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# A Resident-Based Reimbursement System for Intermediate Care Facilities for the Mentally Retarded

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*In this article, the authors present a resident-based reimbursement system for intermediate care facilities for the mentally retarded (ICFs-MR), which represent a large and growing proportion of the Medicaid budget. The statistical relationship between resident disability level and the expected cost of caring for the individual is estimated, allowing for the prediction of expected resource use across the population of ICF-MR residents. The system incorporates an indirect cost rate, a base direct care rate (constant across all providers), and an individual-specific direct care rate, based on the expected cost of care.*

## INTRODUCTION

Expenditures for mentally retarded individuals who reside in ICFs-MR represent a large and growing proportion of the Medicaid budget. Between 1975 and 1994, Medicaid payments to ICFs-MR rose from \$0.4 billion to \$8.3 billion. Per person spending (inflation adjusted to 1994 dollars) more than doubled from \$22,598 in 1975 to \$53,055 in 1994. However, although the number of recipients receiving ICF-MR services rose dramatically from 69,000 in 1975 to 151,000 in 1981, in recent years the number of recipients has leveled off, with 159,000 receiving such services in 1994.

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The proportion of Medicaid payments for ICF-MR services rose from 3.1 percent of total payments in 1975 to 7.7 percent in 1994 (Health Care Financing Administration, 1996).

Despite the large outlays for ICF-MR services, methods for determining reimbursement to a given facility are often based on historical average costs, which may have little or no relationship to the disability level of the residents being served (Myers and Stauffer, 1994). The disadvantage of a reimbursement system based on historical average costs is that it creates a disincentive for facilities to select individuals who are more disabled than past residents, and payments are not necessarily distributed equitably or economically across facilities. Access concerns for persons who are most disabled become magnified as cost-containment efforts constrain overall budgets. The magnitude of ICF-MR expenditures, the need for cost containment, and concern regarding the appropriateness of reimbursement levels have caused a number of States to examine the relationship between their reimbursement methods and policy goals. Several States have recently undertaken studies to develop reimbursement methodologies that are more closely tied to resident resource use (Chapin, Rotegard, and Manard, 1991; Brown et al., 1993; Myers and Stauffer, 1994). Under Federal law, States have the flexibility to use such a payment methodology as long as they do not exceed the upper limits "that can reasonably be

estimated would have been paid for those services under Medicare payment principles" (42 CFR 447.253.(b)(2), 42 CFR 447.272(a)). However, States that partially base ICF-MR reimbursement on resident disability level (e.g., Kansas and North Carolina) use facility-averaged adjusted severity scores, which give equal weight to different measured disabilities. By averaging severity scores across measured disabilities at the individual and then facility level, important differences in the costs of providing treatment for different disabilities are missed. In this article, we describe a resident-based reimbursement system (RBRS) that is based on disaggregated measures of disability, in order to create a reimbursement model that weights the presence of some conditions more heavily than others. The financial and policy implications of severity-based reimbursement strategies are also discussed.

## **ADVANTAGES AND DISADVANTAGES**

Because the reimbursement more nearly reflects the actual costs incurred by the provider, an RBRS is fairer and more economically efficient than a system based on historical average costs. Providers caring for residents with higher needs will receive higher payments, and if a facility's case mix changes during the year, the payment rate can be adjusted accordingly. Thus providers will have less financial incentive to select residents with lower need. It is important to recognize that providing higher payments to facilities that care for individuals with greater disability levels does not automatically ensure that those individuals will receive needed care; to counteract any economic incentive to provide only minimally adequate care, an RBRS must be coupled with quality assurance surveillance, thereby enhancing State goals of quality care.

However, the difficulty of developing and implementing reimbursement-related quality standards should not be underestimated, as there is no gold standard of care by which to compare facilities.

The greatest disadvantage of moving to an RBRS is that such a system imposes computing and reporting requirements that could be substantially more burdensome to both providers and the State than those within a system that uses historical costs. The RBRS would also make it more difficult for providers to budget at the beginning of the fiscal year. Unless resident mix is absolutely stable during the year, some fluctuations in reimbursement will occur. Finally, some ICFs-MR would see their reimbursement fall, making a new system unpopular among these providers.

