

# What Is A Good Statistical Report?

DONALD A. TRAUGER, MS

---

*Mr. Trauger is a supervisory public health analyst, Division of Research, Maternal and Child Health Service, Health Services and Mental Health Administration. Tearsheet requests to D. Trauger, 12A-16, Parklawn Building, 5600 Fishers Lane, Rockville, Md. 20852.*

---

While all levels of government are spending billions of dollars for health services or medical care, it is somewhat surprising that there are so many experts and so little published material on statistical reporting of program operations.

Possibly an exhaustive review of textbooks or curriculums of schools of public health or of journals such as *Public Health Reports* (now *Health Services Reports*) or the *American Journal of Public Health* might reveal significant articles on statistical reporting, but in recent years only two articles have appeared on the reporting of services paid for under Medicare (Title XVIII of the Social Security Act).

Perhaps the collection of information and its collation, tabulation, and publication are regarded as such a pedestrian occupation that it is assumed that adequate skill and knowledge are passed from person to person genetically or universally so that further instruction is unnecessary.

The literature on management contains easily accessible material on reports and reporting. In general, this material is not in manuals or hand-

books on how to do it—in the sense that one can get “how to” information about accounting systems. Literature about management generally is prepared on the assumption that a good manager wants to know where he is, where he hopes to be, how to get from where he is to where he wants to be, and how much progress he is making in doing so. Published material about reports often mainly reemphasizes the point.

## Need for Criteria

The absence of generally agreed on instructive material about reporting public health programs suggests that criteria by which a good reporting system can be distinguished from a bad reporting system may be helpful. It would be surprising indeed if such criteria were promptly and universally adopted. My objective is to present a checklist of items in the hope that persons who disagree can specifically state their criteria or whichever of these criteria with which they cannot agree. From such a process may come a common language.

Initially it is necessary to agree—at least temporarily—that reporting systems are not synonymous with information systems. Information can be acquired through a system of reports, surveys, or research. The important thing about a reporting system is that it entails the use of a plan, it is repetitive, and that reported data usually are derived from records kept for administrative purposes. Surveys need not depend on reported

information—they may depend on special observation. The initiative for collecting the information is engendered by the surveyor. Research is characterized by novel and by acute attention to definition, observation, and recording.

The information that reporting systems collect about health or medical programs is intended to serve several purposes. These purposes include an accounting for the services provided: where and when, to whom, and under what program. In theory, reported information is used in planning, budgeting, and administration and as an indicator of accomplishment.

Reporting and information systems usually emerge from extensive experience with the kinds of questions usually asked about programs. Such experience usually provides information about the kind of data required, in what detail, what precision, how current the information must be, and how it is to be used. From this experience come concepts of how to design a reporting system. Before the widespread application of computer technology, maintaining all the current, detailed information which could be stored on magnetic tape or otherwise filed for ready reference generally was considered wasteful. In the computer age, cost has been relegated to the background or people have been lulled into thinking that the added volume of stored data and speed with which it is possible to retrieve such data is well worth the extra cost—whatever that cost may be.

Despite a certain blurring of vision that results from the glitter of computer hardware, it still seems worthwhile to design systems with due regard to cost in relation to the sort of questions most likely to be asked. Other considerations are the frequency with which the material may be required and with what specifications.

When all of these factors are considered, the system which evolves is usually operating statistics and analyses supplemented by less frequent special studies which provide more detail about the program, its administration, and the people it serves.

Ordinarily, operating statistics provide a few basic facts which can be used either in monitoring programs or in detecting bottlenecks or changes in trends. Such statistics are useful in reporting to legislative bodies, in budgeting, or in planning new or revised legislation.

These data are ordinarily on a complete rather than a sampling basis. Partly because the data are so basic and so readily available, it is

easier to count all events as they occur than to set up a system for counting, for example, every sixth event.

### **Defining the Criteria**

If agreement can be reached regarding what a reporting system is, nine items are suggested as pertinent in distinguishing a good report. Good reports are timely, complete, reliable, valid, accurate, clear, pertinent, economical, and balanced. A discussion of each of these criteria may show that what is important is the degree to which a report meets these criteria.

