Taking the manpower crisis as a point of departure, the authors of this provocative discussion propose an approach to current and future health problems from a wider community viewpoint and in terms of a systemic analysis of output, that is, values and goals of health agencies. They believe that through such planning organized health agencies will be able to influence the future and not have it thrust upon them.

THE HEALTH MANPOWER CRISIS: CAUSE OR SYMPTOM?

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A SPECTRE is haunting public health—the spectre of failure. After decades of hypothesizing a wider scope for their functions, public health leaders are being asked or directed to assume the burdens of new, expanded, and urgent programs. If authorization to move from preachment to action has produced a sense of fulfillment, it has also evoked a sense of unease, a fear of falling short of professional goals and public expectations.

The reason for this fear is well-founded. The chronic shortage of personnel to serve new and continuing demands upon public health has now assumed crisis proportions. In some professional categories, staffs of public health agencies have decreased nationally in absolute numbers. Too few trained workers are entering to replace those who are leaving.[1,2] Moreover, new governmental programs are making the shortages of health personnel in the voluntary and private sector a more direct concern of official agencies.

Amid a crescendo of broad changes in domestic public policies, many public health agencies find themselves called upon to move rapidly against water and air pollution; to assure the availability, quality, and economy of expanded medical care services; to organize new forms of service; to serve the needs of hitherto unserved groups and interests in society; to explore "new problems" such as congenital defects and radiological hazards; to participate in intergovernmental programs to alleviate the problems of the disadvantaged. Great sums of money have been allocated to support such enlarged authorizations.

The size of new challenges, the speed with which they have come about, and the expectations of prompt results would give any institution pause, even if its required resources of men, money, and facilities were at hand and fully ready. Since they are not, the current sense of unease is understandable. Personnel needs are of most immediate concern. Whatever new or expanded services an agency must provide, people are needed to develop the programs and do the work. Paradoxically, the health personnel crisis exists in a society that is technically developed, relatively affluent, and generally rational in its administrative processes.

The current swell of authorizations and funds, then, is not only an opportunity, but a trial. The nature of the new programs is such that the verdict on them will be based not only on professional ideas and standards, but even more on judgments of their social and

economic effectiveness. Behind the political leaders stand publics who now tend to encompass the entire population and not merely small groups at risk or small indigent or marginal population groups. These publics sense problems and interpret results in terms meaningful to them. They expect responses and results that meet their perceptions of need, their ideas about economic vulnerability, their conceptions of quality, and their criteria of relevance. Whether these perceptions and criteria are reasonably congruent with those of public health professionals is, of course, conjectural. But in a free society, the question is far from academic.

When institutions and agencies enter new arenas of social trial, prudence suggests that their leaders scrutinize the usual ways of doing business, normal patterns of action, and customary operating approaches to the execution of responsibilities. It may be that serving new needs requires something different from just doing more of what has been done before. These leaders should explore the question of whether the ways of the past and present will suffice for the demands of the future. If they do not suffice, what new ways of thought and action hold promise?

The urgency of the health manpower shortage provides a case in point and a useful example of how the necessary scrutiny can be effected. We argue that, while the traditional approaches of health administration would identify the chronic personnel shortage as a *cause* of administrative deficiency, the shortage might be better conceived—and dealt with—if regarded as a *symptom* of basic derangements in our health services system.

Input Orientation

Given the traditional approach to organizing health agencies, it is not naive to visualize the manpower shortage in public health as a problem in its own right. The shortage can be considered a causal factor—an independent variable—contributing to the larger problems of public health administration. Prevailing ideas of applied organization theory in American public administration lead to such a conception. Traditional schemes for structuring business and governmental agencies foster a tendency to deal with problem components in semi-isolation from each other. The division of agencies into units embodying distinct jurisdictions of expertness (by disease category, clientele, area, or process), produces not only more sophisticated levels of specialization and technical accomplishment, but also strong psychological tendencies toward autonomy. For specialists in mass screening programs, for disease registries and inservice education, the activities tend to develop their own rationale and justification, their own evaluative standards and ideologies.[7] Autonomous identifications become so strong that they block or warp perceptions of the larger goals of the agency in which the units were originally subordinate parts. We are slowly learning that such dysfunction, arising from dividing the work, is the cost that organizations pay to obtain the benefits of specialization.

