many factors. However, they may help to highlight a particular problem. Weekly or monthly results will provide a more useful measure of the consistency of overall test performance as these can help to identify the batch-to-batch variation and useful pre-acceptance testing protocols, which are also very useful in manual testing. Results analysed by individual staff members can be used to measure competency.

Immunohaematology testing tends to be patient focused and is often manual. In this case, it is important to assure operator proficiency. Dedicated internal proficiency schemes can provide useful ongoing measures of competency and should involve all staff who undertake the task, especially those who do it infrequently. This is an important component of ISO 15189 compliance.

Process control of blood component production is an essential aspect of all manufacturing environments and aims to demonstrate conformance to specifications. It is also important to control the equipment used to measure the parameters, such as the haematology analysers. **Process control data** should be used to improve or maintain good performance of a system. Data visibility is important for all the staff, including senior laboratory staff, the quality team, managers and clinicians. Data must be reviewed in a timely manner to ensure that significant trends are identified, investigated and corrected. Critical datasets will need to be reviewed before the results are signed off or components released for issue. Go/no-go control data are used for infectious disease marker testing. Some specific parameters are used for “special” components such as white blood cells (WBC) in leuko-reduced red cells. Process control datasets should be easily visible as graphs or control charts on the laboratory wall. Individual staff control measures should be reviewed as part of performance or competency appraisal.

Data should be reviewed by each department and each department should take ownership of their own data quality. A formal process is required for collation and review of the data. There are two main components:
local review and management review. Local review involves review and sign-off by department staff, laboratory/donor manager and quality personnel. Management review is a high-level cross-organization review of the quality system, including results of internal and external QC/QA schemes and results of process monitoring such as conformance to specification, wastage, incidents/error reporting and complaints.

In conclusion, process control is an integral component of any manufacturing environment. It provides a measure of the level of control of a system and should identify adverse trends that require review and correction. These systems need not be complex but must be comprehensible and should start with simple monitoring systems and developed as overall capacity improves.

13.6 Regulatory Philosophy and the Role of Regulation in Protecting Public Health

The challenge facing regulators is one of adapting to real and current needs. The role of the regulator is changing, from that of a controller and regulator, to that of nurturer and facilitator, to that of a convener and aggregator. Finding the correct regulatory balance involves a constant balance of role, policy and resources.

This is because no health product is 100% safe, and “safe” does not equal a risk-free product. It is complicated by a constantly changing and unstable external environment, such as infectious disease threats and natural disasters. Operational challenges include service delivery turnaround time, product safety monitoring, and cost-efficiency (maximizing resources and minimizing the cost of regulation and operations).

The zero failure regime of the old conceptual framework of risk management in regulation, with its one-size-fits-all approach, is no longer possible or desirable. The better alternative today is smart regulation with its risk-based approach. This approach however, requires collaboration and partnerships, and a consultative approach to determine what constitutes an acceptable risk management position.

A restructuring of the regulatory approach in HSA has allowed it to deal more proactively with change, improve public health protection while ensuring timely access to medicines, enhance regulatory efficiency by minimizing duplication and using resources appropriate to risk, and reduce regulatory costs.

The regulatory toolkit includes: surveillance (market intelligence, environment scanning, benchmarking), intervention (legislative controls, system and process redesign, inspection, education, communication), enforcement (warning of legal action) and strategic partnerships. Using the right regulatory tools is both a science and an art.
Strategic partnerships have proved to be important for effective regulation in the experience of Singapore’s HSA. Within the country, this is facilitated by a coordinated biomedical landscape, and the HSA is able to work with various partners. These partnerships involve the regulator, business and consumer, and examine HSA’s role in managing the risks to consumers from medicinal products.

The challenge is to determine the acceptable levels of risk in the societal context, and this involves risk assessment, risk intervention and risk communications. Effective risk management involves facilitating access to the appropriate product at the appropriate dose/level to the appropriate patient in an appropriate manner, considering the requirements and expectations of the health-care community.

Legislative restructuring to modernize the regulatory framework resulted in the introduction of the Health Products Act in 2007. The Act is intended to consolidate medicine control laws, and is based on a modular approach, which is more responsive and flexible in dealing with products with different degrees of risk.

The key actions taken are as follows: first, study the regulatory restructuring options, and apply risk management approaches. Then select and use regulatory tools appropriate to the context, and implement matrix structure and coordination. Review and re-engineer systems and processes, and increase regulatory partnerships to leverage on other systems.
14. Effective Programme Management

14.1 Project Planning

Project planning is important in order to get full control of a project and avoid having things fall through the cracks. Project managers should create the project plan, clearly including and articulating all the necessary tasks, which should be broken down into activities, meetings and time frames. Having a time frame is useful for monitoring the progress of a project.

A project plan should be created with tasks and deadlines based on work breakdown structure (WBS). The team will decide the necessary activities and break down all of them in steps in order to follow and assign responsible staff for each activity. Some of these activities can be done simultaneously.

Elements necessary in project planning include the following:

- Describe the project and make a project plan that is clear.
- State project objectives and time frames, and discuss with the team before the plan is finalized.
- Form the project team.
- Identify the risk areas, and write down the names of those who are affected by the outcome(s).
- Plan the key decision points in the project.
- Assign responsibilities for each step to each team member.
- Follow up on the work.

Some projects can become very complex and can be jeopardized if there is poor team cooperation. Good information flow is required in a project involving a large number of project members, external resources and other participants. For a project to progress smoothly, there must be a good project leader who is knowledgeable about the activities and able to coordinate the work of the team members.

There are three levels of project management:

- Level 1: Project team. There may be only one team or many teams.
- Level 2: Steering team for monitoring and evaluating a project. If the project is big, there should be a steering team to drive the project forward smoothly and help to solve problems.
Level 3: A *counselling committee* is required for a very large project, and should involve all relevant stakeholders who are responsible for making decisions on budgeting, managing change, and helping to solve problems.

A Gantt chart is a very simple monitoring tool used in project planning. The Gantt chart is made up the following:

- WBS activities or steps
- Designated responsible staff for each activity
- Start date and finish date of each activity
- Percentage completed and percentage remaining
- Percentage of used budget and percentage of remaining budget
- Time frame for each activity to be followed up; should stick to the time frame. One activity may be broken down into many activities and time frames can be given to each of these subactivities.
- Identify the risks of each activity and try to manage each risk.

### 14.2 Resource Mobilization and Proposal Writing

To make sure that blood is safe and secure, we need money, human resources, materials and technology. For blood safety we must have blood banks and a blood policy such as a national strategy for blood safety. To obtain resources for the activities listed in the national strategic plan, we need to mobilize resources; find out how to mobilize resources, where the required resources are, and how to sustain these resources.

In public health, resources are often defined as triple M: Money, Materials and Manpower (HR), but now with technology transfer being described as Method, it has become 4 M; Money, Materials, Manpower and Method.

Resource mobilization is further divided in two types; internal resources and external resources. Internal resources are enhanced or newly introduced budget lines in the national budget. These require compelling justification to the government or the Parliament, and a good work plan to obtain the requested budget.

To introduce a new strategy or expand the services within the national blood safety programme, it is necessary to look at the cost and impact. Low cost and high impact will be the most important goal for the resource provider of a project.

An example of four priorities for cost and impact in resource mobilization is given below in the form of a checker board.
Diagram 17: Four priorities for cost and impact

<table>
<thead>
<tr>
<th>Cost</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Low</td>
<td>2</td>
</tr>
<tr>
<td>High</td>
<td>4</td>
</tr>
</tbody>
</table>

Priority 1 projects are best, while more compelling justification to get funds is necessary for a Priority 2 project with low cost and low impact. A blood safety programme is an example of a Priority 4 project with a very high cost and low impact and needs compelling justification to get funding.

