WHO Regional Publications, Eastern Mediterranean Series 24

Health care technology management

Eastern Mediterranean regional strategy for appropriate health care technology

World Health Organization
Regional Office for the Eastern Mediterranean

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World Health Organization
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Initiation

Task identification

- *Has the objective for health care technology in the Region been identified?*
- *Has political and other support been advocated and secured?*
- *Has the scope of the process been defined?*

Identification of task force

- *Are human and other resources available at country and regional levels for the development and implementation of the strategy?*
- *Have the terms of reference of the task force objectives been approved?*
- *Has the task force been appointed?*
- *Has the implementation schedule been approved?*
- *Are operational procedures developed?*

Situation analysis

Country situation

- *Have needs assessments studies been conducted?*
- *Are country situation analyses and reports available?*
- *Are health sector, economic and social indicators and other information available?*
- *Have other health care technology initiatives and lessons from them been taken into account?*

Justification

- *What is the policy basis (resolutions, etc.)?*
- *What is the social justification?*
- *What is the economic justification?*
- *What is the programmatic justification?*

Strategy implementation checklist at regional and country levels showing (left to right) phases, activities and specific issues

SUMMARY

Health for all through primary health care remains the main goal and leading strategy of health development in the coming years. To achieve this goal, most countries are reforming their health systems and services to strengthen their capacity to provide equitable access to quality care for all populations and thus to reduce on a sustainable basis the most common causes of morbidity and mortality.

Technological advances have a profound impact and will continue to greatly influence health systems. However, experience has shown that the introduction of new technology may have economic, social and ethical consequences. Health technology should therefore be carefully evaluated before it is introduced. Mechanisms for systematic evaluation of new health technologies represent an essential ingredient for establishing and maintaining up-to-date, high quality and appropriate health care services.

The strategy proposed in this document aims to strengthen the capacity countries to set up health technology policies that supports the implementation of their national health policies. Although the definition of health technology is very broad, this document focuses on two main aspects: equipment and infrastructure.

Priority intervention should address the development of national infrastructure and technology policies as integral part of health policy, institutionalization of infrastructure and technology management throughout all levels of the health system, comprehensive human resources development, strategic macro technology assessment and operational research, and improved access to information.

The WHO Regional Committees, health authorities and health care providers are invited to examine the proposed strategy and to make suggestions for establishing a comprehensive health technology policy in their countries consistent with national health policies and accelerating the implementation of health for all policy.

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PREFACE

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

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

This is the second in a series of four books. The first volume introduces the idea of health technology management and what a health technology management policy might look like. The volumes following this one cover health technology management policy formulation and implementation, and guidelines for conducting a country situation analysis for health technology management purposes. This volume looks at development of a regional strategy for health technology management. It examines the social and economic justifications for such a strategy,

and addresses the key issues and expected results. The importance of human resources development and operational research are not overlooked, and the book considers the issues involved with implementing a regional strategy and criteria for success.

Acknowledgements

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

This document has been benefited from the work done in other WHO Regions. The vision of rational use of technology in the service of health is universal. The similarity of the regional strategies underscores this fact.

1. INTRODUCTION

1. In the context of the WHO Eastern Mediterranean Region, the critical need for developing and implementing a health technology strategy[1] at the present time relates primarily to drugs and physical infrastructure. One of the major issues facing the countries of the Region is the transfer of technology from the highly developed to the less developed countries. This transfer raises serious issues that need to be addressed because of the great variation among these countries in political, social, economic and cultural characteristics. Regional diversity further underlines the need for each country to formulate and implement policies relating to planning, requirements, selection, procurement, standardization, safety, efficiency and maintenance of health technology, consistent with national needs and resources.

2. Technological advances in areas such as gene technology, information technology, laboratory medicine, transfusion medicine, diagnostic imaging, automation and computerization, environmental health and pharmaceutical biotechnology have a profound impact and will continue to greatly influence health systems. Before embarking on new technologies and looking into the suitability of a technology for a certain level of health service, it is important to identify the cost and benefit of these new technologies compared with alternatives.

3. This document does not deal with pharmaceutical issues already addressed by the WHO essential drugs programme. It deals with physical infrastructure and technology management, which is viewed as a broad umbrella term encompassing health facilities (buildings, utilities, services), health care equipment (medical equipment, hospital equipment and plant), logistical support for health services (supply systems, information and communication systems, transport), and proper management of the above. In many conceptual and operational ways, it closely interrelates and overlaps with that area described as health care technology.

