Report

Second Meeting of the WHO Technical Advisory Group on Health Technology

Rio de Janeiro, Brazil
8-9, November 2009

This publication contains the report of the Second Meeting of the WHO Technical Advisory Group on Health Technology and does not necessarily represent the decisions or policies of the World Health Organization.
List of Abbreviations

ACEW  Advanced Clinical Engineering Workshop
ACODESS Cooperation Agency for Health Care Services Development
ADB  Asian Development Bank
AfDB  African Development Bank
AFRO  WHO Regional Office for Africa
AMRO  WHO Regional Office for the Americas
ADVAMED Advanced Medical Technology Association
BENC  Biomedical Engineering Centre
BES  Biomedical Engineering Services
BME  Biomedical Engineering
CC  Collaborating Centre
CE  Clinical Engineering
CED  Clinical Engineering Division
CEN  European Committee for Standardization
CENETEC National Center for Health Technology Excellence
CMMS Computerized Maintenance Management System
Daces Developing Countries
EDF  European Development Fund
EHT  Essential Health Technology
EMBS Engineering in Medicine and Biology Society
EMRO  WHO Regional Office for the East-Mediterranean
EUCOMED European Medical Technology Industry Association
EURO WHO Regional Office for Europe
FDA  Food and Drug Administration
GIHT Global Initiative on Health Technology
GMDN Global Medical Device Nomenclature
HDS  Health System Governance and Service Delivery
HCTS Health Care Technical Services
HIT Health Infrastructure and Technology
HITeMP Healthcare Infrastructure and Technology Management Package
HMIS Health Management Information System
HNN Health Metrics Network
HT  Health Technology
HTA Health Technology Assessment
HTAi Health Technology Assessment International
HTM Health Technology Management
ICMDRA International Conference on Medical Devices Regulatory Agencies
ICD  International Classification of Diseases
ICT  Information and Communication Technology
IEEE Institute of Electrical and Electronic Engineering
IFMBE International Federation for Medical and Biological Engineering
IHTSDO International Health Terminology Standards Development
INHATA International Network of Agencies for Health Technology Assessment
IFMBE International Federation for Medical and Biological Engineering
IHE Integrating the Healthcare Enterprise
IHF International Hospital Federation
Purpose

This purpose of this meeting was to follow up on the first Technical Advisory Group on Health Technology (TAGHT) meeting conducted in April of 2009 in Geneva, Switzerland.

Progress reports on the development of the tools by each of the working groups that were formed during the 1st meeting were presented and discussed. Additionally, further gaps in required guidelines and tools were identified and new working groups were formed to create the additional guidelines and tools. See Annex 3.

Following testing of all of the tools in the selected pilot countries the results will be presented in Cairo in June 2010.

The final launching of the tools will take place at a meeting in Thailand in September 2010 in coordination with the launching of the Priority Medical Devices Report to a large international audience including high level healthcare decision makers.

Participants

The meeting convened participants and observers from many countries, members of TAGHT, members of industry, officers from four of the six WHO Regional Offices, and officers from WHO Headquarters. The full list of participants is presented in Annex 1.

Organization

The agenda of the meeting is in Annex 2.

Opening session

Mr Eric de Roodenbeke welcomed the participants and thanked the organizers for holding the meeting in conjunction with the 36th International Hospital Federation (IHF) Annual Meeting in Rio, the first IHF event in Brazil, and noted the important connection between healthcare technology management and infrastructure development.

Mr Christophe Rerat commented that the Pan-American Health Organization (PAHO) is committed to advancing the implementation of World Health Assembly (WHA) resolution 60.29.

Mr Eduardo Coura Assis reviewed briefly some of the important milestones of healthcare technology management in Brazil.

Dr Steffen Groth emphasized the importance of the task put before the TAGHT group to define the necessary tools for implementing safe and effective healthcare technology management in all countries, regardless of economic status. This meeting is one in a series of meetings that started before the WHA60.29 resolution. In addition to the development of the tools to support the resolution, the meetings are intended to also establish a clearing house that is accessible and
available to all countries. This work is possible because of support from the Gates Foundation. A meeting will take place in Thailand to present the final tools in 2010.

Meeting Objectives and Format

Mrs. Adriana Velazquez and Mr. Roger Schmitt welcomed the group to the meeting and reviewed the agenda for the meeting. Three main tracks were identified for the meeting:

1. An update of the health technology management (HTM) tools currently under development since April 2009
2. A review of the current challenges and strategies facing the pilot countries
3. An interactive session for the group to present proposals for new tools based on information gathered from the earlier presentations and discussions.

Each participant then briefly introduced himself or herself. This was followed by the selection of a Chair and the meeting Rapporteurs. Mr. Elliot Sloane was selected as chairman, and the following persons volunteered as Rapporteurs: Yadin David, Albert Poon, Antonio Hernandez, Jennifer Jackson and Ismael Cordero.

Session 1: Report of the Talloires Inter-Country meeting, October 2008
Mr Tony Easty

Mr Tony Easty presented the background, objectives and action points resulting from the Taillores Inter-Country Meeting.

The WHO and the Luxembourg government entered into a long-term partnership with initial three-year timespan to strengthen healthcare infrastructure and technology management (HIT). The WHO-Luxembourg program directly responds to most of the action points contained in the WHA60.29 Resolution, which recognized that health technologies:

- provide "indispensable tools for … attainment of internationally agreed health-related development goals"
- "represent an economic as well as a technical challenge to the health systems of many Member States"
- cause a "need to expand expertise in the field of health technologies, … and to ensure the effective use of resources through proper planning, assessment, acquisition and management"

The resolution indicates that WHO is to support Member States in:

- "analyzing needs, … implementing policies, … developing guidelines and tools, … jointly with other UN agencies, international organizations, academic institutions, professional bodies and WHO Collaborating Centres"

The Luxembourg – WHO agreement has three main thematic areas:

**Key messages**
- The WHO and Luxembourg partner to strengthen healthcare infrastructure and technology management (HIT)
- This agreement responds mostly to the action points contained in the WHA60.29 Resolution
- The agreement aims to develop an HIT planning and management toolkit as well as testing indicators for evaluating and measuring the impact of HIT management on health sector investments, service delivery and quality of care.
• HIT policy development and sustained implementation including strengthening country institutional and technical capacities;
• Development and country application of a ready-made HIT planning and management toolkit;
• Development and testing indicators for evaluating and measuring the impact of HIT management on health sector investments, service delivery and quality of care.

The countries selected for initial implementation are:

• El Salvador
• Laos
• Namibia
• Nicaragua
• Senegal
• Vietnam

Delegates from each of these countries were present at the Talloires meeting.

Dr. Adham Ismail inquired about the status of the Integrated Healthcare Technology Package (iHTP) tool. The group was notified that the rights to the framework were still under discussion and being clarified by WHO.

Roger Schmitt announced that the official report of this meeting was being finalized and would be available to participants in ten to fifteen days.

Dr Yunkap Kwankam

The principal themes from the 1st meeting of the TAGHT group in Geneva in April 2000 were presented. The decided outcome from this group was to connect expert advice and guidance to the experience of member countries in the development and sustainment of healthcare technology management programs with special attention to gaps identified during the exchange between the experts and the country delegates. The follow up action steps from the meeting was the production of tools for these areas:

• Knowledgebase Clearinghouse managed by WHO
• Computer Maintenance Management System (Management software)
• Human Resources
• Procurement
• Maintenance
• Policy Development
• Policy Implementation
• Needs Assessment

Key messages

• Many groups identified to develop guidelines and tools
• There is a recognition that the approach undertaken for the past 30 years needs to change
• WHO needs to leverage more its role as catalyst and convener
Key messages

- 13 working groups were formed to develop needed guidelines and tools defined in the first meeting
- Common terms are needed to describe healthcare technology and its management
- HTAi is already developing separate glossary for healthcare technology so this glossary should be restricted to medical devices
Following the update on the working groups, Mr Boule provided an overview of the glossary of common healthcare technology terms currently under development as part of WG7. During this presentation, he described the complications encountered when using certain words and phrases as the context can change across different languages and cultures. An attempt to resolve this challenge will include formally requesting NGOs and professional societies for currently-existing glossary terms. A team of experts will then review the glossary and recommend relevant changes.

