

Average Cost of VA Rehabilitation, Mental Health, and Long-Term Hospital Stays

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This article describes the development of a database for the cost of inpatient rehabilitation, mental health, and long-term care stays in the Department of Veterans Affairs from fiscal year 1998 forward. Using "bedsection," which is analogous to a hospital ward, the authors categorize inpatient services into nine categories: rehabilitation, blind rehabilitation, spinal cord injury, psychiatry, substance abuse, intermediate medicine, domiciliary, psychosocial residential rehabilitation, and nursing home. For each of the nine categories, they estimated a national and a local (i.e., medical center) average per diem cost. The nursing home average per diem costs were adjusted for case mix using patient assessment information. Encounter-level costs were then calculated by multiplying the average per diem cost by the number of days of stay in the fiscal year. The national cost estimates are more reliable than the local cost estimates.

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In fiscal year (FY) 1999, the U.S. Department of Veterans Affairs (VA) provided rehabilitation, mental health, and long-term hospital services to 116,438

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veterans. This required approximately 10.5 million inpatient days at a cost of \$3.5 billion dollars. Because the VA health care system is an integrated system with its own facilities and staff, no bills are generated for most of the services provided. Therefore, cost information for health care services provided in VA needs to be estimated based on accounting and utilization records (Barnett 1997, 2003 [this issue]).

This article describes the development of a cost database for rehabilitation, mental health, and long-term hospitalizations. The primary objective of establishing this cost database was to provide individual cost information for health services research and evaluation. To create this database, we merged the Cost Distribution Report (CDR) cost data and Patient Treatment File (PTF) utilization data for each FY from FY 1998 forward and then reconciled any inconsistencies. We classified all non-medical/surgical inpatient stays into nine categories: rehabilitation, blind rehabilitation, spinal cord injury, psychiatry, substance abuse, intermediate bed, domiciliary, nursing home, and psychosocial residential rehabilitation treatment program (PRRTP). For each of the nine categories, we calculated both a national and a local (i.e., medical center) average per diem cost. Local costs that exceeded two times the standard deviation of the national costs were identified as a potential outlier with a flag variable. For nursing home care, we adjusted costs for case mix.

This work resulted in the development of a database that is maintained at the VA Austin Automation Center. VA researchers can contact the Health Economics Resource Center (HERC) to access this database (www.herc.research.va.med.gov).

NEW CONTRIBUTION

This article describes the development of the first national cost database for rehabilitation, mental health, and long-term hospitalizations in the VA. A unique contribution of this database is average per diem costs with case mix adjustment for nursing home care. The article also discusses limitations of and uses for this database. Although this article reflects our work in the VA, the methodology used to develop this database is a good reference for researchers in other integrated health care systems.

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METHOD

VA COST DATA

VA accounting records are summarized in the Financial Management System (FMS) database, which has cost information pertaining to the medical service, nursing service, and so forth. Because FMS cannot be directly linked to patient care departments, the CDR was created. Service chiefs are required to estimate staff time spent on different types of patient care. These time allocations are then used to distribute costs from FMS to cost distribution accounts (CDAs) in the CDR. At the end of each FY, costs in CDAs are reconciled with FMS.

We excluded costs from VA facilities that did not provide patient care, such as VA central offices, information service centers, and other VA support facilities. In VA medical facilities, costs of indirect service departments were allocated to direct service departments in the CDR. The CDR, however, distributes indirect costs only to groups of patient care departments. These indirect costs need to be included with the direct costs to provide complete expenditures. We compared several methods of reallocating these indirect costs and found advantages and disadvantages to each (Wagner et al. 2001). Eventually, we reallocated the indirect costs to each department based on its share of total direct costs.

VA UTILIZATION DATA

VA inpatient care is recorded in the PTF. The PTF characterizes location of care using 76 bedsections, which are analogous to hospital wards in non-VA facilities. For example, nursing home, intensive care, and psychiatric units are assigned to three different inpatient bedsections. Although we could have developed average per diem estimates for each of these 76 bedsections, many bedsections are used interchangeably as they represent similar types of care (e.g., intermediate medicine and geriatric intermediate medicine). Therefore, we grouped the 76 bedsections into 11 categories: medicine, surgery, rehabilitation, blind rehabilitation, spinal cord injury, psychiatry, substance abuse, intermediate medicine, domiciliary, psychosocial residential rehabilitation, and nursing home (Wagner et al. 2001). Since hospital stays in medicine and surgery are relatively short with large cost variations, we developed other methods to estimate costs for those bedsections and reported them in a separate article (Wagner, Chen, and Barnett 2003 [this issue]).

