WHAT ARE THE QUESTIONS WHICH MENTAL HEALTH DATA SYSTEMS ANSWER?

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Professional personnel in mental health delivery systems use management information systems with reasonable efficiency in operating support functions, but they do not regard information as valuable and do not use it efficiently to make decisions that allocate resources and set policies to reach major objectives for populations of clients. A categorization of decision types is presented for heuristic purposes. A series of workshops using computer simulations of mental health delivery system decision problems are described that are intended to provoke creative contributions from mental health professionals of all sorts who participate in them. This strategy is based on the belief that improved management information systems cannot be created by imposing them on the managers and line workers; they must be created and supported by managers and line workers who regard high quality data as useful in day-to-day decision making. Such workshops supported by computer based simulations could become a routine part of the training efforts of most mental health delivery system units that have management information systems.

Introduction

Mental Health Data Systems (MHDS's) appear to be set up to answer questions. The case can be made, however, that existing Management Information Systems (MIS's) serving mental health units are not very effective, and that this ineffectiveness is due in part to lack of clarity in the minds of mental health systems management concerning the decisions that need to be made and the role of information in making these decisions.

It seems useful to make a sharp distinction between two parts of a Management Information System used in a mental health delivery system. The first part of the MIS provides data for making decisions about how the system should reach its major objectives. What clients should be served? What are the objectives we are trying to reach for our clients? How should money be allocated to best serve our clients? We shall call these the core decisions. The second part of the MIS provides information about support systems and helps us to operate them. These support systems include scheduling functions, record storage and retrieval, registration and census of clients for fiscal purposes, patient billing procedures, accounts receivable, purchasing and inventory, cost finding and rate setting, accounts payable, budgetary systems, general ledgers to keep track of financial transactions, personnel records, payroll records, food service records, maintenance, grants management, and special projects, etc. It appears that computerized information systems are now working with considerable efficiency in many places to accomplish these support functions.

In making the claim that information systems are being used inefficiently because of lack of clarity about the decisions to be made, we are referring only to the first part of the MIS, the portion that is relevant to choice of options that are directly concerned with core objectives. The rest of this paper will not be concerned with support services.

This paper will try to accomplish three objectives:

1. Some evidence will be presented to support the claim that MHDS managers and workers do not have a clear picture of the decisions they are in fact making to reach objectives that concern clients. This evidence will be brief and incomplete and is presented only to explain why we have put the effort we have into activities covered in the rest of the paper.
2. A system of categorization of decisions that are made in order to reach core objectives of an MHDS will be presented.
3. A program of training for improving decision making will be described. This program uses workshops and computer-based simulations of carefully structured core decisions.

Lack of Clarity in Setting Objectives and in Using Information to Make Core Decisions

Professional personnel in mental health systems are almost continuously engaged in decision making, and in solving problems of the most complex sort. In many cases, however, these decisions are made in the absence of a real review of the elements relevant to the decision. There is a strong tendency to do this year what was done last year, to change budget allocations only when new funds can be obtained for new functions, and to use time pressures as justification for avoiding a review of the process of decision making. This generalization about the quality of the analysis of underlying decisions in mental health systems
could, of course, also be made about decision making in many other types of organizations. This does not mean the generalization should not be made. The real issue is whether a clarification of the process can contribute to a definite improvement in the quality of decision making.

Our laboratory has conducted a survey of administrators and line workers in a sample of community mental health centers in Michigan. This survey is reported in this Symposium by D. Knesper.

A major finding of this survey is that many administrators and even more line workers do not regard information about the population of clients they serve as very useful. There are, of course, many contributing causes for this phenomenon, including the quality of the actual data bases being used, political problems about confidentiality and the desirability of labeling clients with diagnoses, some mild institutional paranoia about how the information collected could be used by higher authority, etc. We asked each administrator surveyed to give an example of a decision in which client descriptor data might be useful. A few gave very thoughtful examples, but the majority did not use information to clarify the options open to them for decisions. After the survey we have confirmed this impression with many informal discussions with line workers and administrators in many different settings and by recording and analyzing the discussion of participants in workshop settings.

One reason for the perception that information is not very useful for decision making is that existing MHDS's MIS do not provide the data that is relevant to many decisions. Managers rely instead on informed guesses of professionals. It is possible that MIS's could be upgraded to provide useful data that would meet specific needs. One objective of our effort to categorize decisions typologies is to see if we could list precise information needs for a carefully described set of decisions.

