

A Normative Definition of the Process of Areawide Health Services Planning

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DURING the past decade, interest in and the need for health services planning has been at its greatest. But, as yet, the significant benefits that were expected to result from planning have not been realized anywhere near a nationwide scale. Although planning is widely viewed as a necessity and "corporate good" in dealing with health system problems, good intentions alone do not guarantee results. To be effective, planning must be directed toward well-defined objectives, possess a unified and unbiased point of view, and proceed in a rational, analytical manner. In view of the diverse interests represented by existing planning organizations, a lack of consensus on goals and perspectives for planning is understandable.

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However, much of the controversy and frustration that now pervades areawide health planning concerns the appropriateness of various methods for performing planning in an organizational context (1-6). In fact, it is widely agreed that few persons know how to plan in the health area. Direct observations of a number of planning agencies, even of those within a common program structure such as comprehensive health planning, reveal that planning processes differ among agencies and generally are not the result of efforts to create a workable, efficient planning methodology. This condition is less a result of the diversity of interests and organizations in health planning than of the nonexistence of a comprehensive and generally accepted model or theory of planning that could be applied to health services problems.

Belief in the potential of health planning results largely from the perceived "success" of planning in business. Although the inference that "what's good for business is good for health" might contain an element of truth, business has yet no model of a planning process that private or governmental health planning organizations can bor-

row and make operational. In the abstract, the process of planning remains more a property of intuition than of science. Methods and philosophies that succeed in some businesses fail in others. Most of the literature on the subject deals with the "art" of deciding where and when planning is necessary (7-9).

The techniques available to assist planners are largely specific to minute subproblems within the overall planning process. Useful as such techniques may be, they do not insure that a planning body will go through the necessary steps to emerge with a carefully reasoned, implementable health services plan that addresses problems at a causal level. Thus the rapid formation of area-wide and local planning bodies that occurred during the past decade left planners with the Herculean responsibility of organizing for an undefined task.

Heavy Federal involvement in health planning through regional medical program (RMP) and comprehensive health planning (CHP) legislation represents a significant attempt to provide a more uniform definition of objectives for planning and has suggested, by implication rather than overt specification, the process through which objectives can be realized. Although the CHP legislation can be viewed as a positive force in encouraging greater commonality of objective and perspective in health planning, it has retarded the development of systematic methods through which objectives can be realized. In the absence of operational models of the planning process, local CHP councils were forced to turn to the legislation itself for guidelines. In the legislation, the councils found the philosophy of partnership and creative federalism—planning was implied to be equivalent to establishment and maintenance of cooperative arrangements among the many segments of our health delivery system. At the local level, it was reasoned, such arrangements would lead to mutual understanding of important health problems and their eventual solution.

This is certainly not a definition of planning. At best, it constitutes a plausible set of criteria for identifying a viable basis or prerequisite for planning. However, it is only a plausible set of criteria in view of the considerable controversy existing at the procedural level regarding how planning objectives are to be operationalized and implemented. While much of the health planning literature deals with organizational problems, creative work is also required to define the health

planning process in detail and produce guidelines for the conduct and evaluation of this process. This paper presents a first step toward such a definition.

Normative Definition

The normative definition of the process of area-wide health services planning that follows evolves from a study of methods for evaluating health planning. The perspective of the process definition is limited to program (or project) planning in contrast to goal setting, since program planning is most capable of advancing ultimate health and patient care goals. Program planning is defined to include those activities associated with identifying a health problem and developing the necessary program of care delivery to resolve the problem. Goal determination, on the other hand, involves substantially different processes from program planning. The setting of goals is a process of social or political consensus. As such, the appropriateness of goals or objectives is an ethical or a societal value problem that is outside the bounds of this study.

The health planning process is recognized as being composed of four major phases that encompass the following 14 distinct activities:

STIMULUS TO ACTION PHASE

Symptom recognition

Problem definition

ASSESSING FEASIBILITY OF INTERVENTION PHASE

Listing major alternatives

Estimating resource requirements

Surveying availability of resources

PLAN DEVELOPMENT PHASE

Listing alternative resource configurations

Determining resource productivity

Assessing effectiveness of alternatives

Estimating program costs

Program selection

PLAN IMPLEMENTATION PHASE

Coordinating cooperating institutions

Designating an operating group

Attracting resources

Monitoring implementation and operation

Each planning phase and its component activities are described in the following sections.