MATCHING COST WITH UTILIZATION DATABASES

Before matching the PTF and CDR data sets during each FY, we identified VA medical centers that merged during the FY. Mergers during an FY often are reflected in the cost and utilization databases at different times. Therefore, we treated all mergers that happened in an FY as if they occurred at the beginning of the year.

Although there is a formal link of bedsection to respective CDA, the VA does not reconcile these two databases. Therefore, after matching the data, we found that the cost of providing care in a particular bedsection is not always assigned to the corresponding CDA specified in the CDR handbook (U.S. Department of Veterans Affairs 1996, 2000). In these cases, we reallocated utilization to the most relevant cost account. Details on every reallocation can be found in the HERC inpatient average cost guidebook (Wagner et al. 2001).

COST DETERMINATION

After reconciling the CDR with the PTF, we estimated average per diem costs for each of the nine categories of care by dividing costs by the number of days of care. This was done for stays at the local medical center level, as well as at the national level, resulting in local and national cost estimates for each of the nine categories of care. The costs included facility payments, physician payments, and indirect costs. The notable exception to the method is that the nursing home costs were further adjusted for case mix, which is described below.

Estimating encounter-level costs involved multiplying length of stay in the FY by the average daily rate (local or national). If a patient was admitted and discharged in one FY, then the total cost represents a discharge estimate. Many nursing home and domiciliary stays last many years (decades in some cases). In these cases, total costs represent only the costs incurred in the FY.

VA policy allows patients to leave the hospital for short periods while “reserving” the bed. This practice is most common among patients in nursing home facilities. We chose not to assign costs to these “leave” days. Although the PTF separates these days from the length of stay, it identifies only the total number of leave days during a stay; it does not record when they occurred. For stays that cross FYs, the PTF does not record how many of the leave days occurred in a given year. To consistently adjust length of stay in an FY for leave days, we assumed that leave days were uniformly distributed throughout the stay.

CASE MIX ADJUSTMENT FOR NURSING HOME COST

Health care costs should reflect resources used. We generally believe that resource use varies with a patient's medical condition. Since 1994, VA nursing home patients have been systematically assessed for resource use by the resource utilization group (RUG) II instrument. We used the assessment data to adjust cost for case mix. RUG II is a validated instrument to measure nursing home residents' resource use (Schneider et al. 1988; Schultz, Ward, and Knickman 1994; Fries 1990; Fries et al. 1989). To adjust costs for case mix, we first estimated an average RUG II score for each nursing home stay and then normalized the average RUG II score at local and national levels.

AVERAGE RUG II SCORE FOR EACH STAY

VA nursing home patients, excluding those in non-VA community-based nursing homes, are assessed at admission and reassessed twice a year (April and October). Assessments are conducted using the RUG II instrument, and a RUG score is generated to reflect the intensity of resource use. Depending on the date of admission and length of stay, the number of patient assessments varies for each patient. Therefore, we estimated an average RUG score for each nursing home stay.

One limitation with this approach is that the VA does not assess patients at discharge. Therefore, we developed a regression model to estimate a discharge RUG score for any nursing home stay in which the last assessment was taken more than 90 days before the discharge. For the regression, we selected 1,277 nursing home patients whose last assessment was within 30 days of discharge and who had at least three assessments between FY 1994 and FY 1999. When the last assessment was less than or equal to 90 days before discharge, we used the available assessments to calculate an average RUG score. We chose 90 days because it was consistent with the fact that when calculating an average score from two regular assessments, each measures resource use intensity for a span of 90 days. The average RUG score for each stay was calculated by multiplying the RUG score by the number of days associated with each score. More details can be found in the HERC handbook (Wagner et al. 2001).

LOCAL NURSING HOME COST ADJUSTED FOR CASE MIX

To adjust nursing home costs for the medical center case mix, we first normalized the RUG score of each nursing home stay by dividing its RUG score by the medical center average nursing home RUG score. The medical center average nursing home RUG score was equal to the weighted average of

nursing home stay scores, using the length of stay as the weight. We then calculated the local case mix-adjusted cost for each nursing home stay by multiplying the unadjusted local average per diem cost by its length of stay and locally normalized RUG score. Equations for the case mix index can be found in Wagner et al. (2001).

