Impact of the Maine Medicaid waiver for the mentally retarded

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To evaluate the impact of Maine's Medicaid waiver for the mentally retarded, baseline and 1-year followup data were obtained for 191 waiver clients and a comparison population of 115 persons excluded from the program because of enrollment limits. Program effectiveness was evaluated through measures of changes in clients' personal and community living skills. Medicaid and other data were used to establish individual and aggregate costs. It was found that the waiver program is a cost-effective alternative to intermediate care placements but that client screening is necessary to limit the enrollment of clients not at risk of institutional placement.

Introduction

During the past 20 years, support for services to the developmentally disabled has expanded significantly with the availability of Medicaid funding for intermediate care facilities for the mentally retarded (ICFs/MR). With expanded Medicaid funding have come concerns about rising Federal outlays for long-term care services. Congress enacted section 2176 of the Omnibus Budget Reconciliation Act of 1981, the home and community-based waiver authority, to allow State governments to experiment with alternative, noninstitutional services for chronically disabled individuals. The principal objective of the 2176 waiver is to restrain the growth in institutional long-term care expenditures by providing home and community-based services as a substitute for institutional (nursing home and ICF/MR) care. Under the waiver program, nonmedical services such as case management, homemaker services, home health aide services, personal care, adult day care, habilitation, and respite care may be reimbursed with Medicaid funds, but only on behalf of Medicaid-eligible recipients who would otherwise require care in a skilled nursing facility or intermediate care facility.

Since the inception of the Medicaid waiver program, researchers and policymakers have been concerned about the cost-effectiveness of these new services. Previous research and demonstration efforts suggest that home and community-based service programs, particularly those targeted to the elderly, may actually broaden the scope of services so that those who are not at risk of institutionalization and who would otherwise rely on private resources to meet their care needs instead rely on Medicaid-funded services (Health Care Financing Administration, 1984a, 1984b; Weissert, 1985; Hughes, 1985). Moreover, aggregate Medicaid expenditures may rise if the diversion of some clients from nursing home care into Medicaid-funded alternative care services results in additional beds available for Medicaid clients on waiting lists. Federal Medicaid costs will also increase if State governments shift costs of previously State-funded community-based services and programs to the waiver program in order to gain Federal financial participation through Medicaid.

We examine these issues in the context of an analysis of the cost-effectiveness of Maine's Medicaid waiver program for the mentally retarded. We address three central research questions:

- To what extent did the waiver program reduce Medicaid costs?
- Was the program effective in achieving the principal program outcome of improving clients' personal and community living skills (adaptive behavior achievement)?
- How effective was the targeting of waiver services to clients at risk of institutionalization?

Maine's waiver program

Maine's Medicaid home and community-based waiver program for the mentally retarded was implemented in October 1983. Priorities for placement in the waiver program included:

- Individuals discharged from State institutions for the mentally retarded (the Pineland Center and the Elizabeth Levenson Center).
- Clients residing in ICFs/MR who could benefit from more independent living arrangements.
- Individuals living at home or in other types of residences (e.g., boarding care facilities) who, in the judgment of the State Bureau of Mental Retardation, would have been placed in an ICF/MR in the absence of the waiver program.

Habilitation services provided in alternative residential settings (e.g., boarding care and family foster care), day habilitation (e.g., sheltered workshops), and case management were provided under the waiver. Habilitation services include training, therapy, and other services provided to improve clients' personal and community living skills. Waiver recipients living in their own homes were additionally entitled to residential training support, respite care, and transportation.

Maine's waiver application was justified on the assumption that implementation of the waiver would enable the State to avoid building approximately 166 new ICF/MR beds that had been planned and for which the legislature had authorized State funding. Clients would be diverted into home and community-based services instead

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of ICFs/MR. The waiver was approved initially as a 3-year demonstration serving 200 individuals in the first year and an additional 100 clients in each subsequent year, for a total of 400 clients. In this article, we examine the cost-effectiveness of the waiver program in the first year.