## **COST COMPONENTS**

There are two components to reimbursable facility costs: direct and indirect. The direct cost of care includes staff and resource requirements necessary to provide disability-level-appropriate care to an individual resident of an ICF-MR. Direct costs are closely related to an individual resident's level of disability, but the link between these costs and resident disability level is not well developed. Therefore, our data collection and analysis efforts focused on the direct cost of care. To develop a reimbursement methodology, it is necessary to predict the direct costs of care for a given individual. In this article, we estimate the statistical relationship between measures of individual characteristics and estimated individual resource requirements and build upon this link to develop a reimbursement methodology based on the resource requirements predicted to meet an individual's needs.

Reimbursement to a facility must also include a component for the indirect cost

of care, including such items as property ownership and use (e.g., lease or rent, property insurance, real estate taxes), administrative and general costs, and operation and maintenance of plant. These costs are not strongly related to individual resident disability level and therefore can be determined at a facility level. Although the final reimbursement model presented here includes facility-specific indirect costs, we do not focus on calculation of these costs; although in some instances (e.g., homes for the medically fragile), indirect costs may vary based on resident severity, in general, resident disability levels and indirect costs are not strongly related. States employ a number of strategies to minimize the variance in indirect costs across facilities (such as grouping facilities based on size, ownership, location, or property values, and imposing floors, ceilings, or average payment rates), but we do not deal with these issues in this article.

## DATA

The study population included all residents of privately owned ICFs-MR in North Carolina. Individuals in State-owned ICFs-MR were excluded, as our contract was limited to private facilities. Data collection and analysis occurred during the period October 1994 through October 1995. Demographic, behavioral, and medical characteristics of all 2,290 residents in privately owned ICFs-MR were gathered, using the Developmental Disabilities Profile (DDP). The DDP was designed by the New York State Office of Mental Retardation and Developmental Disabilities (OMRDD) to provide a brief and relatively simple means of documenting key characteristics of persons with a range of developmental disabilities (Brown et al., 1986). Items in the DDP were selected because they had been

shown to be or were expected to be predictive of resource requirements and ultimately the cost of resident care. The DDP data for our sample were validated on a 10-percent random sample, stratified on individual and facility characteristics, drawn from the population of ICF-MR residents. Independent mental health/mental retardation professionals personally visited each of the facilities in which the sampled residents resided, reviewed records, and conferred with caregivers, other professionals, and administrators. The DDP instrument was found to be highly reliable (Kilpatrick et al., 1996).

Another instrument developed by the New York State OMRDD, the Staff Activities Survey, was modified and used in our research to capture the expected resource use associated with the care of each individual in the 10-percent sample. The Staff Activities Survey instrument contains a series of detailed items to assess individual resource needs in the following categories: medical/nursing care; personal care; capacity for independence; mobility/motor; and recreation and leisure. For each item, respondents were asked to assess the level of staff support required, the frequency and duration of staff assistance, and the type(s) of staff support generally required. Information was also collected about expected staff response to problem behaviors.

The survey was conducted through one-on-one interviews with staff. Respondents included Qualified Mental Retardation Professionals (QMRPs), nurses (both registered nurses and licensed practical nurses), habilitation aides and coordinators, and resident directors. Thirty-five percent of the surveys were answered solely by QMRPs, 7 percent by resident directors, and 5 percent by habilitation aides. The remainder of the surveys were completed by combinations of different

staff types working as a team. It is possible that the differing disciplines of the respondents could produce some bias in the predictions of staff need.

The Staff Activities Survey measures the resource use of a resident with a given disability level in a particular home. It is possible that two individuals with the same level of disability who reside in different homes would receive different levels of care. Inter-home variation would also be observed with time and motion studies. The advantage of the Staff Activities Survey is that responses are not directly influenced by the actual number of certain types of personnel resources available in a particular facility, as staff base their responses on expected need, regardless of whether or not the facility has the staff to actually meet those needs. Thus the pitfall common to empirically based staffing studies—that of perpetuating an observed staffing level that is constrained by existing funding levels—is avoided.

