

Cost Analysis in the Department of Veterans Affairs Consensus and Future Directions

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OBJECTIVES. In 1997, the Management Decision and Research Center of the Department of Veterans Affairs convened cost experts and health economists in a working meeting. Its goal was to provide consensus guidelines for conducting cost analyses in managed care systems, such as VA, that do not have encounter-level cost data or that do not prepare itemized patient bills. The impetus for the meeting was that too often computer-based cost data were proposed or used in studies that were inappropriate for the question being addressed. There was also a sense that often great effort was being expended by VA health economists "re-inventing the wheel" in developing new cost components for each study.

METHODS. A group of 45 VA and non-VA health economists, health researchers, and policy-makers attended a 2 day working meeting organized around a series of case vignettes to identify areas of consensus, controversy, and gaps in knowledge.

RESULTS. Consensus emerged in the fol-

lowing four areas: (1) *Cost Methods.* A "hybrid model" was identified as the current standard of cost analysis in VA and entails mixing "micro-costing" primary data collection and "gross-cost" computer-based methods to reflect resource-use variations that are essential to the research question. (2) *Cost Infrastructure.* VA is developing a new, but unevaluated, costing system that could allow for computer-based cost analyses at much finer levels of detail than is currently possible. (3) *Data Quality.* Ongoing data validation of existing and developing cost databases is needed, especially concerning inter-facility variation. (4) *Dissemination.* A new cost data center was recommended to provide training, information dissemination, and coordination.

CONCLUSIONS. Consensus was reached about the hybrid model as the current paradigm for cost analysis in systems like VA.

Key words: costs; veterans; databases; health care. (Med Care 1999;37:AS3-AS8)

This is a time of massive and rapid change in health care systems driven largely by cost-containment concerns. The Department of Veterans Affairs medical system (VA), one of the largest health care systems in the world,¹ shares those

concerns in the need to determine which of its services are most cost-effective and how best to spend its health care dollars to benefit veterans. As in private-sector managed care systems, VA is completely responsible for all the health care

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Dr. Swindle's work is supported by VA HSR&D SDR 95-002 "Health Services Databases and Data Quality Information Dissemination."

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needs of its eligible patients, and costs are essentially capitated in a global budget.² Thus, the lessons learned from cost analysis issues in VA may be applicable to emerging issues in managed care systems; as more health care systems move away from a fee-for-service environment, they are arriving at a point in which they also need to know how best to manage costs. This paper provides VA and non-VA planners and researchers an overview of consensus on cost determination issues in VA which resulted from a recent working meeting of VA and non-VA cost experts. It also provides an overview of the papers in this issue, all of which were either commissioned for the meeting or which resulted from it.

The working meeting was largely prompted by two concerns: the perception of proposal reviewers and VA Health Services Research & Development (HSR&D) staff that the cost-analysis components of many VA policy studies and research proposals were inadequate; and the sense that VA health economists expended too great an effort in "reinventing the wheel" by developing new cost components for each study. The goal of the meeting was pragmatic: to develop guidelines and consensus specific to VA on measuring costs. The recent Panel on Cost-Effectiveness in Health and Medicine³ provides a broad framework for cost effectiveness analysis that is fully applicable to cost studies in VA. However, it is not specific enough for VA in one of its nine main areas, which is measuring costs.⁴ That is because, unlike most private providers, VA does not routinely prepare itemized patient bills. Whereas VA knows the total cost of its entire medical care system, its cost data are not detailed enough for many emergent policy and research questions. In contrast to VA, private sector systems are able to assess the costs of health care encounters through standard cost-adjusted charge methods. As private health care moves into managed care, however, actual costs of services become increasingly important, and multi-site HMO systems will have an increased need to manage actual costs which are not just cost-adjusted charges. Private sector cost analyses, therefore, may be increasingly faced with challenges similar to VA and can benefit from this state-of-the-art working meeting in analyzing costs.

Historical Basis of VA Costing

Historically, VA's automated cost systems were developed to support management's needs to

report to Congress on use of appropriated resources for veterans. The major accounting ledger system (Financial Management System: FMS) and cost distribution system (Cost Distribution Report: CDR) were management-oriented and were designed to account for and to control overall programmatic resource expenditures. The costing system provided detailed cost estimates at only a high-level aggregation.⁵ There was no patient-specific costing for services provided by VA, because until recently there were no patient bills and no third-party insurance claims.

