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Knowledge systems and health promotion

M.A. Koelen and A. Brouwers

The knowledge and information systems (KIS) perspective arose from reflections on agricultural development. In the health sector, it is not quite as common to think in terms of KIS. Yet in this complex field, in which health education and promotion play increasingly important roles, the KIS perspective might be very useful. In this article, an attempt is made to apply ideas about KIS functioning and knowledge management to the health sector, by paying attention to historical development, especially of public health, and by exploring the contribution these ideas could make to the field. Some of the observations made in this attempt are: upstream information flows often are developed poorly; interaction and exchange among the different KIS parties require ongoing stimulation; in special projects and complex communication situations, a system-integrator is needed.

From health education to health promotion

In health education, health and the prevention of disease take a central position. However, health in itself is difficult to define in terms of objective, measurable criteria. We would define health as the capability of a living system within a given context to maintain a state that enables it to subsist in accordance with its constitution.

If we consider how health education developed as a professional and scientific field we can observe an interesting shift. In its early days, health education asked: "how can we make people aware of the health consequences of their behavior?" Research in health education was directed at methods to transfer its messages. The approach was based on medical practice at the time, in that it was prescriptive and unidirectional. Individuals were expected to process information in a logical manner and subsequently act accordingly. Changes in individual opinions, attitudes, and behavior were seen to result of information and knowledge.

Practical experience and several studies showed, however, that information and knowledge are important but not sufficient factors in behavior change. Individual motivation, skill, and the influence from the social environment appeared to be very important conditions as well (Ajzen & Fishbein, 1980; Green et al., 1980).

Kok, 1986). It became recognized that individuals cannot be isolated from their material and social environment and that a single behavior cannot be isolated from its context. The (social) function of behavior in the wider context of life-styles had to be considered (Koelen, 1988). In research, the attention gradually shifted to determinants of behavior (including factors such as knowledge, attitudes, social influence, and opportunity/possibilities), the modifiability of such behavior, and characteristics of the target population. In order to implement effective health education, the focus shifted to gathering information from and about the intended target population, and the approach changed from a prescriptive and unidirectional to a more participative one.

Health is affected by a multitude of factors, be they biological (e.g., age, sex, heredity), environmental (e.g., air and water pollution), socio-cultural (e.g., housing, income), or behavioral (e.g., alcohol consumption, physical activity) in nature. Also the organization of health care services and the availability of means and facilities to affect health (Lalonde, 1974; Blum, 1982) are known to be factors. Over the years, it became evident that, due to the complexity and variety of factors influencing health, health education can develop its full potential only if it is supported by structural measures, such as legal, environmental, and regulatory ones (Kickbush, 1986). Health education nowadays is covered by the umbrella of 'health promotion', which can be defined as the process of enabling individuals and communities to increase control over the determinants of their health and thereby improve it (WHO, 1986). Health is no longer seen as an end in itself, but rather as a resource for everyday life.

If we are to achieve the potential for positive health, a broad-based approach will be necessary, one that stands in contrast with the strictly medical approach. This point is very well expressed in five principles of health promotion (Ashton & Seymour, 1988):

1. health promotion actively involves the population in the setting of everyday life rather than focusing on people who are at risk for specific conditions and in contact with medical services;
2. health promotion is directed towards action on the causes of ill-health;
3. health promotion uses many different approaches that combine to improve health, including education and information, community development and organization, health advocacy, and legislation;
4. health promotion particularly depends on public participation;
5. health professionals, especially those in primary health care, have an important part to play in nurturing health promotion and enabling it to take place.

The key issue of health promotion is that health cannot be ensured by the health sector alone. It demands an inter-sectoral approach and a reorientation of medical care, primary and community care, and prevention, with public participation as one of the important issues. Furthermore, it demands coordinated action of governments, health and other sectors, non-governmental and voluntary
Knowledge systems and health promotion

organizations, local authorities, as well as of industry and the media (Kickbusch, 1986; WHO/HWC/CPHA, 1986; Thornton & Draper, 1987). In order to realize real health promotion, an open flow of information is required to produce an informed public, as well as responsive and supportive professional activity (Ashton, this volume).

