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Health care technology management



Country situation analysis

*World Health Organization
Regional Office for the Eastern Mediterranean*

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PREFACE

Technological changes in all areas including medical technologies have proceeded, and will continue to proceed, at a rapid pace. Medical technologies usually are associated with diagnostic or therapeutic devices or procedures. With the continuing technology advances, there is a continuously growing gap between developing countries and the rich countries with “established market economies” in appropriate technology use. It is surprising that most developing countries have neither established an efficient national system for appropriate health technology transfer nor established a mechanism for systematic evaluation of new health technologies and their suitability to local circumstances and conditions in the light of available national resources, infrastructure, knowledge and skills. Such a system and a mechanism represent an essential ingredient for establishing and maintaining up-to-date, cost-effective and high-quality appropriate health care services. Because of a lack of such a system and mechanism, many developing countries waste precious resources by introducing technologies and purchasing medical devices that are not appropriate to local conditions, substandard, obsolete, improperly reconditioned or have reduced life expectancies.

Many developing countries do not have a comprehensive national health care technology policy that maps out national vision and strategy for rational introduction and application of technology. What is appropriate for one country may not be appropriate for another owing to different needs, policies, priorities and capabilities in health care. In order to make the transferred technology viable, cost-effective and sustainable, there is an urgent need for each country to formulate and implement policies consistent with that country’s needs, priorities, resources and capabilities. This document proposes a policy to serve as a stem policy and to provide a framework for the operational and technical policies still to be developed by individual countries.

This is the fourth in a series of four books. The first, second and volumes introduce the idea of health technology management and what a health technology management policy might look like; the development of a regional strategy for health technology management; and national policy formulation and implementation. This volume outlines guidelines for conducting a country situation analysis for health technology management purposes. It summarizes the thinking behind and the need for country situation analyses, and sets out objectives for such projects. Guidelines

and handy checklists are provided so that countries can carry out their own situation analyses of health technology management status.

Acknowledgements

The authors are grateful to the WHO Regional Office for the Eastern Mediterranean for taking the lead by inviting them to write this publication and the three other associated publications, which hopefully will form a part of an interregional approach aimed at producing a complimentary set of guidelines and documents to assist countries in health care technology policy formulation and implementation.

1. INTRODUCTION

Health care systems everywhere face the twin problems of increasing patient needs and expectations and the consequent rising costs. Much of rising expenditure on health is associated with the increasing sophistication of the technologies used in diagnosis, treatment and care. If equity and quality of services are to be improved and costs controlled, an accurate situation analysis of health care is needed for each country to establish the basis for prioritizing activities, improving effectiveness and allocating resources (physical, financial and human). A situation analysis can also provide essential baseline data against which policies and actions to bring about desired improvements in the performance of health care systems can be determined and/or monitored. The issue is not simply that of containing costs. It is a matter of striking a reasonable balance between increased costs associated with the introduction of new technology and the benefits of improved equity and quality of health care provided to the population.

The term “situation analysis” in this instance is defined as the procedures, enquiries, data collection and assessments necessary to provide a reasonable summary of the current state of health technology and physical infrastructure, including its management, in a country.

The definition of health technology used by WHO includes drugs, devices, medical and surgical procedures, the knowledge associated with these in the prevention, diagnosis and treatment of disease as well as in rehabilitation, and the organizational and supportive systems within which care is provided. For the purposes of the situation analysis, this document does not include drugs and hospital supplies. However, it does include physical infrastructure such as health buildings and associated services and utilities, logistics support and information systems, since these are important in ensuring quality in the treatment and care of patients.

This guideline is part of a series of four interrelated documents that will include policies and guidelines relating to health technology management. A situation analysis is the essential first step to understanding the current system. This understanding, in turn, will help identify areas for policy development and interventions that will lead to improved health systems.

The aim of this guideline is to facilitate a systematic approach for the reporting of country situations by survey teams. It can be adapted by survey teams to country specific situations and needs.

