

Use of a Cost Accounting System to Evaluate Costs of a VA Special Program

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BACKGROUND. The Department of Veterans Affairs (VA) established six mobile clinics to provide care for rural veterans. Each was operated by a parent VA Medical Center (VAMC).

OBJECTIVE. To describe the use of a cost-accounting system which does not provide costs at the service or patient level to determine the costs of the mobile clinics.

RESEARCH DESIGN. Costs per visit were compared among the mobile clinics with the parent VAMCs and with simulated fixed-location clinics. Cost data came from VA's Centralized Accounting for Local Management (CALM) data. Utilization data came from VA's outpatient file.

RESULTS. Information was obtained from the VAMCs' fiscal services to reallocate costs among the CALM subaccounts to generate cost data that was comparable among the mobile clinics. Costs per visit for the mobile clinics

were twice as high as those of the parent VAMCs. Costs per visit would be lower at fixed-location clinics unless the volume were substantially less than that provided by the mobile clinics.

CONCLUSION. Differences between cost allocations for accounting purposes and research are likely to necessitate adjusting cost accounting data for research purposes. Fortunately, information from the accountants or primary data can lead to a cost database which is appropriate for research evaluations. In the mobile clinics study, the analysis of cost accounting data led to the conclusion that mobile clinics were not a cost-effective way in which to provide care to rural veterans.

Key words: veterans; costs; outpatient care; mobile clinics. (Med Care 1999;37:AS45-AS53)

Determining the costs of special programs in the Department of Veterans Affairs (VA) poses unique problems. Because VA medical facilities are not reimbursed on a per-service basis, they do not generate billing data that could be compiled for patients treated under a special program. In addition, none of the VA administrative cost databases provide costs at the program level. The Cost Distribution Report is aggregated within each medical facility, combining costs across departments, different types of patients, and resources. The Financial Management System (FMS) provides information on specific categories of spending, such as physicians (full time) and electricity,

but combines costs within those categories for the entire medical facility. The Decision Support System (DSS) will potentially provide costs at the patient and service levels, but it is not fully implemented or validated and does not include unique or special programs.

A lack of billing data is a problem often faced by researchers outside VA. The growth of managed care in the US has led to an increasing amount of health care provided under systems which produce no itemized billing data. Health care systems outside the US which pay providers using capitated or global-budgeting arrangements also lack cost data on individual services. Diagnosis-based

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reimbursement of hospitals requires generating a bill for each discharge, but information on specific services provided within the stay are unnecessary and, if recorded, might be inaccurate. Conducting research on costs without billing data requires the use of the existing cost accounting systems or the collection of primary data. This paper illustrates how cost accounting data which are not at the health care service or patient level can be used to evaluate costs. A VA cost-accounting database was used to evaluate a VA special program, in the form of mobile clinics which provided primary care in rural areas.¹

There have been a few earlier evaluations of VA special programs. The Denver VA Medical Center operated a mobile internal medicine clinic to provide care for rural veterans.² Most of the mobile clinic cost data were primary data collected during the study. For comparison, costs of visits to the Denver VA were obtained from the fiscal service.

For an analysis of a VA adult day health care program,³ managers and fiscal officers provided data on the costs of adult day health care, including personnel, supplies, and equipment. Utilization of other VA health care was extracted from VA computerized databases. VA reimbursement rates were used as the per unit costs for hospitalizations and nursing home care. Costs for outpatient care, tests, and prescription drugs were obtained from VA administrative cost databases. Patients provided data on non-VA care.

For an analysis of a hospital-based home care program, per unit costs and utilization data were obtained from administrative databases.⁴ Non-VA utilization was self reported by patients, and per unit non-VA costs were obtained from standardized sources, such as Medicare.

Because of the paucity of studies which rely on administrative cost accounting systems, there is little guidance available for conducting those studies. The purpose of this paper is to describe how VA cost accounting data were used to analyze the costs of VA mobile clinics. The major results on mobile clinic costs are summarized to illustrate the kinds of analyses that can be conducted using a cost accounting system that does not provide costs at the service or patient level. Issues in determining indirect and patient costs are not discussed, as this supplement focuses on costs from VA's perspective.

