

Fiscal Research in Public Health

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In the New York State Health Department the desire for governmental services of high caliber is combined with an emphasis on effective use of the state's resources. An indiscriminate cut in funds allocated to public health threatens the destruction of a long-time investment in trained personnel and established operating efficiency. To serve the first aim and to prevent the second end result, a program of accounting and performance budgeting was applied experimentally to a tuberculosis hospital. The principles exemplified will be found widely adaptable.

✳ Recognizing that the costs of public health programs and medical research will probably continue to increase, and that the amount of money available to government for these services is limited, the New York State Department of Health, in cooperation with the Legislative Commission on the Fiscal Affairs of State Government, undertook a study of Health Department accounting and budget concepts. Such a study would: (1) be useful in controlling costs; (2) provide to supervisors and administrators at all levels more effective tools for the measurement of alternative courses of action; and (3) assist in the evaluation of performance, the development of priorities, and an understanding of the true costs of specific programs.

The Homer Folks Tuberculosis Hospital at Oneonta was selected for the first phase of this study. It was agreed that before the installation of a department-wide program, it was necessary to test the feasibility of basic principles on a small and controllable scale. A tuber-

culosis hospital seemed to be the ideal proving ground because: (1) it represented an essential governmental service that could be isolated for study; (2) it performed a service which was generally agreed to be one of high quality; (3) it had programs and activities which appeared to represent a fairly complex health program; and (4) expenditure for hospital care represents so great an outlay of state funds that any concepts developed by the State Health Department could be used in other departments providing institutional care.

The study was conducted by one of the authors (DK), the commission furnishing the necessary funds, technical consultation, and guidance. The Department of Health supplied the expert advice of the staff of the Division of Tuberculosis Control, the hospital, and the Office of Program Development and Evaluation, in addition to the Offices of Business Administration, Planning and Procedures, and Personnel Administration. An interdepartmental advisory committee composed of one of the authors (GJ) and representatives from the Division of the Budget and State Comptroller's Office was established to set the scope and limitations, and to provide general supervision for the study.

Principles Tested

The principles tested at the Homer Folks Tuberculosis Hospital were part of the plan to develop a program accounting and performance budgeting system that would provide financial information regularly and inexpensively

to key administrative levels of state government. The true costs of programs and activities should be made routinely available to those people who must make financial decisions (or public health decisions having fiscal significance). This is a basic requirement for sound accounting and budgeting.

The specific concepts tested were: (1) the accumulation of costs by program, function, or area of responsibility; (2) the separation of costs into variable and fixed parts; (3) the relation of variable costs to workload; and (4) the use of standards for planning activities and appraising performance.

The first principle listed contemplates not only that all costs relating to a program, but also all costs relating to a function or an area of responsibility within this program should be segregated. Thus, costs for food service are worth listing separately, since food service is a distinct function of the hospital and is under the supervision of one individual, the supervising dietitian. Since this person supervises all personnel and authorizes all expenditures in the operation of the food service center, she can be held responsible for the control of the costs of carrying out these activities. Costs are controlled by fixing responsibility on one individual. This is a significant principle. Costs themselves can never be controlled; it is only by controlling the action of people that we can hope to influence costs.

Thus, if cost data are successfully accumulated by function or area of responsibility, we can use their figures as "building blocks" to determine the true costs of programs. The outstanding advantage of this approach is that it enables all levels of administration—from the supervisor to the commissioner—to relate functions and services to expenditures. This places these administrators in the best position to choose between alternatives, appraise

results, and develop both short- and long-range plans.

The second principle to be tested involves the separation of costs in each area of responsibility into variable and fixed components. A variable cost is one which increases or decreases in accordance with the changes in the volume of work units produced. Thus, the cost of raw food is a variable cost, since it changes with the number of meals served. Other examples are the costs of soaps for laundry purposes, travel expenses for outpatient clinic sessions conducted, and film for x-ray examinations performed.

Fixed costs, on the other hand, do not vary directly with the volume of work produced, but have a minimum below which the unit cannot function properly. For example, as long as the Homer Folks Tuberculosis Hospital is in operation, a director must be employed. The director's salary, therefore, is a fixed cost. As long as there are hospital grounds and buildings, they must be maintained, and the salaries of groundsmen and other maintenance personnel are fixed costs. Other examples are the salaries of the supervising dietitian and members of the housekeeping and administrative staff. These fixed costs are not directly related to workload as are the variable costs. Rather they are related to a time period, such as a salary per year, which must be paid regardless of the volume of the patient load.

