

Effectiveness of a Nurse-Based Outreach Program for Identifying and Treating Psychiatric Illness in the Elderly

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ELDERLY ADULTS WITH PSYCHIATRIC disorders are less likely to be diagnosed as having a mental disorder or to receive needed mental health treatment than younger adults.^{1,2} This unmet need is likely due to factors such as underrecognition by providers; transportation and access difficulties; reluctance of practitioners to diagnose psychiatric disorder; reluctance of the elderly to accept the diagnosis of a psychiatric illness; difficulties disentangling coexisting medical, psychiatric, and social morbidity; and the 50% copay requirement for mental health services under current Medicare legislation.³⁻⁶ No single solution is likely to address these many issues, but earlier recognition of disorder and improved delivery of services are 2 approaches that may reduce unmet need.^{7,8}

One program developed to address lack of access to care is the Assertive Community Treatment model, which relies on mobile treatment teams and has well-established efficacy in young

Context Elderly persons with psychiatric disorders are less likely than younger adults to be diagnosed as having a mental disorder and receive needed mental health treatment. Lack of access to care is 1 possible cause of this disparity.

Objective To determine whether a nurse-based mobile outreach program to seriously mentally ill elderly persons is more effective than usual care in diminishing levels of depression, psychiatric symptoms, and undesirable moves (eg, nursing home placement, eviction, board and care placement).

Design Prospective randomized trial conducted between March 1993 and April 1996 to assess the effectiveness of the Psychogeriatric Assessment and Treatment in City Housing (PATCH) program.

Setting Six urban public housing sites for elderly persons in Baltimore, Md.

Participants A total of 945 (83%) of 1195 residents in the 6 sites underwent screening for psychiatric illness. Among those screened, 342 screened positive and 603 screened negative. All screen-positive subjects aged 60 years and older (n=310) and a 10% random sample of screen-negative subjects aged 60 years and older (n=61) were selected for a structured psychiatric interview. Eleven subjects moved or died; 245 (82%) of those who screened positive and 53 (88%) of those who screened negative were evaluated to determine who had a psychiatric disorder. Data were weighted to estimate the prevalence of psychiatric disorders at the 6 sites.

Intervention Among the 6 sites, residents in 3 buildings were randomized to receive the PATCH model intervention, which included educating building staff to be case finders, performing assessment in residents' apartments, and providing care when indicated; and residents in the remaining 3 buildings were randomized to receive usual care (comparison group).

Main Outcome Measures Number of undesirable moves and scores on the Montgomery-Asberg Depression Rating Scale (MADRS), a measure of depressive symptoms, and the Brief Psychiatric Rating Scale (BPRS), a measure of psychiatric symptoms and behavioral disorder, in intervention vs comparison sites.

Results Based on weighted data, at 26 months of follow-up, psychiatric cases at the intervention sites had significantly lower ($F_1=31.18$; $P<.001$) MADRS scores (9.1 vs 15.2) and significantly lower ($F_1=17.35$; $P<.001$) BPRS scores (27.4 vs 33.9) than those at the nontreatment comparison sites. There was no significant difference between the groups in undesirable moves (relative risk, 0.97; 95% confidence interval, 0.44-2.17).

Conclusions These results indicate that the PATCH intervention was more effective than usual care in reducing psychiatric symptoms in persons with psychiatric disorders and those with elevated levels of psychiatric symptoms.

JAMA. 2000;283:2802-2809

www.jama.com

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See also p 2844 and Patient Page.

and middle-aged adults.⁹⁻¹¹ Another innovative model, the Gatekeeper approach¹² seeks to increase the likelihood that elderly persons with potential psychiatric disorders are identified and referred to mental health service for assessment by training people who work in the community, such as bank tellers, mail carriers, and meter readers. Its innovation is the use of these community workers as “case finders.”