2. BACKGROUND

In many countries, the effective management of health care technology is limited by lack of: appropriate policies; suitable organizational structures; information systems and resources; staff with relevant skills; and education and training programmes. The result is that rational planning of technology for health care has been impossible to achieve, and use of resources has been less than optimal.

In the 1970s and 1980s, WHO and other organizations promoted the creation of health care technical support services to deal primarily with maintenance and repair of medical equipment. While there was some success, it became apparent that a broad focus on health technology management in all its aspects would be more effective.

Standardization of health care technology is essential for improving asset management, maintenance and use. The choice of public health and clinical interventions, and associated technology modalities, should be governed by the health care needs of the population (based on local disease patterns), available health care services, cost, affordability, cost-effectiveness and equity considerations. Therefore, health care technology assessment should be concerned with justification of purpose, quality, cost-effectiveness and health outcomes, in accordance with priority needs, effectiveness, transferability and impact. Without these considerations standardization is difficult to achieve.

At present advances in health care technology are determined mainly by manufacturers, and their marketing interests lead to pressure on consumers to acquire new technologies. In addition, there is frequently political and professional lobbying to acquire these technologies, and some donors and aid agencies contribute to this process. Therefore the introduction of technology into developing countries is often driven by “wants” as much as by “needs”.

The lack of policies for rational acquisition of health care technology associated with a formal technology assessment has meant that some countries have wasted precious resources by purchasing substandard, obsolete or improperly reconditioned medical devices, or devices with reduced life expectancies. The lack of technology assessment has also led to the introduction of new health care technologies, sometimes based on unjustified preferences or fashions, even before proper evaluation in order to establish safety and effectiveness.

Major investment in expensive equipment is often made without careful assessment and evaluation of the total costs of ownership. The equipment is then not used to its full potential, or not used at all, because replacement parts cannot be obtained, necessary consumables have not been provided, or appropriately trained personnel are not available. This is compounded by inadequate management of equipment, information and personnel.

For example, the acquisition cost of technology (especially equipment) is usually only a small portion of its lifecycle cost. Maintenance activities and budgets are inadequate, resulting in premature equipment failure. Often only 1% or less of the asset value is allocated annually for maintenance, in contrast to an optimal allocation of 4%–8%. In most cases, improving maintenance performance will increase operating life and reduce downtime, and is more efficient (and cheaper) than acquiring new equipment.

The lack of access to information sources is also a major impediment to the formulation of sound policies, and to the establishment of functional mechanisms for rational needs assessment, acquisition and use, and general management of technology at all levels of health care.

In many countries access to databases and other sources of up-to-date technical information is limited. There is little health care technology related information integrated into health management information systems. Articles and documents on technology assessment are difficult to obtain, and lack of continuing education and awareness programmes contribute to limiting access to what up-to-date information might otherwise be available.

The lack of reliable communication links results in the isolation of technical health care services personnel within a country, especially those working at the intermediate and peripheral levels.

As well as inadequate management in equipment maintenance and information, at present, human resource development programmes pertinent to health care technology management generally do not take into account the wide range of staff and skills required. Current training usually involves ad hoc interventions, rather than well planned skill enhancement and professional development activities. As a result, there is a general lack of managerial expertise and technical skills, resulting in poor technology assessment and equipment management capability among decision-makers and health workers at large, and poor practical know-how on proper equipment operation and care among users.

Even with well planned skill enhancement and professional development activities, unattractive career schemes and lack of incentives can lead to a “brain drain” of technical staff to the private sector and other countries.

Finally, when considering the transfer of technology from the highly developed to the less developed countries all of the points discussed above must be taken in context of the great variation between the manufacturing countries and the recipient countries. The differences in political, social, economic and cultural characteristics between countries must raise challenges to the appropriateness of the technology being considered.