To mobilize resources for any plan, it has to be a part of a national strategy and has to be in a written form. To create a base for resource mobilization, there must be clear core activities that should be funded under a national budget. There are non-core activities such as haemovigilance schemes, but core activities must be funded first.

The principles for resource mobilization are identifying multiple sources of funding to ensure independence and flexibility. Shortfalls can be met by external resource mobilization. With increased competition for scarce resources, options for new, diverse, and multiple funding streams are likely to be more helpful rather than aiming for a single source of funding.

In seeking external resource mobilization, it is important to concentrate first on securing core functions such as funding, human resources and materials. The programme capacity must also be examined to see if it can absorb external resources. The rule of thumb is to make sure to not raise extra money from external sources by more than two to three times the national budget.

When preparing for external fund-raising, there must be a national blood policy in place. There must also be a good national blood plan with compelling reasons for donors to provide assistance.
Some key elements that will help to strengthen the case include the following:

- Clear sense and commitment to your vision and mission
- A programme that will have an impact
- Evidence of a good track record in the past
- Effective management and leadership of the national authority
- Accountability and transparency of the organization
- Financial systems that will safeguard the resources raised, including adequate financial controls that demonstrate good management and build trust
- Solid reputation, credibility and a positive image
- Mutual respect and knowledge sharing between the organization and the community it benefits, as well as other stakeholders
- The ability to attract, create and sustain new resources.

Managing external resources is time consuming and donor coordination requires extra managerial skills. This can impact negatively on the normal operations of the programme, e.g. implementation of the established workplan. There needs to be some familiarity with the donor mandate (country strategic plan of donor) and its country operations.

In developing a proposal, it is necessary to identify gaps in funding. Gaps must fall into Priority area No. 1, and a low cost high impact project will be more successful in obtaining funding. If it is not, it should at least be low cost and low impact. A national-level workshop should be held to develop consensus. Assemble a team to write a proposal according to the donor’s funding template and finally negotiate.

In managing donor funds, approvals of the line ministry are necessary and should go through a memorandum of agreement. Clear roles and responsibilities should be defined, with an advisory group to monitor activities and provide oversight on the budget. Regular reports are sent to donors, especially on process and impact indicators, and financial reports in a format for donors. There should be a mid-term review, and an end-of-project report prepared with dissemination of impact analysis to show how the money was utilized. Finally, the sustainability of the programme needs to be ensured.

### 14.3 Project Implementation

A project is a temporary endeavour undertaken to provide a unique product or service, and has a beginning and an end. It is different from normal day-to-day work or production work and requires resources, time, money and planning.
Five steps of project management:

1. **Define**: the goals and objectives, scope, project constraints, risk estimated, commitment and projects initiated.
2. **Plan**: activities identified, duration estimated, resources identified, costs estimated, tasks sequenced, schedules prepared, budgets created, risks identified, resources committed and the go-ahead provided.
3. **Implement**: project staffing, procurement executed, communications executed, work activities executed.
4. **Control**: progress, quality and costs monitored, problems identified and resolved, and corrective actions applied as needed.
5. **Close**: work accepted, contracts closed, project reviewed and evaluated.

The three basic components of a project are *performance*, which is the outcome of the project, *time* that is needed for the completion of the project, and *money* (*resources*). These are known as the triple constraints and are important in every project. The project originator needs to decide which are the most important aspects and prioritize them.

A faster project or one with greater performance will have a higher cost. It is therefore necessary to decide whether the project should be “good and fast” or “fast and cheap” or “good and cheap”. The least flexible constraint (which is often money in many projects) is the driving constraint, and must be overcome or the project will fail.

Replacing computer systems is an example where there is no urgency and there is often a willingness to accept less than the latest technology to save money. Here cost is the driving constraint and performance is the middle constraint. Time is the weakest constraint and the most flexible.

In implementing a project, everything that needs to be accomplished to make it a success must be identified and the project divided into logical, manageable parts. Projects should be translated into tactics that can be implemented. Unnecessary tasks should be eliminated to increase the chances of success. The project becomes more manageable with the use of summaries and milestones.

Make a project simple by identifying every activity in the project. Success will depend on how well each essential activity is identified. The WBS helps to achieve project goals and organize what needs to be done by using a hierarchy of goals, objectives, strategies and tactics. Creating this hierarchy reveals how project outcomes are supported by key objectives or strategies and, in turn, which tactics or activities are needed to implement them.
To create a WBS, one must have a clear understanding of the project goals and objectives, triple constraints and project assumptions. The goal is broken down into its major elements or supporting objectives, and items inserted, deleted or moved within the task list along the way. Adding milestones makes projects easier to understand and manage.

A work schedule should be created and every task should have a start and finish time in the Gantt chart. Projects should be monitored closely and the team must have frequent meetings at the beginning. The best scheduling strategy should be chosen to make sure that the project is completed on time. Identifying and maximizing hidden resources and schedule flexibility, and discovering the constraints are useful for making the schedule fit the needs.

Effective use of resources is important as we usually do not have all the resources that we would like to have. Break each project task into different steps, balance workloads and responsibilities throughout the project team, and make the best use of limited resources by identifying where resources are over- and underallocated.

Reasons for project failures include failure to anticipate problems during the project, not planning the project properly, or not following up on the implementation plan. To overcome these problems, appoint a project manager, train the project team, make sure that procurement is done in time, and prepare the infrastructure. Prepare for the real world. For example, there might be good software and enough computers, but insufficient server capacity for the amount of data the BTS has to handle.

In measuring the progress of an implementation phase, monitor each step as follows:

- Is the implementation strategy producing the expected results?
- Are problems being effectively dealt with? Or have they been avoided, piling up and blocking progress?
- Is the project team staying focused, positive and productive?
- Is the stakeholder’s interest remaining at a satisfactory level or is their interest waning?
- If the project is a success, will it achieve the desired results?

A project cannot be implemented alone. There should be a team and team members must be informed of developments and changes. They must also know the objective of the project and be clear on the overall picture. Coordination and communication among team members is important. Coordination with others involved in the implementation phase is also an important aspect of a new test system.
14.4 Monitoring and Evaluation

Besides having a good project plan and implementation process, the next step is monitoring and evaluation. "Monitoring" generally means to be aware of the state of a system and to observe a situation for any changes that may occur over time. As a part of monitoring and evaluation, the project team and steering team must have a progress review meeting at least once a week or once a month to continually evaluate how successful the progress is.

There are four elements to be monitored in a project activity process – Inputs, Process, Outputs and Outcomes.

*Inputs* refer to resources (i.e. budget), assigned staff and starting materials. Raw materials must be monitored to ensure that they comply with the specifications, and staff capability should be adequate for the tasks required. The budget requires monitoring to ensure that it is sufficient for every step of the process.

*Process* monitoring is important to ensure that the steps of the activities are progressing well over time. Monitoring of *outputs* is useful to ensure that the right products are derived from the project at the right times. *Outcome* monitoring is the qualitative and quantitative measurement of the process outcome.

Routine monitoring can follow the PDCA cycle, which stands for Plan, Do, Check and Act.

- **Plan:** A good plan comes from serious brainstorming
- **Do:** Performing the activity as planned
- **Check:** Monitoring/evaluating using the Gantt chart and managing the risks that obstruct the plan
- **Act:** Taking corrective action to adjust the plan according to the team discussion.

After the plan has been adjusted according to the corrective actions decided upon, the Project team can start on the new plan and review the progress of the project. Gantt charts are used for monitoring the process and progress of the various activities.