Description of the Mobile Clinics

The Veterans' Benefits and Services Act of 1988 required VA to engage in a demonstration program of the use of mobile clinics to provide primary care to veterans living in rural areas. Six mobile clinics were established and each was operated by a parent VA Medical Center (VAMC). The law required the mobile clinics to operate at least 100 miles from the parent VAMCs. Five sites were selected through a competitive application process, and the sixth was designated in the law.

Each mobile clinic contained a small reception area near the driver's seat, three examination rooms, a storage area, and a restroom. All six were identically equipped. Only simple blood and urinalysis tests could be performed on the mobile clinics.

VA Headquarters purchased the coaches and gave each parent VAMC a specified amount for operating costs. However, some sites supplemented that funding from the hospital budget. In addition, each site chose the manner in which to allocate its funding to the various resources needed to operate the mobile clinics.

The mix of staff differed across the six mobile clinics. Each VAMC aimed to have a physician available whenever the mobile clinic was open, but this goal was not met at all sites. Other clinical staff included physicians' assistants, nurse practitioners, and registered nurses. The nonclinical staff also varied and included the coach driver, clerical workers, and social workers.

Each parent VAMC determined the schedule and specific stops for its mobile clinic. Together, the six mobile clinics served a total of forty-nine stops. Three coaches made weekly sojourns and left the parent VAMC on Monday mornings and returned Friday afternoons. That schedule necessitated that the staff stay overnight in hotels. One mobile clinic made daily trips originating from the parent VAMC, with occasional overnight stays. Two coaches were based in the field, with staff returning home each night.

Methods

There were four main research questions. First, how did costs per visit vary among the six mobile clinics? If some were less expensive, their organizational structure and resource allocation might be reproduced at the more expensive sites to lower

their costs. Second, how did costs per visit compare for the mobile clinics and the parent VAMCs? If costs per visit were higher on the mobile clinics, VA managers would have to decide if the mobile clinics were a worthwhile expenditure. Third, how would costs compare for fixed-location and mobile clinics? Fixed-location clinics might be a less expensive alternative to mobile clinics. Fourth, what proportion of mobile clinic patients were new to VA? One goal of the mobile clinics was to improve access to care for veterans who were not already in the VA system. If mobile clinic patients previously used the VAMCs for health care, the mobile clinics would be merely shifting the site of care and not expanding care to underserved veterans.

It was assumed that health outcomes were equal among the alternatives.⁵ It was assumed that once a veteran accessed VA health care at a mobile clinic, VAMC, or a fixed clinic, the subsequent health care received was appropriate. In many cost analyses, health outcomes, such as quality-adjusted life years, are assessed as an effectiveness measure. The mobile clinics project collected only 20 months of data, and patients with many diagnoses were treated. Thus, assessing quality-adjusted life years was considered beyond the scope of the study.

Costs

Identification of the mobile clinic costs followed the principles developed in the literature.⁵⁻⁷ Direct costs to VA included all costs related to operating the mobile clinics, such as the purchase of the coaches, mobile clinic staff, medical and office equipment, supplies, and coach maintenance. The allocation of personnel time to the mobile clinics took one of two forms. Full salaries were allocated to the mobile clinics for staff who spent all of their time on the coaches. At other sites, personnel rotated between the parent VAMC and the coach, in which case only the time spent on the coach was a mobile clinic cost. Time spent traveling to the coach stops was considered part of the staff's work time and was allocated to the mobile clinics. All expenses associated with the operation of the coach itself were included in mobile clinic costs, as follows: gas; routine maintenance; repairs; supplies; and equipment.

Data from October 1, 1992, through May 31, 1994, were used in the mobile clinics evaluation. We present undiscounted costs. Because the study

period was 20 months, discounting made little difference in the results and did not alter the conclusions.

VA's administrative databases did not isolate the costs of the mobile clinics. Fortunately, the six VAMCs in the study agreed to establish separate accounts for the mobile clinics. Their fiscal services set up five funds control points in the Centralized Accounting for Local Management (CALM) data specific to the mobile clinics, as follows: salaries; supplies and services; equipment; travel; and automated data processing. Mobile clinic costs were allocated to those special accounts according to the customary accounting principles applied by each fiscal service. The researchers had no influence over the manner in which expenditures were recorded.