The importance of health care technology management, as a component of health systems organization and management, is underestimated or neglected in most countries. The lack of a health care technology management policy leads to a lack of uniformity of operation and a diversity of types of technology used for similar purposes. The rest of this report discusses the content and role of situation analysis in establishing appropriate health care technology management structure.

3. OBJECTIVES

In general, an accurate situation analysis is needed for each country to establish the basis for prioritizing activities, improving effectiveness of use, and allocating physical, financial, and human resources. A situation analysis can also provide essential baseline data against which policies and actions to bring about desired improvements in the performance of a system can be determined.

In the particular case of health care technology management, the situation analysis is required by policy-makers and senior management as the first step in formulating transparent comprehensive policies for the introduction, management and use of appropriate health technologies. It will also provide up-to-date and reliable information on all aspects of the health care technology management process, upon which subsequent planning for the implementation of those policies will be based. The situation analysis will also provide baseline data against which the impact of policy decisions can be assessed.

In detail, the situation analysis will provide a framework for the documentation of the condition of health care technology, a method for systematic evaluation of the entire managerial processes which include needs assessments, technology innovation, equipment selection, procurement, training, operation and obsolescence, information

which is currently sparse in many countries. A framework where policies that are rooted in a rational and comprehensive analysis of the country's health technology environment will greatly assist decision-makers in ensuring that areas requiring further development are clearly identified, and that the distorting effects of lobbying and professional pressure groups are minimized. And ultimately provide baseline information against which the impact of the changes brought about by future development activities can be measured.

4. CONTENT OF A SITUATION ANALYSIS FOR HEALTH CARE TECHNOLOGY MANAGEMENT

A situation analysis consists of a survey of an entire country to determine the existing state of health technology management in a country (see figure 1). It necessarily involves sampling the representative elements of the health care system from top to bottom, a broad but detailed survey, ranging from the highest level of government to a village clinic. Sampling allows a useful survey to be completed in a reasonable time, for a reasonable cost but yet provide sufficient reliable information.

The political environment

This will include the organization and structure of the government as it relates to health care. What are the interactions between government ministries and between divisions and departments? What are the lines of administration and authority? How is health care financed? How are resources distributed? What policies exist that affect health technology? How are changes made? What are the operating mechanisms? How is health technology currently managed? How is health information distributed throughout the country?

The public health environment

What are the relevant public health statistics? Life expectancy? Infant and maternal mortality? Endemic infectious diseases? Chronic diseases? Burden of key diseases? Morbidity and mortality patterns at health institutions. Comparisons between urban and rural areas of the country? How is the population distributed? What is the distribution of diseases? What are the education and literacy levels? What public health programs are planned, in place and on going? What is the distribution and training of physicians? How are physicians educated and trained?