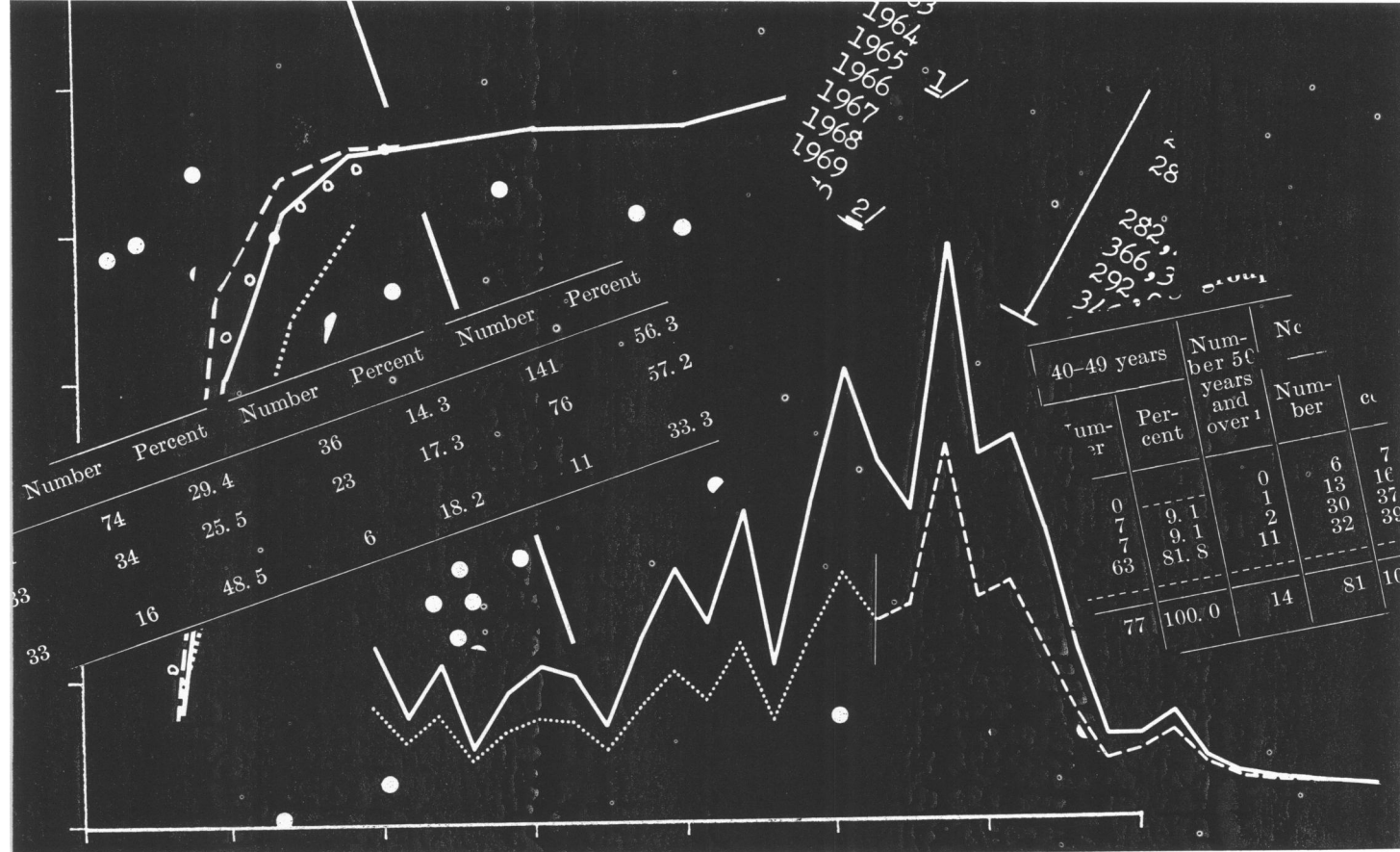
*Timeliness.* Is the report timely? Two time dimensions are pertinent. Annual reports, as distinguished from more frequent reports, obviously furnish material for administrative control and direction only once a year. Once-a-year reporting is not considered adequate for proper and efficient administration in many places.

The second dimension of time relates to the currency of the report. A weekly report which arrives on the desk of a program manager 3 months after the end of the week reported obviously does not lend itself to prompt decision making.

Of course, it should be evident that there is a relation between the two time dimensions that has to be considered. In general, the shorter the time covered by the report, the shorter the interval between the end of the reporting period and the date the report is due. To illustrate, when weekly reports are appropriate, a few days' delay might seem acceptable. When annual reports are appropriate, a 60- to 90-day reporting delay might be acceptable.

*Completeness.* Is the report complete? Completeness is measured in terms of how well the report covers the area, the time period, and the activities it purports to cover. Obviously, a report which purports to cover 65 jurisdictions, but only covers 50, is not in the same league as a report which purports to and does cover 65 jurisdictions. Similarly, a report which purports to cover an entire month and covers only 3 weeks is not complete. Finally, a report of a program which provides 10 distinct and measurable services is not complete if only two services are reported. This definition does not rule out sampling; it merely emphasizes that if sampling is used, the sample must be representative along three dimensions—area, time, and activities.

