*SURE Rapid Response*

# Management of (expensive) medical equipment; lessons from other countries

March 2012

This rapid response was prepared by the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative.

## Key messages

- Effective health technology management leads to among other things, equitable health care.
- Any one setting may need to combine a number of health technology management models to have an effective system.
- The key to selecting the right model is to choose one that integrates health technology management into the existing health management system and health delivery system.
- Management of health technology involves several elements of which procurement processes, are only a part although may receive more attention and draw more concern.
- A point to keep in mind is that the initial purchase cost of a device is a fraction of the total cost when operation, training and maintenance (including parts, time and tools) are taken into account.

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SURE
Supporting the Use of Research Evidence

REACH
Regional East African Community Health Policy Initiative

EVIPNet
EVIDENCE-INFORMED POLICY NETWORK

### Who requested this rapid response?

This document was prepared in response to a specific question from a policy maker in Uganda.

### ! This rapid response includes:

- **Key findings** from research
- **Considerations about the relevance** of this research for health system decisions in Uganda

### X Not included:

- Policy or practice related recommendations
- Detailed descriptions

### What is SURE Rapid Response Service?

SURE Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

### What is SURE?

**SURE** – Supporting the Use of Research Evidence (SURE) for policy in African health systems - is a collaborative project that builds on and supports the Evidence-Informed Policy Network **(EVIPNet) in** Africa and the Regional East African Community Health **(REACH)** Policy Initiative (see back page). SURE is funded by the European Commission's 7th Framework Programme.
www.evipnet.org/sure

### Glossary

of terms used in this report:
www.evipnet.org/sure/rr/glossary

# Background

Effective health technology management (HTM) leads to safe, equitable and quality health care. In addition all parties involved enjoy the fact that the work done is clear and accountable and also to standards that are internationally accepted. Furthermore, funders are confident about the goods and their prices, while health service professionals gain quality materials and tools and the patients who are the ultimate beneficiaries receive appropriate, safe and effective health-care treatment.

There is a concern however, in health systems and governments all over the world about ever increasing health-care costs partly due to increasing and improving technology, because this high cost eventually impacts on service delivery and utilisation by health care consumers (1). This is made even worse when equipment that one is dealing with are categorised as expensive; for these their procurement and management needs to be efficient and effective so as to benefit enough from them and make their price worth it, but also not to need to replace them more often than is necessary.

And so governments and health-care organizations have been searching for ways to take care of the increasing costs including experimenting with various cost containment methods. The methods have not been entirely perfect and there has not been found a one-size-fits-all method for different equipment or for different settings. For example, the use of tendering for medical devices as a cost containment method - although this procurement process increases buyer power and reduces procurement prices considerably, it does not reduce overall health-care spending (1). Furthermore unforeseen issues affecting patient access, market competition and process fairness have been experienced with it.

Effective management should include or lead to the most economically advantageous terms (not necessarily the cheapest) for the organization's needs, timely delivery, satisfactory after-sales service, and satisfactory and and very clear terms for delivery, installation, commissioning, training, maintenance, payment and warranty (2).

Alot of attention is paid to the procurement part of the management process of equipment, however management concerns should not stop at that; they also involve its operation and maintenance once on site, and even its disposal. A point to keep in mind as one plans is that

the initial purchase cost of a device is a fraction of the total cost when operation, training and maintenance (including parts, time and tools) are taken into account (2).

This brief has been prepared to highlight the models of management of medical goods and services which will generally be referred to as health technology, keeping a focus on the applicability for expensive goods. It is based on the World Health Organization's "Medical Device Technical Series (2011)" which were developed by reviewing all readily available internationally relevant country and organizational experiences and guidelines (3). These series are designed to be a practical and comprehensive resource especially useful when a new system is being developed or a fundamental review of policies and services is taking place. The brief also heavily relies on a report from the OECD-DAC[1] and World Bank supported Round Table on Strengthening Procurement Capacities in Developing Countries which presents the initial experiences and lessons learned by volunteer partner countries in Africa, Latin America and Asia (4); and the DFID series on Management Procedures for Health Facilities and Health Authorities (5).

### How this Response was prepared

After clarifying the question being asked, we searched for local or national evidence from Uganda and countries of similar context and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here:

www.evipnet.org/sure/rr/methods

# Summary of findings

Management of health technology involves several elements which include needs assessment, procurement processes, considerations for solicitation and provision of donated goods/services, medical equipment inventory management, maintenance programmes, computerised maintenance management systems, safe use of medical devices, measuring clinical effectiveness and commissioning of the devices.