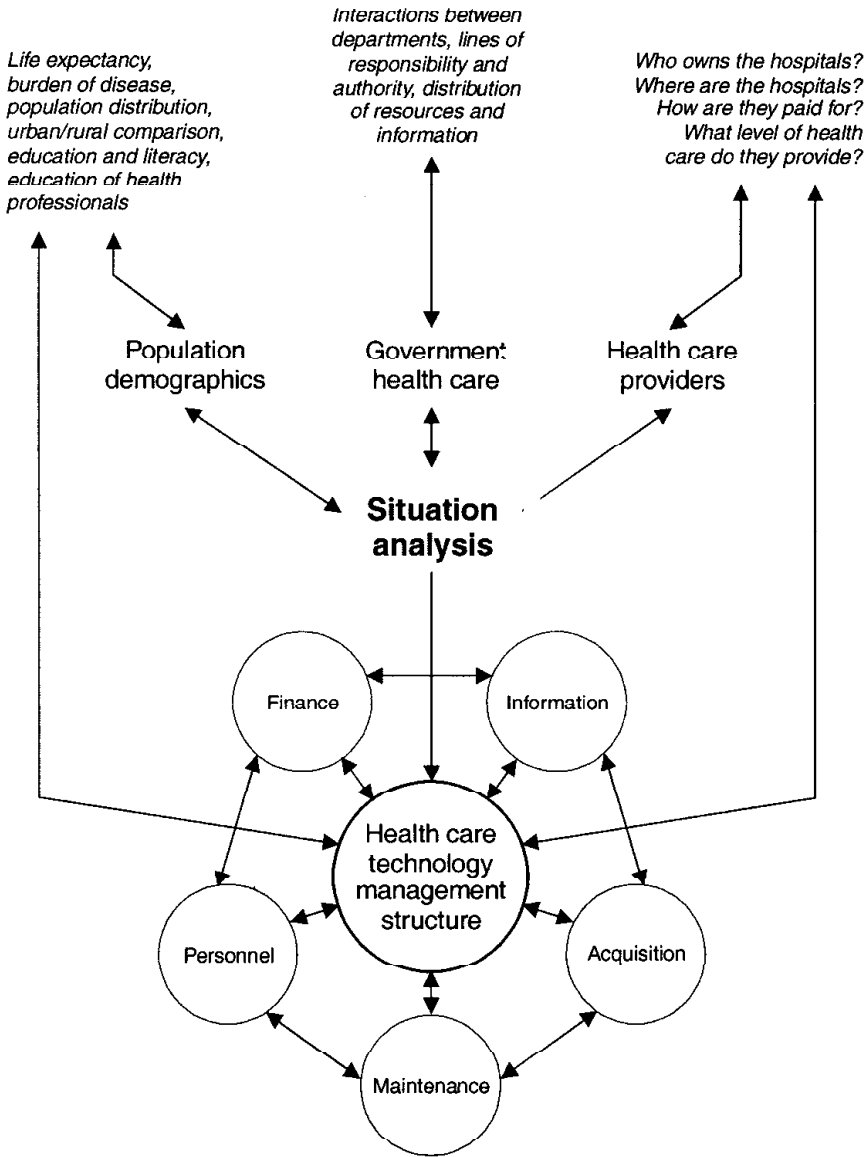


Figure 1 Schematic diagram to show the flow of information into and out of the situation analysis survey into the health care technology management structure and the continuous feedback within and between the components of the health care technology management and its impact on the health technology needs of the country

What specialities exist and which are in need? What is the level of spending per citizen by the government? What percentage of the population is covered by public hospitals of all types? What equity issues exist?

The delivery environment

Issues related to the delivery of health care. What are the different organizations or groups that have their own? What proportion of the population is served by each? How are the different hospital groups organized? How are they financed? What level of cooperation and coordination of services exists between the different hospital organizations? What are the types, numbers and sizes of hospitals? What is the hierarchy of the hospitals? For each level of public hospital (specialist, central referral, regional, provincial, district and village) the quality and condition of buildings, facilities, utilities, equipment, communications, information systems, and transport must be determined.

Availability, distribution, quantity and quality of resources

How are budgets determined? How are operational budgets determined? How are capital and construction budgets determined? How are analogous budgets determined for each level of hospital? Are resources, both material and human distributed appropriately and equitably? How are staffing levels determined? What provisions are made for educating and training of professional and non-professional staff? Are adequate trained human resources available? Does the country have access to sufficient educational and training facilities of appropriate quality?

The information gathered by the survey is intended to provide answers to the above questions. The results of the survey will provide a situation report on health technology management for the country. This report will provide a rational basis for identifying areas in need of attention and in prioritizing resulting activities.

5. SURVEY RESOURCES

Checklists to assist those undertaking country situation analyses for health care technology management are included in Annex 1.

Annex 1 is in the form of a matrix of questions on issues about the current situation, grouped within broad topic areas. The questions are posed in a manner intended to elicit a response of “yes”, “no” or “part”. Space is provided for fuller

details and comments and also for the survey team and others involved in the analysis to make appropriate recommendations concerning actions on future development.

The following is an indicative (not exhaustive) list of the physical resources that will be required: office space with furnishings and usual requisites, computers, photocopying facilities, telecommunications systems, transport.