Stimulus to Action

An important determinant of the quality as well as the quantity of planning performed by an organization is the process motivating that body to take action on a given problem. To perform this phase of planning effectively, an agency must be organized to recognize both obvious and dis-

guised symptoms of health system problems and then to determine the exact nature of the problem for which planning is required.

Since the planning council is frequently the only local organization with comprehensive responsibility for the health system, failure to detect and act upon the symptoms of a developing problem permits the situation to worsen. Where a small problem could have been remedied through a few simple steps by the council, the larger problem will consume large amounts of planning resources and time and, since the problem is now obvious to the public, force the council to work in a politically charged atmosphere.

Even when a planning body acts quickly, it may err by acting on the symptom rather than the root cause of the developing problem. Many local councils have recognized the possibility of solving the "wrong problem" and have sought, for example, concerning infant illness and mortality, solutions in terms of dietary education and improved housing as well as improved pediatric resources.

Symptom recognition. The symptom recognition step in health planning is concerned with the method whereby problems of potential or existing health systems obtain the attention of the planning agency. Although there are several avenues for such recognition, one should predominate. The planning agency should maintain an information system sufficient to allow it to monitor its area of responsibility in order to detect problems as they are developing. This can be done in two ways.

First, and foremost, the agency should identify those measures of health and health system performance it wishes to monitor. From these measures, it can then determine which units within the local health system are sources of information necessary to construct the measures. An information reporting system should then be designed to collect data from operating units and process them for evaluation by the planning council.

Obviously, such a monitoring system will never be possible unless the planning agency has previously established good working relationships with the many organizations active in a local health system. It should be pointed out to every unit from which data are requested that since major health problems do cross organizational lines, early problem detection requires centralized monitoring of the local health system. It is encouraging that several CHP and RMP groups have succeeded in establishing comprehensive information systems

supported by operating units within the health system.

It may not be as obvious, however, that a workable monitoring system should differ from many currently operating or proposed health data systems. Many existing information systems have been criticized as simple aggregations of all available health data, assembled without regard to how the data will be processed and used. The charge commonly heard is "data for data's sake." To be of value, a monitoring system must collect and process only information that supports the measures the planning agency wishes to observe and evaluate. Before proposing to collect a single item of data, planners must determine the ultimate measures they will require for detecting health system problems. The monitoring process will quickly break down if planners insist upon burying themselves in data.

Planners cannot be expected to be prophetic. Although they may go to great effort to construct a comprehensive monitoring system, some problems will still develop unnoticed. Thus, the planning agency should employ a second form of symptom recognition—planners should be receptive and responsive to evidence of problems reported unilaterally from any part of the health system. Again in this instance, receptivity and response will be enhanced where the planning agency has achieved the cooperation of providers and consumers of health services. Potential problems will be reported quickly when planners are known to be concerned about emerging health system difficulties. The agency will be better able to follow up reports when a basis for data collection already exists. Requests for additional information will be honored when the data source trusts planners to make fair evaluations and provide opportunity and guidance for corrective action if necessary.

Since planning agencies have limited resources, they cannot be expected to monitor every potential problem. Guidance in establishing a monitoring system should come from the priorities inherent to the agency's goals. For CHP councils and RMPs, the Department of Health, Education, and Welfare has outlined several health problems and target populations to which local monitoring should be sensitive. Additionally, local units must, as a requirement of their organizational grants, develop further statements of objectives and thereby establish priorities for monitoring.

Thus, a planning agency enhances its oppor-

tunity to be a positive force for change and improvement of the local health system if symptom recognition is an active rather than a passive function. In many local councils, planners seem permanently bound to "fire-fighting" duties as a result of waiting for problems to be brought to them—a sure formula for frustration.

Problem definition. Problem definition is the process through which recognized symptoms of a health system problem are investigated, and a specific well-defined problem is said to exist. The essence of this planning step is that the dimensions of a problem must be stated explicitly and in a manner that facilitates the development of a workable solution. Thus, the concept of a well-defined problem is introduced. A health system problem is considered well defined if the following conditions are satisfied: (a) the organization and specific functions therein having decision-making responsibility in a problem area are known, (b) there is agreement on the measures used to describe and scale the existence and severity of the problem, and (c) the problem is stated in terms of a disparity between health services required and those services the existing system can provide.

The activities of one CHP council illustrate the importance of a problem being well defined. As a part of its monitoring activities the council noted that, compared with national and surrounding urban area statistics, its region posted an unusually high ratio of deaths from accidental injury to total injuries. In other words, a person suffering an injury locally was more likely to die than if the injury were received elsewhere. The council was rightfully disturbed at such a finding. (The first point illustrated by this example is that a necessary part of the symptom monitoring system used in planning is a standard of reference for evaluating local measures. National data or those for areas with similar characteristics may be used when no absolute standard is available.)

