

**Health Services Research and Development Service
Cost Analyses
Information for Applicants and Reviewers**

July 2001

This informational memo describes HSR&D expectations for proposals involving health care cost determination and other types of economic analysis.

Types of Economic Analysis.

Proposals should describe the type of economic analysis to be done. Common types of analysis include cost-identification, cost-consequences, cost-effectiveness, and cost-benefits analysis.

- Cost-Identification Analysis asks the question "What is the cost?" of a health care program, service, or intervention.
- Cost-Consequences Analysis examines all costs associated with an intervention, including its effect on health care utilization.
- Cost-Effectiveness Analysis examines the incremental effect of health care interventions on both cost and outcomes. Outcomes are measured in units of morbidity adjusted survival, called the Quality-Adjusted Life Year (QALY). Since the quality adjustments are often referred to as patient utilities, this type of analysis is also called Cost-Utility Analysis.
- Cost-Benefits Analysis assesses the incremental effect of an intervention expressing outcomes in dollars of value.

Standard Methods of Cost-Effectiveness Analysis.

Most proposals that assess cost-effectiveness will refer to the standard method described by the U.S. Public Health Service advisory panel on cost-effectiveness (Gold et al., 1997). Those that do not should explain why that method is not suitable. Among the key elements of the standard method are the following:

- The analysis finds the incremental effect of an intervention by comparing it to a reference group, often the current standard of care.
- Costs and outcomes are discounted to reflect the reduction in economic value that occurs when cost or benefit is deferred.
- The analysis adopts the perspective of society. Patient-incurred cost is measured.
- Incremental cost-effectiveness is evaluated.
- Outcomes are valued, usually in terms of Quality-Adjusted Life Years of survival.

- Uncertainty should be addressed with statistical testing and sensitivity analysis.
- A model may be needed to estimate the lifetime stream of cost and benefit associated with the intervention.

Determination of VA Health Care Costs

VA is a challenging environment for health economics research, because it does not routinely bill for the services it provides. Researchers may determine VA health care costs by one or several methods. They may directly measure costs. They may use VA cost and utilization databases and apply non-VA measures of relative value to estimate VA health care cost. They may use estimates from the Health Economics Resource Center (HERC) or the Decision Support System (DSS). A combination of methods is often needed. VA cost finding methods are described in a special supplement to the journal Medical Care that was published in April 1999. HSR&D proposals should identify each source of VA cost and utilization data and describe how any relevant limitations of the data will be addressed.

Sources of VA utilization data include the following:

- The Patient Treatment File (PTF) is a hospital discharge data set that characterizes hospitalized patients and the care that they received in acute, observation, and extended care stays.
- The Outpatient Clinic File (OPC) contains data on ambulatory care provided by VA. It characterizes ambulatory patients and the diagnoses assigned and procedures performed in their outpatient encounters. This data source is alternately called the National Patient Care Database.
- Other utilization databases. VA maintains databases on pharmacy, prosthetic devices, and contract care. Prescriptions dispensed by VA pharmacies may be found in the Pharmacy Benefits Management (PBM) database. Information on these data may be obtained from the VA PBM Strategic Health Care Group in Hines, IL, which may be contacted at (708) 202-2079 ext. 2-1213.
- The Veterans Integrated Health Systems Technology & Architecture (VISTA) provides detailed clinical and utilization data for every individual treated at each VA medical center. It is the source of data in the PTF and OPC. Since it is difficult to create electronic extracts from VISTA, proposals to use VISTA should explain that data could not be found in another VA database, and describe a specific plan for extracting data.

Sources of VA cost data include the following:

- Financial Management System (FMS) is a summary of the VA expense journal that reports the cost of supplies and the quantity and cost of each type of staff. Expenditures are reported for each medical center by cost center, a reporting unit that does not correspond to any particular patient care department (e.g., the cost center for nursing service is not divided into inpatient wards or outpatient clinics). This source does not identify the cost of patient care programs, particular services, or patient encounters.

This data was formerly called the Centralized Accounting for Local Management (CALM).

