

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

April 2009

This informational memo describes HSR&D expectations for proposals involving health care cost estimation and 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, and cost-utility analysis.

- A Cost-Identification Analysis determines the cost of adopting a health care program, service, or intervention.
- A Budget Impact Analysis finds the total cost of adoption. It differs from cost-identification by counting only those costs incurred by the provider (VA) over a short time horizon. It considers the number of patients who might need the innovation, and the total impact on the VA budget.
- A Cost-Minimization Analysis compares the costs of alternative treatments under the assumption that they have equivalent effects on patient health.
- A Cost and Consequences Analysis examines the costs associated with an intervention, including its effect on health care utilization, and characterizes its effect on outcomes.

Methods of cost-effectiveness analysis include:

- A Cost-Outcome Analysis determines a ratio of the cost of an intervention to its impact on a non-financial outcome, such as changes in the number of deaths or the number of services used.
- A Cost-Utility 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).
- A Cost-Benefit Analysis expresses outcomes in dollars rather than QALYs. This method it is not often used in health care studies.

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., 1996). Those that do not should explain why that method is not suitable.

Among the key elements of the standard method (or “reference case”) 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. This yields the incremental cost-effectiveness.
- 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.
- 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 benefits associated with the intervention.

Determination of VA Health Care Costs

Researchers may use VA cost data bases, combine VA utilization data with unit cost estimates from another source, or directly estimate health care costs. A combination of methods is often needed. Direct measurement (also called micro-costing) combines staff activity analysis with data on labor cost. This method is often needed to estimate the cost of a novel intervention. Direct measurement is not a feasible method of estimating the cost of all care, however. Sources of VA cost data include the following:

- The Decision Support System (DSS) is a computerized cost-accounting system adopted by VA to allocate cost to VA departments, patient care encounters, and specific health care products used within an encounter.
- The HSR&D Health Economics Resource Center (HERC) creates estimates of the cost of VA hospital stays and outpatient visits by combining utilization data, non-VA estimates of relative cost and department-level DSS cost allocations.
- Information on outpatient prescriptions dispensed by VA pharmacies may be found in the VA Pharmacy Benefits Management (PBM) database or the DSS National Data Extract for pharmacy services.
- Prosthetic devices (including both external and internal prostheses and certain types of medical equipment) are characterized in the National Prosthetics Patient Database (NPPD).
- Care provided on contract through the Fee Basis program is recorded in the Fee Basis files. The Fee Basis program does not pay for all contract care, although it does provide all contracts for selected services, such as community nursing homes.

Information on these data sources is available from the HSR&D resource centers listed below.

- 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 utilization data in all other VA databases. It is difficult to create electronic extracts from VISTA. Proposals to use VISTA should explain that data cannot be found in other VA databases and should describe a specific plan for extracting data.

Other sources characterize VA costs at the level of department and medical center. These sources can be tabulated to find VA labor cost by type of employee, information that is useful for micro-costing. These sources VA cost data include the following:

- The DSS Account Level Budget Cost Center (ALBCC) database can be analyzed to determine cost by department, type of expense, and type of staff within each medical center.
- The Financial Management System (FMS) can be analyzed to determine the cost by cost center, type of expense, and type of staff. Unlike ALBCC production units, FMS cost centers do not correspond to particular patient care departments.
- 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.

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. VIREC has produced a dataset of Medicare records for users of VA services. The matched VA Medicare data are described on the VIREC web site (www.virec.research.va.gov).
- Medicaid is a federally funded, state-operated medical care program for the poor and disabled. Researchers should be aware that there are differences across states in Medicaid policies, services, and datasets. There are multi-state Medicaid data sets, and an emerging national database. Medicaid is overseen by the Center for Medicare and Medicaid Services (CMS). The Centers for Medicare and Medicaid web site (<http://www.cms.hhs.gov/home/rsds.asp>) contains information on publicly available data.
- American Hospital Association (AHA) Annual Survey is a voluntary survey of hospitals. The publicly extract, available for a fee, features data on workload,

staffing, revenues and expenses at the facility level, including many VA medical centers.

VA cost databases are documented by the Health Economics Resource Center (HERC). HERC also provides seminar, courses, and a consulting service to assist VA researchers who have questions about health economic data and methods. For more information go to www.herc.research.va.gov email herc@va.gov or phone (650) 617-2630.

VA utilization databases are documented by the VA Information Resource Center (VIREC) which may be reached at: www.virec.research.va.gov, virec@va.gov, or by phone at (708) 202-2413.

Information on Medicare databases can be obtained from the Research Data Assistance Center (RESDAC) which may be reached at www.resdac.umn.edu, resdac@umn.edu or by phone at: (888) 973-7322.

The VISN Support Service Center (VSSC) offers a menu-driven system for tabulation of an increasing number of VA cost and utilization data sets. VA researchers should contact their facility information security officer to request the specific permission needed to access this system.

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 equal 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 individual 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 (cost-identification, budget impact analysis, cost-utility analysis, etc.)

3. Comparator groups (or usual care) are clearly described.
4. The proposal details the study's relevance to VA and non-VA providers or patients.
5. The proposal identifies the perspective of the analysis (e.g., the patient, payer, provider, society at large). This perspective is 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 describes what permissions must be obtained, and costs incurred, to obtain data.
8. If costs will be measured directly, the method of determining personnel cost is described, including the means of allocating personnel time. Studies of new interventions 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 patient incurred costs or non-healthcare costs are to be considered, the proposal describes how they will be measured. The proposal indicates whether time lost from work or the value of the time of unpaid caregivers 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 clarifies whether indirect costs will be counted as a cost or as an outcome. Cost-effectiveness studies ordinarily measure outcomes in quality-adjusted life years. Such proposals describe the method of measuring the utility associated with different health states.

Analysis

12. The analysis plan addresses uncertainty by including statistical tests and sensitivity analyses.
13. The effect of time on costs and outcomes is considered through discounting.
14. The effect of inflation is accounted for when costs come from multiple years.
15. If a model is necessary, it is completely described.

16. Qualifications of research staff, including their familiarity with VA data sources, are noted. 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. Although there are guides to using VA cost systems, 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 pill 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 new to the VA system will need to become familiar with VA cost data.

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 who is experienced in constructing decision analysis models.

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

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