In view of this rudimentary information, the problem could have been within the jurisdiction of several organizations. Obvious candidates were the area's hospitals, but which functions within the hospitals? The problem may have been with inadequate emergency room procedures for handling shock patients, too few trained trauma specialists, or a deficiency in other surgical and recovery care resources within the hospital. Another candidate was the ambulance system; accident victims may have had to wait too long

for hospital treatment because of an equipment shortage, inefficient dispatching, or other factors.

Since determining organizational responsibility is much like "laying the blame," planners must use measures of system performance that properly locate the source of a problem. In the foregoing example, the accident data for other than automobile accidents were so unreliable they had to be disregarded. Interestingly, local performance in national and surrounding-area comparisons was slightly poorer, where only automobile accident injuries were concerned.

Problem definition activity first considered local hospitals as the responsible system unit. The number of deaths in the emergency room, during and after surgery, as a proportion of total injury victims was judged to be excessive. No particular hospital could be blamed—all showed uniformly poor performance. Hospital staffs expressed considerable amazement—not to mention hostility—at these findings. It was pointed out, however, that particularly dangerous road conditions in the area may be contributing to more serious injuries, thereby producing faulty inferences from the accident data being used. Thus, an improved measure was required—one that reflected hospital performance within limited classes of injury severity.

At this point it should be noted that improved measures of health system performance frequently strain a planning agency's ability to collect data. Since the more common aggregate measures seldom are adequate for detailed problem definition, agencies frequently must scour the many information services and State and Federal agencies for the measures needed. In the example at hand, local planners knew where to look for data and soon learned two things: (a) local hospitals were on or above national averages in saving patients with nearly every kind of injury and (b) area accidents resulted in more severe injuries than elsewhere in the State. Thus, new organizational units, the State and local highway departments, entered the picture.

The problem has not as yet been pinpointed. Although the hospital system has apparently been absolved of responsibility, the ambulance system still stands between the accident scene and hospital treatment. Because of the high number of victims dead on arrival at the hospital, the council examined the average time between the accident and the arrival at the scene of an ambulance, performance was poor. Other measures such as ambulances per 1,000 persons and number of calls

received when no vehicle was available caused attention to focus on the patient rescue system. Further deficiencies were then noticed in the level of medical training demonstrated by attendants and in the system of dispatching vehicles owned by cities, hospitals, and several private organizations.

The problem reached a well-defined state when specific deficiencies in the level of attendant training, peak-load demand for emergency services, and maximum acceptable dispatching delays were identified. It was recommended that road conditions be studied by the appropriate highway divisions.

A well-defined problem is well on its way to solution, usually with the agreement and cooperation of the organizations responsible for the situation. A poorly defined problem is frequently an entree to political confrontation between planners and one part of the health system.

Assessing Feasibility of Intervention

Before detailed planning activity is started, it should be determined that there is a reasonable chance of implementing the results and easing or eliminating the problem. For agencies with limited resources, as well as CHP councils, being challenged to live up to their calling, every dollar and man-hour invested in planning must have the greatest possible impact on the health system. The carefully developed plans of health planning agencies, not unlike corporate planning staffs, are often rejected or simply ignored. Thus, a careful choice of problems frequently can be in the best interest of both the planner and the system planned. (Such a notion, if carried to the extreme, might have planners accepting only the most trivial problems. The only protections against such an occurrence are the commitment of planners to an improved health system and higher level review of the planning agency.)

Three appropriate steps to this phase of planning are (a) listing of major alternative solutions, (b) estimating the resources required by each alternative, and (c) surveying the available health resources to determine if any or all alternatives are feasible. The feasibility test usually takes the form of asking: For each alternative, is it possible to attract and appropriately organize the needed resources in a reasonable period of time? The three steps view the feasibility problem objectively. They force planners to ask if it is physically possible to solve the problem.

Listing major alternatives. The problem under study has already been explicitly defined in terms of a deficit of health care services available to a target population. This earlier step facilitates the suggestion of alternative programs for change in the health system to relieve this deficit by exposing the major parameters of the problem. In the ambulance service example presented earlier, the problem was stated in terms of a need for vehicles, training, and a dispatching system. Alternative programs would involve varying numbers and types of vehicles, different approaches to the training of attendants, and competing systems for dispatching vehicles and crews to an accident scene and then to the appropriate hospital.