Data sources and methods

The principal objective of this study was to evaluate the cost-effectiveness of the waiver program by examining the program's impact on the adaptive behavior achievement of clients served and on Medicaid and other public costs. Adaptive behavior achievement, the degree to which individuals with mental retardation improve their personal and community living skills over time, was the measure of program effectiveness employed in this study.

A quasi-experimental, nonequivalent control group design (Campbell and Stanley, 1966) was employed. The experimental group included 191 clients who received waiver services during the first 12 months of the program (November 1, 1983, through October 31, 1984). Maine actually enrolled 225 clients in its waiver program in the first year. However, nine were dropped from the study because of a lack of cost information, five were placed in an ICF/MR again after their waiver residence was closed because there were problems with residential supervision and no alternate waiver placements could be located for them, and three were dropped from the study because of death. The 115 members of the comparison group were all Bureau of Mental Retardation (BMR) clients recommended by caseworkers for waiver services but not admitted to the program because of limits on the number of placements. A subset of comparison group members consisting of 38 ICF/MR residents is used to compare program costs and effectiveness among three separate groups: waiver clients, ICF/MR clients, and non-ICF/MR clients. In this article, the term "ICF/MR" refers to both community ICFs/MR and the two State institutions for the mentally retarded (the Pineland Center and the Elizabeth Levenson Center), which are also licensed as ICFs/MR.

Baseline data on clients' adaptive behavior skills were obtained from BMR client records, including program intake and assessment records and Individual Program Plans, which are completed and updated for each BMR client. The residential and other service providers most familiar with each client were interviewed to obtain an assessment of the client's progress over the year in achieving goals specified in the care plan. Completed interviews were obtained for 211 of the 306 study participants. The adaptive behavior achievement results reported here are based on these 211 clients.

Measures were developed for six major categories of adaptive behavior: personal activities of daily living (ADLs), instrumental ADLs (IADLs), communication, maladaptive behavior, cognitive skills, and vocational skills. These categories were also combined to form a total adaptive behavior achievement score (Table 1). Each adaptive behavior category was scored on a scale of 0 to 2, with 0 indicating no progress toward achievement of a behavioral goal and 2 indicating achievement of the goal. Although the measures of adaptive behavior achievement are based on subjective assessments and therefore may be subject to bias, any such bias should not affect comparisons of the waiver and comparison groups, as data for both groups were collected in the same manner from the same types of providers.

All costs in this study pertain to a full year for each individual. Cost-related data include Medicaid and other public expenditures for residential and other services (excluding food stamps and social service block grant funds). The cost categories are habilitation (including special education), professional consultation, respite care, transportation, health care, and residential care. Residential care costs include residential training; Supplemental Security Income (SSI); and, when publicly funded, room and board.

The State's Medicaid Management Information System was the sole data source for all Medicaid-reimbursed service costs for both waiver and comparison group clients. Data covering the 12-month study period were obtained on a client-specific basis. Data from the Social Security Administration, also obtained on a client-specific basis, were used to determine SSI payments, social security benefits, veterans' pensions, and railroad retirement pensions. Supplemental residential cost information on boarding home clients was obtained from

Table 1

Variables used in study of Medicaid 2176 waiver for the mentally retarded: Maine, November 1983-October 1984

Variable	Definition
Dependent	
Costs	Total annual per-client costs: residential care (including Supplemental Security Income), day habilitation, routine health care, respite care, case management, consultation, and transportation costs
Adaptive behavior achievement	Scores in 6 areas of adaptive behavior: personal activities of daily living, behavioral problems, instrumental activities of daily living, cognitive skills, communication skills, vocational skills, and total adaptive behavior achievement
Independent	
Group membership	Dichotomous variable: waiver = 0, comparison = 1
	Dummy variable: ICF/MR, non-ICF/MR comparison (waiver group omitted category)
Sex	Dichotomous variable: 0 = female, 1 = male
Level of retardation	Dichotomous variable: 0 = mild or moderate, 1 = severe or profound
History of institutionalization	Dichotomous variable indicating prior residence in a State institution: 0 = no, 1 = yes
Age	Age in years
Health characteristics	Percent of clients with health problems, including problems with mobility, hearing, sight, speech, convulsions, congenital anomalies, central nervous system disorders, and behavioral disorders

NOTE: ICF/MR is intermediate care facility for the mentally retarded.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from the study of Maine's Medicaid waiver program for the mentally retarded.

the State audit division. Finally, a telephone interview survey of service providers was conducted to obtain utilization and unit cost information for day habilitation, transportation, and respite care services for comparison group members whose services were not covered by Medicaid.