To capture total expected daily resource use (in staff time) per resident, the Staff Activities Survey instruments were coded so that an aggregate measure of time required for care of each resident could be calculated. This measure was weighted by the average hourly salary of the type of staff providing the care, resulting in a single, weighted, staff cost measure. We do not know precisely what factors influence the variation in use of staff time and staff type across individuals. The type of caregiver providing a given service (e.g., nurse versus direct care staff) may reflect either the particular need of the resident or a particular facility's operating style. One advantage of weighting by staff salary is that the measure of resource use per day will accurately reflect the relative needs of the resident when higher cost staff is necessary because of disability levels. The disadvantage is that, to the extent that staff

type merely reflects organizational style, the care needs of certain residents could be overstated or understated.

Our final measure of resource use, the expected direct care dollars per day, clearly overstates the staff time and/or staff skill level necessary to care for individuals in ICFs-MR. The mean value across the 10-percent sample of \$566 per day is skewed by a few outliers. The median value of \$265.54, although still an overstatement of direct care resource use, gives a much clearer picture of the extent of "upcoding." It is clear from the Staff Activities Survey data that respondents may have answered with their estimates of ideal interventions, unconstrained by budgetary or staff limitations. Although this potential inflation of staffing hours may bias the absolute reported hours, we do not believe that it will systematically affect the relative hours for residents with similar conditions. As is discussed later, we develop a relative, not absolute, resource use scale.

## **PREDICTION OF DIRECT COST PER RESIDENT**

To establish the statistical relationship between the resident's profile (as measured by the DDP) and the expected resource use (as measured by the Staff Activities Survey), a regression was estimated. The dependent variable was the natural log of the expected dollars per day of staff resource necessary to care for the individual, as measured by the Staff Activities Survey. The independent variables were 13 parcels identified through a factor analysis of the DDP. This process, along with the fitting of the final regression model, is described elsewhere (Brown et al., 1986; Kilpatrick et al., 1996). The 13 parcels allow us to estimate a model that is both parsimonious and explanatory. The parcels are self-care, daily living,

cognitive, communication, fine motor, gross motor, number of seizures, number of medical conditions, number of medical consequences, number of medications prescribed, level of medication support, frequency of behavioral problems, and behavior consequences. In addition to these parcels, we added several variables that ICF-MR staff felt were important for predicting resource use: whether the resident uses a wheelchair or has a psychiatric diagnosis, and the resident's age and age squared. The variables and their definitions are listed in Table 1.

Table 2 reports the regression coefficient estimates from ordinary least squares, with direct expected resource use in log dollars employed as the dependent variable. We have retained all variables in the model, regardless of significance level, as prior work and discussions with providers suggest that all of the variables may be important predictors of resource use. If future work finds continued lack of significance, it is possible that the model should be trimmed. The standard errors are Huber standard errors, which control for the fact that some of the respondents in our sample are from the same facility. Multiple observations from the same facility increase the likelihood of autocorrelation of disturbances, which would result in biased standard errors. The Huber standard errors take into account such autocorrelation (Stata Corporation, 1993).

The model explains 25 percent of the variation in expected resource use for the 243 individuals in the 10-percent sample with complete data. Although predictions made from this model will not be perfect, the amount of variance explained is similar to that found in severity-adjustment models in other practice settings (Thomas, Ashcraft, and Zimmerman, 1986). The challenge is to use these predictions to

construct a reimbursement method that capitalizes on the predictive power of the DDP for individual resource requirements but is not excessively burdensome for providers or States.

A second model was estimated that included organizational variables thought to be associated with the cost of care: the size of the chain to which a facility belonged and the number of beds in the facility. Although chain size was significantly associated with expected resource use (specifically, the larger the chain, the lower the resource use), we decided not to use organizational variables in the algorithm to predict the cost per resident, as our intent was to develop a relationship between individual disability level and resource use, irrespective of facility characteristics. The other difficulty with including organizational variables, such as chain size, in the algorithm is that it is not known why large chains have lower costs. It is possible that the negative association between chain size and resource use reflects a lower standard of care in the larger chains. If this is the case, States may wish to keep reimbursement comparable to facilities in smaller chains in an attempt to raise standards of care. To the extent that the lower cost reflects economies of scale, States might wish to adjust payment rates downward for large chains. However, the addition of a manipulable organizational variable in a reimbursement model might create the wrong incentives. For example, if larger chains were reimbursed at a lower level, the large chains might simply form several smaller legal units in order to receive higher reimbursement.

