PERFORMANCE ANALYSIS IN COMMUNITY SANITATION PROGRAMS

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The ultimate evaluation of a sanitation program must be determined by the effectiveness of control of disease in the community. An analysis of the workload required to achieve a successful program for the management of the environment will include the evaluation of the performance. The correlation of achievement with the number of work units performed is a difficult task for all administrators of sanitation programs. However, by the use of performance analysis, statistical information may be developed that will be useful to the administrator. The data derived from performance analysis, however, must be used in conjunction with other accumulated information.

Morbidity and mortality rates, compliance with sanitation standards as determined by impartial surveys, and the judgment of the administrator as to the degree of accomplishment compared to the efforts expended, together with performance analysis data, are all indices available to the administrator. These indices are helpful in adjusting programs, changing priorities, balancing workloads, and placing certain programs under surveillance standards, as well as determining the feasibility of the inauguration of programs of more recent public health challenge.

An administrator having cold, hard facts before him can offset, when the need arises, having his program upset by the opinions of individual citizens, civic organizations, governmental agencies (fostering specialized ideological programs) and other pressure groups. He will depend upon the available indices for the maintenance of established programs as well as for the generation of ideas for the studying of departmental operational improvements.

The sanitation administrator of today's programs is faced with an impelling fact that must be considered for all future endeavors. The real wealth of our nation includes land, water, food, and air, which are decreasing daily—while the wastes of civilization are increasing in direct proportion to the increase in population. The potential disease hazards are enormous.

Proper planning today is essential to offset this potential.

Administration

The application of planning techniques, organizational standards, management and evaluation is essential. It must be acknowledged, however, that the accumulation of quantitative data is important. However, such data cannot be substituted for administrative initiative and the acceptance of responsibility. The administrator bent upon building a record of the number of work-units performed, without regard to the accomplishment of disease control, is spinning his wheels in the sands of time. He will become so mired down that only abandonment will be left to his choice.

A study of the records of most food sanitation sections of the environmental health divisions of local health departments will reveal that restaurants are inspected in accordance with the local regulations. One will also note that the periodic surveys made by the state official agency over a period of years indicate that the sanitation rating has varied very slightly from the figure of 70 per cent compliance. Equipment, fixtures, housing, and housekeeping meet with the standards, but the standards of operation are not being met. An analysis of the performance records indicates that manpower, finance and other factors are adequate, but the deficiency still prevails. A re-evaluation is indicated.

The effectiveness of the inspection service is not determined by compliance to the duties described by a job description, but to the degree of understanding of the standards by the sanitarians and the operator. The questions not answered by performance analysis are: (1) Did the operator comprehend the meaning of the standard for operation as well as he did the physical standards? (2) Was the operator motivated to comply to all the standards through understanding the disease hazards involved?

I present the hypothesis that the program would improved provided the sanitarian had spent more time on each inspection trip, rather than making many cursory inspections in order to fill up the record book. The administrators of today's programs must be thinking in terms of quantity, but also must be cognizant of the words "understanding" and "motivation."
Performance Analysis

The final decision to be made by the administrator will be based upon many items of information. The cost of a program is an item of interest to all persons concerned, and the one best understood by the public. For this reason, performance analysis may be used to determine the manpower needed to carry out a program and the cost of that program. The comparison of the costs against the benefits to be derived from the program will determine the final decision to be made by the administrator, which will be based on sound reasoning.

The decision as to whether an activity shall be undertaken will be determined principally from the costs of that activity. How many man-days will be required? Will this activity require more man-days than can be spared from the activities required by laws or regulations? Finally, will this activity require additional manpower? Performance analysis will furnish data that will be helpful in making a decision and, as the case may be, it will be helpful in justification of a budget.

To make actual comparison, the administrator should also possess data that indicates the actual experience to which a comparison of the present or anticipated program and costs may be compared. Most administrators have a figure representing the cost of their entire programs as well as the workloads they must consider. However, rarely do you find that the actual costs and manpower requirements are broken down into the various activities. Many feel that this type of division is impractical because of the over-lapping of the duties of the sanitation section. However, one cannot evaluate one activity against another without such a breakdown as to costs and manpower requirements for each activity.

The reviewers of a program for a local health department utilizing performance analysis data should have several questions in mind: (1) How many work units can the average sanitarian be expected to accomplish in a given period of time? (2) What is the average cost of this manpower for each work unit?