For evaluation, five aspects of the output are of concern. They are described as follows:

1. Does the output meet the objectives of the project?
2. Does it fit the timeline?
3. Were there any issues that delayed/affected implementation?
4. What actions/interventions and materials were involved?
5. What, if any, were the variations that intervened during the process?
Successful project management steers progress towards meeting the objective through good planning, effective and efficient monitoring, and good control of the process. Importantly, monitoring and evaluation are necessary throughout the entire span of the project.

14.5 Performance and Outcome Assessment

A project is a one-time activity that commonly involves many tasks and people, has a clearly defined start and end date, and is meant for a specific product, such as equipment, the IT system or a blood centre.

When defining or initiating a project, the project team has to clarify the objectives and expectations of the project. During the implementation phase, the plan is executed and progress monitored. If changes become necessary along the way, the plan will have to be adjusted accordingly. When the project has been completed, the performance and outcome need to be assessed to see whether the objectives have been met and whether the project worked well.

Performance assessment is important because it will help organizations understand how decision-making processes or practices lead to success or failure, and this understanding can lead to future improvements. Management theory and practice have long established a link between effective performance measures and effective management. However, the effectiveness of any given performance measure depends on how it will be used.

It must be noted that performance assessment is a means, not an end. Specific activities or tasks of a project are assessed and benchmarked against project targets and the performance of others. Output measures are compared with performance targets to identify performance gaps. These gaps are analysed to identify corrective actions and improve the project as it proceeds.

Once a project is completed, an assessment can be made of what worked well and where improvements in processes and project teams are needed for future projects. The project outcomes are assessed to develop lessons learned, which can be used as a feedback mechanism to improve policies and procedures, and may drive changes in decision-making and other processes.

In performance assessment of project management, assessment is conducted at different levels. This includes assessment of resource availability, quality of the management plan, process and cost and, eventually, the outcome. The desired outcome is “doing it right and getting what you want.”
The selection of the right measures depends on a number of factors, including who will use them and what decision they support. There are several performance evaluation criteria which can be used for performance assessment. These evaluation criteria are: Integration management, Scope management, Design management, Time management, Cost management, Quality management, Human Resource management, Communication management, Risk management, Procurement management, Occupational health and safety (OH&S) management and Environmental management.

*Integration management* is managing the integration of all project management functions including scope, time, cost, quality, human resources, communications, risk and procurement, and also managing the work of others in the project team.

*Scope management* is management of the scope of the project within the agreed parameters. It means working with the project team to define and document the scope including the planned outcomes of the project, and should work within the project plan to track, monitor and control the scope of the project. Scope controls should be applied within the project as required.

“Scope creep” in project management terms refers to uncontrolled changes in a project’s scope. This phenomenon can occur when the scope of a project is not properly defined, documented or controlled. It is generally considered a negative occurrence that is to be avoided.

*Design management* is the management of the design including its documentation. It comprises working with the project team to develop the design and documentation of the design to meet the planned outcomes, review the design and design documentation, and identify potential issues that may affect positive project outcomes. Lastly, it is to facilitate updating of the design and design documentation to meet the planned outcomes.
**Time management** is the management of project time. Time management needs to adhere to the original completion deadlines. Variations leading to extensions of time within original deadlines should be done with the client’s approval. The progress of the project should be monitored against the approved schedule and time management reviewed on project completion.

**Cost management** is the management of project costs. Adherence to the original budget is important. Variations should be approved within the budget and have the client’s approval. Finally, it constitutes a review of the expenditure on project completion.

**Quality management** is the management of the quality of the project. We must monitor and control quality within the project against specified requirements, and identify and resolve quality problems and issues. Quality management must be reviewed upon project completion.

**Human resource management** is the management of people who are working on the project. Work with the project team to develop a WBS and determine the HR requirements. This will facilitate and allow for better management of project stakeholder groups. Resolving conflicts and supporting the development of skills of the project team members are important.

**Communications management** is the management of communications regarding the project. Managing information flow is important, including information coming into the project and information disseminated from and about the project. This will facilitate communications within the project, and with the client and other stakeholders. Delivery of agreed reports should be done. It is necessary to review project communication throughout the project.

**Risk management** is the management of risk within the project. Project leaders must control and monitor risks with an emphasis on variations management and review the management of risk within the project.

**Procurement management** is the management of procurement within the project. Develop documentation used for compiling contracts, negotiation or administration of contracts. Ensure the selection of contractors through appropriate procedures. Review contract/procurement management within the project.

**OH&S management** is the management of occupational health and safety within a project. Monitor and control OH&S, and identify and resolve problems and issues. Ensure compliance with legal and contractual obligations related to OH&S. Ensure that the contractor complies with the project OH&S management plan, site-specific safety management plan and other relevant standards, and fulfils obligations for subcontractor OH&S management.
Environmental management is the management of the project environment. Ensure compliance with environmental legal and contractual obligations. Ensure that the contractor complies with the project environmental management plan and site-specific environmental management plan. Ensure that the contractor fulfils obligations for subcontractor environmental management. Ensure compliance with environmental impact assessment undertakings, consent conditions and pollution control approvals.

Scores of the performance are graded. These gradings are described with their definitions and ratings in the following table.

### Table 11. Grading of project performance

<table>
<thead>
<tr>
<th>Grading</th>
<th>Definition</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>Standard well above the acceptable standard of performance</td>
<td>10</td>
</tr>
<tr>
<td>Good</td>
<td>Standard often exceeds the acceptable standard of performance</td>
<td>7</td>
</tr>
<tr>
<td>Acceptable</td>
<td>Meets the acceptable standard of performance</td>
<td>5</td>
</tr>
<tr>
<td>Marginal</td>
<td>Mostly meets the acceptable standard of performance but has some weakness</td>
<td>3</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>Well below the acceptable standard of performance</td>
<td>0</td>
</tr>
</tbody>
</table>

Performance assessment can be done by giving scores for the 14 evaluation criteria, according to the grading system explained in the above table. For example, a “best” performer, who scores the maximum rating in all 14 areas of management, will score 140 marks. This is demonstrated in the table below.

### Table 12. Assessment of project performance

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Grading</th>
<th>Rating</th>
<th>Max. possible rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Scope management</td>
<td>Acceptable</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Design management</td>
<td>Acceptable</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Evaluation Criteria</td>
<td>Grading</td>
<td>Rating</td>
<td>Max. possible rating</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------</td>
<td>--------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Time management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Cost management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Quality management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Human Resources management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Communications management</td>
<td>Acceptable</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Risk management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Procurement management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>OH&amp;S management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Environmental management</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Interpersonal skills</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Performance reporting</td>
<td>Good</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>92</strong></td>
<td><strong>140</strong></td>
<td></td>
</tr>
</tbody>
</table>

Performance score = 100 x (92/140) = 65.7%

A key performance indicator (KPI) is the quantifiable measurement which is agreed to before a project commences. It reflects the critical success factors of an organization or a project that provides services, and will differ depending on the organization or project. If a KPI is to be of any value, there must be a way to accurately define, set targets for and measure it; otherwise it will have no value.

KPI for project management is a measurable or quantifiable outcome, e.g. number of patients treated, number of people trained, number of products supplied. We also have to consider the schedule/time, which includes developmental milestone dates and project completion date, as well as the budget for HR cost and recurrent costs. Human resources includes the number and type of people assigned to the project and their quality, which concerns the number of injuries, quantity of material wasted due to error, number of errors and number of complaints.
Performance assessment reporting is also important:

- to encourage project managers to implement a business culture of continuous improvement to benefit themselves and their clients;
- to provide the organization with performance data from past and current contracts to identify the best-performing project managers;
- to ensure that the best-performing prequalified contractors and consultants are offered more tendering opportunities than others;
- to share information with other relevant organizations on contractor and consultant performance on current and past contracts;
- to facilitate the development of a more complete understanding of project procurement by identifying opportunities for improving future project stakeholder relationships and management practices.

