

# Research, Program Planning, and Evaluation

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RESEARCH has been an integral part of the activities of the New York City Department of Health since its inception. The department has had a succession of commissioners who were not only able administrators but who recognized the intimate relationship between research and the service functions of the department. They were also aware of the debt that modern public health owes to the early researchers in bacteriology and sanitary science.

Control of infectious diseases requires constant vigilance, but the need for research in chronic diseases has become more pressing. The attack on the chronic diseases proceeds in three stages: study of the fundamental biological mechanism at work producing the disease state, study of the epidemiologic characteristics of the various chronic diseases, and program research and evaluation to translate the gains achieved through laboratory or epidemiologic investigation into programs of benefit to the population.

This three-way research approach is mounted through three units of the department of health. The oldest of these, the Public Health Research Institute, was organized in 1941 as a private nonprofit corporation to perform funda-

mental health research in New York City. Its activities focus on fundamental biological research in the laboratory. It is concerned, for example, with such basic biological questions as the nature of the antigen-antibody relationship.

The second unit is the Health Research Council of the City of New York. Its activities are detailed elsewhere in this issue. The council's major aim is the mobilization of the resources of the medical community of New York City against the municipality's health problems. It provides grants for studies both in the laboratory and in the community. In 1965 the council supported 172 research investigators, thus increasing the trained research manpower available for the study of city health problems. From the biological point of view, New York's health problems do not differ from those of other communities—except in size—so the work supported by the health research council also contributes to public health in the country as a whole.

With these major research approaches mapped out, the health department felt that it should create an internal focus charged with the responsibility of stimulating activities in the chronic disease area. In a letter to the director of the bureau of the budget, dated March 29, 1956, Commissioner of Health Leona Baumgartner explained her reasons for establishing what was then called the "office of scientific program planning and development." The name was later changed to the office of program planning, research, and evaluation.

I am more convinced than ever of the necessity for a section within the department devoted to public health program planning and development. While it is recognized that program planning constitutes an essential

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element of good administrative practice and should not be divorced from administration, experience has shown that the pressures of day-to-day administration are such as to limit very severely the time and the thinking devoted to evaluation and development. Often, despite the best intentions of program directors to examine their programs critically, evaluation is deferred indefinitely in the face of more immediate claims upon their time. As a result, programs or parts of programs that have outlived their usefulness and methods that no longer mesh with the mechanisms of a changing society, continue in operation.

Having set forth the reasons for the establishment of an office of program planning, research, and evaluation, it is the purpose of this paper to describe how the office carries out these functions, to illustrate the reciprocal relation of the work of the office and the service programs of the department, and to consider certain requirements which must be met if this relationship is to realize its potential.

The functioning of the office of program planning, research, and evaluation (termed the office of research subsequently in this paper) is best described through specific activities. These may be grouped under three headings: (a) evaluation, (b) program planning, and (c) research on emerging problems.

### Two Examples of Evaluation

Two typical examples of the office's evaluation activities are the Lower East Side Manhattan cardiac program (1) and the satellite clinics.

*Lower East Side Manhattan cardiac program.* A 1946 survey by cardiologists suggested that many school children with heart disease were not being identified and that others with neither organic heart disease nor valid histories of rheumatic fever were being followed as "cardiacs." In addition to routine casefinding and followup by the school health service, two types of specialized services were provided then to assist school physicians. The health department's division of physically handicapped children provided approval or disapproval by a reviewing cardiologist of all applications for changes in type of class placement and referral for examination by a cardiologist at borough cardiac consultation clinics of children not already under care.

Because these services reached only a small, selected group of children, a pilot program, the

Lower East Side rheumatic fever project, was established in the department of preventive medicine of New York University. It was sponsored by the department of health, the board of education, and the New York Heart Association and financially supported by the heart association and the Public Health Service. Its objectives were the following:

1. Find all children with suspected heart disease or rheumatic fever.
2. Attempt to confirm all reported diagnoses.
3. Follow all children with diagnoses in need of clarification as well as those with confirmed heart disease or histories of rheumatic fever to be sure that they received the medical and non-medical services they needed and that the services were integrated.
4. Serve as a clearinghouse for information on individual children suspected of having rheumatic fever or heart disease and on the community services available to them.
5. Collect information on the incidence and prevalence of rheumatic fever and heart disease among school children in one area of New York City and on the services available to them, and stimulate improvement of existing services and development of new ones when the need arose.