Within the logic of functional division, with specialties set up as stable units of the agency, administrative deficiencies can be considered logically as the result of inadequate input. The argument runs simply that adequate numbers of trained personnel are necessary inputs to the operation of a health organization. The size of the required input can be measured by counting vacancies in the various units. This count provides the current workload of recruitment and training. This workload is regarded as the distinct objective of a specialized functional unit of the larger agency. Because inadequate input will

result in inadequate output, the extent to which identified vacancies remain unfilled represents a cause for the failure of the organization to meet some portion of its goals.

The input orientation makes unnecessary and inappropriate an inquiry into other elements of the system. Why ask for more trouble? Why make difficult situations more acute by asking if the input requirement is accurately determined in relation to other factors? Why raise questions about manning tables, patterns of personnel utilization, patterns of service, and administrative operation? Why increase organizational uncertainty, at a time when workloads and missions are being enlarged, by questioning and possibly altering operational patterns? The response is all too likely to be that we should not rebuild as long as we can patch. The recurring assertion is: The problem is too few people; the solution is to get more.

Once manpower deficiencies are regarded as an independent causal factor, the problem can be viewed as essentially tactical in nature and, therefore, susceptible of solution by changing tactics. The simplest tactical change would be to do better what has worked relatively well in the past.

Recent articles in this Journal, based on papers presented at the 1964 APHA Annual Meeting, represent this approach. One of them[1] singles out the input problem of the public health physician* and prescribes a five-step program to solve it. The five suggested steps are to: (1) intensify promotional efforts, (2) improve subsidized training plans, (3) connect recruitment-training with specific vacancies, (4) improve salaries, and (5) increase status satisfactions connected with the public health career. Although this proposal for physicians is advanced as a pattern useful to recruiter-trainers in other specialties, it proposes to increase the status satisfactions of a health officer career at the expense of the status satisfactions of the other specialists in the organization: "The health officer must retain or regain leadership as the captain of the public health team. . . . Let the public health physician also take a strong stand and be the leader in public health in his department and in his community. . . . Only the physician can diagnose and treat these community illnesses."[1]

In the event that several conditions obtained, this approach could be viewed as both valid and workable: if the other members of the "team" were of a lower, nonprofessional order; if their functions were merely extensions of the elementary skills of medicine; if these specialists lacked status aspirations for themselves and their disciplines; if these other public health workers were expected to have only clerical-type communications with the world outside the agency; if, in sum, public health were a medical function and not a social function—if it could be defined as "medicine plus statistics"—the proposal would work.

But public health cannot be so defined. The nature and aspirations of nonmedical health workers do not fit these requirements, nor does the world outside the health agency provide the requisite social environment for this approach.

The second of the 1964 papers[2] takes a more comprehensive view of the manpower shortage problem by recognizing the existence of rigidities and inconsistencies in the community health system as presently constituted. It deals

* Some public health agencies exacerbate the problem of fragmentation by subdelegating responsibilities for recruitment-training of different specialists to different specialist units. Administering the intake of nurses or biostatisticians is assigned to units other than the unit that administers the intake of physician health officers or public health physicians in certain disease specialties. The participation of the administrative personnel office in all this activity adds further complications and difficulties in interspecialty communication.

with the component problems of use and retention, as well as those of recruitment, education, and training. It points to the weaknesses of organizational fragmentation, to the invidious results of rigid stratification and barriers to mobility and advancement, and to the confusion rampant in recruitment and educational efforts. The solution advanced is aimed primarily at improving educational opportunities for those who look toward service in community health. It also urges a sensitive response by the health administrator to the emotional needs of health workers, by improving their satisfaction through assignments of higher level responsibilities. It is assumed that this course of action will be compatible with the operational needs of the health organization. One may be sympathetic toward this latter idea and instinctively feel that the path of wisdom lies in that direction. But the idea represents highly generalized advice without any rigorous or specific patterns for application. It consists of making instinctive, tactical (and potentially disruptive) alterations of existing patterns of health services. So, in its preoccupation with the improvement of the educational establishment for increasing the supply of health workers, and its palliative doctrine, this discussion also can be characterized as having an input orientation.

