

VA Health Economics Resource Center Technical Report #6

# Indirect Costs of Specialized VA Inpatient Mental Health Treatment

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of health economics research*

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This technical report describes the indirect cost of specialized inpatient mental health treatment programs of the U.S. Department of Veterans Affairs (VA).

We defined the direct costs of treatment programs as the cost of the staff and supplies used by the treatment program. We surveyed directors of specialized substance use treatment programs and learned the number and type of staff employed. We used salary data from the VA Financial Management System (FMS) to estimate the cost of this staff.

The program directors do not have information about other costs associated with treatment, however. These are indirect costs, such as the cost of space, utilities, housekeeping, meals provided to inpatients, the personnel office, supply service, and other hospital administrative costs. This technical report describes how we estimated indirect costs using data from the national extracts of the Decision Support System (DSS). We used data for the 2000-2001 federal fiscal year (FY01).

To find indirect cost, we made the following assumptions:

- Indirect costs are proportionate to direct cost.
- The cost of other VA services such as research, medical education, and VA benefits programs, should not be included as an indirect cost of mental health treatment. Our estimate excludes the cost of research, medical education, and VA benefits programs. We also excluded the overhead associated with these services.
- The cost of VA national and regional administration should not be included. We excluded these costs because we believe that they represent the cost of administering the VA health plan, and are not a cost of treatment.
- In order to exclude the costs research, education, benefits, and regional and national administration, we assumed that they constitute a fixed proportion of indirect costs.
- The cost of dietary services is the same for all hospitalized VA patients.

The technical report has three sections. The first section presents our calculation of the ratio of indirect to direct costs in VA specialty mental health inpatient programs. We separately identify research, education, benefits, and national and regional administration, all indirect costs that we excluded from our estimate. The goal of this effort is to find an indirect cost ratio, a factor that can be multiplied by observed direct costs to estimate indirect cost.

The second section of this report presents our estimate of the average daily cost of VA dietary services. The third section of this report describes the average daily DSS cost of care of specialty inpatient mental health programs, including both direct and indirect cost. We calculated this so that we could compare our cost estimate to the estimates in DSS.

**1. Indirect cost.**

We used DSS data to find a national indirect cost ratio for specialized inpatient mental health programs in FY01. This was the ratio of indirect costs to direct costs. We adjusted this ratio to exclude four types of indirect cost that we did not wish to include in our cost estimate: research<sup>1</sup>, education, veterans' benefits, and national administration.

We attempted to estimate an indirect cost ratio for each VA facility. We found a wide variation in the ratios for different facilities. This variation was evidently due to the differences in the definition of direct costs used by different facilities. We concluded that facility-level ratios would not provide greater precision about local factors that affect cost, they would merely reflect idiosyncratic differences in the definition of a direct cost. For this reason, we focused our efforts on finding a national indirect cost ratio.

Indirect Cost Ratio. We used a national database of VA hospital costs, the DSS treating specialty file. We tabulated indirect and direct costs reported in this database in FY01 to determine the ratio<sup>2</sup> of indirect to direct costs in specialized VA inpatient mental health programs. We defined four types of psychiatric and substance use treatment programs using codes for bedsections, the VA designation for the location of inpatient care (sometimes called treating specialty). Types of care and the associated bedsection codes are shown in Table 1.

Table 1  
Types of VA Specialty Inpatient Mental Health Programs  
and Associated Bedsection Codes

Type of Care	Bedsection Codes
Psychiatry	33, 38, 39, 70, 71, 76, 77, 79, 89, 91, 92, 93, 94
Substance Abuse	72, 73, 74, 84, 90
Domiciliary	37, 85, 86, 87, 88
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	25, 26, 27, 28, 29, 38, 39

We tabulated these costs for all VA medical centers. Table 2 presents the national ratio of indirect to direct costs for each type of care.

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1. DSS defines research cost as the cost of activities supported by the VA medical care appropriation that do not involve clinical care. The cost of clinical research supported by the appropriation is thus deemed patient care cost in DSS.
  2. This sometimes referred to as an indirect cost rate, however it is not a true rate because the numerator is not a component of the denominator. We thus refer to it as a ratio.