The table from the report of this program illustrates the need for such activity. Brownell and Stix (1) indicate that "These efforts have paid large dividends in terms of the 'delabeling' of children falsely diagnosed as having rheumatic fever or heart disease and thus of fewer children followed needlessly by the school health service. At the same time followup of those correctly diagnosed has improved."

In 1963, after the program had been evaluated, conversations were begun by the office of research with the administrators of maternal and child health and the division of nursing about extending the program to the entire city. Handling of rheumatic fever cases was found to differ considerably in various parts of the city. Therefore a set of uniform procedures was developed and recommendations made to the commissioner for putting these into effect. A plan for the evaluation of the citywide experience was also developed, and evaluation data are now being collected.

**Percent of admission diagnoses confirmed and changed on register, Lower East Side rheumatic fever project, January 1, 1951–December 31, 1958**

Last heart disease diagnosis	Heart disease diagnosis on admission to register				
	All diagnoses (N=4,259)	Possible disease (N=525)	Rheumatic fever (N=2,818)	Congenital defect (N=863)	Other or unknown etiology (N=53)
Total.....	100.0	100.0	100.1	99.9	100.1
Confirmed:					
No disease.....	14.1	52.4	9.3	6.6	13.2
Possible disease.....	4.4	23.8	.9	4.1	3.8
Rheumatic fever.....	50.2	16.4	74.0	.3	28.3
Congenital defect.....	18.0	15.9	.7	82.7	5.7
Disease of other or unknown etiology.....	.8	1.0	.3	.2	34.0
Unconfirmed.....	12.5	10.5	14.9	6.0	15.1

<sup>1</sup> Cases with insufficient information on first report to make a more definite diagnosis possible.

*Satellite clinics.* Recently the U.S. Children's Bureau embarked upon a nationwide maternal and infant care project. This program was designed to concentrate efforts for improving the care of mothers and infants in areas in which vital statistics revealed serious problems. In the City of New York the program, designed as clinics functioning as satellites of a hospital, costs nearly \$1.5 million a year, and it is imperative that an evaluation of effectiveness be an integral part of the program. The commissioner of health directed the heads of the office of research and the maternal and child health program to collaborate on an evaluation of the satellite clinics. Its main feature is that the geographic residence area of women coming to a satellite clinic will be delineated and designated as the "study area." A geographic area without a satellite clinic, where women receive their care through the normally available facilities, will be designated as the "control area." Women in the control area will be matched with those in the study area by a number of characteristics. Three examples of measurements to be made follow:

1. **RESIDENCE AREA MEASUREMENTS.** These will generally consist of the usual vital statistics pertaining to maternal and child health, such as infant mortality rate, perinatal mortality rate, and proportion of women who first come in for care during the various trimesters of pregnancy.

2. **PATIENT MEASUREMENTS.** For example,

the pattern a woman follows who comes to the satellite clinic in her third pregnancy will be compared with her actions in her second pregnancy, when no satellite clinic was available. The outcome of the woman's third pregnancy will also be compared with the outcome of the third pregnancy of a woman coming to the clinic during her fourth pregnancy. The stage of pregnancy in which she first sought care will be examined, and other measurements will be made. Thus, measurements will be made specific for the particular order of pregnancy and the number of previous infant losses of the mother.

3. **PROGRAM MEASUREMENTS.** What is the efficiency of the program? At what rate are appointments kept? What referrals are made? How many persons carry them out?

These examples illustrate the need for concern with the process of evaluation and review of continuing activities. They also illustrate the desirability of building evaluation into a program from its inception. Finally, they demonstrate the intimate relationship between evaluative processes and program development.