A second difficulty seems to be that existing data bases only provide a description of "how we did it last year." There is, therefore, no data in the MIS that permits the evaluation of alternative options. This means that most decision makers consider a very narrow range of options.

A third difficulty is that no data exists in most MIS's about potential clients as opposed to actual registered clients. This means that decisions to improve performance in meeting community needs are crippled.

A fourth difficulty is that the data on the effectiveness of intervention, which would require some measure of the severity of problems, is seldom adequate. Many specialists in management have suggested that measures of this sort can be developed and used, but they do not exist in most community mental health centers and even psychiatric hospitals do not store this data in easily retrievable form.

A fifth difficulty is that cost data and revenue generating activities linked to specific patient care activities are not usually collected separately. Because many third-party payment schemes will pay "costs" or costs minus some specific fraction to be paid by clients, the concept of cost has often become the negotiated amount that third-party payers will accept as "costs." It would be useful to collect "true costs" associated with different intervention options and with different formulae for assigning overhead to functions performed for specific populations.

A sixth difficulty is that most data systems are restricted to isolated units of an MHDS. We do not really know how many clients who were seen in one part of the system are also seen somewhere else. In other words, admissions are not necessarily "unduplicated." It is, therefore, difficult to use new admissions as measures of incidence.

A last difficulty to be mentioned here is that the categorization of clients into diagnostic categories is not often performed in a fashion that can be relied on to yield reliable categories. Many psychiatrists and mental health workers will admit privately they use labels that are not the correct ones, either to protect clients from alleged stigma or to make them eligible for benefits they would not otherwise receive.

We have not found it useful to complain about these inadequacies. When information services are bad, planners and line workers in mental health agencies do not contribute good data, do not ask good questions, do not allocate resources for information, and do not contribute to the development of better information systems. But unless planners and line workers do contribute high quality data, ask good questions, allocate resources, and contribute to the intellectual development of the information system, the system will remain defective and therefore disappoint everyone. To get out of this vicious circle all participants must tolerate a less than adequate MIS as they work to improve it.

We assume great steps can be taken to make computerized data systems more available and more efficient. But we believe the most important objective is to develop widespread understanding among the personnel of MHDS's of the potential role of high quality data in improving services. This has led us to develop an idealized categorization of decisions we believe are actually made by MHDS's, with or without information, and to develop workshops based on computer simulations to develop widespread discussion of the critical decisions in the uses of information in making these decisions.

Description of Mental Health Delivery Systems

We distinguished three types of systems: a Mental Health Delivery System (MHDS), a Manage-
Mental Information System or Systems for a Mental Health Delivery System (MIS), and hardware, software, and peopleware systems that are used to implement the Management Information System (HSP). A MHDS is conceptualized as a network of units that deliver services or establish constraints and policies that govern those services, for a specific catchment area. It is very important to understand that this model of a MHDS requires catchment-wide responsibility and that such a system may contain units that are noncooperative or even competitive. Any hospital or agency that does not have catchment-wide responsibility in one way or another is not an MHDS by this definition. The reason for this requirement is that it permits us to compare the information needs of an MHDS, defined in this way, with those of a unit of an MHDS with responsibility for a population of clients but without catchment area responsibility. We distinguish the MIS from the HSP because if we have the task of assigning components of the MIS to units of a MHDS, this is a different task from assigning hardware, software, and people working for a MIS to those same units.

In our model of an MHDS there are four types of units each of which is related to each of the remaining units by one of five accountability-type relationships. Every unit is seen as a decision maker that makes certain specific decisions, that generates information which can be sent to other units, and that utilizes information that comes from other units. (See Figure 1.)

The four types of decision making units are:

1. **Societal decision makers**: such units do not make direct decisions about the delivery of services to clients or have direct responsibility for unmet needs in a catchment area. They do, however, allocate funds, legitimize other units, create policies that regulate the activities of those units that depend on them for funds for legitimization, etc.

   Examples: state legislatures, Blue Cross/Blue Shield policy groups, etc.

2. **Catchment-wide managers**: these units have a major responsibility to reduce the severity weighted average point prevalence of mental illness and to reach certain other specific objectives for specific geographic areas within certain time constraints. They have this responsibility even though some of the units of the MHDS within that geographical area may not be accountable to them. Such units may be hierarchically organized with one unit having responsibility for a wide geographic area, delegating its responsibility to other units, each adding responsibility for smaller geographic areas.