Both descriptive and multivariate analyses are employed to assess the impact and cost-effectiveness of the waiver program. Descriptive analyses are used to examine the comparability of the waiver and comparison groups; to compare mean annual per-client costs and adaptive behavior achievement scores for the waiver group, the comparison group, and the subset of the comparison group residing in ICFs/MR; and to estimate aggregate program costs with and without the waiver program. Multiple regression techniques are used to estimate the impact of the waiver on program costs and client adaptive behavior achievement and to evaluate the potential for increased program cost-effectiveness through targeting specific subpopulations.

Waiver program cost effectiveness

Comparing waiver and comparison groups

Because participants in this study were not randomly assigned to the waiver and comparison groups, the issue of selection bias is potentially significant. Any findings of cost savings in the waiver program would be suspect if the program served clients who were less severely disabled than comparison group members or who were less likely to have been placed in an institution or ICF/MR.

We used two approaches to assess the comparability of the waiver and comparison groups. First, we reviewed State government procedures for assignment to the waiver program. Second, we made a baseline comparison of health and disability levels and demographic characteristics of the two groups.

In the review of procedures for waiver placement, we found no discernible bias for placement of less severely handicapped individuals. Five regional bureaus were involved in developing placement opportunities and in making placements. Placements were made largely on a best-match basis, with group placements matched to age and sex. No priority list for placement was developed or used.

As shown in Table 2, the waiver and comparison groups generally had similar health and demographic profiles at the time of program implementation. The groups were remarkably similar in age, sex, level of retardation, mobility status, and history of behavioral disorder. The groups differed on only two variables: Waiver clients were more likely to have bowel or bladder incontinence problems (23.6 percent versus 13.9), and a higher percentage of comparison clients (53.0 percent versus 40.3) had been institutionalized at some point in their lives.

The difference in history of institutionalization may indicate a greater risk of institutionalization among comparison group clients. However, examining clients' residence immediately prior to entering the waiver program, we found that the comparison and waiver clients were equally likely to have been in an ICF/MR

Table 2

Percent distribution of mentally retarded persons in Medicaid 2176 waiver program and comparison group, by selected characteristics: Maine, November 1983-October 1984

Characteristic	Waiver[1]	Comparison[2]
Sex	Percent distribution	
Male	60.7	59.1
Female	39.3	40.9
Age		
21 years or under	29.8	29.6
Over 21 years	70.2	70.4
History of institutionalization[3]		
Yes	40.3	53.0
No	59.7	47.0
Level of retardation		
Mild or moderate	34.6	36.7
Severe or profound	65.4	63.3
Mobility status		
Walks independently	79.4	78.1
Needs mobility assistance	20.6	21.9
Behavioral disorder		
Yes	22.5	21.7
No	77.5	79.3
Incontinence problems[4]		
Yes	23.6	13.9
No	76.4	86.1

[1] $N = 191$.
[2] $N = 115$.
[3] Chi square = 4.698; degrees of freedom = 1; $p = 0.030$.
[4] Chi square = 4.186; degrees of freedom = 1; $p = 0.041$.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from Maine Department of Mental Health and Mental Retardation.

(33 percent of the comparison group and 35 percent of waiver clients). This suggests that clients in the two groups had similar risk of institutionalization at the time of entry into this study.

When comparison group clients are grouped according to residence (ICF/MR and non-ICF/MR), some significant differences in key background characteristics are revealed (Table 3). ICF/MR clients were more likely than either waiver group or non-ICF/MR comparison group clients to be severely or profoundly retarded and to have lived in a State institution. These data suggest that, on average, waiver clients are somewhat less disabled than clients living in ICFs/MR. Because these differences in background characteristics may account, in part, for differences in program costs and client outcomes, they are included as covariates in our multivariate analyses of program cost-effectiveness.

