

MEDINFO '95

Proceedings of the Eighth World Congress on Medical Informatics
Vancouver Trade & Convention Centre, Vancouver, British Columbia, Canada
23 - 27 July 1995

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PART 2

1995

INTERNATIONAL MEDICAL INFORMATICS ASSOCIATION

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ISBN: 0-9697414-1-3

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Printed in Canada

Informatics and Healthcare Reform

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This paper examines how informatics has been applied in support of healthcare reform objectives, such as reducing the administrative burden on practitioners, reorienting health services to a community and client-based focus, and promoting intersectoral collaboration. It also discusses why some attempts have failed and resulting implications for the future.

1. Introduction

Healthcare reform—a phrase that is on the lips of politicians and policy makers around the world. In the West, the “graying” of the population, economic realities, and the rapid development of medical technology are driving this process. Eastern Europe faces the same concerns plus a rapidly changing political and economic environment. In many third world countries, rapid population growth, changing disease patterns, and the influence of international institutions, such as the World Bank, are additional motivating forces.

In this world-wide revolution, many people have tried to introduce information systems and apply emerging information technologies to speed the reform process. For a variety of reasons, these attempts are often unsuccessful and can even increase resistance to change. However, the opposite can also occur, where informatics creates a symbiotic relationship that supports and is a catalyst of healthcare reform.

2. Applying Informatics in the Healthcare Sector

Traditionally, information systems have often been used in an attempt to reduce the administrative burden in the health sector. Many hospital information and practice management systems, for instance, had their origins here. Results have been mixed, but in some cases tangible benefits have been proven. For example, a project in an Indian rural hospital used computer technology to streamline data collection and reporting. It freed up significant amounts of time that could be used to provide primary and community health services [1].

Another objective of many health reform processes is to move towards a more community and client-focused service. Since “healthier choices are heavily based on access to information,” [2] informatics has an important role to play in the implementation of these change strategies.

Whether the preparation of a child immunization and growth charts in a rural village or the distribution of smart cards in France, putting the health record in the hands of the patient is becoming increasingly popular. The new focus on the long term effects of lifestyles and interventions on health as well as the increasing mobility of the population are often cited as additional reasons for this type of initiative.

While giving patients responsibility for the maintenance of their own records is a significant step, perhaps more important is the way that new technologies allow people to share ideas and experiences and gain better and more relevant information about their health. For instance, technology allows us to filter and customize information based on the specific needs of the individual. Already, such tools are being used to support client and health practitioner education, locally and through the “information superhighway.”

One of the best known information access tools is the Medline database. Over four million computerized searches are made on this database each year [3]. It and similar systems give administrators, practitioners, students, and researchers around the world access to much of the rapidly expanding published health knowledge base. Future developments in information synthesis and artificial intelligence techniques have the potential to revolutionize this area of information management.

Modern technologies have also been used to support direct care of clients living outside major centers. One of the longest standing examples is the service provided to Australians in rural and remote areas by the Flying Doctor Service. Their radio network links hundreds of people in the outback to knowledgeable practitioners who provide advice and

other services over the air.

Another Australian project aims to use electronic networks to reduce the 'tyranny of distance' for medical practitioners in remote areas. It currently focuses on the exchange of electronic mail (used, among other things, for referrals to specialists), access to databases, and support of the business aspects of general practice [4]. In contrast, the Remote Consultative Network in Alberta, Canada concentrates on the exchange of clinical data and facilitates consultation between physicians in a Drumheller hospital and experts at the University of Calgary. Significant clinical benefits have already been demonstrated [5].

Advances in informatics can also serve as necessary preconditions to or catalysts of health sector reform by allowing new ways of managing the health system, such as examining links between health services and outcomes. "Executive Information Systems," for instance, permit decision-makers to link operational and new information to outcomes, program management, and other strategic frameworks. In doing so, they can leverage their investment in existing activity-based information systems. The challenge is to obtain the leadership and commitment necessary to make the project a success [6].

In addition, the application of several complex health management tools would be unrealistic without sophisticated information technology. In Queensland, Australia, for example, casemix management is being used as the basis for funding public hospitals as of January 1995. Without computers, the collection, processing, and interpretation of patient activity data for the more than 500,000 people served by the public system each year would be prohibitive.

Likewise, advanced statistical methods and information technology are needed to support longitudinal record linkage. This type of research has yielded valuable information on the long term effectiveness of medical procedures, technology, and health promotion campaigns. However, the technological possibilities must always be tempered by ethical evaluation. Specific guidelines on privacy and confidentiality have been developed by various organizations, including the OECD, Council of Europe, and individual countries and regions.