During the discussion period, a request was made to restrict this glossary to only terms related to medical devices since Health Technology Assessment International (HTAi) was already developing a glossary for healthcare technology.

Session 4: Biomedical Engineering professional survey  
Mr Saide Calil

A survey was conducted to identify the education resources available to the member states for local Biomedical Engineering and Biomedical Engineering Technician human resource development. The survey methods and initial results were shared.

Mr Calil asked for help in identifying teaching units including the technical college level and for contact persons in national societies.

It was noted that many of the member states were not accurately represented and many known teaching units were missing. These member states need to be directly contacted to complete the data collection.

A suggestion was made to also look at electrical engineering programs in the member states as these might have biomedical engineering as a minor course of study. Another suggestion was made to provide definitions of the scope and purpose of the survey and teaching units since biomedical engineering is a very broad field with areas such as genetic engineering, etc that may not be relevant to healthcare technology management.

Session 5: Baseline survey and E-documentation centre  
Mrs Adriana Velazquez Berumen

The baseline medical device web based survey tool was introduced to the group and its objectives and data collection methods were reviewed. This survey is to be completed by March 2010 and has the following objectives:

- Monitor the implementation of the Health Technologies Resolution ((WHA60.29) at Headquarters and in Member States.
- Have global information on the health technology institutions and policies available in Ministries of Health.
• Collect medical equipment profiles in countries and regions.
• Identify reference lists of medical devices by clinical procedures, type of health facilities, or public health emergencies.
• Determine key action areas to support the development of health technology programs in regions and countries.
• Establish the requirements of Member States for tools, guidelines, standards and services in biomedical and clinical engineering, as well as health technology assessment fields.
• Define the focal points for health technology management, assessment, regulation and biomedical or clinical engineering in the Member States for future work on the implementation of the resolution.
• Identify best practices to share with other Member States.
• Compile the health technology information provided by the contributing countries into a database to serve decision makers at global, regional and national level.

The group was tasked with reviewing the survey and providing feedback for improvement.

Mrs Velazquez then presented the Health Technologies E-documentation centre that will be hosted and managed by WHO within their website. It was recognized that although documents may be available they are many times not known about or may be difficult to find and retrieve since they may be scattered in many different places.

The Health Technologies E-documentation centre will provide an easily accessible and searchable resource to everyone and will include all of the guidelines and tools developed by the TAGHT group as well as other existing documents published and endorsed by WHO.

**Session 6: Country challenges and strategies (in pilot countries)**

The represented member states each presented an overview of the state of healthcare technology and its management in their respective country. Each state identified challenges that they were facing and the following common themes emerged:

• Lack of human resources
• Lack of HIT policy development and sustainability
• Lack of HTM presence/representation at the ministry level
AFRO:

**Ethiopia**- Ms Jennifer Barragan
- Beginning of biomedical training- lack of facilities, equipment, books
- Problems with procurement and donations,
- New Ethiopian Biomedical and Laboratory Equipment society just got government approval.
- Lack of organization support for health technology needs, lack of tools and knowledge, need for medical equipment officer.
- The Ministry of Health (MoH) is interested to move forward and to develop Health Technology (HT) guidelines but they need experts support and financial backing.

**Namibia**- Ms Paulina Nghipandulwa
- 1 national clinical engineering workshop, 4 regional
- Challenges:
  - No local training institutions for clinical engineering
  - Lack of qualified engineers and technicians- many vacancies
  - No local training institutions for clinical engineering
  - Hardly any high school graduates entering engineering study (not meeting the requirements)
  - Inadequate budget for procurement of Medical Equipment
  - Infrastructure development (5 CEW only)
  - No hospital based engineers or technicians

**Kenya**- Mr Martin Owino
- 125 biomedical engineers, 326 biomedical technicians, 64 handymen
- 2 biomedical equipment training institutions
- Health Technology programs are undertaken by Biomedical Engineering Services Division in the Ministry of Medical Services
- Challenges:
  - Not enough funds,
  - Low technical skills,
  - Inadequate understanding of HT issues by administrators,
  - Poorly designed infrastructure
  - Problem with donated equipment
  - No spare parts, inadequate testing tools
  - No biomedical regulation of training and practice for profession
AMRO:

**Brazil** - Mr Eduardo Coura Assis  
- Secretariat of Science, Technology and Strategic Inputs within in charge of HTM  
- Policies  
  - National Policy of Science, Technologies and Innovation in Health  
  - National Agenda of Priorities of Research in Health  
  - National Policy of Management of Technologies in Health  
- Challenges:  
  - Applying health technology assessment (HTA) in hospitals;  
  - To implement the study of the cycle of life of the medical technologies after the incorporation  
  - Easy access to HTA database  
  - Produce relevant and reliable information to all audiences  
  - Develop continuous training and knowledge process.  
  - To reduce the gap between development of HTA studies and the decision making process.

**Jamaica** - Mr Garfield Prescod  
- Health Facilities Maintenance Unit -part of ministry of health  
- Ensure that physical structures and equipment for health are properly maintained and are kept in the best possible condition.  
- Challenges:  
  - Lack of suitably qualified and trained personnel.  
  - Inadequate for preventive maintenance programme.  
  - Lack of effective coordinated procurement  
  - Lack of a fully accepted computer maintenance management system.

**El Salvador** - Dr Carlos Enrique Hernandez Avila  
- no national program for HTM  
- have 2x training program for technicians, not for engineers,  
- Challenges:  
  - many hospitals have broken equipment  
  - Numerous obsolete equipment  
  - need national HT policy,  
  - need national unit for HT

**Mexico** - Mr Juan Mercadillo Aguilar  
- National agency for health technology- CENETEC- part of ministry of health  
- 3 main areas:  
  - Medical equipment planning  
  - Health technology assessment  
  - eHealth/telemedicine  
- Challenges:  
  - Over utilization of medical equipment  
  - Lack of budget for equipment replacement  
  - Inequity of medical care
Nicaragua - Ms Tatiana María Valdez García

- Technological Development Department under the Supplies and Physical Resources division of the MoH
- MOH is to create a governmental health technology policy - Technological Development Department is not part of this task yet.
- Challenges and needs:
  - no school that offers clinical or biomedical engineering
  - Personnel with little medical equipment experience
  - Limited access to Internet.
  - Some providers try to take advantage of MoH
  - Lack of a National Health Technology Policy
**EMRO:**

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
<th>HTM Program Functions Scattered Among 3 Authorities in Healthy Sector</th>
<th>Challenges/Needs</th>
</tr>
</thead>
</table>
| **Iraq** | Mr Kamel Abdul-Rahim, WRO/Iraq | Separate medical equipment units in different divisions of MoH. No centralized unit | o Level of HT expertise is low  
o No unified entity responsible for medical devices,  
o No policy  
o No monitoring  
o Need to develop database of all technical staff and their competencies  
o Lack of test equipment  
o Need to build technical skills  
o Need to increase awareness on medical device management,  
o Adoption of standardized specification for basic medical equipment. |
| **Sudan** | Dr Mohamed Osman Hamid | HTM program functions scattered among 3 authorities in healthy sector:  
o National Commission for Pharmaceutical  
o Central Medical Supply  
o Medical Engineering Unit at Federal Ministry of Health | o Fragile & fragmented system of HTA  
o Decentralization of health authority.  
o Increase demand for new health technologies.  
o Lack of Institutional and technical capacity  
o Information gap and limited health system research. |
| **Jordan** | Mr Naser Fawwaz Al-Zubi and Mr Alda' Ajeh | Directorate of Biomedical Engineering part of MoH structure  
Full life cycle responsibility including corrective & preventive maintenance, Technical specifications & tender evaluation, manage & monitor contracts Procurement and supply management of spare parts, Quality control, training of medical staff, technical staff, university students, equipment planning | o The increasing demands and expectations of people for effective, accessible and quality health care.  
o Immigration of qualifications.  
o Lack of comprehensive Health Information system.  
o Displacement of trained medical staff.  
Need to build technical skills.  
Need to increase awareness on medical device management,  
Adoption of standardized specification for basic medical equipment. |
### EURO:

#### Moldova - Mrs Ludmila Topchin
- Department of Medical Technologies was created in 2007 (4 persons)
  - Development of policies and promotion of strategies in the medical technologies and drug area.
  - National Hospital Master Plan Development (related to medical technologies and medical devices)
  - Promotion of standards for public procurement
  - Coordination with donors
  - Authorization of imports

