

Service Utilization and Cost of Community Care for Discharged State Hospital Patients: A 3-Year Follow-Up Study

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Objective: This study examined the mental health service utilization and costs of 321 discharged state hospital patients during a 3-year follow-up period compared with costs if the patients had remained in the hospital. **Method:** The study subjects were long-stay patients discharged from Philadelphia State Hospital after 1988. A longitudinal integrated database on all mental health and medical services reimbursed by Medicaid and Medicare as well as state- and county-funded services was used to construct service utilization and unit cost measures. **Results:** During the 3-year period after discharge, 20%–30% of the patients required rehospitalization an average of 76–91 days per year. The percentage of rehospitalized patients decreased over time, but the number of hospital days increased. All of the discharged patients received case management services, and a majority also received outpatient mental health care (66%–70%) and residential services (75%) throughout the follow-up period. The total treatment cost per person was approximately \$60,000 a year after controlling for inflation, with costs rising slightly over the 3-year period. The estimated cost of state hospitalization, with the use of 1992 estimates, would have been \$130,000 per year if the patients had remained institutionalized. **Conclusions:** This analysis suggests that most former long-stay patients are able to live in residential settings while receiving community outpatient treatment and intensive case management services at a reduced cost. There is no indication of cost shifting from the psychiatric to the health care sector; however, some cost shifting from the state mental health agency to the Medicaid program has occurred, since most psychiatric hospital care now takes place in community hospitals.

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In recent years, state hospital closings have occurred in states where considerable deinstitutionalization has already taken place (1). The last patients to be discharged are generally long-term residents who have extremely low levels of psychosocial functioning, adaptive behavior, and coping skills (2–4). Although several

studies (5, 6) have monitored the functioning of state hospital patients after discharge, limited information is available on the type of services and expenditures required to maintain these individuals in a community setting over time.

The closing of Philadelphia State Hospital in 1990 provided the opportunity for a natural experiment to examine the patterns of care and expenditures associated with maintaining a population of seriously mentally ill people in the community. In a previous study of the Philadelphia State Hospital closure (7), annual utilization of psychiatric services and cost of care were reported for an admission cohort of patients whose length of stay was generally under a year. This type of patient was found to be more costly to treat after the state hospital closed.

The current follow-up study investigated the annual utilization and cost of community care of the resident, or long-stay, Philadelphia State Hospital population

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after discharge to the community. The analysis tested the hypothesis that community costs for former long-stay patients are significantly less than institutional care would have been, since residential accommodations and case management services are expected to substitute for state hospital care at a much reduced cost level. The cost perspective chosen for this study was that of the funding agencies and, for the most part, involved direct expenditures for treatment.

Prior studies of long-stay psychiatric patients discharged to community residences found that despite the fact that clinical symptoms before and after discharge are not significantly different, most former patients prefer living in the community rather than in institutional settings (2, 6, 8–11). Functional status outcomes, however, vary among studies, with many investigators reporting improvement in daily living skills (8, 12), social interaction (6, 8, 13), and overall level of functioning (2, 10, 13). The 32-year Vermont Longitudinal Study (14) of formerly institutionalized patients found that more than 50% of the population achieved considerable improvement in functioning over time. A 1989 study of 46 patients discharged over a period of 4 years from the Vermont State Hospital (15, 16) found that most patients were satisfied with their community living situation in comparison with institutionalization, despite the fact that the researchers noted a low level of community integration. Approximately 74% of the former patients lived in structured community housing, and 87% had been rehospitalized at some point during the follow-up period.

A study monitoring service utilization and cost (unpublished report by E. Wright et al., 1997) followed 262 psychiatric patients discharged from Indiana Central State Hospital in 1994. The results showed that the average annual treatment cost for a group of predominantly male long-stay patients with a diagnosis of schizophrenia was \$50,309, 19.2% lower than the preclosure cost of \$58,478.

Beginning in 1986, baseline data on more than 700 long-stay patients were collected in two London hospitals slated for closure. The 1-year follow-up done by the Team for the Assessment of Psychiatric Services (TAPS) (17) found little change in patients' psychiatric symptoms or social behavior problems. Approximately 18% were transferred to community inpatient wards and remained as inpatient residents, while the rest were placed in residential homes, nursing homes, sheltered housing, and independent living or with families. Despite little change in clinical and social functioning, discharged patients were appreciative of their increased freedom and wished to stay in the community (5).

