

General Medical Problems of Incarcerated Persons With Severe and Persistent Mental Illness: A Population-Based Study

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Objective: Persons with severe mental illness have higher rates of chronic general medical illness compared with the general population. Similarly, compared with the general population, incarcerated persons have higher rates of chronic medical illness; however, there is little information about the synergy between severe mental illness and incarceration and the general medical problems of consumers. To address this gap in the literature this study addressed the following question: are consumers with a history of incarceration at greater risk of general medical problems compared with consumers without such a history?

Methods: Administrative data were used to compare the medical problems of 3,690 persons with severe mental illness with a history of incarceration and 2,042 persons with severe mental illness with no such history. **Results:** Consumers with a history of incarceration were more likely than those with no such history to have infectious, blood, and skin diseases and a history of injury. Furthermore, when analyses controlled for gender, race, age, and substance use disorders, consumers with an incarceration history were 40% more likely to have any general medical problem and 30% more likely to have multiple medical problems. **Conclusions:** The findings presented here call for better communication among local public health and mental health providers and jails and better integration of primary care and behavioral health care among community mental health providers. Also, research should be accelerated on evidence-based interventions designed to divert persons with severe mental illness from the criminal justice system and facilitate community reentry for persons with severe mental illness who are released from jails and prisons. (*Psychiatric Services* 61:45–49, 2010)

There is evidence that persons with severe mental illness have higher rates of chronic health conditions and a reduced life expectancy compared with the general population (1–5). For example, between 58% and 74% of persons with severe mental illness report at least one chronic health problem, such as hypertension, diabetes, and pulmonary disease (1,6). Further, persons with severe mental illness, particularly those diagnosed as having schizophrenia, live fewer years on average and have higher relative mortality risks than the general population (5,7,8). The medical needs of persons with mental illness are of particular concern because our mental health and primary health care systems are not well integrated, and there is evidence that the health care needs of persons with mental illness often go unmet (9).

In this context, there is little information about how the general medical problems of persons with severe mental illness who have a history of incarceration—defined here as one or more incarcerations in a local jail during a five-year study period—compare with the medical problems of persons with mental illness who do not have a history of incarceration. This gap in our knowledge is of concern because incarcerated individuals, in general, have higher rates of chronic illness, such as diabetes, coronary artery disease, and infectious diseases (10,11). Compared with consumers with no history of incarceration

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tion, are persons with severe mental illness and a history of incarceration at even greater risk of general medical problems? The aim of this study was to contribute to our knowledge about the complex needs of persons with mental illness by examining the synergistic effects of severe mental illness and incarceration on the general medical problems of persons with mental illness.

Methods

A quasiexperimental design was used to compare the general medical problems of persons with severe mental illness who have an incarceration history and persons with severe mental illness with no such history. Administrative data from local Medicaid enrollment and claims files, a local community mental health authority, and a local jail were obtained in order to enumerate all Medicaid (N=168,993), jail (N=120,109), and community mental health users (N=29,831) in King County (Seattle), Washington, from 1999 through 2003. Then data from these three systems were linked in order to identify single- and multisystem user groups: Medicaid only (N=122,842); jail only (N=88,704); mental health only (N=6,452); Medicaid and jail (N=23,955); Medicaid and community mental health (N=15,929); jail and community mental health (N=1,183); and Medicaid, jail, and community mental health (N=6,267). For this study, 100% of the sample of Medicaid, jail, and community mental health users (N=6,267) and a random sample of 25% of the Medicaid and community mental health users (N=3,983) were used.

Next, a definition of severe and persistent mental illness was applied to these two samples. Here, severe and persistent mental illness was defined as the conjunction of diagnosis, disability, and duration (12). Diagnostic information came from community mental health records. All persons who had a diagnosis of schizophrenia, affective disorder (with some exceptions), delusional disorder, or psychotic disorder not otherwise specified and who were enrolled in Medicaid were classified as having a severe and persistent mental illness. Be-

cause of the lack of an independent measure of severity or chronicity of mental illness in the administrative data, Medicaid eligibility because of Supplemental Security Income or Social Security Disability Income was used as a proxy for duration and disability because it takes evidence of profound impairment of prolonged duration to become eligible for these entitlement programs.