Yet there are valid reasons to doubt the efficacy of the input orientation *by itself* as constituting an adequate response to the problems of health agencies —or even an adequate explanation of the problems. Decades of strenuous and systematic efforts have still left public and private health agencies short of personnel to meet their needs. The air of crisis increases as agencies face the swollen personnel demands contained in legislated programs (Titles 18 and 19 of the amended Social Security Act) scheduled to take effect early in 1966. The information dissemination approach has fallen short. A decade after the Health Careers movement was launched, Goerke still remarks, "The opportunities in the health field have limited visibility and are generally not known to high school students and their teachers. . . ."[2] Glamorizing has had little noticeable effect, and health workers may be justifiably skeptical of its efficacy in the long run. Salary increases and more accessibility to training have helped to some extent, but not enough.

After experience with the inadequacy of tactical moves to increase input, public health leaders charged with responsibility in community health services will have to probe deeper for the causes of their problems. Therefore, we have raised the question of whether they have been confusing symptoms with causes.

Output Orientation and the Systems Approach

To raise this question brings the whole body of community health organization into the arena of social evaluation. It requires that the ways and organizational forms of the systems of health services administration be examined. It shifts from inquiry into the current symptomatic problems of those systems to scrutiny of their purposes, characteristics, and processes. It moves from the periphery to core problems.

In general terms, this approach requires that health leaders first examine the values and goals they seek to achieve (the output of their systems) and then that they make them explicit and detailed. Against the criteria of such outputs, they should ask whether their structures and processes are relevant, adequate, and rational.

The answer might turn out to be affirmative. In this event, public health as an institution would have justified to itself and to the community the right-

ness of its ways, its basis for public trust, and the legitimacy of demanding more support to meet its input needs. If, however, the evaluation revealed administrative and social irrationalities, the inquiry would probably indicate the systematic changes required in various components. These include: service formats; the distribution of leadership and other functional roles; the development, extension, and coordination of specialization; the distribution of resources in response to clinical, geographical, and other ecological factors; the character and content of information systems; and even the content and orientation of professional and technical education. Such findings would not only create an agenda for changes within the system, but might alter drastically the conception of the system's input requirements. As an oversimplified example, if the health administrator judges a sewage treatment operation according to the effluent being discharged into the stream, rather than by the number and qualifications of plant personnel, he is able to manipulate a greater number of problem factors.

The systemic examination here proposed should be subject to several conditions and constraints:

1. It should be conceptualized and conducted by health leaders assisted by systems analysts, and not the other way about.
2. It should not be handed over in toto to the research unit (which is not to deny that research personnel have significant contributions to make, particularly in evaluative methodological designs) but should be conducted by program and service personnel, after orientation to systems analysis.
3. The examination should be highly diversified, involving a large number of models which range in scope and level from small categorical programs to the total community, with all the varying definitions that can be attached to the latter term.
4. The construction of analytical models should not be limited to existing organizational forms, nor indeed to conventional conceptions of what constitutes "public health" in its current institutional form; "community health" is now the more promising term.
5. The examination would have to be undertaken with inadequate systems technology because technology must be developed as the examination process unfolds. An emerging by-product would be the application of newly discovered methods to other health problems and analogous fields of social endeavor.
6. The examination should not be a one-time affair, but must be a continuing analytical and evaluative effort, productive of increasingly refined and dependable products and methods.

Because these conditions and constraints are related, they must be elaborated together, rather than sequentially. What is called for is the inauguration of a vast effort in administrative evaluation of health programs unlike any ever undertaken by an existing institution. However, some of the available theoretical and technical approaches have been successfully applied already in the development of weapons systems and aerospace projects and to smaller industrial enterprises. In these applications, original design, rather than institutional change, has usually been the goal.

The differences in objectives and in health subject matter require the application of a wider body of theory and technology than has been applied in the enterprises cited. Fertile, but somewhat unorganized, findings and insights from the social sciences are available for application. These theoretical fragments are found in such classifications as organization theory, decision theory, management science, information theory, and the over-arching rubric called "systems theory." Scientists and technicians capable of using these tools would have to be involved in the proposed systemic examination of community health. Some examples of the application of these theoretical approaches to community health problems exist in the literature of public health, as in papers in this Journal during the middle six months of 1965.[3-6]

But the job could not be left solely to systems analysts or to research specialists. Ultimately, the necessary work has to be done by health leaders and workers, operating in their specific organizational and community frameworks, with the technical assistance of different specialists, most of them new to public health. The reasons are obvious: public health involves a body of subject matter and an institutional experience around which analysis must revolve. This subject matter and experience can be abstracted and manipulated by systems analysts. But, in crucial aspects of systemic evaluation, current experience of a specific operational nature must be used as the subject matter of analysis. The technicians must go to the subject matter, rather than vice versa.