The accounts of the CALM data represent general service categories, such as medical, surgical, pharmacy, medical administration, and engineering support. Altogether, there are several hundred accounts. The accounts are further subdivided into subaccounts. Those include detailed personnel categories (social worker, physicians [full time], nurse practitioners, etc.); travel and transportation (employee medical travel, beneficiary travel, etc.); various services (telephone [long distance], electricity, and information technology support services, etc.); and supplies and equipment (office supplies, prescriptions, and fuel, etc.). There are several hundred subaccounts in CALM, but only fifty-six of those applied to the mobile clinics.

Note that the CALM data were replaced with a new cost file, the Financial Management System (FMS). The FMS data provide essentially the same information contained in CALM. Thus, the issues discussed here are pertinent to any future research that uses the FMS data.

Costs per general medicine visit at the parent VAMCs were used as comparisons to the mobile clinics. The general medicine clinics provide care similar to the primary care that is emphasized on the coaches. The volume of visits was obtained from the outpatient file and included visits to the clinic stops allocated to the general medicine account in the Cost Distribution Report (CDR). Direct costs were from the general medicine account of the CDR (2110). Overhead costs (account 2800 excluding research) were allocated to general medicine using the proportion of total facility ambulatory visits as represented by general med-

icine visits. The average cost per visit at the parent VAMCs was then the sum of direct and overhead costs, divided by visits.

To compare mobile clinics' costs to fixed-location clinics, a simulation was conducted because fixed-location clinics were not included in the demonstration. The simulation involved making several assumptions. First, we assumed that a fixed clinic would be the same size as the mobile clinics with an addition of a 100-square foot waiting room. Second, we assumed that a fixed clinic would be outfitted with the same equipment and supplies as a mobile clinic. Third, we assumed a range of rental costs per square foot for the fixed clinic space, from \$.50 to \$2. We focused on the total costs of mobile clinics versus fixed clinics. Because patients would have to travel farther to a fixed clinic, their volumes of visits might be lower than on the mobile clinics; however, we did not have information to assess how much lower. We used the percentage difference in total costs to indicate the percentage difference in visits that would equate costs per visit for the mobile clinics and fixed clinics.

Volume

Data on the volume of care provided by the mobile clinics was needed to calculate cost per visit. The VA administrative databases include files on all inpatient, outpatient, and long-term care provided in VA facilities or in non-VA facilities but paid for by VA. The outpatient file indicates the clinic that the patient visited, such as general medicine, psychiatry, or laboratory. However, a special facility like the mobile clinics would not ordinarily be one of the designated clinics. For this study, the six VAMCs established an additional clinic code for the mobile clinics. Medical records and patient questionnaires collected on the mobile clinics also indicated the volume of care provided. They were used to check the accuracy of the special mobile clinic code in the outpatient file.

Patient questionnaires were used to determine whether mobile clinic users were new to VA or shifted care from the parent VAMC. Patients were asked if they would have visited an alternative source of care if the mobile clinic were not available.

Whereas the mobile clinics might have increased the volume of care provided at the parent VAMCs, assessing that effect was beyond the

scope of the project. Patients requiring care unavailable on the coach were referred to the parent VAMC for further treatment, which could have increased the volume of services provided by the VAMC. However, offsetting this effect, some care could be shifted from the VAMC to the mobile clinic. Furthermore, attracting new users to VA was considered a benefit and goal of the program.

Results

Data Cleaning

Large variation among the six sites in the costs allocated to the mobile clinics led us to investigate the manner in which those cost allocations were made. Telephone interviews were conducted with representatives of the fiscal services of each of the six VAMCs to obtain information on the contents of each subaccount at each VAMC and the manner in which each VAMC tracked costs to the mobile clinics. Because the fiscal services had established separate accounts for the mobile clinics, they paid special attention to determining the resources used by the mobile clinics. Therefore, we obtained all necessary information from the fiscal services and did not have to interview personnel from other hospital departments.

First, there was an issue of what types of personnel were appropriately considered as costs to the mobile clinics. Two sites allocated part of the salaries of the pharmacists and pharmacy technicians at their VAMCs to the mobile clinics. They felt that the new patients seen by the mobile clinics placed an extra burden on the pharmacy department because mobile clinic visits often resulted in prescriptions being written. We deleted the pharmacist and pharmacy technician salaries from mobile clinic costs because no changes in the pharmacy department personnel or operations occurred as a result of the mobile clinics. We also excluded the salary of the research coordinator, which is a position dedicated to the evaluation study, from mobile clinic costs.