One must bear in mind that only average manpower, as well as average costs, may be determined. The amount of work units accomplished will vary widely by individuals, and for this reason the unit costs will also vary. The administrator should not compare the workloads for farm sanitarians as against the workloads for in-town restaurant sanitarians. However, for an organization of any size the average figure will provide information upon which a decision may be based.

The survey of the community should be the first step in the collection of data. This type of survey should be an inventory of facilities, establishments and general working conditions. This survey should include an inventory of situations which require "extra curricular" services as they relate to the community disease potential. The condition of alleys, rat harborage sites, stagnant water, garbage and refuse collection all have a bearing on the environmental program. In short, the restaurant inspector who is concerned only with the interior of the restaurant cannot fulfill the full function that public health requires.

The factors that should be determined from this type of survey include: (a) the demand for a particular service; (b) the laws, rules, and regulations making the services possible; (c) the feasibility of incorporating newer services with the present personnel; and (d) the practicability of diluting present activities recognized as essential to the public health of the community in favor of newer public health challenges. These are all factors related to the data derived from performance analysis.

Planning for Performance Analysis

The organization for the utilization of performance analysis must take into account overhead costs, direct costs, work units required, manpower (presently employed or anticipated to be employed, as the case may be), past performance of the agency being analyzed, and the determination that the selected activities being compared are either identical or quite similar.

From the study of these individual factors, we may generalize that overhead costs are those costs which may not be attributed directly to a given function. Such costs are usually under the control of the general administrator. These cost include rent, water, laboratory services, pool-typing services, and salaries of administration personnel. They are usually assigned to the environmental health sanitation program without prejudice on a prorated basis with other divisions of the health department.

In contrast to the overhead costs, the direct costs are those figures attributed solely to the fulfillment of a given function of sanitation. Such costs vary directly with the amount of work units undertaken. These costs include salaries of individuals employed in a given function, the costs of travel, secretarial and clerical assistance, specialized equipment and supplies.

Records of performance are the figures representing the activities of the sanitation section for past years, or, records of performance experience of other similar agencies, provided they are comparable to the organization under study. The basic figure that
must be determined will be the number of employees necessary to carry-on a given function. They may be representative of the number of personnel required to meet future objectives, or simply those required to meet current objectives. All costs are related to the figures of the number of personnel engaged in a project in one way or another.

The number of necessary employees is derived from the inventory of facilities, establishments and conditions. The objectives of a given program must be previously determined by the administrator from past experience, the opinion expressed by some author of a piece of literature, or may be determined solely upon the regulations or laws. An example may be derived from the U. S. Public Health Service Food Service Sanitation Ordinance and Code. This ordinance requires the minimum of one official inspection to be made on each establishment during each six-month period. This is a legal limit. In developing a program objective, one inspection may be deemed to be all that is necessary to maintain an established program. On the other hand, the judgment and experience of the administrator may indicate that four or five inspections within each six-months period will be necessary. The number of work units required will be determined by multiplying the number of legal inspections by the number of establishments under jurisdiction.

This calculation will provide a statistical figure, but does not provide a figure in measurable terms. A fully defined work unit figure would include necessary time to review plans for layout and construction of the establishments, office time, travel time, as well as the time to make the actual inspections. In order to derive a figure that is indicative of the number of inspection work units required, the non-productive time must be subtracted from the total working time.

Personnel requirements in terms of "work units" may be determined by analysis utilizing the following formulae:

1. Average number of inspections required = Number of establishments
   Legal requirements for the number of inspections per establishment

2. Average number of inspections per man-day = Number of inspections required
   Number of man-days to be utilized

3. Average number of hours per inspection = Number of productive hours per day
   Number of inspections per man-day required

Each activity of the sanitation program must be analyzed separately or determined for the total program. The performance analysis made annually will show trends of activity for the entire program. The quarterly or semi-annual analysis will tend to show those activities that are progressing satisfactorily as well as those that need immediate attention. The administrator may also utilize the performance analysis data in conjunction with the survey results and morbidity and mortality rates to determine the allocation of personnel from one project to another project of more public health significance.

One type of performance analysis requires that all tangible services be reduced to comparable units of endeavors. In order to be brief, we will use several examples of the inspection services regarding eating and drinking establishments. Arbitrary weights are given to the several functions of this service unit. Food establishment inspections are weighted as 1.4; bar inspections 1.2; itinerant establishments 4.0; collection of samples as 0.5. These weight units multiplied by the number of establishments will provide a total number of weighted units, which will provide a uniform basis for recapitulation. The survey indicates that the sanitation section has five-hundred eating and drinking establishments within its jurisdiction, and in addition, it has thirty-five bars, five itinerant restaurants and the established number of samples required by ordinance is 2160.