There are several options for developing a service for health technology management. The key for selecting the right model is to choose one that integrates health technology

[1] OECD-DAC Organisation for Economic Co-operation and Development: Development Assistance Committee

management into the existing health management system and health delivery system because for health technology management to be effective, it needs to be seen as a normal part of general health management activities.

When creating a health technology management system, it is suggested to, among other things, establish a health technology management working group at every administrative level that reports to the health management team and is responsible for reviewing the status of equipment and for planning future needs.

Governmental units for health technology management, and/or clinical engineering may be located at the national, regional or local (hospital) level. These units would address topics that range from needs assessment to safe use of medical devices. In some countries the national health technology management team is part of a centre of national excellence that issues national standards and guidelines for best practice in all areas of health technology management. Such a centre may also provide training on health technology management and provide maintenance.

Decision-makers would then consult national centres for health technology for information on a host of issues including medical equipment per facility, technical specifications, procurement best practices, maintenance procedures, content of user training courses, and steps required for certificate of authorization. However, in some cases national centres may choose to concentrate on a particular area. For example, the Directorate of Biomedical Engineering in Jordan only manages maintenance issues related to medical equipment.

Health technology management teams will likely need to work together at national, sub-national and facility levels to ensure coordination and supervision across the entire system. Clarification of roles and responsibilities at each level will greatly facilitate coordination between the different levels and also enable a clearer estimation of human and other resources required to run the system.

## Table1: Options for developing a service for Health Technology Management

| ***Option*** | ***Description*** | ***Advantages*** | ***Disadvantages*** |
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| Individual 'In-house' Skills | As seen in a number of developing countries, individual facilities have invested in technical staff (such as artisans, technicians, engineers), as well as the resources they need to function effectively. | Having one's own technical staff available on site is invaluable for providing advice and a quick response. | • If each health facility develops separate individual in-house skills, the technical staff on site may become isolated, with no back-up or support, and many activities and skills have to be duplicated across the health service.<br>• Also, in many developing countries the reality is that health service providers rarely provide an adequate maintenance service within their facilities, let alone the broader HTM role. In many cases some maintenance services are planned, but cannot be implemented properly due to lack of financial and personnel resources. In these instances, one of the options may be to contract additional technical support from the private sector. |
| Existing Technical Referral Networks in the Health Sector | In a number of countries, different health service providers have already set up a referral network of management and maintenance workshops to cater for the technical needs of their own health facilities. In this way, the 'in-house' skills at individual health facilities are linked in an overall HTM Service. | • A referral network offers a greater range of skills to health facilities by outreach from other locations, as well as support and supervision for individual maintenance staff from their colleagues.<br>• Since small health service provider organizations may not find it economical to develop such a network, an attractive idea for those with an existing HTM Service is the possibility of expanding their network to cover, and sell services to, facilities owned by other health service providers. Thus, government, NGO, and private health service | • The capital investment required to establish a referral network of workshops may not be economical for health service providers that only have a few health facilities.<br>• For health service provider organizations with an existing HTM Service, expanding it to cover facilities of other providers would introduce an extra workload which, at the beginning, may not generate sufficient additional income to cover the cost increases. This may be the case for a number of years, and may even require some subsidies. |

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| | | providers could all consider an expansion of their role. | |
| Collaborative Arrangements | An alternative approach to creating a referral network would be for a number of health facilities under different ownership to collaborate to form a new organization, which is jointly owned. This would then provide an HTM Service for them all. | • Such networking is very important. It may be the only way to obtain an HTM Service, due to the high capital investment involved in its establishment.<br>• Such a collaboration between organizations enables the various health facilities to have an influence over the way the HTM Service is run.<br>• Such a joint venture could also generate significant savings compared to running an independent HTM Service in each health service provider organization. | • When creating such a partnership there would be a lack of any supporting services and structures in the beginning. These would subsequently have to be jointly developed.<br>• In addition, it may be necessary to hire technical and administrative staff. |
| Management and maintenance services from other Sectors | In some countries, other agencies have been given the authority for the maintenance and procurement of certain types of equipment. For example:<br>In the government sector, the Ministry of Works may be responsible for health buildings, plant, and service installations, the Ministry of Supplies may be responsible for furniture and office equipment, and the Ministry of Transport for vehicles. | If these other agencies are effective, they carry out important work for the health ministryand the service providers. Usually you need to follow their policies and guidelines for the types of equipment they are responsible for, and should not interfere with any equipment outside of your responsibility. | • These agencies usually have several other clients besides the ministry and a given health service provider and may not give provide a response in the time required.<br>• If unhappy with the service provided, one may need to re-negotiate the responsibilities of the different agencies, in order to ensure that all the equipment the health service relies upon is in good working condition.<br>• Ideally, the ministry or health service provider should have overall management control of all its equipment. In reality, you have no control over the internal budgets and therefore finances allocated by these management agencies for your needs.<br>• It can often be difficult to coordinate and control staff from other maintenance agencies working on health facility sites.<br>• With many agencies involved, there is often a duplication of |