   Examples: state departments of mental health, community mental health centers, etc.

3. **Population intervention managers**: these are units of the MHDS that do not have responsibility for a catchment area but do have responsibility for a specific population and often are restricted to a limited number of intervention types. This population may be defined by policies transmitted from a unit to which this unit is accountable, or it may be defined by the policies of the unit itself.

   Examples: mental hospitals; clinics; private practitioners who define their own population admission-discharge policies.

4. **Case workers**: these are units of the MHDS that have responsibility for individual clients but who make no policy decisions on populations.

   Examples: psychiatrists; psychologists; social workers; occupational therapists; recreational therapists; "mental health workers"; prevention specialists, etc., who work for a population unit that establishes policies that govern which patients are selected for care and other general conditions of responsibility.

The five types of accountability relationships between units are:

1. **Accountability associated with unidirectional legitimization, granting of subsidies, and policies associated with such legitimization and subsidization**.

   Examples: the relationship between legislatures, county commissions, city councils, boards of United Fund organizations, National Institute of Mental Health, foundations, etc., on the one hand and the units they legitimize and fund on the other.

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**Figure 1. An Example of a Mental Health Delivery System**

![Diagram of Mental Health Delivery System](image)
2. Accountability associated with the unilateral establishment of benefit structures for health insurance and other health payment systems that are contingent on the entry of specific clients in the system. Such health payment programs, in addition to having benefit structures that act as constraints, also can have policies that further constrain the actions of population intervention managers.

Examples: the U.S. Senate may create a national health insurance plan with specific benefit structures. Blue Cross/Blue Shield may create specific benefit structures and have policies that population intervention units must live up to in order to receive these funds.

3. Full accountability: this is a unidirectional relationship in which one unit delegates responsibility to another which, as a result, becomes accountable to the first. Examples: a community mental health center creates an aftercare clinic and delegates to it the responsibility for services to patients discharged from state hospitals and other inpatient services. A community mental health center forms a relationship with an existing child guidance clinic such that the clinic will receive state or federal grant funds allocated to the mental health center if it becomes fully accountable to the mental health center for providing child services for an indefinite time interval.

4. Negotiated accountability: any two units may create a contract or quasi-contract that is revocable that requires each to perform some service, provide funds, etc. for clients or for another unit. Example: a community mental health center and a family service agency prepare and sign a contract in which the community mental health center will allocate funds provided the family service agency will use these funds to make housekeeping and home visits for elderly, chronically mentally ill clients living at home.

5. No accountability: two units are independent and one unit cannot require the other to do anything. Example: two independent, voluntary, semi-private hospitals.

A mental health delivery system, defined in this specific fashion, made up of units of the types specified, all of which are interrelated by the types of relationships we have described, exists for every geographic area in the United States. Most of these MHDS's were not designed with much conscious planning. They have evolved as a result of the extension of the private practice of medicine and psychiatry, the development of state and local inpatient and outpatient services, and by the development of community mental health systems. It is our belief that in the future, considerably more conscious planning will go into the design of such catchment-wide MHDS's and that the design of MIS will be important in this planning and in the coordination and maintenance of the systems. We are particularly interested in MHDS in which there are units that are not fully accountable to one another.

The objectives of any actual MHDS are very complex. The following list does not cover all possible objectives exhaustively, and it does not cover alternative ways of wording the objectives that are based on different value orientations. It also lists clusters of objectives without specifying the precise subobjectives in detail. The list was made up by recording every objective we have heard mentioned in psychiatric and mental health circles. These were then simplified and clustered for convenient discussion. The list is intended to provoke discussion rather than to establish standards or force agreement.

The major objectives of all MHDS's we assume to be:

I. To minimize the severity weighted average point prevalence of all mental illness and/or psychosocial maladjustment, for all the people in a catchment area, over a time scale long enough to include the lifetime of the clients involved, with concern for clients in all categories defined by a set of important sociodemographic variables and by a set of diagnostic or problem identification variables. For purposes of simplification, we shall sometimes call this objective the severity weighted average point prevalence objective (SWAPP).

This major objective is usually thought of as being attained through a set of subobjectives, which can be regarded as means to that end. We can often pursue these subobjectives in parallel but they sometimes compete with one another for resources.