A subsequent analysis of community costs for the initial TAPS discharge patients (18) found a 25%–47% reduction in annualized spending compared with that for patients residing in the hospital. However, results from a prediction model used by Knapp et al. (18) suggested that a much smaller cost reduction would be found when the more difficult-to-place patients, who were awaiting placement, were added to

the case mix. More recent figures, based on actual data, supported the prediction model, since community care costs were slightly higher than costs of institutional care. Nonetheless, TAPS investigators believe that the funds released by the closing of psychiatric hospitals were sufficient to reinvest in community replacement services (5).

In summary, the literature on the findings of prior state hospital studies suggests that the discharged long-stay patient can be maintained in a community setting with little if any deterioration in clinical status and marginal improvement in levels of functioning over time. Furthermore, most patients show an unambiguous preference for life in the community versus an institutional setting. However, the TAPS project in England was the only study to examine the cost of treating discharged patients in the community over a period of several years. The Philadelphia State Hospital closure provided a unique opportunity to do a similar analysis, since comprehensive service and cost data were available from a longitudinal integrated database that has been tracking clients in the public mental health system over the last decade (7, and unpublished report by E. Rothbard et al., 1996).

Before its closure in late 1990, Philadelphia State Hospital was a middle-sized state hospital providing intermediate and long-term psychiatric care to approximately 500 patients. The hospital served the Philadelphia area, which had a population of 1.6 million during the study period. At any one time, 70% of the Philadelphia State Hospital residents were considered long-stay patients, since acute care psychiatric episodes were treated in community hospitals that admitted involuntary as well as voluntary patients. Thus, any Philadelphia State Hospital admission required a prior psychiatric hospital stay of more than 30 days.

Following the closure of Philadelphia State Hospital, the Philadelphia Office of Mental Health received \$50 million annually from the state mental health agency to provide community accommodations and ambulatory care for the residents in the hospital as well as for a projected 250–300 patients who, on an annual basis, might require extended psychiatric care. All discharged patients were assigned to a Community Treatment Team consisting, at the time, of former state employees of Philadelphia State Hospital who were retrained to deliver services in a community setting. The Community Treatment Team provides intensive case management services to the vast majority of patients discharged from Philadelphia State Hospital, as well as a range of housing and support services (19, 20). An extensive network of 12 community mental health centers offer a wide variety of ambulatory services to which patients are referred by the Community Treatment Team staff.

To substitute for the intermediate and long-term beds previously furnished by Philadelphia State Hospital, 60 extended acute care beds in two community hospitals and 100 long-term structured residential beds with 24-hour supervision were added to the public system. Also,

TABLE 1. Characteristics of Long-Stay State Hospital Patients at Discharge (N=321)

Variable	N	%
Male sex	208	65
Race		
African American	146	45
White	159	50
Other	16	5
Age (years)		
≤30	32	10
31–40	104	32
41–50	67	21
51–60	49	15
61–70	46	14
≥71	23	7
Marital status		
Married	8	2
Not married	267	83
Unknown	46	14
Diagnosis		
Schizophrenia	268	83
Affective disorder	13	4
Other	40	12
Length of last episode at Philadelphia State Hospital (years)		
2–5	136	42
6–10	97	30
11–20	48	15
≥21	40	12

483 residential beds in over 50 residential facilities were contracted for with the use of state hospital replacement funds. These beds, along with the 650 beds already available in the community, provided a range of maximum to moderate supervision and support services on site. Furthermore, funding from a collaborative Robert Wood Johnson and Department of Housing and Urban Development grant in the mid-1980s helped to create supported living sites for over 200 persons with serious mental illness, and 300 low-demand housing accommodations for homeless persons with serious mental illness were recently made available through local funds. Thus, residential beds in nonhospital settings increased from 650 in the late 1980s to 1,733 in the 1990s. An extensive description of the community replacement system can be found in a prior publication (1).