Such an approach is needed because public health is a social system. For the conclusions of evaluation to have validity to the members of the social system, health leaders and their staffs must carry out the investigations.[7,8] Indeed, this relationship between health leaders and systems theoreticians and analysts must grow to the point where health leaders themselves begin to apply key insights and technics of management science.

The proposed enterprise, as a whole, would not only be vast but varied. It will be necessary to deal with systems and subsystems as distinct as restaurant inspection, home nursing services, resource allocation processes, water pollution control, long-term medical care facilities, complex neighborhood health needs, disease control programs, and regional service centers. Moreover, relationships among such models will have to be identified. While the relationships will be found no less complex than by current methods of jurisdictional negotiation, systems analysis offers hope that the puzzle of community health relations can be deciphered.

Analysis would have to begin with only approximate problem definitions, allocation models, and goal specifications. The analytical process must provide for successive refinements of such initial approximations; also, participants would have to be emotionally prepared for partial or complete frustration, especially in the early stages. Even in a planned, comprehensive effort, uncertainty would be high and waste probably would be great. Such operational problems, while conjectural, are nevertheless plausible and must be anticipated. If such problems are terrifying to the point of paralysis, if their magnitude compels health administrators not to try such an approach, these leaders are acknowledging that they are not yet ready or willing to experiment with the application of available analytical approaches to health problems. A fundamental incongruity attaches to the idea that health leaders can remain content to suffer the disability because they are not prepared to search out its causes and treatment.

Yet, there is a saving paradox in this situation. While the application of the "total systems approach" to the massive problems of community health services in the United States requires an effort of the size suggested above, the basic tools of systems analysis are readily available to all. They can be applied to this area of responsibility by the county health officer, the supervisor of home nursing services, the executive of the local voluntary health agency or the hospital administrator. The combination of the insights and technics now available from a relatively few sources,[9-11] coupled with an imaginative mind and an interest in administrative innovation and improvement, can produce at least improved utilization of existing resources and new definitions of limited problems. It can also reveal the more significant additional inputs required by the organization. Although such analyses can be more productive if the

parent organization or the higher system is involved in taking "a new look" at the why's and the ways of the organization's functioning, the isolated and humble effort can nevertheless produce its flower and very likely its fruit. However, the fruit is likely to be represented more in methodological contributions than in thoroughgoing organizational change.

Diagnostic Reorientation

Health planners must recognize that evaluations based on the output orientation of systems analysis will be methodologically difficult, emotionally and intellectually demanding, and costly in time and money. These evaluations might possibly produce just those answers that may shake the institutional framework of community health, alter its structure of power and functions, raise new questions about professional education, and call for the development of new self-images on the part of health workers. This approach, in short, contains the ingredients of a self-induced revolution.

Moreover, the revolution might be generated from roots which seem most innocent. Few public health professionals, for example, would take issue with the postulate that: "Public health is, by nature, a problem of changing social behavior." Statements of that type are constantly being made at conferences and in schools of public health, with little noticeable effect upon practices in some agencies. But suppose that such a postulate is used to provide a master criterion to be rigorously applied in an output-oriented analysis of a large community system. What might follow from it?

It could be reasoned that the essence of a problem in changing social behavior would consist of altering conceptions, attitudes, and actions on the part of persons, groups (notably families and other basic social units), and communities. Strategies—the concepts and actions to accomplish this—would be both complicated and complex. Activities to modify the conceptions and attitudes that underlie behavior must be pursued in diverse forms and at various levels. Administrative adaptations may be found necessary not only in the ways in which services are provided to families, but in the way health organization functions at the community level.