Subobjectives:

I.a. Minimizing incidence through primary prevention.

I.b. Maximizing the conversion of non-applicants to applicants (outreach, case-finding, advertising, etc.).

I.c. Maximizing the conversion of applicants to cases receiving care, by maintaining adequate capacity (beds, outpatient slots, manpower, etc.).

I.d. Intervention to treat illness or solve adjustment problems to minimize the duration of illness or disability (produce cures).

I.e. Intervention to treat illness or solve adjustment problems to minimize severity of uncured cases.
I.f.  Minimizing severity of illness on psychosocial maladjustment by preventing increases in severity (tertiary prevention).

Other objectives are:

II. Distributing care evenly over all groups defined by "important" sociodemographic variables.

III. Maximizing human contact, support, and social services for all clients whether or not objective I is pursued.

IV. Minimizing social disruption and social danger in all communities due to the presence there of people who are different, bizarre in behavior, assaultive or homicidal.

V. Minimizing deaths associated with mental illness or psychosocial maladjustment (suicide prevention).

VI. Maximizing the profit of private practice and the self interest rewards of providers.

VII. Minimizing total costs of services for mentally ill whether these costs are met through subsidies (taxes or gifts from individuals), insurance, medicare, etc. (premiums or taxes), or self insurance (client payment).

VIII. Minimizing the dumping of clients when the insurance money runs out.

IX. Minimizing the providing of unnecessary service for clients just to obtain insurance money.

X. Minimizing the stigma of the labels associated with mental illness and/or psychosocial maladjustment and minimizing the deprivation of civil rights associated with care.

XI. Minimizing iatrogenic disability secondary to treatment.

XII. Maximizing the efficiency of client services (peer review to make patient needs match services rendered; other efficiency activities).

XIII. Maximizing the efficiency of support services.

XIV. Maximizing the quality of, and range of, medical services that deal with medical problems other than mental illness or psychosocial maladjustment.

XV. Individualizing client problem solving. Providing a range of services and an appropriate timing of services and a matching of detailed services to precise needs to deal with a very wide set of major and minor problems of individuals that go beyond those defined in I and III.

We assume all units are trying to reach some subset of these objectives. Each unit will do this by identifying a set of options open to it.

In order to make our description of decision making in mental health more detailed we have found it useful to follow the analysis of decision-making based heavily on the work of Bayesian theorists such as Howard Raiffa. However, I would like to stress that decision theory can be used in at least two ways; as a technical tool in making a particular decision, and as a model that provides some anatomical structure for the process of decision making. In this paper, and in the work of our laboratory, we are not at all arguing that all decisions in the mental health field should use decision theory as a tool in practical decision making. It might be useful in some cases; but on the whole, the decisions that need to be made are so complex and the features of the situation so difficult to quantify that decision theory is not likely to be used in most settings. However, decision theory is useful for talking about decision making, particularly about how to conceptualize information within the decision making process.

A decision can be regarded as a series of steps that begin with a vague recognition of the problem and proceed to a tentative identification of the objectives of the organization that are likely to be influenced by the decision and a tentative identification of options among which a choice is to be made.

Consider a typical decision in a mental health unit. Suppose we are considering removing $10,000 from the budget of one cost center (and in so doing reducing the funding of some functions of that cost center) and using it to add to some functions in a second cost center. The options we are considering are A' and A", let us say, leaving $10,000 where it is, and placing it in the second cost center, respectively. The choice between A' and A" is up to the decision maker, but this does not determine the outcome. It is not certain that any single outcome, say that twenty-five people will be cured, will follow from choosing A'. After a decision maker chooses A' or A", nature responds with one or another outcome, each of which has a probability attached to it. Knowing the probabilities of the different outcomes for any option, we can, in principle, compute the desirability of option A' compared with option A". This suggests that for convenience we can think of decision making as consisting of five steps: pre-analysis; structural analysis, in which options are identified, constraints identified, and consequences clarified associated with options; uncertainty analysis, in which the probabilities of consequences associated with options are estimated; utility or value analysis, in which the desirability of the consequences are assessed in a more or less orderly fashion; and lastly, an optimization analysis, in which the choice among the options is made.

