

# **ECONOMIC PARADIGMS FOR HEALTH INFORMATION SYSTEMS AND THEIR IMPACT ON THE QUALITY OF CARE**

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## **1. Objective/ problem**

Many health and management information systems are characterized by the following problems: information gaps or insufficient supply, underutilization of data or insufficient demand, excessive generation of data or excessive supply, poor reliability of validity of data or insufficient product quality, lack of skills in information management or poor production management, lack of links with good health care management. The epidemiological statement of the problem sounds better than the economic one. A company that would disregard quality, management and the balance between supply and demand is bound to go bankrupt.

## **2. Methodology**

Facing such challenges we tried to develop a need-responsive and cost-effective health and management information system in the Philippines. Economic paradigms were decisive in our approach.

- Felt information needs were identified via a survey with health managers using the economic paradigm of an integrated production cycle of information as framework
- Implicit normative information needs were elaborated by an outstanding expert in public health and epidemiology (without economic paradigms)
- Explicit normative information needs were drafted according to an economic decision making framework for the health sector by the leading health economist in the Philippines
- Expressed information needs were analyzed in case studies of good health care management schemes that were discovered by national contests
- Comparative information needs were assessed reviewing health reporting systems abroad.

The health and management indicators that emerged from these steps were reviewed and validated at different levels of management and decision-making. Existing as well as potential data sources for all indicators were then determined and compared according to “cost” criteria of data availability and supply. These steps allowed us to propose and develop the missing links for a need-

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responsive and cost-effective health and management information system with 4 main modules: public health data, hospital data, information on socio-economics (including information on cost and financing, and logistics), information on excellence in (health care) management. This need-oriented data supply was then linked with strategies to increase and rationalize its demand.

### 3. Results

Felt information needs were assessed within the conceptual framework of a socioeconomic production cycle of information. The economic analogy of a production cycle looks into the entire production processes of information starting from (1) a preexisting level of awareness and/or knowledge that leads to (2) a demand and/or need; which might be met (3) via assessing the production factors of information and (4) implementing the production processes proper. Through (5) intermediate uses of information at various levels of processing and utilization, this production cycle leads to (6) an end-use by the front workers of health care leading to (7) improved health of the target groups which again might (8) increase knowledge of target groups and the health workers and produce (9) a need or demand for further or clearer information. This production cycle interlinks needs, demands, production, end-use and reproduction of data and information - a first economic paradigm related to information systems. This repetitive production cycle of information asks especially for looking into the whole chain linking need, demand and supply of information.

#### 3.1 Developing relevant information systems based on routine data of health care

Empirical approaches related to this socioeconomic viewpoint of a production cycle of information lead to interesting findings. Enforced by higher levels of management, local health care managers are usually requested to collect and process data. Many times they themselves do not need such data. If they need them they get them back very late, if ever. Often they are not trained to collect or to analyze and understand them. Even if obligatory data collection and transfer is being mandated from above, it is seldomly supervised and controlled. Higher level program managers sometimes ask for data but do not use them properly, if at all. The data that local health care managers use and need in their daily routine of patient management and prevention and promotion are not being supported, as a rule. Local managers are usually left alone with their own needs and demands for data and information and knowledge to improve services and/or alleviate the burden of everyday work.

These dilemmas between data demand and information supply, and among managers at different levels, lead to poor data quality, to overproduction, and to unsatisfied demand, at the same time. It could be seen as the result of a planned information economy not linked to real information markets. If information and management - i.e. supply and need/demand for data and information - were linked by concepts as e.g., an information based decision making by/for the different levels of managers involved, then a better quality of information and management could result. Conceptually, the best results could be expected when a kind of information subsistence economy would exist, where the consumer of information is the producer of information at the same time. The two paradigms of an information subsistence economy and of market economies for information hint at this intrinsic relationship that is so vital for strengthening health care management.