Program costs and outcomes

As shown in Table 4, total annual per-client costs for the waiver and comparison groups were roughly equivalent, $16,388 for waiver clients and $18,335 for the comparison group. This difference is not statistically significant. However, costs differ significantly ($p \leq 0.05$) between the waiver and comparison groups in several specific areas. The comparison group had higher average residential care costs but lower transportation and day

Table 3

Percent distribution of mentally retarded persons in Medicaid 2176 waiver program and in 2 comparison subgroups, by selected characteristics: Maine, November 1983-October 1984

Characteristic	Waiver[1]	Comparison	
		Living in ICF/MR[2]	Not living in ICF/MR[3]
	Percent distribution		
Sex			
Male	60.7	57.9	59.7
Female	39.3	42.1	40.3
Age			
21 years or under	29.8	10.5	39.0
Over 21 years	70.2	89.5	61.0
History of institutionalization[4]			
Yes	40.3	73.7	42.9
No	59.7	26.3	57.1
Level of retardation[5]			
Mild or moderate	34.6	11.4	48.6
Severe or profound	65.4	88.6	51.4
Mobility status			
Walks independently	79.4	76.3	79.0
Needs mobility assistance	20.6	23.7	21.0
Speech status			
Normal	21.3	13.9	25.7
Impaired or aphasic	78.7	86.1	74.3
Behavioral disorder			
Yes	22.5	18.2	29.0
No	77.5	81.8	71.0
Incontinence problems			
Yes	23.6	13.2	14.3
No	76.4	86.8	85.7

[1]N = 191.
[2]N = 38.
[3]N = 77.
[4]Chi square = 14.463; degrees of freedom = 2; p = 0.001.
[5]Chi square = 14.546; degrees of freedom = 2; p = 0.001.

NOTE: ICF/MR is intermediate care facility for the mentally retarded.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from Maine Department of Mental Health and Mental Retardation.

habilitation costs. These differences are attributable to the substantially higher residential costs for comparison group members living in ICFs/MR and to the fact that costs for transportation and day habilitation for comparison group members living in ICFs/MR are usually paid through per diem reimbursement for residential costs.

With regard to program effectiveness, we found higher average adaptive behavior achievement scores in the waiver group than in the comparison group in all but one area, communication skills, where achievement scores were virtually identical (Table 5). Although only the mean score differences between the two groups for IADLs are statistically significant, a consistent pattern of higher achievement scores among waiver clients can be seen.

Because the rationale for the waiver program is to divert individuals from institutional or ICF/MR placement, one important question is whether total program costs are equal to or less than the costs that

Table 4

Mean annual per-client cost for mentally retarded persons in Medicaid 2176 waiver program and comparison group, by cost category: Maine, November 1983-October 1984

Cost category	Waiver	Comparison
	Mean annual per-client cost	
Total program costs[1]	$16,388	$18,335
	(191)	(115)
Transportation[2]	1,721	121
	(14)	(82)
Respite care	300	29
	(1)	(41)
Routine health care[3]	1,462	1,359
	(187)	(102)
Day habilitation[4]	5,150	4,466
	(183)	(82)
Residential care[5]	9,866	13,848
	(191)	(115)

[1]t = 1.26; degrees of freedom = 147.8; p = 0.2108.
[2]t = −2.56; degrees of freedom = 13.2; p = 0.0234.
[3]t = 0.21; degrees of freedom = 281; p = 0.8316.
[4]t = −2.09; degrees of freedom = 115.4; p = 0.0388.
[5]t = 2.60; degrees of freedom = 134.9; p = 0.0104.

NOTE: Number of persons shown in parentheses.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from Maine Medicaid Management Information System, Maine Department of Human Services.