This study prospectively examines the effectiveness of a treatment model that combines principles of the Assertive Community Treatment and Gatekeeper models. This program, entitled Psychogeriatric Assessment and Treatment in City Housing (PATCH), targets elderly persons living in urban public housing developments.¹³ The PATCH intervention model has 3 elements: (1) the training of indigenous building workers, such as managers, social workers, groundskeepers, and janitors, to identify those at risk for psychiatric disorder; (2) the identification and subsequent referral of potential cases by these workers to a psychiatric nurse; and (3) psychiatric evaluation and treatment in the residents' homes. Psychiatric nurses are the primary service providers, with psychiatrists serving as supervisors or consultants. This study was designed to determine whether the PATCH program could reduce psychiatric symptoms among elderly residents needing care and enable them to remain in public housing. This population was chosen because rates of psychiatric disorder among elderly public housing residents are 50% higher than matched individuals living in the community¹⁴⁻¹⁶ and because this psychiatric morbidity predisposes residents to adverse outcomes such as eviction and termination of lease.^{17,18} We have previously reported that 26.9% of residents of public housing for the elderly in Baltimore, Md, had a psychiatric disorder as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R)* (TABLE 1) and that 58% of those meeting criteria for needing mental health care are receiving no treatment.^{19,20}

METHODS

Six public housing developments for the elderly in Baltimore, Md, served as study sites. Each was a large urban apartment building that provided no on-site psychiatric care. The study was approved by the institutional review board of the Johns Hopkins School of Medicine and was conducted between 1992 and 1996.

Initially, a baseline epidemiological survey was conducted at the 6 sites to determine rates of *DSM-III-R* psychiatric disorder and to measure levels of psychiatric symptoms. Next, a randomization procedure was performed. Three matched pairs of study sites were established by identifying the buildings that most resembled each other on demographic characteristics and number of residents. Within each pair, a coin flip determined whether a building was designated an intervention site or a comparison site. Residents of the 3 intervention sites and 3 comparison sites constituted the study population, with the unit of analysis being the 3 intervention vs the 3 comparison sites. Following the intervention phase, a final epidemiological survey was conducted at all 6 sites to determine final symptom levels. Effectiveness of the PATCH model was determined by comparing baseline and final symptom scores of those with a psychiatric disorder at baseline and the likelihood of residents making “undesirable moves.” The FIGURE shows the flow of subjects through the 3 phases of the study.

All 1195 residents were sent a letter explaining the study. However, before each resident was contacted by a research assistant who explained the study and sought informed consent, 17 residents had moved away or had died. Eighty percent (n=945) of the remaining 1178 residents agreed to participate and gave informed consent orally. For potential subjects who had a cognitive impairment severe enough to impair capacity to consent, a proxy was identified by that subject and his/her consent was also sought. All subjects were informed that some buildings would not be offered PATCH services

Table 1. Estimated 1-Month Prevalence of Psychiatric Disorders (Weighted, n = 881)*

Psychiatric Disorder†‡	No. (%)‡
Any psychiatric disorder†	237 (26.9)
Cognitive disorder§	85 (9.6)
Mood disorders||	69 (7.9)
Psychotic disorders¶	40 (4.5)
Substance use disorders#	38 (4.3)
Anxiety disorders**	17 (1.9)
Other disorders††	7 (0.8)

*From: Black et al.¹⁹

†Psychiatric disorders are based on the Structured Clinical Interview for the *Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R)* and an algorithm for diagnosing dementia that was developed for this study.

‡Percentages are based on weighted data.

§Cognitive disorders include dementia, cognitive impairment but no dementia, and delirium.

||Mood disorders include major depression, dysthymia, and bipolar disorder.

¶Psychotic disorders include schizophrenia, schizoaffective disorder, delusional disorder, brief reactive psychosis, organic hallucinosis, and psychosis not otherwise stated.

#Substance use disorders include dependence on or abuse of alcohol or other drugs.

**Anxiety disorders include panic, agoraphobia without panic, simple phobia, obsessive-compulsive, and generalized anxiety.

††Other disorders include somatization, hypochondriasis, and adjustment disorder.

but that residents of these buildings could seek usual care.

A 2-stage case finding approach was used in the baseline and final epidemiological surveys. In stage 1, each subject was administered a set of demographic questions and 3 screening instruments, the General Health Questionnaire²¹ to screen for emotional symptoms, the Mini-Mental State Examination²² to screen for cognitive disorders, and the CAGE questionnaire²³ to screen for alcohol use disorder. Individuals were identified as having a clinically significant level of psychiatric symptoms requiring further assessment if they scored 5 or more on the General Health Questionnaire, 17 or less on the Mini-Mental State Examination, or a score of 2 or more on the CAGE questionnaire. Subjects who met these criteria were categorized as screen-positive, and those who did not meet these criteria were categorized as screen-negative. Thirty-six percent of the baseline stage 1 participants screened positive.