- The Personnel and Accounting Integrated Data (PAID) system provides occupational and payroll data on all VA employees. PAID includes confidential data and access to it is not routinely granted.
- The Cost Distribution Report (CDR) reports costs of departments at each VA medical center. It is created by allocating the costs reported in the FMS using cost allocation estimates of service chiefs. Proposals for projects that will use CDR data to find costs incurred by patients should describe the method to be employed.
- The Veterans Equitable Resource Allocation (VERA) system allocates funds to VA regional networks based on information in a database created by the VA Allocation Resource Center. The VERA database includes patient level costs estimated using the CDR, OPC and PTF, and other sources. It does not include the cost of specific encounters. Proposals that rely on this data source should explain how the study question would not be sensitive to the assumptions used in creating these cost estimates. This source was formerly known as the Resource Planning and Management (RPM) database.
- HERC Average Cost Data Sets. The HSR&D Health Economics Resource Center is creating a comprehensive set of estimates of the cost of each VA health care encounter that has occurred since October 1, 1998. These estimates are based on the costs reported in the CDR, utilization from the PTF and OPC, and non-VA data on the relative costs of health care encounters. These data rely on the assumption that VA uses the same relative quantity of resources as non-VA providers, and that encounters with the same characteristics have the same cost. Proposals that rely on this data source should explain how the study question would not be sensitive to the assumptions used in creating these cost estimates.
- Decision Support System (DSS) is a computerized cost-accounting system that determines the cost of VA departments, patient care encounters, and specific health care products used in an encounter. DSS is based on extracts of other VA data systems (i.e., VISTA, PTF, CALM, PAID, CDR). Most data are kept in production databases organized by medical center or network, but national extracts have been created of the cost of VA inpatient stays and outpatient visits. Additional cost and clinical extracts are planned. At the present writing, DSS data have not been sufficiently validated for research proposals to rely exclusively on this source. Those who propose to use DSS data may be expected to demonstrate knowledge of the limits and appropriate use of this system. Proposals should describe whether production or national extract data will be used and describe a plan to validate cost data.

Many proposals rely on non-VA cost data. Non-VA data are used to estimate comparable costs where none exist in VA, to identify the costs of non-VA healthcare utilization of VA patients, and to serve as benchmarks for VA costs.

Sources of non-VA cost data include the following:

- Medicare databases include enrollment, entitlement and claims history information on all Medicare beneficiaries. Claims data include records of individual inpatient stays and outpatient visits. Medicare also releases annual hospital financial reports. Medicare data can be obtained as public release files, which do not include patient identifiers. Researchers who need to identify specific patients in Medicare data must comply with a rigorous approval process designed to protect patient confidentiality.
- Medicaid is a federally funded and state-operated medical care program for the poor and disabled. Researchers should be aware that there are differences in state Medicaid policies, services covered, and data sets. There are multi-state Medicaid data sets, and an emerging national database.
- American Hospital Association (AHA) Annual Survey is a voluntarily-completed survey of hospitals. It includes data on workload, staffing, revenues and expenses at the facility level, including VA medical centers.

VA investigators may learn more about cost and utilization databases from the following centers:

Information on VA cost databases may be obtained from the VA HSR&D Health Economics Resource Center. HERC maintains a web site (<http://www.herc.research.med.va.gov>), with resources for researchers. HERC staff may be contacted by e-mail (herc@med.va.gov), or by phone (650-617-2630). HERC is a source of the Medical Care supplement on VA cost determination.

Information on VA utilization databases may be obtained from the VA Information Resource Center (VIREC). VIREC has a web site (<http://www.virec.research.med.va.gov>) and may be contacted by e-mail (virec@research.hines.med.va.gov), or by phone (708-202-2413).

The VA Management Science Group (MSG) has information on sources of non-VA cost and utilization data that are available to VA researchers. MSG make several datasets available at the VA Austin Automation Center, including Medicare cost reports, AHA Surveys, and state discharge data sets. The MSG maintains a web site (<http://world.std.com/~mgtsci/>) and may be contacted by phone (781-687-2678). Information on Medicare databases can also be obtained from VIREC or from the Research Data Assistance Center (RESDAC). RESDAC is a resource center for all researchers who wish to work with Medicare data. It maintains a web site (<http://www.resdac.umn.edu/>) and may be contacted by e-mail (resdac@tc.umn.edu) or by phone (888-9RESDAC).

Issues Addressed by Proposals for Economics Research

Proposals to identify health care costs may need to consider the following issues:

- Economic costs may not be entirely captured in cost or utilization databases.
- Charges do not equate to cost.
- Costs are affected by geographic variations in wages.

- Health care products are diverse, and their cost may be affected by severity of illness.
- The definition of different health care products may differ across institutions.
- Cost and utilization data often require validation.
- Some type of direct measurement of cost and utilization may be required.

The economic analysis section of an HSR&D proposal ordinarily addresses the following:

Research Question(s)

1. The study question is described. Cost questions are posed in an answerable form.
2. The type of analysis is indicated, e.g., cost-identification, cost-consequences, cost-effectiveness, or cost-benefits analysis.
3. Studies that make comparisons to a control group or standard care clearly describe the alternative.
4. The study's relevance to VA is described. The proposal indicates if expected findings will be generalized to the population of VA patients or VA providers.
5. The proposal identifies the perspective of the analysis (e.g., the patient, payer, provider, society-at-large). This perspective should be considered in defining cost.

