POLICY ANALYSIS SERIES

ISSUES RELATED TO STATE HOSPITALS / NO. 7

THE COST OF MINNESOTA STATE HOSPITALS

I. INTRODUCTION

The legislation mandating the state hospital study and plan requires the Long Term Health Care Commission to "evaluate the comparative costs to the state of institutional and non-institutional care for mentally retarded persons." (Chapter 654, Section 20)

There are four major sections of this paper: (1) review of cost literature in the area of mental retardation, (2) current costs of state hospitals, (3) comparison of community and institutional expenditures from fiscal years 1977 through 1984, and (4) a needs approach to cost estimation.

II. METHODOLOGY

The review of literature was prepared as a summary of studies completed to date in the area of mental retardation.

Information on revenue and expenditures was received from the Department of Human Services and prepared in summary form.

Information on comparison of community and institutional costs was prepared by David Braddock, Institute for the Study of Developmental Disabilities, under a grant from the Administration on Developmental Disabilities, Washington, D.C. More complete detail on this project precedes the results of that section.

The research design on a needs approach to cost was prepared by Sharon Patten under contract with the State Planning Agency.

III. REVIEW OF COST LITERATURE IN THE AREA OF MENTAL RETARDATION

Few comprehensive cost studies have been completed at a national or state level. Of those states which have issued reports, the scope of these studies is often restricted. Although underdeveloped, the existing literature does provide

insight into the design requirements of future cost analysis studies. To provide a cohesive structure for the review of literature in the area of mental retardation, three major categories have been selected: (1) cost studies related to public residential facilities, (2) cost studies of community residential facilities, and (3) cost comparison studies of community and public residential facilities.

A. National and International Public Residential Cost Studies

Providing care for mentally retarded people in institutions is expensive and will become even more costly in the future. Baumeister (1970) estimated that "more money is spent on the five percent of the mentally retarded people who are institutionalized than upon the 95 percent who are not" (p. 22).

Lakin (1979) summarized the average annual per capita expenditures for public residential facilities serving mentally retarded people between 1915 and 1978. Table 1 presents these annual per capita costs in both actual and real dollars (1967). Figure 1 presents the steady decrease in residents to 119,335 in 1982 (Lakin, Krantz, Bruininks, and Hill, 1982).

Considerable variability in state expenditures for operation of institutions was reported by Baumeister (1970). For example, in 1966 five states spent less than $4.00 per day compared with over $10.00 per day spent by five other states. Moreover, per capita expenditures were found to be dependent upon the size of the institution and the type of resident served. Southern states generally expended the least amount of money per resident. Baumeister also noted that small institutions had higher per capita costs than larger facilities.

Scheerenberger conducted mail surveys of public residential facilities under the auspices of the National Association of Superintendents of Public Residential Facilities in 1974, 1976, 1977, 1979, 1981, and 1982. Financial data were collected on both the long and short form questionnaires. The items on the long form included: total operating cost (personnel, other, and depreciation); total new construction or major remodeling; and per diem. The short form asked for total operating cost (personnel and other) and per diem.

According to the trends reported by Scheerenberger (1978a) over one-half billion dollars was spent in maintaining public residential facilities in 1970. During 1976 through 1977 this figure had risen to almost $2.4 billion (p. 21). During the study conducted in 1979, 174 facilities completed the long form questionnaire and 104 facilities used the short form which determined only per diem. Scheerenberger estimated the total

TABLE 1

ANNUAL PER CAPITA COSTS FOR MENTALLY RETARDED RESIDENTS OF PUBLIC INSTITUTIONS, 1915 - 1982

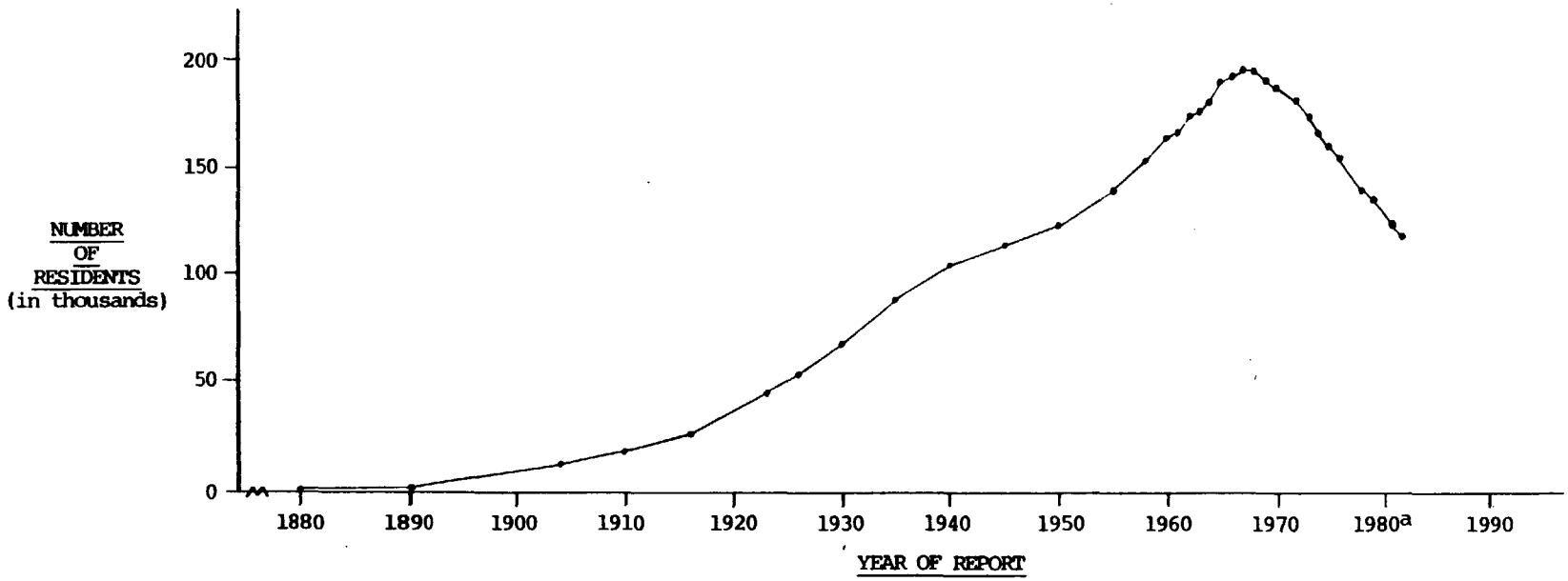
YEAR	ACTUAL COST	ADJUSTED COST FOR INFLATION[a]	YEAR	ACTUAL COST	ADJUSTED COST FOR INFLATION[a]
1915	$ 182.52	$ 600.39	1954	$ 1,204.07	$ 1,495.45
1922	$ 309.81	$ 606.28	1955	$ 1,285.50	$ 1,603.02
1927	$ 304.02	$ 584.65	1956	$ 1,394.34	$ 1,713.23
1928	$ 300.67	$ 586.10	1957	$ 1,507.13	$ 1,787.46
1929	$ 281.10	$ 547.95	1958	$ 1,596.47	$ 1,843.92
1930	$ 265.05	$ 530.10	1959	$ 1,746.92	$ 2,000.22
1931	$ 287.85	$ 631.25	1960	$ 1,867.70	$ 2,104.90
1932	$ 262.57	$ 641.98	1961	$ 1,916.12	$ 2,138.39
1933	$ 238.24	$ 641.02	1962	$ 2,033.96	$ 2,245.49
1934	$ 236.87	$ 590.70	1963	$ 2,130.38	$ 2,324.24
1935	$ 252.22	$ 613.67	1964	$ 2,208.19	$ 2,376.01
1936	$ 259.06	$ 624.24	1965	$ 2,361.08	$ 2,498.02
1937	$ 278.59	$ 647.88	1966	$ 2,619.81	$ 2,695.78
1938	$ 283.43	$ 671.64	1967	$ 2,965.33	$ 2,695.33
1939	$ 238.05	$ 692.43	1968	$ 3,471.99	$ 3,332.04
1940	$ 291.13	$ 693.17	1969	$ 3,965.33	$ 3,695.33
1941	$ 287.98	$ 653.02	1970	$ 4,634.85	$ 3,985.25
1942	$ 315.29	$ 646.09	1971	$ 3,982.15	--
1943	$ 347.48	$ 670.81	1972	--	--
1944	$ 365.20	$ 692.98	1973	--	--
1945	$ 386.11	$ 716.35	1974	$ 9,937.50	$ 6,728.17
1946	$ 433.79	$ 741.52	1975	$ 8,916.95	--
1947	$ 527.91	$ 789.10	1976	$13,052.30	$ 7,655.31
1948	$ 631.38	$ 875.92	1977	$16,143.95	--
1949	$ 697.72	$ 977.51	1978	$18,286.65	$ 9,377.77
1950	$ 745.60	$ 1,034.15	1979	$22,301.50	--
1951	$ 807.11	$ 1,037.14	1981	$28,466.35	--
1952	$ 1,112.50	$ 1,399.52	1982	$31,470.30	--
1953	$ 1,186.83	$ 1,481.16			

Source: Lakin, 1979.

[a]Adjusted cost for inflation using 1967 dollars.

FIGURE 1

TOTAL POPULATIONS OF MENTALLY RETARDED PEOPLE
IN PUBLIC INSTITUTIONS, 1880 - 1982



Source: Lakin, Krantz, Bruininks, & Hill, 1982.

[a]No 1980 data available at this time.

operational budgets were $3,033,907,945 excluding capital construction and renovation costs. The mean per diem was $60.10 for fiscal year 1978-1979 compared with the mean per diem of $44.23 for fiscal year 1976-1977 and $10.91 for fiscal year 1969-1970. During the past decade the per diem rate accelerated 451 percent in public residential facilities. Scheerenberger did not report adjusted costs to account for inflation.

In fiscal year 1981, 282 public residential facilities serving 125,799 residents reported a total budget of $3.58 billion excluding new construction or major remodeling. Of that amount, 82 percent was spent on salaries. In spite of a decline in average daily population the $3.5 billion budget represented a 79 percent increase over fiscal year 1976 figures.

In 1982, 279 public residential facilities serving 119,335 residents completed the national survey. The total operational budget was $3.78 billion, a 5 percent increase over fiscal year 1981. The range of per diems was $37.07 to $225.20 with the average per diem of $86.82, a 24 percent increase over fiscal year 1981.

During the 1977-1978 fiscal year, Krantz, Bruininks, and Clumpner (1978) gathered per diem information for public residential facilities by surveying state government officials. The range of per diems varied from a low of $22.00 (est.) to a high of $116.05. The Southern states continued to provide lower per capita expenditures than other geographic regions. The national average per day per person cost was reported as $50.10 (p. 25). Follow-up surveys were conducted in fiscal years 1980, 1981, and 1982. The mean per diems were $83.96 in 1981, and $89.75 in 1982.

Internationally, there have been two studies completed on the costs of institutions for mentally retarded people in Scotland and Israel. Primrose (1972) assessed the differential costs of institutional care for different groups of residents in a 1,325 bed facility in Scotland. The purpose of the study was to illustrate the variation in cost which exists behind an "average per diem" figure. After classifying the patients by age and level of independence, per week cost-of-care figures were calculated for each group. The lowest cost was reported for adult males who worked off the grounds and lived in hostel arrangements on campus. The highest per week cost occurred for patients in the Admissions and Assessment Hospital Unit. The next most expensive cost of care was provided to people in the geriatric unit. The author concluded:

> Before valid comparisons of cost can be made, like must be compared with like; crude averages have little

> meaning unless details of what is included are known (p. 626).

Don and Amir (1969) investigated the differences in cost between Israeli facilities operated by the government compared with large private facilities. Ten residential institutions constituted the sample (4 government operated, 2 public, and 4 private facilities). The cost of maintenance varied from $89.43 to $99.14 per month with higher costs paid in institutions providing care to more severely retarded residents. Government institutions tended to have higher staff-resident ratios, higher wage rates, but lower food costs. Expenditures on maintenance and repair varied with internal standards of care and budget flexibility rather than the physical condition of buildings or the space to resident ratio. No significant differences were found in expenditures due to heterogeneity of resident characteristics (sex, age, level of retardation).

The size of institutions did vary with costs but in a curvilinear fashion. In government institutions, the average cost diminished up to 70 to 80 beds, then increased upward to 200 beds, then declined after 200 beds. Partial control for differences in characteristics of the population occurred in the selection of facilities by matching levels of resident functioning.

Ownership of facilities was also found to influence expenditures among the three types of facilities. Costs tended to be higher in government operated facilities because of "bureaucratic procedures and decision making, regulations by the Civil Service Commission, strength of the union, and discouragement of thrift" (p. 38). While costs varied by the type of ownership, the level and quality of services did not. Don and Amir (1969) reported after careful personal observation that "the provision of services increased with the size of institutions, but the difference in quality of services tended to be small" (p. 39).

B. Community Residential Facility Cost Studies

Few significant studies have been undertaken in the area of community residential facility costs. Heal, Sigelman, and Switzky (1978) offered a detailed review of cost findings and reported that because of the poor quality of data O'Connor (1976) eliminated cost analyses from her reports.

Several methodological problems hampered collection of cost information in the O'Connor study. First, no comprehensive system of accounting had been developed in group homes so that

comparable fiscal information could be gathered. O'Connor attempted to gather cost data through a personal interview format. This approach failed because local accounting systems were not sophisticated enough to handle the questions; the interviewers and respondents were not accounting-oriented; and the interviewee was not often the most informed respondent about the financial aspects of the facility. To accommodate for these onsite problems, estimates were accepted during the interview and in other cases, local budget records were submitted and analyzed after the completed interview to assist in providing complete data on the protocols.