All subjects aged 60 years and older who screened positive and a 10% random sample of those who screened negative were selected for stage 2 of the

baseline survey in which participants were administered the Structured Clinical Interview for *DSM-III-R*²⁴ and a cognition assessment based on *DSM-III-R* criteria for cognitive disorder that was developed for this study. Eleven of the 371 residents selected to participate at stage 2 moved or died before the initial contact. Two hundred forty-five (82%) of those who screened positive and 53 (88%) of those who screened negative (overall 83% of the 360 asked to participate) agreed to participate. The Structured Clinical Interview for *DSM-III-R* was administered by trained mental health professionals who were blinded to the screening status of the

subjects. The data from stage 2 were used to identify subjects with a psychiatric disorder and estimate the prevalence of psychiatric disorders.¹⁶ The randomization and intervention took place after stage 2 was completed.

The PATCH intervention model was provided in the 3 intervention sites in the following manner:

1. The PATCH nurse met with building management staff to introduce and discuss the outreach program.

2. A structured education program (available on request) was provided to enable building staff to recognize and refer residents needing mental health care. It consisted of seven 1-hour pre-

sentations on normal and pathological aging, mood disorder, schizophrenia, substance abuse, dementia, the emergency petition process, and issues related to death and dying. During this phase of the intervention the nurse also spoke to the tenant council, a monthly governance meeting residents attend voluntarily.

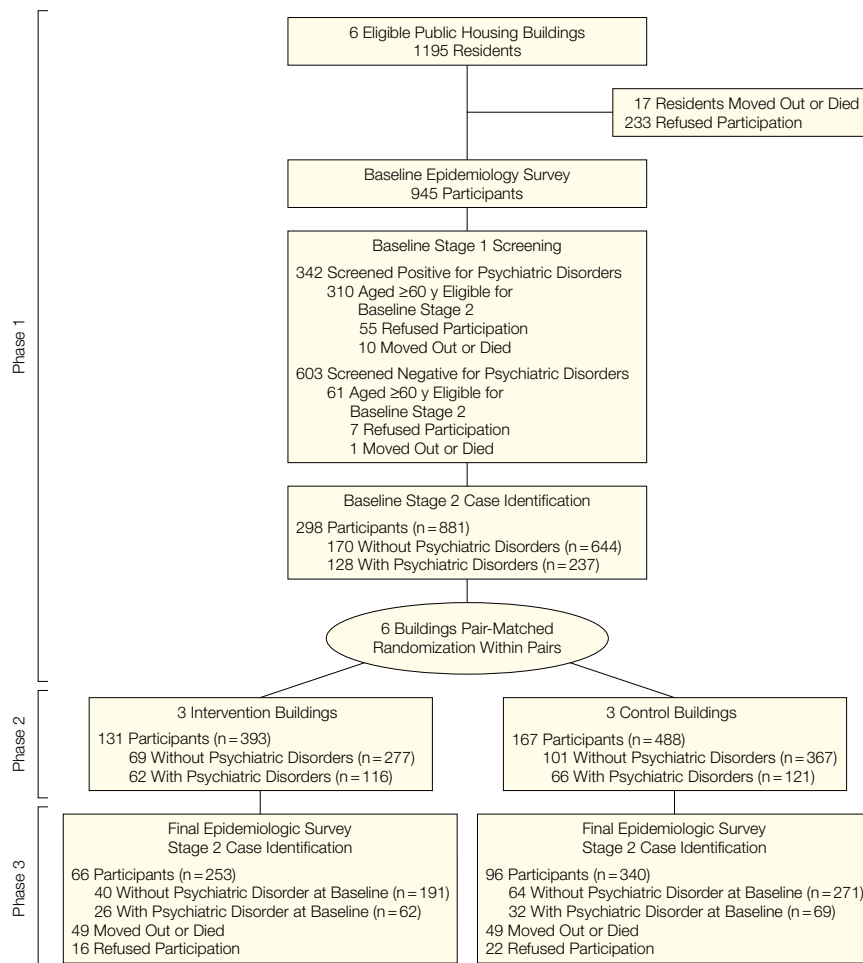
3. Thereafter, the nurse visited each site weekly to receive referrals for residents who may have been at risk for psychiatric disorder and to provide services. PATCH nurses and building staff were blinded to the prevalence of mental morbidity at each study site and to the identity of subjects determined to have a psychiatric disorder during the baseline epidemiological survey.

