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Executive summary

'Early warning systems' for identifying new healthcare technologies

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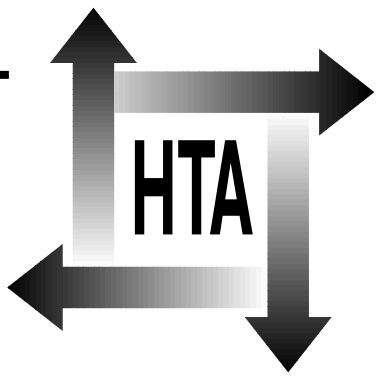

Executive summary

Background

The introduction of new healthcare technologies (whether drugs, devices, procedures or innovative ways of delivering services) can have enormous consequences, both desirable and undesirable, for health services and patients. Often new technologies are introduced in an uncontrolled manner causing unnecessary confusion or expense. Early identification of impending technologies can help to ensure that the maximum benefits and/or minimal costs are realised for the healthcare system (either through the adoption or non-adoption of the technology), and can also help to fulfil a number of other objectives.

This report determines which sources might be used to provide such intelligence and considers how an early warning system (EWS) might operate.

Aims

- To explore the most useful sources for identifying new healthcare technologies.
- To make recommendations to assist the establishment and operation of an EWS in the UK.

Methods

The methods comprised:
- a review of the literature on the methodology of predicting the future of health care
- a semi-structured telephone enquiry of EWS coordinators from around the world
- an international Delphi study about preferred sources for identifying new healthcare technologies
- retrospective case studies to learn how specific innovations could have been identified before their introduction to the NHS.

Results

Four separate methods were adopted as there is no definitive way of establishing the best information sources for identifying new healthcare technologies.

1. Literature review

The literature review identified five scientific attempts at identifying new healthcare technologies which used formal and empirical methods but which did not assess those methods. Although most used several sources of information, the only source that was common to all the studies was consultation with experts. There was no agreed or proven method of identifying new healthcare technologies.

2. Telephone enquiries

The telephone enquiry of existing EWS also suggested that liaison with experts is indispensable. Such an approach allows access to the informal networks in a particular field that communicate research findings by personal contact before they are known by publication. Contemporary sources, such as the Safety and Efficacy Register of New Interventional Procedures (SERNIP), also have an important contribution to make.

3. Delphi study

Participants in the Delphi study ranked the timeliness and the efficiency of searching the sources as being the most important criteria by which their value to an EWS should be judged. On this basis they recommended using a combination of the following information sources: key pharmaceutical journals, pharmaceutical and biotechnology companies, specialist medical journals (i.e. those containing early case reports, case series and uncontrolled studies), principal medical journals, medical engineering companies, private healthcare providers, newsletters and other bulletins from other national and regional health technology assessment agencies and sentinel groups of expert health professionals.

4. Case studies

The case studies suggest that particularly important documentary sources include key pharmaceutical journals, specialist medical journals and Food and Drug Administration (FDA) licensing applications in the USA. Conference reports can also be useful.

From the results of the four methods, a threefold classification for potential sources for identifying new healthcare technologies was devised: **primary** (the manufacturer or innovator), **secondary** (knowledge or expertise intended for other purposes) and **tertiary** (other agencies' efforts to identify technologies). Primary information sources are likely to provide earlier warning but are uncertain indicators of the likely adoption of a new technology. They often provide little detail on the potential new technology. Secondary and tertiary

sources, on the other hand, will provide later warning, perhaps in some cases only after the introduction of the technology, but greater detail and more accurate predictions of its likely impact.

The literature review and telephone enquiry showed that the establishment of an EWS is a recent concept for most countries. An EWS has been in operation in The Netherlands since 1988, and five other national organisations are currently attempting to establish such systems (Canada, Denmark, France, Sweden and the UK). These are often principally aimed at establishing research priorities for health technology assessment but may also seek to inform professional groups and other interested parties of imminent technologies.