Second, two sites allocated full-time salaries to the mobile clinics for staff who only worked part-time on the coach. The fiscal services at those sites provided information on the actual time which personnel worked on the mobile clinics, and adjustments were made to the reported costs.

Third, some sites reported no costs for personnel who were known to work on the mobile

TABLE 1. Comparison of Mobile Clinic Costs Among Sites (\$1,000s)

Site:	A	B	C	D	E	F	Average
Coach (10-year depreciation)	113.2						
Personnel	607.4	434.1	516.3	409.4	362.2	333.8	443.9
Physicians	206.7	142.5	147.1	152.2	109.8	73.9	138.7
PA/RN	204.4	197.6	147.5	212.9	157.9	140.8	176.9
Coach driver	62.6	44.3	62.1	44.3	38.8	31.0	47.2
Clerical	133.7	49.7	37.4	0	55.7	0	46.1
Social worker	0	0	122.2	0	0	88.1	35.1
Nonpersonnel	186.2	107.4	120.7	121.2	112.4	93.6	123.6
Travel	118.3	62.9	55.7	44.1	19.1	0	50.0
Coach maintenance	10.9	6.3	10.2	18.8	2.9	6.7	9.3
Supplies	28.5	8.2	25.2	15.5	47.1	18.5	23.8
Vehicle rent	7.9	12.3	7.6	12.3	10.0	8.0	9.7
Utilities	20.6	16.4	17.9	29.6	27.5	38.1	25.1
Property rent	0	0	0	0.7	5.0	22.3	4.7
Miscellaneous	0	1.3	4.1	0.2	0.8	0	1.1
Total VA cost	906.8	654.7	750.2	643.8	587.8	540.6	680.7
Number of visits	6835	6687	1616	5489	4137	3236	4667
Cost/Visit (10-year coach depreciation)	133	98	464	117	142	167	146
Cost/Visit (20-year coach depreciation)	124	89	429	107	128	150	134

clinics. The main problem was that costs for personnel hired on contract were allocated to contract subaccounts that did not indicate the type of personnel. Therefore, additional information was needed from the fiscal services to determine which personnel were hired on contract. All costs for each type of personnel (physicians, clerical, bus driver, etc.) were summed across all relevant subaccounts.

No adjustments were needed in the nonpersonnel subaccounts. There were large disparities across sites in the amounts allocated at the subaccount level, but those differences reflected actual differences in resource use.

After the cost data were adjusted, subaccounts were combined into broader groups for ease of analysis. The information obtained from the fiscal services was used to group the subaccounts to reflect similarity of resource use. Personnel were grouped based on similarity of function. Consequently, physician's assistants and all categories of nurses were grouped together, as were clerical and administrative employees. Nonpersonnel subaccounts were grouped to represent the major categories of costs, such as travel, coach maintenance, and supplies.

The volumes recorded in the special clinic code in VA's automated outpatient file were the same as those figures independently collected on the mobile clinics through medical encounter records and patient questionnaires.

Summary of Results of the Mobile Clinics Cost Analysis

Comparison of Costs Among Mobile Clinics. Total VA costs (based on 10-year coach depreciation) varied from \$540,600 at site F to \$906,800 at site A, a difference of 68% (Table 1). Site A also had the highest personnel costs (\$607,400) and nonpersonnel costs (\$186,200) and had the highest costs for physicians, the coach driver, and clerical personnel. Site F had the lowest personnel costs (\$333,800) and nonpersonnel costs (\$93,600) and had the lowest costs for every personnel category except social worker.

High total costs did not necessarily lead to high costs per visit. Site A had the highest total costs but the third lowest cost per visit (\$133). Site B had the lowest cost per visit, \$98, but the third highest total costs. The two sites with the lowest total costs, E and F, had high costs per visit (\$142 and

\$167, respectively). Site C was clearly an outlier, with a cost per visit of \$464; total costs were comparable with the other sites, but the volume of visits was far below the others. Site C performed poorly because it was chosen for political reasons, and the VAMC was not supportive of the project. Note that assuming a 20-year depreciation for the coach had a small effect on the results because the coach represented a small proportion of total mobile clinic costs.