As previously mentioned, O'Connor made no statements about the costs of community residential care because of incomplete data. In replacement for the results, several excellent recommendations were presented to urge improved accounting procedures at the local level as well as the publication of an accounting manual (Sipe, 1976).

In 1973, Baker, Seltzer, and Seltzer collected annual budget figures from 196 community residences. The average annual budget for community facilities in 1973 was $56,000 or $4,680 per resident (1977, p. 205). In reporting the results, Baker et al. presented annual per capita expenditures by prototypic models or types of residential programs. The models were defined by size, type of resident served, or specialized services. Small group homes serving 6 to 10 residents reported a per capita budget of $5,690 which was almost twice as expensive as a large group home (21 to 40 residents) with an annual expenditure of $3,380. During that same year, the per diem in public residential facilities was $24.42 or $8,917 per year per resident (Baker et al., 1977).

Heal et al. (1978) cautioned that comparisons of per diem figures between public and community residential facilities proposed by Baker et al. (1977) were dangerous. Public residential facilities do not include capital costs of land and buildings in the per diem figures. The cost of rent, on the other hand, was included in the cost estimates provided by community residential facility administrators. Program and service costs, however, were included in the public residential facility per diem, but were excluded from the community residential facility per diem.

Disparity in public and community residential facility data emerges from two other sources: (1) differences in the characteristics of the population served, and (2) the effect of population decline within public residential facilities on fixed costs. In recent national surveys of community and public residential facilities (Bruininks, Hauber, & Kudla, 1980; Scheerenberger, 1978a), the population served in public residential facilities was primarily residents with severe or profound levels of mental retardation (75 percent). This figure contrasts with 32 percent of the

population in community residential facilities with the same classification. The degree of dependence of residents significantly contributes to the differences of cost. The second problem relates to the rapid decline in number of residents in public residential facilities. This flux of numbers causes an acceleration of fixed costs that cannot be reduced quickly. Certain fixed costs such as administrative overhead and maintenance of buildings cannot fluctuate with changes in resident attendance. Thus, as the population declines, the volume of resident days decreases which drives up unit costs. Nihira (1979) has identified other hidden costs such as state administrative support, depreciation, interest, and differences arising from multiple institutional programs on one campus.

Peat, Marwick, Mitchell & Co. (1976) was commissioned by the Illinois Developmental Disabilities Advisory Council to estimate the cost of designing and operating ten various residential service arrangements. The costs included start-up financing, operating expenses, and the capital financial requirements for establishing normalized residential service facilities.

One of the most important assumptions of this report was that community residential facilities typically underpay professional and paraprofessional staff. If competitive rates of pay similar to public residential facilities were paid by community residential facilities, the average daily cost was estimated to be in the range of $26.08 to $41.98. This per diem range included capital costs and was comparable to the range of per diems in public residential facilities at the time of the report in 1976.

Peat, Marwick, Mitchell & Co. also found that there was a generally predictable relationship in human service organizations between personnel and other direct operating costs. The relationship varied depending upon the size of facilities and composition of services, but generally, over a long time period with a large number of providers, the salary mix of staff personnel in each arrangement tended toward the overall mean salary for each position. If salaries showed wide variability, it was a result of educational qualifications, experience, or the supply and demand of the local labor market for qualified personnel.

On a smaller scale, the Department of Mental Health in Indiana (1975) produced a progress report on ten community residential facilities at the request of the Indiana Legislative Council. Lower costs were associated with offering the least services and the highest functioning residents. Differences within apartment units depended on resident characteristics such as functioning level and independent living skills. Differences within larger group homes were affected by rent or mortgage payments with lower rates reflecting gratis or donated buildings and furnishings.

Those facilities which served younger, severely handicapped children experienced higher costs. Personnel expenses consumed the largest share of the budgets ranging in proportion from 32 to 73 percent of total operating costs. The average cost of personnel for all ten agencies totaled 53.2 percent of the budgets.

Heal and Daniels (1978) completed a cost-effectiveness analysis of three community alternatives (natural homes, supervised apartments, and group homes) in three counties in northern Wisconsin. Personal interviews were conducted with a representative sample of 29 developmentally disabled individuals and their residential supervisors to collect data about the individuals and the facility. The major purpose of the study was to identify and measure five major dimensions: (1) competence, (2) social adjustment, (3) normalized life style, (4) satisfaction and (5) economy. There were two sources of costs: those borne by the individual resident and those paid by society. Apartments were found to have the lowest society cost, the highest individual contribution, and the highest approximation to a normalized life style. On the other hand, the group homes were more expensive for society and were less normalized than apartments. Natural homes were found to be at intermediate levels between these two types of residences. Table 2 presents the results of this study.

TABLE 2

MEANS, STANDARD DEVIATIONS, AND NUMBER OF CASES
FOR THREE RESIDENTIAL ALTERNATIVES

RESIDENTIAL ALTERNATIVE	INDIVIDUAL COST		SOCIETY COSTS		TOTAL COST
	Mean	Standard Deviation	Mean	Standard Deviation	Mean
Group Home (n = 16)	$1,564.25	399.65	$5,361.00	112.53	$6,925.25
Natural Home (n = 9)	$1,423.22	1,417.45	$4,576.33	1,751.94	$5,999.55
Apartment (n = 4)	$3,645.00	1,617.92	$1,833.75	1,174.05	$5,478.75

Source: Heal and Daniels, 1978, p. 3a.

As noted earlier in this section, O'Connor was unable to publish cost data from the interview study of 105 facilities conducted in 1973. Based on that experience, O'Connor and Morris (1978) designed a study with specific emphasis on a specially designed accounting system that would record accurate cost information for a 12 to 18 month period. The second purpose of the study was to analyze costs by facility and resident characteristics (facility location, administrative structure, size of facility, and age of residents).

Of the 200 community residential facilities in HHS Regions IX and X, 50 facilities volunteered to participate. No selection was made although certain strata were identified such as profit/non-profit ownership, size, age of residents and location. A four-month pilot study was conducted with eight facilities to test the accounting system. Following minor changes in the forms, four workshops were conducted throughout those regions to give training to 50 facility administrators. Follow-up workshops were conducted two months later. The final sample size was 29 facilities located in four states: Washington: (n = 8), Oregon (n = 10), California (n = 18), and Arizona (n = 11). Of the 29 facilities, 9 were proprietary, and 20 were nonprofit organizations. The average size was 24 residents, and the average age of the residents was 25 years.

The results were reported as average monthly expenses per resident by type of operating costs. Relationships were analyzed by correlation, one-way analysis of variance tests and stepwise multiple regression. Table 3 presents the mean costs per month per resident by type of operating cost and capital cost. The per diem was $12.80 per person for operating costs and $2.27 per person for capital costs.

TABLE 3

SUMMARY OF GENERIC OPERATING COSTS AND CAPITAL COSTS BY RESIDENT PER MONTH

TYPE OF COST	MEAN	STANDARD DEVIATION
Staff	$262	195
Food	47	13
Utilities	19	11
Insurance	4	4
Repair and Maintenance	10	7
Taxes, Licenses, and Fees	4	4
Supplies	13	11
Vehicles	14	11
Miscellaneous	11	15
TOTAL OPERATING COSTS	$384	226
TOTAL CAPITAL COSTS	$ 68	46

Source: O'Connor and Morris, 1978, p. 28.

Ten variables were selected and one-way analyses of variance were completed with four dependent variables--staff costs, total operating costs, capital costs, and total costs. According to O'Connor and Morris:

> Five variables were significantly related to all four costs including state, region, degree of programming, staff to resident ratio, and age of residents. A sixth variable, profit orientation was related to all but the capital costs. Two variables, type of dwelling and size of facility, were significantly related only to capital costs (p. 44).

The only variables that were not related to costs of CRFs were facility isolation and resident IQ.

The final level of analysis was a stepwise multiple regression to ascertain the predictive combinations of variables. Results indicated:

> There were probably three underlying factors in the data. The first factor which was related to both operating costs and total costs, was a combination of staff to resident ratio, degree of programming, and age of residents. The second factor which was related to all three costs, was the type of dwelling. The third factor appears to be the state in which the facility was located. (p. 58).

In discussing the results, O'Connor and Morris cited staff to resident ratio as a major factor contributing to personnel costs and in turn, expenses consuming the majority of community residential facility budgets. The level of programming is related to both staff to resident ratio and personnel expenses. Nonprofit facilities tended to have higher staff to resident ratios and levels of programming. Size was related to capital costs with the larger facilities reporting higher capital costs.

Gross (1978) analyzed existing cost data from community residential studies in Massachusetts and Virginia using five different cost reporting methods. This study was the first attempt to describe and categorize cost reporting techniques applicable to social welfare literature.

Cost reports can vary in response to three basic questions:

1. Cost to whom?
    a. resident
    b. families
    c. service agency
    d. federal government
    e. society

2. What is the object of the cost study?
    a. individual
    b. agency
    c. government level

3. What is the method of determining costs?

   a. Reimbursable cost reporting coined by Gross to mean determination of the level of cost sharing by a specific government unit. After total cost is determined for the program under study, all other contributions are subtracted from this amount leaving the reimbursement level of the specific government unit. Mayeda and Wai (1975) attempted to report the share of financial participation as money flowed from the federal government down. This method has not been fully developed.

   b. Average per person cost reporting, according to Gross, is widely accepted because readers can readily grasp the meaning of the measure. The problem with this approach is the inherent weakness in averaging across all individuals. The objective of this type of analysis is to determine the total costs of a program to the government and the total number of people served.

   c. Functional cost reporting is an accepted term in the literature that means an internal method that separates costs into direct program costs (variable costs) and support service costs (fixed costs). Beatrice (1974) divided residential costs of Massachusetts into these two categories in order to project the effect of rapid deinstitutionalization (volume change) on cost over time.

   d. Unit cost reporting is also found in the literature and means calculation of the cost one for unit of service by dividing the total costs for a service by the total number of service units. The difficulties of this approach have been thoroughly expounded by Bowers and Bowers (1976) and include: (a) lack of service objectives, (b) poor service definitions, (c) no common language of services, (d) poor unit definitions, (e) lack of data, (f) no public pricing of services, (g) the unique nature and composition of human services, (h) lack of project continuity in experimental efforts, (i) the apprehension of workers that units of service will be linked to nature and composition of human services, (h) lack of project continuity in experimental efforts, (i) the apprehension of workers that units of service will be linked to worker efficiency, (j) lack of system designers who understand the whole of the unit of service system, (k) a lack of support systems in place, and (l) a lack of information use by management (pp. 11-28).

e. Needs approach of cost reporting is a recent development which has no theories and no studies to support its use. The method begins with a diagnostic procedure of individual resident needs followed by a prescription of services to meet those needs including timeline and the appropriate number of units of service. Costs are then calculated for the prescription according to the type of provider. Anderson, Greenberg, Patten, and Fine (1976) have selected 200 elderly residents in nursing homes and matched them with 200 elderly people who live in their own homes.

After reviewing the contradictory results of four cost studies on residential services (Rathbone-McCuan et al., 1975; Jones & Jones, 1976; Mayeda & Wai, 1975; Beatrice, 1974), Gross argued that the inconclusive findings may be a result of differences in cost reporting methods. By applying the five cost reporting methods to two sets of data from the Commonwealth of Virginia alternative living environments for the elderly and the Commonwealth of Massachusetts alternative living environments for mentally retarded people, Gross found that outcome varied with type of approach used.

Of the five methods, Gross (1978) found:

> There is no one way to calculate costs for such analysis...without full knowledge of the methodological and behavioral implications of each cost reporting approach, they are all potentially susceptible to misuse (p. 38).

The Minnesota Developmental Disabilities Council/Program of the State Planning Agency (1981, 1983a, 1983b) has completed studies of ICF-MR per diems for 1979, 1980 and 1981. The primary purpose of these studies was to identify the critical factors (separately and in combination) which produce variations in per diem costs in community ICF-MRs. The population frame included 185 facilities in 1979, 230 facilities in 1980, and 261 facilities in 1981. There were statistically significant differences in per diems based on geographic location (urban facilities were more expensive), size (6 or fewer and 17 or more have higher per diems), staff-resident ratios (lower ratios had lower costs), licensure (Class B more expensive), age of residents (children are more expensive), level of retardation (more severely handicapped are more expensive), self care skills (more dependent persons are more expensive).

C. Comparison Cost Studies of Public and Community Residential Facilities

One of the most carefully designed studies of comparison between community and public facilities was conducted by Mayeda and Wai (1975). The model they employed aggregated costs over six direct variables and one indirect cost variable including: (1) room and board, (2) attendant services, (3) special programs, (4) special professional services, (5) educational programs, (6) support services, and (7) general and administrative costs. By analyzing budgets of state hospitals and regional centers in California, Florida, and Washington for a six-month period in 1974 and 1975, Mayeda and Wai were able to trace and record the total costs for services provided to 4,284 community and institutional residents.

In addition to the collection of cost data, a performance measure of resident adaptive behavior was taken with one of three scales: the Adaptive Behavior Scale, the Washington Assessment and Training Scale, and the Florida Client Assessment Instrument. Mayeda and Wai planned to link individual progress with expenditures as a means of approximating cost-benefit relationships. The last objective of this study was to study the "input/output funding flow structure in two community-based systems" (p. 2).

The cost data of the Inland Counties Regional Center in California were analyzed in combination with the input/output studies and the assessment data of individual clients. Although this Center is responsible for purchase or provision of services to developmentally disabled clients, there was "an expenditure bias toward children living at home with natural parents" and evidence to indicate that "many clients were not being provided with certain professional services" (p. 4). The first conclusion of this study was:

> The cost of services to developmentally disabled persons in state hospitals does not differ significantly from the adjusted true costs of services in community settings provided both groups are provided with a full array of needed services (p. 4).