NATIONAL CASE MIX-ADJUSTED NURSING HOME COST

Case mix adjusting nursing home costs for the nation was very similar to calculating the local case mix-adjusted costs. We first normalized the RUG score of each stay for all stays in the nation and then calculated the national case mix adjusted nursing home cost by multiplying the unadjusted average per diem cost by its length of stay and its nationally normalized RUG score.

VARIATION IN LOCAL COSTS

Local nursing home costs varied substantially from \$170 to \$845 per diem. To examine how much of this variation was due to wage differences and how much was due to variation in case mix, we regressed unadjusted nursing home average per diem cost on wage index, percentage deviation of medical center case mix index from the national average case mix index, and indicator variables for FY 1998 and FY 1999. To adjust wage difference for a medical center, we used the 1997 wage index developed by the Centers for Medicare and Medicaid Services for reimbursing Medicare hospitals that shared the same labor market with the medical center. Comparison of the R^2 values between the regression models with and without the wage index is discussed below.

RESULTS

NUMBER OF STAYS, AVERAGE PER DIEM COST, AND LENGTH OF STAY

Table 1 summarizes the number of stays, national average per diem costs, and the mean and median length of stay for the nine categories of nonacute inpatient care provided by VA from FY 1998 through FY 2000 (all in year 2000 dollars). Psychiatric care accounted for 42 percent of the stays. Over the 3-year period, the total number of hospital stays for these nonacute inpatient care declined from 311,000 to 289,000, with rehabilitation (rehabilitation and blind rehabilitation) and substance abuse care declining the most.

Average per diem costs varied substantially from \$116 (FY 1998) for domiciliary up to \$826 for rehabilitation (see Table 1). For most categories, average

TABLE 1 Number of Stays, Average Per Diem Cost, and Length of Stay of Nonacute Inpatient Care: Fiscal Year (FY) 1998 to 2000

Category	Number of Stays			Per Diem Cost ^a			Length of Stay ^b							
	FY 1998	FY 1999	FY 2000	FY 1998	FY 1999	FY 2000	M	Mdn	M	Mdn	M	Mdn	M	Mdn
Rehabilitation	9,323	7,087	6,176	826	969	1,021	18	15	17	15	17	15	17	14
Blind rehabilitation	2,100	2,063	2,071	793	803	863	40	40	38	38	37	38	37	37
Spinal cord injury	8,607	8,470	8,089	765	830	829	40	13	42	12	37	12	37	12
Psychiatry	131,382	126,756	123,773	526	588	635	19	9	17	8	16	8	16	7
Substance abuse	27,278	21,305	16,528	553	484	455	13	8	12	8	12	8	12	8
Intermediate care	50,369	55,129	48,988	408	438	491	25	9	19	7	20	7	20	7
Domiciliary	23,955	24,054	25,796	116	123	112	127	61	109	54	101	54	101	43
Nursing home care	45,973	47,706	48,117	269	291	305	167	35	149	31	137	31	137	29
PRRTP	11,980	11,513	9,828	157	166	172	33	25	40	28	43	28	43	29

Note: PRRTP = psychosocial residential rehabilitation treatment program.

a. Costs are in year 2000 dollars.

b. Length of stay was calculated by subtracting the bedsection admission date by the bedsection discharge or transfer date.

TABLE 2 Three-Year Average Per Diem Costs among U.S. Department of Veterans Affairs Medical Centers, Fiscal Year 1998 to 2000

<i>Category</i>	<i>Number of Medical Centers</i>	<i>Mean</i>	<i>Median</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Rehabilitation	48	1,074	947	491	286	2,659
Blind rehabilitation	10	738	774	262	77	1,005
Spinal cord injury	24	859	835	287	410	1,560
Psychiatry	125	762	716	319	101	2,155
Substance abuse	59	888	545	1,687	95	12,096
Intermediate care	95	626	500	643	58	6,014
Domiciliary	42	184	137	287	79	1,981
Nursing home care	125	312	284	104	170	845
PRRTP	40	190	166	111	16	521

Note: PRRTP = psychosocial residential rehabilitation treatment program. The average cost was calculated after adjustment for inflation by the Consumer Price Index.

per diem costs increased between FY 1998 and FY 2000, even after adjusting for inflation (not shown). The cost increase varied from 8 percent (spinal cord injury) to 24 percent (rehabilitation).

