

The Vermont Longitudinal Study of Persons With Severe Mental Illness, I: Methodology, Study Sample, and Overall Status 32 Years Later

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The authors report the latest findings from a 32-year longitudinal study of 269 back-ward patients from Vermont State Hospital. This intact cohort participated in a comprehensive rehabilitation program and was released to the community in a planned deinstitutionalization effort during the mid-1950s. At their 10-year follow-up mark, 70% of these patients remained out of the hospital but many were socially isolated and many were recidivists. Twenty to 25 years after their index release, 262 of these subjects were blindly assessed with structured and reliable protocols. One-half to two-thirds of them had achieved considerable improvement or recovery, which corroborates recent findings from Europe and elsewhere.

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Understanding of the long-term course and outcome of patients with prolonged psychiatric disorders is often thwarted by patient and clinician mobility (1, 2), short-term caseloads shaped by academic training and service delivery systems (3, 4), the magnitude of methodological hurdles (5-13), and disputes

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over the classification of the disorders under study (10, 14-16). These conditions have produced sporadic, contradictory data and untested assumptions that undercut attempts to clarify the nature of psychiatric illness, erode the ability to target treatment interventions, and muddle efforts toward comprehensive public policies.

It is possible, however, to generate a longitudinal study that overcomes most of these obstacles (7, 17). What is required is an intact cohort of patients, selected for the established chronicity of their illness, who are prospectively followed over many years, with careful record keeping, structured and reliable protocols, operational definitions, and standardized assessments of psychopathology and psychosocial functioning. The Vermont longitudinal study meets these criteria.

Since the early 1950s, members of the Vermont Longitudinal Research Project have been prospectively following the course of an intact cohort of 269 patients from the back wards of Vermont State Hospital (7, 17-26) in much the same manner as the catamnestic studies of Manfred Bleuler at Burghölzli Hospital in Switzerland (27-33). Known in the literature as *The Vermont Story* cohort (26), the majority of these once profoundly ill, severely disabled, long-stay patients came from the sickest group in the hospital and met the DSM-I guidelines for the diagnosis of schizophrenia. They participated in an innovative pioneering rehabilitation program and were released to a hospital-run comprehensive community aftercare program between 1955 and 1965 (26).

Ten years after the inception of the program, we conducted a follow-up study, which indicated that two-thirds of the cohort were not hospitalized but were being maintained by heavy expenditures of clin-

ical effort, time, and money (34). Many of these patients were socially isolated while living and working in other institution-like settings. This follow-up period was similar to that charted by many longitudinal studies of similar patient groups, studies that have heavily influenced our ideas about the long-term course and outcome of people with severe and prolonged psychiatric disorders. The Vermont study and other longer studies provide evidence that some psychiatric illnesses require longer time periods to acquire a more complete and accurate picture of course and outcome.

In our effort to reassess the outcome of the Vermont cohort over a longer period of time, we were able to account for all but seven members of the original cohort (97%) in the early 1980s. This situation gave us the opportunity to find out whether these subjects were still as disabled as they had been 20 or more years earlier. We conducted both a structured cross-sectional assessment of the subjects' current status across a wide range of characteristics and a retrospective documentation of what had happened to members of this cohort in the intervening years. Adding these new data to the prospectively gathered information from the earlier hospitalization and rehabilitation program, we have been able to provide a more comprehensive picture of the long-term course of schizophrenia and other severe psychiatric disorders.

The specific focus of this report from the Vermont Longitudinal Research Project is a description of the sample, methodology, and design of the project and documentation of the long-term outcome for the cohort as a whole. A companion paper in this issue of the *Journal* examines the long-term outcome of those subjects within the larger cohort who were re-diagnosed as meeting the newer *DSM-III* criteria for schizophrenia (35).

HISTORY OF THE PROJECT

Phase I: The Rehabilitation Program in the 1950s

In the early 1950s, one of us (G.W.B.) began to study the efficacy of the then-new drug chlorpromazine (36). The back-ward "hopeless cases" were chosen as subjects. Some patients responded well and were eventually released. Other patients did not respond as well, but the effect of the releases was to give fresh hope to both the staff and the patients. In 1955 a multidisciplinary clinical team, sponsored by the Vermont State Hospital and the Vocational Rehabilitation Division of the Vermont State Department of Education, initiated a program of comprehensive rehabilitation and community placement for those back-ward patients who had not improved sufficiently with chlorpromazine. From January 1955 to December 1960, 269 patients who were considered among the most severely disabled and chronically mentally ill in the hospital were referred to the program (26). After the

re-education of the staff, a program was constructed in collaboration with the patients that consisted of drug treatment, open-ward care in homelike conditions, group therapy, graded privileges, activity therapy, industrial therapy, vocational counseling, and self-help groups.