#### Albania - Mr Entela Zeqo
- The Biomedical Engineering Centre (BENC)- national workshop for maintenance of medical devices, supports health care institutions in all of Albania with maintenance of medical devices
- MoH has identified a number of health policy goals, but none address safe and efficient use of medical devices
- Challenges/Needs:
  - Equipment underutilized or inappropriately used due to lack of consumables, lack of maintenance and lack of competent users
SEARO:

**Sri Lanka- Dr Eeshaara Kottegoda Vithana**

- Bio Engineering Services Unit within MoH:
  - Medical equipment management-
  - Repair and maintenance by BES staff
  - Arrangement of service and maintenance
  - Contract with Vendors
  - Procurement of medical equipment,
  - Installation, commissioning,
  - Maintenance and disposal
  - Forecast and purchase of spare parts
  - Arrangements of service and maintenance
  - Contract with Vendors
  - Procurement of medical equipment,
  - Installation, commissioning,
  - Maintenance and disposal
  - Forecast and purchase of spare parts
  - Arrangements of service and maintenance
- Challenges and Needs:
  - Funds: e.g. 12,000 pieces of equipment worth 1500 Million $.
  - MOH receive only 5 Million $ for maintenance and 20 Million $ for the purchase of new equipment
  - Staff leave the country (brain drain)
  - Dollar fluctuation
  - Few satellite workshops. Centrally driven operation
  - No technology assessment
  - Sometimes have to accept bad donations though WHO guidelines are followed due to political pressure.

**Nepal- Mr Mr Bhanu Bhakta Yengden**

- Health Logistics maintenance division is new integrated unit
- Have information system for reporting from remote to central office
- Developed web-based inventory system for all districts facilities
- Implemented Telehealth system in 25 remote locations
## WPRO:

<table>
<thead>
<tr>
<th><strong>China, Peoples Republic</strong>- Professor Jie Chen</th>
<th><strong>Laos, People's Democratic Republic</strong>- Mr Thanom Insal</th>
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</thead>
<tbody>
<tr>
<td><strong>HTM programme:</strong></td>
<td><strong>Medical products supply center (MPSC)</strong> which has the role as technical department for medicine and medical equipment management.</td>
</tr>
<tr>
<td>o Dep. of Planning &amp; finance- responsible for making policies on allocation, procurement and management of medical equipments in hospitals.</td>
<td>o support to the hospitals to manage the health technology</td>
</tr>
<tr>
<td>o Dep. of Hospital administration- responsible for regulating safe utilization of medical equipment in hospitals.</td>
<td>o provide the services for the maintenance</td>
</tr>
<tr>
<td>o Dep. of Science &amp; Education is responsible for facilitating R &amp; D of medical equipment.</td>
<td><strong>Challenges</strong></td>
</tr>
<tr>
<td>o Dep. of Medical Equipment- responsible for drafting professional standards, good manufacturing practices of medical equipments and supervising their implementation, and registration.</td>
<td>o Financing of technology</td>
</tr>
<tr>
<td><strong>Challenges:</strong></td>
<td>o Lack of training institutions on health care technology in the country</td>
</tr>
<tr>
<td>o more and more expensive medical technologies also make medical services more expensive</td>
<td>o Lack of guidelines and standards</td>
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<tr>
<td>o Quality of medical</td>
<td></td>
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<tr>
<td>o Excessive reliance on medical equipment rather than doctors</td>
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<td>o Equipment not available in rural areas.</td>
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</table>
This session covered Health Technology Assessment and the reasons why developing countries need to use HTA and the best approach that countries should undertake for its development. Additionally, the actions to be undertaken by WHO for supporting HTA projects in member states were covered.

HTA contributes to getting good health technologies to poor people in poor countries and is a pragmatic, highly adaptable tool to improve decision-making. HTA processes can:

- create consensus among stakeholders on priorities and on needed actions
- guide and support implementation
- improve governance and strengthen health systems

WHO can play a key role in developing HTA by:

- Facilitate links between country HTA focal points and international knowledge resources
- Support a Community of Practice of Country HTA Focal points
- Advocate HTA as part of Good Health Governance and Health Systems Strengthening
• Establish linkages at WHO between HTM, HTA, National Health Research and Evidence informed decision-making
• Increase the number of staff with the relevant skills and understandings of HTA
• Support the evaluation of the pilot projects
• Access to financial resources

A gradual introduction of HTA in developing countries with support from WHO and other international organisations, accompanied by an appropriate evaluation, will help to get good health technologies to poor people in poor countries, improve governance and strengthen health systems.

**Session 8: Health infrastructure and technology policies - framework and formulation and implementation; findings in countries**
*Mr Roger Schmitt and Mr Bastiaan Remmelzwaal*

This session covered a tool for the formulation, implementation and assessment of policies for Health Infrastructure and Technology (HIT) at the country level.

Many countries despite having HIT policies in place often experience problems with its implementation and still experience poor HIT performance, dissatisfied health workers, ineffective use of resources, poor quality of care, etc.

There is a need to assess the effectiveness of HIT policies as well as a need to update the WHO guidelines. We need a tool to systematically assess policy formulation, implementation and impact at country level. This tool must:

• Be easy to use, simple and smart
• Include all stages of policy life-cycle
• Facilitate rapid appraisal
• Be results-based- ‘key indicators’
• Yield concrete recommendations
• Facilitate inter-country comparison
• Learn from the Health Metrics Network (HMN)

This tool has been initially piloted in 3 resource-poor countries (Namibia, Senegal, Laos PDR ) and 3 more will follow (Vietnam, El Salvador, Nicaragua ). The results to date shown that:

• Good Policies facilitate effective HIT-planning, acquisition & management
• However, having a HIT Policy in place does not guarantee implementation
• ‘HIT-optimisation’ is important in resource poor settings
• ‘Infrastructure’ policies are often lacking

**Key messages**
- Many countries with HIT policies have problems with implementation
- Tool is needed for assessing policy formulation, implementation and impact of HIT policy
- HIT policy should be accompanied by implementation guidelines
It was also observed that there is a lack of global information sharing and countries develop their HIT policies in isolation. The importance of having a country ‘Champion’ was recognized. Additionally, it was pointed out that Information Technology (IT) systems are sustainable only if suited to local context.

The findings and observations so far have lead to the following general recommendations:

- Preconditions in place before policy formulation
- Buy-in from top decision makers
- Participation by Development Partners
- Extensive public consultation needed when drafting Policy
- HIT Policy should be embedded in broader Policies and Development Plans
- Policy should be accompanied by a strategy and practical implementation guidelines

**Session 9: Health infrastructure and technology indicators**

*Mr Antonio Hernandez*

Mr Hernandez presented the Luxembourg-WHO project to develop indicators for evaluating and measuring the impact of healthcare infrastructure and technology management on investments, service delivery and quality of care. The objective of this project is to define and develop models to assess and predict the impact of healthcare infrastructure, technology allocation and investments at local and country levels. This project is being piloted in 6 countries: El Salvador, Nicaragua, Namibia, Senegal, Laos, and Vietnam.

The indicators developed in this project aim to measure:

- The implementation of health technology management (process indicators)
- The quality of health technology management (outcome indicators).

The group discussed the huge complexity of the indicators presented and commented on the need to combine and simplify and to organize in a hierarchical manner while identifying key indicators.

**Session 10: Health technology procurement and incorporation guidelines**

*Mr Andrew Gammie*

This session presented an update on the work performed so far to establish medical equipment procurement guidelines. This working group was to:

- Review & categorise existing guidelines
- Draft generic procurement performance indicators
- Draft generic guidelines on procurement of devices and hospital plant equipment
It was recognized that many procurement guidelines already exist but some of the essential details may not be available or they may not be generic enough for widespread adoption.

The new guidelines being drafted follow these principles:

- Useful first, comprehensive second
- Main body short & clear
- Distilled from others, not all-inclusive
- Clickable references for details
- Be a road map, planning aid, checklist
- Be practical
- Not a replacement for procurement departments
- Rely on local expertise
- Fit with other guidelines

It was noted that the procurement process should not be an open loop and there is a need for performance indicators to measure effectiveness of the procurement process and to monitor progress against goals.

