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# Assessing the Contribution of the Deinstitutionalization of the Mentally Ill to Growth in the U.S. Incarceration Rate

Steven Raphael and Michael A. Stoll

## ABSTRACT

We assess the degree to which the mentally ill who would have been in mental hospitals in years past have been transinstitutionalized to prisons and jails. We also assess the contribution of deinstitutionalization to growth in the U.S. prison population. We find no evidence of transinstitutionalization for any demographic groups for the period 1950–80. However, for the 20-year period 1980–2000, we find significant transinstitutionalization rates for all men and women, with a relatively large transinstitutionalization rate for men in comparison to women and the largest transinstitutionalization rate observed for white men. Our estimates suggest that 4–7 percent of incarceration growth between 1980 and 2000 is attributable to deinstitutionalization. While this is a relatively small contribution to prison growth overall, the results suggest that a sizable portion of the mentally ill behind bars would not have been incarcerated in years past.

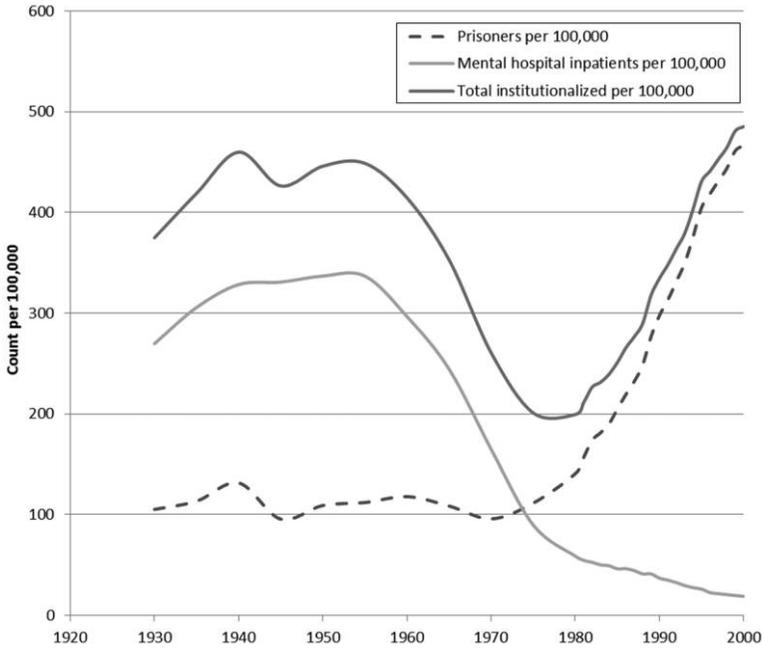
## 1. INTRODUCTION

The prevalence of mental health problems is extremely high among U.S. prison and jail inmates (James and Glaze 2006). Approximately half of state and federal prison inmates and over 60 percent of jail inmates report having mental health problems or symptoms indicative of mental illness. The relative prevalence of severe mental illness is particularly high (nearly five times that of the general adult population). Applying these prevalence rates to the 2008 incarcerated population implies that roughly

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**Figure 1.** Prisoners, mental hospital inpatients, and all institutionalized persons per 100,000 residents, 1930–2000.

316,000 severely mentally ill people were inmates in the nation's prisons and jails (115,000 jail inmates and 201,000 state and federal prison inmates) at that time. By contrast, the mental hospital inpatient population was less than 60,000.

That the population of the incarcerated mentally ill exceeds the inpatient mental hospital population is a relatively new development. In fact, as of midcentury, the number of mental hospital inpatients per 100,000 U.S. residents greatly exceeded the prison incarceration rate. This fact is illustrated in Figure 1, which presents the number of state mental hospital inpatients,<sup>1</sup> state and federal prisoners, and the sum of these two populations per 100,000 residents for the period 1930–2000. During the 1950s and 1960s, the inpatient rate was approximately three times the prison incarceration rate. Shortly thereafter, the inpatient rate declined precipitously, falling below the incarceration rate in the mid-

1. Data on inmates in state and county mental hospitals through 1970 are drawn from Palermo, Smith, and Liska (1991), and data for later years are from Raphael (2000).