The number of estimated weighted units will be the weight times the number of functions required. Thus, for this example, a total of weighted units of work would amount to 1842. The estimated budget expenditure for the period is $47,308.64. Thus, we know that the cost of each work unit will average $25.68. To secure an estimate of each function, which would more nearly indicate a true cost, the cost of unproductive time would have to be calculated and deducted from the cost of productive time.

This type of information provides a means of evaluation of the effort to be performed by the sanitary. However, the evaluation of effort and the cost thereof does not give the key answers to the effectiveness of the efforts or costs expended. When performance is evaluated, the number of inspections of the establishments or the number of samples taken are reduced to a numerical value or a cost value.

Whenever it is possible, the measurement of performance should always be made in terms of the total need for the function. This type of analysis is described as measuring the "adequacy of performance." Estimates for the evaluation of the adequacy of performance are difficult figures to obtain with any precision. The denominators require data that describe the total amount of unmet need under a given program.

The efficiency of a function may be reduced to the equation of output divided by input. In other words, efficiency represents the ratio between the
improvement of the public health in a community to the effort expended, whether this data be in terms of the time expended by the sanitarian or by the number of dollars spent on the effort. The concept of efficiency is often used in the attempt to streamline a traditional program. In other words, can the administrator recapture some of the resources now expended on a given program? It is an attempt to reduce effort to mathematical figures in order to answer the following question: Could the same end result be obtained at less cost of time and material?

Such data is important to the administrator in determining budget requirements and the allocation of work units, but do not indicate the results in obtaining the objectives of a program designed to provide the maximum protection against public health hazards. Such figures provide the data to develop ratios of funds or manpower expended, or anticipated to be expended, to total funds available. The success of a program will depend upon the judicial use of such data; but the final analysis will consider all the aspects of the program and the judgment utilized by the administrator. Success can only be assured by the responsible interpretation of data and in the employment of competent, well-trained personnel who are motivated to the necessity for the control of the sanitation aspects of the environment in order to provide one phase of a total public health endeavor.

Performance analysis is one important method of determining data essential in evaluating a program by the administrator. It should not be just a dog wagging its tail; it should not wag the dog.

REFERENCES


STUDY EFFECT OF LIGHT ON MICROORGANISMS

Scientists at the University of California are pioneering in research on how laser beams kill yeasts and bacteria and how such microorganisms protect themselves against light. The work, supported in part by grants from the Public Health Service, U.S. Department of Health, Education, and Welfare, may help point the way to better methods for preserving foods.

So far the research has shown that the continuous laser beams will kill bacteria in test tubes to which a photo-sensitizer, such as toluidine blue, has been added. The amount of exposure, however, varies with different kinds of microorganisms.

Although it has been known for a long time that visible light can kill certain kinds of microorganisms, the researchers hope to discover how they protect themselves against light. The laser is valuable in these experiments because it speeds up processes which might normally occur with other light, such as that produced by the sun.

It is believed that more knowledge of the self-protective systems used by bacteria and fungi will be valuable for its own sake and might also point the way to better food preservation methods. The current aims of the research are to determine the role of the carotenoids, which are naturally occurring pigments, in protecting microorganisms exposed to the laser beam and to investigate the mechanism by which the organisms are killed.

SUMMER FIELD TRAINING INSTITUTE
AT OKLAHOMA UNIVERSITY

The 16th Summer Field Training Institute for sanitary engineers and sanitarians sponsored jointly by the Oklahoma State Health Department, the University of Oklahoma and the USPHS is scheduled for June 6 to July 29, 1966 at the University of Oklahoma at Norman. Purpose of the course is to provide practical field training through "learn-by-doing" techniques and to give students a broad acquaintance with public health practice.

Courses will cover rural and municipal water supply and sewage disposal, food and milk sanitation, refuse storage and disposal, camp and school sanitation, swimming pool sanitation, industrial hygiene, radiological health, insect and rodent control, housing and emergency sanitation. The first five weeks will be attended by all enrollees and the last three weeks will provide specialized field training in the three areas of general sanitation, sanitary engineering and radiological health. A separate program for a fourth group is planned for those interested in international health.

Requests for information and applications for admission should be addressed to George W. Reid, Director, School of Civil Engineering and Environmental Sciences, University of Oklahoma, Norman.