- > Information subsistence economy: this concept reinforces the point of view that information is being produced properly and with quality if it is being needed, demanded and used or consumed by the producer her/himself.
- > Information market economy: this concept looks into the different markets of information for the different demands of different customers and stresses that information is being "bought" only if demanded and usable.

Within this economic paradigm the felt information needs of health managers do not primarily pinpoint a certain set of data or indicators. They rather ask to close the existing gap between knowledge and management through appropriate technical *and* social tools of HAMIS.

This has at least three implications for developing or strengthening health and management information systems.

- > *From information to management*: It is important to analyze, to strengthen and to reinforce the self-sustained authentic and autochthonous data production processes and information systems at any level of health care management, i.e. “informal information systems” of insiders, e.g. the scribbles on diagnoses and treatments in the patients histories.
- > *From management to information*: A self-sustained way of proceeding from management to information would be, for example, a hospital information system that is a byproduct of proper case management. In developing our Hospital Information System we proceeded from the understanding that the routine practices of admission and discharges - a bit rationalized, though - should be the starting point for collecting and processing the data. This avoids additional data collection and reduces the burden of the admissions and medical records clerks. The same holds true for managing the data of cashiers and accountants in the hospitals.
- > *Comparing viewpoints or even confronting information systems*: Opposing views will persist, however strong our arguments are in favor of an integrated information production cycle. This should not be seen as something negative. Rather, it gives the chance of comparing them: public health data as shown in imposed information systems versus those in self-sustained information systems, hospital data as reported to data demanding agencies versus those that are a byproduct of good management, logistics data from the money point of view versus the material point of view, cost and financing information at the level of households versus the level of institutions. Comparisons are rather relevant to check reliability and validity.

The first two issues show that health and management information systems can evolve from the actual pattern of concerns of the managers rather than from any kind of imposed data and information collection that does not correspond to the management needs. The third point shows that a systems perspective is advisable. Such are some lessons to be learned from an analysis of the felt information needs of health care managers.

### 3.2 Reinforcing social processes of analyzing and using routine data

Social processes, which bring data and information and knowledge into health and health care, seem to be one of the most important strategies for an applied HAMIS. In one of our pilot provinces, in Quezon Province, we started to conduct monthly Quality Assurance Conferences aimed at sending our information tools and results back to the health managers. Once in a month, the main hospital staff meets with some HAMIS staff and invitees from centers of excellence, academe or other hospitals. Clinical, nursing, technical, administrative staff participates as well as district health officers and members of the provincial health planning boards. Based on results and findings of our information systems health and health management issues are being presented and discussed, mainly led by representatives of the province. There is always one recurrent theme: *avoidable or preventable morbidity and mortality*. Printouts of our hospital information system are the leading papers, especially a detailed mortality listing. For interpreting such data many other data from different information systems are being presented and referred to. Data linkages are usually hybrid ones, i.e. via the residence of the patients. The most important data linkages are nevertheless the understanding of the audience and the taking over of responsibility when discovering that there are ways and means to reduce the number of preventable and avoidable deaths and diseases. In addition to the focus on avoidable deaths, a special topic or theme is introduced. Special topics are decided upon beforehand to allow preparation of the participants. Topics are varied and range from

infectious diseases and economics, to hospital development. These monthly conferences are held for the purpose of being updated on trends and issues, and of providing the hospital staff some kind of reinforcement. Externals are accepted as lecturers as long as there are no internals to do the presentations yet.

This is how we spell the HAMIS quality assurance conferences:

- H **H** Health and management information systems are presented in its various aspects; at least one different information system is looked into in some detail.
- A **A** Avoidable or preventable deaths are being used as a quality tracer with reference to the detailed mortality listing generated from our hospital information system. A moderator coming from outside the catchment would be preferable.
- M **M** Mini-research should be presented by the participants, i.e. questions arising in meetings should be addressed by the participants in a "research" minded way. Cooperation of universities and pharmaceutical industries can bring some incentives.
- I **I** Invited speakers should be **I**nvolved speakers, i.e. they should be asked to join occasionally to comment and improve on the mini-researches of the hospital staff. The speakers should give updates on the latest technology or state of the art and stimulate the audience to frame their own research questions.
- S **S** Strategic planning for the next quality assurance conferences, based on the understanding that the most important aspect is to convert information into understanding and ultimately, into action.