4. Residents referred were contacted by telephone (if they had one) or by mail, told that someone had expressed concern about them, and offered an evaluation. Each resident who was referred and agreed to have an evaluation was assessed by the nurse in his/her apartment. Subsequently, the nurse presented the case to the psychiatrist, and they conducted a joint in-home clinical examination. Based on the evaluation, the psychiatrist and nurse developed a treatment plan for each resident who needed care and offered this plan to the resident.

A concomitant study of the PATCH nurses' daily activities was conducted to illustrate the types of interventions provided after a resident's in-home assessment and clinical examination. TABLE 2 lists the services most frequently provided by 3 nurses during four 1-month periods. On average, patients were seen 5 times. Most initial assessments took approximately 1 hour and follow-up contacts averaged 30 minutes. The 2 most frequent interventions were counseling patients and providing patient education about their illness and positive health behaviors. Four of the 10 interventions involved ensuring that patients obtain and use medications appropriately.

Each month during the study, a research assistant visited the 6 housing sites and obtained information on individuals who had moved to another

Figure. Psychogeriatric Assessment and Treatment in City Housing Flowchart



Numbers in parenthesis reflect weighted data for each group. Stage 2 data were weighted to adjust the sampling procedure and response rates.

setting or had died. The intervention ended at 26 months and a second 2-stage epidemiological survey was conducted. The final screening interview was readministered to all the residents of the 6 buildings who had participated at baseline stage 1 and again gave consent to participate in the final stage 1 survey. The final stage 2 interview (Structured Clinical Interview for *DSM-III-R* and cognitive assessment) was administered to all final stage 1 subjects who screened positive, a 10% random sample of those who screened negative, and any other residents, not otherwise selected from those who participated in the baseline stage 2 survey. This sampling approach enabled us to maximize the number of baseline survey participants on whom complete outcome data were available. Participants in both the baseline and final surveys were reimbursed for their time: \$3 to \$5 for stage 1 participants, \$10 for stage 2 participants in the baseline survey, and \$15 for stage 2 participants in the final survey.

During both the baseline and final epidemiological surveys, interviewers who found a resident at any of the 6 study sites to be in urgent need of care consulted with 1 of the study's psychiatrists (P.V.R., R.R., or M.M.) by telephone and referred the subject to an appropriate provider. Following completion of the final epidemiological survey, the PATCH program was implemented at the 3 comparison sites.

There were 3 primary outcome measures: the Brief Psychiatric Rating Scale (BPRS)^{25,26} to measure psychiatric symptoms and behavioral disorders; the Montgomery-Asberg Depression Rating Scale (MADRS)^{27,28} to detect change in mood and to measure depressive symptoms. These were administered during stage 2 of both the baseline and final surveys. The third outcome, a composite measure entitled undesirable moves, included subjects who were evicted or who moved from the building to a nursing home or to a board-and-care home during the study. Undesirable moves did not include moving to live with family members since this

Table 2. Interventions Most Frequently Provided by Nurses in the Psychogeriatric Assessment and Treatment in City Housing (PATCH) Program*

Types of Intervention†	Contacts Made During Four 1-Month Periods (n = 556)‡§	Patients Who Received the Intervention (n = 107)
Counseling patient	365 (65.6)	90 (84.1)
Patient education	198 (35.6)	69 (64.5)
Liaison with patient's on-site social service worker	142 (25.5)	55 (51.4)
Supervise patient's compliance with medication	123 (22.1)	41 (38.3)
Provide or prepare patient's medication	97 (17.4)	26 (24.3)
Liaison with patient's physician or medical clinic	90 (16.2)	44 (41.1)
Monitor patient for medication side effects	72 (12.9)	31 (29.0)
Refer and/or facilitate patient to receive care and support for physical health problems	69 (12.4)	42 (39.3)
Discuss patient's medication regimen with appropriate source, eg, home care provider	62 (11.2)	29 (27.1)
Monitor patient's vital signs	55 (9.9)	29 (27.1)

*Data are presented as number (percentage).