The third principle recognizes a direct relation between total variable costs and volume of work produced. This re-

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sults in the development of variable unit costs. The development of variable unit costs can be very useful for both program planning and appraisal of performance. It simplifies budgeting, since the administrator may quickly determine what added costs will be required by multiplying the cost per unit by the number of units of work he plans to produce in a specified period. In order to control expenditures and appraise performance, the actual expenditures are then compared with those budgeted. For instance, if an allowance of 30 cents per meal had been budgeted for raw food, but in actual experience the cost turned out to be 35 cents per meal, attention is directed to the need for a special examination of the problem and possible corrective action.

The fourth principle involves the testing of certain "standards" in planning activities and measuring performance. In many fields of administration standards can be established that will relate variable costs to work units (standard variable costs) or fixed costs to periods of time (standard fixed costs). Special consideration was given to the development of suitable standards at the Homer Folks Hospital. Ideally, standard costs should be based upon standards of performance which reflect the agreement of qualified individuals on what is good performance in any activity. Although there is agreement on the general standards for the medical program of tuberculosis hospitals, there are no series of widely accepted standards for each activity.

Conducting the Study

All the field work involved in this study was done at the hospital during the months of July and August, 1954. While most of the data tabulated were derived from records of expenditures and consumption reports, the opinions and judgments of hospital officials were

reflected in the results. Similarly, wherever publications, such as those of the American Hospital Association or the National League for Nursing,* were pertinent and available they were used.

A complete description of the test installation of the program accounting system is being reported elsewhere.^{1, 2} The technical accounting details are of interest primarily to those individuals working in the field of business management. The following listing of the major procedural steps should be sufficient to orient the reader: (1) determination of cost centers or departments of the hospital (Table 1); (2) definition of units of measurable work (Table 2); (3) segregation of variable and fixed costs; (4) development of unit costs for variable costs; (5) development of total allowances for fixed costs; (6) development of standard costs; and (7) preparation of forecast budget.

Utilization of Program Accounting Data—The financial information and performance data obtained from this program accounting system have many potential uses. They may be used for planning programs, controlling the execution of activities, and measuring or evaluating what was actually accomplished by the activities. In our study,

* One of these is the publication "Cues to Staffing Tuberculosis Units in Hospitals" prepared by the National League for Nursing, Inc., which points out that a director and assistant director of nursing must be employed by a tuberculosis hospital regardless of the volume of patient-days, while the various classes of nurses assigned to ward service should be assigned in accordance with volume standards (i.e., so many hours of nursing care to a patient-day, classified as to type of patient). It should be noted that, while such publications assist in deciding whether a cost is variable or fixed, the standards published were not those adopted for this study. All of the standards which were developed were based on actual staffing at the Homer Folks Hospital. Hence, all standards are reasonable and realistic in relation to the operation of this specific hospital.

Table 1—Homer Folks Tuberculosis Hospital

Cost Centers or Departments
Outpatient Service
1. O.P.D.
Professional Care of Patients
2. Ward service
3. Ancillary professional service
4. Surgery
5. Laboratory
6. X-ray
Dietary
7. Food service
Household and Property
8. Laundry
9. Housekeeping
10. Maintenance
11. Power plant
Administration
12. Administration

these uses may be illustrated by a brief examination of the various levels of decision-making, from the level of the operating supervisor of one of the cost centers at the hospital to the commissioner of health.

Cost Center Supervision—The program accounting system supplies the person who supervises the cost center with financial and performance data which will enable that person to accept responsibility for cost control as well as activity or program control. Routinely these supervisors can be kept informed of the ways in which the actual costs of their activities compare with budgeted costs. Comparisons of these actual costs with the anticipated standard costs will indicate the areas in which specific investigation of apparent problems should be initiated. Routinely and currently any significant variations should be explained by operating supervisors to their superiors and, when indicated, corrective action undertaken. The types of

information which may be provided in the routine reports are shown in Tables 3, 4, and 5.

Table 3 illustrates a report which gives current information to the supervisor and his superiors on the variations between the amount budgeted and actually spent for each account at the ward service center for a specified period. It also includes an explanation of significant variances.