The survey team should comprise persons who can make a full-time commitment to the work for an agreed period. Between them, the team should possess experience and expertise in public health planning, economics and provision, relevant human resource development and physical assets including equipment and infrastructure required for health services. (Also see recommendation below.)

6. RECOMMENDATION

It is important that the outputs from the country situation analysis are accessible to policy-makers and planners. For this reason it is recommended that a joint working group, comprising senior management and the survey team, is established before the surveys are initiated to reconfirm the terms of reference and give necessary authority to the team undertaking the field work. It is equally important that the joint working group shares the responsibility for recommending actions based on the data and preliminary analysis undertaken by the survey team.

Annex 1

ANNEX 1

(* Use separate sheets if necessary)

Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
NEEDS ASSESSMENT				
	Has a country health situation analysis been done?		Give reference, etc., and summarize contents	
	Are health care issues prioritized?		Give main headlines	
	Has an essential services package been developed?		Obtain details and annex to country situation analysis report	
	Does an health care technology management infrastructure exist?		Explain/illustrate key relationships	
	Do health care technology policies exist?		Obtain details and annex to country situation analysis report	
	Has the need for macro technology assessment been defined at national level?		Describe process and recommendations	
	Is there access to micro/macro technology assessment reports, systematic reviews and other technical documentation?		Describe resources and summarize available documentation	
	Have technology needs assessments been conducted?		List participants, summarize topics and methods	
	Has an Essential Technology Package (or equivalent standard lists of equipment) been developed?		Obtain details and annex to country situation analysis report	

ANNEX 1

(* Use separate sheets if necessary)

Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment	Recommended action
ORGANIZATIONAL				
Policy objectives	Have health care technology policy objectives been identified?		Give main headlines	
	Has a directive been granted by the relevant ministry to develop an health care technology policy?		Give main headlines	
	Are health care technology policies and procedures available in written format?		Obtain details and annex to country situation analysis report	
Management and authority	Have all the health care technology organizational issues been identified, such as reporting structures, budget implications and levels of authority?		Give main headlines	
	Is there any other legislation relevant to the development of health care technology management policy?		Give main headlines	
	Are professional development and training programmes (public and private sector) subject to regulation by the government?		Explain requirements	
	Has the policy framework and authority been defined?		Summarize and annex official documentation	
	Are personnel available for the policy development process?		Name individuals, parent organizations and job responsibilities	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Management and authority	Does management at facility level have health care technology management skills?		<i>Describe skill development process</i>	
	Have operational procedures for health care technology management been established?		<i>Summarize and annex official documentation</i>	
Information systems	Are existing information systems relevant to and adequate for health care technology management?		<i>Summarize type of information available and records kept</i>	
	Are technical databases available to assist health care technology management decision making?		<i>Summarize type of information available as databases</i>	
	Is information available at all levels (national/regional or hospital information systems)?		<i>Summarize type of information available and records kept</i>	
	Are information systems easily accessible?		<i>Describe access situation and problems</i>	
Public-private mix	Is there cooperation/dialogue between public/NGO/private health care providers on health care technology management matters?		<i>Describe extent of cooperation</i>	
	Do the responsibilities/requirements of the public and non-public sectors with respect to health care technology management differ significantly?		<i>Explain roles of public and private sector and differences in needs and practices</i>	