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1. The definition of health technology used by WHO includes drugs devices, medical and surgical procedures, the knowledge associated with these in the prevention, diagnosis and treatment of disease as well as in rehabilitation, and the organizational and supportive systems within which care is provided.

4. The purpose of this document is to propose a strategy to assist countries of the Region to develop and implement national health technology and infrastructure policies.

2. SITUATION ANALYSIS

5. The adoption by the WHO Regional Committee for the Eastern Mediterranean of resolution EM/RC44/R3 on appropriate technology in 1997 was in reaction to the situation where no country in the Eastern Mediterranean Region had established an efficient national system for appropriate health technology transfer. There were no mechanisms for systematic evaluation of new health technologies (except for the drug industry) and insufficient national resources and infrastructure to make the transferred technology viable, cost–effective and sustainable.

6. During the past 40 years, approaches to health care and patient management have changed dramatically, mainly as a result of the remarkable progress made in medical technology. The increasingly important role technology plays in medicine is evident in everyday clinical and public health practice; this has had both positive and negative effects. On the positive side, we have gained an increased life expectancy, greater diagnostic precision, less time needed for investigations and treatment, and consequently less stress to patients. On the other hand, these advances and innovations in health technology are in part responsible for enormous increases in the cost of health care, which in many countries has become a serious economic burden. Moreover, in some situations, there are significant time lags before beneficial technologies are made available to potential users. In addition, major investments are often made in expensive medical equipment which is then not used to its full potential or, worse, not used at all because appropriate trained personnel are not available or a critical part cannot be obtained.

7. Many developing countries face increasing populations, leading to an increased demand for health services. This is accompanied by an ever-growing gap in economic development between them and the wealthy industrialized countries. This gap is a limiting factor for development of services and technology transfer to countries in need. A more effective mechanism is needed for the transfer of

appropriate health technology, taking into consideration the local forces that may shape the environment, among which are trends in the demographic profile, macroeconomics, government spending, political forces, and changes in structure and financing of health care.

8. A serious problem in the Region is lack of qualified technology/equipment management and maintenance personnel. In addition to this and the need to finance recurrent costs, more important issues which concern the administrative, economic and political environments of Eastern Mediterranean countries impinge on the sustainability of technologies and equipment.

9. Although information is the key to evidence-based decision-making on health care technology, this is often not available or is not in a comprehensible and/or standardized form. Similarly, reliable communications remain a critical priority for improving the effectiveness and efficiency of technical health care services.

10. There have been very few technology assessment activities carried out in the Eastern Mediterranean Region. Technology assessment is an analytical process aimed at estimating the value and relative contribution of each health technology to the improvement of individual and collective health, taking into account its economic and social impact. Health technology assessment, particularly macro assessments, should be carried out in order to orient decision-making.

11. Owing to free market choice at the time of purchase, and absence of agreement between countries and organizations, little is done to normalize medical equipment used in health facilities as well as in research and teaching institutions. Donated equipment from various sources, which accounts for a significant portion of the stock of equipment in the developing world, usually means a multiplicity of makes and models of the same type of equipment, thus making its operation and maintenance extremely difficult and unnecessarily costly.

12. All the difficulties discussed above are exacerbated by the need to provide health services to a rapidly growing population concentrated in increasingly congested conditions in cities and in economically depressed environments. These problems require the immediate attention of policy-makers.

3. JUSTIFICATION

3.1 Policy basis

13. The role of health technology in the health and well-being of the community in general is underscored in various texts. Some of the most important are cited below.

14. The 1978 Alma-Ata Declaration, which called for countries to focus on primary health care as the basis for their health services, gives particular attention to the use of appropriate technologies-scientifically valid, socially acceptable and universally available to all individuals and families of the community at a cost that the community and the country can afford at all steps of their development-in the implementation of primary health care.

15. Resolution WHA29.74 (1976) of the World Health Assembly requests the Director-General to "take adequate measures to establish and develop a programme of health technology relating to primary health care and rural development as part of the overall primary health care programme".