Further work on the procurement guidelines is needed to consider national legislation & regulations, quality assurance and product security among others.

**Session 11: Healthcare equipment donations guidelines update**

*Mr Billy Teninty, Prof Robert Malkin, Ms Jennifer Barragan*

Inappropriate donated equipment still remains a problem today with corporations, individuals and non-profit organizations, which should know better but continue to send inappropriate equipment as long as their donors support the “great” work they are doing.

This working group was charged with reviewing and updating the existing WHO guidelines for donations of medical equipment. The main work consists of clarifying the guidelines, facilitating the implementation of the guidelines where possible and using primary source data to evaluate donations.

This effort included interviews on examples of good and bad donations with 28 individuals from 22 equipment donation organizations. Additionally primary source statistics were obtained from 60 sources, 5 with published primary source data and policy information was obtained from 62 nations (high, medium and low development).

The following are the main suggested revisions to the guidelines:
Key messages

- The manual is being drafted in coordination with preventive maintenance manual
- Manual will include planning, management and technical issues
- Performance indicators should be added to manual

New Sections (not yet written)
- Donations from a Public Health Perspective (Background)
- Single-use and Implantable Devices (Guidelines)
- Donors: Suggestions on How to Adhere to Guidelines
- Recipients: Suggestions on How to Implement a Policy on Health Care Equipment Donations

Session 12: Corrective maintenance (CM) of medical equipment

Mr Matthew Baretich

In this session Mr Baretich provided an update on the drafting of the WHO Manual of Corrective Maintenance for Medical Equipment in Developing Countries. This manual is being drafted in coordination with the manual on preventive maintenance. This manual aims to be basic & concise (wide audience) while being flexible (various resource levels) and adaptable (various settings). Additionally the manual will incorporate the inclusion of many examples.

Planning issues including human resources, financial resources and physical resources required will be covered in this manual. Additionally, guidance for management and technical issues will be included:

Management issues:

- Personnel management,
- Financial management,
- Operational management
- Service vendor management
- Working with equipment users,
- Performance monitoring
- Performance improvement
Technical issues:

- Equipment manuals
- Prioritizing CM activities
- Troubleshooting techniques
- Levels of corrective maintenance
- Repair techniques
- Safety
- Repair resources
- Factors influencing equipment failure

Questions arose from the group about performance indicators and the need to know how to measure compliance. It was also noted that this manual should be translated into various languages and it was suggested that it include a checklist.

Session 13: Preventive maintenance (PM) of medical equipment

Mr Frank Painter

The preventive maintenance manual is being drafted in coordination with the manual on corrective maintenance. As with the corrective maintenance manual, this manual aims to be basic & concise (wide audience) while being flexible (various resource levels) and adaptable (various settings).

The planning issues covered by this manual include:

- Limitations of PM
- Guidance on PM
- Strategies to accomplish
- Human Resources
- Budgeting and cost planning
- PM work load calculations
- Donated equipment
- Record keeping
- Tags & Labels

The management issues covered by this manual include:

- Overall PM Program management
- Scheduling PM
- Prioritization
- PM program performance monitoring
- Monitoring program quality
- Measuring PM productivity
- Improving performance and quality
Key messages

Priority of any maintenance program should be patient safety

Important to understand impact of maintenance on healthcare delivery

Key indicators need to be identified

- CMMS in PM
- Tracking and locating equipment
- Communicating with users

The technical issues covered by this manual include:

- PM procedures
- Training
- Test Equipment & Tools
- Parts
- Supplies
- Contracts & Contracting
- Environmental Considerations
- Safety

This manual will also include as appendices:

- Generic Procedures
- Database structure
- Generic templates
- Department policies and procedures
- Job descriptions-PM technician
- Calculating Inspection and Preventive Maintenance (IPM) workload
- Calculating your service cost per hour
- Review of CMMS system PM features
- Test Equipment for IPM

As with the previous session questions arose from the group about performance indicators and the need to know how to measure compliance. A comment was made that PM completion rate is not a good indicator of performance.

**Session 14: Indicators and infrastructure for maintenance**

*Mr Jim Wear*

In this session Mr Wear emphasized the required indicators and infrastructure for maintenance of medical equipment within the context of patient care and patient safety.

It is important to not just know the inventory of medical equipment assets but also to understand the repair needs and the impact of repairs on healthcare delivery. The priority of any maintenance program should be patient safety.

The required infrastructure for a maintenance program includes:

- Trained staff
- Basic Tools/Equipment
- Dedicated Space - Location
• Budget
• Mechanism for ordering parts in a timely manner
• Records
• Location of staff in hospital organization

Comments from the participants included a need to integrate this section with the guidelines for corrective and preventive maintenance. Also there is a need to identify key indicators and to put indicators in a hierarchical order. Country experiences in this area should also be put into evidence.

Session 15: Computerized Maintenance Management System (CMMS)
Dr Iyad Malkawi

This session presented the work performed in developing the guidelines on Computerized Maintenance Management Systems (CMMS). These guidelines explain:

• The purpose and function of a CMMS
• The challenges in implementation in developing countries
• The impact of a CMMS on HTM
• The basic elements and modules of a CMMS
• The various reports generated by a CMMS
• The dashboard concept
• Guidance on evaluating commercial packages
• How to plan and implement
• Advantages and disadvantages of a locally developed CMMS

Further work is required by WHO to evaluate the experiences with various CMMS packages (HighTemp, ECRI, etc.), to recommend a common nomenclature and standard indicators, and to facilitate piloting in member states.

Participants asked about open source software packages. There are about 18 such sources and they are included in the appendix of the guidelines.

Session 16: Selection and use of laboratory technology
Ms Anita Sands

This session began with a review of the importance of laboratory diagnostics and a summary of the current global trends in diagnostics. This was followed by an explanation of the WHO Prequalification program, which focuses on commercially available diagnostics for priority diseases. The objectives of this program are:
• To facilitate access to appropriate & affordable diagnostics of good quality to resource-limited settings
• Provide advice to WHO Member States, other UN agencies and NGOs on the acceptability of particular diagnostic technologies
• To increase country capacity to effectively regulate diagnostics & to monitor the quality of diagnostics on their market

The WHO post market surveillance system for diagnostics includes a proactive component and a reactive component. The proactive component includes batch released testing and testing of kits in the field. The reactive component comprises the vigilance system.

Laboratory equipment can be categorized as dedicated and general. Provision of specifications must be generic enough to encourage competition & discourage corruption/collusion but must also be specific enough to only select good quality products.

Standardising laboratory equipment can provide the following benefits:
• Streamlines procurement processes
• Standardises training needs
• Simplifies maintenance requirements for biomedical engineers
• Improves capacity for Quality Assurance

However, it can also impede innovation and competition.

Ms Sands introduced the maintenance manual for laboratory equipment developed by WHO and other resources posted on the WHO website: www.who.int/diagnostics_laboratory/en/

Several participants felt that many of the procurement and maintenance issues discussed in this session should be integrated into the guidelines being developed for procurement, corrective maintenance and preventive maintenance of general medical equipment.

Session 17: List of medical devices by health care facility
Ms Claudia Cardenas

Ms Cardenas explained her work to help guide equipment planning for each type and size of healthcare facility. Equipment lists were created in Microsoft Excel using both the Global Medical Device Nomenclature (GMDN) and ECRI nomenclatures systems and containing information in both Spanish and English. In addition to medical equipment, these lists also include instruments and furniture.
Session 18: List of medical devices by clinical practice guidelines

Ms Mariela Jimenez

Ms Jimenez explained her work to help guide equipment planning by clinical practice guidelines (CPGs). The objectives of this effort are to:

- Create a database to link 100 CPG’s with the respective medical equipment need to fulfill the required interventions.
- Link the CPG’s interventions with:
  - ICD 9: International Classification of Diseases
  - ICD 10: International Classification of Interventions
  - Basic Chart of Instruments and Medical Equipment (Mexican, Federal Government))
  - GMDN
  - UMDNS (Universal Medical Device Nomenclature System)

These lists do not include furniture or surgical instruments, nor do they provide the minimum level of equipment required.

Session 19: Interrelated database

Mr Elliot Sloane

Mr Sloane explained his work to link the work described in the previous two sessions by integrating all the Excel lists into an Access database that relates/links equipment and devices to type of facilities, CPGs, UMDNS and GMDN.