At this point in the planning process, a preliminary list of alternatives should be proposed. Each alternative program should be described only enough to permit gross estimates of the resources required to implement such a program. Nonetheless, the feasibility assessment phase is a good point to begin considering a wide range of alternatives. A small "brainstorming" session may suffice to uncover innovative programs that withstand the test of subsequent analysis. One advantage of early identification of major alternatives is that the magnitude of the planning task can then be estimated. Sometimes the alternatives are so complex or require technology so unfamiliar to the planning body that the entire effort should be abandoned or outside consultants used. Obviously, this is an important part of the feasibility assessment.

Estimating resource requirements. Once alternative programs have been specified, the medical resources required to finance, staff, and implement each program must be estimated. Although these initial estimates will necessarily be imprecise, they should reflect more than simply the total cost of each alternative. Estimates should be stated in terms of all resources (levels of manpower, working capital, equipment, buildings, operating systems, and organizations) that a program will require. Cost estimates alone are insufficient for assessing program feasibility. One can easily imagine rural health care programs calling for only modest funding that cannot be implemented because of insufficient medical personnel. Similarly, financial resources may be readily available, but only for certain projects. Local tax revenue that would support hospital improvements may not be available for a drug control program.

Surveying availability of health resources. The

final step in assessing the feasibility of intervention in a problem is to determine if the area's medical resources are sufficient to satisfy the requirements of one or more of the alternatives thus far proposed. Such a determination requires a survey of the availability of those resources used by alternative programs.

As for nonfinancial resources, planners who are familiar with the local health system often can quickly determine if programs make unrealistic demands. For the ambulance service problem described earlier, planners would have little difficulty learning earliest delivery dates for vehicles and the size of the labor pool from which attendant trainees could be drawn. A somewhat more political issue would be involved in determining if ambulance owners would accept a centralized dispatch system and if area hospitals would cooperate in the admission of emergency patients.

The survey of financial resources requires a planning staff familiar not only with the local scene but also knowledgeable of the multitudes of State, Federal, and private foundations' programs for the support of health system projects. Although local tax revenues may be available for the support of a program such as the ambulance project, the survey should be extended in the hope that outside funds can be attracted. This tactic has two benefits: (a) local revenues are "saved" for another project that cannot be funded externally and (b) the planning agency earns political points it may well need at a later time.

Plan Development

Once a problem has been defined and intervention by the planning agency is judged reasonable, full-scale development of a health services plan can be started. For this phase of activity the agency will assemble all planning resources (such as planning staff, consultants, advisory committees, and project financing) that, during the feasibility assessment phase, were estimated to be necessary for completing a plan.

The planning process described in the following sections is a direct application of what may be termed cost-effectiveness analysis. Once alternative programs have been defined in detail, the effectiveness of each alternative in alleviating the problem is estimated. This is done by first estimating the effect of each individual resource employed by an alternative and then combining all resources into an operating program. When the costs of the various alternatives are known, it is

possible to determine the allocation of resources (alternative program) which is most appropriate for dealing with the problem. The phase "most appropriate" suggests that not all planning agencies would implement this process in the same manner. Although several planners may employ the same logical process, their philosophies (or meta-objectives) of planning may be widely different.

Ackoff (10) has identified three major planning strategies: "satisficing," "optimizing," and "adaptivizing." Although the strategy may differ, the logical process should remain the same. A brief description of the three primary planning strategies will facilitate discussion of several steps in the plan development phase.

When satisficing the planner selects an alternative that will attain a minimum level of effectiveness in dealing with a problem but not necessarily exceeding that level. In a classic example of satisficing behavior, a planner would accept the first alternative he identifies that (a) he can afford and (b) achieves the standards of effectiveness he regards as the minimum acceptable. Such a planner would not seek more effective or less costly alternatives; he is not concerned with the trade off between effectiveness in dealing with a problem and the medical resources consumed by alternative programs. On the positive side, this strategy is simple to use and preferable to no planning at all.

Satisficing, however, does not protect against inefficient allocations of health resources. While it permits identification of the deficiencies of past policies, it does little to insure that future opportunities will be exploited. Such planning is further weakened because it traditionally ignores the possibility of organizational change within the health system and plans for a certain rather than an uncertain future. Nonetheless, the logical order of events for a satisficing strategy of planning is essentially the same as the steps described in this phase. The primary difference is in the rule the satisficer would use to allocate resources to alternatives.