## **DEVELOPMENT OF THE SYSTEM**

The regression analyses allow us to use DDP scores to simulate the predicted log

**Table 1**  
**List of Independent Variables in the Model**

Variable	DDP Item	Description
Self-Care Skills	27 a-k	Describes how independently client performs activities such as toileting, dressing, and eating, ranging from total support to no functional limitations.
Daily Living Skills	28 a-j	Describes how independently client performs activities such as managing money, housekeeping, and transportation, from total support to no functional limitations.
Communication	24 a-i	Captures the presence or absence of receptive and expressive communication skills.
Cognitive	23 a-i	Captures the presence or absence of simple math skills, simple reading skills, ability to distinguish right and left, understand simple signs.
Behavior Frequency	25 a-j	Describes the frequency ("not this year" to "daily") of a range of problem behaviors such as tantrums, stealing, running away, and assaults.
Behavior Consequences	26 a-f	Captures the presence or absence of consequences to the identified behaviors, such as necessity to specially structure the client's environment.
Medical Conditions	14 a-f	Captures the presence or absence of 6 different medical conditions: gastrointestinal, respiratory, cardiovascular, genitourinary, neoplastic, neurological.
Seizures	15 b	Describes the types of seizures the client has experienced in the last 12 months, ranging from none to Grand Mal.
Medications Prescribed	16 a	Describes the number of different prescription medication types the client receives, such as antipsychotic, anti-anxiety, anticonvulsant, diabetes.
Medical Support	16 c	Describes the level of support required for taking prescription medications, ranging from no medication, takes independently, to total support required.
Medical Consequences	17 a-d	Captures whether medical conditions resulted in special training for staff, or the client being hospitalized, missing day programming.
Gross Motor Skills	22 a-c, e	Indicates whether client can perform activities requiring gross motor skills such as rolling over, pulling up, and walking.
Fine Motor Skills	22 d, f-i	Indicates whether client can perform activities requiring fine motor skills such as picking up small objects, marking, and cutting with scissors.
Psychiatric Diagnosis <sup>1</sup>	q 13	Captures the presence or absence of a psychiatric diagnosis.
Wheelchair <sup>1</sup>	q 21 a	Indicates whether or not the client uses a wheelchair.
Age <sup>1</sup>	6 c	Resident's age.
Age Squared <sup>1</sup>	—	Age*age

<sup>1</sup> These variables were not parcels identified in the factor analysis but were added to the model based on provider recommendation.

NOTE: DDP is Developmental Disabilities Profile.

SOURCE: Developmental Disabilities Profile, New York State Office of Mental Retardation and Developmental Disabilities, Albany, NY.

**Table 2**  
**Statistical Association Between the Log of Expected Dollars Needed for Care in Private Intermediate Care Facilities for the Mentally Retarded and Resident Characteristics as Measured by the Developmental Disabilities Profile**

Variable	Coefficient	Standard Error	t	95-Percent Confidence Interval
Self-Care Skills	-0.0005856	0.0056470	-1.037	(-.01698, .00527)
Daily Living Skills	-0.0020310	0.0058401	-0.348	(-.01354, .00948)
Communication	0.0015365	0.0035723	0.430	(-.00550, .00858)
Cognitive	-0.0016852	0.0036128	-0.466	(-.00881, .00543)
Behavior Frequency	-0.0103541	0.0041124	-2.518	(-.01846, -.00225)
Behavior Consequences	-0.0013799	0.0029039	-0.475	(-.00710, .00434)
Medical Conditions	0.2122745	0.0710368	2.988	(.07229, .35226)
Seizures	0.1270389	0.0715903	1.775	(-.01403, .26811)
Medications Prescribed	-0.0949417	0.1055023	-0.900	(-.30284, .11296)
Medical Support	-0.0654656	0.0915321	-0.715	(-.24584, .11490)
Medical Consequences	-0.0108938	0.0755746	-0.144	(-.07252, .13803)
Gross Motor Skills	-0.1597124	0.0800891	-1.994	(-.31753, -.00189)
Fine Motor Skills	0.1754667	0.0646689	2.713	(.04803, .30290)
Psychiatric Diagnosis	0.1455465	0.1564298	0.930	(-.16271, .45380)
Wheelchair	0.3181342	0.1982431	1.605	(-.07252, .70879)
Age	0.0167352	0.0184288	0.908	(-.01958, .05305)
Age Squared	-0.0004640	0.0002938	-1.579	(-.00104, .00012)
Constant	6.5827970	0.5319124	12.376	(5.53463, 7.63096)

NOTES: n = 243. R-squared = 0.3018. Adjusted R-squared = 0.2490.