†These are the most frequently provided interventions among a wide range.

‡A contact is defined as the work activities of a PATCH nurse devoted to a specific patient over the course of 1 day.

§Data were collected over four 1-month periods (December 1994, and March, April, and May 1995) by 3 nurses at all public housing sites for the elderly served by PATCH. The contacts reported herein were made with or for 107 PATCH patients.

is considered a positive outcome by many residents.

We hypothesized before the study that persons identified as having a *DSM-III-R* defined psychiatric disorder at baseline and residing in the active treatment sites at follow-up would have lower psychiatric symptom scores and fewer undesirable moves at follow-up than residents with a psychiatric disorder living in the nonintervention comparison sites. We did not hypothesize that rates of disorder would decline, because most of the prevalent disorders in this population (cognitive impairment with behavior disorder, mood disorder, schizophrenia, and substance abuse) are chronic conditions.¹⁶

To determine whether a broader definition of *need for treatment* would result in findings similar to those for subjects with a psychiatric disorder, post hoc analyses were conducted using data from those identified as needing mental health care.¹⁹ This secondary definition of needing treatment was based on any of the 3 criteria: (1) having a psychiatric disorder identified by the Structured Clinical Interview for *DSM-III-R* or having a cognitive disorder and a BPRS score above the mean (thus defining individuals with both a cogni-

tive disorder and significant noncognitive psychiatric symptoms), (2) having moderate or severe emotional distress (General Health Questionnaire score ≥ 5), or (3) reporting poor or very bad self-rated mental health.

Descriptive and bivariate statistics were used to characterize the stage 1 participants and the psychiatric cases identified at stage 2 of the baseline survey. The sampling approach used at stage 2 minimized cost but necessitated weighting the stage 2 data to make inferences about the larger stage 1 sample. Stage 2 data were weighted to account for the sampling procedure used to select subjects who screened negative and the differing stage 2 response rates of the screen-positive and screen-negative subjects. The data for subjects who screened negative were weighted to adjust for both the 10% random sampling procedure and their stage 2 response rate of 88%. Since all subjects who screened positive were selected for interviewing at stage 2, their data were weighted to adjust for only their stage 2 response rate of 82%. Weighted data from subjects who were present at both the baseline and final epidemiological surveys were used in the analysis of the BPRS and MADRS scores, the repeated-measures analy-

sis of variances and multiple regression analyses to determine significance of score changes. Unweighted data on these subjects were used in the Cox regression analysis of undesirable moves since weighted data cannot be used in this procedure. Data on those who moved into the study sites after the baseline survey was completed are excluded from these analyses.

RESULTS

TABLE 3 presents demographic and descriptive data at baseline for all stage 1 subjects. The sample is made up of pre-

dominantly black persons and women. Most subjects lived alone. Subjects residing in the intervention and nonintervention sites were comparable except for higher mean education, fewer people with incomes below the poverty level, and fewer black persons among those living in the intervention sites.

At baseline, there was no significant difference ($\chi^2=2.74, P=.10$) in the prevalence of psychiatric disorders between the comparison sites (24%) and intervention sites (29%) and no difference ($\chi^2=0.18, P=.67$) between these sites (36% vs 38%) based on the broader

definition of needing mental health care. TABLE 4 compares psychiatric cases in the intervention and comparison buildings at baseline. Subjects with a psychiatric disorder residing in the comparison sites included a greater proportion of men and people who had never married. Thirty-five percent of subjects with a psychiatric disorder and 43% of subjects needing mental health treatment reported having received mental health care from either their medical provider or a mental health professional in the previous 6 months.

TABLE 5 presents baseline and 26-month follow-up scores on the BPRS and MADRS in the intervention and comparison groups. It presents weighted data on subjects defined as having a psychiatric disorder and subjects defined more broadly as needing mental health care who were living in the buildings at the beginning and end of the study. There were no significant differences at baseline between mean scores for the intervention and comparison sites, although repeated-measures analysis of variances demonstrate that subjects had lower BPRS and MADRS scores in the treatment group at the end of the study. Subjects without a need for psychiatric treatment did not show significant differences in BPRS ($F_1=1.74, P=.19$) or MADRS ($F_1=3.48, P=.06$) scores.

