

Research must lie at the basis of good public health practice. This is the theme of Dr. James's paper. In terms of this theme, he discusses the kinds of research that can be carried on by health departments and how public health research is organized in the New York City Health Department.

RESEARCH BY LOCAL HEALTH DEPARTMENTS— PROBLEMS, METHODS, RESULTS

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ANYONE WHO has discussed the career of a health officer with young medical graduates has noted the profound change which the last decade has brought to the challenges facing public health. While much remains to be done in every aspect of public health practice, it is becoming increasingly difficult to recruit the best physicians by stressing our need for a continuation of familiar activities in tuberculosis control, child health, and general sanitation. Certainly we rate a poor second to the glamor of the cardiac surgeon, the neurophysiologist and the laboratory investigator. Our newer technics for chronic disease control offer promise, but effective public health programs based on them are still few, expensive, and untested. To the potential recruit the time of most health officers seems to be fully occupied with their more traditional commitments, leavened at intervals with "administrative" emergencies caused by poliomyelitis immunization, civil defense, or influenza.

This discussion deals with one activity of the modern health officer which can present our field as creative, challenging, and stimulating to the most ambitious and energetic of medical graduates. I am referring to the unique opportunities offered by public health

research. What the laboratory bench is to the virologist, what the medical ward is to the clinical researcher, every single community can be to an inquiring health officer. This report seeks to point out the range of activities and projects of public health research, some of the problems involved in their development, how one local health department organized to promote research, and why it is essential to give research a high priority.

Kinds of Research Activity

Whenever a local health officer asks questions such as "how," "why," "what if," or "which," and the answer is not available to him or his colleagues, there exists a potential problem for research. When he has properly set up a study which may provide an answer to this question not only for himself but for his professional colleagues, he is then on his way toward a possible research contribution. This is the only limit which should be imposed when defining research in public health. It is a thoroughly pragmatic definition, and includes any research which a public health department can do and can do well. Hardy and Dublin¹ have divided public health research into five major categories, but this discussion will ap-

proach the problem somewhat differently by emphasizing a few special kinds of research of particular interest and importance to the local health officer.

Evaluation Research

Since a large part of every local health officer's work must deal with the conduct of traditional programs in tuberculosis, school health, child health, immunization and general sanitation, it is only natural for him to spend a portion of his time investigating some of the problems which present themselves in these fields.

It is true that we could use a more effective vaccine for tuberculosis and perhaps a longer acting diphtheria toxoid. As Burnet² has said, however, such discoveries, useful as they would be, are not truly essential to our already highly successful control programs. On the other hand, let us look at another kind of question raised by our daily activities in these programs:

How effective is the child health conference in influencing the attitudes and practices of mothers in caring for their children? Is it really necessary to maintain the present elaborate milk control program in order to insure the high quality of milk? How could the school health examination program to which so many local health departments have committed their major resources be streamlined without adversely effecting its ability to instill proper health education, pick up significant defects, and insure their correction?

If it is true that the taxation toleration limit of our citizenry is rapidly being reached, if it is true that there is a serious shortage of qualified personnel, then it must be obvious that the major support for many new programs in public health will have to come from a re-direction of existing effort. No sophisticate in our field seriously doubts the predominant role that large programs of chronic disease control will have in

the public health practice of the future. Evaluation research is one of the few ways open to us for methodically changing the direction of our activities.

But many a health officer will say, "It does not matter what I prove, the community will still insist upon the same extensive school health, restaurant sanitation, or milk control programs. The citizens have become conditioned to them, they believe them necessary and no glib small research project is going to change their minds." This is a partial truth, but it is not the entire truth.

Evaluation research is important not only in the aspects of the program concerned with preventive medicine but in its implications for social science. Why do these citizens feel so strongly about the value of such programs? Are there no possibilities that the activities they appreciate can be streamlined and made more efficient in a way that they can approve? Does not industry constantly change its product and yet increase consumer acceptance?