In the community treatment component, the same clinical team went into the community and established halfway houses and outpatient clinics, found job openings, made job placements, and linked patients to natural support networks. In that era of custodial care, before the advent of community mental health centers and the later deinstitutionalization movement, this comprehensive program was considered unusual and innovative.

The average age of the subjects was 40 years. The group was described by their clinical team in *The Vermont Story* as follows:

At the time of selection, the group averaged 16 years' duration of illness with an average of ten years of total disability and six years of continuous hospitalization. The group members had from one to ten hospitalizations, with a median of about two hospitalizations each. They had completed from none to sixteen years of schooling, with a median of about nine grades. Nearly all had been declared financially incapable of paying anything for their own care, and were committed to the hospital at State expense. The group was, in other words, quite characteristic of the schizophrenic group as outlined by Hollingshead and Redlich (37). They were middle-aged, poorly educated, lower-class individuals further impoverished by repeated and prolonged hospitalizations. In addition, this group had little social support. About five out of six were single, divorced, widowed, or separated. They were seldom visited by friends or relatives, and received very few packages or letters. (26, p. 30)

At the time the subjects were selected, the research team also described their presenting disabilities and impairments:

The patients, as a group, were very slow, concentrated poorly, seemed confused and frequently had some impairment or distortion of recent or remote memory. They were touchy, suspicious, temperamental, unpredictable, and over-dependent on others to make minor day-to-day decisions for them. They had many peculiarities of appearance, speech, behavior, and a very constricted sense of time, space, and other people so that their social judgment was inadequate. Very often they seemed to be goalless or, if they had goals, they were quite unrealistic. They seemed to lack initiative or concern about anything beyond their immediate surroundings. Because of their very low socioeconomic level and prolonged illness, they suffered from profound poverty, inadequate educational opportunities, and a very limited experience in the world.

These patients also suffered a high incidence of chronic physical disabilities. Their psychomotor performance in a wide variety of tests was impaired so that their reaction times were prolonged and their ability to perform any type of skilled or precise activity was impaired. They suffered an increased incidence of many degenerative and chronic diseases, including tuberculosis and malignant tumors.

This is on p. 275. Terrible.

There was a very high incidence of needs in such areas as dental care, visual corrections, and hearing aids. Many patients, especially after prolonged phenothiazine treatment, were obese. Care of the feet had been neglected. In our experience, there also seemed to be a high incidence of chronic skin disorders including eczema-dermatitis, tinea, and psoriasis. (26, p. 31)

Phase II: The 1965 Follow-Up Study

In 1965, after 5 years of the hospital-based rehabilitation program and 5 years during which the primary focus was the community component, Deane and Brooks (34) conducted a follow-up study of these patients. They found that two-thirds of the cohort could be maintained in the community if sufficient transitional facilities and adequate aftercare were provided. Seventy percent of the subjects were out of the hospital at that follow-up: 30% had been discharged and had never returned, and 40% had been readmitted at some time but had been discharged again. Of the 30% of the subjects who were in the hospital at follow-up, 20% had been readmitted and had stayed, and 10% had never been discharged. The average number of readmissions for the recidivists in the cohort was 1.98.

Other findings indicated that being female, schizophrenic, chronically ill, and married during some part of one's life were important predictors of good functioning at follow-up. Age at first admission did not predict which patients would do better. At the 1965 follow-up, most subjects were single (60%), used community care facilities primarily for socializing, had a tendency to replace the institution with sheltered employment (e.g., a job as a cook in a nursing home, with bed and board), and maintained substantial contact with rehabilitation workers.