Further analyses demonstrated that the intervention remained a significant factor after controlling for subjects receiving mental health treatment at baseline (among those with a psychiatric disorder, BPRS $F_2=3.56, P=.032$; MADRS $F_2=13.0, P<.001$; among those needing care, BPRS $F_2=4.1, P=.018$; MADRS $F_2=11.5, P<.001$). To assess whether certain diagnostic groups had more positive outcomes, we categorized diagnoses into 3 groups: mood disorder (depression plus anxiety), psychotic disorder (schizophreniform disorders plus cognitive impairment with behavioral disorder), and substance abuse, and examined their change in BPRS and MADRS scores. In stepwise multiple regression analyses, only the mood disorder group showed significant improvement in MADRS scores ($F_1=17.6,$

Table 3. Characteristics of Baseline Stage 1 Subjects by Sites (n = 945)*

Sample Characteristics	3 Intervention Sites (n = 446)	3 Comparison Sites (n = 499)	Statistical Test	P Value
Sex				
Men	22.9	26.9	$\chi^2 = 2.0$.16
Women	77.1	73.1		
Age, y				
60-69	34.8	38.7	$t_{943} = -1.8$.07
70-79	41.9	39.7		
>79	23.3	21.6		
Mean (SD)	73.1 (8.7)	72.0 (9.4)		
Race				
Black	89.2	96.4	$\chi^2 = 18.4$	<.001
Nonblack	10.8	3.6		
Education, y				
<7	25.1	31.9	$t_{900} = -3.4$.001
7-8	21.3	23.0		
9-12	43.9	39.5		
>12	9.2	4.6		
Missing data	0.4	1.0		
Mean (SD)	8.8 (3.6)	8.0 (3.2)		
Marital status				
Never married	10.3	11.6	$\chi^2 = 7.3$.12
Separated	13.5	18.2		
Divorced	14.6	14.2		
Widowed	50.4	48.3		
Married	11.2	7.6		
Living arrangement				
Lives alone	89.2	92.0	$\chi^2 = 2.1$.15
Lives with someone	10.8	8.0		
Monthly income, US \$				
≤538	51.1	58.9	$\chi^2 = 3.9$.05
≥584	37.0	32.3		
Missing data	11.9	8.8		
Residency, y				
<1	11.0	11.2	$t_{943} = 0.5$.59
1-5	33.0	32.1		
6-10	29.1	34.1		
11-15	26.9	9.0		
>15	0.0	13.6		
Mean (SD)	6.8 (4.8)	7.0 (5.5)		

*Data are presented as percentages unless otherwise indicated.

$P < .001$). The decline in BPRS scores was attributable only to subjects without a psychotic disorder ($F_1 = 4.5, P = .04$).

Nine percent of the baseline stage 2 subjects ($n = 28$) had died by the end of the study and 12% ($n = 37$) had made desirable moves to either a private home or apartment, to another public housing building that was not one of the study sites, or in with family. There was no difference between the intervention and comparison sites in the proportion of residents with desirable moves ($\chi^2_1 = .05, P = .82$) although subjects at intervention sites were more likely to die ($\chi^2_1 = 5.18, P = .02$) than those at the comparison sites (14% vs 6%). Three of the stage 2 subjects, all of whom were residents of the comparison buildings, reported psychiatric hospitalizations. Eleven percent of stage 2 subjects had made undesirable moves to either a nursing home or to a board-and-care home, and none were evicted. A Cox proportional hazard regression analysis found no difference in undesirable moves between the treatment and comparison sites ($\beta = -.03, SE = .41, df = 1, P = .95$); (relative risk [RR], 0.97; 95% confidence interval [CI], 0.44-2.17). A log-minus-log survival plot showed that the data met the assumption of proportionality; no time-dependent variable was included in the model. Sixty-six percent of subjects in the comparison sites with psychiatric disorders reported receiving mental health treatment during the trial.