SOURCE: Slifkin, R.T., Kilpatrick, K.E., Bollen, K.A., and Johnsen, M.C., University of North Carolina at Chapel Hill, 1995.

cost of direct care for an individual. There are two different ways to use the predicted log cost for actual facility reimbursement. The first would be to simply take the anti-log and reimburse at the predicted cost. We rejected this strategy for four reasons: (1) the resource use that was recorded on the Staff Activities Survey and subsequently used to create the dependent variable was clearly an overstatement of true costs; (2) there is no gold standard of appropriate levels of care for an individual with a given disability profile; (3) facilities must be reimbursed at a level sufficient to meet minimum Federal staffing requirements, regardless of disability levels of individual residents; and (4) reimbursing at the absolute predicted cost does not allow for the very real need for cost containment.

Instead we use the predicted log cost as a predicted resource use (PRU) weight, in order to capture the intensity of resources needed to care for a given individual, relative to all other ICF-MR residents in the State. For a given individual, the PRU is calculated by the equation:

$$PRU = b_0 + \sum_i b_i x_i$$

where:

- $b_0$  = constant, as reported in Table 2
- $i$  = 1, 2, ..., 17 variables in the model (listed in Table 2)
- $b$  = estimated coefficient, as reported in Table 2
- $x$  = the individual's score

We use the PRU in its logged form to reduce the possibility of extreme outliers. This weight can then be multiplied by a conversion factor that converts the PRU into dollars. The advantage of using a conversion factor is that it allows for control over total expenditures (e.g., expenditure containment compared with a prior reimbursement system might be desired), while still maintaining relative equity in reimbursement across disability levels. The conversion factor could be adjusted annually for inflation and also for geographic variation in input prices, if these were shown to vary substantially in a given State.

Because all ICFs-MR have basic direct care expenses independent of resident disability levels, the resident-based reimbursement system we present includes a direct base rate per diem that is constant for all providers. This base rate represents the reimbursement necessary to cover labor, food, and supplies for a minimum care resident and to meet Federal staffing requirements. The actual dollar amount of this rate should be determined by the individual State, to reflect market and regulatory conditions. Although we recognized that determination of an appropriate direct base rate will be a difficult task, that was not the objective of this study.

The RBRS would operate as follows: For any facility, the total daily reimbursement would consist of:

$$TR = n(IPD_f + DPD) + CF \sum_i (PRU_i)$$

where:

- $i$  = 1, 2, ...,  $n$  residents in the facility
- $n$  = Total number of residents in the facility
- TR = Total reimbursement
- $IPD_f$  = Indirect per diem (facility or group of facilities specific)
- DPD = Direct base rate per diem
- CF = Conversion factor
- PRU = Predicted resource units

## SIMULATION OF THE SYSTEM

This section presents a demonstration of the RBRS, under the assumption that one goal of the reimbursement system is budget neutrality with an existing facility-based reimbursement system. The PRU is calculated using the coefficient estimates from the analysis as already reported. The next step is to calculate a budget-neutral conversion factor:

$$DA = (TDCD - (DPD \times 365 \times n)) / 365$$

$$CF = DA / \sum_i (PRU_i - \min(PRU))$$

where:

- $i$  = 1, 2, ...,  $n$  residents in the State
- DA = Dollars available
- TDCD = Total direct care dollars per year
- DPD = Direct base rate per diem
- $n$  = Total number of residents in the State
- CF = Conversion factor
- PRU = Predicted resource units
- $\min(PRU)$  = Minimum PRU value across all residents

To illustrate these calculations, we used data for 2,290 individuals for whom complete DDP information was available. Total prospective yearly direct care expenditures for these individuals was estimated at \$112,027,286.50.