In contrast to other state hospital closures, the Philadelphia State Hospital closure had several unique features. Most important, housing opportunities and specialized services were developed from the outset, because the state provided start-up funds before patients were discharged. Furthermore, there was a legal mandate to monitor, evaluate, and provide extensive case management services to the discharged population as a result of a class action suit by consumers and clients. Finally, a long history of support for community care in Philadelphia by imaginative leaders and consumer advocates provided a rich environment for this type of system change.

METHOD

The original study group consisted of 329 individuals discharged from Philadelphia State Hospital at the time of its closure in April

1988 or transferred to an adjoining state hospital and subsequently discharged between 1989 and December 1993. The selection criteria were based on the length of state hospitalization and the ability to live in a community setting. The subjects were all long-stay residents of 1 year or more who were not in the geriatric or forensic wards. This definition for long stay has been used in several other studies of state hospital patients (5, 21, 22) and is also based on an empirical analysis by Fisher et al. (23) showing the probability of discharge from state hospitals to be extremely low 200 days after admission.

A one-group pretest-posttest design was used to examine service utilization and costs of the subjects over a 3-year period. Each person had a time line that began on the date of his or her state hospital discharge. Individuals were included in annual estimates only if a full year's worth of data were available for them. Data from the first year consisted of service utilization by all subjects except eight individuals who died during the year. Year 2 data contained information on 94% (N=309) of the original study group, and year 3 data are based on 86% (N=283) of the discharged subjects. The smaller number of observations in the follow-up years reflects both deaths (24 people died during the 3-year period) and incomplete utilization information due to lags in the claims files for subjects discharged in later years.

Service utilization and expenditure data are patient-specific, covering the time period between 1988, when the first patient was discharged, through 1994. A composite data set was developed with the use of Medicaid and Medicare claims records, as well as automated county and state patient records. County provider contracts provided additional information on residential care, outpatient programs, and Community Treatment Team services. The state hospital reporting data were used for demographic and diagnostic information as well as prior length of stay, and state budget reports were used to develop per diem estimates. Shelter admission data were obtained from the county Office of Services to the Homeless and Adults and criminal justice information from the Pennsylvania Commission on Crime and Delinquency. No direct client contact was involved in the study, and all identifiers were removed once data were merged.

Average utilization rates per user and unit costs per subject were constructed by type and year of service. The per-subject measure is the mean value of the study group, whereas the per-user measure characterizes the care for subjects who received services in the year. Service units were measured in days, visits, or contracts, and pharmaceutical information was based on the type of psychotropic drug and the percentage of users. Service data from various funding sources were integrated across data files and any duplicate claims were eliminated (24).

Unit costs were calculated in 1992 dollars with the use of paid claims, program budgets, and contracts. State hospital costs were derived from Philadelphia State Hospital budget figures that included personnel and operating expenses and fixed assets. The cost of operating Philadelphia State Hospital was constructed by projecting the hospital's 1989 costs to 1992 on the basis of the rate of increase documented in contiguous state hospitals. The projected number of "staffed" beds was used to estimate total bed-days and divided into the 1992 Philadelphia State Hospital budget figure to develop a per diem bed-day cost. The Philadelphia State Hospital cost figures did not allow us to differentiate between long-stay patients and the forensic and geriatric patients, who were excluded from the study. Furthermore, since capital valuations were only available for Philadelphia State Hospital, unit program costs and fees were used as a proxy for long-run marginal opportunity costs. Purportedly, fees are set at a level that covers both revenue and capital costs and reflect the monetary resources required to produce one additional visit or unit of service or to treat one more client (25).

RESULTS

Table 1 shows the sociodemographic and prior hospitalization characteristics of 321 subjects at the time of discharge. The group was predominantly male and unmarried, with a diagnosis of schizophrenia. The mean age was 46 years (SD=14.4; median=43). The

mean length of the state hospital stay was 3,556 days (SD=4,111; median=2,069), with 58% of the subjects hospitalized more than 5 years. Approximately 81% were eligible for Medicaid, and 68% received Supplemental Security Income (SSI) after discharge.

Service Utilization Rates

Utilization of psychiatric services. Table 2 shows percentages of users and services per user during the first year after discharge. In year 1, 30% of the study group were rehospitalized for psychiatric treatment, including 5% who required long-term care. Acute psychiatric care declined from 27% to 20% by year 3, with long-term care remaining fairly constant throughout the study period.