*Reliability.* Is the report reliable? A report which yields different results in different hands



is suspect. Reports and reporting processes which depend on any unusual degree of expertise or esoteric insights of the reporters are likely to stand or fall with each change in such personnel. By definition such reports and reporting processes are virtually impossible to audit or verify. It is probable that reports which are unreliable will—sooner or later—run into a credibility gap. The reader learns about the degree of reliability of a report by understanding the way in which it is put together. He needs to learn how the reported events are discovered and observed and how reports of individual events flow into the central reporting office.

*Validity.* Is the report valid? Validity concerns the extent to which a report provides the kind of information it purports to provide. As an example, a report which purports to provide a basis for comparison of teacher qualifications and presents only information on salaries at most raises questions as to whether salary information can be used as a proxy indicator of qualifications. A report of a dental care program which provides information only on the number of dental examinations can scarcely be used to measure dental care unless a predictable relationship between dental examinations and dental care can be established.

*Accuracy.* Is the report accurate? Accuracy has several dimensions, some of which are closely related to other criteria. As used in this paper, accuracy means that totals are equal to the sum of the parts; that figures at the beginning of one reporting period are the same as those at the close of the previous period. The sort of accuracy I am concerned with at this point is that which can be checked clerically or by machine. The standard in judging a report is the extent to which any possibility of checking for accuracy is built into the system and into practice.

*Clarity.* Is the report clear? Obviously, reports which attempt to measure things which are not clear seldom are able to provide clear or understandable information. Clarity is not the same as simplicity, but nonparsimonious concepts are likely to lack clarity. In statistical reporting the use of standardized terms and definitions is to be encouraged. As an illustration, even though the conventional classifications of marital status leave much to be desired, it is preferable to a simple classification of men and women according to whether they have or have not been engaged in a heterosexual relationship. The phrase, heterosexual relationship, simply lacks clarity.

*Pertinence.* Is the report pertinent? Program statistics should be confined to information which

measures a program activity: the impact on a target group, a cost, or a result. Counts of tangential matters may only prove confusing. The number of women of childbearing age has much to do with the dynamics of population growth. The number of men with procreative ability is not generally regarded as pertinent so long as it exceeds zero.

*Economy.* Is the report economical? Although the concept of economy may be closely related to clarity and pertinence, the economy referred to in this paper is in dollars. The reader attempts to discern the extent to which the reporter recognizes that a complete information system may usefully employ surveys and special studies as well as reporting techniques.

It is not economical to load a reporting system with requirements for information which (a) is needed infrequently or (b) involves detailed or complex problems that could be handled better as either a research project or a special study. Reporting systems are best when confined to information which (a) is widely and frequently used, (b) needs to be kept current, and (c) is readily available through rather uncomplicated methods of collection and collation. Often the material reported is developed as an integral part of an administrative process or procedure.

*Balance.* Is the report balanced? The balance of a report is reflected in the extent to which the information collected gives a balanced picture of a program. For example, if 90 percent of a report is about activities on which only 10 percent of program effort or money is expended, it is hardly a balanced report. In this sense, balance is closely related to completeness.

There is another aspect of balance—an aspect which may or may not exist within an information system. A complete information system might include provision for an accounting system, a statistical reporting system, a program of special studies, surveys, or analyses, and a research program. Balance would be determined by an appraisal of how appropriately each major part of the system was developed. Attempts to incorporate a research project in a reporting system do not seem to work, and attempts to use the techniques of a survey to do what reporting systems do better are obviously impractical.

It is my thesis that if the report meets the suggested criteria, it will be useful. Whether the report is used or used well will depend on the program's managers.

## Testing the System

The ultimate test of any reporting system is "How many important questions does it answer and how well?" If the ultimate test of the system is its power to answer questions, the number of questions is not a valid test. An overwhelming report is frequently ignored. What is important is whether the system provides (a) solid information rather than merely a basis for estimates or guesses, (b) a basis for perceiving the development or change of trends soon enough to permit an adequate administrative reaction, and (c) output sufficiently selective to answer the most important questions without overwhelming the potential user or the person who compiles the report. The information provided in a report should be the kind needed by a good administrator on a fairly regular and current basis.

A careful study is not needed to anticipate the kind of information most frequently sought about a health services delivery program. The following questions are typical of those to be answered.

1. How many people have received the service provided?
2. How does this number compare with previous periods or forecasts?
3. How is this number related to the target population?
4. How many people have sought the service who have not received it because of ineligibility, delay, or similar reasons?
5. What major categories of service are most frequently provided?
6. To what extent are the people who apply or are served the same or different people from period to period?
7. What kinds of people are served and how do they vary in the amount and type of service received?
8. What time intervals exist in providing various services?
9. Are the services accomplishing the desired result?

A reporting system which is economical may not answer all nine questions. The first six types of questions usually can be answered promptly and with current information from a good periodic reporting system. Questions such as seven and eight usually are answered most economically by surveys. Questions of the type suggested by number nine usually require a well-controlled experiment and may not be answerable given the present state of the arts.