#### **Program Planning Activities**

*Selective Service.* Early in 1961 the Armed Forces Selective Service System and the Public Health Service began discussions about the men rejected by Selective Service for health reasons. The New York City Department of Health at

that time received a phone call asking if the department would be interested in developing a demonstration program for referring these men to community resources to help them with their health defects. The telephoner from the Public Health Service was a former Service trainee who had spent a year with the New York City Department of Health on research, program planning, and evaluation. He had called New York's health department because he knew of its interest in new approaches to community health problems.

In October 1962 the department began a demonstration program. Each man rejected for health reasons by the New York City Selective Service System was referred by public health nurses of the health department referral service to an appropriate community health resource (private physician or agency) for care. By August 1, 1965, 18,270 rejectees had been registered for the program.

The procedures have served as a model for the development of similar programs in other cities and States, and staff members have been consulted in the development of referral services. The findings formed part of the request to Congress for funds to develop a nationwide program. This referral service is now integrated into the health department under the assistant commissioner, preventable and chronic disease services.

In addition to the immediate objective of taking care of health problems of selective service rejectees, this program is significant for two other reasons. First, the Selective Service System may be viewed as a kind of community health screening program which identifies the individual citizens with health problems. Before the health department's referral service was developed, these men were returned to the community with no provision for health care. Assuming that the earlier health problems are brought under care the better the prognosis, the desirability of referral programs is clear.

The experience of the selective service referral program suggests the possible use of other already available screening procedures as a source of cases for referral services. Some of these would be pre-employment examinations for industry, applications for disability insurance in the programs of the division of voca-

tional rehabilitation, and applications for life insurance. These screening points could be developed into a generalized casefinding mechanism and referral service if systematic procedures were instituted.

Second, the selective service program offers the opportunity for development of two specific research projects, health of the school child and mental health problems. The rejectees for health reasons have been out of school but a short time. A Public Health Service grant to study the relationship between the school health records of these former students and the reasons for their rejection by the Selective Service System has recently been awarded to the department.

The opportunity for mental health research is an outcome of the finding that in New York City, 38 percent of the health rejectees were rejected for psychiatric reasons. "Psychiatric reasons" is an Armed Forces classification; the percentage cannot be taken as representing the prevalence of psychiatric conditions among young men subject to the Selective Service System because not all men receive a psychiatric examination.

The number of these young men is sizable—4,544 in the New York City area in the first 2 years of operation of the selective service program. Many are difficult to motivate to take care of their health problems. One approach is to develop a demonstration program offering psychiatric rejectees a variety of services preparatory to referral in addition to the normal services available to all rejectees. Those in the special service program would then be compared with those in the regular program.

Another approach is to follow for 5 years a group of men rejected for psychiatric reasons (but not served by a special department program) to determine how well they adjust to civilian life. This group would be compared with a group entering the health department's special referral program. A grant application is being developed to study this approach.

Thus the initial inquiry from the Public Health Service led to the development of demonstration programs to aid young men rejected from the Armed Forces for health reasons and the assumption of these programs as part of the normal activities of the department. The find-

ings led to a national program for these young men and development of further research on important health problems growing out of the original project, made possible by the availability of data on a particular population. The research is directly related to the planning of effective school health services and the best means of meeting the mental health needs of young men.

*Medical care.* Today health departments are called upon to exercise leadership in seeing that adequate medical care programs are provided for people in their jurisdictions. The pressing reasons for such leadership were listed recently (2).

1. Increasing numbers of persons with chronic diseases. The only adequate method at the present time for control of the diseases is good medical care.

2. Increasing urbanization. It is largely in urban centers that the demand exists for adequate medical care for large populations.

3. The need to find new ways to move the results of research in laboratories and at the bedside into the community to benefit the entire population.

For these reasons the health department has entered into a number of cooperative arrangements with voluntary hospitals in the city, seeking new ways to provide better medical care for citizens. While details of the arrangements differ, each hospital assumes responsibility for the complete medical care of the persons in the population which it serves. The office of research aids each project director in developing methods of evaluation. The office of research, at the request of project directors, also takes the initiative in bringing groups together periodically to discuss mutual problems and to consider how comparable information can be obtained from the various projects, so that the entire program can be assessed and made more generally useful for those planning programs for the entire city.