These conferences have been greatly appreciated by the participants. It seems to be a good way for feeding back information of our HAMIS to those who should benefit from the data for improving health and health care for the poor. A master's thesis from Heidelberg University compared the avoidable deaths before and after introducing these monthly meetings. It could be shown that there was a significant reduction of avoidable deaths within a year's time.

In Guatemala we are beginning to use a similar philosophy to improve quality and efficiency of health care for outpatients. Routine data on consultations are encoded, diagnoses and treatments are semi-automatically coded and fed back in monthly meetings that deal with quality and efficiency of treatments and their context. First results confirm our experiences from the Philippines.

### 3.3 Expanding technical information systems into social information movements

Very often in informatics we forget about the connotations of information. Information is not just data and statistics. Information has also to do with understanding, knowledge and even wisdom. Health information systems are not just what is in our computers but also what is in the heads and fingertips of the best managers. This distinction between information for management and information on management was one of our crucial yardsticks to improve the quality of health care management in the Philippines.

The best managers know what information it being needed for improving health care. But how can we obtain information on the best managers? We opted for the economic paradigm of *panem et circenses*, i.e. combining economic and cultural incentives. We conducted national contests that originally were trying to discover local projects and initiatives that excel in effectiveness (medicine), in efficiency (economics) and equity (sociology). In another paper for this conference I give some details. In the context of the European SIEHE-project it might be interesting to review our indicators on these three criteria and three additional criteria that we added during quite some social processes in defining quality in health care: sustainability, innovativeness and - not to forget -

technical quality. The following list was discussed, defined and approved by the association of the best health care managers in the Philippines.