Table 4 presents an example of the workload analysis and performance data which can be routinely supplied by this system. This sample report illustrates the utilization of ward service personnel during a given quarter of a year.

Table 5 gives a somewhat more elaborate type of performance report which can be provided currently to the food service supervisor and her superiors. This table shows also the spending variance as illustrated in Table 3 and, in addition, demonstrates (in column 4) the workload and the value of services actually performed by this supervisor. Thus, it is seen under "Gross Costs" that this supervisor saved \$2,968 (column 5), but she should have saved an additional \$2,942 (column 7). The explanation of this illustration is simple, while raw food costs declined with the decrease in the number of meals served, the cost of salaries and related expenses remained constant.*

Hospital Director—The data and reports discussed are useful to the director of a hospital, since they provide him with the information he needs to evaluate the performance of his staff. In addition to measuring performance, the program accounting system gives him

* This situation is not due to any failure on this supervisor's part. Only the accounting system is being tested, while all other operations of the hospital are unchanged. Thus, during this experimental period, the various supervisors and administrators are not supposed to take overt action to cause variable costs to decline when workload declines.

Table 2—Homer Folks Tuberculosis Hospital

Defined Units of Measurable Work	
Cost Center	Unit
1. Outpatient department	Field clinic sessions
Travel expense	Examinations
All other expenses	
2. Ward service	Special patient-days
	Bed patient-days
	Semiambulant patient-days
	Ambulant patient-days
3. Ancillary professional service	None *
4. Surgery	Major operations performed
5. Laboratory	Laboratory tests performed
6. X-ray	Hospital (inpatient) examinations
	All other examinations
7. Food service	Served meals
8. Laundry	Pounds of laundry processed—staff
	— Special patient
	— Bed patient
	— Semiambulant patient
	— Ambulant patient
9. Housekeeping	None *
10. Maintenance	None *
11. Power plant	None *
12. Administration	None *

* "None" does not imply that no measurable units exist. Rather, it means either: (1) incurred costs are so relatively fixed that no useful planning or control purpose would be served by comparing costs with units of work done; or (2) the identification and recording of measurable units of work would be uneconomical compared with possible benefits to be gained.

a tool for estimating his financial requirements for short- and long-range planning.

Using this technic, budgeting for the following year becomes a simple, rapid, and inexpensive operation. Let us say the standard cost developed for a served meal is 50 cents. On the basis of projected trends in patient population the director can estimate the number of meals to be served. This is only one of several estimates of workload based on hospital census. Then, to determine the amount required for variable food service costs, he simply multiplies the

planned number of meals by 50 cents. To this amount are added the fixed costs for the period, and the budget estimate for that activity is completed.

General Director of Tuberculosis Hospitals—This executive serves in the central office of the state department of health, and is charged with the general direction of all tuberculosis hospitals. Using this method of cost accounting, he can measure the performance of each of the hospitals under his supervision, bearing in mind their respective standards, and can compare the cost of accomplishing given objectives with what

was budgeted for those purposes. In addition, this accounting system provides him with an essential tool for planning the best use of physical facilities.

For example, one of the crucial problems facing administrators in a department of health is the proper use of the physical facilities of tuberculosis hospitals during this period of declining patient census. In New York State, the following are among the alternate courses of action to meet this problem: (1) Should wards of state tuberculosis hospitals be closed? (2) Should some of these hospitals be closed and their patients accommodated in the remaining state hospitals? (3) Should small local tuberculosis hospitals be closed and their patients cared for in state tuberculosis hospitals? (4) Should the facilities of state tuberculosis hospitals be used to care for patients with chronic nontuberculous conditions?

Under accounting systems maintained

by object of expenditure currently in use throughout the country, the cost data required to make such decisions could only be obtained after a lengthy and expensive special study. Under this program accounting system, such information can be readily and routinely provided to the decision-making authorities. It is understood, of course, that the ultimate decision made in each of these cases is not based upon cost alone. However, cost should play its part in the decision, and it would be unrealistic for any public health administrator to make decisions which were entirely based on factors other than cost.

