

National Estimates of Recovery-Remission From Serious Mental Illness

Mark S. Salzer, Ph.D., Eugene Brusilovskiy, M.U.S.A., Greg Townley, Ph.D.

Objective: A broad range of estimates of recovery among previously institutionalized persons has been reported, but no current, community-based national estimate of recovery from serious mental illness exists. This study reports recovery rate results, based on a remission definition, and explores related demographic factors.

Methods: A national, geographically stratified, and random cross-sectional survey conducted from September 2014 to December 2015 resulted in responses from more than 41,000 individuals. Lifetime prevalence of serious mental illness was assessed by asking about receipt of a diagnosis (major depression, bipolar disorder, manic depression, and schizophrenia or schizoaffective disorder) and hospitalization and impairment associated with the diagnosis. Recovery was determined by asking about impairments over the past 12 months.

Results: Almost 17% reported receiving one of the diagnoses in their lifetime, 6% had a lifetime rate of a serious mental illness, and nearly 4% continued to experience interference associated with serious mental illness. One-third of those with a lifetime serious mental illness reported having been in remission for at least the past 12 months. Recovery rates were low until age 32 and then progressively increased.

Conclusions: Lifetime estimates of diagnosed illness and current prevalence of serious mental illness are consistent with previous research. Results indicate that recovery is possible and is associated with age. Further research is needed to understand factors that promote recovery, and sustained evaluation efforts using similar parsimonious approaches may be useful in conducting timely assessments of national and local mental health policies.

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Determining the prevalence of serious mental illness is important because of its implications for the development and prioritization of clinical interventions and health policy, especially funding decisions. Estimates are that between 4.1% (1) and 5.8% (2) of US adults experience a serious mental illness at any point in time. The variation reflects different methodologies used to survey respondents, define serious mental illness, and calculate estimates. Costs associated with serious mental illness, including health care expenditures, loss of earnings, and disability benefits, have been estimated to be \$317.6 billion per year (3). Less discussed, and equally as important, are estimates of recovery from serious mental illness, which can inform knowledge about the course of these illnesses and be used, for instance, as a benchmark of success in evaluating health policy in terms of how well these conditions are being addressed. Recent efforts have attempted to develop strategies to determine national recovery rates (4).

Schizophrenia, for example, has traditionally been viewed as a chronically deteriorating condition, or at least a condition that does not improve; if improvement is detected, it suggests to some a possible misdiagnosis. However, this perspective has been replaced by a series of studies indicating that from 20% to 70% of people with a carefully

determined schizophrenia diagnosis who leave institutional settings experience significant periods of symptom abatement, limited hospitalizations, and enhanced functioning over time (5). These findings have served as the basis for one perspective of recovery (5,6) that is consistent with the notion of remission from schizophrenia, which is described as occurring when patients experience an improvement in core signs and symptoms to the extent that any remaining symptoms are of such low intensity that they no longer interfere significantly with behavior and are below the threshold typically utilized in justifying an initial diagnosis of schizophrenia. (7) Although remission rates have been studied in people with schizophrenia, primarily among those who have been institutionalized, remission rates have not been reported for community-based samples of those meeting criteria for serious mental illness, broadly speaking, including major affective disorders with significant functional impairments.

The patterns of remission in schizophrenia, also discussed as “course of illness,” have been extensively described in the literature, with Ciompi (8) producing a classic study in the area. Factors associated with remission, such as age, have been infrequently examined. Remission rates varying by age could reflect many things, including natural

recovery processes, better coping strategies, and increased access to and utilization of effective services and supports. Schultz and colleagues (9) conducted one of the few detailed studies examining the relationship between age and symptoms associated with schizophrenia; they found that increased age was associated with decreased positive symptoms, but not with decreased negative symptoms. Comparable studies were not found for other diagnostic groups.

In this study, we used data from more than 41,000 non-institutionalized individuals who were surveyed by Truven Health Analytics between September 2014 and December 2015 to identify a national sample of individuals with a lifetime serious mental illness. An estimate of 12-month recovery rates was determined on the basis of the notion of remission, which is in line with the clinician's (5) or recovery-from (6) perspective on recovery. We referred to this as "recovery-remission" to differentiate it from other perspectives, discussed later. We then examine sociodemographic factors associated with recovery-remission.