### Calculation of a Budget-Neutral Conversion Factor

If we assume a direct base rate per diem of \$100.00, the dollars available to be allocated based on individual PRU weights are calculated as:

$$(\$112,027,285.50 - (100 \times 365 \times 2,290)) / 365$$

$$= \$77,924.07 \text{ per day}$$

The PRU weights for our sample ranged from 3.7248 to 7.7325. The lowest value was subtracted from all individual weights to norm the scale to begin at zero. The weights were then summed across all individuals, resulting in a total PRU in the sample of 4,763.77. A budget-neutral conversion factor was then calculated:



$$\begin{aligned} \text{Conversion factor} &= \$77.924.01/4,763.77 \\ &= \$16.36/\text{PRU} \end{aligned}$$

The issue of an appropriate level for the direct base rate per diem is critical. Although it is important to set a base rate that is high enough to allow all providers to remain in business, the lower the base rate, the more dollars available for distribution according to individual predicted resource use, as the conversion factor increases. As shown in Table 3, with the base rate set at \$75.00, the conversion factor rises to \$28.38/PRU, while for a base rate of \$125.00, the conversion factor falls to only \$4.34/PRU. It is important to note that the hypothesized base rates used in this example are for illustrative purposes only. Actual implementation of a system as proposed here would necessarily be preceded by a detailed cost analysis to ensure the adequacy of the base rate.

### Calculation of Resident-Based Reimbursement Rate

To calculate the final RBRS, we use the historical cost-based indirect rates that were in place at the time of the study.

Facility daily rates are calculated under the three different assumptions of a direct care base per diem rate:

$$\begin{aligned} \text{TR1} &= n(\text{IPD} + \$75) + 28.38\sum_i (\text{PRU}_i) \\ \text{TR2} &= n(\text{IPD} + \$100) + 16.36\sum_i (\text{PRU}_i) \\ \text{TR3} &= n(\text{IPD} + \$125) + 4.34\sum_i (\text{PRU}_i) \end{aligned}$$

where:

- $i$  = 1, 2, ...,  $n$  residents in a given facility
- TR = Total daily reimbursement
- IPD = Indirect per diem
- PRU = Predicted resource units

As shown in Table 4, changing the base rate within the constraints of remaining budget-neutral has a large impact on the range of reimbursement rates across homes. As the base rate increases, the variation in reimbursement rates across facilities will decrease. Although the mean reimbursement rate is quite similar across the two different base-rate calculations, the difference between the highest and lowest reimbursement rates is \$41.03 when the base rate is \$100.00, compared with only \$15.18 when the base rate is \$125.00.

**Table 3**  
Calculation of Resident-Based Reimbursement Rate for Privately Owned Intermediate Care Facilities for the Mentally Retarded

Formula	\$75 Direct Base Rate	\$100 Direct Base Rate	\$125 Direct Base Rate
$DA = (\text{TDCD} - (\text{DPD} \times 365 \times n))/365$	$(\$112,027,285.50 - (75 \times 365 \times 2,290))/365$ = \$135,174.00 per day	$(\$112,027,285.50 - (100 \times 365 \times 2,290))/365$ = \$77,924.07 per day	$(\$112,027,285.50 - (125 \times 365 \times 2,290))/365$ = \$20,674.07 per day
$CF = DA / \sum_i (\text{PRU}_i) - \text{min}(\text{PRU}_i)$	$CF =$ $\$135,174.00/4,763.77$ = \$28.38/PRU	$CF =$ $\$77,924.01/4,763.77$ = \$16.36/PRU	$CF =$ $\$20,674.07/4,763.77$ = \$4.34/PRU
$TR = n(\text{IPD} + \text{DPD}) + CF \sum_i (\text{PRU}_i)$	$TR1 = n(\text{IPD} + \$75) + 28.38 \sum_i (\text{PRU}_i)$	$TR2 = n(\text{IPD} + \$100) + 16.36 \sum_i (\text{PRU}_i)$	$TR3 = n(\text{IPD} + \$125) + 4.34 \sum_i (\text{PRU}_i)$

SOURCE: Stifkin, R.T., Kilpatrick, K.E., Boilen, K.A., and Johnsen, M.C., University of North Carolina at Chapel Hill, 1995.

**Table 4**  
**Facility Average Per Diem Reimbursement Rates for Privately Owned Intermediate Care Facilities for the Mentally Retarded, Using the Resident-Based Reimbursement System With Varying Direct Care Base Rates**

Base Rate	Mean Across All Facilities	Standard Deviation	Minimum	Maximum
\$75.00	\$188.02	11.05	\$159.57	\$230.74
\$100.00	189.31	6.36	172.98	214.00
\$125.00	190.60	1.94	182.08	197.26

SOURCE: Slifkin, R.T., Kilpatrick, K.E., Bollen, K.A., and Johnson, M.C., University of North Carolina at Chapel Hill, 1995.