Commissioner of Health—The chief administrator of a health department can use the financial data in the same manner as has already been discussed for his staff executives. He can appraise the effectiveness of the performance of hospitals, of various case-finding programs and other public health activities. He can plan the best use of facilities and

Table 3—Homer Folks Tuberculosis Hospital Ward Service—Analysis of Spending Variance, July 1—September 30, 1954

Account	Actual Expense	Budget Estimate	Spending Variance
Directly Incurred Costs			
Salaries	\$57,062	\$60,289	\$3,227 *
Workmen's compensation	671	709	38 *
Retirement contribution	5,199	5,497	298 *
Clothing	51	125	74
Medical supplies	2,244	3,194	950
Antibiotics	5,726	6,664	938
Outside hospital services	..	13	13
Repairs to medical equipment	229	108	(121)
Distributions			
Maintenance service received by ward personnel (food, laundry, and rent)	7,059	7,059	
Deduction from salaries for maintenance service	(5,519)	(6,076)	(557) *
Total	\$72,722	\$77,582	\$4,860 †

* Staffing under budget during this period included one senior TB physician vacancy and an average of two staff nursing positions.

† There were 20,249 patient-days of care actually given as compared to 22,813 forecast. (For breakdown of patient-days of type of patient, see Table 4.)

Table 4—Homer Folks Tuberculosis Hospital Ward Service—Analysis of Hours of Nursing Care, July 1–September 30, 1954

Type of Patient	Patient-Days		Standard Nursing Hours per Patient-Day	Standard Hours		Hours Variance
	Forecast	Actual		Forecast Requirements	Actual Requirements	
Special Bed	1,551	1,140	2.5	3,878	2,850	1,028
Bed	5,292	6,213	1.5	7,938	9,320	(1,382)
Semiambulant	9,125	8,337	1.0	9,125	8,337	788
Ambulant	6,845	4,559	0.25	1,711	1,140	571
Total	22,813	20,249	..	22,652	21,647	1,005

Comments:

Budgeted hours of nursing care exceed actual hours required by 1,005 hours.

This variance of 1,005 hours multiplied by the standard variable cost per hour for nursing salaries of \$2 = \$2,010. Accordingly, if it were administratively and medically feasible to do so, nursing salaries of approximately \$2,000 should have been saved during this period. However, it is recognized, in the case of nurses, that there are other factors in addition to cost control which have a great affect on any decision to leave nursing positions unfilled.

he can estimate their future fiscal requirements.

In addition to these decisions on tuberculosis, the commissioner of health must make decisions on the relative priorities of all health programs. He can be sure that program directors will conceive new programs to contribute to the general welfare of the citizens of the state. Realism compels him to acknowl-

edge that there are equally zealous bureau directors in the departments of education, mental hygiene, commerce and labor whose combined programs could exceed available revenues. Hence, the commissioner must decide which programs should start now and which must wait for future new resources. In making these decisions, costs of program must be considered in addition to

Table 5—Homer Folks Tuberculosis Hospital Food Service Department—Actual, Budgeted, and Standard Costs, July 1–September 30, 1954

	1	2	3	4	5	6	7
	Actual Expenditures	Budget Estimates		Services Rendered at Variable Standard Unit Costs †	Spending Variance Budget and Actual. Cols. (2) and (3) Minus (1)	Volume Variance Between Standard and Budget Col. (4) Minus (3)	Net Variance Between Actual (1) and Total of Budgeted Fixed Costs (2) Plus Standard Variable Value of Services (4)
		Fixed	Variable *				
Salaries	\$33,930	\$ 9,992	\$24,071	\$21,381	\$ 133	\$(2,690)	\$(2,557)
Workmen's compensation	399	116	283	251	..	(32)	(32)
Retirement contributions	3,092	899	2,197	1,956	4	(241)	(237)
Food	26,418	..	29,237	25,969	2,819	(3,268)	(449)
Linens, tableware, etc.	439	575	136	..	136
Repairs to equipment	463	250	(213)	..	(213)
Deduction from salaries for maintenance	(3,611)	(629)	(2,893)	(2,572)	89	321	410
Gross Costs	\$61,130	\$11,203	\$52,895	\$46,985	\$2,968	\$(5,910)	\$(2,942)

* 97,455 meals planned for this period

† 86,563 meals actually served during this period

their value to the health needs of the people. Such cost knowledge can contribute to a sound decision only if it represents true costs of programs and only if it is readily available for use in planning and budgeting. Both of these criteria are met by this program accounting system.