16. Resolution WHA31.34 (1978) of the World Health Assembly invites Member States to "promote the use of available appropriate technology and develop new technology needed for the better implementation of health care, particularly primary health care".

17. Resolution WHA40.30 (1987) of the World Health Assembly, on economic support for national health for all strategies, urges Member States, *inter alia*, to "establish a programme for better management and maintenance of equipment through appropriate procedures, training of personnel and ensuring availability of spare parts".

18. Resolution EM/RC44/R3 (1997) of the WHO Regional Committee for the Eastern Mediterranean calls on Member States, among others things, to "develop national programmes on health technology; developing suitable mechanisms for the assessment and acquisition of health technologies; developing means of obtaining

access to health technology information systems and databases [and to] take necessary measures to ensure that donor support in the area of health technology is given where it is most needed and likely to be most cost–effective".

19. Resolution EM/RC44/R3 of the WHO Regional Committee for the Eastern Mediterranean also requests the Regional Director to "consider the development of technical guidelines and technical codes on selection and rational use of modern technology; strengthen the role of the WHO collaborating centres in support of transfer of appropriate health technology to Member States of the Region; [and] convey to the Director-General the importance attributed by Member States to the removal of undue barriers and restrictions on the access of all countries to appropriate health technologies and medical equipment".

20. The common factor of all these declarations and resolutions is that they stress the need for countries to adopt comprehensive and integrated strategies in the area of health technology.

3.2 Social justification

21. Technology and infrastructure can play a key role in achieving health sector reforms objectives such as better access to health services for the population, greater equity, improved quality of care and increased cost–effectiveness of health services. This requires an appropriate strategy in order to plan and manage the various aspects of health care equipment as well as other components of physical infrastructure and technology, which consume the bulk of ministry of health investment budgets. A successful strategy would lead to the attainment of these objectives in a sustainable manner.

22. Countries need a collective strategy in order to overcome the many common problems which they face in their effort to use health technology and infrastructure for the improvement of the health of their populations.

3.3 Economic justification

23. Health care equipment is often associated with increasing health care costs. Thus

rational and cost-conscious planning and management of health care equipment along with other components of physical infrastructure and technology, which consume the bulk of ministry of health investment budgets, is the foundation for sustainable provision of quality care to the population.

24. Experience has shown that the acquisition cost of health technology is usually only a small portion of its life cycle cost. Provision should be made to ensure coverage of recurrent costs during all phases of the technology (provision and assessment, acquisition, use).

3.4 Programmatic justification

25. The ongoing health sector reforms, the increasing needs of populations and their expressed demand for quality health care services present both an opportunity and an obligation for countries and WHO to combine improvement in the functioning of health systems with a rational health technology policy.

4. REGIONAL STRATEGY

4.1 Aim

26. This regional health care technology strategy aims to contribute to the achievement of the health objectives of the Region by strengthening the capacity of countries to optimize the management and use of their technology resources in order to ensure universal, equitable and accessible essential quality care.

4.2 Guiding principles

27. Guiding principles for the effective implementation of this strategy, include the following:
    i. application of health technology is aimed at supporting the improvement of health outcomes
    ii. health technology policy should be an integral part of health policy
    iii. health technology should ensure improved and equitable access of the

population to affordable and sustainable quality care

iv. health technology and infrastructure management must take into account the needs and aspirations of the population, the environment and available resources

v. preference must systematically be given to technological options which are consistent with the needs and capabilities of the Region.

4.3 Strategic objectives

28. The strategy aims to ensure that each country:

i. formulates and implements a health technology policy which is supportive of its health policy

ii. acquires the required capacities for mobilizing stakeholders and implementing, monitoring and evaluating the policy

iii. establishes, where necessary, and reinforces a comprehensive human resources development process in order to provide the health system with qualified personnel in the areas of planning, management, use and maintenance of health technology

iv. promotes and monitors the development of health technology that meets its needs and priorities

v. encourages operational research and development in the key area of technology assessment, a rational basis for judicious long-term policy and strategy decisions, and promotes the use of evidence in decision-making

vi. establishes and applies norms and standards in the use of health technology and infrastructure.

4.4 Expected results

29. By the end of 2010, at least half of the countries of the Region will have:

i. developed a national health technology policy

ii. established adequate structures to cope with technology management at all levels of their health systems

iii. carried out a country-wide situation analysis, using appropriate tools

iv. included macro technology assessment in their health systems research

plans

v. included technology information as part of their health information system.