The mean annual number of days of psychiatric hospitalization per user was 76 (SD=82.9) during the first year, increasing to 91 days (SD=109.8) by year 3. During the 3-year study period, 52% of the discharged population had no psychiatric inpatient care, while 11% received inpatient care continuously or repeatedly each year.

With respect to ambulatory care, all discharged patients were engaged in some form of outpatient mental health services throughout the 3-year follow-up period. Intensive case management services were provided to all clients, primarily by Community Treatment Team staff. In addition, Community Treatment Team staff provided medication monitoring, drug administration, evaluations, advocacy, and linkage activities. Individual-level data were not available at the time for these services; however, costs are captured in the Community Treatment Team budget.

One of the services considered to be a substitute for hospitalization is partial hospital care. One-half of the study group received partial care in their first year, while 31% received social and vocational rehabilitation. Over the years, partial care declined from 50% in the first year to 41% in the third year, while more subjects received rehabilitation services (i.e., 31% in the first year versus 47% in the third year). As former patients adjusted to the community, more of them engaged in social and vocational programs in place of partial hospital programs. However, for those continuing to use these services, the intensity increased over time, a possible indication that those who continued may have been more disabled.

Utilization of psychotropic medications. On an annual basis, at least 74% of the study subjects received psychotropic medication documented by Medicaid pharmacy data. However, we believe that this figure represents a conservative estimate of medication use, since there may have been other funding sources for medication that were not known to the research team. We noted a substantial medication trend in the use of new antipsychotic drugs, particularly the introduction of clozapine treatment (26). During the first year after discharge, 10% of the study group received clozapine; the rate increased to 22% in year 3.

TABLE 2. Annual Service Utilization by Long-Stay State Hospital Patients in the First Year After Discharge (N=321)

Treatment	Subjects With Service Contact		Per-User Units	
	N	%	Mean	SD
Psychiatric services				
Inpatient (days)				
State hospital	15	5	157.0	106
Extended acute care	9	3	108.6	54
Acute care	85	27	47.8	40
Any inpatient days	97	30	76.2	83
Residential (days)	236	74	309.3	103
Outpatient (hours)				
Partial hospitalization	159	50	459.7	364
Rehabilitation	98	31	477.4	446
Psychotherapy	91	28	5.8	9
Any outpatient use	224	70		
Emergency visits	13	4	1.2	1
Intensive case management (hours)				
Any psychiatric outpatient use	321	100	66.9	108
Psychotropic medication				
Clozapine	32	10		
Other	229	71		
Any medication use	236	74		
Drug and alcohol services				
Inpatient (days)				
Outpatient (contacts)	8	3	18.1	25
Any drug and alcohol service use	14	4	15.0	32
Health care services				
Inpatient (days)				
Outpatient (physician contacts)	31	10	17.5	34
Health care				
Mental health care	147	46	3.6	3
Drug and alcohol services	53	17	2.5	3
Any outpatient contacts	2	1	2.0	1
Any outpatient contacts	159	50	4.2	4
Any health care service use	168	52		

Utilization of residential care. Approximately 75% of the discharged group lived in subsidized residential care settings for a mean of 309 days (SD=103) in year 1; this increased to 349 days (SD=56) in year 3. Approximately 21% lived in small group home settings with fewer than six people, and 79% lived in larger facilities that accommodated up to 30 people. Most facilities have staff supervision during the day and night, and the majority of clients receive mental health treatment off site.

Utilization of drug and alcohol treatment. Although the literature on serious mental illness and substance abuse shows a high rate of comorbidity, only 1%–3% of the discharged patients received inpatient drug and alcohol treatment during the 3-year follow-up period. The mean number of hospital days per user was 18 (SD=2.3) in year 1 and increased to 21 days (SD=30.5) in year 3.