Some encourage benchmarking for performance measures to have meaning and provide useful information, and to make comparisons. Benchmarking is a core component of continuous improvement programmes. Measuring, comparing with the competition, and identifying opportunities for improvement or best practices are the essence of benchmarking.

Post-project benchmarking is usually used to assess the performance of a project delivery system to provide lessons learned and feedback that can be used to establish benchmarks for future comparisons. Over time, when sufficient data are available, trends can be analysed to provide insight into the performance of project management systems. Since project team members will normally have moved on to new projects, trend analyses of project-level cost and schedule metrics would typically be used at programme and department levels.

At the end of the performance assessment, the next step is to measure the outcome. If it is a construction, we have to do site inspection and commissioning. If it is equipment and IT, we have to look for the acceptance test, commissioning, validation and trial run. For training, we have to assess the proficiency or competence. For products, their quality and quantity should be assessed.

14.6 Managing Change

Change management is the process of aligning the organization’s people and culture with changes in business strategy, organization structure, systems and processes. It results in ownership and commitment to change, and sustained and measurable improvement. It also improves capability to manage future change.

Managing change well is about creating awareness and understanding among the people, as well as knowing why and how things ultimately change. Change involves engagement, the key to ensuring a positive
perception; people will then be willing to test out ideas and take actions leading to commitment.

There are four critical stages in a typical blood bank function in term of changes.

The first stage is to have a clear vision, which is very important and must be articulated clearly. The question to be answered at this stage is: where do we want to reach? In order to achieve the vision, measurable goals must be specified, as well as the ways to measure outcomes.

The general approach to setting goals and measures involves identifying key objectives, necessary changes in organizational structure and systems, systems and activities needed to measure outcomes and high-level focus areas or issues. These can be translated to the health-care perspective, such as the following considerations.

- Conduct sessions with the management on policy and practice issues.
- Determine new processes or behaviours that clinicians will have to perform/adopt.
- Consider the changes within the context of performance, quality and transparency.
- Gather insights through benchmarking against equivalent agencies.

The success factors in this stage are to identify leading practices, trends and benchmarks across services offered, service times, processes and structures, and also an aligned vision of change, whereby major stakeholders have been consulted.

The second stage is to assess and build preparedness for change.

The approach to this is to identify people in the organization who are willing to change, especially those within the key functions that will be affected by the change. These are potential change leaders who can commit to and take ownership for change implementation. It is important to engage a broad mix of professional and technical staff.

All implementation initiatives are led by three stakeholder groups: the top management, change leaders and implementation champions. The top management demands, guides and authorizes changes. Change leaders influence people and keep everyone connected, shaping the way change takes place. Implementation champions are those who deliver the change, by initiating the actual change. The latter group of stakeholders is the most vital for transformation at the ground level.

The success factors in this stage are to identify change champions from all key functions at various levels in the organization and communicate the change vision clearly.
The third stage is to engage people and realign for change. This means engaging key stakeholders throughout the change cycle, and managing diverse stakeholder expectations and requirements. Change champions are empowered to ensure buy-in and continuity. The organization may also be restructured or realigned to facilitate the change.

The key challenges from the health-care perspective would be acquiring the necessary skills to manage blood programmes effectively. For example, when considering change, it is important to look at a specialty, such as the area of quality, and consider how to obtain and retain knowledge in that area. Other challenges are to embrace change within a sound risk management framework; identify training needs to develop specialized skills such as project management; introduce experienced staff such as clinicians to new working practices; and identify saleable elements of the initiatives to stakeholders, i.e. clinicians, hospital transfusion committees.

It will be useful to prioritize opportunities well in order to appropriately implement changes at the right time. For example, the diagram below maps opportunities according to the level of benefit against the extent of change. Opportunities with different levels of benefits and different extent of change call for different actions.

**Diagram 19: Prioritizing opportunities by mapping level of benefit against extent of change**

It is absolutely essential to articulate the benefits of change in order to implement changes successfully. This will help to deal with the fear that often surrounds change. It will ensure that affected staff appreciate the benefits and operate in an organizational environment conducive to the change. An example of a general benefit of change is the reduction in turnaround times, which then leads to improved customer perception.
The success factors in this area are to ensure that benefits are clearly communicated and that the message is channelled towards a particular audience via a credible source. Change should be an adaptive process, involving ongoing evaluation and revision.

The fourth stage is to reinforce and sustain change. This is the most critical stage. It is important to have effective governance to measure, monitor and sustain the change programme. This also ensures that benefits are truly translated to outcomes.

There are two general approaches: to monitor change, and to sustain change. To monitor change, actions include ongoing progress review to check if the goals have been achieved as well as obtaining feedback from staff. To sustain change, staff may be incentivized to stay with the change, such as being provided with effective development paths. It is very important to showcase successes and reward performance.

The success factors in this stage are to establish effective management reporting to monitor progress and performance, and to actively track the success criteria.

The criterion for overall successful change implementation includes two aspects: knowledge transfer and quality improvement. In the former, knowledge of best practices should be retained, i.e. ability to achieve goals, develop budget plans. In the latter, there must be improvement in overall standards.

One important aspect to remember is that the task of change management is to bring order to a disordered situation, and not to mistakenly suppose that the situation is well organized and risk free. The management has this responsibility to understand stakeholders’ needs and concerns, and proceed in ways to prepare and engage staff for change. The management should also be open and willing to get help from selected people with the relevant skills and enthusiasm to drive change positively.

**14.7 Communicating change**

The top concern of people regarding change is the reason for it, i.e. “Is the change really necessary?” Added to this are various other issues such as the scale of the change, the change process, and how it will impact the individual’s duties in the organization. There will be varying responses from people in the organization, as change will impact different people in different ways. People will also receive and perceive change differently. Thus, communication to address the issues within the change process is important.

Leadership is important in any change process, and leaders are responsible for effective communication. The ideal change leader is
influential, leading and bringing people through the change process. To be able to move people, the change leader is able to empathize with people’s concerns and needs, thus gaining their trust. The change leader is also skilful in building momentum along with optimism to encourage people along the change journey.

Overall, people adopt different roles in the change process, and at different stages. This is especially influenced by the context in which change has impacted them, e.g. personality, leadership style, organizational culture and timing.

There are generally four roles that people play in change: an Initiator, a Sponsor, an Implementer or a Recipient of change. Understanding the roles that people take on during change will be useful for understanding the dynamics of relationships and communication.

- **An initiator** feels the need to create a compelling vision that ignites the energy and commitment of others, and builds a case for urgency. An initiator is also usually out in front communicating the vision, identifying the leadership team for change, being a role model for what is needed, and showing that they care for those affected by the change.

- **A sponsor** is the same as an initiator, except that ideas or first moves do not come from the sponsor but rather from the initiator. A sponsor gives the same support as an initiator to the implementation team.

- **An implementer** identifies what change means for the department, creates a clear picture of its importance and relevance, and recruits the change leadership team. An implementer engages those who will be affected by the change. If the change is transformational, it is broken down into phases and processes. An implementer also sets up the action plans and change management plans.

- **A recipient** needs to understand the vision and rationale for change. A recipient is engaged in the change process, in understanding the plan, and knowing what is needed to address and execute change. In the midst of change, a recipient needs to ensure that operational work continues. A recipient should identify potential problems and solutions, develop criteria to measure the success of the change, and provide ongoing feedback and ideas for improvement.

Communication is a two-way exchange and understanding of information. Listening is important for the two-way exchange; a common problem is that some hear but do not listen. A good listener would put effort into listening and understanding the speaker, as well as receiving and digesting the information.
It is important to recognize that there are formal and informal communication channels. The former refers to arranged meetings or sessions where information is formally and properly transmitted, though communication may be controlled or restricted. On the other hand, informal channels, or the “grapevine”, may allow information gaps to be filled and management decisions clarified. They also allow real opinions to be freely expressed; however, there is a risk that the information obtained may be unreliable and inaccurate.