Discussion and comments on the last 3 sessions suggested making the lists more globally pertinent by moving from Mexico specific to a more generic template. Also, there is a need to understand how to furnish and equip small health centres. The issue of how hospitals can deal with lab and other equipment that comes in through the reagent/consumable door was brought up i.e. the hospital buys the reagent and gets the equipment at no cost.

Session 20: Health technologies in primary health care reform

Dr Carissa Etienne, Assistant Director General, WHO

Dr Etienne gave a talk on health technologies in Primary Health Care (PHC) reform.

There are many evolving health needs and challenges including fragmentation and inequity. Further complicating this is the current financial crisis.
Large populations do not have access to care and many times when they can access care it is of poor quality and this has a critical impact on their finances and on global finances.

All persons want to live long healthy lives and to have a say in what affects their lives and that of their families. They also want to be treated as human beings and not just "cases". They want health authorities they can rely on, medicines and technologies that work and more efficient services.

Technologies form one of the building blocks of health systems but at the centre of any health system is the people.

Universal coverage means ensuring sufficient supply of care and removing barriers to access and scaling up services in underserved areas.

For people-centred primary care it is essential to establish close-to-client networks of primary care teams and promote personal relationships between service providers and users were there is trust. Primary care networks with responsibility for all members of a defined population need to provide integrated, continuous and quality care. Better and more effective public health policies that are integrated in all policies (e.g. labour, environment).

There is a need for inclusive leadership and governance. We need to move from command and control to steer and negotiate, were consensus is built and decisions are made around evidence. There is also a need to involve non-state actors. Participation should include users, local communities and civil societies. Consumers should be empowered and protected.

Implications for Technology include: universal coverage, people centred primary care, healthy public policies, leadership and governance and participation

There is a formidable gap between innovations in health technologies and their delivery to communities in the developing world. There is a greater gap in innovations in health technologies tailored to the needs of the developing world. Basic technology is unavailable to a large segment of the population.

In order for technology to ensure universal coverage it needs to be available, appropriate, affordable, equitable, safe, effective and efficacious

The dots must be joined between primary care networks, district hospitals, specialised hospitals, public/private hospitals. The dots must also be joined between experts, technology, drugs, health professionals, service providers, financing and information. WHO plays an important role as convener to help solve problems and join the dots.

Following Dr Etienne’s talk, there was a lively discussion on the role of technology in primary health care.
Session 21: Professional organizations and NGOs support round table

This session provided an opportunity for several professional organizations involved with HTM and HTA to communicate their role in improving health technologies and their potential support for the work that WHO is conducting in this area.

**IFMBE- Mr Yadin David**
- 120,000 members in 58 affiliated organizations.
- International Federation for Medical and Biological Engineering (IFMBE) operates through Divisions and working groups like health technology assessment and the Clinical Engineering Division (CED).
- The mission of the CED is:
  - To stimulate knowledge creation and sharing through research and application of new methodologies and practices within the Clinical Engineering field.
  - To improve co-operation and exchange of information between Clinical Engineers working in different regions and/or countries.
  - To promote technical and professional guidelines for the practices within the Clinical Engineering field.
  - To promote collaboration between individual Clinical Engineers, institutions and other professionals or societies interested in improving safe healthcare delivery.
  - To facilitate professional development, and
  - To promote improvement in the capacity and quality of the healthcare delivery
- The CED has new working groups:
  - Group #1 Professional Practices & Education
  - Group #2 Standards and Guidelines
  - Group #3 Strategic development & communications

IFMBE/Clinical Engineering Division has a unique network of experts and is looking forward to collaborating with WHO in the technology life-cycle management field.

**IEEE EMBS- Mr Elliot Sloane**
- Institute of Electrical and Electronic Engineering (IEEE) Engineering in Medicine and Biology Society (EMBS) is the world's largest international society of Biomedical Engineers
  - 8,200 members residing in some 70 countries
  - 119 chapters worldwide, 40 student branch chapters and 27 student clubs,
- Mission
  - advances the application of engineering sciences and technology to medicine and biology
  - promotes the profession
  - provides global leadership
  - for the benefit of its members and humanity
  - by disseminating knowledge, setting standards, fostering professional development, and recognizing excellence.
- Has a Clinical Engineering Committee

**IHF- Mr. Eric de Roodenbeke**
- International non-governmental organisation, supported by members from over 100 countries.
- Worldwide body for hospitals and health care organisations it develops and maintains a spirit of cooperation and communication among them
- Primary goal of improving patient safety and of promoting health in underserved communities.
- Official relations with WHO
Session 22: Financial support

African Development Bank: Mr. Pap Williams

The African Development Bank is headquartered in Abidjan, Cote D'Ivoire with a temporary location in Tunis (since March 2002). It is involved in all 53 African Countries & 43 Non-Regional Countries. It is governed by a board of governors.

The Bank finances health operations projects (including many standalone projects) with a focus on health systems development in the areas of maternal and child health, disease control, rehabilitation/construction and equipment and supplies.

Some of the lessons learned from the Bank’s projects include:

- No Health technology assessment
- Poor Planning: equipment arrived long after construction- (cannot be installed without breaking walls)
- Long delays in procurement- (particularly due to the delays in preparation of specifications of equipment to be procured)
- Poor/no preventive maintenance policy
- Poor/no training on operation and maintenance
- Poor/no results on service delivery

The Bank’s current focus includes spearheading the development of infrastructure in (African Union's Mandate), higher education, water & sanitation and climate change.

ACCE- Ms Jennifer Jackson

- Volunteer Organization (with 1 paid employee) with 400+ members
  - Membership sponsorships are available, funded by ORBIS
- Mission:
  - To establish a standard of competence and to promote excellence in clinical engineering practice
  - To promote safe and effective application of science and technology in patient care
  - To define the body of knowledge on which the profession is based
  - To represent the professional interests of clinical engineers.
- Recent Activities
  - Produce Symposia for Healthcare Technology Management Professionals
  - Develop International Workshops on Advanced Clinical Engineering (ACEW) in collaboration with WHO
  - Networking- INFRATECH Discussion Group
  - Advocacy-
    - Promotion of best practices through publication of Professional Practice Guidelines
    - Recognizing thought and practice leaders in the field through a comprehensive awards program
    - Developing standards and frameworks for future interoperability systems (Integrating the Healthcare Enterprise (IHE), etc.)

HTAi- Mr Reiner Banken

- 1,000 members- about ½ from Europe, Canada, 100 from US, 6 from Africa.
- Sister organization International Network of Agencies for Health Technology Assessment (INAHTA)- They have working group on middle and low income countries and meeting attendance subsidies.

Session 22: Financial support

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The Bank’s current focus includes spearheading the development of infrastructure in (African Union's Mandate), higher education, water & sanitation and climate change.
Some opportunities that involve health technologies include:

- **Infrastructure:**
  - Health infrastructure to improve ambient environment for health technology
  - Promote e-health e.g. for improved surveillance & case management

- **Higher Education**
  - Support to RMs tertiary education facilities (include institutes of technology) to strengthen capacity to:
    - Assess national needs for health technologies
    - Develop policies & plans
    - Research & conduct professional surveys etc.

- **Water & Sanitation**
- Health technologies to prevent/control water borne and water related diseases etc

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**Session 23: Industry support- AdvaMed**

*Mr Raalph Ives*

Mr Ives of AdvaMed spoke about the value of innovation and the fact that most innovation comes from small companies, which comprise 90% of AdvaMed’s membership. 80% of medical device companies in the U.S. have fewer than 50 employees and revenues of less than $100 million.

New medical technologies can bring many benefits to patients, caregivers and clinicians. They can improve the quality of life of patients through more efficient and effective treatments; enable patients to remain in their homes rather than being admitted to hospitals or care homes; make remote diagnosis and treatment possible; reduce treatment times; and enable clinicians to treat more patients more effectively.

Innovations in medical technology can bring solutions to meet basic needs. Not all innovations have to be expensive ones involving fancy equipment.