*Specific chronic diseases.* Much research has been done on specific chronic diseases, such as coronary disease and cancer, and additional information is constantly becoming available about the epidemiology of these conditions and the risk factors involved. However, translating research findings into service programs to

control these diseases in the population has received relatively little attention. It may be argued that control programs would be premature since the etiology remains clouded, but certain risk factors have been identified. Perhaps a broad casefinding program to identify persons with these risk factors might suggest ways to develop control programs or at least to initiate demonstrations.

The Framingham studies show that persons with raised serum cholesterols, who smoke, and who are overweight have a much greater risk of developing coronary disease than those without these risk factors. Could a health department offer practicing physicians a service to help identify high-risk persons in their practice? Could a control program, perhaps involving dietary advice for those with increased cholesterols, be developed? The office of research and the appropriate program directors are exploring ways of developing such programs.

#### **Research on Emerging Problems**

*Chronic respiratory disease.* Death certificate information routinely analyzed by the health department confirms that the chronic respiratory diseases are of growing importance in public health. However, research in these diseases is hampered by a lack of adequate diagnostic criteria. Therefore, to determine the frequency of symptoms in a study of chronic respiratory diseases among 5,000 New York postal workers and 8,000 transit authority employees, it was decided to use a simple test of pulmonary function and a questionnaire adapted from the one formulated by the British Medical Research Council.

In addition to yielding data on frequency of symptoms and abnormal pulmonary function, the study suggested additional lines of investigation, such as the possible prognostic significance of symptoms and pulmonary abnormalities and comparisons of subgroups among the 13,000 study subjects. The subsamples ranged from a group of nonsmokers, free of respiratory symptoms and with normal pulmonary function, through groups with intermediate degrees of impairment and symptoms to a group of heavy smokers with abnormal pulmonary function and high frequency of symptoms. These subgroups are now being followed for 5 years.

Epidemiologic research requires that degree of exposure to risk should be clearly defined. One hypothesis on chronic respiratory disease points to increased air pollution, but present methods of measuring exposure to pollutants are relatively crude. Areawide measurements do not relate one person's symptoms to his particular exposure to contaminants. A solution being investigated by the office of research and New York University under a grant from the health research council is the development of a personal air monitor which an individual can wear to measure his exposure to pollutants.

Another difficulty is how to define a pollutant. There will probably be no agreement on this until the concentrations of various pollutants are linked to effects on health. These effects are not necessarily specific but may manifest themselves through such general phenomena as increases in disability and death, as suggested by the Meuse and Donora Valley episodes. Under examination now are two other measurement problems in the study of chronic respiratory disease—classification of smoking habits and methods of describing pulmonary function.

Current activities related to the chronic respiratory diseases thus illustrate several points: (a) use of routine vital statistics to reveal emergence of public health problems, (b) use of epidemiologic techniques to define their nature and size, (c) testing hypotheses in the literature on reasons for an increase, and (d) need for better measuring instruments.

*Medical care and health economics.* Chronic disease programs are expensive. Partnership between government and private resources will probably be required because health departments cannot provide medical care to large populations. Nevertheless, some agency must be responsible for serving the interests of the whole community; in New York City the health department assumes this function in concert with other city departments which have health components within their activities. The roles and interrelationships of government and voluntary medical care agencies must be determined in such matters as the proportions of the population receiving care from various community agencies and the degree of overlapping and duplication of services. This is the domain of health economics, a continuing activity of the