An optimizing strategy seeks an alternative that in terms of the effectiveness-resource cost trade off is in some way the "best." That is, the planner may select the most effective, the least costly, or the most resource-efficient alternative program. Certainly this is a more complex strategy, but it produces benefits over and above satisficing. By regarding the future as uncertain, the optimizer

is more likely to select a flexible program that will not fail if the future is unlike the past. Perhaps its greatest advantage is that the effort required to optimize produces a considerably better understanding of the problem and the trade offs required by a solution than does satisficing. Both strategies, however, can employ essentially the same logical processes.

Adaptive, or innovative, planning is based on the proposition that the value of planning is not the plan that results but the process used to create a plan. Proponents of adaptivizing argue that only when a thoroughly rational planning process is used will a problem be sufficiently understood to permit the creation of an organization and management system minimizing the need for further retrospective planning. Adaptive planning combines the optimizer's willingness to plan for an uncertain future with a desire to create organizational flexibility. Thus, such a planning strategy does not take the structure of the health system for granted; rather it builds into a plan motivation or incentives for change. The process of plan development recommended here is general enough to serve even this most ambitious planning strategy.

Listing alternative resource configurations. The first step in full-scale plan development requires explicit definition of all alternative programs—configurations of medical resources—to be evaluated. This is an extension of the listing process of the previous phase while differing in two respects. First, alternative programs must be specified in greater detail than before. The specific resources required, although not the quantity thereof, and a plan for organizing those resources should be made explicit. Second, in the active planning phase extensive search for new alternatives is clearly justified, particularly if an optimizing or adaptive planning strategy is being followed. Ideas previously regarded as poorly formulated must be investigated and either rejected as infeasible or fully specified as alternatives.

Emphasis in the definition of programs should be on the specific health resources to be employed, their organization into definable health services, and the target populations to be served. For the ambulance service example, one alternative program might be defined as consisting of the following components:

Three separate ambulance services to meet the varied needs of the community for patient transport: (a) two-man accident service units staffed with former armed services medics or those similarly trained in the treatment of fractures, laceration, concussion, shock, blood loss,

and rescue and removal of the injured, (b) two-man service units staffed by one intern and one nurse for calls related to cardiac attack, seizure, stroke, pregnancy, and other nonaccident factors, and (c) two-man transport service units staffed by medical aides for nonemergency transport of patients to hospitals or other care facilities.

Accident service vehicles owned and operated by municipal governments and equipped for patient rescue, removal, and onsite treatment.

Medical service vehicles owned and operated by the area-wide association of hospitals and equipped for emergency medical treatment.

Transport service vehicles owned and operated privately by ambulance services and morticians with State licensing of equipment and crews.

Physicians, shock therapists, and nurses organized into three ambulance-crew training programs administered by a single local hospital.

Central and remote radio equipment for dispatching vehicles and crews in response to a call for service.

Computer devices and necessary system support to assist the dispatcher in selecting an appropriate service unit, routing it to the call, and designating a receiving hospital.

Radio dispatch personnel.

The level of detail illustrated here is indeed necessary. Without it, for instance, it would not be possible to examine differences in cost and effectiveness arising from different patterns of crew composition or vehicle ownership.

Determining resource productivity. The previous step will have produced a list of alternative resource configurations for which estimates of productivity or "service capacity" must be obtained. In other words, for a unit of a specified resource organized under a given configuration, the planning agency must determine how much service that resource can provide. For example, with central dispatching services in operation a transport service unit may be capable of completing 30 calls in a 24-hour period, whereas the accident service unit could complete 16 calls.

The determination of resource productivity requires attention to defining the units of measure that will eventually form the basis for all future analysis and decision making, as well as evaluation of the resulting operating program. The ambulance problem, for instance, is not strictly one of insuring that a minimum number of calls can be answered in a given day. A new program must demonstrate that the appropriate medical equipment and talent can be delivered to the scene of an emergency in a reasonable amount of time. Resource productivity, when considered in these terms, is clearly a function of the volume of calls and the number of units in service as well as the

reaction time of those units. Productivity estimates can be determined via a simple simulation model that will produce, for a likely pattern of calls, a response time (call to arrival) as a function of the number of units of each type that are placed in service. Clearly, a time-per-unit figure would be meaningless since, over a given range, response time would decrease as the number of available units increased.

Finally, it should be anticipated that the productivity of a given resource will be highly dependent upon the configuration in which that resource operates. An ambulance can make more calls if it is in simple transport service rather than emergency or accident use. In the same sense, the response time of all system units may decrease if the dispatching system is replaced by a decentralized calling system.