The health knowledge and information system

The health sector is a knowledge intensive one. The amount of scientific and practical knowledge and information in all fields relevant for health promotion grows rapidly. Also the major issues change continuously, due to, for example, new insights, knowledge, or health hazards, and societal changes. At this moment, topics such as AIDS and the consequences of aging draw attention, while they were not important ten years ago. Furthermore, the public actively interferes with the professionals. Active client groups (e.g., patient groups, organizations for parents of handicapped children) seek for information, and in turn provide professionals with practical experiences. And, probably partially due to health education in general, the public at large became more and more health-minded and shows an increased 'need to know' about health-related topics.

In the continuum from fundamental research to client involvement, many individuals and institutions from different professions and in different countries are active, either at the scientific, intermediar, or public level. Each of these subsystems creates and transforms knowledge and information in its own specific manner. In the process a distinction between 'knowledge by experience' and 'scientifically validated knowledge' can be made. Knowledge by experience is integrated in all facets of public health and is used in all subsystems, but most extensively by the public. Scientifically validated knowledge, which can be divided in 'application oriented' and 'fundamental' knowledge, is fragmentary in nature, as it is directed at specific aspects of public health. Scientifically validated knowledge is not an exclusive domain of the scientific subsystem, it is accessible to and used by intermediaries and the public as well, be it to a lesser extent.

In a KIS, a differentiation between 'downstream' and 'upstream' flows of knowledge and information can be made (Röling & Engel, this volume). Downstream flows refer to information flows from the scientific subsystem towards the public, whereas upstream flows refer to information flows from public towards science. For a KIS to operate effectively, knowledge and information must circulate between the different subsystems. However, in the health sector, as in other domains, downstream transfer is dominant over upstream influence. So far, the upstream process did not receive much attention. This may seem contradictory to what we said earlier about the shift from a unidirectional to a more participative approach, but it is not. The shift mainly reflects the intention to take the characteristics of the target population 'into account'. This population itself is
often not actively involved. However, effective health promotion asks for such active involvement. What is needed is an interactional approach, with active sharing of information, dialogue with the target population, and participation in decision-making.

The activities to enhance public health undertaken by the subsystems can be placed on a time scale, ranging from direct action to long-term activities. The short-term activities refer to operational processes that deal with ad hoc problems regarding the primary necessities of life (e.g., immediate life threats). The medium term activities concern tactical processes, for example, activities aiming at changes of specific health-related behavior and adoption of healthier life-styles. Long-term activities refer to strategic processes, basically aiming at long-term health effects. Each of the processes has specific characteristics, requires typical actors, and provides specific needs for exchange and extension.

To illustrate this, a health knowledge and information system can be placed in a diagram with the subsystems (the public, intermediaries, and research) along the vertical axis (including the two distinguished types of knowledge), and the different time horizons (defining the operational, tactical, and strategic processes) along the horizontal axis (Figure 1).

The need for coordinated action

Due to the rapid growth in the amount of information and the complexity of the field, the need for quick and adequate exchange of knowledge and information increases. Health promotion, therefore, demands coordinated action from all professionals and institutions involved (e.g., governments agencies, research centres, and volunteer organizations). However, it is an extremely difficult task to manage the downstream and upstream communication processes. Often, actors have their own specific knowledge domain, their own philosophy, their own objectives, and a need for protection of their domain (Warmenhoven & Hagedoorn, this volume), and their own finite horizons (Brouwers & Graafmans, 1989). Experiences from the Department of Biomedical and Health Care Technology (Technical University Eindhoven) show that the diagram presented in Figure 1 can be of practical use to initiate and reinforce communication and coordination between the different parties involved in a health knowledge and information system.

In KIS theory, much attention is paid to interfaces and linkage mechanisms among subsystems. These are extremely important, for example to bridge the gap between research groups and target population. Interface management provides a practical approach to the design of knowledge and information systems. Health promotion often requires multi-disciplinary projects. The Healthy Cities project of the World Health Organization (WHO) is a fine example (De Leeuw, this volume; Ashton, this volume). Such interdisciplinary projects require a great
Figure 1: Healthcare: subsystems and time horizons.