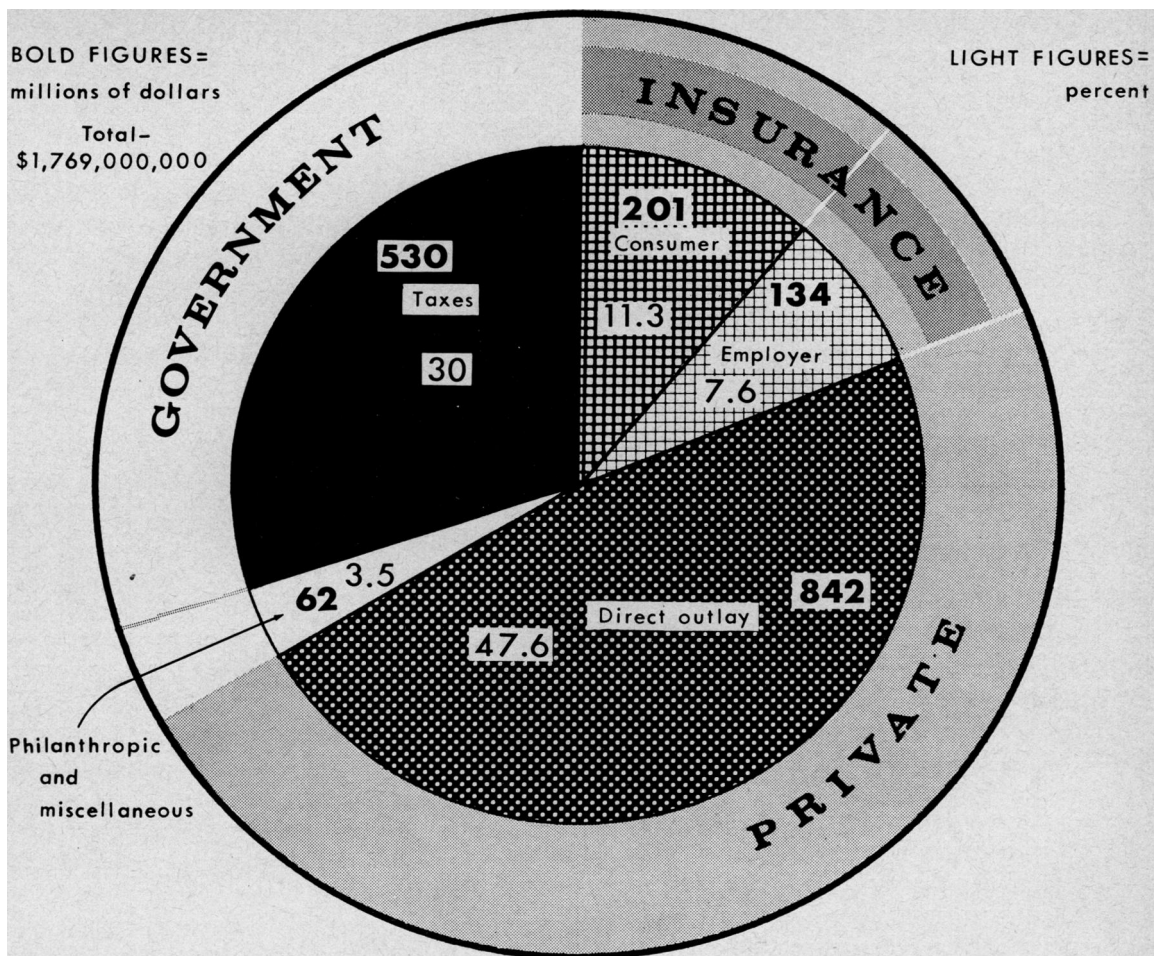
office of research. "Metropolitan Medical Economics," a recent article by N. K. Piore, the office's director of health economics, sets forth some issues and problems (3). The chart adapted from data in this article illustrates some complexities of the problem. More research is needed along the lines laid down in the report of the National Committee on Vital and Health Statistics (4). It is part of the long-range plan of the office of research to carry out activities along these lines.

*Application of computer technology.* Chronic disease studies often require long-term followup, and more demands are thrown upon statistical units of health departments to determine whether or not a given individual has died and the cause of death. The mechanics of answering these questions are largely outmoded today. Modern electronic data processing equipment makes it possible to match these requests against death certificate files without resort to slow, costly, and clumsy hand methods. The office of research is now studying the feasibility of matching, by computer, to determine (a) probability of making a match, (b) how probability varies with the number and kinds of items to be matched, and (c) cost of matching on any given number of items. The research directed at solving this technological problem for the department would have wide applicability. A national death clearance program, available to investigators anywhere, might then be possible. Such a death clearance mechanism would, for example, permit clearing out the Social Security files regularly to determine which persons have died.