Thus, 5-10 years after release from the rehabilitation program, 70% of the patients were out of the hospital, which was considered remarkable at the time because they had been expected to live out their lives in the hospital. However, the study concluded with a warning:

Implicit in our findings is the fact that any plan for rehabilitation of the chronic patient be conceived as long-term, since all of our evidence suggests that the commitment necessary to the chronic mental patient has no foreseeable end, and that unless constant attention be given to the chronic patient, the end result may be simply that he is out of the hospital, but operating at a high level of inadequacy and a low level of employment. (34, pp. ii, iii)

It is at this point that most follow-up studies stop and most programs are discontinued. Thus, most of our understanding of the long-term outcome for severe mental disorder is derived from such shorter-term data. The question asked in the present study was, Do these patients still continue to display such impairment and disabilities 20 to 25 years later, as predicted earlier by our own research team?

TABLE 1. Status at 20- to 25-Year Follow-Up of 269 Chronic Psychiatric Patients in the Vermont Study

Subjects' Follow-Up Status	Total Group	Subjects Remaining After Exclusion of 22 With Organic Disorders (N=247) ^a	
		N	%
Alive and interviewed	178	168	68
Deceased; family interviewed	71	61	25
Alive; refused participation ^b	13	11	4
Could not be located	7	7	3

^aTwenty-two subjects classified as having organic disorders according to DSM-III criteria at the index admission were excluded from the data analyses.

^bMost of these subjects were interviewed and gave considerable information, but they refused to sign the forms permitting use of their data.

Phase III: The 20- to 25-Year Follow-Up Study

We recently completed our latest follow-up of the original 269 subjects. We have follow-up data on the 22 subjects with organic disorders but removed them from our ongoing analyses to make our study comparable to others in the field. Table 1 reveals the cohort's current status.

The catamnestic period of the subjects ranges from 22 to 62 years, with an average of 32 years, which makes this study one of the longest ever conducted. The subjects who were still alive at follow-up (N=168) were divided nearly evenly between the sexes (81 men and 87 women). The mean age was 59 years (range=38-83 years), with two-thirds of the group 55 years old or older. The year of birth of the subjects ranged from 1897 to 1942.

The remainder of this report focuses on the method and results of the long-term follow-up study of the subjects who were still alive and could be interviewed.

METHOD

Measures

Batteries of structured instruments were used for collecting data. They included interview schedules and record abstraction protocols.

The Vermont Community Questionnaire (VCQ) was a battery of interview instruments designed to document and assess a subject's history and functioning in a wide variety of areas across time. Fifteen established scales were combined to create the VCQ and to acquire such a data base (7). The field interviewers were blind to hospital records and diagnostic information about each subject.

The VCQ consisted of two structured interviews, each with standardized probes, ratings, and computer coding. The VCQ-cross-sectional interview (VCQ-C) assessed current status; the VCQ-longitudinal inter-

ew (VCQ-L) documented retrospective data over the preceding 20–25 years.

The major areas of functioning covered by the CQ-C were residence, work, finances, intimate relationships, family information, social support system, typical weekly activities, basic self-care, utilization of treatment/social services, contact with the criminal justice system, community involvement, degree of satisfaction, environmental stressors, competence, and psychopathology. Approximately 1 hour and 15 minutes were required to administer the interview's 135 questions. The rater section of the interview battery contained 98 additional items based on observation and other information gathered from the subjects and their environment.

The second interview (the VCQ-L) required 75 minutes and was held within 1 week of the first. The VCQ-L had 156 questions that documented status and events during the preceding 20 years in a year-by-year follow-back procedure utilizing a modified Meyer/eighton Life Chart (38). This chart provided a graphical overview of each subject's life and was completed with a set of structured probes, codes, and protocols created for this project. The Life Chart was a large, lined sheet of paper vertically separated into years, from 1982 at the top to 1955 at the bottom, and horizontally separated into 10 outcome areas. These domains included residence, hospitalization, work, source of income, important personal relationships, deaths of important people, other life events, use of community support systems, physical health, and medications. A Life Chart was completed for each subject, who worked with the interviewer on the chart spread out on a table.

Each of the field interviewers had had 5–8 years of previous clinical experience with a range of clients who were deinstitutionalized and labeled "chronic patients" by their community mental health clinics.

A small instrument called the Verinform was designed to verify the interview information by asking a variety of informants about the subjects' current status and historical data. The Verinform was used for interviews with general practitioners, aftercare or vocational rehabilitation counselors, family, or friends—whoever knew the subject well.