During the six-month period of this study, the mean cost of services to residents in state hospitals was $6,247 compared with $638 for clients in the community. When the additional costs of educational programs, special professional services, and generic services were added, the true cost of services in community settings approached the cost

of care in state hospitals. The original difference between the two settings ($6,247 and $638) was explained as a function of utilization patterns since none of the 463 clients served through the Inland Counties Regional Center received dental, psychological, speech, audiology, occupational therapy, physical therapy, or any other special professional services during that six-month study period. The authors concluded:

> The service utilization patterns in community settings are lower than utilization patterns of services in state hospitals due partially to the weaknesses of the coordinating interface in community settings and differences in repayment criteria and policies (p. 5).

It should be mentioned that not all clients needed these professional services, while in some instances those who did need services received them in community residential or day programs rather than the Inland Counties Regional Center. Mayeda and Wai redefined the difference between state hospitals and community programs as a difference in organizational administrative structures. A state hospital was a unified service system administered by a single person or unit and was demand-dominated whereas community programs were multiply administered and supply dominated.

Developmentally disabled individuals who lived at home with their parents cost society less than placement in group homes and significantly less than placement in state hospitals. The Inland Counties Regional Center reported providing liberal services to parents to help maintain children in homes. This finding led to the third conclusion by Mayeda and Wai:

> The major actual cost savings for services to developmentally disabled persons who actively require nurturance and assistance are rooted in the natural home environment. The cost of liberal home support and special professional services to those living at home will not deplete these savings (p. 8).

Jones and Jones (1976) collected budget information on 13 community residential facilities in Massachusetts as part of a larger study of community placement of discharged residents. Cost savings did accrue when residents were placed in the community, particularly to the state since the financial burden was shifted to federal, local, and private sources of funding.

Cost data were collected on a small sample of 24 residents which was considered representative of the larger population. Between January 1, 1972 and June 30, 1973 individual records were kept in terms of Supplemental Security Income, costs to the Massachusetts Department of Mental Health, in-kind services provided, and

resources coming from private agencies for the sample. A comparison was made with institutional costs if the sample residents had not been released. Jones and Jones found:

> The average cost in the institution is $7,464 versus $6,112 in community residences. However, when the costs of rehabilitative programs and federal input are added, the difference narrows markedly (p. 87).

Jones and Jones also examined some of the same issues addressed by Mayeda and Wai. They questioned whether cost comparison of services provided in state hospitals and community settings could be made without controlling for the needs of residents and the actual services delivered to residents. In terms of differences in service utilization patterns between unified systems such as state hospitals and coordinated systems such as community programs, Jones and Jones proposed that other factors beside administrative variables should be examined. Utilization may be in response to need, awareness of need, availability of subsidization, and any combination of these factors. Based upon observation and personal judgment, the authors concluded:

> The institution, as a treatment site for the developmentally disabled, does not come out as very desirable on either a cost or an effectiveness criterion and certainly not on an effectiveness to cost ratio (p. 18).

In the Commonwealth of Virginia, Murphy and Datel (1976) undertook a cost-benefit analysis to project costs and benefits over a ten-year period for 52 clients transferred from institutions to community settings. Clients were stratified by housing, employability, and source of income. Costs were entered for community support services, client maintenance, service integration, deinstitutionalization, and lost economic productivity. Benefit elements included savings of institutional costs and increased economic productivity. The ratios of benefits to costs for all but one strata ranged from 1.52 to 11.86. The only stratum for which costs exceeded benefits were those clients who needed intensive care, were not employable, and received at least half of their income from public sources. In this stratum, the average net cost per client for the 10-year period was $395.93. The average net benefits per client ranged from $2,500 over 10 years for residents in nursing homes to $29,000 over 10 years for clients who are employable full-time. The authors noted that savings in deinstitutionalization benefit state sources. On the societal cost side, federal sources carry much of the load in maintaining deinstitutionalized residents.

More recently, Intagliata, Willer, and Cooley (1979) completed a cost comparison study of institutional and community based

alternatives for mentally retarded people in New York. The purpose of this study was to analyze and compare costs for residential care separate from professional services in both public and community settings. The sample consisted of a public residential facility (1,400 residents); a hospital based rehabilitation unit for children; a county Association for Retarded Citizens agency providing residential services, school services, and sheltered workshop services; and a Board of Cooperative Education Services Center providing special education services.

Several problems were encountered with the quality of cost data. First, there were no consistent standard units of service defined or applied in the cost records of the sample. Second, budgets were prepared according to conventional line items rather than functional lines using services as cost centers. Last, there was little or no cross referencing of cost data with resident characteristics. For example, 76 percent of the public residential facility population were severely retarded, but the facility could not determine how many of those residents received a particular service such as physical therapy and at what cost. This last limitation was projected by the authors to have even greater importance in the future since "subpopulation analyses will become increasingly relevant as the population of individuals being released from institutions becomes more diverse" (p. 12).

Given these limitations, Intagliata et al. (1979) found that the annual per capita costs of natural family ($2,108) and family care ($3,130) settings were significantly less expensive than the institution ($14,630). However, the annual per capita cost of residential care provided by group homes ($9,255 to $11,000) was significantly greater than that of other community settings examined, and in fact, depending upon resident level of disability, approached the cost level of the public residential facilities.

In response to a need for nationwide data on capital outlays for public and community residential facilities, the President's Committee on Mental Retardation commissioned the National Association of State Mental Retardation Program Directors, Inc. (NASMRPD) to conduct a state-by-state survey in 1978-1979. The major purpose of this study was to determine:

> To what extent are the states, the traditional providers of residential services to mentally retarded citizens, using capital construction dollars to reconstruct and expand existing public institutions, as opposed to enhancing the development of community residential programs. In other words, are we seeing the recent trend toward community based residential facilities undermined by widespread efforts to rebuild existing institutions. (p. 2).

The staff at NASMRPD completed the survey in three phases between December, 1978 and July, 1979. The first phase consisted of phone interviews to each state to determine the best respondent who could handle questions related to capital budgeting. Copies of state capital budget plans were solicited from all states and received from 39 respondents. In February 1979, the second phase of the study began with analysis of budget materials sent by states. This analysis led to the drafting of a pilot interview form. The questionnaire was finalized and sent in advance of the phone interview. During the third phase, phone interviews were conducted between March and July 1979. Verification of answers occurred by mail follow-up.

Because of varying definitions, approaches to budgeting and time frames employed by individual states, comparisons of capital improvement projects on a state-by-state basis were very difficult to complete. At a national level, capital outlays were reported for fiscal year 1977-1978, fiscal year 1978-1979, and fiscal year 1979-1980. The actual and projected state appropriations for capital projects totaled $1 billion for this three--year period. Five states (California, Michigan, New Jersey, New York, and Ohio) accounted for 52 percent of the total outlays during that period.

The predominant type of project funded was construction or renovation projects on the grounds of state-operated residential facilities which accounted for 82.7 percent of the appropriations. In 33 of 50 states, the entire capital improvement budget was earmarked for state institution renovation projects. The primary reason cited by respondents for capital improvements in state institutions was the need to comply with federal Intermediate Care Facility/Mental Retardation (ICF-MR) standards. Failure to comply with ICF-MR standards would cost $758.8 million in federal money, according to 35 state respondents.

No states reported plans to build new public residential facilities or to increase total bed capacity of public residential facilities. States did plan, however, to construct community day program buildings (8) and community residential facilities (13).

The per capita outlays for public residential facility renovations (based on relative number of residences in PRFs) ranged from a high of $24,205 in Washington to a low of $404 in Rhode Island. The national median was $5,460.

Touche Ross & Company (1980) conducted a study in Nebraska which compared Beatrice State Developmental Center to the community based mental retardation regional programs. The study identified costs for residential care, day programs, support services, social services, medical care, and administrative overhead. In

addition, costs for services not provided by the facilities were included such as generic services, public education, and Medicaid. For fiscal year 1979 the cost for community facilities in six regions ranged from $9,400-$19,700. Four regions reported costs at less than $15,000. Beatrice annual cost was $19,500. Cost was directly related to the number of hours of direct care services. High overhead costs raised the cost of Beatrice.

Templeman, Gage and Fredericks (1982) described the cost effectiveness of a group home as interim living arrangements prior to return to natural or foster families. The home served 21 children (ages 7-17) and had higher initial costs ($1,355 @ month) than an institution ($1,200 @ month). Over a five year period, however, the cost of group home services and follow-up family placement was 57% less costly than if the children had remained in state institutions.

Bensberg and Smith (1983) compared cost information from Texas group homes (n=17) and public institutions (n=12). The researchers had difficulty in making comparisons because the line items were not equivalent. The community facility per diems were equal to or in some cases greater than the public facilities because of ICF-MR requirements that community facilities must meet. Among the 17 group homes, higher per diems were associated with the level of support services and low occupancy rates.

Wieck and Bruininks (1980) completed a national study of public and community residential costs in terms of descriptive totals and several organizational variables. They examined per diem costs as a function of location (geographic region, metropolitan location), size, staff turnover, staff-resident ratio, staff/service index, occupancy rate, ownership, membership in a chain, number of years in operation, resident age, and resident level of retardation. Public residential per diem costs were found to vary by region, and inversely with the number of years on operation. Community facility per diems were found to vary positively with the size of the chains of which they are part. Both public residential facility per diems and community residential per diems were found to correlate positively with staff/patient ratios and with an index of staffing/services, and negatively with occupancy rate and with resident age. Family owned and operated facilities were consistently small operations which offered domiciliary care only and reported significantly lower per diems. Lower per diems were also related to two resident characteristics. Adults were significantly less expensive to serve than children, while individuals who were mildly or moderately retarded were also less expensive to serve than more severely handicapped people. Finally, facilities that reported lower turnover had higher per diems, which suggests that these facilities offer higher salaries for personnel.

Wieck and Bruininks concluded that cost effectiveness analysis between public and community residential facilities seems futile as the characteristics of each group tend to polarize. Public facilities tend to have different purposes, serve a more dependent population, offer broader and more medically related services, and have greater capital investments in land, buildings, and furnishings. In contrast, community residential facilities usually represent only one portion of the total cost of services with day programming, transportation, and medical services constituting separate costs. To make the two types of settings equivalent for purposes of comparing costs is virtually impossible.

However, if the current movement of residents from public institutions continues, there will have to be a reallocation of funds to community based alternatives. The overall implication of these findings is that the transfer of severely or profoundly mentally retarded people to community-based settings requires the necessary level of funding to provide the required level of staffing and services necessary to meet individual needs. While community facilities may not be as expensive as public residential facilities, it is equally true that up to this time, community facilities have not served the same clientele nor provided the same level of services.

Ashbaugh and Allard (1984) completed one of the most comprehensive cost studies in Pennsylvania that focused on the Pennhurst Mental Retardation Center and the five county catchment area surrounding Pennhurst. Both residential and day program costs were comparatively analyzed in terms of cost per client day and cost per hour of direct care staff time.

In fiscal year 1982 (July 1, 1981-June 30, 1982) the Pennhurst Center unit costs ($99.74-$208.94) were higher than comparable community residential programs ($19.64-$252.60). There are four major reasons to account for these differences: (1) relative prices paid for resources; (2) level of resources employed; (3) mix of resources employed; and (4) client variables.

The Pennhurst Center (state institution) staff are paid more and receive more fringe benefits than community staff. If the state salaries and fringes were reduced to the community level, the per diem would drop $23.77.

The second reason for differences in unit cost is attributable to the differences in hours of direct staff time. The community program staff spent more hours of direct staff time per client than Pennhurst staff.

The mix of resources employed refers to organizational structure. At Pennhurst, there is a greater division of labor,

more layers of management, more specialists, and more medically oriented staff. In community programs, residential staff are expected to perform a wide range of jobs such as supervision, training, fund management, food preparation, cleaning, laundry, and administering medications.

The sample of residential and day programs in this study were classified to control for several client variables such as age, adaptive behavior, and medical need. Statistical differences among community programs were related to maladaptive behavior scores, adaptive behavior scores, and medical needs.

Ashbaugh and Allard raised several policy implications:

1. There are some "out-of-pocket" savings inherent with smaller community-based programs because of use of generic services.

2. There may be no economic advantage to larger organizations. Smaller, community programs have staff performing several jobs at a lower salary level.

3. Employees of state institutions command higher salaries/ benefits than their counterparts:

    a. Will the community sector unionize?

    b. Should policy makers continue to rely on low paid, transient work force in the community or expect higher salaries as more severely handicapped people move to the community?

4. Community programs are better sold on the basis that you "get more direct staff time for your money" rather than arguing simply that "they are cheaper" than institutional programs.

5. Within each system (state/community) there is a wide range of costs. Pennhurst range was $99.74 to $208.94 and in the community, $19.64 to $252.66. Some community programs can be more expensive than some institutional programs.

6. Four client variables--adaptive behavior, maladaptive behavior, age, and medical need--explained 21.6% of variation in program per diem. Should program models be prescriptive rather than descriptive?

7. Future questions:

   a. What is the projected growth of the developmentally disabled population, and what are the costs and budget implications of this growth?

   b. What are the long-term costs of closing a state institution?

   c. What are the costs/benefits of shifting Title XIX funds from the institution to the community?

IV. CURRENT COSTS OF STATE HOSPITALS

The amount and use of financial resources for state hospitals can be analyzed in terms of operating expenditure by the hospitals, gross and net cost to state government, and unit costs. Cost is the amount of money or "money's worth" that is exchanged for services and property. Operating expenditure is an accounting term used for the cost of goods and services to carry on state hospital programs during a specified period of time, e.g., a fiscal year. Unit cost is the total cost for a service divided by the total number of service units.

A. Operating Expenditure

Minnesota State Hospital operating expenditures during Fiscal Year 1984 are presented in Table 4. Expenditure reported by hospital indicates the relative size of hospital operations; reporting by object of expenditure indicates the use of financial resources. Total expenditures by hospital and by object were divided by the number of patients/residents in average daily population in all programs to give a per capita operating expenditure.