The cost per visit tended to have the usual downward sloping relationship with the number of visits (Fig. 1). (Note that the curves connect the actual data points. A regression analysis was not possible with only six observations.) The major breakdowns of total costs also followed this pattern. Most of the costs of the mobile clinics were fixed costs. The coaches were purchased for a given price. A fixed staff was hired or assigned from the VAMC and was not altered depending on the volume of care provided. The coaches had to be equipped with medical supplies, office supplies, and communications equipment before beginning operation. Thus, as visits rose, those fixed costs were spread over the larger volume. The slight

increase in cost per visit at the tail of the graphs might reflect the high travel costs at site A. Not only were there the direct expenses for overnight stays contributing to nonpersonnel costs but there were also personnel costs, including travel time.

Comparison of Mobile Clinic Costs to Alternatives. The cost per visit was higher for the mobile clinic compared with the general medicine clinic at the parent VA hospital for all six sites (Fig. 2). The average mobile clinic cost per visit was \$146 as compared with \$69 for the VAMC. According to the simulation, the total cost of a fixed-location clinic would be lower than the total cost of the mobile clinic for all six sites (Fig. 3). On average, the mobile clinics cost \$681,000 as compared with a simulated total cost of \$479,000 for a fixed-location clinic, which is a difference of 30%. Thus, the fixed clinics could provide about 30% fewer visits and still have the same cost per visit as the mobile clinics. If the volume was not reduced that much, the cost per visit would be lower at fixed-location clinics.

New VA Users. Most of the mobile clinic patients were already VA users. About 54% indicated that they would visit the VAMC if the mobile clinic

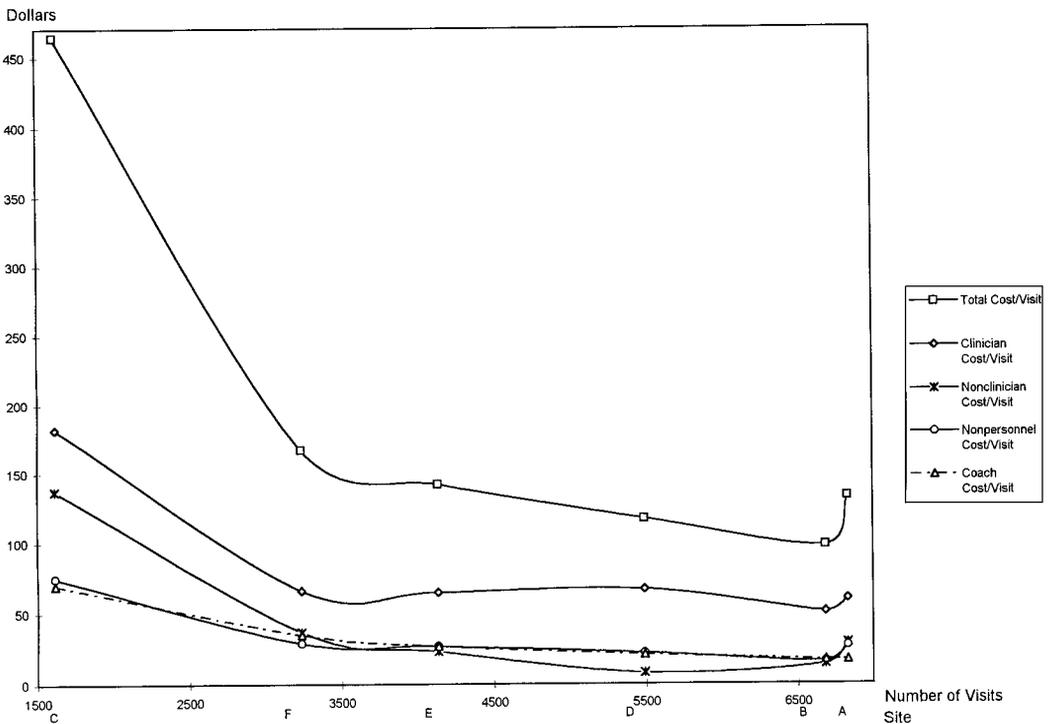


FIG 1. Mobile clinic costs per visit.