Table 2  
Indirect Cost Ratio  
by Type of VA Specialty Inpatient Mental Health Programs FY01

Treating Specialty	Indirect Cost	Direct Cost	Ratio of Indirect to Direct Cost
Psychiatry	383,710,652	526,368,778	0.72898
Substance Abuse	24,543,530	32,240,724	0.76126
Domiciliary	137,515,497	141,619,328	0.97102
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	58,992,590	59,800,866	0.98648

Adjustments to DSS indirect costs.

The indirect costs reported in Table 2 include indirect costs that we wished to exclude from our estimate. These include research, education, veteran’s benefits, and national and regional administration.

We used the VA national database of department level costs, the DSS Account Level Budget Cost Center (ALBCC) extract. We tabulated the total indirect cost reported in this extract and the percentage of these indirect costs that were in the categories that we wanted to exclude. Total indirect costs were found by summing costs in the administrative production unit (production unit=00), exclusive of costs in the cost centers listed in Table 3 (veterans’ benefits, and the regional and national administration cost centers).

Table 3  
Cost Centers in Administration Production Units  
Excluded from Indirect Cost Ratio

602	Patient Care Travel
603	Care of The Dead
614	VA Headquarters
652	VISN Director Costs

We deducted from the administrative costs the share of administration attributable to research (production unit=01), and teaching (production unit=02). This was accomplished by applying the following formula for the adjusted indirect cost ratio:

$$\frac{I}{D} \left( \frac{A \left( \frac{P}{P + R + E} \right)}{A + N + R + E} \right) = \text{adjusted indirect cost ratio}$$

Where:

From DSS National Data Extracts:

- I Indirect cost of type of specialized inpatient mental health care
- D Direct cost of type of specialized inpatient mental health care

From DSS ALBCC:

- A Administrative costs, not including national and regional administration, veteran benefits, research and teaching administration
- P Total expenditures for patient care production units
- R Total expenditures for research production units
- E Total expenditures for education production units
- N Total national and regional administration and veteran benefits

The ratio I/D is the unadjusted indirect cost ratio. The factor in parentheses is the adjustment. It is the percentage of indirect costs that we included.

The adjustment excludes the costs of research (R), education (E), and benefits, and regional and national administration (N). It also excludes the indirect costs associated with research and education.

In the largest brackets the right term in the numerator,  $\frac{P}{P + R + E}$ , is the percentage of direct cost that was patient care cost. This was multiplied by total indirect cost (A) to determine the indirect costs of patient care. In this way, we excluded the indirect cost associated with research and education.

We then found the percentage of indirect costs that are includable. We found this by dividing the indirect costs assigned to patient care (the numerator of the factor in parentheses) by total indirect costs (the denominator, the sum of A, N, R, and E). We found that 87.61% of the indirect costs met are our criteria for inclusion. We applied this national adjustment factor to all types of care to arrive at the national indirect cost ratios for the each type of inpatient care presented in Table 4.

Table 4  
 Indirect Cost Ratio  
 by Type of VA Specialty Inpatient Mental Health Programs FY01  
 Excluding Education, Research, Benefits, and Regional and National Administration

Treating Specialty	Raw Indirect Cost Ratio	Adjusted Indirect Cost Ratio
Psychiatry	0.72898	0.6387
Substance Abuse	0.76126	0.6669
Domiciliary	0.97102	0.8507
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	0.98648	0.8643

## 2. Dietary Cost

Our direct cost survey did not obtain information on the cost of dietary services. We used DSS data to estimate the national average daily cost of the VA dietary services. We added this cost to our estimate of the direct cost of the program.

We found the national and site specific total costs of all VA dietary departments from the DSS national department-level extract, the ALBCC. We found the national and site specific total days of stay from the DSS treating specialty file. We divided total cost by total days to find the national and site specific mean daily cost of the dietary department.