Length of stay was calculated by subtracting the bedsection admission date from the bedsection ending date. This measure of length of stay includes days from previous years and is used to present an accurate picture of length of stay. The median length of stay varied from 7 days for substance abuse to 65 days for domiciliary in FY 1998. Except for domiciliary and nursing home care, in which length of stay declined, length of stay was relatively stable over the 3-year period. Table 1 shows both the mean and median lengths of stay because nursing home and domiciliary care had a few patients with multiyear stays. As a result of these extremely long stays, the average was significantly different from the median. In addition, we excluded those stays (approximately 9 percent) that were not discharged at the end of the FY.

COST VARIATION

As one might expect, local (i.e., medical center) average per diem costs varied substantially (see Table 2). Variation could be due to geographically determined wage rates or economies of scale. However, the variation might also reflect accounting mistakes or inconsistencies between the PTF and CDR at the medical center level. In some instances, the difference in local costs between the maximum and the minimum was more than tenfold.

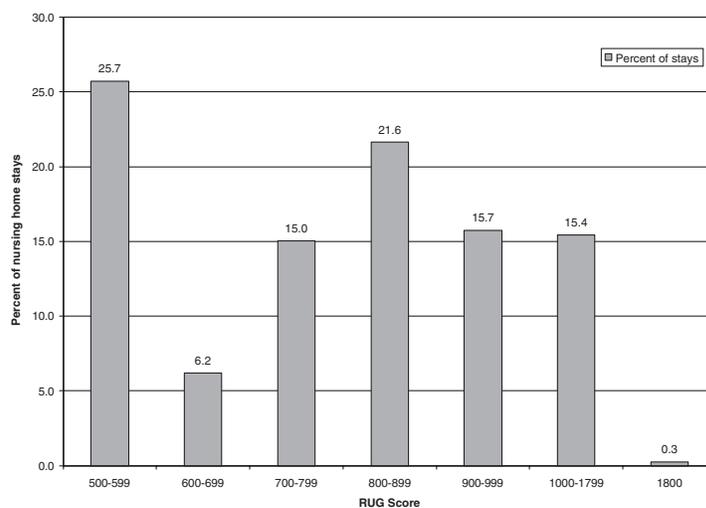


FIGURE 1 Distribution of Resource Utilization Group (RUG) Scores of U.S. Department of Veterans Affairs Nursing Home Stays

CASE MIX ADJUSTMENT FOR NURSING HOME COST

Costs for nursing homes were adjusted for case mix using RUG II assessments. The national average risk-adjusted per diem cost of a nursing home stay was proportionate to its RUG score because the risk-adjusted per diem cost was estimated by multiplying the national unadjusted average per diem cost (a constant) by the RUG score of the stay. RUG scores reflect the level of acuity of care, ranging from 400 to 1,800. For example, the highest RUG score (1,800) corresponded to patients who were ventilator dependent (0.3 percent of stays). Figure 1 presents the distribution of RUG scores for all the nursing home stays during the 3-year period. Twenty-six percent of the 141,796 nursing home stays had a RUG score less than or equal to 500. More than 30 percent of nursing home stays had a RUG score more than 900, suggesting that these patients obtained relatively more intensive care.

Proportionately allocating cost to a nursing home stay by its RUG score was based on the assumption that all other resources used for nursing home care were distributed in proportion to the level of acuity of care. This was a strong assumption. A recent study showed that RUG III explained only about 10 percent of the variance in total per diem costs (White, Pizer, and White 2002). The limitation of RUGs in explaining the variance does not necessarily mean that RUGs do a poor job of measuring the relative cost of caring for different

TABLE 3 Regression of Nursing Home Case Mix on Nursing Home Average Per Diem Costs, Fiscal Year (FY) 1998 to 2000

<i>Independent Variable</i>	<i>Estimated Coefficient</i>	<i>t-Value</i>
Intercept	230	5.78
FY 1998 (versus 2000)	-44	-2.71
FY 1999 (versus 2000)	-23	-1.40
1997 HCFA wage index	1	2.86
Percentage deviation from the national average	3	4.49

$R^2 = .098$

Note: HCFA = Health Care Financing Administration. The average cost was calculated after adjustment for inflation by the Consumer Price Index.

patients. Per diem costs at different sites, for example, could differ because of fixed costs being spread across a different number of patients, other economies of scale, differences in local wage rates, and different methods of allocating indirect costs among the departments of the hospital. Because these factors did not affect costs consistently, researchers should make adjustments based on their specific studies.