Elements of a supportive policy environment include:

- **Reasonable regulatory requirements; efficient and timely regulatory review**
  - Excessive or burdensome requirements i) increase the benefit of the “bad "guys, ii) increase costs, iii) reduce market competition and iii) drive innovation and technology from the market, to the detriment of patient care
  - Effective fazed implementation – Clear simple necessary rules
  - Efficient services from regulatory bodies
  - Enforce regulation

- **A fair, transparent, and predictable healthcare payment system, most optimally a mixture of private and public systems.**
- **Transparent HTA , Explicit Decision Criteria, Sustainable rules,**
- **Never mix HTA and Safety / Efficiency Regulation**

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Key messages

- Most innovation comes from small companies
- Innovations can solve basic needs in resource-poor settings
- Innovations can happen quicker in an environment with supportive policies
• Incorporation should consider: Device cost and comparisons, Total Procedure Cost, Full treatment cost, Overall Budget Impact, Impacts of denied incorporation on long term health budget and general economy approach.
• Robust intellectual property protection (innovation requirement)

**Session 24: Open discussion on missing issues: human resources; needs assessment; nomenclature and regulations**

*Open discussion and group work*

In this participatory session the whole group identified the issues that require further tools and guidelines, which were either not identified or fully addressed during the first TAGHT meeting. The following issues were identified beforehand for the group to consider: human resources, needs assessment, nomenclature and regulations. Additional issues resulted from the participant tables as follows:

**Country Table 1**
1. Dissemination of tools and how to give to authorities
2. Implementation of tools
3. Human resources
4. HTM/HTA
5. Regulations
6. Nomenclature

**Country Table 2**
1. Making HTM visible
2. Budget allocation
3. Health technology promotion
4. Risk management

**Country Table 3**
1. WHO to give advise on how to benefit from HT
2. Assistance in hiring long and short term advisors
3. Workshops with biomedical engineers departments
4. Regulations
5. WHO could help us with international reference price list

**Country Table 4**
1. Human resource development
2. Easily accessible HT information
3. Technical assistance at country level
4. Make standards available

**Experts Table 1**
1. Human resources, nomenclature
2. Needs assessment, regulation
3. Guidelines for medical device network development
4. Innovative technologies for public health
5. Funding coordination with project needs
6. Developing/identifying working models for HTM

**Experts Table 2**

1. Human resources and HT training
2. Publication of evidence to support policy for partners
3. A single international nomenclature
4. WHO campaign of health tech to MOH
5. Promotion of HT programs
6. Webpage to share experiences
7. Connections between innovations and hospitals without conflicts of interest
8. Promotions of incremental innovations for developing World Health Organization

**Experts Table 3**

1. Framework for integration of the work done; documents to tie work
2. Guidelines for equipment replacement planning
3. Country-based education and training

**Experts Table 4**

1. Guideline on retention on health technology workforce at country level
2. Outsourcing of asset management to private sector
3. Replace the Advanced Clinical Engineering Workshops (ACEW) with regional training centres
4. Continuous training of persons in the region
5. Produce evidence from these tools
6. HTM to use results

**WHO Table 1**

1. Impact of HT in epidemiology problems
2. Convincing policy makers
3. Framework for future firmly in wider complex
4. Align with drivers wider context
5. Link with health technologies and vertical programs
6. Institutionalization of clinical engineering in countries i.e. through certification

**WHO Table 2**

1. Regulation of medical devices
2. Practical implementation
3. Telemedicine- delivery of health care by ICT
4. Patient safety and technology
5. Impact of human health and environment and technology (disposals)

### Session 25: Working groups on recommendations for country implementations

*Open discussion*

The issues and gaps identified in the previous session where then further discussed and prioritized by each table. Volunteers were identified to lead working groups to develop the required tools and guidelines. The following working groups were formed:

1. Nomenclature
2 Human resources and health technology training
3 Needs assessment for medical technologies to address country gaps
4 Regulation of medical devices
5 Dissemination of tools
6 Visibility of health technology
7 Method to create and identify HTM centres of excellence
8 Evidence based justification of HT
9 Standards
10 Patient safety
11 Telemedicine
12 Framework for integration of work

Further details on the working groups can be found in Annex 4.
ANNEXES
Annex 1: List of participants

2nd meeting of the Technical Advisory Group on Health Technology
8-9 November 2009
Pre-Conference meeting of the 36th IHF World Hospital Congress
Rio de Janeiro, Brazil

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Mr Roger SCHMITT
Technology and Facilities Planning
Email: roger-olive@gmx.net
Annex 2: Meeting Agenda

Sunday, 8 November 2009

08:00-09:00 Registration

09:00-09:30 Welcome address
Mr Eric de Roodenbeke
Dr Christophe Rerat
Mr. Eduardo Coura Assis
Dr Steffen Groth

Meeting objectives
Mrs. Adriana Velazquez

09:30-09:45 Introduction of participants
Election of Chair and Rapporteurs

09:45-10:00 Report of the Talloires Inter-country meeting, October 2008
Mr Tony Easty

10:00-10:15 Report of the 1st Technical Advisory Group Meeting on Health Technology, April 2009
Dr Yunkap Kwankam

10.15-10:30 Working Groups and HTM glossary
Mr. Andre Mboule

Biomedical Engineering Professional Survey
Baseline Survey and E-documentation Center
Mrs Adriana Velazquez Berumen

10.45-11:00 Coffee break

11:00-11:40 Country challenges and strategies (in pilot countries)
AFRO:
Ethiopia: Ms Jennifer Barragan
Kenya: Mr Martin Owino
Namibia: Ms Paulina Nhipandulwa

11:40-12:20 AMRO:
Brazil: Mr Eduardo Coura Assis
El Salvador: Dr Carlos Enrique Hernandez Avila
Jamaica: Mr Garfield Prescod
Mexico: Mr Juan Mercadillo Aguilar
Nicaragua: Ms Tatiana María Valdez García

12:20-13:00 EMRO:
Iraq: Mr Kamel Abdul-Rahim, WRO/Iraq
Jordan: Mr Naser Fawwaz Al-Zubi and Mr Alda'Ajeh
Sudan: Dr Mohamed Osman Hamid

13:00-14:30 Lunch
EURO: Albania: Mr Entela Zeqo
       Moldova: Mrs Ludmila Topchin

SEARO: Sri Lanka: Dr Eeshara Kottegod Vithana
       Thailand: Mr Nakorn Tangwancharoenchai
       Nepal: Mr Mr Bhanu Bhakta Yengden

WPRO: China, Peoples Republic: Professor Jie Chen
       Laos, People's Democratic Republic: Mr Thanom Insal
       Malaysia: Mr Abdul Rahman Zamane
       Philippines: Mr Renato Ongcoy

16:00-16:20 Coffee break

16:20-16:40 Health Technology Assessment Guidelines
          Mr Reiner Banken, Mr Donald Juzwishin

16:40-17:00 Healthcare Infrastructure and Technology Policies - Framework and Formulation and Implementation;
          Findings in Countries
          Mr Roger Schmitt and Mr Bastiaan Remmelzwaal

17:00-17:20 Health Infrastructure and Technology Indicators
          Mr Antonio Hernandez and Mr Joachim Nagel

17:20-17:40 Health Technology Procurement and Incorporation Guidelines
          Mr Andrew Gammie

17:40-18:00 Healthcare Equipment Donations Guidelines - Efficacy Measurement and Specific Medical Devices
          Mr Billy Teninty and Mr Robert Malkin

18:00-18:30 Discussion
18:30 Adjourn

Monday, 9 November 2009

08:30-08:45 Corrective Maintenance (CM) of Medical Equipment:
          Mr Matthew Baretich

08:45-09:00 Preventive Maintenance (PM) of Medical Equipment:
          Mr Frank Painter

09:00-09:15 Indicators and infrastructure for Maintenance:
          Mr Jim Wear

09:15-09:30 Computerized Maintenance Management System (CMMS):
          Dr Iyad Malkawi

09:30-09:45 Discussion

09:45-10:00 Selection and use of laboratory technology
          Ms Anita Sands

10:00-10:15 List of medical devices by health care facility:
          Ms Claudia Cardenas

10:15-10:30 List of medical devices by clinical practice guidelines:
          Ms Mariela Jimenez
10:30-10:45 Interrelated database:  
Mr Elliot Sloane

10:45-11:15 Coffee break

11:15-11:45 Health Technologies in the Primary Health Care Reform  
Dr Carissa Etienne, Assistant Director General, WHO

11:45-12:45 Professional organizations and NGOs support round table:  
IFMBE: Mr Yadin David  
IEEE, EMBS: Mr Elliot Sloane,  
IHF: Mr. Eric de Roodenbeke,  
ACCE: Ms Jennifer Jackson  
HTAi: Mr Reiner Banken

12:45-13:15 Financial Support  
World Bank: Ms Akiko Maeda  
African Development Bank: Mr Pap Williams

13:00-13:15 Industry support: ADVAMED, EDMA, EUCOMED

13:20-14:50 Lunch

15:00-15:30 Open discussion on missing issues:  
Human Resources;  
Needs Assessment;  
Nomenclature;  
Regulations.