METHODS

Procedures and Measures

Truven Health Analytics (Truven) conducts the PULSE Survey, the largest privately funded multimode health survey in the United States, using landline, cell phone, and Internet sampling methods. The survey involves a geographically stratified random sample of the US population and results in approximately 7,000 respondents per month who answer questions about various health-related topics, such as vaccines, the Ebola virus, and childbirth. The vast majority of the surveys by Truven are conducted in English, although a small number are conducted in Spanish. Additional items can be added to the survey for a fee, as was done for this study. The Truven survey includes each respondent's demographic characteristics, including age, gender, race, marital status, education, and household income.

The 1992 ADAMHA Reorganization Act (P.L. 102-321) definition of serious mental illness for adults (age 18 and older) served as a guide for developing survey questions to assess the presence of a serious mental illness. According to the act, a serious mental illness is defined as a "diagnosable mental, behavioral, or emotional disorder of sufficient duration to meet diagnostic criteria" that "has resulted in functional impairment which substantially interferes with or limits one or more major life activities." There has been significant variability in how serious mental illness has been assessed in epidemiological studies and other research.

The Substance Abuse and Mental Health Services Administration, which depends on such estimates for block grants, currently uses serious mental illness estimates from the National Survey on Drug Use and Health (NSDUH), which makes its determination on the basis of responses to questions regarding psychological distress and functional

impairment, with adjustments based on previous samples involving structured clinical interviews. Kessler and colleagues (2) used National Comorbidity Study Replication data to classify respondents as having a serious mental illness if they had any of the following characteristics, determined through an interview: a past-year suicide attempt with serious lethal intent; work disability because of a mental or substance use disorder; diagnosis of nonaffective psychosis, bipolar I, or bipolar II disorder; substance dependence with serious role impairment; impulse control disorder with serious violence; or any disorder that resulted in 30 or more days of role impairment at work, home, or in social relationships during the past year. Pratt (10) used the National Health Interview Survey to assess a lifetime serious mental illness; respondents indicated whether they had ever been told by a doctor or other health professional that they had schizophrenia, bipolar disorder, or mania or psychosis.

After consulting with several psychiatric epidemiologists about brief approaches to assess serious mental illness, the following yes-no sequence of questions was developed and added to the Truven survey. First, all respondents were asked, "Have you ever been told by a psychiatrist or other mental health professional that you have major depression, bipolar disorder, manic depression, schizophrenia or schizoaffective disorder?" If they answered "yes" to this question, they were also asked the following two questions: "Have you ever been hospitalized for this mental health or emotional problem?" and "Has this mental health or emotional problem substantially interfered with or limited your ability to participate in any major life activities such as work, school, recreation, social activities, religious activities, family relationships, or caring for yourself?" The hospitalization question was included because it is in line with work suggesting that inpatient treatment is an "indication of definite serious mental illness" (11). Lifetime serious mental illness was determined if the individual answered yes to all three questions.

Individuals who indicated having a lifetime impairment were also asked, "Was this substantial interference or limitation within the past 12 months?" A no answer to this question was used as an indicator of 12-month remission.

Truven provided unduplicated, clean data from 42,658 individuals who were contacted between September 2014 and December 2015, were between ages 20 and 65, and responded in English. Of these individuals, 876 (2.1%) did not answer the diagnosis question. Of the remaining individuals who indicated having a diagnosis, 49 did not answer the question about a hospitalization, 179 did not answer about a lifetime limitation, and 102 individuals who reported a lifetime limitation did not answer the question about a current limitation. These individuals were removed from the analyses, giving a final sample of 41,452.

Institutional review board approval from the lead author's university was obtained for this study.

TABLE 1. Demographic characteristics of 41,452 respondents to a national health survey, by presence of serious mental illness