In decisions of some complexity, each consequence resulting from the choice of one option over another may have more than one important attribute. For instance, in the example we have
chosen, in which we have considered the wisdom of moving money from one cost center to another, for both options we must consider the effect on the number of admissions, the type of clients treated, the number of cures, the cost, the revenues generated and perhaps the incidence of undesirable side effects, among others.

Information is needed at several of the stages of decision making.

1. Preanalysis: Information of various sorts can help in the preliminary formulation of the problem.

2. Structural analysis: Information can be used to identify objectives; to list performance variables relevant to specific attributes of objectives; to describe the quality of data available using performance variables; to identify options already tried and to suggest alternatives; and to identify constraints limiting the outcome possibilities.

3. Uncertainty analysis: Information should be able to help us predict the probability of the system performing within certain limits provided we adopt one option or another.

4. Value analysis: Information could be made available on the preferences for outcomes and the value tradeoffs made by decision makers.

5. Optimization: The actual optimization will usually be made informally in most present day MHDS units (i.e., computational approaches to optimization through linear programming, etc., are probably out of place at this time). The results of optimization decisions can, however, be stored as information for use in future decisions.

We have described a MHDS as a network of units linked by different accountability relationships. Each unit becomes a "locus of decision making." The types of decisions made at each type of unit are different and the decisions also differ depending on the nature of the accountability relationships. For instance, although a legislator establishes subsidy support for a community mental health center and the manager of that community mental health center may, in one sense, have the same objective, let us say, to reduce the severity of mental illness in a specific community, the options open to them to achieve this objective are different. The legislator must decide how much money to approve to support the budget request of the community mental health center (made through the channels of a state department of mental health), and he must further decide whether he wishes to make the subsidy he approves conditional on the manager following specific policies laid down by the legislator. The manager must decide what options are open to him in spending the money, and how to allocate funds to specific populations and to specific intervention functions, etc.

The fact that efforts to reach the same objective require totally different decisions at different loci in a MHDS is partly responsible for the difficulty in deciding what decisions are in fact being made. Societal decision makers, catchment managers, population intervention managers, and case workers describe the work of MHDS's in very different terms. We have a situation very like the blind men examining an elephant. Those handling the tail don't understand the verbal reports of those handling the trunk or ears. Case workers often talk as if the only important decisions being made in a MHDS are the choices of the details of individualized treatment plans. They totally ignore the need for policy decisions on how populations with specific problems are to be handled and yet these population decisions are critical for planning facilities and budgets. Population intervention managers are concerned about populations but they often do not need to worry about populations not under their direct care and they often are not concerned with prevention of illness in the general population. Catchment managers must be very concerned about allocating funds between preventive and therapeutic services or between inpatient and outpatient facilities, but they often sound as if their job is completed once services are made available.

This description of decision making in a MHDS is a preamble to suggesting that an orderly categorization of decision types is possible and that given such a categorization of decision types and a statement of the loci in the MHDS where the decision is made, it should be possible to describe the information needs of each unit in a MHDS.

A tentative list of decision types is displayed in Table 1, with an indication of the types of units in a MHDS that are likely to make such decisions. This is insufficient to describe the actual decisions made in each unit. The actual decision depends on the constraints operating, on the policies determined at higher levels in the system, or based on negotiation with other units, etc.

The details of a full list of decision types would also depend on the specific description of an actual MHDS. Let us suppose that some unit in the system is admitting patients selectively based on their revenue generating capacity (only insured patients are admitted) and patients are discharged when their insurance money runs out, whether they are still sick or not. These policy decisions must be made at some specific decision point in the system, and we must assume the policies are adopted to achieve some specific objectives: any specific detailed description of the location of decision types in this MHDS would identify the locus of the decision making, the type of unit making the decision, the accountability relationship with other units, and specify the information needed by that decision maker to decide whether the policies should be continued another year in order to meet unit objectives and to conform with the values of the appropriate value establishing manager or board.

We began this paper by asking what the ques-
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<th>Decisions to establish or change constraints:</th>
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<th>Catchment Manager</th>
<th>Population Intervention Manager</th>
<th>Case Worker</th>
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tions are that mental health data systems answer.
We now say that some of these questions are relevant to the support functions of the MHDS or one of its units. We decided not to concern ourselves with these questions, important as they are. The other important questions are the ones that need to be asked to clarify and make all the decisions listed in our tentative categorization of decision types at all loci in the MHDS where decisions are made.