15:45-16:15 Working groups on recommendations for country implementations  
Open discussion

16:15-16:45 Coffee break

16:45 Tasks, timeframes for pilot countries and report back June 2010

17:30 Conclusions and next meeting agenda (Cairo, June 2010)

18:00 Closure of the meeting
### Annex 3: List of Proposed New Working Groups

<table>
<thead>
<tr>
<th>Topic of Working Group</th>
<th>Description of Deliverables</th>
<th>Proposed Leader(s)</th>
<th>Working Group Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Nomenclature</td>
<td></td>
<td>Albert Poon, Elliot Sloane</td>
<td></td>
</tr>
<tr>
<td>2 Human resources and health technology training</td>
<td></td>
<td>Andre Boule, Robert Malkin</td>
<td></td>
</tr>
<tr>
<td>3 Needs assessment for medical technologies to address country gaps</td>
<td></td>
<td>Ronald Bauer</td>
<td></td>
</tr>
<tr>
<td>4 Regulation of medical devices</td>
<td></td>
<td>Antonio Hernandez</td>
<td></td>
</tr>
<tr>
<td>5 Dissemination of tools</td>
<td></td>
<td>Jennifer Barragan</td>
<td></td>
</tr>
<tr>
<td>6 Visibility of health technology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 Method to create and identify HTM centres of excellence</td>
<td></td>
<td>Ismael Cordero, Jennifer Jackson</td>
<td></td>
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<tr>
<td>8 Evidence based justification of HT</td>
<td></td>
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<tr>
<td>9 Standards</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Patient safety</td>
<td></td>
<td>Claudia del Carmen, Geeta Mehta, Tony Easty</td>
<td></td>
</tr>
<tr>
<td>11 Telemedicine</td>
<td></td>
<td>Antonio Hernandez</td>
<td></td>
</tr>
<tr>
<td>12 Framework for integration of work</td>
<td></td>
<td>Calil, Yunkap, Elliot</td>
<td></td>
</tr>
</tbody>
</table>
### Annex 4: Timeline

**Goal:** To make available the benefits of core health technologies at an affordable price, particularly to communities in resource-limited settings, in order to effectively control important health problems

<table>
<thead>
<tr>
<th>Objective</th>
<th>Meeting</th>
<th>Milestones</th>
<th>Activities</th>
<th>Date</th>
<th>Venue</th>
<th>Region</th>
<th>Kind of Meeting</th>
<th>Objective of Meeting</th>
<th>to following event</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT programme</td>
<td>1st</td>
<td>1, 2, 7</td>
<td>1, 2, 4</td>
<td>21-23 April 2009</td>
<td>HQ, WHO, Geneva</td>
<td>1st Advisory Group</td>
<td>To review and adopt guideline document</td>
<td>Health Technology Assessment Int. (HTAi) and INAHITA</td>
<td></td>
</tr>
<tr>
<td>Innovative Tech</td>
<td>1st</td>
<td>9</td>
<td>3, 4</td>
<td>20-21 June 2009</td>
<td>Singapore</td>
<td>WPRO</td>
<td>To select key health concerns for Innovative Technologies</td>
<td></td>
<td></td>
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<tr>
<td>HT programme</td>
<td>2nd</td>
<td>4, 5</td>
<td>1, 2, 3, 4</td>
<td>8-9 November 2009</td>
<td>Rio de Janeiro, Brazil</td>
<td>AMRO</td>
<td>2nd Meeting of the Advisory Group on Health Technologies</td>
<td>To review and adopt methodology and tools for health technology</td>
<td>International Hospital Federation (IHF) Congress</td>
</tr>
<tr>
<td>Innovative Tech</td>
<td>2nd</td>
<td>19</td>
<td>8, 9</td>
<td>27-28 April 2010</td>
<td>Copenhagen, Denmark</td>
<td>EURO</td>
<td>2nd meeting of Advisory Group on Innovative Technologies</td>
<td>To select Innovative Technologies</td>
<td></td>
</tr>
<tr>
<td>HT programme</td>
<td>3rd</td>
<td>9</td>
<td>3, 4</td>
<td>8-10 June 2010</td>
<td>Cairo, Egypt</td>
<td>EMRO</td>
<td>3rd Advisory Group</td>
<td>To review and adopt tools and guidelines after trial in countries</td>
<td></td>
</tr>
</tbody>
</table>
Annex 5: Meeting Evaluation by Participants
   a) Evaluation of meeting arrangements

1. Flight arrangement
   - Poor: 17%
   - Good: 83%

2. Hotel arrangement
   - Regular: 17%
   - Good: 83%

3. Email communication
   - Regular: 50%
   - Good: 50%

4. Meeting room
   - Regular: 33%
   - Poor: 34%
   - Good: 33%

5. Coffee breaks & lunch
   - Regular: 33%
   - Good: 67%

6. Agenda
   - Regular: 50%
   - Good: 50%
7. Meeting programme

- **Good**: 33%
- **Regular**: 67%

8. Recommendations and way forward

- **Good**: 50%
- **Regular**: 50%

**General comments on meeting arrangements:**

1. Room too hot
2. Could have included a city tour!
3. Round tables forced many to have their backs to the screen

b) Evaluation of Presentations

**Taillores Report**

- **Good**: 47%
- **Fair**: 53%

**Comments:**

- Would have liked a high level summary
- Meeting report needs to be widely distributed
- Could have been improved with highlights and graphics
- Great orientation to project

**1st TAG Report**

- **Good**: 44%
- **Poor**: 3%
- **Fair**: 53%

**Comments:**

- Presentation able to bring more insights and revisit issues
- Excellent summary
- Great awareness raising
**Working Groups and Glossary**

*Comments:*
- Need to invigorate working groups- use teleworking?
- Slides not very clear and too busy
- Needed better preparation
- Needs more streamlining
- Necessary to see the big picture it would be nice to have a project document more widely available
- Work needs prioritizing and involving others to assist