Total operating expenditure ranged from $11,875,263 at Anoka State Hospital to a high of $29,115,435 at Faribault State Hospital with a total operating expenditure of $149,498,251 for the entire system during Fiscal Year '84. Staff salaries which include employee benefits, represented the largest object classification at $128,433,135 (85.9%) of total operating expenditure. The second largest object classification was fuel at $3,973,204 (2.7%) followed by food at $3,576,272 (2.4%). While per capita operating expenditure by hospital is of interest, it is not a valid measure of comparative efficiency because of differences in composition of patient/resident population, staff seniority, and other factors among the eight state hospitals.

TABLE 4

ANALYSIS OF STATE HOSPITAL OPERATING EXPENDITURES
DURING FISCAL YEAR 1984

	STATE							
	ANOKA[a]		BRAINERD		CAMBRIDGE		FARIBAULT	
OPERATING EXPENDITURE	Cost/ Number	Per-cent	Cost/ Number	Per-cent	Cost/ Number	Per-cent	Cost/ Number	Per-cent
Staff Salary:[c]								
• Mentally Ill	$ 4,208,224	--	$ 991,981	--	--	--	--	--
• Mentally Retarded	--	--	9,734,716	--	$12,061,859	--	$18,901,981	--
• Chemically Dependent	930,700	--	641,996	--	--	--	--	--
• General Services	4,670,371	--	4,434,429	--	4,862,308	--	5,283,838	--
• Regional Laundry	--	--	563,117	--	461,180	--	807,413	--
TOTAL STAFF SALARY	$ 9,809,295	82.6%	$16,366,239	86.0%	$17,385,347	86.6%	$24,993,232	85.8%
Food	275,671	2.4	399,465	2.0	425,149	2.1	635,593	2.3
Fuel	329,152	2.8	594,244	3.1	430,630	2.2	956,787	3.3
Utilities	160,021	1.3	261,334	1.4	257,851	1.3	256,006	0.9
Drugs	188,649	1.6	137,940	0.7	226,968	1.1	257,271	0.9
Repair/Replacement[d]	156,584	1.3	139,765	0.7	102,830	0.5	304,835	1.0
Special Equipment	33,453	0.3	37,943	0.2	30,063	0.1	71,566	0.2
Regional Laundry Supplies and Special Equipment	--	--	28,824	0.2	26,019	0.1	42,016	0.2
Consultants	404,419	3.4	132,810	0.7	129,528	0.7	143,220	0.5
Patient Pay	136,739	1.1	128,984	0.7	36,718	0.2	85,024	0.3
Student Workers	6,977	0.1	71,080	0.4	--	--	128,999	0.4
Unemployment Compensation	14,101	0.1	38,810	0.2	7,000	0.0	58,310	0.2
Workers' Compensation	141,207	1.2	400,519	2.1	705,650	3.5	717,991	2.5
All Other[e]	218,895	1.8	300,850	1.6	320,355	1.6	434,585	1.5
Rochester Adjustment[f]								
TOTAL OPERATING EXPENDITURE	$11,875,263	100.0%	$19,038,807	100.0%	$20,084,108	100.0%	$29,115,435	100.0%
Average Number of Residents/Patients	316		450		483		709	
Operating Expenditure per Capita	$ 37,580		$ 42,308		$ 41,582		$ 41,065	
Central Office Special Project								
TOTAL OPERATING EXPENDITURE (DISBURSEMENTS)								

SOURCE: Institutions Fiscal Management, Department of Human Services.

[a]Anoka State Hospital operating costs are overstated by $357,210 because of 11 positions that provide services systemwide.

[b]Includes Security Hospital.

[c]Includes employee benefits. Brainerd State Hospital MR salaries include Minnesota Learning Center. General Services include all activities other than direct care.

HOSPITAL										
FERGUS FALLS		MOOSE LAKE		ST. PETER[b]		WILLMAR		TOTAL		TOTAL OPERATING EXPENDITURE PER CAPITA
Cost/ Number	Percent	Cost/ Number	Percent	Cost/ Number	Percent	Cost/ Number	Percent	Cost/ Number	Percent	
$ 2,200,722	—	$ 2,905,017	—	$ 8,597,031	—	$ 5,058,762	—	$ 23,961,738	—	—
6,764,203	—	3,203,212	—	4,916,574	—	4,916,574	—	59,607,208	—	—
2,343,674	—	2,350,885	—	712,024	—	1,258,322	—	8,247,601	—	—
3,647,714	—	3,238,912	—	3,696,847	—	4,590,344	—	34,424,763	—	—
—	—	—	—	126,032	—	234,083	—	2,191,825	—	—
$14,966,314	87.5%	$11,698,026	85.4%	$18,048,508	85.9%	$15,166,174	86.9%	$128,433,135	85.9%	$32,060
445,740	2.5	386,281	2.8	525,265	2.5	483,108	2.8	3,576,272	2.4	893
377,531	2.2	406,642	3.0	473,833	2.3	404,385	2.3	3,973,204	2.7	992
140,463	0.8	175,671	1.2	257,098	1.2	103,633	0.6	1,612,077	1.1	402
153,328	0.9	147,349	1.1	268,853	1.3	187,810	1.1	1,568,168	1.0	391
170,469	1.0	83,444	0.6	184,123	0.9	130,222	0.7	1.272,252	0.8	317
31,933	0.2	24,782	0.3	74,301	0.4	48,691	0.3	352,732	0.2	88
—	—	—	—	8,998	—	15,471	0.1	151,328	0.1	38
169,210	1.0	114,350	0.8	329,007	1.6	124,698	0.7	1,546,342	1.0	386
131,329	0.8	148,344	1.1	239,131	1.1	183,301	1.0	1,089,570	0.7	272
51,203	0.3	22,901	0.2	—	—	58,960	0.3	340,120	0.2	85
33,362	0.2	19,263	0.1	11,002	—	38,440	0.2	220,288	0.1	55
128,990	0.8	183,255	1.3	194,159	0.9	142,466	0.8	2,614,237	1.8	653
303,564	1.8	284,612	2.1	390,499	1.9	362,761	2.0	2,616,121	1.8	654
								125,473	0.1	31
$17,103,436	100.0%	$13,694,920	100.0%	$21,004,777	100.0%	$17,449,120	100.0%	$149,491,339	100.0%	$37,317
469		435		590		554		4,006		
$ 36,468		$ 31,483		$ 35,601		$ 31,497		$ 37,317		
								6,912		
								$149,498,251		

[d] Includes repair, replacement, and betterment of regular and special projects. Energy saving measures also included.

[e] Includes other current operating expenses for MI, MR, CD, MLC (Minnesota Learning Center), and general services.

[f] Includes $23,391 for relocation and $102,082 for Workers' Compensation.

Both total and per capita operating expenditure for Anoka State Hospital are somewhat overstated because $357,210 for 11 positions with systemwide and central office responsibility are included. While separate reimbursement rates are applied to services for mental illness, mental retardation, and chemical dependency, the $37,317 per capita indicates the statewide average hospital operating costs of care for one patient/ resident for one year.

A. Gross and Net State Cost

The gross state cost aggregates all financial resources used by the state hospital system; operating expenditure, indirect expense, bond interest, and depreciation added together. Indirect expense includes expenditures for Department of Human Services operations associated with or prorated to state hospital operations including Fiscal Management, Reimbursement, Personnel, Information Systems, and Mental Health Bureau. It also includes prorated expenditures for departments of Administration, Employee Relations, Finance, Attorney General, and other state agencies that provide services to the state hospital system. Bond interest is the cost of money borrowed to finance construction and improvement of plant facilities. Depreciation expense recognizes an amortized amount of capital expenditure for land, buildings, and equipment. The depreciation expense is not placed in a reserve account, but it does recognize state capital costs and is an allowable item for federal reimbursement.

Table 5 presents a breakdown of actual gross state cost for Fiscal Year '84 and estimates for the next three fiscal years. The operating expenditure of $147,755,064 is less than the total in Table 4 because: (1) offsetting receipts for regional laundry services, state hospital miscellaneous cash receipts and central office salaries paid on hospital line items have been deducted; and (2) it reflects account balances as of August 1--one month after the end of the fiscal year, but before closing entries on or about September 1.

Actual indirect costs for Fiscal Year '84 totaled $3,970,098. The addition of $2,284,951 for bond interest and $5,035,366 for depreciation brought the gross state cost to $159,045,479. Dividing the total gross cost by the 4,006 average daily population gives a per capita gross cost of $39,702. In other words, $2,385 or 6 percent of the state gross cost per patient/resident is made up of indirect, bond interest, and depreciation expense.

TABLE 5

GROSS AND NET STATE COST OF STATE HOSPITALS
FOR FISCAL YEARS 1984 THROUGH 1987

COST OF STATE HOSPITALS	FISCAL YEAR 1984 (Actual)	FISCAL YEAR 1985 (Estimated)	FISCAL YEAR 1986 (Estimated)	FISCAL YEAR 1987 (Estimated)
Hospital Operating Expenditures[a]	$147,755,064	$154,662,055	$159,952,300[b]	$160,385,100[b]
Hospital Indirect Expense:				
• Central office support and reimbursement[c]	$ 2,395,743	$ 1,737,538	---	---
• Statewide support[d]	1,444,517	1,435,484	---	---
• Other[e]	129,838[f]	2,710,725	---	---
TOTAL INDIRECT COSTS	$ 3,970,098	$ 5,883,747	$ 6,119,097[g]	$ 6,363,860[g]
Bond Interest[h]	$ 2,284,951	$ 2,078,545	$ 1,891,476[i]	$ 1,721,243[i]
Depreciation[j]	$ 5,035,366	$ 4,566,573	$ 4,141,882[k]	$ 3,756,687[k]
Gross State Cost	$159,045,479	$167,190,920	$172,104,755	$172,226,890
Reimbursements:				
• Medicare[l]	$ 1,847,435	---	---	---
• Insurance[m]	2,024,030	---	---	---
• Medical Assistance:				
— Federal	52,656,694	---	---	---
— State	46,825,724	$ 44,144,460[n]	$ 42,974,580[n]	$ 40,434,350[n]
— County	5,202,858	---	---	---
• County[f]	6,362,510	---	---	---
• Patients/families	5,675,169	---	---	---
TOTAL REIMBURSEMENTS	$120,594,420	$121,532,800	$122,071,400	$119,623,000
NET STATE GOVERNMENT COST[o]	$ 85,276,783	$ 89,802,580	$ 93,007,935	$ 93,038,240

TABLE 5

GROSS AND NET STATE COST OF STATE HOSPITALS
FOR FISCAL YEARS 1984 THROUGH 1987
(continued)

SOURCE: Financial Management and Reimbursement Section documents, Department of Human Services.

[a] Includes salaries, employee benefits, food, fuel, drugs, supplies, and all other current operating expense. Fiscal year (FY) 1984 net Reimbursement Section figure is less than total in Table 5 because: (1) $414,281 Regional Laundry receipts, $417,422 miscellaneous cash receipts, and $394,430 central office salaries are excluded; and (2) Reimbursement Section data are obtained from State Accounting as of August 1 while the Financial Management Section data are as of September 1 when books are closed.

[b] Same level funding Department requests. Not included in these amounts are: (1) a projected reduction of 644 MR staff positions to be accomplished by June 30, 1987, which reduces operating expenditure by an estimated $2,267,000 for FY 1986 and $9,241,000 for FY 1987 making a total of $11,508,000 for the biennium, and (2) projected increase of 175 MI staff which would increase expenditures by an estimated $2,258,800 for FY 1986 and $4,496,800 for FY 1987 making a total of $6,755,600 for the biennium. Other lesser changes under consideration but not included total $238,500 for FY 1986 and $225,800 for FY 1987.

[c] Includes state hospital share of Department of Human Services costs for Institution Fiscal Management, Personnel, Information Systems, Mental Health Bureau, and Reimbursement sections.

[d] Includes proration of costs for statewide departments of Administration, Finance, Employee Relations, Legislative Auditor, Treasurer, Attorney General, and others.

[e] In prorations of Regional Laundry, Client Protection, Commissioner's Office, etc., actual amount for FY 1984 was lower due to offsetting receipts and other adjustments.

[f] Includes hold orders, poor relief, and detoxification charges at Fergus Falls State Hospital.

[g] Assumes a 4 percent increase over prior year.

[h] Portion of interest on state bonded debt chargeable to construction and improvements at state hospitals.

[i] Assumes a 9 percent decrease based on the change from FY 1984 to FY 1985.

[j] Recognizes prorated portion of long-term plant construction and remodeling costs.

[k] Assumes a 9.3 percent decrease based on the change from FY 1984 to FY 1985.

[l] Includes Part A Inpatient Hospital Services, Part B Physicians Services, and Ancillary Services.

[m] Includes all private health insurance carriers.

[n] Based on 44.73 percent state share.

[o] Gross State Cost minus Total Reimbursement excluding state share of Medical Assistance.

The Reimbursement Section of the Department of Human Services recovers state hospital costs from many sources through calculation of per diem rates and billing procedures. During Fiscal Year '84, reimbursements totaled $120,594,420 from all sources. The largest source was the federal share of Medical Assistance, $52,656,694 or 43.7 percent of all reimbursement. The second largest source was the state's own share of Medical Assistance at $46,825,724 or 38.6 percent followed by county payments for hold orders, poor relief, and detoxification charges for $6,362,510 or 5.3 percent of the total. Counties also pay a share of Medical Assistance that amounted to $5,202,858 for state hospitals during Fiscal Year '84.