If we are sure of our ecologic, economic, and social facts we will know more about how to undertake a planned program of gradual readjustment. At the very least, research knowledge can be collected without any immediate need to put it into effect. When we have such knowledge we may not wish to apply it, but certainly there is no hope of applying it if we do not have it.

Let there be no mistake about the difficulties in carrying out evaluation research. Most of the papers written on the subject are either frames of reference carefully prepared for "someone else" to use, or the evaluation is performed after having made so many (often unstated) assumptions that the final result is "tailor-made" and useless for general application. The literature even contains a number of papers in which the author expounds at great length that his program might still have

been effective even though the evaluation study failed to prove it!

The following examples are illustrative of effective studies in evaluation research:

1. The department of public health of a university in cooperation with a city health department studied the practical health significance of certain degrees of hearing loss detected at school health examinations.³ Among other significant findings, they noted that the greatest degrees of loss were often associated with the best prognosis. Based upon the evaluation findings of this study, a more streamlined and effective program was recommended.

2. A county health officer, faced with the threat of a diphtheria outbreak, used the opportunity provided by a special immunization program to test the antibody levels of high school students.⁴ The results indicated a high degree of diphtheria susceptibility even among those who had received booster doses of toxoid five years before. The study also revealed the ease with which a tiny booster dose of purified toxoid could raise immunity to a high level without significant reactions, even though many years had elapsed since the primary immunization. This finding provides health officers with a simple, safe and economical means of combating a diphtheria threat promptly, without the need to check on the interval since the last immunization.

3. Two public health nurses provided with statistical assistance undertook to study how nurses spend their time in schools.⁵ The result highlighted the significant proportion of nursing time spent in low priority and even nonprofessional activity. As a result this situation was corrected immediately by adding many nurse assistants who relieved public health nurses of these responsibilities.

4. One of the finest examples of evaluation reasoning has resulted from the

work on fluoridation and dental health. Since we know the potential benefits of water fluoridation and topically applied fluorides, the best possible combined usage of these technics can be used as a goal. Assuming the continuation of the usual amount of corrective care by local dentists, the potential caries reduction can then be determined for any health jurisdiction.⁶ The existing fluoridation and dental correction efforts of that area can then be expressed as a mathematical percentage of this potential. This affords us a rare opportunity in public health of expressing the benefit from an existing health program in terms of the total remaining and correctable public health need.

Operations Research

Operations research, a special technic of evaluation,⁷ usually provides an interdisciplinary approach to problems. It sets up a representative model of the situation and then extrapolates from this model to high probability predictions that certain events will occur if recommendations are followed.⁸ The practitioner need not feel obligated to follow these recommendations. Rarely can all of the factors upon which the decision depends be made part of the theoretical model. Yet, through this technic, the area of understanding of the problem based upon probable fact can be increased, and the use of the scientific method extended further into the realm of administrative decision.

Operations research has helped greatly to clear the air for public health evaluation by stressing and not glossing over the compromises between research findings and the art of public health practice. If it should reveal, for example, that restaurant sanitation emphasizes goals that are aesthetic rather than disease-preventing then attention can be switched to technics which can achieve a maximum aesthetic return for the least effort. The pressure to treat evaluation

findings as final answers has been eased. The results of evaluation should now be looked upon not as mandates for specific action but rather as facts available to us when needed to help reach program decisions.

Operations research has also contributed greatly to public health research in that it recognizes the need to assign a quantitative status to certain human values. There is real value in good public relations, in paying attention to the wishes of the citizens, in developing programs in logical sequence, in not moving too fast, and in administrative compromise. Any research which succeeds in defining these values in quantitative terms similar to those we use to explain the epidemiology of disease, will indeed contribute much to the practice of public health. In summary, then, a true evaluation of our programs must consist of factors other than those of medical science, but our approach to them should attempt to be no less scientific.