Existing MIS for MHDS do not come close to providing the data needed to clarify most of these decisions. We should seriously consider improving the quality of existing data bases to see where better data is possible, and we should consider changing our perception of MHDS MIS to include special studies and even informed guesses of professionals. We need to be able to compare the numbers and types of clients in a MHDS as active customers with the numbers and types of potential clients not in the system. If we design our special studies of non-patients and our utilization data so that the categorization of clients and severity ratings are compatible, we could, in principle, combine data from these two sources to help us with some specific important decisions.

A major difficulty in improving decision making and the MIS's is the fact that there are major philosophical differences within the field about what the important decisions are and how information systems can help. For some people, the confidentiality issues, the poor quality of most data entered in MIS, and the difficulties in labeling and categorizing clients are such serious matters that they have no desire to improve MHDS MIS. As we stated earlier, we do not feel that complaining about this state of affairs serves any useful purpose. We do believe it may be useful to develop training methods that acquaint mental health professionals of all types with core decision issues, and that permit a review of the role that improved MHDS MIS's could play in better decision making.

Provocative Structured Learning Workshops

I would like to devote particular attention to our activities using simulations of mental health decision making processes. It has been our experience that mental health workers of many types become bored when issues of administration are raised. The usual picture in the mind of a clinician of an administrative problem has to do with sending out bills or arguing about the levels at which fees should be set. Therefore, it is not easy to interest such individuals in evaluation and information systems through standard lecture techniques. Over the years, we have found that workshop approaches are much more acceptable, partly because they do not make the pretense there is one expert who is prepared to impart knowledge to others who know nothing about it. The workshop is an honest effort to get the best knowledge from every participant and, in a sense, everyone is both teacher and learner. The major difficulty with such workshops is that they are often so unstructured that it is very difficult to anticipate what ideas will emerge and what type of learning will take place. We have, therefore, tried to combine the workshop notion with the use of some highly structured experience, making use of computer simulations. We have conducted pilot studies on these methods with individuals from both community mental health settings and the Department of Psychiatry.

In each of the simulations, students work in pairs and are given a case study problem to solve. The reason for the work in pairs is that this permits us to ask each participant to clarify his ideas, and it permits us to make a tape recording of the team efforts at problem solving, in each of the simulations, information is available about the system that would be useful in the decision making, but there is always the possibility of obtaining more information at a cost. The individuals must therefore evaluate many different levels and types of information and decide which types are relevant to their purposes and which not, and which are worth the cost. Then the individual makes a decision and the computer tells him what the outcome is. The computer is thus really used as a way of generating complex data as a consequence of different decisions. In addition to this, we have simulated decision making in the computer, using linear programming optimization models, so that we can, if we wish, ask the computer itself to make a decision using values adopted by, and the information available to, the subjects.

One of these simulations is an evaluation of the effectiveness of different types of treatment. It raises problems that are often associated with the research designs used in the evaluation of drugs or psychotherapy but it does this in a setting that is as much as possible like that faced by the average clinician.

A second simulation is concerned with the allocation of funds to different functions in a large system. It particularly stresses the issues involved in decisions to allocate money either to prevention or to treatment for the same condition. The issues include the fact that it is obviously foolish to put large amounts of money into either prevention or treatment unless it can be determined that it is effective. It is also possible that putting large amounts into prevention would make treatment unnecessary even if treatment is effective. It also raises the issue of comparing the desirability of putting money into one illness compared with another.

A third simulation is primarily concerned with the development of admission, discharge, and treatment assignment policies in order to achieve outcomes that are consistent with one's values. This simulation takes into account a wide range of sources of revenue and permits decision making to be based on many different insurance and subsidy situations.

The "Insurance Subsidy Game" places pairs of players in the role of U.S. senators designing national health insurance policy, state senators designing subsidies for community mental health
and inpatient facilities, and facilities managers who must use resources from these sources to maximize patient benefits at reasonable cost levels. All of these players call for and use mental health utilization data to help them make optimization decisions based on their objectives and values.

A "Data Base Manipulation Game" uses a simulated data base in MICRO, a University of Michigan Time Sharing System data base management language. This gives experience in formulating questions and answers as sequences of routinely requested sets of data based on highly selected populations of patients, selected in many different ways, and in formulating and asking spontaneous and unusual questions that might occur to mental health workers.