The Legislature appropriates the gross state cost of the state hospital system. State hospital reimbursements are deposited into the State General Fund and designated as dedicated revenue for Medical Assistance, thereby reducing that appropriation. The presence of substantial reimbursement collection is the basis for computing net costs. Had eligible persons been treated in other settings, the state's share of Medical Assistance would clearly have been a "cost" to the state with no chance of cost recovery through the reimbursement process. In the case of treatment in state hospitals, reimbursement from the state's share of Medical Assistance functions more like an interagency transfer; state government helps individuals, but in doing so moves money from one account to another. From the state government's viewpoint, state hospital reimbursements from other than state sources are revenue receipts and, therefore, the gross state cost of state hospitals minus reimbursements from nonstate sources yields a net cost. Following this procedure, the net state government cost for the state hospital system in Fiscal Year '84 was $85,276,783. If the net cost is divided by the 4,006 average daily population, the net state cost per capita becomes $21,287, slightly more than half (53.6 percent) of the gross state per capita cost.

V. COMPARISON OF COMMUNITY AND INSTITUTIONAL EXPENDITURES FROM FISCAL YEARS 1977 THROUGH 1984

The Evaluation and Public Policy Division of the Institute for the Study of Developmental Disabilities at the University of Illinois at Chicago conducted a comprehensive analysis of Mental Retardation/Developmental Disabilities (MR/DD) funding in the 50 states and by the federal government. In collaboration with the Council of State Governments, and supported in part by a 24-month Project Grant of National Significance from the Administration on Developmental Disabilities, the Division analyzed the record of MR/DD expenditures in the state executive budgets of each of the 50 states for the last eight years (Fiscal Years 1977 through 1984).

The prime purpose of the project was to develop and test a methodology for accomplishing annual or biennial updates of MR/DD spending trends in the states and nationally. Other purposes were: (1) ascertaining comparative net state general fund expenditures for community services compared to institutional services funding in the 50 states; (2) projecting if or when fiscal parity has or will be achieved in each state between community and institutional services expenditures; and (3) correlating growth in MR/DD state expenditures with the presence or absence of litigation, state deinstitutionalization patterns, and indices of state fiscal capacity.

The procedure used to obtain MR/DD state expenditure data had three steps. First, published state executive budgets were obtained to address the period of intended analysis: Fiscal Years 1977 through 1984. Most budget documents obtained reported expenditure figures for the preceding one or two fiscal years. Then, each budget document was inspected for relevant MR/DD content. The relevant MR/DD sections of the budget were duplicated and filed on a state-by-state basis.

The second step involved constructing a "general state ledger" for each state using the same terminology employed by the state in the presentation of its executive budget. Again, the ledger covered the time period of Fiscal Years 1977 through 1984. To make analysis manageable, initial attention was focused on recapitulating a summary of the principal state agency(ies) operating expenditures for MR/DD state institutions and community programs. This refers to the functional state agency equivalents of the MR/DD division of (usually) the Department of Mental Health and Mental Retardation. Title XX and ICF-MR reimbursement data were also obtained. Special Education and SSI/SSDI funds are excluded from this analysis at this time.

The third step, now nearing completion, consisted of implementing a comparative expenditure analysis to ascertain which operating funds have been deployed in the states between Fiscal Year 1977 and Fiscal Year 1984 for the provision of MR/DD community services and which funds have been deployed to fund the operation of state MR/DD institutions. Community and institutional expenditures were further analyzed by the following revenue sources: state funds, federal Title XIX, Title XX, and other federal funds. The published state budgets, of course, imperfectly break out community and institutional MR/DD expenditure figures and revenue sources. Therefore, the project staff had extensive contacts with state fiscal and program personnel to obtain and verify expenditure data. This required mail and telephone surveys of the medical assistance and social services bureaucracies in addition to the state mental health/DD agencies.

These steps have resulted in the development of a graphic analysis series. Copies of charts were made available to state MR/DD administrators during the summer of 1984. Accompanying these state graphs were technical notes, detailing analysis methods, and the sources of expenditure and revenue figures. Near the end of federal fiscal year 1984, project monographs, which overview the methodology and state-by-state analyses in more detail, will be available.

The definitions used in this section include:

Principal State Agency (PSA): The state Department, Agency, Division, Bureau, Office, or other administrative subdivision primarily responsible for planning, funding, and managing noneducational institutional and community services to MR/DD persons. In most states, the PSA is the MR/DD Division within the state's Department of Mental Health and Mental Retardation. Some states, however, divide institutional and community services responsibility between two separate departments. In cases such as these, the PSA construction includes both agency components.

Institutional Services: State-operated developmental centers, learning centers, schools, training schools, hospitals, etc., which have mentally retarded and developmentally disabled individuals in residence, and the portions of mental health centers, hospitals, etc., serving primarily a mentally ill population which may also have wings, buildings, or units devoted to services for the MR/DD population.

Community Services: State-operated, state-managed, and/or state-funded MR/DD residential and day services. Programs of the "Principal State MR/DD Agency" plus Title XIX ICF-MR funds and Title XX Social Services Funds are included in the analysis. Local funds are excluded except in rare instances and specified as such in a technical note.

Operations versus Capital: Capital construction or renovation projects in institutional services, or major bond issues or other capital initiatives in community services are excluded from the present analysis. "Capital" costs included in reimbursement per diems, or in grants-in-aid to private community services which are for regular repair and maintenance, mortgage reimbursement, lease/rental, etc., are considered operational costs, as are the usual facility or campus repair and maintenance lines in institutional facility budgets.

Administration: Central office administration is excluded, regional, field service, area or other local support offices providing community program development services are included, as are administrative services at state-operated institutions such as superintendents' offices.

Figure 2 shows that in 1980, expenditures for community services reached the same level as expenditures for institutional services in Minnesota. Since 1980, expenditures for community services have exceeded institutional services. In 1984, $130 million was designated for community services and $95 million was allocated for institutional services for a total of $225 million. This amount excludes SSI/SSDI and special education.

Figure 3 depicts the split between federal ICF-MR sources (49.6 percent), other federal sources (0.8 percent), and state/local sources (49.7 percent) for institutional services that totaled $555 million from fiscal year 1977 through fiscal year 1984. There are three revenue sources for community services including federal ICF-MR (36.2 percent), other federal funds (0.1 percent), federal Title XX funds (17.7 percent), and state/local funds (46.0 percent) for a total of $622 million during fiscal years 1977 through 1984.

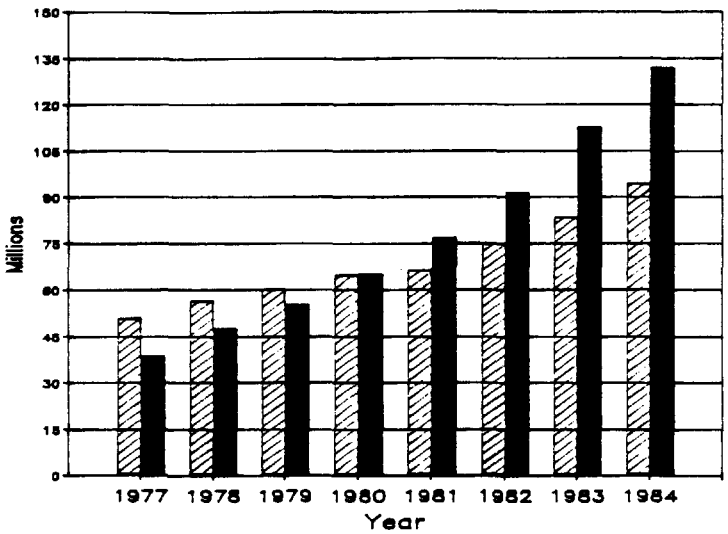
Figure 4 indicates the per diems of institutions have tripled between Fiscal Year 1977 and Fiscal Year 1984 in unadjusted dollars. By adjusting for inflation, the per diems increased by one and one-half times. At the same time, the average daily population has decreased by 855 mentally retarded people from Fiscal Year 1977 to Fiscal Year 1984.

The sources of revenue for community and institutional services are compared in the exit figure (Figure 5) for fiscal years 1977 and 1984. In Fiscal Year 1977, $55 million was spent on institutional services with 51.5 percent coming from federal ICF-MR funds and 47.2 percent from state funds. In 1984, the cost of institutional services increased to $94 million with federal ICF-MR funds decreasing to a 45.0 percent share and state funds increasing to a 54.8 percent share. Community services increased from $39 million in fiscal year 1977 to $132 million in fiscal year 1984. State sources increased from 43.8 percent to 48.6 percent in that time period, while Title XX decreased from 31.6 percent to 11.7 percent. Federal ICF-MR funds increased from 23.9 percent to 39.7 percent.

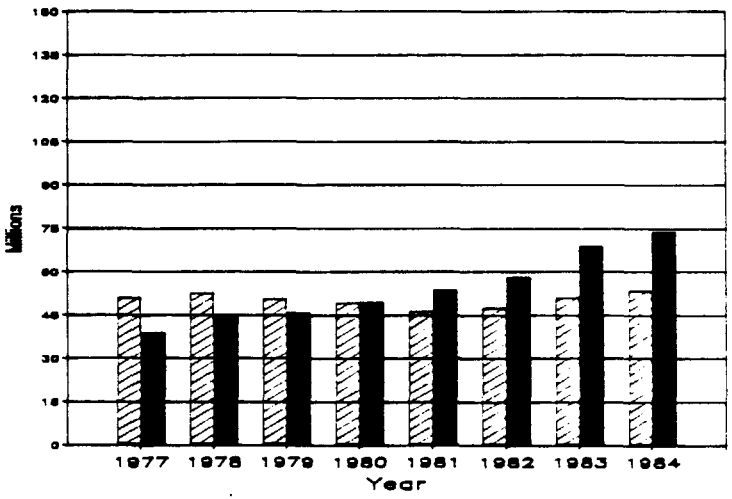
FIGURE 2

MINNESOTA COMPARATIVE ANNUAL MR/DD EXPENDITURES
FOR INSTITUTIONAL AND COMMUNITY SERVICES, FY '77 - '84[a]

In Unadjusted Dollars



In 1977 Dollars



KEY:
Institutional
Community

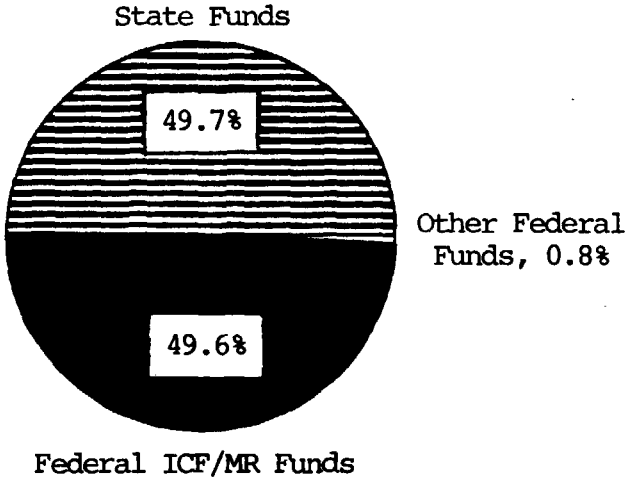
Source: Braddock, Howes, Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984.

[a]Community services funds excludes Income Maintenance (SSI/SSDI) and Special Education Expenditures.

FIGURE 3

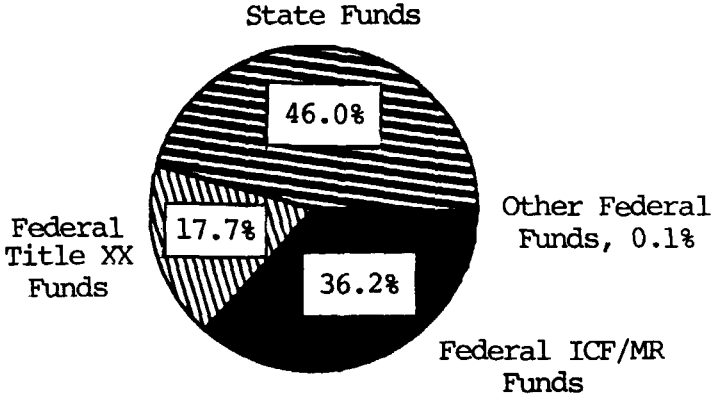
MINNESOTA EIGHT-YEAR TOTAL MR/DD EXPENDITURES
BY REVENUE SOURCE: FY ' 77 - '84

Institutional Services Funds
Total Dollars: $555 Million



Source: Braddock, Howes, and Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984.

Community Services Funds[a]
Total Dollars: $622 Million

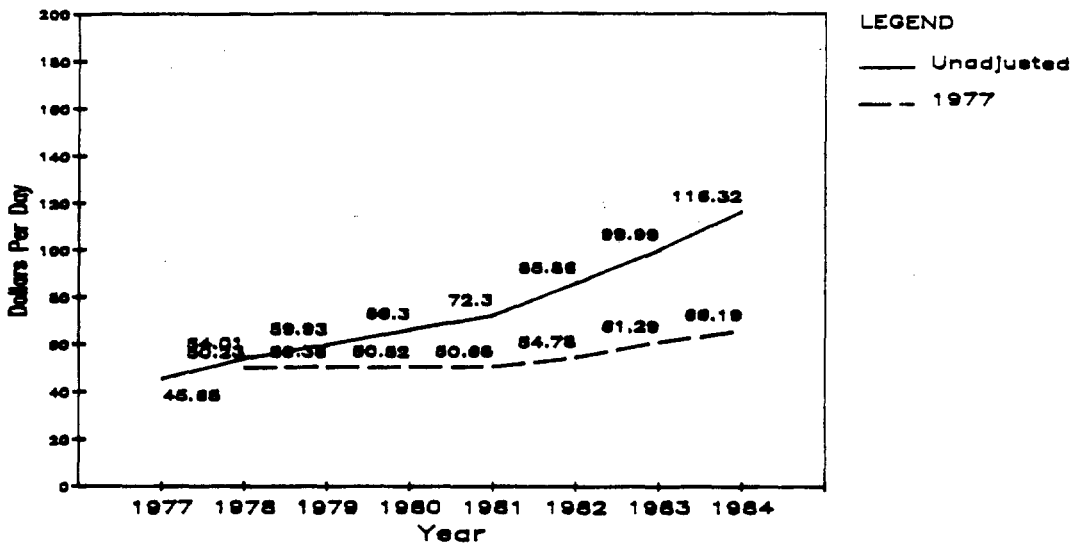


[a]These funds exclude Income Maintenance (SSI/SSDI) and Special Education expenditures.