As identified earlier, people want to know why change is necessary. Hence, clear communication is vital in explaining the importance and rationale for change, as well as the urgency for it. Change leaders must take note of the following pointers for clear communication.

- The change leadership team, vision and rationale for change
  - Publicize the people in the change leadership team.
  - Frequently communicate the vision and objectives.
  - Explain the potential consequences if the change is not made.
- Constant and open communication
  - Communicate in person.
  - Prepare regular updates.
  - Communicate even when answers are lacking.
  - Be straightforward.
- Empathy for others
  - Allow and encourage people to express themselves about the change.
  - Recognize that people’s initial reactions to change may reflect their personal style.
  - Recognize that people may begin to understand the rationale only midway through the process.

Resistance to change is inevitable, but should be addressed and tackled nonetheless. The leadership team should view resistance as a window of opportunity, recognizing that resistance indicates how much their people care and that they are not apathetic towards the organization. Often, people who resist change have valid reasons that should be seriously considered by the leadership.

Resistance can be changed to support with clear communication, following the pointers given above. In addition to these, people can be engaged in the early stages of planning and decision-making. This will help them to see the vision and rationale behind the change. It is also important to emphasize the benefits of the change, as well as provide incentives and opportunities for success.
Other helpful pointers include:

- involving people whom others trust and respect in the change leadership team;
- recognizing that it is often the process of change that evokes strong reactions, rather than the change itself;
- finding ways to combine initiatives so that people are not overwhelmed with the degree of change;
- communicating that wise risk-taking is preferable to maintaining the status quo.

In the long run, to develop an organization that is agile in adapting to change, a common change management process, including a common communication framework, should be established. Training and education should be provided in the change process and change management. The organization should consider adding “leading and managing change” as a core leadership competency. When necessary, people with expertise in transformational change may need to be brought in to help with the transition.

Ultimately, clear communication should address the concerns of the people, and from there, build up team work among the people for successful change implementation.

14.8 The Singapore International Foundation Overseas Programme

The Singapore International Foundation (SIF) is a non-profit organization founded in 1991. It is patronized by His Excellency SR Nathan, President of the Republic of Singapore, and funded by public and private sector contributions from Singapore. SIF seeks to nurture active global citizens and friends for Singapore through working with the community, exchanging experiences and collaborating with other countries.

There are three main programmes that SIF runs: Friends of Singapore, Singapore Volunteers Overseas and Partner for Good.

Started in 1991, Friends of Singapore consists of various initiatives to forge strong networks of goodwill and friendship for Singapore, projects Singapore’s image overseas, and plays a key role in educating Singaporeans about the region and the rest of the world.

The second programme is the Singapore Volunteers Overseas (SVO) programme. The programme has three core objectives:

- Support capacity building of individuals, institutions and communities to achieve long-term growth and self-sufficiency.
- Facilitate exchange of knowledge, skills and experiences by sending skilled Singaporean professionals to train overseas.
Enable participation of corporations and other donors in the development of overseas communities.

The overseas programmes are developed and managed in Singapore and work in collaboration with the countries involved. Support is given by SIF for bringing in expertise and resources. SIF relies heavily on volunteers and, for the past 15 years, has done projects in the healthcare sector and other sectors such as education, social and community development, business, IT, administration and governance.

There are different modes of volunteering. In-field SVOs (long term, 1–2 years) carry out specific duties and skills training to improve the work of the host agency. Short-term SVOs impact organizations through service delivery for 3–6 months. Specialist SVOs focus on skills enhancement and training of trainers to ensure long-term sustainability. Lastly, workshop SVOs conduct skills and knowledge training to enable service delivery by the host agency.

Since 1991, more than 1800 people have experienced “living, sharing, learning” as SIF volunteers in 16 countries – Afghanistan, Bhutan, Cambodia, Indonesia, India, Laos, Myanmar, Timor-Leste, Viet Nam, Botswana, China, Ghana, Malaysia, Nepal, Philippines and Sri Lanka. Success stories include providing palliative care for terminally ill patients in Viet Nam, restoring eyesight in Myanmar, and conducting leadership training for civil servants in Afghanistan.

The third programme is Partner for Good, launched in October 2008. Corporate and organizational partners choose how they want to support sustainable development projects – either through funding, volunteering or both. In recent years, a corporate service responsibility platform was established for overseas community development work.

One of the capacity-building projects is the Blood Group Serology Training in Myanmar, which was started in 2007 and is ongoing. The objectives are:

- skills upgradation in blood group serology
- Providing assistance in developing clinical guidelines for blood transfusion
- equipping a core group of trainers to continue training
- assisting in consolidating the Yangon Blood Bank as the National Reference Laboratory.

Training in blood group serology is a two-year project that aims to do four training programmes. Two trainings have been completed in 2007 and 2009 in the cities of Yangon and Mandalay. Twenty-five clinicians and 20 medical technologists participated in each of the trainings in Yangon and Mandalay. Training in the clinical aspects of transfusion includes the
importance of safe blood, quality in blood transfusion and managing patients in transfusion medicine. Training in blood group serology includes knowledge on ABO group systems and subgroups, ABO discrepancies, antibody screening and a practical workshop on blood groups.

Leadership training in Afghanistan is another partnership project with the United Nations Institute of Training and Research (UNITAR), which aims at building the leadership and management skills of middle- and senior-level Afghan government officials. The UNITAR–Hiroshima Fellowship for Afghanistan also aims to provide technical and institutional support to a core group of trained professionals to further train government officials involved in rebuilding Afghanistan. Every year, SIF sends expertise and volunteers to help with this project. In the leadership training, the core training is on leadership and organizational development, project planning and proposal writing, leading project implementation, management skills in human resource management and development, and communication skills.

International understanding, exchange and working with different communities are significant for future developments and therefore each one of us has a role to play in making this world a better place.
Appendix 1: List of WHO secretariat/advisors, speakers and participants

A. WHO Secretariat

<table>
<thead>
<tr>
<th>Name</th>
<th>WHO Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Dhingra, Neelam</td>
<td>Blood Transfusion Safety</td>
</tr>
<tr>
<td></td>
<td>WHO HQ, Geneva</td>
</tr>
<tr>
<td>Mr Yu Junping</td>
<td>Blood Transfusion Safety</td>
</tr>
<tr>
<td></td>
<td>WHO HQ, Geneva</td>
</tr>
<tr>
<td>Dr Bhatia, Rajesh</td>
<td>Regional Office for South-East Asia</td>
</tr>
<tr>
<td></td>
<td>(New Delhi, India)</td>
</tr>
<tr>
<td>Dr Ghadiok, Gayatri</td>
<td>Regional Office for the Western Pacific</td>
</tr>
<tr>
<td></td>
<td>(Manila, Philippines)</td>
</tr>
<tr>
<td>Dr Hira, Subhash</td>
<td>Office of the WHO Representative</td>
</tr>
<tr>
<td></td>
<td>(Jakarta, Indonesia)</td>
</tr>
<tr>
<td>Mr Rogers, Paul</td>
<td>Office of the WHO representative</td>
</tr>
<tr>
<td></td>
<td>(Ha Noi, Viet Nam)</td>
</tr>
</tbody>
</table>

b. Facilitators

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation/Address</th>
</tr>
</thead>
</table>
| Dato Dr Ayob, Yasmin| Senior Consultant
                        Ministry of Health
                        National Blood Centre
                        Malaysia                                                  |
| Dr Flanagan, Peter | National Medical Director
                        New Zealand Blood Service
                        New Zealand                                               |
| Dr Lin Che Kit     | Chief Executive
                        Hong Kong Red Cross Blood Transfusion Service
                        (Hong Kong SAR, People’s Republic of China)               |
| Dr Phikulsod, Soisaang | Director
                        National Blood Centre
                        Thai Red Cross Society
                        Thailand                                                  |
| Dr Teo, Diana      | Group Director
                        Health Sciences Authority
                        Blood Services Group
                        Singapore                                                 |
### Invited speakers from Singapore