<b>Table 1 Quality indicators used to discover excellent health (care) management</b>		
<p><b>(Technical) Quality</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> has clear objectives</li> <li><input type="checkbox"/> identifies target groups</li> <li><input type="checkbox"/> identifies properly the needs for target groups</li> <li><input type="checkbox"/> has clear focus</li> <li><input type="checkbox"/> acceptable standards are maintained</li> <li><input type="checkbox"/> is appropriate to peculiar economic character of the area</li> <li><input type="checkbox"/> is appropriate to peculiar social character of the area</li> <li><input type="checkbox"/> has clear program for implementation consistent with set objectives</li> <li><input type="checkbox"/> has potential as an instrument for social change</li> </ul> <p><b>Innovativeness / Uniqueness</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> uses no conventional, common and routine procedures</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis community mobilization</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis fund/resource generation</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis delivery of services</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis info dissemination/education</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis training</li> <li><input type="checkbox"/> uses no conventional procedure vis-à-vis project evaluation</li> <li><input type="checkbox"/> explores non-routinary means of supporting health services</li> <li><input type="checkbox"/> utilizes resources or capacity available in the area but not fully considered before</li> <li><input type="checkbox"/> introduces new initiatives for health and health care</li> </ul> <p><b>Effectiveness</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> improves health status</li> <li><input type="checkbox"/> improves health care delivery</li> <li><input type="checkbox"/> produces better health attitudes</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> includes aspects of quality of life</li> <li><input type="checkbox"/> achieves an acceptable goals achievement</li> <li><input type="checkbox"/> mainly goal oriented activities undertaken</li> <li><input type="checkbox"/> does not provide incentive for curative services alone</li> </ul> <p><b>Equity</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> deals with those in need</li> <li><input type="checkbox"/> deals with vulnerable population</li> <li><input type="checkbox"/> deals with underprivileged or marginal population</li> <li><input type="checkbox"/> gives services especially to target beneficiaries</li> <li><input type="checkbox"/> considers felt need of population</li> <li><input type="checkbox"/> improves accessibility of health care</li> <li><input type="checkbox"/> implies willingness of beneficiaries to participate and share</li> <li><input type="checkbox"/> stimulates risk and cost sharing across the sick and the healthy</li> <li><input type="checkbox"/> introduces concept of risk sharing</li> <li><input type="checkbox"/> encourages individual action for collective good</li> <li><input type="checkbox"/> stimulates participatory behavior</li> <li><input type="checkbox"/> stimulates active participation of the poor</li> </ul> <p><b>Efficiency</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> focuses on managerial practices beyond expectations</li> <li><input type="checkbox"/> focuses explicitly on managing well financial issues</li> <li><input type="checkbox"/> focuses explicitly on cooperating with local governments</li> <li><input type="checkbox"/> promotes improved productivity of services</li> <li><input type="checkbox"/> uses appropriate technology</li> <li><input type="checkbox"/> uses appropriate management style</li> <li><input type="checkbox"/> involves minimal overhead only</li> <li><input type="checkbox"/> brings in resources hitherto not available for health (e.g., from university, other agencies)</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> raises funds from untapped sources</li> <li><input type="checkbox"/> utilizes community resources</li> <li><input type="checkbox"/> accepts flexibility in the use of resources raised</li> <li><input type="checkbox"/> drives at cost containment</li> </ul> <p><b>Sustainability</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> is initiated from own resources</li> <li><input type="checkbox"/> is appropriate and responsive to local social and economic conditions</li> <li><input type="checkbox"/> avoids dole-out mentality</li> <li><input type="checkbox"/> promotes self reliance</li> <li><input type="checkbox"/> increases community confidence to take active role</li> <li><input type="checkbox"/> encourages greater community commitment to improved health status</li> <li><input type="checkbox"/> discourages (complete) dependence on government</li> <li><input type="checkbox"/> seems to be easily replicable</li> <li><input type="checkbox"/> strong engagement of core group</li> <li><input type="checkbox"/> has supportive leadership available</li> <li><input type="checkbox"/> is not dependent on one personality as leader</li> <li><input type="checkbox"/> is not dependent on outside financial support</li> <li><input type="checkbox"/> had no foreign involvement yet</li> <li><input type="checkbox"/> is supported by health services</li> <li><input type="checkbox"/> has no need of continuous outside support</li> <li><input type="checkbox"/> exhibits transsectoral character</li> <li><input type="checkbox"/> combines public and private sector</li> <li><input type="checkbox"/> is build around other concerns (religion, university, etc.)</li> <li><input type="checkbox"/> implies continuity of resources generated</li> <li><input type="checkbox"/> is not designed for raising funds for organization only</li> <li><input type="checkbox"/> has committed leadership available</li> <li><input type="checkbox"/> is taking into consideration value formation</li> <li><input type="checkbox"/> is taking into consideration ecological aspects</li> </ul>

A tripartite evaluation team had to find a consensus with those to be evaluated on the applicability of these criteria. The best projects were reviewed again by high ranking officials (so to spread the knowledge on local initiatives at the national level). The best managers were discovered by us in up to now three national contests and up to now 160 were awarded by the Presidents of the Philippines. We associated them and used them as national resources for improving health care, health policies and health legislation. We brought them as speakers into the quality conferences in our pilot hospitals in various provinces. It turned out that their input - information, understanding,

knowledge, vision and wisdom - was crucial to mobilize the participants of the quality conferences to improve quality of care in a multidimensional sense, including equity, innovativeness and sustainability. By this we linked technical information systems with social information systems.