Characteristic	Lifetime serious mental illness				Current serious mental illness (N=1,619)		In recovery-remission (N=782)	
	No (N=39,051)		Yes (N=2,401)					
	N	%	N	%	N	%	N	%
Gender								
Male	16,581	42.4	1,039	43.3	726	44.8	313	40.0
Female	22,470	57.5	1,362	56.7	893	55.2	469	60.0
Race-ethnicity								
White	31,273	81.1	1,906	78.0	1,276	79.4	630	81.2
Black/African American	3,395	8.8	208	8.7	143	8.9	65	8.4
American Indian, Eskimo, Aleut	545	1.4	65	2.7	50	3.1	15	1.9
Asian or Pacific Islander	1,232	3.2	71	3.0	56	3.5	15	1.9
≥1	1,264	3.3	91	3.8	54	3.4	37	4.8
Other	848	2.2	42	1.8	28	1.7	14	1.8
Marital status								
Married	22,318	57.3	1,029	42.9	726	44.9	303	38.8
Not married	16,637	42.7	1,369	57.1	891	55.1	478	61.2
Household income								
<\$50,000	18,026	50.1	1,523	66.7	998	64.4	525	71.6
≥\$50,000	17,981	49.9	759	33.3	551	35.6	208	28.4
Education								
Less than high school	1,254	3.2	179	7.5	119	7.4	60	7.7
High school or equivalent	7,435	19.1	522	21.8	361	22.3	161	20.6
More than high school	30,199	77.7	1,695	70.7	1,136	70.3	559	71.7

Analysis

We used chi-square tests to assess differences between the groups. In addition to these descriptive results, we used multivariable logistic regression to examine the relationship between remission and the demographic variables.

RESULTS

Lifetime Serious Mental Illness and Percentage in Recovery-Remission

Of the 41,452 individuals in the final sample, 7,002 (16.9%) responded that they had been given a psychiatric diagnosis by a medical professional. Of those, 2,874 (41.0%) indicated they had been hospitalized for this mental health or emotional problem, and 4,949 (70.7%) indicated that the mental health problem had caused significant interference with or limitation in major life activities. Of the 41,452 individuals in the final sample, 2,401 (5.8%) answered yes to all three questions, indicating a lifetime serious mental illness.

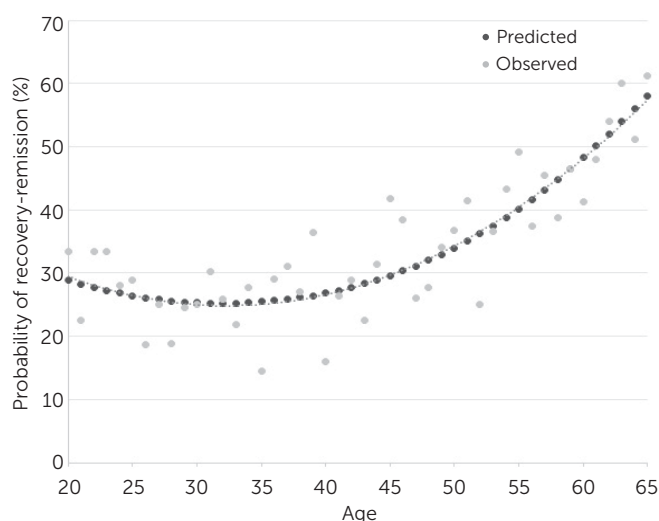
Of these 2,401 respondents, 1,619 (67.4%) reported a substantial interference or limitation within the past 12 months. This equates to a 12-month (that is, current) serious mental illness prevalence rate of 3.9% (1,619 of 41,452). The remaining 782 (32.6%) individuals who answered no to this question were categorized as being currently in remission from a serious mental illness.

Sample Characteristics

Table 1 presents the demographic characteristics of the sample without a lifetime serious mental illness, those with lifetime serious mental illness, those who were not currently

in recovery-remission, and those who were in recovery-remission. More than half of the individuals in each sample were female, approximately 80% were white, and more than 70% had more than a high school education. The mean±SD age was 46.99±13.16 for the sample without a lifetime serious mental illness, 41.61±12.91 for those with lifetime serious mental illness, 40.11±12.35 for those with current serious mental illness, and 44.73±13.49 for those in recovery-remission. Comparisons between the groups without a lifetime serious mental illness and those with a lifetime serious mental illness indicated that the former group was younger ($t=21.93$, $df=1,773$, $p=.001$), was less likely to be married ($\chi^2=97.19$, $df=1$, $p=.001$), reported a lower income ($\chi^2=122.62$, $df=1$, $p=.001$), and was less likely to have more than a high school education ($\chi^2=139.53$, $df=2$, $p<.001$). We found no gender differences.