Discussion

In developing standard costs for activities and programs, it was shown that, ideally, standard costs should be based on accepted standards of performance. However, standard costs can be developed where generally accepted standards of performance are either nonexistent or extremely crude. Since these standard costs would then become basic data for planning and evaluation, it should create desirable pressures toward the establishment of sound standards of performance in areas of public health. Such an end product of this new system of program accounting and performance budgeting would make a major contribution to the evaluation of public health services.

It has been noted that the system provides those true costs of programs which permit the administrator to choose between alternatives. These costs are also expressed in terms of workload. At the present time, when tax moneys are appropriated in terms of objects of expenditure, the legislature authorizes the hiring of certain numbers of physicians, nurses, engineers, and also expenditures for travel, utilities, supplies, and similar items. In periods of economy or of great competition among programs, the legislature commonly reduces funds by a reduction of positions, miles traveled or supplies to be purchased. This could be done without a keen sense of having curtailed essential services. However, if the budget is expressed in the following terms, the effect of the cuts in funds

upon the essential program is immediately apparent:

For care of 1,000 tuberculosis patients	\$XXXXX
For research in the early diagnosis of breast cancer	\$XXXXX
For the rehabilitation of 2,000 children with paralysis from poliomyelitis	\$XXXXX

If costs are based upon standards which reflect the cost for one patient-day of care for a citizen with tuberculosis, and if there are 1,000 such people needing hospital care, the budget needs for the tuberculosis hospitalization become clear-cut. Funds to support such a budget can be denied only when the legislature decides that only a portion—or none—of these individuals should be hospitalized. A legislature, responsive to its constituents would find it very difficult to make this type of adverse decision in the field of public health.

Health administrators may believe that the approach to the problem of standards in public health should first be made on a scientific basis before one becomes concerned about the fiscal aspects of the problem. Since health officers are now dealing routinely with fiscal authorities in order to obtain funds, practical considerations dictate that this problem be approached from the financial side. Much money is now being appropriated and spent for health activities, and one may well begin by noting how much each activity or groups of activities cost. After those standards which mirror our current practice are defined, it will be incumbent upon health administrators to undertake appropriate studies aimed at improving the scientific quality of these standards. Ideally, the final standard will be an expression of public health accomplishment. Such standards will be in terms of patients restored to health, active cases discovered, children immunized, and environmental hazards corrected. In the mean-

time, we may have to accept standards of "work effort," such as patient-days of hospital care, nursing visits, clinic visits, and sanitation inspections.

One of the most important features of the new system is its value to the health officer in the development of his long-range plans. Fiscal planning, as done by government, is usually an annual problem, with the preparation of each year's budget an independent operation. If the health officer knows the cost of each of several alternate plans for the performance of health service, he will be able to adjust his program more readily to the funds made available each year by appropriating bodies. The health officer may, for example, be fortunate enough to secure budget approval to an arrangement whereby any money saved in one specific program might automatically be diverted to another group of activities of public health value. This will place the premium on economy and give a health officer an added incentive to make the most efficient use of all his funds so that he may proceed with some new programs. In our present period of rapid change in program priorities in public health, such an arrangement would assist in persuading health officers to decrease their emphasis on relatively unproductive activities.

When alternate plans are considered by the health officer, budget officer, or the legislature it is important to emphasize that taking "no special action against the problem" is always one of the alternates. It should be possible to gather data on the fiscal implications of this "do nothing" alternate as well as alternates which require special services

by health units. Public and fiscal leaders should be presented with data describing the high cost of inactivity as compared with that of productive services, particularly when such services can take advantage of certain fixed costs already committed. This may well lead to greater success in securing funds for necessary health programs in chronic disease.

Summary

The health officer must secure adequate funds to provide high-grade public health services for his community. He must, therefore, have a knowledge of the financial implications of his administrative decisions. Such knowledge will help him secure the funds he requires from appropriating bodies, and to spend them wisely. A study aimed at the development of such a system was established, on a trial basis, at a state tuberculosis hospital under the New York State Department of Health. This program accounting and performance budgeting system has been described, as well as some of the important implications of this system to health administrators. During this era of changing priorities in public health, it is suggested that this method will be of considerable value to public health planning, operations, and evaluation.

REFERENCES

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