*New sources of health information.* Other methods than the use of vital statistics are needed to measure the population's health status. The National Health Survey is another method of measurement, but there is a vacuum at the local level. Therefore, to fill this vacuum, a New York City household survey was begun in 1964, using mechanisms similar to those of the National Health Survey. It has the following purposes:

1. Obtain new measures of the population's health status not available from routine vital statistics or program statistics but needed for program planning and evaluation.

2. Compare differences between National



**Expenditures for medical care of New Yorkers, 1961**

Health Survey findings and data for New York City. Large differences are expected for certain variables.

3. Identify groups needing more intensive study, such as those suffering from a particular disease.

Although the household survey in New York City is just beginning to yield data, its potential is great. Local areas need up-to-date information on numbers and characteristics of their population, particularly as the mobility of the population increases. Continuing sampling should provide more accurate population estimates than the decennial census and other information such as school registration currently used. Such estimates are needed not only for the city as a whole but also for particular

neighborhoods, because many urban problems must be approached on a neighborhood basis.

Data useful at the local level resulted from a recent study of health insurance coverage in New York City among various ethnic groups. Although 83.3 percent of the white population have health insurance, only 50.7 percent of the Negro and 42.2 percent of the Puerto Rican populations are so covered. These findings have attracted citywide attention.

A gauge of the economic impact of illness, perhaps measured in days lost from work, would be useful in evaluating such service activities as community rehabilitation programs. Data on the proportion of the population in various neighborhoods confined to the home, by type of disability, should prove im-

portant in planning rehabilitation programs. The household survey will eventually provide such data.

Setting up the mechanisms for obtaining basic information on a community problem is often the most difficult, expensive, and time-consuming part of such research. With its continuing household survey project, the office of research has at hand the mechanisms for answering many of the emerging questions in the health field. It is thereby equipped to take on some of the more difficult kinds of research and to shorten the time lag between the appearance of new community problems and their final solution by action.

### Future Problems and Needs

The growth of the health department's research, program planning, and evaluation activities is attributable largely to the existence of an internal unit to initiate and develop such functions. Also, the chief of the office has the rank of deputy commissioner, enabling him to explore all of the department's activities. This freedom and policy-level rank is essential in developing research, program planning, and evaluation and in engendering the creativity and effectiveness that move research findings into services of the department.

To incorporate the findings of a project or demonstration into service programs requires a forum before which the research can be discussed and implications considered. In New York the deputy commissioner in charge of research has access to the commissioner and his first deputy, and through them to program directors; also, staff meetings can be used to discuss findings. Some mechanism of this sort for feeding findings into service programs is vital to prevent a dichotomy between research and service programs.

Good research starts with an idea; there must be flexibility to explore this idea, to consider its ramifications, in short to play with it. Without flexibility research loses its chief characteristic of impertinent curiosity. To achieve flexibility some health departments have set up independent, nonprofit corporations to serve as

research affiliates. The Medical and Health Research Association of New York City, Inc., serves this function for the department and carries out much of the research done under grant funds.

Both the financing and the organizational structure for conducting research require flexibility. In general, governments do not have the kind of money that industry plows into furthering its general growth and development. Health departments greatly need fluid funds to further their research programs. Federal project money is available, but project applications must be specific and the plan of action clear. Often research ideas are half formed and need to be played with before they become specific enough for a project grant. Also, the ability to recruit outstanding personnel is vital to the development of research activities. A relatively small amount of fluid funds would enable the commissioner of health to recruit and hold good men and further the total program. In short, fluid funds can make the difference between a mediocre and an inspired operation.

The need for research and evaluation by operating health agencies will continue to grow. The degree to which official agencies discharge their responsibilities to the public through imaginative programs depends upon the support of such research. Statesmanship will be required to provide the financial and administrative mechanisms to further research by operating agencies.

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