COMMENT

These results demonstrate that a model of care that uses indigenous workers as case finders and a mobile treatment team staffed by psychiatric nurses can decrease levels of psychiatric symptoms in elderly persons with psychiatric disorders who reside in a high-risk setting. The PATCH intervention consisted of several elements: the education and use of indigenous case finders who encounter members of the target population on a daily basis; a reliance on psychiatric nurses to provide assessment, guide treatment, and provide case management services; and the initial provision of services in the patient's apartment. We believe the mod-

el's effectiveness rests on the improved case recognition provided by the case finder model and better treatment adherence resulting from on-site treatment by the nurse. Whether any of these elements would have been effective by itself can only be determined by further study. As this is one of only a handful of population-based interventions that demonstrate the effectiveness of psychiatric assessment and treatment in the elder-

ly,²⁹⁻³¹ replication and adaptation to other high-risk settings and other populations would be of interest.

The declines in symptom scores (17% in BPRS scores, 32% in MADRS scores) among subjects in the treatment sites are comparable to those reported in efficacy studies and are clinically meaningful. The use of rating scales rather than case criteria as outcomes allowed us to demonstrate an im-

Table 4. Characteristics of Baseline Stage 2 Psychiatric Cases by Sites (Weighted, $n = 237$)*

Sample Characteristics	3 Intervention Sites (Weighted, $n = 116$)	3 Comparison Sites (Weighted, $n = 121$)	Statistical Test	P Value
Sex				
Men	15.5	29.8	$\chi^2 = 6.8$.009
Women	84.5	70.2		
Age, y				
60-69	22.2	27.5	$t_{235} = 0.7$.49
70-79	42.7	32.5		
>79	35.0	40.0		
Mean (SD)	75.0 (8.4)	75.8 (8.5)		
Race				
Black	91.4	89.3	$\chi^2 = 0.3$.58
Nonblack	8.6	10.7		
Education, y				
<7	31.9	54.6	$t_{229} = -1.4$.16
7-8	34.5	9.9		
9-12	26.7	22.3		
>12	2.6	10.7		
Missing data	2.1	3.0		
Mean (SD)	7.5 (3.5)	6.8 (3.6)		
Marital status				
Never married	4.3	23.0	$\chi^2 = 24.4$	<.001
Separated	11.2	9.8		
Divorced	25.0	9.0		
Widowed	50.0	50.8		
Married	9.5	7.4		
Living arrangement				
Lives alone	8.6	5.8	$\chi^2 = 0.7$.40
Lives with someone	91.4	94.2		
Monthly income, US \$				
≤538	50.0	54.0	$\chi^2 = 2.8$.09
≥584	18.9	34.9		
Missing data	31.1	11.1		
Residency, y				
<1	18.3	9.1	$t_{235} = 0.3$.79
1-5	20.0	30.6		
6-10	37.4	34.7		
11-15	24.3	16.5		
>15	0.0	9.1		
Mean (SD)	6.9 (5.1)	7.1 (4.8)		
Any mental health care in past 6 months				
No	61.2	69.4	$\chi^2 = 1.8$.18
Yes	38.8	30.6		

*Data are presented as percentages unless otherwise indicated.

pact on the target population rather than on individual subjects. However, the intervention did not prevent placement of residents into nursing homes or to board-and-care facilities, perhaps because such placement was recommended when an individual was deemed unsafe to live alone.

The 2-stage epidemiological case finding method used in this study has not been widely used in intervention trials. This approach provides an efficient means of identifying individuals in the population with target disorders and provides a random sample of persons who do not have psychiatric symptoms. This method requires weighting back to the stage 1 sample and can be criticized as artificially increasing sample size and power. However, we believe it is a useful strategy for studying interventions in which the unit of analysis is a population and the targets of the intervention are persons with a disorder. It is a practical and cost-effective method that might be used in other treatment trials that target individuals who meet the study criteria.^{32,33}

This study illustrates several of the challenges faced by effectiveness studies of models of care.³²⁻³⁵ One significant limitation is the lack of a single standardized treatment as the independent variable. The education intervention did follow a specific format, but the clinical intervention could not be formalized because it targeted individuals with any *DSM-III-R* disorder and because

many subjects had coexisting medical and social morbidities that also required treatment. In contrast, effectiveness studies of single treatments for specific disorders can apply a standard approach to all subjects in the active treatment group.^{29-31,36} This study is best viewed as a test of how care is delivered rather than an assessment of what specific services are being delivered.