The VA costing system involves two steps once funds reach the medical center. The first step is the FMS. Each medical center is organized by service discipline in the cost accounting system (eg, psychiatry, nursing, pulmonary function, etc.). When a budget allocation is received, each service receives a cost ceiling for the year for various types of expenditures allowed under the budget (personnel, supplies, travel, etc.). Expenditures in each category are tracked in the accounting system. That first step provides cost accounting records about expenditures by each service within a medical center. It does not detail expenditures for specific clinical programs such as clinics, wards, operating rooms, outreach programs, or for individual patients.

Estimates of the expenditures made on clinical programs are prepared through the cost distribution report, the second step of VA costing. An official from each service represented in the cost accounting system estimates how much of their staff's time went to each clinical program. Salary costs, supplies, overhead, and other expenditures are then distributed. The cost estimates from each service are then summed, producing the cost for a clinical program type, such as Psychiatry Inpatient Bedsection or General Medicine Clinic.

At the overall facility-level, the CDR costing system is extremely accurate. However, for less aggregated analyses at the patient- or clinical-program levels, the CDR estimates may not be accurate.^{5,6} For example, if two patients are treated in a Medicine Ward, one recovering from a heart attack with co-morbid diabetes and the other receiving palliative care for a kidney stone, the daily cost for each of those patients is equal on the CDR cost report because only an average cost is calculated over all patients in any medicine bed-section. The diagnoses for those patients imply very different treatment plans and resource needs, but all of those differences are averaged into the

daily rate for medicine wards. Using those CDR-based costs is an inappropriate way in which to answer research or policy questions that need to be sensitive to the actual resources consumed in treatment for the two conditions. That is the dilemma that most directly prompts the working meeting: how can policy and research cost studies proceed if the CDR-based cost is inappropriate and if there is no charge data?

Working Meeting Consensus

The consensus-development process was led by staff from HSR&D's Management Decision and Research Center (MDRC) who convened health economists and cost experts to develop a guide to VA cost issues and to plan a 2 day working meeting.

Approximately 45 VA and non-VA health economists, researchers, and policy-makers attended the 2 day meeting. The charge to the group was to identify areas of consensus about costing of VA health care, controversies, and gaps in data. The working meeting itself was organized around discussion of a series of cases which exemplified cost research and policy scenarios. Small groups reported back summaries of their discussion to the full group. Points of consensus and controversy were highlighted and recommendations were developed.

By the end of the meeting, consensus emerged in the following four key areas: cost methods, cost infrastructure development and support, data quality, and dissemination.

1. Cost Methods

In the examples discussed, it became surprisingly clear that most cost researchers have already adopted a "hybrid model" for VA cost analysis because the limitations of the CDR have become widely accepted. As described in this Supplement of *Medical Care*,⁷ the hybrid model combines direct primary cost data (eg, "microcosting") with secondary or administrative database cost information ("gross costing") in the same study.

A common error in costing studies and research proposals is using only a gross-costing method (FMS or CDR) when those database sources cannot reflect variations in the resource consumption many questions require. Thus, for example, the

inpatient costs incurred in recovery from a heart attack need to reflect the likelihood of higher pharmacy expenses, greater intensity of staffing, and more costly specialty consulting staff compared with costs for kidney stone palliation. Only micro-costing will reflect those differences; yet primary data collection is expensive and the cost of relying on it solely is prohibitive.