The logistic regression treated 12-month recovery-remission (yes or no) as the dependent variable. The independent variables were gender, race, education, marital status, household income (multiple cutoffs were used), and age and age-squared, with the latter added because of the nonlinear relationship observed in Figure 1, which plots observed recovery-remission rates among persons with lifetime serious mental illness and predicted probabilities of recovery-remission by age. The results of the regression, presented in Table 2, found the age (Wald $\chi^2=7.51$, $df=1$, $p\leq.001$) and age-squared (Wald $\chi^2=13.86$, $df=1$, $p\leq.001$) effects to be significant. As shown in Figure 1, the predicted probability of recovery-remission decreased from 29% to 25% between ages 20 and 32 and then rose steadily beginning at age 33, reaching 58% at age 65.

FIGURE 1. Probability of recovery-remission among persons with lifetime serious mental illness, by age^a

^a The estimated regression curve formula is $P(\text{recovery-remission}) = .0003 \text{ age}^2 - .0197 \text{ age} + .5678$

DISCUSSION

A large, national survey was conducted to assess 12-month recovery-remission rates from serious mental illness. Almost 17% of the respondents indicated having been diagnosed as having a schizophrenia spectrum, bipolar, or major depressive disorder at some point in their lifetime. Approximately 6% were estimated to meet criteria associated with lifetime serious mental illness, which included also having an impairment and hospitalization associated with this condition. Of the individuals with a lifetime serious mental illness, approximately 33% indicated having been in recovery-remission for at least the past 12 months. Age was the only demographic variable that was associated with recovery-remission. A decreasing rate of recovery-remission was found until age 32, followed by a gradual increase to 58% at age 65.

TABLE 2. Demographic predictors of recovery-remission among survey respondents with a lifetime serious mental illness

Independent variable	OR	95% CI	Wald χ^2 ^a	p
Age	.93	.88–.98	7.51	.006
Age-squared	1.001	1.001–1.002	13.86	≤.001
Race-ethnicity ^b	1.08	.86–1.35	.4	.525
Sex (reference: female)	.9	.75–1.08	1.26	.262
Household income	.82	.66–1.02	3.2	.074
<\$50,000 (reference: ≥\$50,000)				
Education (reference: high school)				
Less than high school	1.21	.82–1.77	.9	.342
More than high school	1.23	.97–1.54	3.00	.084
Married ^c	.9	.74–1.10	1.13	.287

^a df=1

^b Binary variable, with white coded as 1 and nonwhite coded as 0

^c Binary variable, with married coded as 1 and not married coded as 0

The percentage of those reporting a lifetime diagnosis of schizophrenia, bipolar disorder, and major depression (17%) was in the range of lifetime prevalence rates reported elsewhere for these disorders. For example, one study estimated the rates of lifetime major depressive and bipolar (I and II) disorders at 16.6% and 3.9%, respectively (2). Lifetime prevalence rates of schizophrenia spectrum disorder have been estimated to be 1.26% (12) to 4% (13). This study found a lifetime prevalence of serious mental illness of 5.8%. No other comparable statistic was found in the literature. Nearly 4% of our sample had an impairment in the past 12 months that corresponded to a 12-month prevalence estimate. This percentage is very close to the 2014 NSDUH estimate of serious mental illness of 4.1% (1).

One novel finding from this study is that approximately one third of individuals who experienced a serious mental illness in their lifetime reported no impairments in the previous 12 months. This finding is contrary to traditional beliefs about a consistently deteriorating negative outlook for individuals diagnosed as having schizophrenia, for example, although this sample included other diagnostic groups. The findings reported here are the first to assess the recovery-remission rate among a national, community-based population. Being in remission does not imply that impairments may not return, but the remission rate is consistent with findings suggesting that these conditions are typically episodic (there are at least periods of remission), including schizophrenia (14), although remission rates and patterns should not be presumed to be the same across all diagnostic groups. Although recovery-remission rates are positive, a large percentage of individuals continue to report current impairments associated with their diagnosis, especially at younger ages.

We found a statistically significant nonlinear relationship between age and recovery-remission, with a clear low point at age 32 and a clear upward trajectory after that. One plausible explanation is that the initial onset of a serious mental illness may be associated with significant life disruptions at a critical developmental stage at which help-seeking is not considered to be a desirable path (15). This may explain diminishing recovery-remission rates during young adulthood as impairments build without treatment or the desire for support. The increased recovery-remission rate may reflect a growing inclination to seek and engage in services, possibly indicating greater maturity, greater confidence in advocating for one's needs, or other developmental processes. It may also reflect some who experience natural recovery without treatment; one estimate has suggested that only 69% of individuals with a serious mental illness received services in the previous year (16).