We calculated an average case mix index (RUG score) weighted by the number of days associated with each stay for all 112 medical centers in each of the three FYs. Among the 342 case mix indexes (112×3), the mean was 706 and the median was 698 with a standard deviation of 70. The maximum case mix index was 33 percent higher than the mean, and the minimum was 30 percent lower. A regression analysis indicates that 10 percent of the local cost variation was explained by the medical center case mix index and wage index (see Table 3). When the wage index was excluded from the model, the R^2 dropped to 7.5 percent (data not shown). For each percentage deviation from the national mean case mix, the average per diem cost deviated by \$3. The regression results indicate that most (90 percent) of the cost variation among medical centers is associated with neither wage differences nor case mix.

DISCUSSION

The primary objective of this study was to develop an encounter-level database from VA cost and utilization data for all rehabilitation, mental health, and long-term inpatient services. The encounter-level estimates reflect all days of stay incurred during the FY. These costs may not reflect a discharge view, as some stays crossed FYs. By reviewing the admission and discharge dates, one

can quickly identify those stays for which we only generate a partial cost estimate.

A unique feature of this database is that it has national representation, large size, and consistent delivery and coverage for health care across medical centers in the nation. Another important feature of this database is that cost for nursing home care has been adjusted for case mix based on an average of multiple assessments during a stay. With care, this database can be used for health services research and by VA management. For example, the shift from inpatient mental health care to outpatient services is reported elsewhere in this issue (Barnett 2003).

As discussed above, the HERC nursing home cost estimates are directly proportional to case mix by construction. Researchers should be aware that some costs (e.g., for capital) are not completely proportional to case mix. About one-third of the Medicare prospective reimbursement rate for skilled nursing homes is not adjusted for case mix. This implies that our method may slightly overestimate the costs for patients with high RUG scores and underestimate them for patients with low RUG scores. However, as capital financing costs are not included in the VA budget, this bias is limited.

With the exception of nursing home care, the average per diem costs are not case mix adjusted. HERC will try in the future to include case mix adjustments to inpatient services for rehabilitation and psychiatric care. Unfortunately, we currently are not able to adjust other types of stays for intensity of care because either no severity measures exist (e.g., psychiatric stays) or the VA does not use the available risk-adjustment measures.

LIMITATIONS

The cost data described in this article have been put in a database that is available to eligible researchers. To use this cost database appropriately, one must understand its limitations. These cost estimates reflect a merger of data from VA utilization and cost files. The cost data include facility and physician costs but not the cost of capital financing or malpractice. This suggests that the average per diem costs may be low compared to the private sector. Although we do not have exact data on the size of the capital financing and malpractice, we suspect that these may be approximately 5 percent of the cost. Future research will try to determine methods for incorporating these costs.

Although this database may be excellent for descriptive studies, more caution should be used in analytical studies, as these cost estimates may not be sensitive to experimental interventions. For instance, the growth in PRRTTP and domiciliary stays reflects a programmatic change at some VA medical centers. A recent study evaluated the adoption of PRRTTP care, which is a less

intensive psychiatric and substance abuse program, and found that it was associated with substantial savings (Wagner 2002, 350). In this case, the adoption of PR RTP care had a large effect on costs. However, for many interventions, these cost data may not be appropriate. For example, if an analyst is studying a slightly more expensive treatment that improves a rehabilitation patient's quality of life, these cost estimates may not be sensitive enough unless the treatment affects the production of care, the probability of admission, or the length of stay. In cases in which analysts need more sensitive cost estimates, micro-costing methods are available (Swindle et al. 1999; Barnett, Chen, and Wagner 2000). Although such methods have been used successfully in VA studies, they can be very time consuming and expensive to employ (Smith and Barnett 2003 [this issue]).

Some health care services, particularly for long-term care, are contracted to non-VA facilities. In FY 2000, total contracted services accounted for approximately 7 percent of total VA costs. Because VA does not have accurate cost and utilization data at the encounter level, the HERC Average Cost Database does not include contracted services. For inpatient care discussed in this article (i.e., rehabilitation, mental health, and long-term care), however, encounter-level utilization data are reported in the VA PTF. Therefore, one possibility to estimate costs for contracted inpatient services is to use the average VA costs estimated by HERC in the same category. Another possibility to estimate contracted inpatient services is to use an average reimbursement rate from non-VA sectors such as Medicare.