The Hospital Record Review Form was designed to provide a standardized method for recording data from Vermont State Hospital records. The interview instrument known as the Psychiatric and Personal History Schedule from the World Health Organization (WHO) Collaborative Project on Determinants of Outcome of Severe Mental Disorders (39), was converted from an interview format to a standardized form for abstracting record information on psychiatric history in a systematic and structured manner. The new format maintained the coded answers but assigned them to document five different time periods: first admission, episodes between first and index admission, index admission (the admission preceding entry into the rehabilitation program—the only common denom-

inator across all subjects and designated arbitrarily as index for research definition purposes), life history, and episodes during the years in the community after index release. In addition, the WHO signs and symptoms checklist was augmented with Strauss's Case Record Rating Scale (40), the Strauss-Carpenter Prognostic Scale (41), and the Global Assessment Scale (42). The record reviewer was blind to all outcome and interview data. She was a clinical psychologist with several years of experience with Vermont State Hospital records.

The component instruments in each battery that used the work of others had been tested extensively for reliability and validity by their originators. However, groups of individual questions from each classic scale were taken from their original context and interwoven with questions from other instruments (e.g., the questions on social relationships from all instruments were put together to make a more natural interview sequence); therefore, reliability studies of the entire VCQ and Hospital Record Review Form batteries were deemed essential.

Initially, the VCQ-C and VCQ-L interviews were each field-tested with a wide range of community people matched in age to the cohort. These consultants critiqued the appropriateness of the questions vis-à-vis their life experiences and suggested that we add questions about powerlessness, disability income, medication compliance, and the increasing number of deaths of people in their personal support systems. This strategy led to improvement in the battery's ability to tap relevant issues for people in the age ranges to be assessed and improvement in its construct validity. Changes and deletions of items honed it to the size used in the follow-up study.

Each field battery was then subjected to two sets of interrater trials (trial 1, $N=21$ pairs; trial 2, $N=18$ pairs). The sets were completed 6 months apart to test for the degree of change in raters' assessments during the intervening time period. Both raters attended a cross-sectional and a longitudinal interview for each of the test subjects. Each rater scored the interview independently, and the pairs of ratings were then compared for concordance. The kappa coefficients from the first and second sets of trials are shown in table 2.

The Hospital Record Review, with 1,800 items, was divided into its five subsections and also subjected to trials of interrater agreement between the one reviewer who left the team and the one who subsequently joined the project. Kappa coefficients ranged from .40 ($p<.01$) to .95 ($p<.001$), and all were significant.

In summary, on the basis of the evidence presented, we rendered the conclusion that these instruments were moderately reliable and contained an acceptable degree of face and construct validity.

Procedure

Each subject still living at the time of follow-up who was willing to participate was given two interviews

TABLE 2. Kappa Levels for Interrater Agreement on Trials of Instrument Batteries Given to Vermont Study Subjects

Instrument	Kappa	
	First Trial	Second Trial
Field instruments		
Vermont Community Questionnaire		
Cross-sectional		
Interview	.96 ^a	.97 ^a
Rater section	.50 ^b	.70 ^b
Longitudinal		
Interview	.96 ^a	.96 ^a
Rater section	.64 ^b	.59 ^b
Hospital Record Review Form		
First admission	.41 ^b	
Episodes between first and index admission	.95 ^a	
Index admission	.40 ^b	
Episodes after discharge	.94 ^b	
Topical life history	.67 ^b	
Life Chart (experimental)	.98 ^a	.78 ^b

^ap<.001.^bp<.01.

(approximately 1 week apart) at his or her place of residence by one of the two interviewers. In addition, two or three people who knew the subject well were interviewed in a structured protocol to verify current status and historical data. These people included relatives, general practitioners, counselors, clinicians, and friends. All but 17 subjects (10%) resided in Vermont. The subjects who lived elsewhere were interviewed with the same protocol. Strict attention was paid to the protection of patients' rights such as privacy, confidentiality, refusal, and informed consent.

Relatives, friends, and caregivers of the deceased members of the original cohort were also interviewed. A structured protocol documented the lives and the levels of functioning of these subjects until the time of their deaths. The inclusion of these data provided a more balanced view of the long-term course of severe psychiatric disorders than has been available in past studies, which have relied on data from survivors only. A separate report will be devoted to the deceased subjects.

RESULTS

This group of back-ward patients represented the most severely ill group from Vermont's only state hospital. Two to three decades after a comprehensive rehabilitation program and a planned deinstitutionalization, one-half to two-thirds of these patients were rated as considerably improved or recovered. The findings also showed a wide variation in many areas of functioning for these patients.