Research in Program Development

It is generally agreed that in developing a public health program one must consider the need for the program, the resources available for its development, and the attitudes of citizens toward it. Once it has been decided to develop a program, there are many opportunities to add to our knowledge on each of these three factors. One of the simplest methods of doing this is to carry out a survey to collect relevant data concerning needs, resources and attitudes, carry out the program, and then to repeat the survey to evaluate the changes. Curiously enough, although steps one and two are fairly common, health officers have done relatively little with step three. By the time step three is reached, the program is deemed a success and evaluation relegated to a low priority. This has been the case with both child

guidance and crippled children's programs, two amazing instances of the lack of priority given to the follow-up of the hundreds of thousands who have received such care in every section of the country during the past two decades.

Hopefully, the public health profession does not intend to accept so much on faith as it develops its programs against chronic illness. Realizing that with about 20 per cent of our adult population overweight obesity control could easily absorb a major portion of public health resources, health workers have a welcome interest in the study of pilot efforts at weight reduction. Jolliffe⁹ has indicated that of the highly motivated group who cooperate sufficiently to complete the 10-week regimen and lose the requisite poundage, 35 per cent were able to maintain this loss over a period of four years. Diabetes studies are being carried on to discover the proper blood sugar levels for community detection programs, with the unknown importance of the prediabetic glucose tolerance curve still the crucial factor in the decision.¹⁰ Studies to determine the significance of orthostatic albuminuria in the ultimate development of nephritis,¹¹ the methods for detection of cervical cancer, and the value of various ways of teaching breast self-examination¹² are of inestimable value to the correct development of future effective health programs.

Research in program development is merely the health officer's way of building evaluation into his new health programs. Had more of this been done in the past, we would not now be facing as great a problem in attempting to prove the effectiveness of much of our current effort. We must accept the principle that every full-time local health officer can make a sound contribution to research in program development. Ample resources for a host of selected studies of this nature can be found in any locality.

Fiscal Research

Recently health officers have been urged to make studies in the development of program budgeting and performance budgeting.¹³⁻¹⁵ These efforts will enable them to appreciate the cost of making alternate decisions in public health practice, including the cost of not executing the program. Such studies complement the emphases on evaluation research, operations research and research in program development, and round out the category of administrative research for the public health officer.

Yardstick Research

The investigation of chronic diseases has made increasingly evident the need for precision in our terms of reference. With so many of our diagnoses based solely upon symptoms or pathology instead of a knowledge of etiology and pathogenesis we need more research to provide clearly defined descriptive terms which have validity. It is also important for the terms to have reliability, which means that different workers will obtain similar results by investigating the same problem under similar conditions. The health officer, with an unusual opportunity to observe and study the presumably well human being, can, (a) note the range of normal as well as pathological findings, (b) observe patterns of symptoms and signs throughout these ranges whose recognition may suggest new tools of measurement, and (c) study the reliability of the individual measurements. Work in this field has been performed by Yerushalmy for the reading of chest x-rays,¹⁶ by the Albany Study¹⁷⁻¹⁸ and the Framingham Study¹⁹ for coronary heart disease, and by Cobb and others in arthritis.²⁰ Studies along similar lines are well within the resources and capabilities of local health officers.

Health officers as a group are a new addition to the field of yardstick re-

search, but through follow-up of screening programs they have an unusual opportunity to make solid contributions. The highlighting of the hazards of the use of cause-of-death data²¹ and household canvas information²² for epidemiological studies suggest methods of obtaining better data which the health officer himself is in a unique position to supply.

Epidemiologic Research

This is one field which requires no special elaboration for the local health officer. The literature upon which we have been raised is replete with instances of epidemiologic truths elaborated by public health workers. Recently, we have seen this approach extended to the complex problems of heart disease, diabetes, obesity, and arthritis. No matter what the findings in the metabolism ward, it will usually require a number of carefully planned and controlled, prospective, incidence-measuring, community studies to bring concrete proof of the hypothesis. Most will agree that proof now exists of a positive relationship between long-time cigarette smoking and a significantly higher risk of developing lung cancer. Additional studies must be made on the possible relationship of saturated fats in the diet to coronary heart disease, and on the influence of various factors on diabetes. Studies are under way on the influence of ionizing radiation on the incidence of congenital defects and neoplastic disease. Along a somewhat different line, studies have been undertaken by means of social science technics on such questions as the differential use of the mass chest x-ray program by people in a community.²³

Promotion of Local Health Department Research

The National Institutes of Health have urged health departments to per-

form more research of high quality and have taken special steps to encourage such efforts.¹ Every local health officer in this nation is a potential research worker. The mobilization of this vast potential should be one of the foremost priorities of state and federal health agencies.