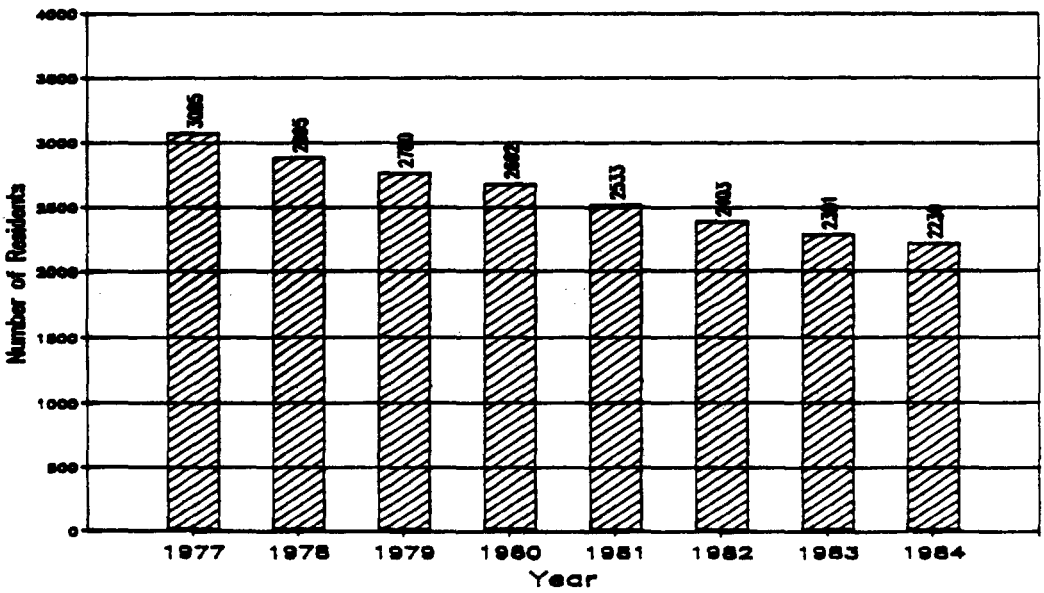
FIGURE 4

MINNESOTA DAILY EXPENDITURES PER RESIDENT IN PUBLIC MR/DD INSTITUTIONS: FY '77 - '84

In Unadjusted and 1977 Dollars



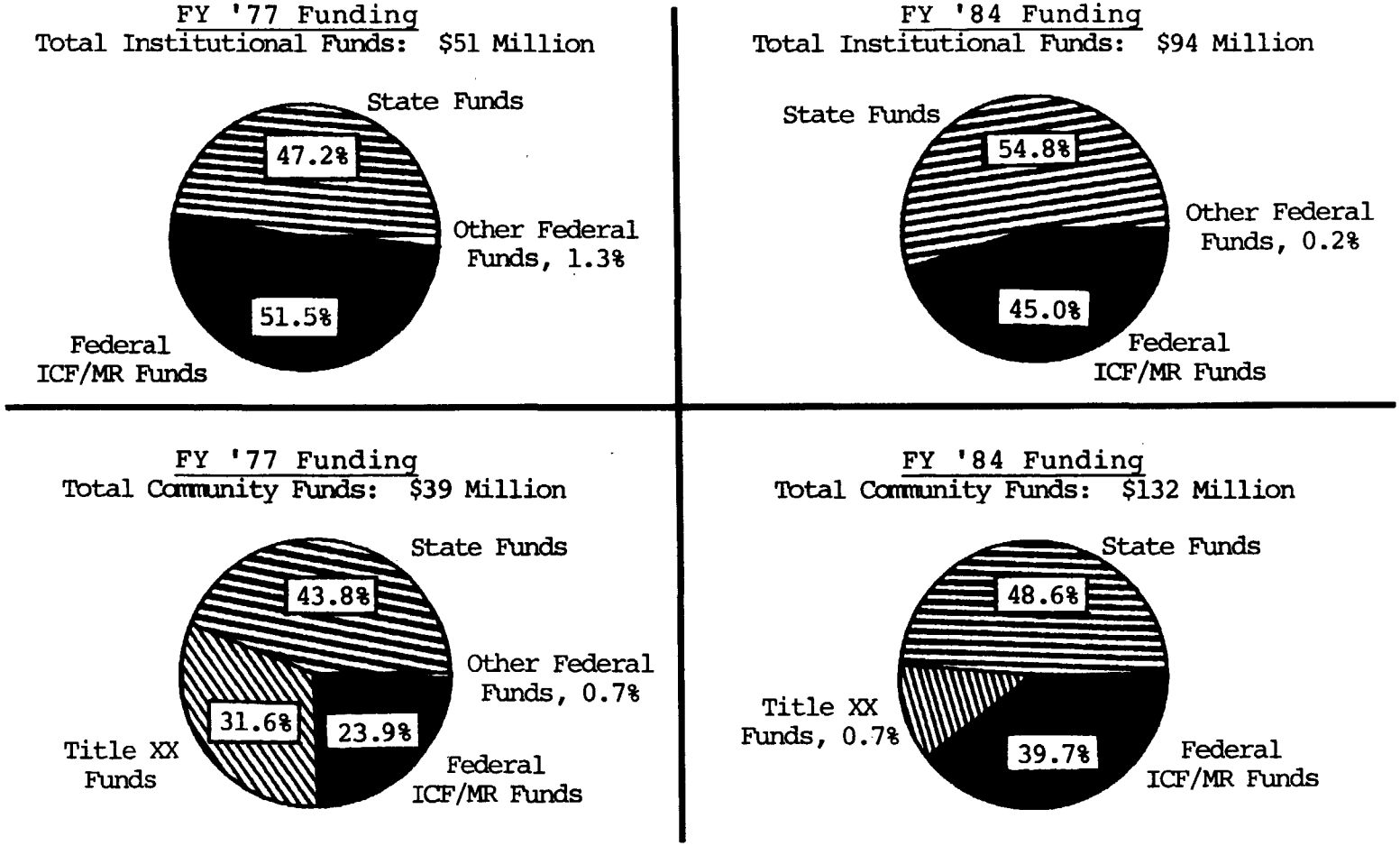
Average Daily Residents in Institutions



Source: Braddock, Howes, and Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984.

FIGURE 5

MINNESOTA MR/DD EXPENDITURES FOR INSTITUTIONAL AND COMMUNITY SERVICES:
A COMPARISON OF STATE AND FEDERAL FUNDING, FY '77 and '84



Source: Braddock, Howes, and Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984.

[a]Community Services funds exclude Income Maintenance (SSI/SSDI) and Special Education Funds.

The total cumulative federal ICF-MR reimbursements for state hospitals and community facilities totaled $500 million for fiscal years 1977 through 1984. Community ICF-MR facilities received 45 percent of that amount while state institutions received 55 percent. Figure 6 depicts this breakdown.

In comparing institutional expenditures to community expenditures over the past seven years, the ratio has decreased from 1.32 to 0.72. Parity or a ratio of 1.0 was reached in 1980 as shown in Figure 7.

VI. A NEEDS APPROACH TO COST

From a public policy perspective, a major barrier to a more thorough understanding of the long-term care system is the quality of the data base. Our current understanding is limited with regard to who receives what services from which providers at what costs. Data on existing and potential long-term care users in both institutional and noninstitutional settings, the type and quantity of services used, the associated costs, and the effectiveness of various service and living arrangements are necessary in order to "get a handle on the system" and to help policy makers develop policy and program which are responsive to existing and emerging issues.

The major focus of this section is on service utilization and cost and more specifically on how a "needs approach" to cost estimation might be applied to the state hospital population in Minnesota.

Policy and Program Issues

Examination of the state hospital system requires looking at a number of policy and program issues including the population served, services provided, the associated costs, the distribution of the cost burdens, and the effectiveness of various service and living arrangements. Some key questions pertaining to these areas are given below:

Population Served:

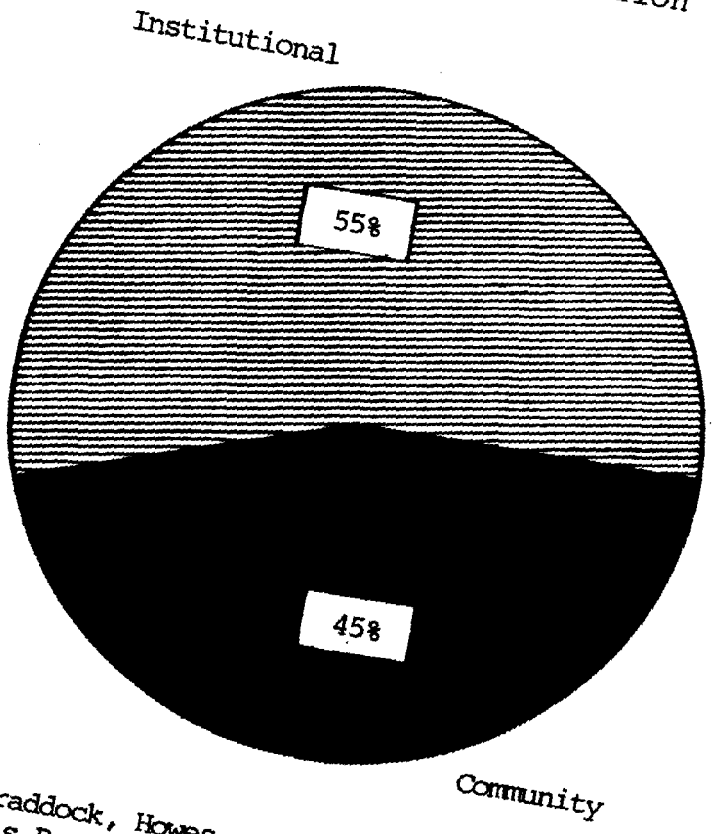
What are the personal, social, health, functional ability, and related characteristics of the residents in state hospitals?

How have new and readmissions to state hospitals changed over the past years?

FIGURE 6

MINNESOTA CUMULATIVE FEDERAL ICF/MR REIMBURSEMENTS IN INSTITUTIONAL AND COMMUNITY SETTINGS, FY '77 - '84

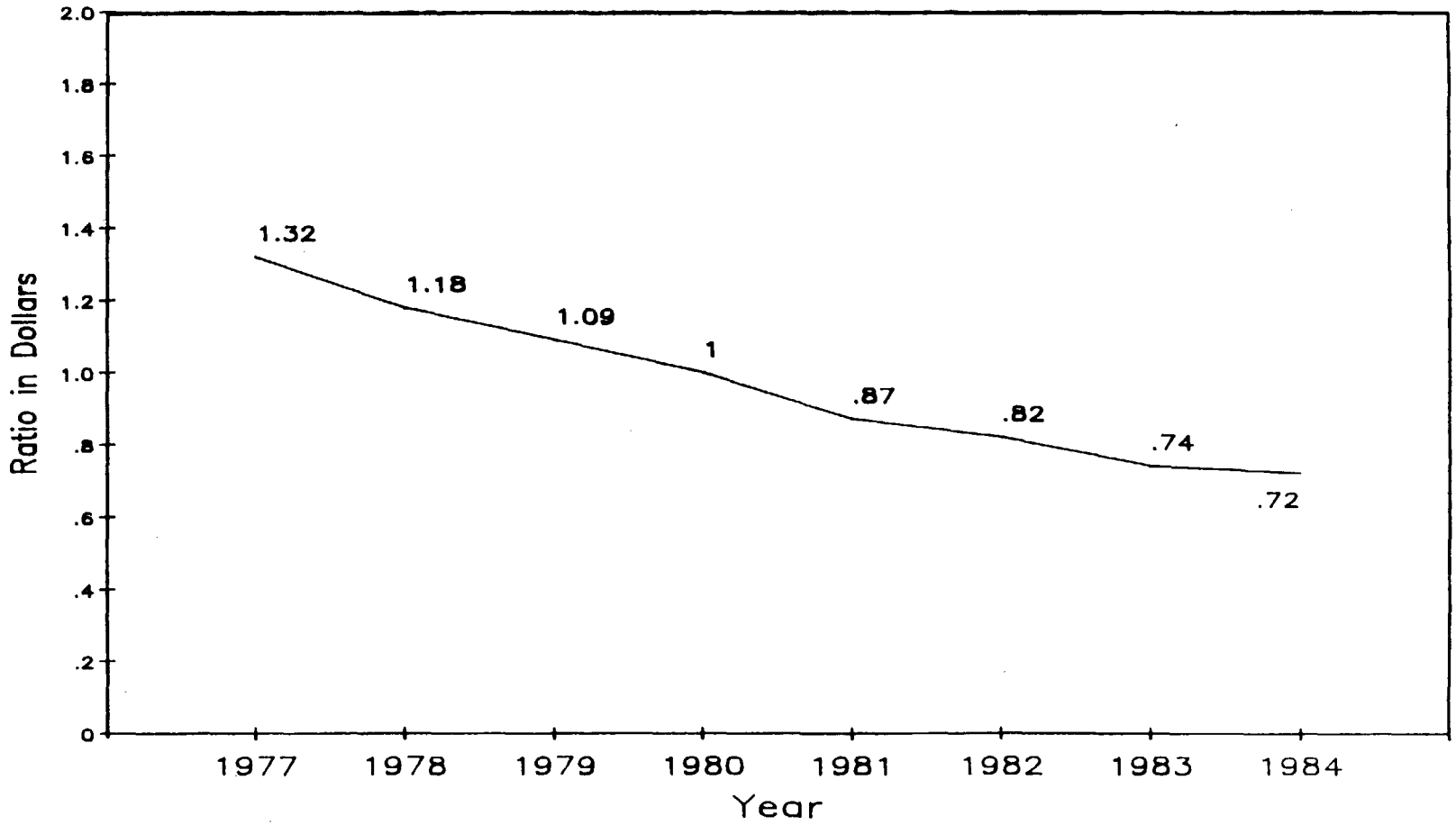
Total Dollars: $500 Million



Source: Braddock, Howes, and Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984

FIGURE 7

MINNESOTA RATIO OF MR/DD INSTITUTIONAL EXPENDITURES PER DOLLAR OF COMMUNITY SERVICES FUNDING: FY '77 - '84[a]



[a]Includes state general funds, ICF/MR Reimbursements, and Title XX.