The hybrid model suggests researchers should develop direct cost estimates from primary data when the research questions require information about resources that are not tracked by the available computer-based databases or when the organizational level of aggregation is not available in the computer-based databases. The study method must be tailored to the study questions. Database cost information can be used when resource variation is less likely, when the level of aggregation needed is fairly high (eg, bedsection, clinic, or facility), or when gathering such information through primary data collection would be prohibitively expensive. As Gold et al³ note, "the choice between micro- and gross-costing approaches should reflect the importance of precise cost estimates, feasibility, and cost". In VA and in broader health care systems in general, the question is not either, micro, or gross-costing, but how to combine them.⁸⁻¹⁰

2. Cost Infrastructure Development and Support

Decision Support System (DSS). VA has recognized the need to develop a new patient-focused costing system and has chosen to deploy the commercial software platform developed by Transition Systems Inc. (TSI) (referred to as DSS within VA). DSS can track the resources actually used for each patient and can aggregate the costs of those resources into organizationally meaningful units, such as programs, wards, clinics, and clinical products (such as coronary artery bypass grafts: CABG). Meeting participants acknowledged that the future of improved VA costing analysis capabilities lay in the developing DSS. All VAs are in various stages of implementing DSS, and there are 30 sites which are completely implemented. However, the outputs of any software package can only be as good as its inputs and the quality of VA DSS data is unknown.

The consensus was that VA researchers need to develop formal ties with DSS developers to assess

the capabilities and limitations of the new system and to provide them feedback on areas needing improvement.¹¹ In addition, it was recommended that HSR&D sponsor a special research initiative in the use of DSS in cost-effectiveness analysis. That would include the evaluation of the accuracy of DSS data, comparison of DSS to private versions of the same system in the United States and Canada and other settings, methods of extracting DSS data, and applications of DSS data to VA research.

Data System Design, Monitoring, and Change. There was strong agreement by participants that cost analysts and researchers need to take advantage of recent opportunities for representation on national VA data decision-making groups (such as the VA Corporate Data Users Steering Committee and the DSS Steering Committee organized by the Chief Network Office). One of the agenda items for those committees is the need for VA to contract for independent external audits of the cost data systems and DSS as a means of knowing what ongoing action is needed to improve and maintain cost data quality. The data quality and management utility of the DSS system were still untested at the time of the working meeting by independent auditors. It is essential for VA to invest in DSS quality monitoring to improve the adequacy of its cost databases.

Meeting participants were also concerned that VA is losing detailed patient-level cost and utilization data for patients treated under sharing or contract agreements. VA is aggressively increasing the use of purchased care for some veteran services. Historically, purchased care cost data are adequate for accounting and administrative oversight purposes, but not at the level of aggregation (patient-, illness-, or program-level) needed for most cost analysis studies. As VA is purchasing more care from non-VA private providers, detailed patient-specific utilization and costs are needed from those purchased service contracts: first, to assess the cost-effectiveness and cost-benefit of those contracts and second, to provide VA clinicians and managers with the details of patient utilization needed to manage patient care in an integrated health care system.¹²

New Methods. As mentioned previously, much of the difficulty with VA cost analyses stems from the need to micro-cost or develop other approaches because VA does not have patient bills and charges. Meeting participants recognized that the development and evaluation of new costing

methods should be an ongoing VA research initiative.

A high priority project is to develop a national cost-multiplier file to estimate unit costs of specific services, procedures, and care episodes. It is possible that best estimates and ranges for unit costs could be derived from the 30 most advanced DSS sites or from Medicare reimbursement rates. Researchers could, then, use those estimated costs to multiply to the detailed utilization data available in medical records, patient surveys, or the local hospital automated utilization databases to micro-cost services using standard unit cost estimates. For example, the DSS data could provide a median cost and confidence interval for a CABG and other surgeries that could be used in sensitivity analyses to estimate surgery costs among VAs using a standard cost metric in comparison with CDR-based estimates.

VA should take advantage of the opportunity to examine alternative cost methods in previously approved studies that could add or augment cost components. Those new methods might include: "pseudo bill development." That method applies unit costs from a non-VA setting to VA utilization data to create an itemized bill for VA "as if" it came from the non-VA setting; the result is comparable with cost-adjusted charges used in non-VA cost studies. For example, a funded "hybrid design" study could add an evaluation of a "pseudo bill" method at little incremental expense, as the primary cost analysis is already funded. There may also be opportunities for fruitful secondary analyses in existing data sets.¹³

Personnel Resources. A critical aspect of improving cost analysis capability and taking advantage of additional opportunities for research is adequate personnel. The meeting attendees recommended aggressive recruitment and comprehensive training for new VA economists, supported by mentoring, and a career development program. Meetings and workshops should be devoted to cost methods and to training noneconomist researchers in those methods.