Discussion

Of the many information sources identified by the various methods, each has its own advantages and disadvantages. There were some discrepancies between the sources recommended by the four methods, but widespread consensus that key pharmaceutical and medical journals, specialist medical journals and liaison with experts are important components of an EWS. The iteration between the use of documentary sources and the involvement of experts appears to be vital to any EWS. A number of the information sources (e.g. the Internet and patient special interest groups) are becoming more prominent; their value to an EWS will need to be monitored.

Predicting when a technology will become widely diffused often requires 'watchful waiting' with the aid of experts.

Conclusions

A combination of the following information sources (many of which can now be accessed via the Internet) is recommended, and is based on all four methods:

- scanning of 'specialist' medical journals, key medical journals, FDA licensing applications, key pharmaceutical journals and conference abstracts, and liaison with pharmaceutical and biotechnology companies, to produce a database of potential technologies
- regular meetings and/or surveys involving sentinel groups of expert health professionals.

An EWS, established at a national level, could help to inform the preparation of guidelines for commissioners of health care (whether health authorities or general practitioner consortia) in advance of the introduction of new innovations, the estimation of future expenditure implications, and the establishment of national priorities for researching cost-effectiveness. Such an EWS should be evaluated. The value of an EWS for health technology assessment purposes should be judged by the extent to which it facilitates timely research-based evidence on new technologies.

Research recommendations

Information sources

- To design a system for prospectively recording the information sources used to identify new technologies in order that their accuracy can be assessed at a later date when the value of the output from the EWS is known.
- To undertake further and more detailed case studies of technologies (preferably prospectively) to help understand the diffusion processes of new healthcare technologies and to assess information sources for identifying them before their introduction into health services.
- To determine the best methods for accessing expert opinion and for selecting experts. This will involve a systematic review of the literature on expert selection, management and knowledge retrieval.

Establishment and operation of an EWS

- To estimate the likely 'payback' from providing early warning of a variety of new healthcare technologies i.e. estimating costs and valuing early warning.
- To systematically review and experiment with models (assessed at two to three year follow-up) to estimate the likely impact of new healthcare technologies, in terms of cost, effectiveness and number of people affected.
- To determine through surveys of policy makers and other methods how much early warning is required for (1) strategic policy decision making and (2) day-to-day operational management decisions, which will include determining what is the most appropriate balance between length of early warning and the level of certainty as to the likelihood of the importance of the new technology.

Publication

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NHS R&D HTA Programme

The overall aim of the NHS R&D Health Technology Assessment (HTA) programme is to ensure that high-quality research information on the costs, effectiveness and broader impact of health technologies is produced in the most efficient way for those who use, manage and work in the NHS. Research is undertaken in those areas where the evidence will lead to the greatest benefits to patients, either through improved patient outcomes or the most efficient use of NHS resources.

The Standing Group on Health Technology advises on national priorities for health technology assessment. Six advisory panels assist the Standing Group in identifying and prioritising projects. These priorities are then considered by the HTA Commissioning Board supported by the National Coordinating Centre for HTA (NCCHTA).

This report is one of a series covering acute care, diagnostics and imaging, methodology, pharmaceuticals, population screening, and primary and community care. It was identified as a priority by the Methodology Panel and funded as project number 94/10/02.

The views expressed in this publication are those of the authors and not necessarily those of the Standing Group, the Commissioning Board, the Panel members or the Department of Health. The editors wish to emphasise that funding and publication of this research by the NHS should not be taken as implicit support for the recommendations for policy contained herein. In particular, policy options in the area of screening will be considered by the National Screening Committee. This Committee, chaired by the Chief Medical Officer, will take into account the views expressed here, further available evidence and other relevant considerations.

Reviews in *Health Technology Assessment* are termed 'systematic' when the account of the search, appraisal and synthesis methods (to minimise biases and random errors) would, in theory, permit the replication of the review by others.

The editors have tried to ensure the accuracy of this report but cannot accept responsibility for any errors or omissions. They would like to thank the referees for their constructive comments on the draft document.

Copies of this report can be obtained from:

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