Source: Braddock, Howes, Hemp, Expenditure Analysis Project, ISDD, University of Illinois at Chicago, 1984.

What are the patterns of movement of resident through the long-term care system?

Service Utilization Patterns and Relationships:

What types and quantities of services from all sources (internal and external) do the state hospital residents receive? What are the patterns of service utilization?

Who are the providers of these services, i.e., provider types such as social worker, nurse, psychiatric technician, occupational therapist, and volunteer?

How does service utilization (types and quantities of service) vary with regard to personal, social, health, function ability, and related characteristics of the state hospital residents?

What is the proportion of services utilized by a specified proportion of the highest users? Is service use highly concentrated such that a small proportion of the residents account for a high proportion of the services utilized?

Costs:

What are the costs of the various services used by the state hospital residents?

What is the relationship(s) of resident characteristics (e.g., functional ability) to the costs of service?

What are various components of cost, e.g., services provided directly to resident, housing, food, other living expenses, etc.?

What is the incidence, distribution, and dollar value of public income transfers or benefits received by state hospital residents?

What is the distribution of the cost burden by governmental level, between the government and the resident and the family, etc.?

Effectiveness of Services and Setting:

How effective are the services provided in a state hospital setting in meeting identified client and program objectives?

Family and Informal Support System:

What is the nature of involvement of families of state hospital residents?

What are the concerns, needs, expectations of family members of state hospital residents?

Comparisons across Service and Living Arrangements:

To what extent are the state hospital residents similar to persons receiving services in other settings in terms of the joint distribution of client characteristics?

How does service utilization vary across care settings?

What are the comparative costs of care provided in a state hospital environment and in other settings?

How do the various components of cost vary across care settings?

What is the distribution of the cost burden across various types of services and living arrangements?

How effective is the care provided in a state hospital environment compared to care in other settings? What is the well-being of residents in state hospitals compared to other service and living arrangements?

Alternative Service and Living Arrangements:

What services (quantity and type), setting/environment, and provider types would be required for state hospital residents to live in other settings?

How available and accessible are these services and living arrangements?

What are the needs, wants, and concerns of the state hospital residents if alternative service and living arrangements were to be developed?

What are the needs, wants, and concerns of the family members of state hospital residents if alternative service and living arrangements were to be developed?

What are the costs of providing the required services and living arrangements?

What is the distribution of the cost burden for these services and living arrangements?

While this is not an exhaustive list, it does focus on a number of important policy and program issues, many of which directly or indirectly are related to the development of a study using a needs approach to cost estimation.

B. Measurement Issues in Long-Term Care:

Over the past few years, there have been increasing efforts in the long-term care area to determine the costs and effectiveness of various service and living arrangements. While the findings of some studies have been very instructive, others have limited applicability and cannot be generalized due to basic conceptual and operational limitations. In many instances, study findings are questionable due to various measurement problems. Some of these problems are given below:

Population Served:

In the long-term care area as in many health and human service areas, our understanding of the nature of the population being served is limited. In many studies, the target population under investigation is not clearly defined. This is particularly problematic when a comparison is being made of two or more different programs or service and living arrangements. Frequently, it is unclear whether the populations being compared are similar on characteristics associated with service utilization, cost, and other factors.

Thus, data on client or resident characteristics further our understanding of who is being served by the current system and are an essential ingredient in the identification of the correlates of service use and the associated costs.

Uniform Service Definitions:

In order to conduct comparative studies of service use and cost, certain elements of an accounting system need to be in place including: (1) uniform definitions of services and programs, (2) uniform cost-accounting procedures, and (3) uniform cost allocation procedures (Sorenson, 1976). The first of these is discussed in the following paragraphs, and the latter two are addressed later in this section.

A major problem encountered in studies comparing service use and costs across agencies and organizations is the lack of uniform, mutually exclusive service definitions. This problem arises when studies are conducted on similar types of agencies (e.g., home care agencies), and in efforts to

compare rather different agencies/organizations such as state hospitals and various types of noninstitutional service and living arrangements.

Services are defined rather broadly here to include: (1) direct client or resident services such as physical therapy, recreational therapy, nursing procedures, and dental care; (2) goods such as medications, eyeglasses, assistive devices; (3) food; (4) shelter; (5) other personal living expenses; (6) overhead not included in the specific direct service categories; etc.

One problem in defining services or programs is that the activities or tasks associated with a particular service (e.g., counseling, case management, and homemaker service) vary widely across provider agencies and organizations. Also, services are not usually synonymous with provider types, e.g., homemaker, human services technician, nurse, social worker, etc. The activities defined under a particular service, e.g., case management, psychotherapy, personal care, often can be and are provided by various service provider types.

In order to understand what is going on within the state hospital setting or in any other care setting, it is necessary to identify both the types and quantities of services provided. An essential step in this process is the development of a taxonomy of service definitions. The classification scheme should provide uniform, mutually exclusive service definitions and capture all of the services provided. Such a system is most useful if it is applicable across care settings thus permitting comparative analyses.

Service Providers:

As previously noted, types of services are not the same as types of service providers. While service and cost studies can be done without identifying the types of providers delivering the services, such identification can further our understanding of the delivery system. Moreover, since some long-term care services can and are performed by various kinds of service providers depending upon the care setting, data on service providers and the types of services performed allow for analysis of manpower substitution issues.

A first step in this process is the development of a list of provider types. This classification scheme can include both formal providers (e.g., behavior analyst and registered nurse), informal providers (e.g., spouse and parent), and quasi-formal providers (i.e., volunteers).

Uniform Units of Service:

In order to calculate service utilization and the associated costs, it is critical that uniform units of service are developed. Greenberg (1984) describes three possible means of defining the unit to be costed: (1) cost per unit of service, (2) cost per case or episode, and (3) cost per time interval. The objectives of a particular study as well as the nature of the specific area being investigated affect the selection of the service unit.

The example given below illustrates the difficulties encountered in trying to specify the appropriate service unit:

> Unfortunately, when dealing with services or care for the chronically ill elderly, the theoretically appropriate unit is not quite as clear. First, length of stay in nursing homes or length of service by public health nursing and homemaker or health aide services frequently exceeds a year. Thus, it is not clear how one would meaningfully define "a case." Second, in addition to the long average lengths of stay, there is considerable variation in lengths of service. Thus, not only would a measure of average cost based on case be dominated by the average length of service, it is likely that the average length of service itself would be significantly influenced by the availability of services. (Greenberg, 1974)

In a study of service use and cost at state hospitals and of alternative service and living arrangements, a determination will need to be made of the appropriate service unit to be used for costing purposes.

Formal Services Utilized:

A thorough analysis of service utilization and of costs requires the identification of all formal services or of all major types of services provided internal to the primary care setting as well as those "external" formal services provided by other agencies/organizations, e.g., emergency room services. Institutional type of arrangements such as nursing homes and state hospitals provide a majority of services internally while noninstitutional arrangements often involve service

provisions from several agencies and organizations. Calculation of service use and costs across these settings would be misleading if only internally provided services were examined.

Inclusion of externally provided services is also particularly critical if persons in one setting are more likely to utilize a specific service than their counterparts in other settings, e.g., home care clients versus nursing home residents' use of hospital emergency room and outpatient services.

Thus, the identification of the types and quantities of services received from all sources and the associated costs allows for a more complete and accurate picture of what is happening within care settings as well as across treatment settings.

In some studies, the types and quantities of services provided by informal caregivers are identified; and in a few, a dollar value or cost is also estimated. One of two approaches is generally used to calculate this implicit service cost. Some analysts use a replacement cost approach where the dollar value is equated with what it would cost to have the particular service provided through a formal service provider. A second approach is to measure what economists term the opportunity cost, in this instance, "the opportunity foregone" due to one's current caregiving activity. In essence, a comparison is made of present activity (e.g., caring at home for a mentally retarded adult/child) with the "next best" alternative (e.g., employment in the paid labor force).

If in certain services and living arrangements a major portion of care is provided by informal caregivers, then consideration needs to be given on how to measure these activities.

Room, Board, and Other Nondirect Service Costs:

A related problem encountered in some comparative cost studies is the inclusion in one setting of the costs of all direct client services as well as of room and board, and other living expenses while counting only the direct client service costs in another type of care setting. It is important that whatever components of cost are being studied, that they are identified and counted in a uniform manner for all settings under investigation.

Uniform Cost-Accounting and Allocation Procedures:

Once a classification of services or programs is developed, it becomes necessary to develop a scheme for classifying or recording the costs incurred by an agency or organization in providing the services, and procedures for distributing or allocating these costs to the appropriate service or program (Greenberg, 1984).

For allocation purposes, cost is often divided into direct and indirect costs. The former refers to costs directly associated with specific services or programs, e.g., salaries and supplies. Indirect costs are generally defined as those shared by more than one service or program such as administrative costs, rent, utilities. The development of a set of procedures for allocating these indirect costs to the various services is an important element in cost of service studies. If different allocation procedures are used by the agencies and organizations being studied, differences in their costs may be an artifact of their allocation procedures rather than reflecting actual cost differences (Greenberg, 1984).

Measurement of Costs:

In making cost comparisons, it is important to define what is meant by cost and to determine how costs are to be measured, which costs will and will not be calculated, and who bears these costs.

A critical ingredient in cost of service studies is a clear definition of and approach to the measurement of cost. While from an accounting perspective, costs are generally measured as the direct monetary expenditures associated with any given activity. An economic view of costs would incorporate the notion of opportunity costs and overall costs to society.

Thus, in some circumstances, the monetary value of resources used in a particular activity may be the appropriate definition of cost. Market prices, however, may not in some instances reflect the true costs. Programs may have intangible costs (or benefits) associated with them due to their effects on the overall system. Sometimes the economic concept of opportunity cost (the best alternative) may be viewed as the appropriate measure of costs.

In cost of service studies, it is also important to determine who bears the cost. Sorting out the distribution of costs by levels of government between the public and private sectors and between the public sector and the informal support network

of family, friends, and neighbors is a difficult task. Such an effort, however, can be instructive regarding the presence, direction, and magnitude of financial incentives and disincentives faced by various decision makers in considering various service and living arrangements.

Calculation of the total costs involved as well as the relative cost burdens can also help in distinguishing between actual cost savings and redistribution of cost. Often in the field of long-term care, what has been defined as cost savings has simply been a redistribution of the costs from one level of government to another or from the government to the family. Calculation of the cost burden by government levels is discussed in the next section.

Calculation of total costs and the distribution of the cost burden also raises the issue discussed earlier of whether to place a dollar value on the services and care provided by informal caregivers and, if so, how should this cost be estimated.

In short, what has been argued in the preceding paragraphs is that it is not sufficient to simply calculate total costs, rather a determination needs to be made of who bears these costs in various treatment settings.

Briefly, when conducting cost-of-service analyses, it is essential that the methodology specify what is meant by cost, how costs are measured, which costs are included and which are excluded from the analysis, and who bears the cost in various service and living arrangements.

Public Income Transfers:

The income maintenance system provides income in the form of cash, vouchers (e.g., food stamps), services, and goods. Some of these programs are means-tested, that is, income and assets are used in determining program eligibility and calculating the transfer or benefit amount while others are non-income tested in nature. Frequently, people are eligible for and receive benefits from more than one program.

While cost of service studies on long-term care sometimes calculate costs for programs such as Medicaid, few attempt to identify the array of public benefits received by long-term clients. Such limited analyses provide only a partial picture of the distribution of the cost burden by government levels.

To more fully understand the impact of public programs and to examine the distribution and redistribution of cost burdens among government levels requires the identification and valuation of the public income benefits received by long-term care users in various service and living arrangements. One recent effort to examine the incidence, value, and distribution of public income transfers by government levels for nursing home and home care clients was conducted in Minnesota (Patten, 1980; Anderson [Eustis], Patten, & Greenberg, 1980).

As Patten notes:

> The distribution of cost or the cost burden among various levels of government, between the public and private sectors, among various parties in the private sector may shift significantly from one care setting to another. In other words, the proportion of total cost that any one level of government or any particular party such as the client or a family member bears is hypothesized to be in part a function of the treatment or care setting. . . . Sorting out the distribution of cost . . . can provide data that are instructive regarding the impact of the public dollar on redistribution and on the existence and extent of incentives and disincentives to utilization between care settings . . . .
>
> An analysis of the distribution and redistribution of long-term care costs among government levels raises issues regarding what is a "fair" share for each level, what incentives are operative given current policy and programs, and what might be changed to alter the current distribution of cost and related incentives. (Patten, 1980, pp. 81-82)

Program Effectiveness and Outcomes:

The focus of this paper is mainly on service utilization and costs. During the past years, the emphasis in long-term care as in other health and human service areas has been on cost containment and cost-cutting. At the same time, increasingly less attention seems to be given to issues related to program effectiveness and quality of care.