Assessing effectiveness of alternatives. After estimates of resource productivity have been determined, it will be necessary to develop another order of measure that describes the effectiveness (utility or value to the community) of providing services over the ranges considered by the alternative programs. This new measure is needed since alternative programs may provide different services to different target populations and are, therefore, not immediately comparable. For comparability, it is usually necessary to develop a common measure into which the benefits of alternative programs can be translated. Only in the most narrowly defined problem situations will programs be comparable without this translation.

In the ambulance example, the program alternative defined previously deals with three target populations: victims of accidents, other medical emergencies, and patients requiring simple transport. It would be difficult to compare this program with another that was directed only at accident victims. Certainly the time required to respond to a call would not be an adequate basis for comparison since one program may be slower to respond but may serve many more persons. In fact, time to respond is an inconsequential factor for patients requiring only simple transportation.

One of several possible measures of effectiveness that could be used to compare alternatives such as these uses a fairly simple point system to score programs. One scoring system would award points based on the average response time required to deliver the appropriate medical talent to victims of an accident or other medical emergency. Point values would decrease with increas-

ing response time, as follows:

<i>Response time (minutes)</i>	<i>Point value</i>
0-5	10
5-10	9
10-15	8
15-20	6
20-25	4
25-30	2
More than 30	1

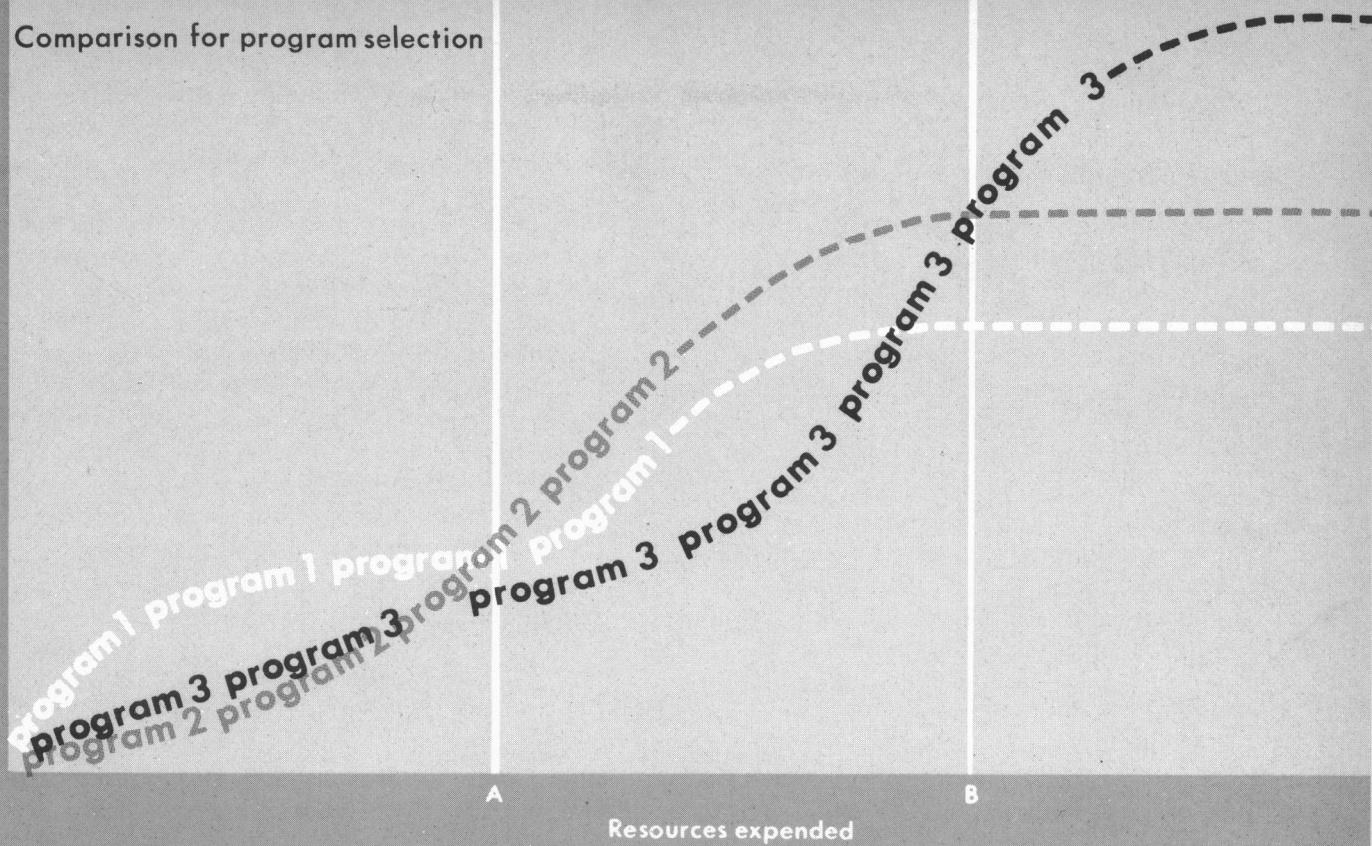
Patients provided with transport service would receive a score of, say, three points. A total program effectiveness score could then be determined by multiplying the number of persons receiving each service by the point score for that service. As a result, programs could be made comparable on a basis that reflected quality of service and the volume of services provided.