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Topic/issue	Question	Yes/no/part	Details* (if yes or part)/comment	Recommended action
Public-private mix	Are there processes for cooperation?		Explain mechanisms and list any examples of cooperation.	
TECHNOLOGY INNOVATION				
Technology tracking	Does a mechanism exist to identify new and emerging technologies?		Explain mechanism and list any case histories	
	Have the main stakeholders in the health care technology management processes been identified?		Name organizations, individuals and responsibilities etc. and describe their participation	
	Is there access to technology assessment expertise and/or information?		List resources/organizations/individuals involved and summarize type of information available	
Standards	Are international and/or local standards utilized?		Give details of standards adopted/employed	
	Do standards exist for local products?		Give details of standards adopted/employed	
	Are there relevant quality assurance programmes?		Summarize details of programmes and methodologies	
Research and development	Is technology innovation actively promoted?		Describe processes and mechanisms giving examples of any activities	
	Are research priorities identified?		Describe process and give examples of topics addressed	
	Are partnerships with industry encouraged?		Explain mechanisms giving examples of any activities	
Local production	Are there mechanisms/procedures to assure product quality?		Describe mechanisms and summarize quality standards used	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Local production	Do existing policies/practices encourage local production?		Summarize policies and practices and give examples of resultant local production	
	Are there regulations or legislation which promote local production?		Give main headlines and references	
	Do product certification procedures exist?		Explain procedures and give examples of products certified	
Technical cooperation	Is there local capacity to undertake product certification?		Describe resources and summarize local activities	
	Is there cooperation/dialogue with donors?		List donors involved, health care technology topics addressed and development partnerships	
Ethics	Are procedures for cooperation documented?		Summarize content of documentation	
	Are legal and ethical issues formally addressed?		Describe procedures, forums and participants	
ACQUISITION				
Planning and financing	Are all stakeholders (such as users, maintenance organization, ministry of health, ministry of finance, industry, donor agencies, etc.) identified and involved in the procurement process?		List stakeholders explaining their roles and relationships in stages of procurement process	
	Is a formal planning process used which includes appropriate technical and financial expertise?		Describe process and involvement of participants	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Planning and financing	Are the on-going costs of operation and maintenance fully considered in the planning process?		Explain basis for estimating costs and how these are incorporated into procurement plan and operational budgets	
	Is there a defined mechanism to determine and evaluate needs?		Describe methods used and illustrate with case histories	
Selection	Are the results subject to independent review?		Give details of process	
	Are relevant clinical and technical experts involved in the selection process?		Describe current practice giving examples of expertise involved for specific technologies	
	Is technical information available?		Summarize information/databases available	
	Does the acquisition process include the development of technical specifications?		Explain process and list involvement of experts	
	Have technical specifications been developed through a process of consultation including all the stakeholders?		List technical specifications drafted/adopted through this process (annex details if available)	
	Has a process of equipment vendor identification been established?		Explain process and list major vendors identified	
Safety	Are infrastructure, human resources and training needs addressed?		Explain processes and participants	
	Are safety issues considered for patients and personnel?		Describe local safety legislation or mandatory requirements and processes for instituting these in respect of health technology. Also list current safety codes, standards or guidelines	