The criterion for having psychiatric illness in this study was defined a priori as having any disorder identified by the Structured Clinical Interview for *DSM-III-R* or having a cognitive disorder. Post hoc analyses demonstrated that a broader definition of needing mental health care was also associated with a positive outcome. Although the identification of those in need of mental health care is complex,^{19,37} these results suggest that the PATCH model is effective whether a narrow or broad definition of need for treatment is used.

The use of a nontreated comparison group raises appropriate questions about the ethical use of a nontreatment group.³⁸ In this study, the nontreatment group could receive usual care and two thirds did receive care. Nevertheless, individuals were identified in both the active-treatment and comparison buildings who had a potentially treatable psychiatric disorder and were not informed of this. We believe this is ethically justifiable because the model being tested had not been studied before and therefore its ef-

fectiveness was unknown.³⁹ Subjects with severe symptoms of depression, psychosis, hypotension or bradycardia identified during screening or the Structured Clinical Interview for *DSM III-R* were referred for immediate care whether in an intervention or comparison site. Fewer than 10 individuals required such a referral. PATCH services were made available to all building sites at the completion of the study.

Current Medicare policy reimburses home care only for persons who are homebound. The results presented herein demonstrate that persons who have a serious and persistent mental illness and have not had their needs met in traditional office settings can benefit from home-based evaluation and treatment. They support an extension of the Medicare home care benefit to cover home mental health care for the following individuals: those who would otherwise not be treated; those who would come to treatment later and suffer adverse effects (such as eviction); those whose untreated psychiatric disorders would cause significant distress to them, their family members, their caregivers, or their neighbors; and those at high risk of institutionalization. The 100-year tradition of public health nursing remains the ideal model for such care.⁴⁰⁻⁴⁴

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Table 5. Baseline and Final Brief Psychiatric Rating Scale (BPRS) and Montgomery-Asberg Depression Rating Scale (MADRS) Scores for Residents With Psychiatric Disorders and Those Needing Mental Health Care at the Intervention and Comparison Sites*

Variables	Baseline				Final				Repeated-Measures ANOVA	
	Intervention Sites	Comparison Sites	t Test	P Value	Intervention Sites	Comparison Sites	t Test	P Value	F Test*	P Value
No. of psychiatric cases (weighted, n = 132)	62	69	...	...	62	69	...	...	...	...
BPRS scores	29.7 (8.4)	30.1 (11.2)	0.10	.92	27.4 (7.2)	33.9 (13.6)	3.20	.002	17.35	<.001
MADRS scores	13.7 (9.5)	11.7 (5.8)	-1.38	.17	9.1 (6.2)	15.2 (9.5)	4.01	<.001	31.18	<.001
No. needing mental health care (weighted, n = 178)	77	101	...	...	77	101	...	...	...	...
BPRS scores	28.4 (8.3)	28.4 (10.2)	-0.11	.91	26.7 (7.3)	31.5 (12.5)	2.89	.004	13.11	<.001
MADRS scores	12.1 (9.7)	10.5 (6.2)	-1.27	.21	8.5 (6.3)	13.4 (9.1)	3.76	<.001	26.46	<.001

*ANOVA indicates analysis of variance. Ellipses indicate not applicable. Data are presented as mean (SD) unless otherwise indicated.

Policy and Management (Drs Rabins and German) and Mental Hygiene (Dr Rabins), School of Hygiene and Public Health, Johns Hopkins Medical Institutions, Sheppard and Enoch Pratt Hospital (Drs Roca and McGuire), and Gerontology Research Center, Na-

tional Institute on Aging (Dr Brant), Baltimore, Md. **Funding/Support:** This work was supported by grants MH 42412, MH 48673, and MH P5043703 from the National Institute of Mental Health, Bethesda, Md. **Acknowledgment:** We thank Mary Tlasek-Wolfson

RN, MSN, and Jane Penrod, RN, MSN, for helping develop the PATCH model. We thank the Housing Authority of Baltimore, Baltimore Mental Health Systems Inc, and the Maryland Department of Health and mental Hygiene for their support.

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