Similarly, 1%–3% of the study group received outpatient drug and alcohol treatment, with the per-user average ranging from six visits (SD=2.3) to 15 visits (SD=32.4). There was also great variability in utilization, with one subject visiting the outpatient clinic 95

TABLE 3. Annual Cost of Long-Stay Hospital Patients in the First Year After Discharge (N=321)

Treatment	Cost per Subject (\$)		Cost (\$)		
	Mean ^a	SD	Median	Minimum	Maximum
Psychiatric services					
Inpatient					
State hospital	2,626	14,272	0	0	121,720
Extended acute care	1,217	7,962	0	0	78,800
Acute care	7,623	17,693	0	0	125,269
All inpatient services	11,467	25,999	0	0	173,001
Residential	30,152	25,235	26,645	0	84,315
All inpatient and residential	41,619	31,989	42,167	0	177,099
Outpatient					
Partial hospitalization	1,503	2,271	0	0	9,192
Rehabilitation	1,108	2,506	0	0	11,400
Psychotherapy	34	114	0	0	1,008
Emergency visits	2	9	0	0	108
Intensive case management and other Community Treatment Team program services ^b	9,624	—	9,624	9,624	9,624
All outpatient services	12,270	3,690	10,588	9,624	24,579
Psychotropic medication					
Clozapine	397	1,512	0	0	11,063
Other	513	651	322	0	3,990
Any medication	910	1,578	376	0	11,063
All psychiatric services	54,799	32,619	57,384	9,624	190,892
Drug and alcohol services					
Inpatient	247	2,417	0	0	40,578
Outpatient	10	136	0	0	2,423
All drug and alcohol services	257	2,434	0	0	40,833
Health care services					
Inpatient	1,820	12,520	0	0	173,273
Outpatient					
Health care	46	77	0	0	393
Mental health care	8	27	0	0	190
Drug and alcohol services	0	5	0	0	79
Any outpatient	55	87	0	0	393
All health care services	1,875	12,531	19	0	173,528
Total	56,931	35,023	60,663	9,624	219,000

^a Subject means were calculated by dividing the amount of expenditures by the total number of study subjects per year.

^b Other Community Treatment Team services include assessment, evaluation, service coordination, medication management, transportation, etc.

times in the first year, 73 times in the second, and 43 times in the third year; the rest had 1–10 visits a year.

Utilization of medical care. Besides comorbidity of mental illness and substance abuse, persons with serious mental illness are reported to have a substantial number of unmet health care needs of a fairly serious nature, given the increased mortality rates found in this population (27, 28). During the 3-year period after discharge, between 8% and 10% of the study subjects were hospitalized annually for medical reasons. The main reasons were symptoms, signs, and ill-defined conditions; injury and poisoning; diseases of the respiratory system; diseases of the circulatory system; and diseases of the skin and subcutaneous tissue. In the year before discharge, 6% were hospitalized 23 times for similar medical problems.

The percentage of individuals having a physician contact for medical care other than psychiatric treatment was 46% in year 1 and remained constant throughout the study period. The mean number of physician contacts per user ranged from 3.6 (SD=3.1) to 4.6 (SD=4.4) per year. The major reasons for a visit were symptoms, signs, and ill-defined conditions; injury and poisoning; diseases of the nervous system; dis-

eases of the respiratory system; diseases of the circulatory system; and endocrine, nutritional, and metabolic diseases. This compares with an annual user rate of 78% for the general population (which includes children and the elderly) and an average of four to five ambulatory medical visits (29).

Expenditure Patterns

Table 3 shows the mean and median expenditures per subject for the first year after discharge. All expenses are based on 1992 dollar figures.

Psychiatric costs. In the first year after discharge, the annual inpatient cost per subject for all psychiatric hospitalization was \$11,467. The majority of the inpatient expenditures (i.e., 66%) were for acute care days in a general hospital. A few patients returned to a state hospital setting other than Philadelphia State Hospital when no appropriate community placements were available. The annual cost of all outpatient services was \$12,270 per subject. Almost 75% of these costs were associated with services provided by the Community Treatment Team.

Residential costs. The mean housing cost of persons living in subsidized residences was \$30,152 per subject

TABLE 4. Annual Cost of Long-Stay State Hospital Patients in the 3 Years After Discharge