3. When Informatics Fails

Informatics is often seen as an important component of a healthcare reform strategy. Frequently, though, it fails because the information supplied does not meet policy-makers needs or because the systems themselves become barriers to reform.

Health care reform, like any other type of policy development, follows a predictable cycle: problem identification, issue definition, search for alternatives, choice of solution, implementation, and evaluation [7]. Typically, a problem must be identified before information is collected. This lag means that, for new and emerging questions, few answers exist [8]. As a result, decision-makers are forced to make choices based on data of poor quality, timeliness, and reliability.

In addition, the new approaches frequently require data to be linked and compared across traditional disciplinary boundaries, institutions, and geographic areas [9]. Incompatibilities between existing data and systems can mean that a seemingly simple question (e.g., what kind of care is provided to elderly patients who fracture a hip) can be virtually impossible to answer.

Compatibility problems are most obvious at the international level. Cross-country comparisons have been prominent in the healthcare reform debate, with comparisons of health costs and outcomes for OECD and G7 nations making headlines around the world [10]. However, given the tremendous differences in data collection systems, health care, the social environment, and other factors, many question the utility of these statistics in deciding what type of health system provides the best value for money in a given country.

On a national level, many countries are taking steps to improve the compatibility of systems and comparability of data. For instance, working groups in Australia have established a National Data Dictionary of institutional care [11]. Other groups in Europe, Canada, and elsewhere are working on similar projects in primary and community health. In the end, though, these disparate efforts may create future problems by producing a multiplicity of standards that reinforce divisions between sectors and across countries. The slow adoption of ICD-10 provides an early example of how difficult the introduction of new standards can be.

This mismatch between current information systems and the information requirements of policy makers means that, while drowning in data, we do not have the information that is needed [12]. Popularly called "information overload," this problem will continue to grow. De Dombal estimates that there are already over 15 million facts in clinical medicine alone [13]. As this number increases, the gap between the rate of growth in information provision

and the expansion of information consumption widens.

Even where information needs are met, information systems themselves can serve as barriers to change. For example, duplication, over-investment, and erroneous effort all pull resources away from other parts of the health system. Information technology may increase efficiency but, without being tied into a complete reform strategy, it will not succeed [14].

Another way information systems can slow the reform process is by reinforcing the old paradigms and policies. Many health decision makers today are bombarded with operational details about the health system. This may reinforce a focus on inputs (such as how many beds there are in a particular hospital) instead of outputs, outcomes, and strategic directions.

Problems can also occur even if information systems are very closely tied to the reform initiatives they are designed to support. The two can become synonymous, and fears related to information technology and computers (if not properly managed) can be transferred to the change process itself, and vice versa. For example, distrust of a particular clinical costing system can lead to an overall rejection of the underlying management approach. Similarly, one bungled information systems project can mean a long term suspicion of the value of similar initiatives.

Even when the information system delivers what managers and clinicians need in a form they can use, when it reflects current strategies but is flexible enough to adapt to new directions, and when it fosters commitment to and understanding of the healthcare reform process, it can fail. In the broadest sense, its very success can mean a failure to achieve social justice, since informatics has the potential to increase disparities in incomes and social class. The "information ghetto" operates at every level, from the individual to the community to the international arena. Globally, world production and activities related to information "is the area in which the North-South gap is the most blatant; it is also the major cause of the growth of this gap [15]. Those with the least resources have the greatest need for information, and these same groups are often the ones with the largest potential health gains. Just by applying the knowledge that already exists, healthcare could be substantially improved.

4. Implications for Informatics and Information Managers

Today, informatics is acknowledged as "both an integrated and integrating element in the HFA [Health for All] framework." [16] Recognizing this, WHO Member States in Europe have pledged that "by the Year 2000, health information systems in all Member States should actively support the formulation, implementation, monitoring, and evaluation of health for all policies" [17].

For this to be achieved, health services must move towards an information sharing culture and integrate informatics initiatives into the health reform agenda. As New Zealand found after a recent review of their national information infrastructure, the result will be a shift:

- from data acquisition to information outputs,
- from collecting statistics to providing information to support decision-making at all levels,
- from a patient-based to a population-based approach,
- from central validation and quality assurance to local responsibility and accountability,
- from limited central access to user friendly local access,
- from a focus on hospital care to information from all levels of care in the public and private sectors,
- from comprehensive, maximum central collections to minimum data sets, and
- from a centralized directive role to a "hands off" approach controlled through standards [18].

Informatics has never been, and will never be, the health sector's penicillin, providing a quick cure for all manner of ills. However, used as part of an integrated reform strategy, it can support and encourage the on-going evolution of the health industry. In so doing, it can contribute to the ultimate goal: health for all.

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