Table 5

Adaptive behavior achievement scores for mentally retarded persons in Medicaid 2176 waiver program and comparison group, by type of score: Maine, November 1983-October 1984

Type of score	Waiver	Comparison
	Mean score[1]	
Total achievement	1.44	1.36
	(141)	(70)
Personal activities of daily living	1.43	1.32
	(108)	(47)
Behavior	1.43	1.34
	(102)	(43)
Instrumental activities of daily living[2]	1.53	1.15
	(73)	(31)
Cognitive	1.43	1.33
	(65)	(36)
Communication	1.48	1.49
	(53)	(41)
Vocational	1.38	1.27
	(37)	(15)

[1]0 = no improvement, 1 = some improvement, 2 = significant improvement.
[2]t = 2.4464; degrees of freedom = 102; p = 0.0101.

NOTE: Number of persons shown in parentheses.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from client records and survey of case managers.

would have been incurred had waiver program recipients been institutionalized. For this reason, we compare waiver clients' costs with those of the 38 comparison group clients living in ICFs/MR.

As indicated in Table 6, total annual program costs were significantly ($p \leq 0.01$) higher for ICF/MR residents ($37,251) than for either members of the waiver group ($16,388) or members of the non-ICF/MR comparison subgroup ($9,000). Cost differences among the three groups are attributable to higher residential and day habilitation costs for ICF/MR residents. It should be noted that many non-ICF/MR comparison group clients

Table 6

Mean annual per-client cost for mentally retarded persons in Medicaid 2176 waiver program and in 2 comparison subgroups, by cost category: Maine, November 1983-October 1984

Cost category	Waiver	Comparison: Living in ICF/MR	Comparison: Not living in ICF/MR
	Mean annual per-client cost		
Total program costs[1]	$16,388.00 (191)	$37,251.00 (38)	$9,000.00 (77)
Transportation	1,721.00 (14)	—	140.00 (71)
Respite care	300.00 (1)	—	38.00 (32)
Routine health care[2]	1,462.00 (187)	1,256.00 (38)	1,420.00 (64)
Day habilitation[3]	5,150.00 (183)	6,077.00 (11)	4,127.00 (71)
Residential care[4]	9,886.00 (191)	34,236.00 (38)	3,787.00 (64)

[1] $F = 170.90$; degrees of freedom = 2, 303; $p = 0.0001$.
[2] $F = 0.04$; degrees of freedom = 2, 286; $p = 0.9575$.
[3] $F = 6.70$; degrees of freedom = 2, 262; $p = 0.0014$.
[4] $F = 328.88$; degrees of freedom = 2, 303; $p = 0.0001$.

NOTES: ICF/MR is intermediate care facility for the mentally retarded. Number of persons shown in parentheses.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from Maine Medicaid Management Information System, Maine Department of Human Services.

were living in their own homes and were therefore ineligible for residential training support or room and board support. Substantial costs for these individuals, borne by their families, are not reflected in our analyses of program cost.

Impact of waiver program

Utilizing multivariate regression equations, we evaluated the impact of the waiver program on client program costs and adaptive behavior achievement while controlling for the effects of other potentially important explanatory variables: client age, sex, level of retardation, and history of institutionalization. Again, we compared the waiver clients with the full comparison group and with the two subpopulations of comparison group members (ICF/MR and non-ICF/MR clients). The results of these analyses are summarized in Table 7.

Annual per-client program costs were $1,400 lower in the waiver group than in the comparison group. These differences are not statistically significant, however. The services that waiver program participants received appear to have been more effective than the services that comparison group participants received in improving client adaptive behavior achievement. Waiver clients had significantly higher total adaptive behavior achievement ($p \leq 0.05$) and higher IADL ($p \leq 0.10$) and personal ADL scores ($p \leq 0.05$) than members of the comparison group had. These findings suggest that, controlling for client characteristics, the waiver program is cost effective compared with nonwaiver service and program alternatives for the comparison population.

When compared with the ICF/MR program, the Medicaid waiver has been effective in reducing per-client costs while producing equivalent, if not better, client outcomes. As indicated in Table 7, annual per-client costs were approximately $20,546 lower in the waiver program than in the ICF/MR group ($p \leq 0.01$). Adaptive behavior achievement scores in the waiver group were either equal to or significantly higher than those in the ICF/MR group.