Treatment	Cost (\$)					
	Year 1 (N=321)		Year 2 (N=309)		Year 3 (N=283)	
	Average Cost per Subject	Percent of Total Cost	Average Cost per Subject	Percent of Total Cost	Average Cost per Subject	Percent of Total Cost
Psychiatric services						
Inpatient	11,467	20.1	12,446	20.2	9,870	16.1
Residential	30,152	53.0	33,509	54.4	35,642	58.0
Outpatient	12,270	21.6	13,031	21.1	13,532	22.0
Medication	910	1.6	1,316	2.1	1,687	2.7
All psychiatric	54,799	96.3	60,302	97.9	60,730	98.9
Drug and alcohol services						
Inpatient	247	0.4	243	0.4	140	0.2
Outpatient	10	0.0	7	0.0	2	0.0
All drug and alcohol	257	0.5	250	0.4	142	0.2
Health care services						
Inpatient	1,820	3.2	1,010	1.6	503	0.8
Outpatient	55	0.1	58	0.1	58	0.1
All health care	1,875	3.3	1,068	1.7	562	0.9
Total	56,931	100.0	61,620	100.0	61,433	100.0

annually. The cost of domiciliary care, boarding homes, and family housing is not included; however, they were likely paid for out of monthly SSI benefits, which the majority of the discharged patients received once they left the state hospital. These welfare transfer costs were excluded from this analysis.

Pharmaceutical costs. The annual cost per subject for typical psychotropic medications was \$513, whereas the cost of clozapine was \$397 per subject and \$4,000 per user.

Drug and alcohol treatment costs. Only a few clients received drug and alcohol treatment services; thus the annualized cost per subject was \$257.

Health care costs. The mean cost of hospitalization for medical treatment was \$1,820 per subject during the first year after discharge. Despite the fact that 50% of the discharged patients received physician-related services in the outpatient setting, the cost was only \$55 per subject. The mean total expenditure for medical care was \$1,875 per subject.

In summary, the cost of an annual service package for discharged patients was approximately \$60,000 in the first year after discharge. As expected, psychiatric care comprised 96% of the total cost, and the residential care component contributed the largest portion of the care package (53%).

The second- and third-year costs are shown in table 4. An increasing cost trend is noted in areas other than psychiatric inpatient and medical care, which show a decrease. The total expenditure was \$61,620 per subject in year 2 and \$61,433 per subject in year 3.

Other Relevant Findings

Several other findings merit discussion. First, a 7% death rate was recorded in the discharged patient group during the study period (the mean age of those who died was 62 years). Although this rate is considered high in a nongeriatric population, an investigation into the circumstances surrounding the deaths found that most of the them were due to natural causes, with

no recorded suicides. Second, an investigation of the extent to which discharged state hospital patients end up in homeless shelters or jails found that only 2% of discharged patients were admitted to a homeless shelter between 1990 and 1994, and only 2% were arrested, with two people convicted for offenses such as assault, recklessly endangering, and possessing an instrument of crime.

DISCUSSION

Although large numbers of state psychiatric hospitals are downsizing or closing throughout the United States and abroad, little empirical information is available on the service levels and cost required to treat seriously mentally ill persons in the community over time. The results of this study suggest that the direct treatment costs of former long-stay state hospital patients are at least 50% less than institutional care would have been in Philadelphia State Hospital (i.e., \$60,000 annually per person, in 1992 dollars, in the community versus ~\$130,000 at the state hospital). The \$60,000 cost figure includes health and behavioral health services as well as residential accommodations. These costs increased slightly over the 3-year postdischarge period after control for inflation. Furthermore, despite the decrease in psychiatric costs, cost shifting between the psychiatric and health care sectors is not evident. However, we see a reallocation of dollars within the mental health sector from institutional beds operated by the state to residential beds operated by private providers. Also, postclosure hospital care was shifted from the state mental health agency to the Medicaid program, which now pays for both acute and extended acute care beds.

The reduction in cost after state hospital closure for the long-stay patients is in striking contrast to our findings for admission, or short-stay, patients (7). The annual psychiatric costs alone of the latter increased from

\$48,631 to \$66,794 in the postclosure era. Not surprisingly, the short-stay patient's largest cost is psychiatric hospitalization, whereas the long-stay patient's is residential care.

Also, concerns about the 7% mortality rate among the discharged patients are unfounded in persons with schizophrenia, whose standardized mortality ratio is more than 1.5–3.0 with respect to the general population. Other studies (30, 31) suggest that it is 2.5 times as great for those under 40 years of age. Furthermore, there was little evidence relating state hospital closures to transinstitutionalization, since we found surprisingly low rates of shelter and jail admissions. Similar to our Philadelphia State Hospital study findings, TAPS researchers found that only 1% of discharged patients had a homeless episode in the first year after discharge, and only two persons were imprisoned, with five others sent back to psychiatric facilities for assault-type crimes (32). Both studies provide empirical evidence that the increased number of mentally ill living on the streets is not the result of emptying the mental hospitals. A more likely cause is inadequate housing for people with marginal income support, as well as poor follow-up care for patients leaving an acute care hospital after a crisis episode.