Obviously, more elaborate effectiveness measures could be devised for the ambulance program. Planners should take care, however, that the measures they employ do not become unwieldy or difficult to interpret. The temptation, particularly for outside consultants, to devise a formal masterpiece as a measurement scheme is often irresistible.

Estimating program costs. Before a decision can be made as to which program alternative should be selected, the resource costs of each program must be estimated. A cost function must be developed that accurately describes the expense of establishing and operating alternative programs at various feasible levels of resource utilization. The functional representation is necessary since in the planning step where alternatives were defined only the resource configurations were specified, not the scale of those configurations. Thus, in the ambulance program the existence of three two-man service units was proposed, but the specific number of trained crews and vehicles was left open. Had this not been done, there would have been an absurdly large number of different alternatives. One program with 10 accident crews and 8 emergency teams would have been different from a program using 9 of each crew. As a result, only major distinct alternatives are recognized.

However, another and more important reason underlies the way in which alternatives are defined. As the scale of a configuration changes, one would expect effectiveness to vary. Adding more ambulances should, over some range, improve the program effectiveness measure. But an increase in effectiveness comes only with increased resource cost. The value of this definition of the planning process, then, is its emphasis on the

Comparison for program selection



trade off between cost and effectiveness. This discourages satisficing behavior, simplifies the determination of a proper level at which a program should operate, and encourages efficient use of medical resources.

Program selection. The necessary groundwork has now been established to permit the planning agency to select the program it wishes to implement. The information base assembled up to this point consists of cost functions for various levels of program activity, measures of effectiveness relating to alternative resource commitments, and a knowledge of the availability of medical resources required by the programs under consideration. Broadly conceived, the selection problem is one of classic resource allocation, wherein financial and other medical resources are expanded to buy effectiveness in dealing with a well-defined health system problem.

The planner must now decide which rule to

apply to the allocation process. A satisficing strategy merely requires adding resources to the various alternatives until one program produces an acceptable effectiveness rating. However, since the satisficer has gone to the effort of assembling the information available at this stage, he can easily afford to become an optimizer.

While the optimizing strategy of planning presents a variety of rules for selecting programs, it also enables the planner to learn more about the decision he must make. Two rules are used most commonly in program selection. The first is but a simple modification of the satisficing strategy—it selects the program with a minimum acceptable level of effectiveness at the lowest possible cost, subject to constraints on the availability of non-financial medical resources. The second rule is complementary—it maximizes program effectiveness subject to limitations on budgets and other resources. Both rules suggest linear or integer

programming formulations to determine levels of resource commitment, although when the number of alternatives is small such elaborate technology is not required.

The planner need not commit to either rule, however. A useful analytic device (see chart) is to compute the effectiveness resulting from each program over a range of resource levels. This produces a graphic means of comparing programs. One interpretation of the chart is that for any level of resource expenditure up to amount A, program 1 is clearly preferred. However, above the budget level, program 2 dominates all other alternatives until resource commitment reaches amount B. At this point program 3, which heretofore did not seem promising, becomes the preferred alternative. Such an approach allows the planning agency to construct, when needed, forceful arguments for additional resources by showing the incremental benefits that can be earned.

Plan Implementation

Health planning agencies are often accused of working in a vacuum; that is, they observe a problem, develop plans for resolving it, and then abandon both problem and plans for activities in another area. The brief history of federally sponsored health planning suggests that if plans are to be realized, the planning organization must direct implementation efforts. Far from being a separate and avoidable duty, implementation is a central part of the planning process, requiring as it does the development of decision-making procedures and the design of organizations for the long-term operation of new programs. In a sense, planning for a given problem is never finished. Since the problem environment is constantly changing, it is important that a system be provided for maintaining the plan, thereby eliminating the need for further retrospective planning. This is synonymous with implementation.