Demographic Data for the Cohort at Follow-Up

Fifty-one percent of the 168 subjects who were alive, did not have an organic disorder, and were interviewed

had not completed high school. However, an eighth-grade education was considered to be the norm before the 1940s in Vermont (43).

Nineteen percent (N=32) of the 168 subjects were currently married, and seven percent (N=11) were widowed. Fifty-one percent (N=86) were still single, and 23% (N=39) were divorced or separated.

Eighty-eight percent of the subjects (N=148) lived in residential and rural neighborhoods rather than industrial or commercial areas. Fifty percent (N=81) lived in independent housing (house, apartment, mobile home, or rooming house), and 40% (N=64) lived in boarding homes. (This information was coded for an N of 161.) Five single middle-aged men were currently in the hospital, seven were in level II nursing homes (institutions for individuals, including the mentally retarded, who do not require 24-hour nursing care but who do require care above the level of room and board), and four were in other settings. Of the subjects receiving boarding home care, seven seemed capable of living independently, often assisting the boarding home operator and taking responsibility for management of the home. An additional 23 were actively involved in activities within the house, at the local community mental health center, or in the community and were self-motivated. Longitudinal patterns of residence revealed an average of two readmissions for the group since release from the index hospitalization. The average total length of stay was 2 years or less.

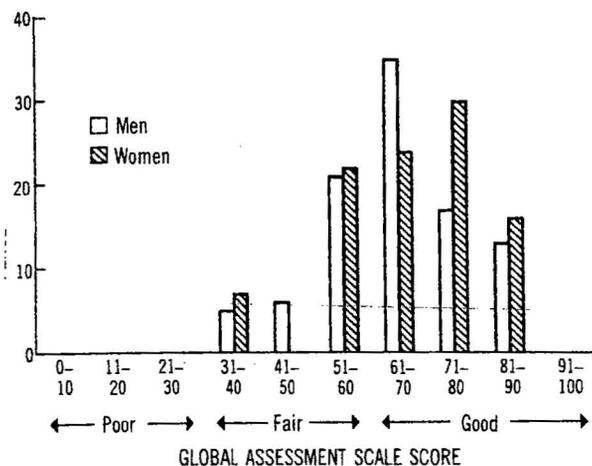
Twenty-six percent (N=44) of the 168 subjects were employed; half of them were classified as working in unskilled jobs. Thirty-three percent (N=56) were unemployed, 8% (N=14) were volunteers, and 5% (N=8) were housewives. Due to the advanced ages in the sample, an additional 26% (N=44) were classified as elderly, widowed, or retired. Solid information was unavailable on four (2%) of the subjects for this rating.

Our findings also indicated that 85% of the sample had a gross income of less than \$10,000 a year. In 1982 Vermont ranked 36th in the nation for per capita income, with an average of \$9,979 (44). Using an assessment from the Community Care Schedule by Schwartz et al. (45) and budget sheets outlining expenses and income, we rated 77% of the subjects as having an adequate income; the schedule's definition of adequate was that the "amount of money received will cover the subject's basic needs comfortably."

Overall Psychological and Social Functioning

The Global Assessment Scale (GAS) (42) was chosen to provide a single score that would capture the essence of the subjects' psychological and social functioning. Scores on this scale showed that 68% (N=114) of the study sample were functioning above the cutoff point of 61 designated by the authors as "some mild symptoms (e.g., depressive mood or mild insomnia) or some difficulties in several areas of functioning, but generally functioning pretty well, has some mean-

FIGURE 1. Global Assessment Scale Scores of 168 Subjects in the Vermont Study Who Were Alive and Were Interviewed at Follow-Up



ngful relationships and most untrained people would not consider him sick." A 2x2 (GAS by Sex) chi-square test with Yates' correction revealed no significant differences between the sexes in level of functioning ($\chi^2=0.13$, $df=1$, $p=.72$), but it should be noted that 68% of those with a GAS score between 31 and 70 were men, while 62% of those with a GAS score between 71 and 90 were women (see figure 1).