New York City Health Department Research Program

The New York City Health Department has always viewed research as one of its most important programs, and has felt the responsibility to perform research in fields of public health importance when effective knowledge for disease control was lacking. In 1942, the department took an unprecedented step in establishing an independent corporation known as the Public Health Research Institute for the performance of basic research in the biological sciences of ultimate importance to public health. The Health Department has also contributed many significant studies in field research, but until the last few years its emphasis was largely epidemiologic and oriented to the laboratory.

Recently the department has attempted to expand its program by taking full advantage of the unique opportunities offered by its location, population distribution and availability to research institutions. It has found that much of its research can be carried out more effectively by teaming up with other agencies and by using freely the skills of local qualified consultants. While many of its research projects are limited to a single bureau, it is also engaged in a significant number of studies that are being carried on by a team comprising investigators from several medical schools, city, and state agencies. The department encourages each staff member to join one or more research teams whenever the person has a particular contribution to make. As a result, most of the professional staff of

the Health Department are in some way involved in productive research.

Organization for Research—The Research Committee and the Staff Research Team

The arrangement used in the New York City Health Department for communication and promotion of research consists of a special interdisciplinary research team and of a research committee. One of the two deputy commissioners of the department has been charged with the major responsibility for research, program planning, program development and evaluation, and acts both as leader of the team and as chairman of the research committee.

The special research staff, still partly in process of formation, is composed of two epidemiologists, two consultant public health nurses, a social worker trained in research, a sanitarian, a principal statistician, a social scientist, and several part-time research consultants and field workers. The nurse, sanitarian, and social worker on the team have all been carefully selected by their respective bureau directors for this specific assignment, thereby insuring a high priority for research within these traditionally strong service bureaus. The special research staff is charged with the responsibility of promoting and assisting the performance of high quality research by all interested and qualified members of the department. The members of the team communicate frequently on research activities. They have the freedom to approach problems of special interest to them as individual research investigators without awaiting a team decision. They are free to join any professional colleague from any discipline either within or outside the department for any specific research project. At times they may function only in a liaison capacity between an outside agency wishing access to the department's facilities or data; as such they are merely members of that study's

advisory committee. Usually, however, each is a full research partner.

The members of the research committee include all of the assistant commissioners of the department as well as certain key bureau directors, district health officers, and the members of the special research staff. Every proposed research project is submitted to each committee member in the form of a brief outline at least one week before a general discussion is scheduled with the principal investigator. At that time the committee may invite outside consultants who are expert in this field and who can add to the discussion.

In no sense is this research committee intended by the department as a selector or censor of research. Research is too new in its struggle for priority in a health department for any committee to take even a mildly negative attitude. Rather, each research project submitted is regarded by the members as a challenge to think of ways in which it can be improved, assisted, sharpened scientifically, and made administratively feasible. Each potential investigator is the leader of his own study program. He is not obligated to accept any recommendations given him by the committee, short of outright rejection, an action which has not yet occurred.

The committee believes that public health staff members and health workers from cooperating agencies can develop worth-while projects when given the appropriate assistance, encouragement, information and support of their colleagues. During the first year's operation of this committee, during which 30 separate research projects* were considered, there has been no apparent reason to question this assumption. On the contrary, the improved communication among key members of the department on new research has been of inestimable value in assimilating research into the total Health Department pro-

gram. Such matters as changes in physical facilities, special equipment, fiscal problems, assignment of key personnel, interrelationships with the service bureaus of nursing and statistics and over-all public relations have been worked out satisfactorily through this committee on research.

