

The United States General Accounting Office (GAO) defines audit methodology as "the methods and techniques used to gather and analyze data needed to accomplish the audit objectives." The selection of appropriate methods depends on the types of questions the audit/evaluation seeks to answer. This section introduces the GAO's general framework for determining which methods are appropriate for evaluations of various types. [Return to Table of Contents](#)

**AUDIT/EVALUATION QUESTIONS ARE DESCRIPTIVE, NORMATIVE, OR CAUSE-AND-EFFECT**

GAO classifies audit/evaluation questions as either descriptive, normative, or cause-and-effect, as follows:

- **Descriptive** questions gather data on existing conditions.
- **Normative** questions gather data to compare observed outcomes with given levels of performance. This is often referred to as benchmarking.
- **Cause-and-effect** questions gather data to determine if observed conditions, events, or outcomes can be attributed to program operations.

**FOUR PRIMARY AUDIT/EVALUATION STRATEGIES**

Different audit/evaluation questions may require different strategies. GAO notes the four basic strategies listed below, the first three of which gather primary data.

- sample surveys
- case studies
- field experiments
- use of available data

**SAMPLE SURVEYS**

Sample surveys gather data on descriptive and/or normative issues from a sample portion of a total population in order to estimate the characteristics of the whole population. Among the usual characteristics of interest are frequency of events or behaviors, average values, range of values, and dispersion of values.

Sample surveys are usually either criterion-referenced, cross-sectional, or panel.

- **Criterion-referenced** sample surveys deal with outcomes or the processes that generate such outcomes. These surveys gather data to answer normative questions and compare actual performance to an external performance standard. However, criterion-referenced designs do not permit auditors to make inferences about whether a program has caused the outcomes. Note that the audit model "criterion, condition, cause, and effect" is a special case of the criterion-referenced design.
- **Cross-sectional** sample surveys measure characteristics of interest at a single point in time. Because the design requires rigorous sampling procedures, the population must be well defined. To ensure the uniformity of the data, data collection instruments must be unambiguous and likely to elicit complete, unbiased answers from all respondents. It is important to pretest any data gathering instrument a number of times before using it.
- **Panel** sample surveys gather data from each observation (unit in the sample) at two or more points in time. The design makes possible measuring changes in fact, attitude, and/or opinion. But, if observations leave the sample, changes in the sample may be mistaken for changes in the conditions being assessed. Thus, keeping the panel intact is important. When observations are lost, data reliability and validity may suffer, and adjustments may be needed to minimize distortion in survey results.

**CASE STUDIES**

Case studies analytically describe the events, properties, processes, or variable relations of one or more sample units under study and are often used to gather in-depth data on complex situations. Case studies can address descriptive and normative questions if there are no requirements to generalize from the results.

Case studies are usually qualitative in nature and include the following types:

- **Critical instance** case studies gather data to examine a single instance of unique interest and/or to perform a limited test on an assertion about a strategy, program, or problem.
- **Cumulative** case studies gather data from many case studies to answer audit/evaluation questions.
- **Exploratory** case studies gather data both to describe conditions and to generate hypotheses for future investigation.
- **Illustrative** case studies gather data to describe and add realism and/or in-depth examples about a program or policy.
- **Program effects** case studies gather data to examine causality and usually involve multiple program sites and multiple audit/evaluation methods.
- **Program implementation** case studies gather data on program operations, often at multiple program sites.

**FIELD EXPERIMENTS**

Field experiments gather data to determine causes and effects by comparing outcomes associated with a program to an estimate of what the outcomes would have been without the program. They may be quantitative or qualitative.

The three primary field experiments are the before-and-after design, the non-equivalent comparison design, and the true experiment design.

- **Before-and-after designs** compare results before and after participation in the program. A comparison group is not used. While this design can determine the amount of change, it does not permit attributing such change to the program itself since other variables may influence the change observed. Thus, the absence of a comparison group weakens the kinds of conclusions that can be drawn from before-and-after experiment results.
- **Nonequivalent comparison group designs** are used to answer cause-and-effect questions when membership in a comparison (control) group cannot be randomly assigned. However, note that using a dissimilar or non-random comparison group usually weakens results since it is not possible to rule out factors other than the program as plausible causes for the differences between the treatment group and comparison group.
- **True experiment designs** randomly assign selected program participants to either a treatment group or a comparison (control) group. However, note that assignment to the comparison group means that program benefits must be withheld from certain program participants during the course of the experiment. Moreover, if treatment and comparison groups are not randomly assigned, it is unsound to suggest that any differences between the two groups arise due to program benefits. Thus, for these reasons, true experiments are rarely used at the SAO.

**USE OF AVAILABLE DATA**

This strategy gathers and/or analyzes data previously collected by others. Two general approaches are used -- evaluation synthesis and secondary data analysis.

- **Evaluation synthesis** summarizes results of previous studies and aggregates findings from such studies to provide a credible conclusion. Some form of synthesis is appropriate when available evidence can answer or partially answer an audit/evaluation question. Synthesis often identifies gaps in available information which can trigger the gathering of new data. A synthesis may range from a review of the literature to complex techniques such as meta-analysis (a quantitative composite of existing research).
- **Secondary data analysis** is not really a design because data have already been acquired under a previous design. However, this method can answer questions that were not posed when data were first collected and/or analyzed. Such analysis is generally qualitative and/or descriptive but can address more quantitative normative and cause-and-effect questions, depending on how suitable the data are to the audit/evaluation issues under scrutiny. Note that users of secondary data are well advised to examine the reliability and validity of such data as part of their data analysis.

The following table shows the relationship between the four primary audit/evaluation strategies discussed above and various design considerations. Most audits/evaluations use more than one strategy.

<b>Audit/Evaluation Strategy</b>	<b>Type of Audit/Evaluation Question</b>	<b>Availability of Data</b>	<b>Kinds of Information</b>	<b>Sampling Method</b>	<b>Need for Comparison Set</b>
<b>Sample Surveys</b>	Descriptive or normative	New data collection	Usually quantitative	Probability sampling	No
<b>Case Studies</b>	Descriptive or normative	New data collection	Usually qualitative	Nonprobability	No
<b>Field Experiments</b>	Cause-and-effect	New data collection	Quantitative or qualitative	Probability or nonprobability	Required by the design
<b>Use of Available Data</b>	Descriptive, normative, or cause-and-effect	Available data	Quantitative or qualitative	Probability or nonprobability	If available

The flowchart on the next page shows these considerations in a slightly different form.

Source: U.S. General Accounting Office, "Designing Evaluations," GAO/PEMD-10.1.4, May 1991

**FINAL COMMENT**

To derive maximum benefit from the various audit/evaluation strategies and designs discussed in this module, auditors should clearly and carefully define the following:

- Accountability project objective(s) and related audit/evaluation questions
- Nature, scope, and availability of data required
- Plans for identifying, collecting, and sampling data
- Criteria for evaluating data
- Plans and methods for analyzing data