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Topic/issue	Question	Yes/no/part	Details* (if yes or part)/comment*	Recommended action
Safety	Are safety issues considered for the environment (including waste management) and infrastructure?		Describe local environmental safety legislation or mandatory requirements and processes for instituting these in respect of health technology. Also list current standards or guidelines	
	Has an Essential Health Care Package (or equivalent) been articulated?		Summarize content and annex official documentation	
Standardization	Is there an associated Essential Technology Package (derived from the above)?		Summarize content and annex official documentation	
	Are any other standard equipment lists used?		Summarize content and annex equipment lists	
Costing and finance	Is there a distinct budget allocation process for new acquisitions?		Describe budgeting procedures and rules governing use	
	Do procurement decisions take in account life-cycle costs (total costs of ownership)?		Explain mechanisms in place to ensure adequacy of required capital investment and on-going operational funding. Give examples to illustrate	
Procurement	Are there legal and tax implications for imported equipment?		Describe these and any indicate circumstances under which exemptions or other concessions may be granted. Explain rules regarding future import of spares and special consumables if different	
	Do procurement guidelines exist?		Summarize main features of government system and list any other guidelines in regular use such as World Bank procedures	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Procurement	Are there adequate checks and balances in the procurement process?		Describe review and verification processes	
	Are working relationships with other involved parties (e.g., ministry of finance, local banks) smooth?		Indicate roles, strengths and weaknesses of involved parties	
	Are model tender procedures and guidelines used?		Summarize main features of government system and list any other guidelines in regular use such as World Bank procedures	
	Are adequate criteria for evaluating tender bids developed and are these disseminated and effectively applied?		Describe criteria and processes, indicating responsibilities of involved parties	
	Is there an organizational infrastructure capable of managing procurement?		Describe the place of the procurement department in the organizational hierarchy and its routine responsibilities. Summarize the human and material resources available	
Vendors and supply	Are financial control mechanisms in place?		Explain mechanisms and comment on their effectiveness	
	Are there effective mechanisms to monitor the procurement process?		Describe mechanisms and comment on any particular features requiring further strengthening	
	Have model purchase/supply contracts and agreements been developed?		Summarize main features of government system and list any other guidelines in regular use such as World Bank procedures	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment	Recommended action
Vendors and supply	Is there a supplier registration scheme?		Summarize main features and indicate how to access register information	
	Are there guidelines for donated items?		Summarize main features	
Importation	Are there import controls, regulations and directives that hinder the acquisition process?		Describe these and any indicate circumstances under which exemptions or other concessions may be granted. Explain rules regarding future import of spares and special consumables if different	
Distribution	Are there problems with distribution of procured goods?		Describe typical practice and problem areas	
	Are there procedures for managing and monitoring distribution?		Describe mechanisms and comment on any particular features requiring further strengthening	
Storage	Are storage arrangements satisfactory?		Describe facilities and resources, and comment on any particular features requiring further strengthening	
	Are stock management procedures adequate to ensure continuity of supply without excessive outdated stock?		Describe procedures and comment on any particular features requiring further strengthening	
	Is the availability of spare parts satisfactory?		Describe system for acquisition. Comment on features requiring further strengthening	
Installation and Commissioning	Are operating and technical service manuals routinely ordered and supplied with the product?		Outline any problems of access to technical information required by technology users or maintenance personnel	

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Installation and Commissioning	Is non-vendor acceptance testing performed?		Describe mechanisms, parties involved and their responsibilities. Comment on any particular features requiring further strengthening	
	Are warranty and liability issues understood and appropriate follow up action taken when necessary?		Describe parties responsible for follow up action. Comment on any particular features requiring further strengthening	
USE				
Use	Are managers responsible for ensuring the competence of equipment users?		Describe how user competence is assured and responsibilities of parties involved	
	Are there regulations restricting the use of specific technologies (e.g., anaesthesia machines, X-ray sets) to formally qualified staff?		List any specific technologies and explain rules governing their use	
	Do operational guidelines exist for different technologies including routine performance verification and calibration?		Summarize guidelines and list routine testing requirements and frequency for illustrative range of technology	
	Are records kept that allow measurement of use rates and downtime?		Summarize record keeping practices and illustrate with sample analyses of typical experience to date	
	Is use compromised by lack of consumable supplies, accessories, unreliable utilities, or lack of trained staff?		Describe main problems and contributing factors	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Quality assurance	Is medical equipment subject to regular inspection to ensure proper performance?		Summarize procedures and frequency for range of technology, parties involved and their responsibilities. Comment on any particular features requiring further strengthening	
	Is there an equipment quality assurance programme in place based upon documented procedures?		Summarize main features	
	Are the results of the quality assurance activities used to improve practice?		Describe process and give illustrative examples	
Training	Is initial training given to users in operation, safety and care of equipment?		Give details of training institutions	
	Are there on going training programmes to maintain and improve user competence?		Give details of training institutions	
	Are vendors routinely involved in staff training?		Give details of firms and products	
Safety	Are training programmes evaluated in terms of their impact on trainees' knowledge, skills and practice?		Describe process and give illustrative examples	
	Are necessary technical and managerial measures taken to minimize potential hazards to patients and staff?		Describe measures and who is responsible for implementation	
	Are there any workforce or workplace general safety regulations that apply?		Outline issues and main features of regulations	