Over the past decade or so, one of the "buzz" words in health and human services had been "cost-effective analysis." It has been used to describe a range of evaluation activities. Unfortunately, what have passed as efforts to look at the cost-effectiveness of programs have focused on costs and given only lip service to measuring program outcomes or effectiveness.

Cost-effectiveness as used here refers to the evaluation of two or more programs by determining which can meet a specified level of effectiveness at the least cost or given a set amount of dollars which program can achieve the highest level of effectiveness (Stokey and Zeckhauser, 1978). Thus, cost-effectiveness evaluation has two key areas of measurement: cost and effectiveness.

While the measurement of program effectiveness or outcomes and of the quality of care is not always an easy task, it is an essential one. We need to have better information on clients' well-being, changes in client and family functioning, etc. Information on service use and cost is not enough.

A NEEDS APPROACH TO COST ESTIMATION

One method for estimating program costs is referred to by Gross (1977) as a "needs approach to cost reporting." He notes:

> In this type of cost reporting, we are interested in looking at the cost of service to the agency providing the service or the cost to the individual in need of service. We have also used this method to compare costs to the state and federal governments. A diagnosis of needs is developed and a prescription of services needed to fill those needs is then developed. Generally, unit costs are then used to determine the cost of filling the prescription. (Gross, 1977, p. 99)

A study incorporating this approach was recently conducted by Sager (1983). Among other things, this research involved the development and pricing of home care service plans for 50 patients in acute care hospitals who were to be discharged to nursing homes. Various elements in the design and implementation of this study are incorporated in the discussion presented below.

A Strategy for Estimating Cost Using a Needs Approach

A study based on a needs approach would involve at least the following five components: (1) identification of client characteristics associated with service use and cost, (2) selection of a sample of state hospital residents/patients from one or more of the three disability populations, (3) collection of client-specific data through an assessment process and other data collection

procedures, (4) development of a care plan specifying services and living arrangement required, and (5) identification of the costs of providing the plan of care.

Identification of Key Client Characteristics:

In order to develop a services or care plan it is necessary to first identify and then incorporate into the data collection instruments those client characteristics known or thought to be associated with service use and cost. It is important to try to specify the relationships between type of client and service receipt and quantity of service used. These relationships are probably not straight line functions.

Selection of a Sample of State Hospital Residents:

Given the size of the current state hospital population, it is not feasible to apply this approach to the total population. Rather, what will be required is the drawing of a sample of residents/patients from one or more of the three disability groups: mentally retarded, mentally ill, and chemically dependent. Once a decision is made regarding the disability groups to be included in the study, additional decisions will be required regarding sample selection. It is essential that the sample drawn is representative of the larger population. The state hospital population is not a homogeneous group. Within each disability group there is probably wide variation on personal, social, health status, functional ability and client characteristics. Since the study is interested in estimating service use and cost, it will be important to ensure that the sample drawn provides a good distribution on those variables related to differences in service need, service use and cost. In other words, our notions of what are the best predictors of service utilization and cost need to be incorporated into any decisions on the sampling frame. Whether a simple random sample, a stratified random sample, or some alternative sampling technique is most appropriate requires further discussion. Obviously, it is important that we have confidence in the representativeness of the study sample, and in the generalizability of the study findings to the total state hospital population.

Assessment of Client Characteristics:

A third component of the study involves the collection of client-specific data on variables or characteristics thought to be related to service use, i.e., correlates of service use. For purposes of the study, the information collected via an assessment process will serve three basic objectives: (1) to describe the personal, social, health status, functional ability and other relevant characteristics of a sample of state hospital residents from one or more of the three disability

groups; (2) to serve as a basis for the development of a detailed hypothetical services or care plan; and, (3) coupled with the services and cost data to determine how the service "prescription" varies with regard to client characteristics.

Collection of the appropriate client-specific data involves the following steps:

Identification of Potential Data Sources: Several sources of data might be utilized. If, for example, the study is of mentally retarded residents, appropriate client-specific data might come from a combination of sources including the most recent form from the QA&R annual review (especially the items focusing on the person's functional ability), the hospital resident chart/record including the individualized program plans (IPP's), an interview with the staff person(s) most knowledgeable of the resident, and an interview and/or observation by project staff of the resident.

Development and Testing of Data Collection Instruments: Tools which collect data on the various assessment dimensions, e.g., functional ability, psycho-social functioning, health status, employability, etc., need to be developed and tested. These instruments will be designed to record existing client-specific data (e.g., from the chart) as well as collect new data (e.g., through structured interviews). In certain measurement areas, scales or indexes would be included. Whenever possible, scales would be selected which have been carefully developed and tested for their psychometric qualities.

Development of Data Collection Procedures and Assessment Protocol: At the same time the assessment and other data collection tools are being developed and tested, a protocol for the assessment and other data collection processes needs to be developed specifying among other things staff training, field operations, editing and storage of data. The development of the protocol will require working closely with state hospital staff, other agency staff, residents, families and other relevant parties.

Collection of Client-Specific Data: The final step is the actual collection of data on individual residents. Some of the types of information can be collected by non-professional staff who have been trained in the data collection procedures. Some of the data collection efforts, especially those where assessment data are obtained via interviews and through observations, staff trained in such areas as nursing, social work, special education, psychology, etc., would be used. Once the data are collected they would be edited and stored.

The final product of the assessment and data collection process would be a data set profiling each study participant.

Development of a Plan of Care:

Once the client-specific data are collected, the next step is to develop an individualized plan based on these data which details the setting and services required for a particular individual. This process involves several activities.

Development of a Services Taxonomy: A service classification system needs to be developed which is applicable across care settings thus permitting comparative analyses.

Development of a Taxonomy of Provider Types: A list of service provider types needs to be developed which is applicable across care settings and includes formal, quasi-formal, and informal providers.

Development of Uniform Service Units: A determination needs to be made of the appropriate service unit to be costed, e.g., cost per unit of service, cost per case or episode, cost per time interval.

Development of a Hypothetical Services or Care Plan: Based on the information collected through the assessment process and other data collection activities, a detailed plan of care would be developed. This care plan could be developed by a professional(s) hired specifically for the study, by state hospital staff or by a combination of the two using a "team" approach. A somewhat modified version of this approach would have study staff develop the plans of care and then go over them with appropriate state hospital staff. Modifications in the plans could be made by study staff based on these "team" meetings.

In the process of developing the detailed plan of care, staff would be required to go through the full list of services indicating whether or not a specific service is needed. This process helps structure the professional to consider all of the possible services needed rather than concentrating on those with which s/he is most familiar.

In the development of the plan of care, the care planner would indicate the following:

- whether or not the service is required;
- length of time required to provide service each time;
- frequency of service units;
- type of providers required; and
- type of possible setting(s) where person could live.

The plan might also specify any major equipment, supplies, medications, assistive devices, etc., that the person requires. A three-month and six-month plan might be developed.

It is important to note that we currently do not have available to us clearly specified algorithms for translating identified needs into a detailed care plan which specifies type and quantity of service, living arrangement, etc. Studies suggest that professionals within and across professions, clients, and family members do vary on what they view as the appropriate mix of services needed in a particular situation.

Determination of the Costs of the Care Plan:

As one might expect, this component presents some difficult measurement issues. Since the various community provider agencies differ in their decisions, rules for defining and allocating direct and indirect costs, the expenditures comprising service unit costs will vary. Given resource constraints, it will not be feasible to work with all of the providers to determine their various service unit costs using uniform cost accounting procedures.

A "second best" approach might involve collecting cost per unit of service by obtaining agency service charge data or reimbursement data, i.e., the amount they are reimbursed under a particular government program. In the process of collecting these data, one might attempt to obtain from the agencies a sense of how agency expenditures are allocated, in other words what elements of cost are included and excluded in the unit cost.

These data could be collected from several agencies for the various services defined in the service taxonomy. In this way a range of per unit costs could be derived. For those services where either variation in cost is minimal or where they contribute only marginally to the total cost of the care plan, cost data might be obtained from only a single source.

These cost data can then be applied to the care plans in order to calculate the direct client service costs. Indirect client service costs such as housing, food, etc. will also need to be determined or estimated. In some service and living arrangements it may not be feasible to attempt to separate out direct client service costs from other cost components.

In order to look at the distribution of the cost burden by government level for the care plans, it would be necessary to determine the public cash and noncash income transfers that each study participant is eligible for and then identify

which programs would cover the services and living arrangements prescribed in the care plans. Based on these data the cost burdens could be derived by applying the appropriate program cost-sharing ratios.

Some Additional Thoughts

In addition to the activities described above, two other steps might be included in the study. First, efforts might be made to determine the availability in the area where the person would reside of the services and living arrangements prescribed in the care plan. Second, the study might attempt to contact family members (e.g., by phone interview) to gather information on their needs, concerns, expectations; the problems they have encountered in the past with local service providers such as doctors, dentists; the types of assistance and support they might need if different service and living arrangements were to be made, the type of service or living arrangement they think would be most appropriate for their relative, etc.

Such information could help inform a planning process aimed at moving residents from a state hospital setting to other service and living arrangements.

In the preceding paragraphs one approach for conducting a needs approach to cost estimation has been outlined. Two other strategies are worth mentioning. One alternative approach would involve the collection of client-specific data on current service use within the state hospital for a sample of residents (see earlier section describing approaches for collecting service utilization data). These services would then be costed using the method described above. Thus, instead of developing hypothetical care plans, current service usage would be taken as the appropriate mix of services needed. The type of living arrangement required for each resident would still need to be determined.

A second alternative strategy would involve finding a matched sample of persons currently participating in other service and living arrangements, and then determining their present service use and the associated costs. A critical issue of such an approach would be how closely matched these community residents are to state hospital residents with regard to variables that predict service utilization and cost.

A question frequently raised is how the cost of providing care in a state hospital setting compare with the cost of other care settings. As noted previously, such comparisons usually fall prey to various measurement issues (e.g., uniform service definitions, uniform units of service, uniform cost accounting and allocation procedures).

Currently there are three per diem rates used by all state hospitals ($135.85 per day for mentally retarded, $108.60 per day for mentally ill, and $77.05 per day for chemically dependent). It is difficult to separate out the various components of cost comprising the per diem rates. Since the per diems only vary across disability groups and not within each group, it is difficult to get a sense of the relative cost of caring for different types of residents/patients. While bottom line cost figures such as state hospital per diems can be compared with the total cost of providing care in other settings for a sample of state hospital residents/patients, the problems in such comparisons need to be acknowledged.

Another interesting question that might be examined using the data collected through this study is whether the dollar amount ($52 per day) for service costs currently allowed under the Medicaid waiver is a sufficient amount to purchase the services required (e.g., those prescribed in the care plan). A related question is how this amount compares with the proportion services represent in the state hospital per diem rate.

In brief, the preceding pages have described the various measurement problems associated with cost-of-service studies and possible approaches to addressing them. A study using a needs approach to cost estimation could provide data that would address some of the policy and program questions outlined in the early sections of this paper.

SUMMARY OF FINDINGS

- Comparisons between community facilities and institutions for mentally retarded people are difficult for several reasons:
  - Public residential facilities may not include all capital costs in per diems.
  - Community residential facilities do include all capital costs in per diems.
  - Program and service costs are usually included in public residential facilities but not in community residential per diems.
  - The public residential population is more severely handicapped than the population in the community. There are severely handicapped people in community residential settings but not to the extent of the state hospital population.

- Personnel in community residential facilities are underpaid compared to public residential facilities.

- The past population decline in public residential facilities affects fixed costs which cannot be reduced quickly.

- Public residential facility per diems contain other hidden costs such as central office administrative support. Multiple institutional programs on one campus also contribute to differences.

- Cost differences can be reduced through provision and accounting of the full array of services to people in both state hospitals and community facilities.

- The gross cost of state hospitals for fiscal year 1984 was $159,045,479 which includes $11,290,415 for interest, indirect cost, and depreciation. The total operating expenditure for fiscal year 1984 was $147,755,064 (this figure doesn't include offsetting receipts and central office salaries; this figure reflects balances of August 1 not September 1).

- The largest expenditure was for personnel at $128,433,135 or 85.9% of operating expenditure.

- Reimbursements totaled $120,594,420 from all sources with the largest amount coming from federal Medical Assistance ($52,656,694).

- In 1980, expenditures for community services reached the same level as expenditures for institutional services for mentally retarded people. Since 1980, expenditures for community services have exceeded institutional services.

VII. REFERENCES

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The 1984 Legislature mandated that a study and plan for Minnesota State Hospitals be prepared (Chapter 654, Section 19).

An Institutional Care and Economic Impact Planning Board was created composed of the following state agency heads: Sister Mary Madonna Ashton, Dept. of Health; Barbara Beerhalter, Dept. of Economic Security; Gus Donhowe, Dept. of Finance; Bill Gregg, Dept. of Veterans Affairs; Sandra Hale, Dept. of Administration; Leonard Levine, Dept. of Human Services; Orville Pung, Dept. of Corrections; David Reed, Dept. of Energy & Economic Development; Nina Rothchild, Dept. of Employee Relations; James Solem, Housing Finance Agency; and Tom Triplett, Chair, State Planning Agency.

Responsibility for the studies was given to the Developmental Disabilities Program/Council of the State Planning Agency.

Eight technical papers have been prepared to respond to the legislative requirements. This paper may be cited:

State Planning Agency. (1985, January). Policy Analysis Series Paper No. 7: The cost of Minnesota State Hospitals. St. Paul, MN: Developmental Disabilities Program, State Planning Agency.

"Residents" refer to people with mental retardation who live in state hospitals.

"Patients" refer to people with mental illness and people with chemical dependency who receive services at the state hospitals.

Additional free copies of reports or information about this project can be received from:

Developmental Disabilities Program
State Planning Agency
201 Capitol Square Building
550 Cedar St.
St. Paul, MN 55101
612-296-4018