Reasons for the Priority of Research

There are many compelling reasons for treating research as equal to the most essential service programs when allocating personnel, funds, interest, and effort. Research is an important key to the grand strategy of effecting change from the traditional in public health to the newer challenges awaiting us in chronic disease and rehabilitation. Only through research can the most inquiring and keenest minds be attracted to the public health field. The health department is often the only agency that can make an effective attack upon a research problem dealing with the long term follow-up of citizens living and working in the community. Without health department cooperation in such efforts, an important source of essential research knowledge could not be adequately exploited.

Most health departments should consider themselves obligated to undertake research, since they operate under laws

* The Box Score for the Period November, 1956, to November, 1957:

Three studies completed with local support—one published and two presented at the 1957 APHA Annual Meeting.

Two awarded NIH project grants.

One supported by separate appropriation in Health Department budget, especially approved by the Board of Estimate as a research project.

Three supported by special contracts with PHS, Bureau of State Services.

In seven NIH study grants have been requested.

The remainder are being supported by the usual resources of the department and those of the cooperating agencies.

which require the department to assess existing public health problems and to take the steps necessary to deal with them. When lack of resources prevents significant action in the control of disease, this legal requirement can be accepted as a mandate to perform research aimed at the development of new resources.

Research deserves priority because it will force the health department staff to maintain a scientific approach. Research will help the staff to exercise the self-discipline required to keep abreast of the scientific literature. Emphasis on research will insure that staff members maintain a critical point of view instead of resting content with their traditional assumptions. It will lead them to seek outside advice and consultation. It will help public health workers to accept new developments instead of resisting their incorporation in the programs. It will improve communication between the various disciplines working in public health and reaffirm the common goals which keep us productive in this field. It will also improve communication between various health agencies so that we may learn how to be helpful though critical, without becoming either antagonistic or provincial.

Conclusion

There has been a major change in the community's attitude toward the health officer during the past fifteen years. Formerly, he was regarded as an expert, an essential source of health knowledge, wisdom, and practice. Today, the scientific enlightenment of the population and the rapidity with which news streaks from central sources over the head of the health officer to the public has changed his role considerably. The health officer now has a greater and more difficult responsibility. Instead of simply administering his department in keeping with a pattern of

appropriate programs meeting approved standards, he must develop it by means of proper scientific methods so as to keep his programs effective, timely, and streamlined.

The consequence is that research can no longer be considered a luxury for public health. It must lie at the very root of good public health practice. This is why the New York City Department of Health has now incorporated research at its highest levels as a task of each of its members, ranking in equal importance with its general service and operational activities.²⁴ This is why the department is now undertaking a number of research projects in cooperation with each of the six local medical schools and the school of public health. This is why each of its high level employees is personally engaged in research and devotes a generous portion of his time to the improvement of the efforts of others.

No one can predict the ultimate limits of the public health field, or the challenges which await us in the future. Nor do we know what new organizations will appropriate portions of our present field as their particular domain of action or what new skills will be applicable to it. During the coming years, the health officer must look to research and the emphasis upon research technics as his major source of stability, communication and cooperation. Through these he can maintain his enlightened leadership in developing future effective programs for the community's health.

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AMA Model Poisoning Control Law

The American Medical Association has prepared a model law for the precautionary labeling of hazardous substances in commercial, household, and industrial chemical products. Based on a 15-month study, the Committee on Toxicology proposes this as a model for uniform laws requiring declaration of hazardous ingredients and warning statements on the label and in accompanying literature of chemical products. The study of existing laws revealed a

hodgepodge of regulations for labeling chemicals.

Among the features of the law are requirements that all chemical products containing hazardous substances be so labeled, that the same labeling standards apply to products for export as for domestic consumption, and that strongly sensitizing chemicals be identified and warned against, and prohibiting the reuse of food and drug containers bearing their original labels.