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation/Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr Chan, Edwin</td>
<td>Head Singapore Clinical Research Institute, Head Biostatistics and Head Evidence-based Medicine</td>
</tr>
<tr>
<td>Ms Chan, Grace</td>
<td>Director Health Sciences Authority Finance</td>
</tr>
<tr>
<td>Mr Chew, David</td>
<td>Executive Director Deloitte &amp; Touche Enterprise Risk Services Pte Ltd</td>
</tr>
<tr>
<td>Dr Koh, Mickey</td>
<td>Division Director Health Sciences Authority Blood Services Group Patient Services Division</td>
</tr>
<tr>
<td>Dr Kuperan, Ponnudurai</td>
<td>Senior Consultant Hematologist Tan Tock Seng Hospital Department of Laboratory Medicine</td>
</tr>
<tr>
<td>Dr Lam Kian Ming</td>
<td>Division Director Health Sciences Authority Strategic Planning, Operations and Communications</td>
</tr>
<tr>
<td>Dr Lee, Jennifer</td>
<td>Senior Consultant Ministry of Health Primary and Community Care</td>
</tr>
<tr>
<td>Dr Lim, John</td>
<td>Chief Executive Officer; Group Director , Health Product Regulation Group Health Sciences Authority Health Products Regulation Group</td>
</tr>
<tr>
<td>Mr Lim, Peter</td>
<td>Communications Consultant</td>
</tr>
<tr>
<td>Mr Loh, William</td>
<td>Manager National Library Board Knowledge and Quality Management Office</td>
</tr>
<tr>
<td>Mr Morris, Chris</td>
<td>Principal Consultant Frost &amp; Sullivan Growth Consulting</td>
</tr>
<tr>
<td>Mr Pwee, Benjamin</td>
<td>Managing Director I-deo Asia</td>
</tr>
<tr>
<td>Ms Tan, Amy</td>
<td>Director Centre for Organizational Effectiveness Pte Ltd</td>
</tr>
<tr>
<td>Ms Tan, Cecilia</td>
<td>Director Singapore Red Cross Society Blood Donor Recruitment Programme</td>
</tr>
<tr>
<td>Dr Tan, Celia</td>
<td>Deputy Director Singapore General Hospital Allied Health Division</td>
</tr>
</tbody>
</table>
### Invited speakers from Singapore

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation/Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ms Teo, Carol</td>
<td>Communications Manager, Singapore Red Cross Society</td>
</tr>
<tr>
<td>Ms Thevarakom, Margaret</td>
<td>Deputy Director, Singapore International Foundation, International Volunteerism</td>
</tr>
</tbody>
</table>