Cost Methods

6. Cost is defined. All important and relevant costs for each alternative are identified. The investigator may wish to consider the cost of non-VA healthcare costs, and the costs of capital, such as buildings and equipment.
7. Data and methods are described. The proposal demonstrates an understanding of the limits and appropriate use of data sources. It discusses the strengths and shortcomings of each data source, and its validity and accessibility. The proposal should describe what permission must be obtained, or cost incurred, to obtain data.
8. If costs will be measured directly, the method of determining personnel cost should be described, including the means of allocating personnel time. Studies of new interventions need to explain how costs that pertain to the intervention will be distinguished from costs incurred in researching its effect.
9. The proposal considers any special circumstances that may make cost measurement difficult and describes appropriate strategies.
10. If indirect costs or non-healthcare costs are to be considered, the proposal describes how they will be measured. The proposal should indicate if time lost from work, or the value of the time of volunteers, will be included.

Outcomes and Benefits

11. If the proposal is a cost-effectiveness or cost-benefits analysis, then the method of measuring outcomes is described. The proposal should make clear if indirect costs will be counted as a cost or as an outcome. Cost-effectiveness studies ordinarily measure outcomes in Quality Adjusted Life Years. Proposals for this type of study should describe the method of measuring the utility (Quality Adjustment) associated with different health states.

Analysis

12. The analysis plan should address uncertainty by including statistical tests and sensitivity analyses.
13. The effect of time on costs and outcomes should be considered by discounting.
14. If a model is necessary, it should be completely described.
15. Qualifications of research staff, including their familiarity with VA data sources. Not every cost study requires a health economist.

Involving a Health Economist

Some cost analyses may be straightforward enough to be conducted by an experienced VA researcher without economic training or costing experience. Other analyses will require the assistance of a health economist. While there are guides to using VA cost systems available, be prepared for many challenges if no one on the research team has prior experience with VA costing. There are no formal rules about when to use a health economist, but there are some good rules of thumb.

An economist is not needed for every health services study involving cost. If cost is the secondary rather than central outcome of the study, if the study takes the payer's perspective, or if the study is limited to an examination of the cost of the intervention, an experienced health services researcher or biostatistician may be able to carry out the study without the assistance of an economist. An example of this type of study is a cost identification analysis in which the payer's perspective is used and the cost of a single intervention is determined (e.g., the cost of pill A versus B). Some very experienced researchers may be able to conduct cost-effectiveness studies without the assistance of a health economist. Familiarity with VA databases may be at least as important as health economics training. Health economists who are unfamiliar with the VA system will need to learn VA cost determination methods.

An economist may be needed for complex studies. Greater complexity requires greater expertise. A health economist may be needed if the study will determine all health care costs, if it adopts a societal perspective, if it examines cost-effectiveness, or if costs and outcomes are to be discounted. Adoption of the societal perspective requires methods to measure patient-incurred cost and costs that VA patients incur in visits to non-VA providers. Studies that require modeling may require research staff that are experienced in constructing decision analysis models.

A list of VA economics researchers is maintained at the HERC web site at:
<http://www.herc.research.med.va.gov/findexpert.asp>

References on VA Cost Determination

Swindle R, VanDeusen-Lukas C, Alexander-Meyer D, Barnett PG, Hendricks, AM. 1999. Cost analysis in the Department of Veterans Affairs: Consensus and future directions. *Medical Care* 37(4 Supplement):AS3-AS8.

Barnett PG 1999. Review of methods to determine VA health care costs. *Medical Care* 37(4 Supplement):AS9-AS17.

Swindle RW, Beattie MC, Barnett PG. 1996. "The quality of cost data: a caution from the Department of Veterans Affairs experience." *Medical Care* 34(3 Supplement): MS83-90.

References on Cost-Effectiveness Analysis

Drummond NE, Stoddart GL, Torrance GW. *Methods for the economic evaluation of healthcare programs*. 2nd Edition. Oxford: Oxford University Press, 1997.

Gold MR, et al. *Cost-effectiveness in health and medicine*. New York: Oxford University Press, 1996.

Russell LB, Gold MR, Siegel JE, Weinstein MC. 1996. "The role of cost-effectiveness analysis in health and medicine." *Journal of the American Medical Association* 276(14): 1172-1177.

Siegel JE, Weinstein MC, Russell LB, Gold NM. 1996. "Recommendations for reporting cost-effectiveness analyses." *Journal of the American Medical Association* 276(16): 1339-1341.

Sloan FA, ed. *Valuing health care: costs, benefits, and effectiveness of pharmaceuticals and other medical technologies*. Cambridge: Cambridge University Press, 1994.

Weinstein MC, Siegel JE, Gold MR. 1996. "Recommendations of the panel on cost-effectiveness in health and medicine." *Journal of the American Medical Association* 276(15): 1253-58.