After applying this definition, the Medicaid, jail, and community mental health group contained 3,690 individuals with severe mental illness, which was 59% of the original group (N=6,267) and the Medicaid and community mental health group contained 2,062 individuals with severe mental illness, which was 52% of the original group (N=3,983). These groups included all Medicaid-eligible mental health consumers with severe mental illness in the county during the study period.

A consumer was classified as having a history of incarceration if he or she was incarcerated in jail one or more times during the study period. Next, data from Medicaid claims, outpatient behavioral health providers, and local and state hospitals were used to identify diagnosis of or treatment for general medical problems from 11 broad diagnostic categories, which included infectious and parasitic diseases; cancer; endocrine, nutritional and metabolic disorders; diseases of the blood; diseases of the nervous system; diseases of the circulatory system; diseases of the respiratory system; diseases of the digestive system; diseases of the skin; diseases of the musculoskeletal system; and injury and poisoning. To restrict the data to confirmed diagnoses, codes for ruling out diagnoses and diagnostic testing were excluded.

This study was approved by the institutional review boards at the University of North Carolina at Chapel Hill and the Washington State Department of Social and Health Services Research and Data Analysis Division.

Chi square tests were used to examine the association between incarceration history (coded yes or no) and 11 dummy variables (coded yes for having a medical problem or no for

not having a problem) representing each of the 11 categories described above. Also, dummy variables for any problem (coded yes or no) and multiple problems (coded yes or no) were created, and their associations with incarceration history were examined.

Next, a series of logistic regression models were used to examine the relationships between incarceration history and the probability of having the general medical problems that were significant in the bivariate analyses, controlling for gender, race, age, and co-occurring alcohol and substance use disorders. Also, separate logistic regression models were used to examine the associations between incarceration history and having any problem and multiple problems.

Results

The demographic characteristics of the samples are shown in Table 1. Compared with consumers with no incarceration history, those with such a history were more likely to be male (60% versus 38%) ($\chi^2=239.10$, $df=1$, $p<.001$) and African American (27% versus 13%) ($\chi^2=295.10$, $df=1$, $p<.001$). Also, compared with consumers with no incarceration history, those with an incarceration history were more likely to be diagnosed as having schizophrenia (37% versus 32%) ($\chi^2=15.59$, $df=1$, $p<.001$) and were more likely to have co-occurring substance use disorders (49% versus 14%) ($\chi^2=701.34$, $df=1$, $p<.001$).

Also shown in Table 1, consumers with an incarceration history were more likely to have infectious diseases (34% versus 27%), blood disorders (13% versus 11%), skin disorders (23% versus 18%), and injuries (38% versus 29%). Consumers without an incarceration history were more likely to have medical problems related to cancer (11% versus 6%) and endocrine disorders (29% versus 25%).

Moreover, consumers with an incarceration history were 1.4 times more likely than those with no such history to have any general medical problem and were 1.3 times more likely to have multiple medical problems. The statistically significant bivariate relationships remained significant in the multivariate models, with the exception of endocrine dis-

orders (Table 1). Thus, compared with those with no incarceration history, consumers with an incarceration history were more likely to have infectious diseases (odds ratio [OR]=1.4), blood disorders (OR=1.2), skin disorders (OR=1.4), and injuries (OR=1.5) when the analyses controlled for gender, race, age, and substance use disorders.

As shown in Table 2, when the analyses controlled for gender, race, age, and substance use disorders, consumers with an incarceration history were 1.4 times as likely to have any general medical problem and 1.3 times as likely to have multiple physical health problems. That is, persons with severe mental illness with an incarceration history were 40% more likely to have medical problems and 30% more likely to have multiple problems compared with those with no history of incarceration.