We assumed that the cost of meals is the same for all patients, regardless of whether they were hospitalized in a general medical care ward or a residential care facility. It is possible that the meals served to patients with medical illness are more expensive, because they must comply with dietary restrictions. Patients who are medically healthy may consume more food, however. In the absence of any information about the quantity of resources used to provide food to specific patients, we assumed that the daily cost of meals is the same for all patients.

Total cost of dietary departments. We found the total cost of all VA dietary departments from the DSS national department-level extract, the ALBCC. We found the total cost the production units DP (food production), DR (clinical dieticians), and DS (food delivery) for each VA medical center.

Total days of stay. We determined days of stay from the DSS national extract treating specialty extract. We calculated the number of days in each bedsection segment of a hospital stay. Length of stay was the date the patient left the bed section (TRTOUT) less the date they entered it (TRTIN) less the aggregate number of days of absence (AGGABS). If the number of days of stay was less than 1 day, we set the length of stay as 1 day.

The DSS national extract treating specialty file contains one record per patient per bedsection for each calendar month in which the stay occurred. The number of records per stay equals the number of different calendar months in which the stay occurred. We removed all but the last record of each stay thus ensuring that the days associated with any stay were counted just once.

Mean daily cost. We found the mean daily cost of the dietary production units at medical centers reporting any dietary cost. We divided cost by days to find the national mean daily cost of the dietary department. There were 19 medical centers dropped from this calculation because they did not report any dietary cost. Table 5 reports national dietary costs.

Table 5  
Daily Cost of VA Dietary Departments

Total Cost of Dietary Departments	Total Days of Stay	Cost per Day of Stay
156,212,168	11,158,755	14.00

We calculated the daily dietary cost of individual medical centers. The mean of medical centers' daily costs was \$14.09, with a standard deviation of \$13.21. Because of the high variance in these estimates, we used the national mean daily cost to determine costs.

We found the direct cost of dietary programs for mental health inpatients by multiplying the national average daily cost by total days of stay. Dietary cost is treated as a direct cost department by DSS. We added it to the direct costs of treatment that we found by program survey. We included by treatment cost and dietary cost as direct costs; we multiplied these by our indirect cost ratio to find indirect cost.

### **3. DSS Data on Daily Cost**

We found the average daily cost reported in DSS for each type of inpatient mental health care. We wanted to estimate these daily costs as a basis of comparison for the survey based cost estimates.

We defined types using the definitions provided in Table 1. We tabulated cost and days of stay in the DSS treating specialty extract. The result of this tabulation is found in Table 6.



Table 6  
National Unadjusted Average Daily VA Cost of Specialty Mental Health Inpatient Programs  
by Type of Bedsection, FY01

Treating Specialty	Unadjusted Total Cost	Days of Stay	Unadjusted Mean Daily Cost
Psychiatry	910,079,431	1,480,063	615
Substance Abuse	56,784,255	92,854	612
Domiciliary	279,134,824	1,863,698	150
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	118,793,456	437,400	272

Exclusion of Indirect Cost. We then adjusted this average data cost to exclude five categories of indirect costs-- education, research, veterans' benefits, and regional and national administration. Table 7 provides the national average of this adjusted daily cost.

Table 7  
National Adjusted Average Daily VA Cost of Specialty Mental Health Inpatient Programs  
by Type of Bedsection, FY01

Excluding Education, Research, Benefits, and Regional and National Administration

Treating Specialty	Adjusted Total Cost	Days of Stay	Adjusted Mean Daily Cost
Psychiatry	862,537,681	1,480,063	583
Substance Abuse	53,743,311	92,854	579
Domiciliary	262,096,654	1,863,698	141
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	111,484,274	437,400	255

Table 8 compares daily cost with and without the exclusion of the five types of indirect cost.

Table 8  
 Difference between Unadjusted and Adjusted National Average Daily VA Cost of  
 Specialty Mental Health Inpatient Programs  
 by Type of Bedsection, FY01

Treating Specialty	Daily Cost Before Exclusion	Excluded Cost (per day)	Adjusted Daily Cost
Psychiatry	615	32	583
Substance Abuse	612	33	579
Domiciliary	150	9	141
Psychosocial Residential Rehabilitation Treatment Programs (PRRTP)	272	17	255