At the same time

vi. all countries will have included training in all levels of health technology management as part of their human resources for health development plans.

4.5 Priority interventions

30. At country level, it will be necessary to embark upon advocacy *vis-à-vis* policy-makers and health officials to create the political will to include health technology and infrastructure in their national policy priorities and to identify and mobilize institutional partners so as to benefit from their support.

31. At country level, appropriate mechanisms and tools for the formulation and implementation, monitoring and evaluation of the health technology policy, should be established.

32. At regional level, the measures to be taken will focus on endorsement of this strategy by countries themselves, leadership to support the inclusion of health technology and infrastructure among the national health development priorities and implementation of the relevant national plans.

5. KEY ISSUES

The issues described below are interrelated and concomitant. However, they should not be considered as either exhaustive or successive steps in time.

5.1 Technology management

a) Policy development

33. Countries should take necessary measures to formulate sound national policies on health care technology and establish comprehensive plans for policy implementation.

b) Institutionalization

34. Adequate structures should be created and capacities developed for institutionalized technology and infrastructure management at regional and country levels, in order to guide the acquisition of needed technology, to monitor its use and to maintain it.

c) Situation analysis and identification of needs

35. At country level, an objective situation analysis of technology needs and present capabilities is an essential step in the formulation and implementation of the strategy. A national expert committee should be in charge of the evaluation, assisted, if necessary, by external support. The situation analysis should lead to recommendations that take into account the epidemiological profile, and the available human, material and financial resources of the country.

36. At regional level, support should be provided by WHO and its regional offices, and all concerned international organizations and nongovernmental organizations through facilitating exchanges and making expertise available to countries at their request.

d) Normalization and standardization

37. Normalization and standardization of infrastructure, equipment and procedures are a necessity and are in line with reforms and approaches for the rational use of resources.

38. At country level, it will be advisable to:
    i. establish mechanisms for identifying the resources and types of technology needed at each level of the health system
    ii. develop norms and quality standards applicable to both the public and private sectors
    iii. prepare a timeframe and identify support needed to achieve the standards, taking into account the current situation and resources available.

39. At regional level:
    i. a methodology for acquisition and use of equipment should be developed along with tools for evidence-based decision-making
    ii. technical cooperation on regulation to ensure user and patient safety should be promoted
    iii. group purchases among countries and/or institutions should be encouraged where possible, for selected types of equipment and consumables. Among other advantages are better prices, better use of available expertise, and more rigorous financial control.

e) Information systems

40. Measures should be taken to improve the collection, analysis and use of information on management of infrastructure and technology. This should include maps indicating existing and operational health institutions, available personnel and epidemiological data.

41. At country level, the following measures should be taken:
    i. services for the collection, processing and dissemination of information should be strengthened

ii. information should be accessible to all levels of the health system as needed
iii. information collected at each level of health care should be used for management purposes at that level as needed
iv. information on health technology and infrastructure should be integrated into health and management information systems.

42. At regional level:
    i. a health technology database should be established to provide information on technologies to address the health care priorities of the countries
    ii. networks of individuals and institutions should be created at national and regional levels, and use appropriate mechanisms to facilitate communication, including access to the database.

5.2 Human resources development

43. One major thrust will be to obtain a "critical mass" of personnel trained in health technology assessment and management.

44. At country level, a special effort should be made:
    i. to provide training for health technology management personnel and users
    ii. to promote retention of trained staff through career development
    iii. to integrate trained health technology professionals into health management at all levels of the system, including the district teams.

45. At regional level:
    i. assistance should be provided to countries to train essential human resources to organize, manage and operate the technology
    ii. centres of excellence should be identified and/or strengthened to support the country actions
    iii. training programmes adapted to the regional context should be promoted and encouraged to take advantage of existing fellowships programmes.

5.3 Operational research

46. Operational research on technology is part of health systems research, and should be based on the following thrusts:
    i. emphasize macro-assessments
    ii. be linked more with quality and effectiveness than cost containment
    iii. be perceived as an essential component of policy-making process and the regulatory role of the ministries of health
    iv. be an important field of regional and international technical cooperation.