Discussion

This population-based study of persons with severe mental illness expands our knowledge about the general medical problems of one of our country's most vulnerable populations. Findings suggest that the behaviors, chaotic lifestyles, and unsafe living environments that increase the probability of incarceration are likely associated with an increase in the probability of developing a number of medical problems for persons with severe mental illness. Also, to some extent these findings give credence to the notion that jails have become

Table 1

Characteristics of persons with severe mental illness, by incarceration history

Characteristic	No incarceration history (N=2,042)		Incarceration history (N=3,690)		OR ^a	95% CI
	N	%	N	%		
Gender						
Male	779	38.1	2,194	59.5	—	
Female	1,263	61.9	1,496	40.5	—	
Race						
White	1,483	72.6	2,505	67.9	—	
African American	256	12.5	1,011	27.4	—	
Other	301	14.7	174	4.7	—	
Age (M±SD)	36.67±11.63		33.84±9.37			
Diagnosis						
Schizophrenia	646	31.6	1,359	36.8	—	
Affective disorder	1,616	79.1	2,873	77.9	—	
Co-occurring substance use disorder	279	13.7	1,800	48.8	—	
Health problem						
Infectious disease ^b	552	27.0	1,259	34.1	1.40	1.24–1.57**
Cancer ^{b,c}	217	10.6	221	6.0	.54	.44–.65**
Endocrine disorder ^b	582	28.5	912	24.7	—	
Blood disorder ^{b,c}	230	11.3	486	13.2	1.20	1.01–1.41*
Nervous system	600	29.4	1,024	27.8	—	
Circulatory system	512	25.1	867	23.5	—	
Respiratory system	623	30.5	1,198	32.5	—	
Digestive system	551	27.0	1,061	28.8	—	
Skin disorder ^{b,c}	361	17.7	843	22.8	1.38	1.20–1.58**
Musculoskeletal system	569	27.9	1,022	27.7	—	
Injury ^{b,c}	588	28.8	1,399	37.9	1.50	1.34–1.70**
Any problem ^{b,c}	1,219	59.7	2,460	66.7	1.44	1.27–1.64**
Multiple problems ^{b,c}	982	48.1	1,961	53.1	1.31	1.16–1.49**

^a ORs were calculated only if the multivariate results were significant.

^b Significant in bivariate model

^c Significant in multivariate model when controlling for gender, race, age, and substance use disorders

*p<.05

**p<.001

public health outposts such that a jail detention for some persons living with mental illness could be their

first, only, or best opportunity to get screened, diagnosed, and treated for general medical problems (13).

Table 2

Probability of any and multiple general medical problems among persons with severe mental illness^a

Indicator	Any medical problem				Multiple medical problems			
	B	SE	OR	95% CI	B	SE	OR	95% CI
Male (reference: female)	.10	.03	1.23	1.10–1.38*	.10	.03	1.21	1.09–1.35*
Race (reference: white)								
Black	–.22	.05	.66	.58–.75*	–.21	.05	.66	.58–.75*
Other	.02	.07	.83	.68–1.02	.01	.07	.82	.67–1.00
Age	.03	.01	—	—	.03	.01	—	—
Substance use disorder (reference: no disorder)	.15	.03	1.34	1.18–1.51*	.15	.03	1.35	1.20–1.52*
Incarceration history (reference: no history)	.37	.07	1.44	1.27–1.64*	.27	.06	1.31	1.16–1.49*

^a Logistic regression models controlled for race, gender, age, and substance use disorders.