<table>
<thead>
<tr>
<th>PUBLIC knowledge</th>
<th>OPERATIONAL</th>
<th>TACTICAL</th>
<th>STRATEGIC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>daily life activities, avoiding health threats</td>
<td>activities changing specific behavior towards a more healthy lifestyle</td>
<td>activities aiming at long-term effects on health</td>
</tr>
<tr>
<td></td>
<td>nutrition</td>
<td>safety</td>
<td>housing hygiene income</td>
</tr>
<tr>
<td>INTER-MEDIA-RIES</td>
<td>media/extension - warnings</td>
<td>media/extension - how to improve lifestyle</td>
<td>media/extension - about healthy lifestyles and healthy aging</td>
</tr>
<tr>
<td></td>
<td>health care systems</td>
<td>recreation facilities</td>
<td>suppliers of products and services</td>
</tr>
<tr>
<td></td>
<td>government - direct action</td>
<td>government - stimulation programs - environmental care - regulation &amp; legislation</td>
<td>government - policy development</td>
</tr>
<tr>
<td>SCIENCE</td>
<td>clinical research</td>
<td>occupational research sociology</td>
<td>medical research epidemiology</td>
</tr>
</tbody>
</table>

A variety of expertise. Each domain brings its own specific knowledge and information contents, its own general aims, and its own finite horizons, making heavy demands on health education. A multi-disciplinary project usually cannot function without effective intermediaries, and especially needs a powerful 'system integrator'. Its coordination requires mutual information and education. A 'shared KIS' has to be developed around the explicit goals of the project, and the incentives for the parties involved should be reflected in the general objective of the project. Cooperation only works when participants gain enough to make it worthwhile to invest the required extra effort. Furthermore, the function of the system integrator has to be self-sustaining (economically, or otherwise).
The variety of standards

We mentioned that the KIS includes several subsystems. In many ways, these subsystems are inclined to function as closed systems (e.g., research often acts as a closed system). Generally speaking, a university researcher concentrates on a limited area of reality. He applies specific tools developed by his own discipline on mostly self-chosen problems. He is inclined to explain only certain parts of reality. Very often fundamental researchers are not really interested in the practical value of their results. Their standards are based on the question whether statements or hypotheses are true or false.

Applied sciences, on the other hand, are more sensitive to the applicability of their theories and products. Their standards are related to the question whether their results are efficient and effective. Health educators have again other standards. They work on a problem, and in doing so, they make use of knowledge and information from and about the target population (e.g., for a better definition of the problem), but also of insights from the research system (e.g., for a better understanding of the problem). Their standards are related to situations-specific effectiveness and efficiency. In multi-disciplinary projects, this variety of standards can obstruct communication and cooperation processes. It is for this reason that such projects need a strong system integrator, and that special attention is required for the sharing of knowledge and information, as well as for mutual insight into each other's standards.

Concluding comments

Health care is a complex problem area. Science is making astonishing progress. One experiences rapid increase in the number of specialties and dynamics of all research fields. However, our ability to cope with integration of the knowledge of the many experts (including the public) needed for complex problem areas, seriously lags behind. In dealing with such challenges much can be gained by looking at extension research and training.

As may be clear from the above, KIS theory can provide a useful framework for the exchange of ideas and experiences with regard to public health. We pointed out that the upstream transfer of knowledge and information, even if we take into account the recent tendency to consider the target population, has been neglected in the past. In the new approach to public health, involvement of the public is a crucial element. The upstream transfer, therefore, is in need of strong support. In health education and health promotion, several organizations, departments, and institutions are engaged in the gathering and exchange of knowledge and information, either on the theoretical, practical, or political level. These organizations often are more or less autonomous, and share the tendency toward closeness and defense, not only with regard to their ideology, but also with regard to their
professional territory.

It is of great importance, therefore, to stimulate interaction and exchange among parties involved. The communication diagram, presented in Figure 1, can be a practical instrument at the onset of such a process. In complex communication situations an effective system-integrator is indispensable. Communication is not only important to establish exchange of knowledge and information, but also to gain insight into the various standards and the needs for coordination.

References