In order to describe more of the individual components that went into the assessment of overall functioning, the Levels of Function Scale (41) was used. On this scale, subjects are scored from 0 (poor) to 4 (best) on nine items of interest; the reliability of the scale has been demonstrated. A product-moment correlation revealed that the overall total score was highly correlated ($r=.88$) with the GAS score just reported. Table 3 summarizes the findings from the Levels of Function Scale. Individual areas of functioning were restored for one-half to four-fifths of this group. Because of the wide variation in outcome functioning at follow-up within specific subjects, the global rating of slight or no impairment was given to only 55% ($N=92$) of the cohort. No impairment was rated for subjects who were asymptomatic and living independently, had close relationships, were employed or were otherwise productive citizens, were able to care for themselves, and led full lives in general. Other subjects did well in some areas of functioning but not so well in others. Theirs was a very mixed picture on a continuum weighted toward dysfunction.

DISCUSSION

Current assumptions about the long-term course of schizophrenia and other severe mental illnesses include the idea that people with repeated episodes are at best likely to achieve marginal levels of functioning over time. Heterogeneity of outcome is expected, with a

TABLE 3. Results From the Strauss-Carpenter Levels of Function Scale for the 168 Subjects of the Vermont Study Who Were Alive and Interviewed

Area of Functioning	N	%
Not in hospital in past year	140	83
Met with friends every week or two	111	66
Had one or more moderately to very close friends	128	76
Employed in past year ^a	79	47
Displayed slight or no symptoms	121	72
Able to meet basic needs	133	79
Led moderate to very full life	128	76
Slight or no impairment in overall function	92	55

^aQuality of work could not be rated; issues of confidentiality prevented visits to subjects' work sites.

dichotomized split between "process" and "reactive" patients (46), good premorbid and poor premorbid functioning (47), or type I and type II illness (48), or the familiar breakdown into "one-third get better, one-third stay the same, and one-third get worse." The findings from the Vermont cohort, drawn from the most chronically ill patients (the lowest third of the hospital), revealed that over one-half of these once profoundly ill, long-stay patients had achieved a much higher level of functioning than had been predicted by our own research team during the early days of the patients' community tenure. Their achievement is even more remarkable given their original levels of chronicity.

These findings hold for other subsets of the cohort as well. For example, our companion paper in this issue (35), about the subjects who were rediagnosed as meeting the *DSM-III* criteria for schizophrenia, describes similar proportions of restored and heterogeneous functioning, as does our forthcoming paper about the outcome of the deceased subjects before they died. Another paper will delineate the reduction by 46% of the number of individual subjects who currently use the public mental health system in Vermont. It appears that they have left the formal system and turned to natural community supports over time.

Our findings of heterogeneity of outcome, with significant improvement or recovery for half the cohort, corroborate the results of four other long-term follow-up studies conducted within the last 15 years: Manfred Bleuler's 23-year study of 208 patients at Burghölzli Hospital in Zurich (32), Ciompi and Müller's 37-year study of 289 patients in Lausanne (49), Huber and colleagues' 22-year follow-up study of 502 subjects in Bonn (50), and the "Iowa 500" study by Tsuang et al. (51). The studies from Europe have not been seriously regarded by some investigators because of such methodological difficulties as the lack of reliable diagnostic criteria, the number of deceased and missing subjects at follow-up (especially in the Lausanne and Bonn studies), and the use of less structured clinical interviews to assess psychopathology and acquire outcome data (9). However, the Iowa and Ver-

mont studies have improved on many of these methodological deficiencies, and the findings are nearly identical to those of the European studies.

Thus, of the 1,300 subjects in the five studies who were assessed two or three decades later, more than one-half were found to have considerably improved or recovered (52). Such similarities in the findings across studies seem to override the differences. Together, the data give evidence that, contrary to the expected downward and deteriorating course for schizophrenia or for other severe and chronic psychiatric disorders, symptoms can be ameliorated over time and functioning can be restored. Further support for the heterogeneity of patients' outcome functioning is supplied by many other shorter follow-up studies as well (41, 49, 53-55).

Although the Vermont Longitudinal Research Project achieved a more rigorous design than many earlier efforts, the study still has several shortcomings. In 1955, the original selection of the subjects depended on referrals of patients by the staff to the rehabilitation program. The original investigators then restricted entry into the research cohort to the most chronic patients only.

The project was primarily aimed toward establishing a treatment program to deinstitutionalize the patients remaining in the back wards. This program represented one of the first attempts at deinstitutionalization in the United States and was one of the few that was carefully planned. The study became a follow-up study as time and contacts continued. The standardization of assessments and the structured protocols were instituted as the study proceeded. Thus, the study was not initially planned as a 32-year follow-up but ended up as such.