### d. Participants

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
<th>Organization/Department</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Regional Office for South-East Asia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh</td>
<td>Dr Mian Belayet Hossain</td>
<td>Directorate General of Health Services, Safe Blood Transfusion Programme</td>
<td>OSD and Programme Manager</td>
</tr>
<tr>
<td>Bhutan</td>
<td>Mr Dorji Phuntsho</td>
<td>Jigme Dorji Wangchuk, National Referral Hospital</td>
<td>Laboratory Technician</td>
</tr>
<tr>
<td></td>
<td>Mr Nima Pelden</td>
<td>Ministry of Health, Department of Medical Services, Health Care, Diagnosis Division, District Health Services Programme</td>
<td>Programme Officer</td>
</tr>
<tr>
<td>DPR Korea</td>
<td>Dr Kim In Chol</td>
<td>National Blood Center (Pyongyang)</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr So Ryong Ju</td>
<td>National Blood Center</td>
<td>Chief of Information Section; Interpreter (for NBC)</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Dr T. Marwan Nusri</td>
<td>Ministry of Health, Directorate-General of Medical Care</td>
<td>Director of Basic Medical Care</td>
</tr>
<tr>
<td></td>
<td>Dr Ratna Rosita, MPHM</td>
<td>Ministry of Health of Republic of Indonesia</td>
<td>Secretary General</td>
</tr>
<tr>
<td>India</td>
<td>Mrs Shanthy Gunasekaran</td>
<td>Central Drugs Standard Control Organization – South Zone</td>
<td>Deputy Drugs Controller (India)</td>
</tr>
<tr>
<td></td>
<td>Dr Pushkar Kumar</td>
<td>National AIDS Control Organization, Blood Safety</td>
<td>Senior Technical Officer</td>
</tr>
<tr>
<td>Country</td>
<td>Name</td>
<td>Organization/Department</td>
<td>Title</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------</td>
<td>-------------------------------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>Regional Office for South-East Asia</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maldives</td>
<td>Dr Aminath Huda</td>
<td>Ministry of Health and Family National Blood Transfusion Services</td>
<td>Head</td>
</tr>
<tr>
<td></td>
<td>Ms Shareefa Manike</td>
<td>Ministry of Health Department of Medical Services Laboratory Services</td>
<td>Director</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Dr Khin Htwe Hlaing</td>
<td>Mandalay General Hospital National Blood Centre/ National Blood Bank</td>
<td>Medical Officer</td>
</tr>
<tr>
<td></td>
<td>Dr Myat Thiri</td>
<td>Magway General Hospital</td>
<td>Medical Officer (Pathologist)</td>
</tr>
<tr>
<td>Nepal</td>
<td>Dr Manita Rajkarnikar</td>
<td>Director Nepal Red Cross Society National Blood Centre Central Blood Transfusion Service</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr Prakash Kumar Yadav</td>
<td>Nepal Red Cross Society</td>
<td>Senior Medical Officer</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>Dr D.A.K. Gunasekera</td>
<td>National Blood Centre National Blood Transfusion Service</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr (Mrs) A.N. Hettiarachchi</td>
<td>National Blood Centre National Blood Transfusion Service</td>
<td>Medical Officer</td>
</tr>
<tr>
<td></td>
<td>Dr Neetha Manthriratne</td>
<td>National Blood Centre National Blood Transfusion Service</td>
<td>Senior Medical Officer</td>
</tr>
<tr>
<td><strong>Regional Office for the Western Pacific</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>Dr Hj Mohamad bin Hj Kassim</td>
<td>RIPAS Hospital Department of Laboratory Services</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Mr Teo Shyh Kheng</td>
<td>RIPAS Hospital Department of Laboratory Services</td>
<td>Scientific Officer</td>
</tr>
<tr>
<td>Country</td>
<td>Name</td>
<td>Organization/ Department</td>
<td>Title</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------</td>
<td>----------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Regional Office for the Western Pacific</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>Dr Hok Kim Cheng</td>
<td>National Blood Transfusion Center</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Dr Ith Samnang</td>
<td>Battambang Provincial Blood Transfusion Centre</td>
<td>Chief</td>
</tr>
<tr>
<td></td>
<td>Mr Ly Sovith</td>
<td>Kg. Cham Province Blood Transfusion Centre</td>
<td>Deputy Chief</td>
</tr>
<tr>
<td></td>
<td>Dr Sok Srun</td>
<td>Ministry of Health Department of Hospital Services</td>
<td>Deputy Director</td>
</tr>
<tr>
<td>China, People’s Republic of</td>
<td>Dr Fu Yongshui</td>
<td>Guangzhou Blood Centre</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr Gao Dongying</td>
<td>Beijing Red Cross Blood Centre</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Dr Li Shaodong</td>
<td>Health Department of Jiangsu Province</td>
<td>Section Chief of Medical Administration</td>
</tr>
<tr>
<td></td>
<td>Dr Shi Xin</td>
<td>Beijing Red Cross Blood Center</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mr Sun Ming Ming</td>
<td>Ministry of Health Department of Medical Administration Division of Blood Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Wang Hongjie</td>
<td>Fujian Province Blood Center</td>
<td>Vice Director</td>
</tr>
<tr>
<td></td>
<td>Dr Wang Naihong</td>
<td>Chengdu Blood Center</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr Wang Yi</td>
<td>Ministry of Health Department of Medical Administration Division of Blood Management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dr Yi Mei</td>
<td>Ministry of Health Department of Medical Administration Division of Blood Management</td>
<td>Director (of Division)</td>
</tr>
<tr>
<td></td>
<td>Dr Zhou Yuan</td>
<td>Taiyuan Red Cross Blood Center</td>
<td>Vice Director</td>
</tr>
<tr>
<td></td>
<td>Dr Zou Zhengrong</td>
<td>Shanghai (Red Cross) Blood Center Blood Operating Affairs</td>
<td>Vice Director</td>
</tr>
<tr>
<td>Country</td>
<td>Name</td>
<td>Organization/Department</td>
<td>Title</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-----------------------------</td>
<td>------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td><strong>Regional Office for the Western Pacific</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lao People’s Democratic Republic</td>
<td>Dr Chanthala Souksakhone</td>
<td>Lao Red Cross National Blood Transfusion Centre – Training Section</td>
<td>Head</td>
</tr>
<tr>
<td></td>
<td>Dr Te Thammavong</td>
<td>Lao Red Cross National Blood Transfusion Centre</td>
<td>Director</td>
</tr>
<tr>
<td>Malaysia</td>
<td>Dr Norhanim Binti Asidin</td>
<td>National Blood Centre</td>
<td>Pathologist/Director</td>
</tr>
<tr>
<td></td>
<td>Dr Afifah Hassan</td>
<td>National Blood Centre</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Dr Sabrina Binte Che Ab. Rahman</td>
<td>Ministry of Health Medical Development Division</td>
<td>Senior Principal Assistant Director</td>
</tr>
<tr>
<td>Mongolia</td>
<td>Dr (Ms) Tuya Alimaa</td>
<td>Ministry of Health National Center for Transfusiology</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Ms Yadam Amarjargal</td>
<td>Ministry of Health Health Services Management Division</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Dr Danzan Enkhtsetseg</td>
<td>Mongolian Red Cross Society Blood Donor Recruitment Programme</td>
<td>Manager</td>
</tr>
<tr>
<td></td>
<td>Dr Jambaljav Lkhamsuren</td>
<td>Ministry of Health Health Services Management Division</td>
<td>Director</td>
</tr>
<tr>
<td>Papua New Guinea</td>
<td>Dr Evelyn Lavu</td>
<td>Department of Health Central Public Health Laboratory/Blood Service</td>
<td>Acting Director</td>
</tr>
<tr>
<td>Philippines</td>
<td>Dr Criselda Abesamis</td>
<td>Department of Health National Center for Health Facility Development</td>
<td>Director IV</td>
</tr>
<tr>
<td></td>
<td>Dr Andres Bonifacio</td>
<td>Philippine Blood Center c/o Philippine Children’s Medical Center</td>
<td>Medical Specialist IV</td>
</tr>
<tr>
<td></td>
<td>Dr Pedrito Tagayuna</td>
<td>Philippine Blood Centre</td>
<td>Medical Specialist III; Pathologist</td>
</tr>
<tr>
<td></td>
<td>Dr Milagros M. Viacrucis</td>
<td>Department of Health Center for Health Development for Davao Region</td>
<td>Medical Specialist IV; Regional Blood Programme Coordinator</td>
</tr>
<tr>
<td>Country</td>
<td>Name</td>
<td>Organization/Department</td>
<td>Title</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>----------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Regional Office for the Western Pacific</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viet Nam</td>
<td>Professor Nguyen Anh Tri</td>
<td>National Institute of Hematology and Blood Transfusion</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Dr Nguyen Khac Tien</td>
<td>Ministry of Health Medical Services Administration</td>
<td>Medical Officer</td>
</tr>
<tr>
<td></td>
<td>Dr Pham Tuan Duong</td>
<td>National Institute of Hematology and Blood Transfusion</td>
<td>Deputy Director</td>
</tr>
<tr>
<td></td>
<td>Dr Truong Thi Kim Dung</td>
<td>Blood Transfusion and Hematology Hospital</td>
<td>Vice Director</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Designation/Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observers</td>
<td></td>
</tr>
<tr>
<td>Dr Hui Ping, Crystal</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Macau Blood Transfusion Service Health Bureau</td>
</tr>
<tr>
<td></td>
<td>Republic of China</td>
</tr>
<tr>
<td></td>
<td>Macau</td>
</tr>
<tr>
<td>Ms Tan, Cecilia</td>
<td>Director</td>
</tr>
<tr>
<td></td>
<td>Singapore Red Cross Society</td>
</tr>
<tr>
<td></td>
<td>Blood Donor Recruitment Programme</td>
</tr>
<tr>
<td></td>
<td>Singapore</td>
</tr>
</tbody>
</table>
Dr Balaji Sadasivan, Senior Minister of State (Ministry of Foreign Affairs and Ministry of Information, Communications and the Arts), gave the keynote address at the opening ceremony of the 1st Singapore-WHO Workshop on the Management of National Blood Programmes on 3rd September 2007. The text of the speech is reproduced below.

Keynote Address by Dr Balaji Sadasivan

Dr Han Tieru, WHO Representative for Brunei, Malaysia and Singapore; Distinguished Guests; Ladies and Gentlemen;

Good morning and a very warm welcome to all of you.

In 2002, I had the pleasure to officiate the Opening Ceremony of the 1st WHO Regional Quality Management Training (QMT) Course in Blood Transfusion Services here in this same auditorium. As part of the WHO Quality Management Project (QMP) and Global Blood Safety Initiative, the QMT courses that were organized in Singapore in the past few years have helped to train many senior blood bank and health officers in the fundamentals of implementing quality management programmes in their countries.

It therefore gives me great pleasure this morning to deliver the keynote address for the Opening Ceremony of the 1st WHO Workshop on the Management of National Blood Programmes.

This Workshop is a Singapore-WHO joint training programme organized under the auspices of the Singapore Cooperation Programme, or SCP. Established in 1992, the SCP brings together the different technical assistance programmes of Singapore under a single framework. Since its inception, the SCP has organized courses, workshops and study visits for more than 49,000 officials from 166 countries.

Singapore started to work with WHO on joint training programmes in 2002 with the launch of the Regional Quality Management Training (QMT) course in Blood Transfusion Services. A total of 44 participants from 15 countries were trained during the two regional QMT courses in 2002 and 2003, and 24 participants from 11 countries were trained in the Advanced QMT course held in 2004. After the Singapore workshops, 13 national QMT courses were conducted in 8 countries by the participants of the
QMT courses. At the same time, an informal regional quality network was initiated amongst the participants of the workshops, facilitating cooperation with each other in strengthening quality systems. Through these and other QMP initiatives, we have seen improvements in quality systems in participating countries, contributing towards establishing safe and effective blood transfusion services in the Region.

In May 2005, the World Health Assembly urged Member States to support the full implementation of a well-organized nationally coordinated and sustainable blood programme with appropriate regulatory system. Member States were also urged to establish a quality process for policy and decision-making for blood safety and availability based on ethical considerations, transparency, assessment of national needs, scientific evidence, and risk/benefit analysis.