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| | | | skills on site (such as welders, electricians, carpenters). |
| Private Sector Companies and Individuals | Most countries have to count on private sector support for some, if not all, of the following: maintenance and repair, supplies of spare parts, technical advice, installation and commissioning, training. They may also be used for procurement of rare and specialised equipment. | Private sector companies and individuals (such as artisans) can have substantial technical skills, plus extensive knowledge about the particular equipment they make or sell. | • Private sector individuals may have few resources and limited access to the spare parts required. Support from private sector companies is usually limited to certain brands of equipment, which they also sell. It is unlikely that private enterprises will be either able or willing to expand their services to cater for all brands of equipment.<br>• Usually ministries and departments of health, and health service providers would not want to be tied to such a monopoly situation.<br>• It is also rare for private sector companies and individuals to be based at your health facility site, so the quality of their support may be affected by factors such as the distance to travel, response time, and their workload.<br>• Besides maintenance, repair, installation, commissioning, and training, it is unusual to hand over control of any other HTM activities to private sector companies that have been contracted, such as making work schedules, advising on selection and procurement, planning and costing work, monitoring and ordering stores, managing the database, financial management, writing reports and keeping statistics, managing and supervising technical staff. Thus you will still always need in-house technical staff to undertake these tasks, manage the contracts with the private sector, and monitor the work of private sector personnel. |

**Other strategies to consider**

Health Technology Management activities fall under the 'service provision' function of health services which means that, as with any other health services, they could be controlled and run either by:

- government agencies such as the Ministry of Health
- non-government organizations
- private sector companies such as health insurance companies
- or a mixture of these entieties

From the experiences of other countries, it is usually simplest for a health technology management service to be controlled and run along the same lines as the health service provision system. For example, if health service provision is totally dependent on the government, it is advisable to include the health technology management service in government services, yet if health service provision is run privately or by a mixture of the private and public sector, it might be more effective for the health technology management service to be run privately. Whichever choice is made, there is need to establish a regulating system in order to ensure quality, standards, and safety of the services provided.
Health Technology Management systems and services also evolve and are often reviewed as a whole or in part. For example as research about best procurement practices goes on and reveals results, many countries have been adjusting their practices accordingly. Similarly as new technology is procured, the maintenance preactices may have to cahnge accordingly. And so the team has got to be flexible and has also got to set timelines in which routine programand service reviews should be done in line with the emerging trends and evidence.

**Conclusion**

Health technology management is a vital part of healrh service delivery and if done well ensures safe and equitable health care. For it to be efficient and acceptable, it would need to be incorporated in the already existent health system. There are different models including 'In-house' services and private sector or individual services. All have advantages and disadvantages but the appropriate choice may have to be a combination of two or more. Whatever the authorities opt for should be combined with a regulating system to ensure quality and standards are kept.

## References


1. Ken Graves. Global best practices in medical device procurement - A road map to system success. Journal of Medical Marketing. 2011;11:101-8.
2. World Health Organization. WHO Medical Device Technical Series: Procurement Process Resource guide 2011.
3. Global Health Initiative on Technologies. Medical Device Technical Series 2011. Available from http://hinfo.humaninfo.ro/gsdl/whoghp/en/cl/CL2.3/clmd,50.html#hlCL2_3
4. Compendium of Country Examples and Lessons Learned from applying the methodology for assessment of National Procurement Systems. 2008. Available from www.oecd.org/dataoecd/18/37/42107830.pdf
5. Andreas Lenel, Caroline Temple-Bird, Willi Kawohl, Manjit Kaur, Caroline Temple-Bird. How to Organize a System of Healthcare Technology Management. In: Caroline Temple-Bird, editor.



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**Conflicts of interest**
None known.


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