47. Two factors militate in favour of undertaking research and training in technology assessment.
    i. There is a bewildering array of technologies available. Estimates in 1988 showed that there are about 6000 different types and 750 000 brands and models of equipment in the market, available from over 12 000 manufacturers world-wide.[1]
    ii. There is pressure on countries in the Eastern Mediterranean Region from special interest groups such as manufacturers' representatives, end-users and professionals.

48. Each country should identify its own needs and priorities in the area of health technology assessment and operational research, as well as the way of organizing the activity that is most appropriate to national characteristics and strategies for development and health sector reform. In this regard, the experience gained by WHO and its partners in programmes such as drugs and vaccines, diagnostic imaging, radiation therapy, radiation protection, clinical laboratories and blood banks, and in appropriate technologies for the primary level, serves as an excellent reference and a good starting point from which to forge ahead.

49. At regional level, WHO should serve as a facilitator, cooperating with countries and other partners in the preparation of appropriate policies and mechanisms for promoting health technology assessment and operational research, which includes, among others:

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1. International Conference of Medical Device Regulatory Authorities (ICMDRA), Washington DC, June 1986

i. identifying relevant national and international partners and institutions in this field
ii. encouraging coordination of activities at country level
iii. supporting situation analyses and identification of needs
iv. supporting the setting of priorities for health technology assessment and management
v. facilitating coordination with international agencies, groups and networks
vi. supporting and/or organizing workshops and seminars on the methodology and practice of health technology assessment and supporting the introduction of health technology assessment in different curricula
vii. supporting technical cooperation on assessment of specific technologies, and dissemination of the results.

6. IMPLEMENTATION FRAMEWORK

6.1 Mobilization of resources

50. At country level, a strategy for developing a multisectoral approach should be adopted which brings together all institutional partners concerned in both the public and private sectors-lawmakers, health professionals and administrators, researchers, engineers, facility planners and architects, managers of medical equipment, nongovernmental organizations and the community.

51. Adequate resources should be made available through the national health budget and other sources. Even at this time of scarcity, resources for health infrastructure and technology are available for well delineated and coordinated programmes.

52. At regional level, WHO should establish a task force, made up of experts from within and outside the Eastern Mediterranean Region, in order to assist the Regional Office in the implementation of this strategy.

53. At regional level, WHO and other partners should support country efforts in the formulation, adoption and implementation of a coordinated health technology policy.

6.2 Monitoring and evaluation

54. There is need to monitor and evaluate the implementation of this strategy in the countries. For this purpose, WHO will provide support in developing monitoring and evaluation indicators. Evaluation should be conducted periodically, for example every two to three years.

55. At country level, a national advisory committee, representing the institutional partners cited above should assist the ministry of health in regular monitoring and evaluation, of the implementation of the process, using well defined indicators, and when necessary, propose adjustments.

56. At regional level, the health technology task force, in cooperation with relevant partners in the field (collaborating centres, professional associations, universities, cooperation agencies, nongovernmental organizations, and so on) will support the Regional Office in monitoring the implementation of the strategy.

6.3 Critical factors for success

57. Successful implementation of this strategy will depend, among other things, on long-term political commitment, the establishment of real conditions for ownership of the process within countries, continued availability of a critical mass of trained technical personnel, effective resource mobilization and adequate budget provision.

58. An enabling environment for the strategy includes the commitment of countries of the Region and other partners to health sector development, including technology and infrastructure, as an integral component of socioeconomic and human development; reformed health management which introduces more transparency and equity in resource allocation and use, and the expressed will to improve the health status of the population in the Region.

7. CONCLUSION

59. Technology has assumed increasing importance in various fields, including health, and the astonishing advances that have been made in health care would not have been possible without technology. However, experience has shown that the introduction of new technology may have economic, social and ethical consequences. Health technology should be carefully evaluated before it is introduced. Mechanisms for systematic evaluation of new health technologies, represent an essential ingredient for establishing and maintaining up-to-date and high quality appropriate health care services.

60. Countries of the Region should therefore establish efficient national systems for appropriate health technology transfer and management. Of special importance is the availability of national resources and infrastructure to make the transferred technology effective beneficial and sustainable.

61. There is a need for rational mobilization of all resources available at country and regional levels.

62. The development and implementation of a comprehensive and health technology policy, consistent with health policy, is critical, if not decisive, to the achievement of the objectives of this strategy.

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