It is not surprising that implementation is a highly political activity, more so than even problem definition. The first step in this phase requires agreement on the suitability of the plan by other organizations concerned with the health system. Only when this agreement is reached, can planners proceed to identify an existing body or establish a new operating group to assume long-term responsibility for the program being installed. Finally, resources can be attracted and committed to the project and the progress in implementation monitored.

Coordinating cooperating institutions. Once a plan has been selected, the planning agency should immediately identify the groups and institutions whose cooperation is vital to the plan's success and then move to insure that cooperation will be forthcoming. Perhaps the most successful strategy for gaining cooperation is to have involved these organizations in earlier phases of the planning process as problems were identified, alternatives explored, and final plans selected. Thus, the CHP model of establishing cooperative arrangements among groups within the health system should result in a good basis for plan implementation.

It is important that all groups that may contribute to or be affected by the proposed program reach some consensus as to the appropriateness of the plan. If objections are particularly strong, a small amount of time invested in further plan development activities should prevent substantial losses from occurring when an embattled program fails. In the ambulance program situation described previously, mutual trust had to be gained among planners, municipalities, and independent ambulance operators before the operators would agree to a central dispatching system. Since the dispatch service was to become a public office, the private-service owners felt they would be the last to be called when transport service was requested. When the necessary accommodations were made, objections ceased.

Designating an operating group. The configuration of resources in the program selected will, in part, suggest the organization responsible for implementing and operating the program. If the organization is an existing institution, the planning agency must offer assistance in reorganizing for the new function, as well as consultation on issues of timing, interagency cooperation, and progress monitoring. In the ambulance example, one local hospital becomes responsible for conducting a training program for attendants. The planning agency should advise that hospital on a number of matters, including the annual graduation rate needed to sustain the program, the level of training prospective students can be expected to have, and means of attracting trainees. Given the conditions of the funding for this program, the planning agency will also have to negotiate an amount, if any, of reimbursements to the hospital for the training program.

Where new organizations are required to operate a program, the planning agency must actively

participate with cooperating institutions in defining the structure and staffing. In several instances a program has failed because a newly created operating unit did not integrate well with the other units in the program. Often such failure results as much from poor organization or staffing as from political factors. Again returning to the ambulance situation, the way in which the new dispatching service was organized and functioned was important to the success of the entire program. As noted earlier, private ambulance service owners did not trust the dispatching system, if operated as a public department similar to a county public health office, to act in their interests. The prevalent suspicion was that when publicly owned vehicles were idle, they would be used for transport duties rather than be limited to emergency calls; thus, private operators would receive very little business. The planners therefore had to define the operations of the dispatching service to the extent that private operators would work within the program, thereby benefiting all the proposed services.

Attracting resources. Now that the planning agency has identified possible funding sources during the feasibility assessment phase, it should join with the newly formed operating groups to attract and commit the needed funding as well as other medical resources. In the funding area, many planning bodies are extremely knowledgeable and practiced at obtaining grants, contracts, and other forms of program support. Community based planners have spent years developing relationships among local government and civic and business groups. These relationships are often valuable when program funding is required. Further, when planning has been analytical, the planning agency can usually be an effective sales representative to skeptical sponsors.

As noted earlier, some planning agencies are more effective than others in attracting program funding. Hospital planning associations develop new systems for one or more hospitals that require no outside funding. Where a number of facilities are involved in a plan, a consortium is easily formed to determine each member's share of the costs and administrative duties. Several RMP groups sponsor programs directly from their budgets or through project grants. Charitable organizations and CHP councils frequently look to community sources of project funding, at times with little success.

Monitoring implementation and operation.

The operating group rather than the planning agency physically installs the new program. But the planners must be watchful of the implementation process and be ready to question and advise the operating group when cause appears. The argument here is much like the one presented at the symptom recognition step; problems are most easily resolved when they are detected early. Schedule slippage and budget overrun are frequently signs of faulty estimation. Such signals must be studied quickly to determine if implementation should proceed or new programs again considered.

The planning agency had proposed the new program in response to a problem that had been detected and identified. Wherever possible, the agency should monitor the program once it passes into the operational stage to determine if it functions as expected and if it shows effect in alleviating the problem. In situations where problem monitoring is through rather stable measures of health status, little change will be noticed. However, intermediate measures such as those used in estimating resource productivity and program effectiveness may be used to check the program's operation. Another monitoring device often used is a requirement that the operating group submit periodic evaluations of the program.

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