The cost-effectiveness of the waiver program is not as clear when compared with the non-ICF/MR comparison subgroup. Per-client waiver program costs were $7,246 per year higher than those of the non-ICF/MR group. Waiver clients appear to have achieved somewhat higher adaptive behavior achievement scores, although only the difference for IADLs is significant. We cannot determine from these data, however, whether the higher costs associated with the waiver program are justified by these marginal improvements in client outcomes.

Waiver program targeting

One critical policy question facing Federal and State policymakers is whether the cost-effectiveness of programs like the Medicaid 2176 waiver can be enhanced

Table 7

Regression results for impact of Medicaid 2176 waiver program for the mentally retarded on cost and client adaptive behavior achievement scores: Maine, November 1983-October 1984

Dependent variable	Waiver group compared with total comparison group[1]: Coefficient	t	Waiver group compared with[2]: Persons living in ICF/MR: Coefficient	t	Waiver group compared with[2]: Persons not living in ICF/MR: Coefficient	t
Annual per-client cost	$1,400	1.086	$20,546	***14.30	–$7,246	***–6.94
Client adaptive behavior achievement score:						
Total achievement	–0.23	**–2.31	0.07	0.80	–0.13	–1.48
Instrumental activities of daily living	–0.36	*–1.73	–0.45	**–2.26	–0.39	*–1.89
Personal activities of daily living	–0.37	**–2.18	0.06	0.40	–0.12	–0.79

* Statistically significant at the $p \leq 0.10$ level.
** Statistically significant at the $p \leq 0.05$ level.
*** Statistically significant at the $p \leq 0.001$ level.
[1] Regression analysis conducted with waiver group = 0 and comparison group = 1.
[2] Regression analysis conducted with waiver group as omitted category.

NOTE: ICF/MR is intermediate care facility for the mentally retarded.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from the study of Maine's Medicaid waiver program for the mentally retarded.

through more effective targeting of specific populations at risk of institutionalization. To examine this question, we constructed split-sample regression models for estimating program impact within specific subpopulations. By comparing the coefficients in these models, we are able to assess the difference in program impact (measured in annual per-client costs) between clients with a history of institutionalization and those without such a history; between clients who are severely or profoundly retarded and those who are moderately or mildly retarded; and between older and younger clients (controlling for other variables).

As indicated in Table 8, the impact of the waiver program on annual expenditures is greatest among severely or profoundly retarded clients, who represent 65 percent of all waiver clients. Among clients with severe or profound retardation, the waiver program produced annual per-client savings of $6,240 compared with nonwaiver services. Among clients with moderate or mild retardation, however, the waiver program is associated with a $7,005 increase in annual per-client costs when compared with nonwaiver services and programs. By targeting clients with severe or profound retardation, the Medicaid program would achieve a total savings of $13,245 annually: $6,240 in savings achieved by targeting the program to clients with severe or profound retardation plus $7,005 in averted costs that would have been incurred had the program been targeted to clients with mild or moderate retardation. In light of the fact that program effects on adaptive behavior outcomes are at least as favorable for clients with severe or profound retardation as for clients with moderate or mild retardation, excluding the 35 percent of waiver clients with mild or moderate retardation would significantly improve the overall cost-effectiveness of the waiver program.

Total program impact among clients over 21 years of age ($7,687 per client per year) and among those with a history of institutionalization ($4,623 per client per year), although somewhat smaller than the impact for the severely or profoundly retarded group, is nonetheless substantial. Again, adaptive behavior outcomes for these two groups are at least as favorable as those for other clients.

These findings indicate that the waiver program costs no more (and perhaps a little less) than the range of nonwaiver services being provided to a similar population and has produced significantly better results on some measures of adaptive behavior. On average, the cost-effectiveness of the waiver program is greatest among particular subgroups: the severely or profoundly retarded, those with a history of institutionalization, and older clients (over 21 years of age). In contrast, the waiver program appears to be an expensive option for school-aged clients, those who are moderately or mildly retarded, and those who have not been institutionalized. These clients are cared for less expensively in other program arrangements with little or no effect on client or program outcomes.