**Baseline Country Survey**

*Comments*
- Informative and well planned
- Work in progress
- Good job

**Professional Survey**

*Comments*
- A nice piece of work out of a dramatic amount of data
- Work in progress
- Use TAGHT team to help complete it
- Working with professional societies is key
- Better definition of teaching units is needed
- Need to simplify
<table>
<thead>
<tr>
<th>Region</th>
<th>Presentation Quality</th>
<th>Comments</th>
</tr>
</thead>
</table>
| AFRO     | Good 50% Poor 3% Fair 47% | • Country presentations should have followed a standard template  
• Should have provided less geographical and economic information and more HTM specific information - do professional societies exist?  
• Time too short for country presentations  
• Did not tell enough about needs or lessons learned  
• Ethiopia - excellent presentation  
• Many interesting experiences not shared  
• Recommend including indicators to measure progress  
• Good presentations from Ethiopia and Kenya. |
| AMRO     | Good 50% Poor 3% Fair 47% | • Country presentations should have followed a standard template  
• Should have provided less geographical and economic information and more HTM specific information - do professional societies exist?  
• Time too short for country presentations  
• Overall summary by Antonio Hernandez was good  
• Mexico is a great example to follow |
| EMRO     | Good 62% Poor 3% Fair 38% | • Country presentations should have followed a standard template  
• Should have provided less geographical and economic information and more HTM specific information - do professional societies exist?  
• Time too short for country presentations  
• Jordan is a great example  
• Jordan looks like a model intervention of WHO in countries  
• Jordan leads the progress |
<table>
<thead>
<tr>
<th>Region</th>
<th>Category</th>
<th>Percentage</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>EURO Presentations</td>
<td>Good</td>
<td>48%</td>
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<tr>
<td></td>
<td>Poor</td>
<td>6%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>46%</td>
<td>-</td>
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<tr>
<td>Comments</td>
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<td></td>
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<td></td>
<td>Country presentations should have followed a standard template</td>
<td></td>
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<tr>
<td></td>
<td>Should have provided less geographical and economic information and more HTM specific information- do professional societies exist?</td>
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<tr>
<td></td>
<td>Time too short for country presentations</td>
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<tr>
<td></td>
<td>Excellent overview of systems, pros and cons</td>
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<tr>
<td>SEARO Presentations</td>
<td>Good</td>
<td>42%</td>
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<tr>
<td></td>
<td>Poor</td>
<td>8%</td>
<td>-</td>
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<tr>
<td></td>
<td>Fair</td>
<td>50%</td>
<td>-</td>
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<tr>
<td>Comments</td>
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<tr>
<td></td>
<td>Country presentations should have followed a standard template</td>
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<td></td>
<td>Time too short for country presentations</td>
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<td></td>
<td>Thailand presentation missing</td>
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<td></td>
<td>Very good presentations and informative</td>
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<td></td>
<td>Great effort by Geeta Mehta who recently started</td>
<td></td>
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<tr>
<td>WPRO Presentations</td>
<td>Good</td>
<td>60%</td>
<td>-</td>
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<tr>
<td></td>
<td>Poor</td>
<td>3%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Fair</td>
<td>37%</td>
<td>-</td>
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<tr>
<td>Comments</td>
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<td></td>
<td>Very good presentations and informative</td>
<td></td>
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<tr>
<td>Health Technology Assessment</td>
<td>Good</td>
<td>63%</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Poor</td>
<td>3%</td>
<td>-</td>
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<tr>
<td></td>
<td>Fair</td>
<td>37%</td>
<td>-</td>
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<tr>
<td>Comments</td>
<td></td>
<td></td>
<td>-</td>
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<tr>
<td></td>
<td>Government procurers- listen to this!</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Need guideline for countries that are just starting with this</td>
<td></td>
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<tr>
<td></td>
<td>How is HTA and clinical engineering joined- how do they connect?</td>
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<tr>
<td></td>
<td>Excellent speakers</td>
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<tr>
<td></td>
<td>Too theoretical</td>
<td></td>
<td></td>
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<td></td>
<td>Need to include HTA into HTM and regulations</td>
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<td></td>
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<td></td>
<td>Concrete examples are needed</td>
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</tbody>
</table>
### Healthcare Infrastructure & Technology Policies

**Comments**
- This topic and the indicators topic should be combined/developed together
- Great direction
- Need simple tools that are accepted by the member countries
- Need to divide infrastructure and health technology
- Should be related to primary health care

### Health Technology Indicators

**Comments**
- The indicators need to be simpler
- Reduce the number of indicators
- Must be harmonized
- Lexicon needs to align with other projects
- Some indicators not measureable
- Too complex and cumbersome
- Put indicators in hierarchy of importance
- Combine this with healthcare infrastructure and technology policies
- Need to define key indicators

### Health Technology Procurement

**Comments**
- Needs finishing, review group
- Simplify summary section
- Must be harmonized/coordinated with health technology indicators
- Good guidelines, however it needs to be simpler and applicable to countries with limited budgets to implement computer processes
- Needs to consider national regulations

### Healthcare Equipment Donations

**Comments**
- Should tie into procurement
- Moving forward it should probably look like regular procurement guidelines
- Keep pushing this work
- Need to send to donors and have them comment before publication
- Should be the same as procurement
- It is too difficult to implement a policy for donations
- Need more evidence
Corrective Maintenance

Comments
- Need to identify key performance indicators
- Combine/coordinate with preventive maintenance
- No examples
- Country experience in this area needs to be put into evidence

Preventive Maintenance

Comments
- Need to identify key performance indicators
- Combine/coordinate with corrective maintenance
- No examples
- Add road map of development
- Country experience in this area needs to be put into evidence
- Develop guidance how to choose best maintenance philosophy

Indicators and Infrastructure for Maintenance

Comments
- Number of indicators needs to be reduced to only key indicators
- Too complex and burdensome
- Simplify- put indicators in order of hierarchy
- There should be only one set of indicators
- Country experience in this area should be put into evidence
### Computerized Maintenance Management System

**Comments**
- It should suffice to say what is available now, not create more
- Need to add software version as a basic component
- It needs to be very simple
- Need to look into open source
- Needs a roadmap, i.e. from paper system to Excel based to Access based to CMMS
- In the long run it is better to use commercial products (in open source)
- Problems with language and translation need to be considered

**Pie Chart**
- Good: 75%
- Fair: 19%
- Poor: 6%

### Selection and Use of Laboratory Technologies

**Comments**
- Need to tie the importance of labs to the rest of the medical care cycle
- Need to harmonize with procurement and maintenance guidelines
- Excellent presentation
- Very useful

**Pie Chart**
- Good: 62%
- Fair: 38%
- Poor: 6%

### List of Medical Devices by Healthcare Facility

**Comments**
- Excellent job
- Should be merged with the priority medical devices report
- Not clear where this will lead to
- Very comprehensive but it needs to specify the level of medical expertise
- Try to develop an essential list
- Impressive effort with lots of good work
- Hopefully it will be rolled out for widespread use in multiple languages
- Copied from iHTP!
- Should be coordinated with WHO guidelines for physical infrastructure development
- Difficult for secondary and tertiary level
- Should include the primary healthcare
- Tools that take the basic need and let you know what medical device you need are great
- Very comprehensive but it needs to specify that it is the Mexican experience

**Pie Chart**
- Good: 54%
- Fair: 40%
- Poor: 6%
List of Medical Devices by Clinical Practice | Comments
---|---
![Pie Chart] | • Not clear where this will lead to
• Very comprehensive but it needs to specify the level of medical expertise
• Try to develop an *essential* list
• Impressive effort with lots of good work
• Hopefully it will be rolled out for widespread use in multiple languages
• Copied from iHTP!
• Tools that take the basic need and let you know what medical device you need are great
• Not sure of the utility of this work Very comprehensive but it needs to specify that it is the Mexican experience

Interrelated Database | Comments
---|---
![Pie Chart] | • Needs more clarity
• Good use of Access database
• Impressive effort with lots of good work
• Hopefully it will be rolled out for widespread use in multiple languages
• Presentation not too clear
• Needs more organization
• Please make available as soon as possible!
• Tools that take the basic need and let you know what medical device you need are great

**General Representative Comments on Presentations and Meeting:**
- I appreciate the good work done here
- One of the key outputs is a sustainable body of shared information (the repository). It would be good to decide now on indicators that will show the value of this so that future maintenance of the repository can be guaranteed- it will be out of date in 12 months! Can we identify ways of making it useful to us immediately? i.e. allowing web access updating, clarifying who is moderator, setting up in advance roles for operation/management.
- Many topics were hurriedly dealt with
- Implementation strategies not dealt with
- Need simplified tools- check lists required
- More focus on Primary Health Care, resource poor situations required
- Very important and interesting meeting and well organized
- A lot of material covered with short time frames. Need to digest.
- Need to add other countries to the 14 pilot countries for implementation of the tools and guidelines
- Country representatives and experiences needs to be increased!
• Need discussions on how experts presentations can be applied to country experiences
• Good that WHO hierarchy was involved
• Big subjects need more time
• Need better arrangements concerning time of presentations, hotel, travelling
• We need to make sure that all the efforts that are being made integrate the various projects that are underway.
• Training of country-based staff needs to be boosted. We should be working on how best to do this.
• Try to more clearly define the *context* and *drivers* for this work in resource limited public health settings
• A lot of the documents reflect a developed country context and are too complicated and detailed for developing countries. Each document should be broken down into a roadmap of increasing complexity. For example, what are the basic essentials and how is this done manually, then how this can be further developed.
• Separation of HTA and HTM. The former is a policy issue at the national level and a decision making tool at the operational level. However, HTM is really an operational issue to be embedded within quality management systems.
• The presentations were OK in general, but again, we lack some kind of creativity as these presentations have been there for a while now.
• When are we going to talk about the impact of HTM on important public health problem such as maternal mortality, child mortality? How is HTM positively impacting the countries’ health, economies, etc.?