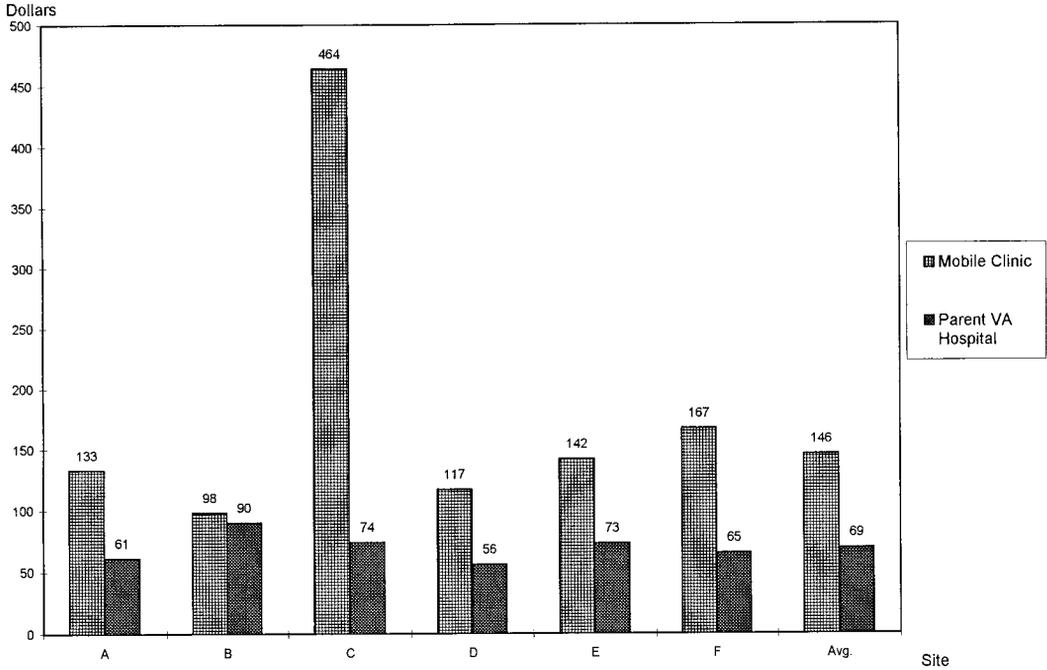


FIG 2. Comparison of costs per visit for mobile clinics and parent VA hospitals.

were not available. Therefore, the mobile clinic cost per visit for new VA users was nearly \$300.

Policy Implications. The analyses led to the conclusion that the mobile clinics were not a worthwhile expense for VA. The mobile clinics operated at a high cost per visit compared with the general medicine clinics at the parent VAMCs, a benchmark against which the mobile clinics were compared. Furthermore, the fact that about one-half of the patients who visited the mobile clinics were already VA users indicated that the cost per visit for new users was extremely high, approaching \$300.

The decline in mobile clinic cost per visit with volume suggested that the cost per visit might have been comparable with the VAMCs if the volume of visits provided had been higher. In fact, the target volume established by VA Headquarters was 10,000 visits per year, which is a number that was not attained by any mobile clinic, despite efforts to attract veterans to the mobile clinics. Publicity was given to the mobile clinics in the local media and through veterans' organizations. Low-volume coach stop locations were dropped and new coach stop locations were added which would, hopefully, attract more veterans.

There are two possibilities for providing care to rural veterans at a lower cost per visit. Mobile clinic costs could be scrutinized for possible reductions. Travel costs might be decreased by minimizing the number of overnight stays, by hiring staff who lived near the mobile clinic stops, or by obtaining discounts for frequent stays at particular lodging facilities. Some sites spent large sums on communications equipment and that may not have been necessary. Costs might be reduced on personnel by consolidating the driver and clerical functions and by ensuring optimal use of clinicians.

Another possibility is to use fixed-location clinics instead of mobile clinics. Because the mobile clinic coaches were very expensive, costing about \$750,000 each, renting space for as much as \$2 per square foot would lead to lower total costs than the mobile clinics. Further research is needed to determine if longer travel distances might deter some patients from visiting a fixed-location clinic.