3. Data Quality

Meeting participants strongly endorsed the need for ongoing validation of data quality in both existing (FMS/CDR) and developing (DSS) cost databases, as well as in utilization data. Major concerns were that inter-facility variation in data

quality is not monitored by any external audits, and that independent external auditing is needed. Data validity monitoring is still largely a local facility responsibility despite VA being a national system. Each medical center defines its own coding conventions. Even if data quality was acceptable within each facility, there was no guarantee of comparability across sites.

Given that concern, there was widespread agreement on two points. First, sensitivity analysis of cost data should be a standard practice in cost studies (sensitivity analysis determines if changes in study assumptions affect study conclusions³). Second, data validation should be built into studies whenever cost is a significant aspect of the analytic question.

4. Dissemination

Probably the most remarkable insight from the meeting was that consensus does exist over what is the best current approach to determining the cost of VA health care and how the methods need to be improved. Meeting attendees concluded that VA needs to develop ways to centralize information related to cost methods and data, and to provide for easy access and dissemination of it. Documentation needs to be continually updated and made accessible. That centralization could occur through a single free-standing cost data center or through a distributed consortium of cost researchers. Information to be collected centrally would include the following: cost methods sections of final research reports; data on VA data system accuracy and access; technical reports; and survey instruments used to measure direct program costs. In addition to central collection, information about cost analyses needs to be regularly disseminated. For example, monographs could be prepared for noneconomist researchers that include decision trees and methods summaries. Web pages could be produced to provide cost information, and e-mail list server groups could provide opportunities for ongoing dialogues related to cost methods and lessons learned.

Overview of Papers in This Supplement

Five of the papers in this supplement were commissioned for the working meeting, revised based upon its results, and subjected to peer review. Two

of the papers^{7,13} resulted from the meeting discussions. Together the papers provide detailed background and essential information for the consensus points summarized in this paper.

Three papers summarize what is now known about cost methods in VA and their applications. Barnett⁸ provides a review of six methods of cost analysis and their use in published VA studies. Hendricks et al¹² review the literature on comparisons of the cost of health care of VA and non-VA medical systems. Hynes et al⁹ provide an overview of cost issues in VA multi-site studies using two cooperative studies as exemplars.

The other four papers advance the state of our knowledge about VA costing methods with original contributions derived recent VA studies. Menke, Homan, and Kashner⁷ present the hybrid model of cost analysis identified in the working meeting and provide three examples of its use in VA. Barnett and Rodgers¹¹ provide the first independent assessment of the capabilities of the DSS system. Menke and Wray¹⁰ provide an exposition of the strengths and limitations of using existing VA accounting ledger data from the VA Mobile Clinics multi-site study. Chapko and Hedrick¹³ demonstrate the potential utility and validity of national CDR-based cost estimates under some circumstances using data from the multi-site Adult Day Health Care project. Those papers provide an essential overview of the status of cost analysis in the VA and of guidelines for future research that are relevant to both VA and non-VA researchers.

Conclusion

This Supplement represents an important step for policy analysts and researchers conducting cost analyses toward understanding what is involved in working in environments, such as the VA, which do not have detailed billing systems. Building on the principles of cost analysis detailed by Gold et al,³ this Supplement provides a better understanding of the strengths and limits of working with existing administrative cost data and new developing cost systems such as DSS. The hybrid model articulated in this working meeting represents a welcome framework for conducting cost analyses and for developing new methods. Although the working meeting and papers in the supplement focus on VA, we believe they provide lessons for

the broader managed care world. VA is moving closer to the private sector in developing the capacity to analyze the cost of patient-care encounters. The private sector is moving toward VA in receiving revenues based on the number of individuals served, independent of the quantity of services provided. Both are working to evaluate their efficiency. This working meeting and those papers represent a movement toward joining these perspectives in a uniform model of health care cost analyses.

Acknowledgments

Our thanks to Elizabeth Adams, John Francis, John Rodgers, and Jennifer Rotchford for transcribing the Working Meeting group discussions and resolutions used in creating this article and in producing recommendations to the Director of the VA HSR&D Service.

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