Although an understanding of the recovery-remission rate is important, caution should be taken in how it is interpreted in the broader context of the concept of recovery that has been discussed in the literature and that drives mental health policy and service delivery models around the world. Remission has been described as necessary but not sufficient for recovery (7), but it may be neither. Two

perspectives on recovery have been discussed in the literature. One perspective, referred to as the “clinician’s” (5) or “recovery from” (6) perspective, is consistent with the notion of recovery-remission as discussed in this study in that it focuses on the absence of or decreases in symptoms and impairment. Recovery is also understood from the consumer (5) or in-recovery (6) perspective, which acknowledges that people with serious mental illnesses can live satisfying and fulfilling lives regardless of the presence or absence of symptoms or impairments associated with a diagnosis. High levels of quality of life and community participation (e.g., work, school, parenting, leisure and recreation) occur even when impairments are present. Therefore, although one-third of individuals were found to be in recovery-remission over a 12-month period, this likely does not reflect recovery to the degree that these individuals, as well as those still reporting impairments, are leading satisfying and fulfilling lives. Interventions to address symptoms are important, but so are interventions directly focused on impairments, which have been argued to be a medical necessity in the sense that they are associated with reduced symptoms and cognitive impairment (17).

Our sample had an overrepresentation of women and more educated respondents. This is common in surveys (18). Given that education was found to be associated with the lifetime presence of a serious mental illness, these results may underrepresent the rate of lifetime serious mental illness. Whether education affects remission estimates, the main issue being addressed, is unknown. Self-reported diagnoses and impairments may have resulted in an undercount of the prevalence of serious mental illness because respondents may never have sought treatment, could reject a diagnosis they had been given, or fear disclosing a diagnosis, especially in a phone call with a stranger. Moreover, the survey did not ask about posttraumatic stress disorder, which is often included in discussions of serious mental illness, possibly leading to further undercounts of lifetime serious mental illness. These conditions may or may not have higher remission rates. Perceptions of a connection between a specific life problem and a diagnostic label are also subjective and may also have affected estimates.

Regardless, the lifetime prevalence estimates for the diagnoses that we inquired about and the current prevalence of serious mental illness that we obtained in this study were comparable to previously reported estimates, leading to some confidence in these methods. Finally, the survey excluded non-English speakers, who may have different remission rates because of, for example, socioeconomic and racial-ethnic factors associated with disparities in access to services. Inferences about to whom such results may generalize should be adjusted accordingly.

CONCLUSIONS

Serious mental illness is associated with significant emotional and economic costs and is a priority for federal,

state, and local health care systems. In this study, nearly a third of individuals with a lifetime serious mental illness had been in recovery-remission during the past 12 months. This is an inspiring number that should provide hope to many about their future after a diagnosis as well as to caregivers and other loved ones. It can also serve as a benchmark for future efforts aimed at evaluating the effectiveness of mental health policies and service delivery systems at all levels. Nonetheless, there is ample room to improve recovery-remission rates, and more research is needed to explore how to enhance recovery when it is defined based on other perspectives, including promoting opportunities for people to live satisfying and fulfilling lives, especially by increasing community participation.

These findings also point to age as a factor in remission. The clear curvilinear relationship validates the current emphasis on preventing the emergence of disorders and better addressing the mental health needs of young adults and speeding the likelihood of recovery-remission. In addition to investing in specialty programs to address the needs of this young adult population, understanding what other factors might affect these rates, other than the limited sociodemographic characteristics examined here, would be beneficial. Plausible targets could include biological or genetic factors, as well as social support, environmental barriers, self-stigma, and support and encouragement to lead a meaningful life even when symptoms are present. Increasing the speed and likelihood of recovery-remission will plausibly result in incredible individual and societal benefits.

AUTHOR AND ARTICLE INFORMATION

Dr. Salzer and Mr. Brusilovskiy are with the Department of Rehabilitation Sciences, Temple University, Philadelphia. Dr. Townley is with the Department of Psychology, Portland State University, Portland, Oregon. Send correspondence to Dr. Salzer (e-mail: mark.salzer@temple.edu).

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