The HERC rehabilitation, mental health, and long-term care database contains two cost estimates: a national cost and a local medical center cost. In both cases, the encounter-specific costs reflect an average per diem rate times the length of stay. However, the national and local average per diem rates differ. The national rates are calculated by dividing all costs in one of the nine categories (e.g., rehabilitation) by number of days of stay for that category. The local cost estimate uses the same calculation, but it is restricted to stays at a given medical center. The large variation among local average per diem costs suggests that accounting mistakes and inconsistencies are significant in some medical centers. For example, one medical center with \$3.2 million for substance abuse costs in FY 1998 provided 282 days of substance abuse care. This yields a very large cost estimate (\$12,095 per day), which may be valid or symptomatic of a potential error.

One explanation for this difference is that the PTF and CDR are not officially reconciled, and local accounting differences may be partially to blame. Therefore, we strongly recommend using the national cost estimates for studies that evaluate health care interventions. Researchers may wish to use local costs in a sensitivity analysis but should be cautious to outliers. Extremely

low workload and inappropriate cost allocation are two common reasons for generating average per diem cost outliers. To provide further guidance to researchers, we included a flag variable in the database that identifies a record in which the local cost is greater than two standard deviations from the national cost.

DATA EVALUATION

Because the HERC Average Cost Database is based on allocated budgets, it may not accurately reflect the true costs of production services. The discrepancies between actual costs and HERC estimated costs could significantly affect study results, especially using the local costs, because budget allocation varies considerably across medical centers. HERC will evaluate this cost database and report the evaluation results to users, but researchers should also evaluate cost data obtained from this database. One evaluation strategy is to compare your costs with the VA national average for similar services. Another method is to compare your costs with that in the non-VA sectors (e.g., Medicare or Medicaid reimbursement rates). When costs are unreasonably high or low, further investigation may be needed. For example, researchers can use the micro-costing method to validate the data in a selected sample. With appropriate evaluation and adjustments, this database will be useful for health care research and management.

REFERENCES

- Barnett, P. G. 1997. Research without billing data. Econometric estimation of patient-specific costs. *Medical Care* 35 (6): 553-63.
- . 2003. Determination of VA health care costs. *Medical Care Research and Review* 60 (3 Suppl.): 124S-141S.
- Barnett, P. G., S. Chen, and T. H. Wagner. 2000. *Determining the cost of VA care with the average cost method for the 1993-1997 fiscal years*. HERC working paper no. 2. Menlo Park, CA: Health Economics Resource Center.
- Fries, B. E. 1990. Comparing case-mix systems for nursing home payment. *Health Care Finance Review* 11 (4): 103-19.
- Fries, B. E., D. P. Schneider, W. J. Foley, and M. Dowling. 1989. Case-mix classification of Medicare residents in skilled nursing facilities: Resource utilization groups (RUG-T18). *Medical Care* 27 (9): 843-58.
- Schneider, D. P., B. E. Fries, W. J. Foley, M. Desmond, and W. J. Gormley. 1988. Case mix for nursing home payment: Resource utilization groups, version II. *Health Care Finance Review*, 39-52.

- Schultz, B. M., D. Ward, and J. R. Knickman. 1994. RUG-II (resource utilization group, version II) impacts on long-term care facilities in New York. *Health Care Finance Review* 16 (2): 85-99.
- Smith, M. W., and P. G. Barnett. 2003. Direct measurement of health care costs. *Medical Care Research and Review* 60 (3 Suppl.): 74S-91S.
- Swindle, R., C. VanDeusen-Lukas, D. Alexander-Meyer, P. G. Barnett, and A. M. Hendricks. 1999. Cost analysis in the Department of Veterans Affairs: Consensus and future directions. *Medical Care* 37 (4): AS3-AS8.
- U.S. Department of Veterans Affairs. 1996. *CDR handbook: A guide for preparing the cost distribution report*. Washington, DC: U.S. Department of Veterans Affairs.
- . 2000. *CDR handbook: A guide for preparing the cost distribution report*. Washington, DC: U.S. Department of Veterans Affairs.
- Wagner, T. H., S. Chen, and P. G. Barnett. 2003. Using average cost methods to estimate encounter-level costs for medical-surgical stays in the VA. *Medical Care Research and Review* 60 (3 Suppl.): 15S-36S.
- Wagner, T. H., S. Chen, W. Yu, and P. G. Barnett. 2001. *Handbook for HERC's inpatient average cost datasets for VA care: Fiscal years 1998-2000*. Menlo Park, CA: VA Health Economics Resource Center.
- White, C., S. D. Pizer, and A. J. White. 2002. Assessing the RUG-III resident classification system for skilled nursing facilities. *Health Care Finance Review* 24 (2): 7-15.