## DISCUSSION

The results of our study confirm earlier work in New York that showed that the DDP can reasonably predict expected resource consumption for individual residents in ICF-MR facilities. Using only resident characteristics available in the DDP, our model predicts the cost of expected resource use for an individual resident with sufficient precision to explain 25 percent of the variation in cost of expected resource use. The factors contributing to the unexplained variance in the model are still unknown. Although it is likely that some of the unexplained variance results from individual characteristics that are not adequately captured on the DDP, there is also variation that is the result of the style of care in a particular facility. From interviews with providers, we believe that these style-of-care effects may be substantial.

To the extent that a move from historical average costs to a disability-based reimbursement system recognizes that an individual with a certain set of disabilities should receive the same level of care irrespective of facility, the fact that facility-specific differences are left in the residuals as unexplained variation is not a problem. These differences are removed from the calculation of an individual resident's PRU, which prevents a reimbursement system from locking into place what is, rather than what should be. However, more research is needed to control for these facility-specific

differences to determine the extent to which the DDP accurately captures the particular individual resource needs across the array of disabilities seen in the ICF-MR setting.

When moving to a disability-based reimbursement system, States must weight the precision of an instrument such as the DDP against the costs of using the instrument. Although the DDP does not completely account for all resident characteristics that relate to resource use, it is relatively easy and inexpensive to implement. Past research has shown that assessments that are more precise also are more expensive to implement (Klein-Parris, Clermont-Michel, and O'Neill, 1986). If instruments that measure resident disability level are administered by the facilities, the cost will most likely be passed back to the States in some form. Therefore, States must balance the competing goals of precise measurement of disability with reasonable implementation cost when choosing an instrument.

When implementing a reimbursement system that is based on facility-measured disability levels, States must make provisions to ensure consistent responses across facilities by continually monitoring the quality of the data. Such an ongoing validation process is a necessary but possibly costly endeavor. Further research is needed to know whether the added administrative complexity of a resident-based reimbursement system would be justified

by increases in resource-allocation efficiency and improved alignment of provider incentives with the State's goal of equal access to care regardless of degree of individual impairment.

As the demand increases for accountability of State program expenditures, States will be pressed to have in place a measure of ICF-MR residents' progress in achieving higher levels of functioning. Instruments such as the DDP, in addition to being used for reimbursement, can be employed to track resident functioning over time. In fact, monitoring a home's progress on improving DDP scores (i.e., lower scores) could act as a force to counterbalance an incentive to increase DDP scores as a means of gaming the system toward higher reimbursement levels.

One issue of concern when using an instrument such as the DDP for reimbursement is the extent to which actual resident behavior is weighted more heavily than potential behaviors that could occur if appropriate interventions were not provided. Use of this framework may result in adverse incentives: If providers spend more resources on aggressive interventions that keep behaviors under control, the resident's disability level improves, resulting in a lower reimbursement rate. Conversely, lack of appropriate intervention could result in worse behaviors and a higher reimbursement rate. There is a fundamental question behind this issue: To what extent can States ensure that privately owned ICFs-MR provide an appropriate program of active treatment as required by Federal law? Federal regulations require that ICFs-MR provide a treatment program "that is directed towards the acquisition of

the behaviors necessary for the client to function with as much self-determination and independence as possible" (42 CFR 483.440(a)(1)(i)). Although a reimbursement system designed to further that objective demands some measure of an individual's disability level, there is considerable variability among providers as to what is considered appropriate active treatment. In the absence of an industrywide gold standard, determining the actual dollar reimbursement that should be tied to a given disability level will be difficult.

## LIMITATIONS

In this article, we have described a methodology for developing an RBRS. The intent of the article is illustrative rather than prescriptive, and we consider it preliminary in the difficult process of developing a reimbursement system based on individual disability level. It is important to emphasize that the model was developed using a relatively small sample and that the data came from a single State. Although this article informs the process of developing an RBRS, it is unlikely that the actual estimated coefficients reported in this article would be replicated if the model were estimated using a larger sample or with individuals who reside in ICFs-MR in other States. Therefore we would urge that this model be validated on other populations prior to its use.

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