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Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Safety	Are formal risk assessments conducted to minimize liability exposure?		Explain process and illustrate with examples of assessments conducted	
	Are formal procedures in place to deal with emergencies in place?		Describe general features	
Maintenance and repair	Does a maintenance management programme exist?		Summarize programme(s) and indicate responsible parties	
	Is there capacity-building within the maintenance programme?		Give details on resources and programmes	
	Does an adequate maintenance and repair infrastructure exist competent to deal with the majority of needs and problems arising?		Describe capabilities for maintenance within the public and private sectors	
	Is preventive maintenance performed within the health care system?		Summarize nature and extent	
	Do public health sector maintenance arrangements include the use of non-government providers?		Summarize existing activities of this type and annex list of nongovernmental service providers involved	
	Are competent technical personnel available?		Categorize numbers of staff in maintenance jobs by knowledge, skills and experience	
	Are adequate workshop facilities, tools and test equipment, etc., available?		Summarize available resources	
	Are procedures in place to efficiently obtain spare parts?		Describe procedures and comment on any particular features requiring further strengthening	

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Maintenance and repair	Are procedures manuals for preventive and corrective maintenance available?		Summarize availability, and outline any problems of access by technology users or maintenance personnel	
	Are adequate records being kept on maintenance and repair activities and costs?		Describe records systems in use and illustrate with examples of actual records and summary reports on services delivered	
	Are there guidelines for contracted maintenance and repair services?		Summary main features	
	Are there basic education and training programmes for technical personnel?		Give details of training institutions	
	Is appropriate vendor training available?		Give details of firms and products	
	Are there opportunities for continuing professional development for technical personnel?		Give details of methods/institutions	
	Are training programmes evaluated in terms of their impact on trainees' knowledge, skills and practice?		Describe process and illustrate with examples of analyses	
	Is the maintenance process adequately supported by financial and human resources?		Summarize resources available and comment on any remaining significant gaps	
	Is there a separate budget for maintenance and repair activities?		Give details of budget allocations in recent years and spending rules	
	Is the maintenance budget under the control of the manager in charge of maintenance?		Give details of budget holder(s), service beneficiaries and relationships	

ANNEX 1

(* Use separate sheets if necessary)

Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment*	Recommended action
Maintenance and repair	Does a revolving maintenance fund exist?			Give details of operation and mechanism for replenishment
	Are any regular assessments made of the availability (inventory analysis) and functionality of health care technology?			Describe process and responsible parties. Summarize results of most recent assessments
Monitoring	Are any indicators used to monitor use and maintenance of equipment?			Describe indicators and give examples of analyses that illustrate their recent use
	Are staff performance reviews conducted on a regular basis?			Describe process and responsible parties
Decommissioning	Are technologies regularly assessed for clinical effectiveness and cost efficiency compared with alternatives?			Describe process and parties involved. Illustrate with recent examples of assessments conducted
	Is there an official decommissioning procedure?			Summarize main features
	Does the decommissioning procedure include technical and financial evaluation?			Describe criteria used
Costing and finance	Is the decommissioning procedure effective?			Indicate any aspects that require further strengthening
	Are budget issues addressed?			Describe process
	Has management costing been addressed?			Explain mechanism and basis of estimates

ANNEX 1

(* Use separate sheets if necessary)

Topic/issue	Question	Yes/no/ part	Details* (if yes or part)/comment	Recommended action
HEALTH CARE TECHNOLOGY MANAGEMENT CAPACITY DEVELOPMENT				
	Are prospects for developing health care technology management professionals hindered by poor working conditions and lack of appropriate career opportunities, professional incentives and salaries competitive with the marketplace?		<i>Describe main barriers</i>	
	Is the management of health care technology dependent significantly on external assistance and experts?		<i>Give details of significant current or planned capital aid or technical assistance from external sources</i>	

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