The pre-requisites for an effective quality system are a nationally coordinated blood service, commitment and support from the management, and appropriate, adequate and sustainable resources. A key element towards achieving this is organizational management.

Organizational management is not a topic commonly found in textbooks of transfusion medicine or blood banking. It is only in recent years that we find it even being mentioned at blood transfusion meetings and conferences. Perhaps this is due to the inherent nature and practice of management. To many professionals, management is an amorphous and broad field with difficult-to-define boundaries, strategies, procedures and methods. Success or effectiveness of any particular intervention is difficult to determine due to the many variables and factors present. It is no help that most blood bank and transfusion medicine specialists regard management as a dry and uninspiring job to be relegated to managers.

And yet the success of a blood service hinges on its ability to provide adequate supplies of safe and high quality blood and blood components to the population it serves. Conventional wisdom tells us that this cannot be possible without the presence of a good management system with efficient infrastructure, good corporate governance, adequate allocation of resources, and financial sustainability. To achieve these would require amongst other things, a senior management team that is familiar with the concepts of organizational management, such as strategic planning, human resource, financial, logistics, and inventory.

Providing senior management teams with the practical know-how of organizational management will help developing countries embarking on developing and strengthening their blood programmes to better manage change and limited resources. Blood itself is a precious and limited resource, and blood services must find different ways to better manage the supply and demand for blood, whether it is through reducing outdates, improving collection and distribution efficiency, or introducing
blood conservation programmes. Similarly, we must introduce new ways to improve the efficiency in which we manage trained and skilled people, limited budgets, and other finite resources.

It is therefore timely for WHO to focus on building and strengthening capacity amongst senior blood bank and health officials, to enable them to achieve maximum effectiveness in managing the national blood programmes in their country. This programme is designed to be conducted in a series of workshops which will include a wide range of topics identified through various WHO meetings and workshops.

Senior management teams from blood services in the region will have the opportunity to update themselves on current information and practices relating to organizational management and governance, and also to share their experiences in managing their blood programme. It will further provide them with opportunities to network.

I would like to congratulate the WHO and HSA on the production of the new training CD on Quality in Blood Collection that will be launched this morning. The production of the CD is a reflection of the close partnership that exists between the two organizations, as well as their strong commitment towards the advancement of blood safety and quality and regional quality management initiatives.

I would also like to thank the WHO Regional Office for the Western Pacific and the WHO Regional Office in South-East Asia, and WHO staff for working with the CTM\textsuperscript{15} in developing this series of workshops. These workshops are made possible through the sponsorship of WHO, HSA and the Singapore Ministry of Foreign Affairs.

To conclude, let me extend a warm welcome to our participants and temporary advisors from overseas. I hope you will enjoy your week here in Singapore, and that you will find the workshop beneficial to you. Do find some time to enjoy the multicultural sights and cuisines, and more importantly the shopping in Singapore.

It now gives me great pleasure to declare this WHO Workshop on Management of National Blood Programmes open.

---

\textsuperscript{15} The Centre for Transfusion Medicine (CTM) is now known as the Blood Services Group (BSG).
Appendix 3: Speech by the Regional Director for the Western Pacific, WHO

The text of the speech at the opening ceremony of the 1st Singapore-WHO Workshop on the Management of National Blood Programmes is reproduced below.

Speech of Dr Han Tieru, WHO Representative to Malaysia, Brunei Darussalam and Singapore, on behalf of the Regional Director, World Health Organization Regional Office For The Western Pacific, at the opening ceremony of Workshop on the Management of National Blood Programmes

3 September 2007, Singapore

Honourable Dr Balaji Sadasivan, Senior Minister of State, Ministry of Foreign Affairs and Ministry of Information, Communications and the Arts;

Dr John Lim, Chief Executive Officer, Health Sciences Authority;

Dr Diana Teo, Director, Centre for Transfusion Medicine, Health Sciences Authority;

Distinguished guests, ladies and gentlemen

On behalf of WHO and our Regional Director for the Western Pacific, Dr Shigeru Omi, I am pleased to welcome you to the WHO workshop on the management of national blood programmes.

Let me start by expressing my sincere thanks to the government of Singapore for hosting this first of three annual workshops on the management of national blood programme. Singapore has supported WHO’s efforts to introduce and implement quality management programmes in the Western Pacific Region, and we are delighted to be joined today by Member States from the South East Asia Region. Blood and blood products are essential in the treatment of a wide range of hospital procedures but they also are potential vectors for a variety of infectious diseases.

The HIV/AIDS pandemic highlighted the need to improve the safety of blood supplies in order to maintain a sufficient and equitable supply of safe blood and blood products. For many developing countries, this remains a major challenge.
There are two key areas that need to be addressed.

Firstly, in the Western Pacific Region there are 6 blood donations per 1000 population in the developing countries, which is less than the 20-50 donations recommended by WHO. There are also supply inequities, with people in urban areas having easier access to blood. This shortfall has a major impact, for example, on women with pregnancy complications, trauma victims and children with severe anaemia. Globally, it is estimated that there are 150,000 preventable pregnancy related deaths each year due to the lack of a safe blood supply. In many countries the gap between supply and demand is further widened by the inappropriate use of blood.

Secondly, there are serious safety concerns associated with inadequately screened blood. Despite the availability of effective screening methods available to all Member States, transmissions of HIV and other diseases continue to be reported. In some countries this may be due to the lack of continuity in the supply of screening materials. The potential risk is further increased by the lack of voluntary non remunerated donations. Three countries in the Western Pacific Region continue to report paid donations of blood. Also, blood supplies often depend on family donors, which can result in the recruitment of donors from high risk rather than low risk populations.

A major constraint to the improvement of the blood supply is the lack of infrastructure and systems to ensure the availability of a sufficient supply of safe blood. For example, few countries have established a fully functional audit and inspection programme. In some countries blood transfusions depend on fragmented blood supply systems which result in control being exercised by different players and layers of government. This threatens the sustained supply of good quality blood and blood products. A lack of an effective blood supply management structure also leads to unnecessary duplication of effort and a waste of limited resources.

To address these issues, WHO recommends that Member States adopt and implement the following integrated strategies:

Firstly, the establishment of nationally coordinated blood transfusion services. Secondly, collection only from voluntary non remunerated blood donors from low risk populations. Thirdly, testing of all donated blood, including screening for transfusion transmissible infections; and fourthly, minimizing unnecessary transfusions through the effective use of blood, including the use of simple alternatives when possible.

As a prerequisite for the implementation of blood safety strategies, appropriate national policies and structures must be developed. Government support and commitment are essential to ensure that responsibility is given to a single organization that has adequate technical
and sustained financial support. This crucial activity was recommended by the fifty-eighth World Health Assembly in May 2005.

The objective of this first workshop is to strengthen the leadership and managerial capacity of those responsible for their national blood programmes. This year we will address organizational models, strategic planning and implementation, the introduction of standards for blood safety, and the management and effective use of the communication media.

This three year annual series of workshops come at an opportune time because developing countries are organizing their blood programmes based on the strategic objectives recommended by WHO. The initiatives in some countries involve significant policy changes and structural reform and are supported by development partners. We hope these workshops will help make these initiatives successful and lead to improvements in a sustained and safe blood supply.

The workshops will present another opportunity to further strengthen the networks among country participants and temporary advisers who include colleagues from Hong Kong (China), Malaysia, New Zealand and Singapore. We thank them for their time and for sharing their experiences with us.

In closing, I would also like to take this opportunity to express my sincere appreciation to Dr Diana Teo, Director of the Centre for Transfusion Medicine, and her team for their efforts in preparing for and making this workshop possible.

It gives me great pleasure to open this workshop, which I’m certain, will be a success.