For the health agency to function rationally—through relevant actions and accurate adaptations of its means to social ends—it may have to equip itself with a wide range of new specialists offering distinctive insights and skills. If the health agency is to function effectively, it will have to modify relationships and responsibilities among existing and newly added specialists. At the community level, it will probably have to involve a widened range of experts in its planning and communications. This range would go beyond the specialties of community analysis and group relations, now found in a few modern departments, to include specialties whose presence in community health has been sporadic and circumscribed at best: the social psychologist, political sociologist, systems analyst, and others who have a professional contribution to make in changing social behavior. Such specialists must not be isolated from each other in the semiautonomous "boxes" of traditional organization, but must be flexibly involved with each other for interdisciplinary actions. They must be able to work with the planning and service units of the organization toward actions that affect social action. Not only may they offer background "solutions" of problems—they may help define health problems in different terms.

Should this come about, community health as a multifaceted problem would be matched by an appropriate group approach. Its social system would be more responsive to the problem of ef-

fecting social action and would be capable of serving collectively as "physician to the community." Indeed, given the initial postulate that community health is a problem in changing social behavior, it is difficult to see how any lesser aggregation of insights and skills can adequately be used to diagnose and minister to the sociopolitical characteristics and ills of communities. Health leaders would be living up to a conception of community health needs that goes far beyond tabulating the frequencies of psychic and somatic deficiencies among the community's individual members.

Lest it be inferred that this line of development would altogether disregard the substance of community health services as they have been traditionally conceived and ordered, there should be explicit recognition that the key component is its subject matter. This is the scientific and technical knowledge that administration seeks to articulate into social effect. But this subject matter could no longer be its sole component, and in many applicative situations, it is possible that it would cease to be its crucial component.

Such a conclusion is not particularly new. Experiences at the community level[12,13] have long indicated that sociopsychological barriers must be penetrated before health-promoting information will be found acceptable or even intelligible by certain groups. Experience with group approaches to institutional care have produced notable instances of success, as well as considerable information on the difficulties of such operations. The literature, too, contains strong hints that an institutional widening of perception at the community level may be fruitful.[14-16] Any comprehensive analysis and new organizational change would do well to integrate the experimental and developmental experiences of the past.

What are the implications for the role of the health officer as the agent of a collective interdisciplinary, "physician to the community?" Certainly the health officer need not cease to serve as the organization's symbol in the community, but he would primarily function as coordinator of a wider spectrum of cooperating specialists, depending on how well he learns to perform such leadership functions. Structurally, this conception is not notably different from the way most physicians heading large health agencies function at present. Pushed as they are by the inherent complexity of technical specialization in modern health administration, they must rely heavily, even absolutely, on the autonomous action of the heads of nursing, environmental health, laboratory, business management, and pediatric services, among others.

But two changes should be recognized in the physician's role in the type of group operation here projected. First, more and different players will be involved. Second, the internal relationships may well change more in kind than in degree. Most of today's health professionals and technicians represent components of a primarily technical domain of which the physician is, by his training, coordinator and chief. The projected system, however, includes professionals outside the traditional domain of community medicine. The community health agency would change because of its membership, and because there would be alterations in the relationships of existing specialists. Crucial to the leadership of the health officer would be his capacity to function ever more effectively in relation to the concept "community health."

For "community health" implies the progressive reduction of the boundaries between the official health organization and other community health and welfare agencies. It implies better communication and increased interaction among the official health agencies and

other agencies organized to act in the same broad problem areas, among the same people. While the needs of persons and families for education, employment, housing, social status, a healthful environment, medical care, and the constructive use of leisure time can be intellectually factored and functionally divided for purposes of administrative organization, the problems themselves are unified in persons and social groups. The inflexibility of the bureaucratic categories tolerable in earlier periods becomes intolerable when a society moves toward raising the social level of its members generally, with particular attention to the needs of disadvantaged groups. The trend toward liaison and exchange of specialists at national and state levels of government attests that the traditional administrative walls are being breached. These are probably only the first gentle cracks of a coming mighty rupture. What began as a movement for racial integration, first looked upon as a distinct and restricted problem, has engendered visions and ideals that promise to sweep relentlessly—among other results—toward greater administrative integration of social services.

The choice has ceased to be whether or not the old order of public health will change in the way it conceived of its mission and of the administrative problems to be solved. The choice is whether coming changes will be thrust upon community health agencies ill prepared to absorb them or adapt to them, or whether organized health agencies will seize their opportunities, through foresighted planning, and influence the shape of the future.

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