Although improved targeting of waiver services is likely, on average, to achieve more cost-effective outcomes, there are undoubtedly individuals in nontargeted groups for whom the waiver program represents an appropriate and cost-effective program alternative. Further, the outcome measures in this study capture only one dimension of program impact on the study participants. There may be significant issues related to client satisfaction and quality of life for both the client and the family that are affected either positively or negatively by the waiver program but are not measured in this study.

The greater costs of waiver than nonwaiver services provided to the mildly and moderately retarded could also be justified if the waiver program were associated with substantially better outcomes for these clients. Indeed, the waiver clients within this group, on average, scored higher than their counterparts in the comparison group, but the differences in gains were not as great as differences for the more severely retarded. These analyses suggest that, in the absence of the waiver, mildly or moderately retarded clients would receive fewer services or would be served in less expensive residences and programs but would have adaptive behavior outcomes similar to those in the waiver program. These clients apparently are not at risk of institutionalization and are therefore not the best candidates for the waiver program.

The findings regarding the effectiveness of program targeting should not be seen as a basis for narrowing program eligibility to older and more severely retarded individuals. Rather, they suggest the need for effective preadmission screening criteria and procedures to ensure that the waiver program is directed toward those at greatest risk of institutional placement.

Table 8

Split-sample analysis regression results for impact of targeting specific groups in Medicaid 2176 waiver program for the mentally retarded: Maine, November 1983-October 1984

	Target group					
	Severely or profoundly retarded		Clients with history of institutionalization		Clients over 21 years of age	
Type of client	Coefficient	*t*	Coefficient	*t*	Coefficient	*t*
	Impact on annual program per-client costs					
Target clients	–$6,240	***–3.32	–$3,816	*–1.83	–$3,154	**–1.96
Other clients	$7,005	***5.23	$807	0.50	$4,533	*1.94
Percent of waiver clients	65.4		40.3		70.2	

* Statistically significant at the $p \leq 0.10$ level.
** Statistically significant at the $p \leq 0.05$ level.
*** Statistically significant at the $p \leq 0.001$ level.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from the study of Maine's Medicaid waiver program for the mentally retarded.

Aggregate Medicaid expenditures

The cost-effectiveness of the waiver program depends largely on whether clients served in the program would have resided in ICFs/MR in the absence of the waiver program. Our previous analyses show that any savings attributable to the waiver program must be predicated on the assumption that clients would have been cared for in this more expensive setting.

The design of this study does not allow us to determine precisely how many waiver clients would have been in ICFs/MR in the absence of the waiver. However, 66 of the waiver clients (35 percent) resided in an ICF/MR immediately prior to entering the waiver program. If we assume that, at a minimum, these 66 clients would have remained in ICFs/MR in the absence of the waiver, we can compare the aggregate costs of the waiver program with the costs that would have been incurred had these 66 clients remained in ICFs/MR. According to these analyses, shown in Table 9, total costs are somewhat lower with the waiver program ($3.1 million versus $3.6 million).

This aggregate cost analysis, however, also indicates a shift in the Federal-State share of total expenditures under the waiver program. Without the waiver, the Federal share of total costs would have been an estimated 46.2 percent, or $1,655,607. The Federal share of total program costs with the waiver program in place was 67.4 percent, or $2,109,693. If one assumes that the waiver diverted more placements from ICFs/MR than the 35 percent of waiver clients who were in ICFs/MR prior to waiver program placement, then greater savings have been realized and the shift in Federal funding is less pronounced than this model indicates.

Trends in Medicaid ICF/MR expenditures before and after implementation of the waiver also provide a means for evaluating the impact of the waiver program on Medicaid expenditures. As mentioned earlier, the State government justified the waiver program as a cost-effective way to avoid building new ICF/MR beds that had been planned. In fact, no new ICF/MR beds have been built (beyond those that were already on line) since the waiver was implemented. The rate of growth in Medicaid ICF/MR expenditures declined significantly in Maine following the implementation of the waiver program. These expenditures, which had grown at a rate of 66 percent, 36 percent, and 13 percent, respectively, in the 3 years immediately preceding the startup of the waiver, increased by 1.9 percent and 6.1 percent in the next 2 years (fiscal years 1984 and 1985). Nationally, Medicaid ICF/MR expenditures increased by 14.4 percent from fiscal year 1983 to fiscal year 1985.