*p<.001

This study has a number of important implications. First, information sharing between local public mental health, public health, and local jails is critical. Communication among the primary health, behavioral health, and jail systems is generally poor and information-sharing arrangements that would allow for continuity of care from the community to the jail (that is, community mental health agents communicating to jail staff about an individual's medical or prescription needs) and from jail back to the community (that is, discharge planning and timely notification of release to ensure aftercare appointments and follow-up for general medical and behavioral health care) are not typical in most communities. Poor communication among these systems is of serious concern for consumers because many medications prescribed for the symptoms of mental illness have metabolic and cardiovascular side effects that could exacerbate existing medical conditions (14). Consumers could be at risk if jail medical staff members do not have access to medical histories and consumers are unwilling or unable to share information about comorbid mental illness and general medical problems. Moreover, left untreated upon release to the community, infectious and blood disorders among persons with severe mental illness can have the potential to become serious and costly public health issues. Local barriers that prevent information sharing among public health, behavioral health, and jails must be overcome so that health care for persons with severe mental illness is not disrupted.

Second, the integration of primary care and behavioral health care is important for all consumers but may be especially so for consumers who have a history of incarceration because these consumers are more likely to have multiple medical problems. The integration of primary care and behavioral health care is a significant challenge for many communities around the country, and a number of integration models and strategies have been implemented, including colocating primary care, behavioral care, and pharmacy services; embedding nurse care managers within

mental health treatment teams; offering wellness programs to educate consumers about diet and exercise, diabetes management, smoking cessation, disease management, and other topics; and providing evidence-based screening and education related to heart, vascular, and respiratory diseases; infectious diseases; injury and violence; alcohol, drug, and tobacco use; and nutritional issues (15–19). The extent to which these strategies are implemented in routine mental health settings is not clear, and the evidence base that these strategies improve the physical well-being of persons with severe mental illness needs to be developed. Nevertheless, these strategies do offer some hope and guidance for community mental health authorities struggling to integrate primary and behavioral health care.

Finally, local jails were never designed to be providers of general medical and behavioral health care, yet jails have seen their role as providers of such care expand greatly over the past decade or longer. Diverting persons with severe mental illness from jails and facilitating community reentry from jails and prisons are strategies that could lessen the burden of care on the criminal justice system and prevent disruptions in primary and behavioral health services among consumers. Research on evidence-based diversion and reentry programs for persons with severe mental illness must be accelerated in light of the fact that persons who have general medical and behavioral health problems have an increasingly difficult time with successful community reentry, including accessing safe and adequate housing, obtaining gainful employment, and accessing much-needed general health and behavioral health services (10).

The strengths of this study include unique data from multiple public systems and population-based samples of persons with severe mental illness over a five-year study period. Limitations of the study include the reliance on administrative data to enumerate the general medical problems of persons with severe mental illness and the generalizability of findings from one county. Moreover, data about to-

bacco use were not available for this study. Given the association between smoking and cardiovascular, respiratory, and neoplastic disease, future research should include tobacco use when examining comorbid general medical problems among persons with severe mental illness. Also, the sample in this study excludes consumers who were not in contact with the behavioral health service system long enough or consistently enough to become eligible for Medicaid. The data used in this study are over five years old, and changes or trends in the medical problems of consumers over the past several years, although unlikely, may not be reflected.

Conclusions

The findings of this study underscore the need for improved information sharing among mental health, public health, and local jail systems; encourage the implementation of strategies designed to better integrate mental health and primary care among mental health providers; and call for accelerating research on effective criminal justice diversion and reentry interventions.

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The authors report no competing interests.

References

1. Chwastiak L, Rosenheck R, McEvoy J, et al: Interrelationships of psychiatric symptom severity, medical comorbidity, and functioning in schizophrenia. *Psychiatric Services* 57:1102–1109, 2006
2. Daumit GL, Pratt LA, Crum RM, et al: Characteristics of primary care visits for persons with severe mental illness in a national sample. *General Hospital Psychiatry* 24:391–395, 2002
3. Dickey B, Normand ST, Weiss RD, et al:

- Medical morbidity, mental illness, and substance use disorders. *Psychiatric Services* 53:861–867, 2002
4. Hansen V, Arnesen E, Jacobsen BK: Total mortality in people admitted to a psychiatric hospital. *British Journal of Psychiatry* 170:186–190, 1997
 5. Joukama M, Heliovaara M, Knekt P, et al: Schizophrenia, neuroleptic medication, and mortality. *British Journal of Psychiatry* 188:122–127, 2006
 6. Jones DR, Macias C, Barreira P, et al: Prevalence, severity, and co-occurrence of chronic physical health problems of persons with serious mental illness. *Psychiatric Services* 55:1250–1257, 2004
 7. Colton CW, Manderscheid RW: Congruencies in increased mortality rates, years of potential life lost, and causes of death among public mental health clients in eight states. *Preventing Chronic Disease: Public Health Research, Practice, and Policy* 3:1–14, 2006
 8. Hennekens C, Hennekens A, Hollar D, et al: Schizophrenia and increased risk of cardiovascular disease. *American Heart Journal* 150:1115–1121, 2005
 9. Salsberry P, Chipps E, Kennedy C: Use of general medical services among Medicaid patients with severe and persistent mental illness. *Psychiatric Services* 56:458–462, 2005
 10. Mallik-Kane K, Visser CA: *Health and Prisoner Reentry: How Physical, Mental, and Substance Abuse Conditions Shape the Process of Reintegration*. Washington, DC, Urban Institute, Justice Policy Center, Feb 2008
 11. The Report of the Re-Entry Policy Council: *Charting the Safe and Successful Return of Prisoners to the Community*. New York, Council of State Governments, Justice Center, 2005
 12. Goldman HH, Gattozzi AA, Taube CA: Defining and counting the chronically mentally ill. *Hospital and Community Psychiatry* 32:21–27, 1981
 13. Steadman H: The jail as a public health outpost. Presented at the American Public Health Association, 133rd Annual Meeting and Exposition, Philadelphia, Dec 10–14, 2005
 14. Kiraly B, Gunning K, Leiser J: Primary care issues in patients with mental illness. *American Family Physician* 78:355–362, 2008
 15. Druss BG, Rohrbach RM, Levinson CM, et al: Integrated medical care for patients with serious psychiatric illness. *Archives of General Psychiatry* 58:861–868, 2001
 16. Gilbody S, Bower P, Fletcher J, et al: Collaborative care for depression: a cumulative meta-analysis and review of longer-term outcomes. *Archives of Internal Medicine* 166:2314–2321, 2006
 17. Lorig KR, Sobel DS, Stewart AL, et al: Evidence suggesting that a chronic disease self-management program can improve health status while reducing hospitalization: a randomized trial. *Medical Care* 37:5–14, 1999
 18. Pratt SI, Bartels SJ, Mueser KT, et al: Helping older people experience success: an integrated model of psychosocial rehabilitation and health care management for older adults with serious mental illness. *American Journal of Psychiatric Rehabilitation* 11:41–60, 2008
 19. *Guide to Clinical Preventive Services, 2008: Recommendations of the US Preventive Services Task Force*. AHRQ pub no 08-05122. Rockville, Md, Agency for Healthcare Research and Quality, Sept 2008. Available at www.ahrq.gov/clinic/pocketgd08

Management Problems Invited for an Interactive Column

Readers of *Psychiatric Services* are invited to submit management problems encountered at their work site to the journal's new interactive column, Case Studies in Public-Sector Leadership.

The editors of the column, Jules M. Ranz, M.D., and Susan M. Deakins, M.D., director and associate director, respectively, of the Columbia University Public Psychiatry Fellowship (PPF) will use an electronic mailing list (e-list) to present the problem to PPF fellows and alumni. The fellowship, which prepares psychiatrists for leadership roles in the public sector, emphasizes the importance of understanding systems and working in teams to solve problems, and the PPF e-list has proved useful as a tool to generate a collaborative problem-solving process. The first column, published in the October 2009 issue, addressed obstacles encountered at a community outpatient clinic during implementation of an initiative to monitor the metabolic effects of second-generation antipsychotics.

Please send a description of the problem, along with contact information, to Dr. Ranz at jmr1@columbia.edu.