There are several limitations regarding the data, the study design, and the method of determining costs that merit discussion. Regarding completeness of data, information on outpatient drug and alcohol treatment funded through non-Medicaid dollars was not available on a patient-specific level because only aggregate data were reported by county-funded programs at the time of the study. Thus, the small number of subjects receiving substance abuse services may be an underestimate given the literature on comorbidity. On the other hand, Community Treatment Team program staff felt that the low utilization rates were accurate and were more likely due to a lack of appropriate services for individuals with dual diagnoses.

Although the pre-post study design used in this analysis is not ideal for comparing alternative service delivery systems (33), few alternatives exist for investigating major system changes. TAPS investigators tried using a quasi-experimental design in which the hospital patients waiting for discharge were used as a comparison group for those discharged to the community. The design was abandoned when they found that the hospital group differed in their needs when they were compared with the earlier discharged groups, who were easier to place and whose care was much less expensive. Also, the cost of the hospital comparison group increased as the hospital emptied out, since fewer patients were there to spread the fixed costs. In the final set of cost analyses (5), the TAPS team combined all the discharged groups to reflect an average cost, similar to the approach used in this study.

The cost perspective used in this study did not include the social welfare system, the consumer, and society. For example, transfer costs such as social security income (SSI or Social Security Disability Insurance),

which many discharged patients are eligible to receive, were not included. If we assume that two-thirds of our subjects received SSI, this would have increased the cost to the state welfare agency by \$8,724 annually for those individuals (i.e., \$727 per month for SSI in Pennsylvania in 1992). A substantial portion of this money is used to pay for residential accommodations as well as daily out-of-pocket expenses such as clothing, food, and transportation.

Chisholm et al. (34) noted that there are additional hidden costs of closing hospitals, such as the cost of running two systems at the same time. Other relevant costs related to personal consumption or individual living expenses outside the hospital and, more important, the social costs associated with increased family burden require investigation (34). This last cost, although difficult to value in monetary terms, is of great concern to those who become caretakers as the burden is more and more shifted away from institutions. Solomon and Draine (35) found that families of discharged patients were satisfied with community care, although they felt more burden than before. Weisbrod et al. (36) and Dickey et al. (37) estimated family burden to be less than 1% of total costs; however, Wolff et al. (38) estimated a 10% cost as the most conservative. This area requires more intensive follow-up.

Although not a limitation of this study per se, the lack of patient outcome information restricts the scope of our findings to that of cost efficiency, whereas our ultimate objective is that of cost-effectiveness. We can nominally address the issue of patient outcomes on the basis of a prior study by Solomon (11) on patients discharged from Philadelphia State Hospital and on evidence from other studies such as the TAPS study (32). Solomon found that patients discharged from Philadelphia State Hospital between November 1988 and August 1989 were more satisfied with their current living arrangements in terms of food, rules, privacy, and freedom than they were in the state hospital. This outcome is consistent with previous studies of long-stay discharged patients, including TAPS patients, who preferred less restrictive settings to institutional living even though their clinical status did not show much improvement.

The present analysis suggests that the majority of long-stay patients are able to live in residential settings, while receiving community outpatient treatment and intensive case management services, for a reduced cost. This is possible for all but a small percentage of former state hospital patients, who require either a secured accommodation setting (i.e., forensic patients) or special medical support (i.e., nursing home patients).

Our findings to date indicate that the population requiring further study is the "new" long-stay patients, who in the past used the state hospital on a sporadic basis for several months at a time. These were the individuals found by study investigators to be more costly to treat in the community after Philadelphia State Hospital closed (7). In the future, managing the care of these patients will prove to be a challenge to public

mental health systems, which have fewer and fewer long-term care beds available and are coping with diminished community acute care beds because of the implementation of large-scale managed care programs for vulnerable populations. Developing appropriate services for this group will be an important challenge in the years ahead.

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