There were no subjects who could become a control group in the Vermont State Hospital, inasmuch as the entire most severely ill third of the patients in the state's only hospital (excluding the geriatric population) was selected to participate in the program. For years an appropriate comparison sample was sought, and recently a study was undertaken in the state of Maine that matched each of the Vermont study's subjects by age, sex, diagnosis, and level of chronicity with a patient from the Augusta Mental Health Institute. These new subjects are being interviewed with the same protocols and instruments to determine their life courses and illness trajectories. The primary difference between the two samples is the presence or absence of rehabilitation efforts. It is hoped that the difference in outcome between rehabilitated and nonrehabilitated subjects will be helpful in the study of mediating factors in long-term course.

As we have noted, the Vermont subjects were selected from the most disabled patients in the hospital. We have portrayed the severity of their handicaps, the length of their institutionalization, their lack of response to phenothiazines after an average of 2½ years of psychotropic treatment, the back-ward hopeless atmosphere in which they had lived for years, the

broken ties with family and community, as well as impoverished financial and educational backgrounds. In addition, many subjects behaved violently or in other unacceptable ways in their communities and were often brought to the hospital by local police. Few of these subjects used street drugs, but some abused alcohol.

Our findings should be generalizable to similar long-stay patients, estimated by Minkoff (56) and others to number about 1.1 million in the United States. The results of the study could be considered conservative for the long-term course of severe mental illness because anyone who is less severely ill, who has spent less time institutionalized, and who is less severely handicapped may have a better chance of long-term recovery. However, the use of street drugs, multiple short-term hospitalizations, and the predominance of *DSM-III* axis II diagnoses add new complexities to the current picture of prolonged psychiatric disorder, especially schizophrenia, for subgroups of younger patients; these are currently being assessed in the elegant studies of Test et al. (57) in Wisconsin.

Another aspect of the question of generalizability is whether our subjects' improvement was an artifact of the quiet, benign rural environment. Zubin (58) pointed out, "Where in the world would you get the natural history of schizophrenia if not under the best circumstances? You wouldn't want to go to the ghetto, where people are suffering from a lot of other sources of distress, to see whether the outcome is good there. You want to go to the best place, where triggering mechanisms are at a minimum" (p. 407).

The impact of rural life on the course of illness is very complex. In 1982 Vermont was a community of 518,846 people scattered in clumps across 9,273 square miles (59, 60), with a density of 56 people per square mile. Vermonters tend to pride themselves on Yankee individuality and independence (61, 62); therefore it is possible to regulate one's social distance and to find a niche sometimes for people with eccentric behaviors. Despite its ecological niches and visual beauty, however, Vermont registers fairly high rates of suicide (63), alcoholism, and incest (64), as well as unemployment, poverty, and long, difficult winters. Families and patients alike experience the pain of stigma and social rejection. Therefore, it is not clear whether the primary environment has been the deciding factor in the improvement process, but perhaps the secondary effects of a rural environment, such as small numbers and stability, have been helpful. As we said earlier in describing phase I of the project's history, the same five members of the clinical research team went with patients to the community and were available for support and clinical care over a 10-year period when the subjects were both in and out of the hospital. This continuity of contact persisted during the second 10 years, as people changed their roles from clinicians and patients to friends and neighbors. (It also may explain the 97% rate of original subjects found and the 5% refusal rate.)

Further, in any discussion of the effect of rural life, it is important to point out that the data from the Bonn and Zurich studies came from industrialized cities and that Lausanne is a medium-sized city. Only Iowa and Vermont are clearly rural localities, but the trends in the data across all five studies with different environments are similar.

The knowledge gained from our study and others that there is a wide range of long-term outcomes provides an impetus to continue the search, begun by the investigators in the three European studies, for longitudinal patterns of course of illness demonstrated by subgroups of patients who achieve considerable improvement or recovery and those who do not. Additional questions to be asked now are: When in the course of their illness did those patients who improved begin to do so? Are there any predictors of future outcome status? Many older concepts of predictors have not been as strong as once thought (32, 41, 65-67, and our companion paper in this issue), and we have begun investigations into these important questions.

The answers will begin to reshape our psychological and biological concepts of severe mental illness and the way in which service delivery systems and treatments are designed.

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