Description of one simulation: the Five-Value Trade-off Game

I shall go into a little more detail in describing the third simulation because it clarifies the use of these games in teaching. A group of eight or ten potential students is divided into pairs. An effort is made to include both clinicians and individuals with some administrative interests or skills so that they can learn from one another. A pair of individuals acts as a decision making team in setting admission, discharge, and treatment policies. Before the decision making occurs, a questionnaire is used to clarify the values of the individuals. We are particularly interested in getting the participants to see that trade-offs are necessary among the objectives they may have. They may be interested in providing service to as many people as possible without concern for any improvement that may be expected. On the other hand, they may be interested in achieving cure rates that are high. Still others may be interested in cost containment or in achieving profits of one sort or another. It is also possible that the decisions they make could harm the patient by keeping him after treatment has become unnecessary, or perhaps by discharging him before he has benefitted from treatment because his insurance money has run out. The problem is to pick an admission strategy that will help meet the set of values chosen. This might mean that only insured patients would be accepted, that the ratio of insured to uninsured would equal that in the community, or that only uninsured patients would be admitted. A discharge policy then is chosen which states whether patients will be discharged only when they are cured or when it is determined that treatment will no longer be effective; whether they will be discharged when the money runs out, even if these other conditions are not met; or whether they will be exploited by being given unnecessary hospitalization just for their insurance money. Clients can be assigned to treatment at three levels. Each treatment carries with it a mean cure rate provided individuals are kept as long as it is necessary for them to stay for improvement. Patients get better at different rates and both the time of the first recovery and the time of the last recovery are dependent on the treatment. This means that the analysis of the effectiveness of treatment is dependent not only on the treatment chosen, but on the duration of time that a population is, on the average, kept in a unit. As a result, relatively complicated strategies must be worked out. To do this, a variety of forms of information are available. Players can receive information free that is roughly equivalent to the standard utilization data available in most agencies, but they must pay money for more detailed information about the effect of treatment on similar groups of patients in the past, both with the same and with different treatments.

In practice, we have found that students engaged in these decision making processes clarify most of the issues that we wish to have discussed that are concerned with the use of management information systems. When the simulation is over, the results are displayed on a chart which indirectly teaches much of the conceptual material involved in decision analysis. No effort is made to teach the formal structure of decision theory. There is then a debriefing session in which the students discuss their decision and discuss the relationship that this task has to the type of decision making they do in their own agency. At a later date, all of the individuals are gathered together and there is further discussion of the simulation. By this time, the tapes of the discussions between the decision makers have been analyzed, using a content analysis procedure that separates those discussions that are relevant to decision making from those discussions that are relevant to the strategies for use of information. Issues which may have been raised by one pair but not others can now be raised for discussion by the group. In this way, all of the major items which we think should be discussed can be brought in in some way.

When the workshop is over, each individual participates in an interview with staff and in a semistructured way is led to make comments about the entire experience. This provides an additional opportunity for learning, but it also is a useful evaluation procedure for getting at what has been learned from the experience, particularly with individuals who have widely varying value systems. It is instructive to have a pair in which one individual, who strongly believes in providing social services to all patients and has relatively little concern for either cures or cost containment, has an opportunity to interact with a business oriented person interested primarily in both cures and cost containment. Because the discussion is focused, it brings out the relationship of values to objectives and clarifies many of the issues which we have identified as problems in the earlier sections of this paper.

Conclusions

1) Professional personnel in mental health delivery systems use management information systems with reasonable efficiency in operating support functions, but they do not regard information as useful and do not use it very efficiently to make decisions that allocate resources and set policies to reach major objectives for populations of clients.

2) Somewhat arbitrary categorizations of decision
types assigned to specific loci in complex mental health delivery systems can be prepared. These categorizations can be used to provoke discussion among mental health professionals and might contribute to better organization of management information system data bases and better design of question formulation and question answering capabilities.

3) Political differences among mental health professionals over system objectives, concerning the value of information, and over the contribution of information systems to confidentiality leaks and troubles due to labeling, are barriers to efficient design of, and use of, mental health delivery system management information systems.

4) Workshops that provoke creative thinking about the value of information in decision making and about the structure of important decisions may be useful in changing attitudes and skills of mental health professionals.

5) Such workshops, supported by computer based simulations of decision problems could become a routine component of the training efforts of most mental health delivery system units that have management information systems.

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Bibliography