Conclusions

This study described the use of a cost accounting system, which does not provide costs at the service

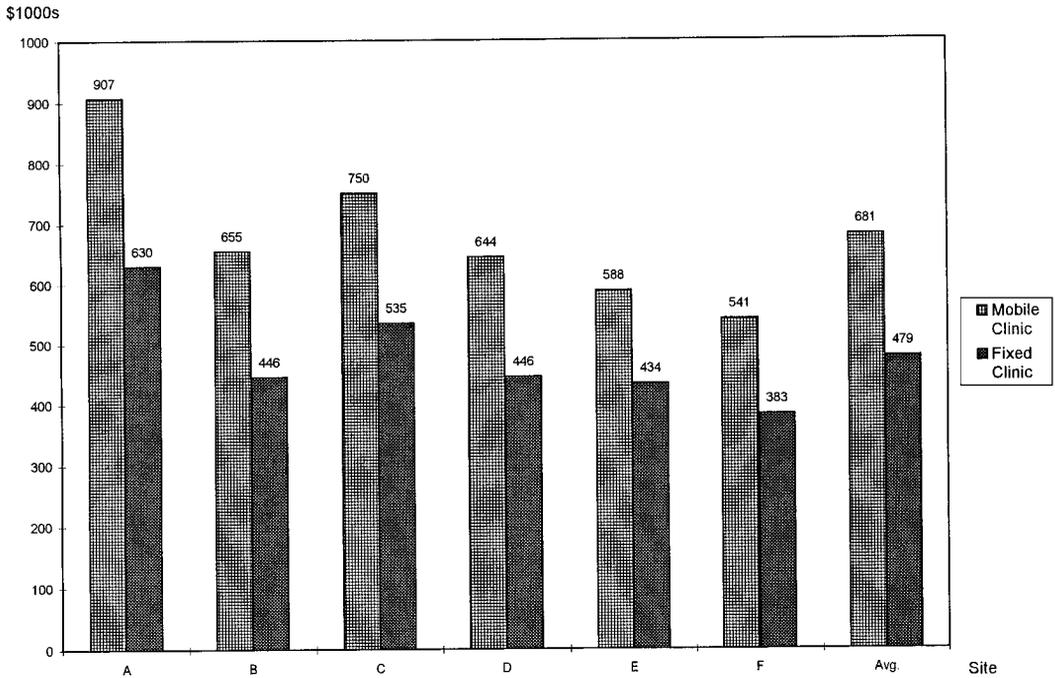


FIG 3. Total costs of mobile clinics versus fixed clinics.

or patient level, to evaluate the costs of VA mobile clinics in rural areas. It led to several lessons about the use of cost accounting data for research purposes and about cost analyses in general.

As administrative cost data are based on accounting principles, they are not likely to directly yield appropriate data for economic cost analyses. In the mobile clinics study, we obtained information from the participating VAMCs' fiscal services on the contents of the accounting subaccounts. We were able to reallocate costs to conform with our research goals. Building redundancy into the data collection process is another method of cross-checking cost accounts. Maintaining logs of major personnel and equipment expenditures would provide a check against the cost accounts. Problems uncovered could be investigated with the accountants. A final option is to forgo cost accounting data altogether and, instead, to collect primary cost data. That option would only be necessary if methods could not be developed to ensure the accuracy of cost accounts for a study. The expense of collecting primary data would have to be balanced against the expected improvement in data quality.

The mobile clinics study also led to several lessons about cost analyses. First, deriving policy implications from the results requires the use of bench-

marks. In the mobile clinics study, the cost per visit at the VAMCs was used as the target for the mobile clinics, which provided the goal against which the mobile clinics were compared. Second, comparing costs among different sites in a study might reveal important conclusions or policy implications. In the mobile clinics study, the comparison of costs per visit among the six sites suggested that costs per visit dropped as the volume of visits rose; thus, it was concluded that the volume was not high enough to lead to an acceptable cost per visit as compared with the VAMCs. Finally, simulations of costs can yield important implications. In the mobile clinics study, the cost of fixed-location clinics was simulated by making some assumptions about how fixed-location clinic costs might differ from those of mobile clinic costs. That analysis led to the conclusion that fixed-location clinics might provide a less expensive alternative to mobile clinics.

Likely, researchers will have to increasingly rely on data from cost accounting systems that do not provide costs at the service or patient level as more US patients are covered under managed care arrangements. Other countries that lack billing data must also rely on such systems for economic studies. Fortunately, information can be obtained from accountants or from primary data collected

independently from the cost accounting system to generate a cost database which is appropriate for a research evaluation.

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