By the very fact that many winners of our good health management contests came from the grassroots of health care management and by the fact that they were a kind of combination of teachers and preachers there was a very strong advocacy for *equity* concerns. Case studies on quite a number of winners by five research groups from universities of the Philippines show us that the context of initiatives seems to be not the decisive factor to predict good management. It is rather the human factor. It is the proper personality traits and leadership qualifications of the managers. Leadership means empowerment of partners, staff and target groups. One who excels in clarifying or even simplifying goals and objectives, especially at the earlier stages of a project. One who keeps the processes going on through smooth follow up and motivation. In the Philippines it is women that often play this role of a "guiding star" or "moving spirit" behind good health management. This - in a nutshell - are the findings of the extended case studies on good health (care) management. [4] And exactly this human factor had to be added to the quality assurance conferences to improve quality of care in a rather comprehensive sense. During the social processes of quality review by peer reviewers we were able to distinguish the above mentioned indicators for six major dimensions of quality: effectiveness, efficiency, equity, (technical) quality, innovativeness and sustainability. Further social processes will add more indicators. But what matters most is a kind of *gestalt* of quality. Outstanding managers will understand this *gestalt* and will try to realize it whenever and wherever possible.

#### 4. Discussion

Economic paradigms inherent in health and management information systems reassess the importance of health reporting. HAMIS do not need that much sophisticated indicator systems. What is needed most is the *intelligent and imaginative analysis and use* of data, information, understanding and even wisdom for an improved health care. Social processes to discuss and analyze data are crucial. Guidance should be given by outstanding health care managers. They will try to steer processes towards better health (effectiveness), better economics (efficiency) and improved fairness (equity) and will not forget innovativeness and sustainability beyond technical quality. Concentrating on subsistence economies of information for health care management and letting interested parties pay for any other information might be seen as a powerful strategy. Health and management information systems are vital to improve management and quality of care. Economic paradigms can help to improve them considerably.

But just economics is not enough. Besides "*economics*" there are quite some other paradigms that have to be taken into account when dealing with meaningful health and management information systems.

- a *Legitimacy*: The aspect of legitimacy, i.e. the aspect of who defines what information systems address and if the patient and the health worker and health systems research are equal partners to define it, was the starting point for the development of our HAMIS, by assessing felt needs, expressed needs, normative needs and comparative needs for information. By that we tried to establish an interplay of the perceptions and experiences of health managers, of health systems research and public health as well as health economics, and of international experiences related to health information systems.
- c *Psychology*: The psychological aspect of the level of cognition and understanding is especially essential so that information systems are being used by the target groups. In this area, we think that the information supply should adjust very much to the levels of

understanding of the front line health workers and we stress that midwives are midwives and doctors are doctors and that they should not be expected to be statisticians. This approach accepts the consumer of information as s/he is, requiring rather the development of tailor-made data presentation, e.g., comics instead of regressions, lists and newsletters instead of data presentations, figures and graphics instead of tables.

- d *Philosophy*: The philosophical issue of what information systems address is sometimes overlooked. It is the question of whether it is just the production of tables and figures or if they try to contribute explicitly and actively to our and the health workers understanding and knowledge and to knowledge-based health care, i.e. rational and reasonable as well as efficient health care. We understand that there is a dialectics between data / information / knowledge / understanding and even wisdom and that Health and Management Information Systems can not subsist with data only.
- e *Sociology*: Last but not least, there is the sociological aspect of “Who benefits from the production and consumption of information - the powerful or the powerless?” and “Whom do we serve with what we are doing?” Our bias is that it should serve for basic need satisfaction of the poor. And the mandate of the international development policy asks for the same: to improve the living conditions of the poorer parts of the population - a mandate of humanity.

These dimensions of HAMIS deny a predominantly technical notion of health and management information systems. Rather, they favor an incremental but nevertheless systematic approach to utilizing data and information and understanding to strengthen a knowledge-based, rational decision making to improve effectiveness, efficiency and equity in health care.

Our choice to attach to technical information systems the knowledge and wisdom of outstanding health care managers that were discovered by national contests can be seen as a step towards “Sustainability, Innovation and Equity for Health”. These objectives were three of six main issues in our selection processes of outstanding health care managers. These very criteria were essential yardsticks to discover them. By that we hope to be able to contribute some valid experiences to improve “Sustainability, Innovation and Equity for Health in Europe” (SIEHE).

## 5. References

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Note: This paper addresses some issues related to the project “Sustainability, Innovation and Equity for Health in Europe” (SIEHE).