Table 9

Estimated aggregate Medicaid costs for treatment of mentally retarded persons with and without 2176 waiver program: Maine, November 1983-October 1984

Waiver status	Number of clients	Mean annual per-client cost	Total annual program cost
No waiver:			
All clients	191	$18,762	$3,583,566
Living in ICFs/MR	66	37,251	2,458,566
Not living in ICFs/MR	125	9,000	1,125,000
Waiver	191	16,388	3,130,108

NOTE: ICF/MR is intermediate care facility for the mentally retarded.

SOURCE: Human Services Development Institute, University of Southern Maine: Data from the Maine Medicaid Management Information System, Maine Department of Human Services.

We cannot attribute all of the decline in the growth of aggregate Medicaid ICF/MR expenditures to the waiver program: At least some of the decline in growth probably stems from a decline in general inflation and the implementation in 1982 of a Medicaid prospective payment system for ICFs/MR. However, these data indicate that, at a minimum, the waiver program did not increase Medicaid expenditures. Medicaid expenditures for ICF/MR services would have increased at a much higher rate had the State proceeded to build the 166 ICF/MR beds that had been planned prior to the waiver program.

Conclusions

Policy debate over the home and community-based waiver program has been focused almost exclusively on its impact on public expenditures for long-term care. Little attention has been paid to the program's impact on client outcomes. According to this study, in its first year, Maine's waiver program had a positive impact on the adaptive behavior achievement skills of the clients served. Waiver group clients achieved significantly higher adaptive behavior scores than comparison group members on items related to instrumental activities of daily living. The waiver group also had higher scores than the comparison group in total adaptive behavior achievement, personal activities of daily living achievement, behavioral problem improvement, and cognitive skill improvement, although these differences were not statistically significant. In general, differences between the waiver and comparison groups in adaptive behavior achievement held up even after controlling for age, level of retardation, and other critical background variables.

Overall, no differences in cost were found between the waiver and comparison groups, but waiver clients achieved significantly higher adaptive behavior scores than comparison group clients. These findings suggest that the waiver program is cost effective compared with the range of service and program alternatives represented in the comparison population.

Compared with the ICF/MR program, the waiver program has been effective in reducing program costs while producing equivalent, if not better, client outcomes in most areas of adaptive behavior. The waiver group's annual per-client costs were approximately $20,500 lower than those of the ICF/MR group, and its adaptive behavior achievement scores were higher in all categories except behavioral problem improvement.

The cost-effectiveness of the waiver program is less easily evaluated when compared with the non-ICF/MR comparison group clients. Waiver clients had higher adaptive behavior achievement scores than non-ICF/MR comparison group clients, but annual costs per client were $7,246 lower for non-ICF/MR clients than for waiver clients.

Although based on a relatively small sample of clients, this study suggests that, in its first year, Maine's waiver was a cost-effective alternative to institutional and ICF/MR placements. According to a conservative estimate, aggregate waiver expenditures were equivalent

to the amount that would have been spent in the absence of the waiver program. Similarly, analyses of trends in Medicaid ICF/MR expenditures indicate that the waiver program has not increased overall Medicaid expenditures. In fact, more modest waiver program costs have substituted for the substantially higher ICF/MR expenditures that would have been incurred had the State proceeded with its planned development of 166 new ICF/MR beds.

Finally, study findings indicate that the waiver program's cost-effectiveness would be significantly enhanced through more effective targeting of clients at risk of institutionalization: severely or profoundly retarded clients, clients over 21 years of age, and those with a history of institutionalization. However, these clients may not always be the most appropriate candidates for the waiver program. There may be important clinical or programmatic reasons for using the waiver program for nontargeted clients that would justify the increase in program costs.

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