1970s and continuing to decline in later decades. Meanwhile, during the 1980s and 1990s, the country experienced a nearly fivefold increase in incarceration rates.

The juxtaposition of these trends and the current high incidence of severe mental illness among those behind bars begs the question of whether the mentally ill have simply been transinstitutionalized from mental hospitals to prisons and jails. A related question concerns the extent to which the unprecedented growth in incarceration since the late 1970s is driven by a reduction in public investment in inpatient mental health services. Past changes in sentencing and corrections policies are currently under heightened scrutiny as state prison populations are at record levels and many states are seeking to scale back correctional populations with an eye on the fiscal benefits of doing so. To the extent that the run-up in state prison populations was driven by deinstitutionalization, the current focus on sentence enhancements and the evolution of the U.S. sentencing regime may be misplaced.

In this paper, we analyze various facets of this question using U.S. census data covering the period 1950–2000. We begin with a detailed descriptive analysis of the population of state, county, and private mental hospitals as of midcentury. We document the fact that many of those who were institutionalized in the 1950s and 1960s, and were subsequently deinstitutionalized, did not experience large increases in incarceration. Conversely, those most likely to be incarcerated as of the 2000 census experienced pronounced increases in overall institutionalization between 1950 and 2000 (with particularly large increases for black males). Thus, the impression created by aggregate trends is somewhat misleading, as the 1950 demographic composition of the mental hospital population differs considerably from the 2000 demographic composition of prison and jail inmates.

We then estimate the rate at which individuals who would have been institutionalized in years past have been transinstitutionalized to prisons and jails. We construct a panel data set that varies by state, gender, race, and age and estimate the impact of changes in regional mental hospital inpatient rates on changes in regional incarceration rates, controlling for a variety of fixed effects defined by the dimensions of the panel. For the early period, 1950–80, we find no evidence of transinstitutionalization for any of the demographic groups analyzed. For the 20-year period 1980–2000, we find significant transinstitutionalization rates for all men and women, with a relatively large transinstitutionalization rate for men

in comparison to women and the largest transinstitutionalization rate observed for white men.

The magnitudes of these transinstitutionalization effect estimates suggest that deinstitutionalization has played a relatively minor role in explaining the phenomenal growth in U.S. incarceration levels. Our results indicate that 4–7 percent of incarceration growth between 1980 and 2000 can be attributed to deinstitutionalization. While this is a relatively small contribution to the prison population growth overall, the results do suggest that a sizable portion of the mentally ill behind bars would not have been incarcerated in years past.

## 2. DEINSTITUTIONALIZATION AND THE CRIMINAL JUSTICE SYSTEM

### 2.1. Policies, Innovations, and Legal Decisions Driving Deinstitutionalization

Deinstitutionalization refers to the set of policies and treatment innovations driving the half-million-person decrease in the mental hospital population between 1955 and the present. Initial declines during the late 1950s are often attributed to the introduction of medications, particularly phenothiazine, designed to control psychotic symptoms and permit more effective outpatient treatment for the least severe cases of mental illness. A further impetus toward reduction came with the 1966 introduction of the Medicaid and Medicare programs, under which the federal government committed to a 50 percent match for treatment costs in nursing homes. The match created an incentive for states to transfer all eligible residents of mental hospitals to nursing homes and other facilities, and many did. Such state responses account for much of the decline in the inpatient census during the 1960s and 1970s (Mechanic and Rochefort 1990).

The one policy change that embraced deinstitutionalization as an explicit goal occurred under the Kennedy administration. The 1963 Community Mental Health Act (Pub. L. No. 88-164) established community mental health centers (CMHCs) designed to provide outpatient, emergency, and partial hospitalization services for the mentally ill (Mechanic and Rochefort 1990). The legislation embodied the shift in professional opinion regarding the effectiveness of outpatient care and the importance of maintaining residence in the community.<sup>2</sup> A further force

2. Many have questioned the effectiveness of this legislation, however, since the number of community mental health centers (CMHCs) falls far short of projected needs (Foley and

reducing inpatient population counts was the 1975 U.S. Supreme Court decision in *O'Connor v. Donaldson* (422 U.S. 563). A key element of this decision was the finding that mental illness alone was not sufficient grounds for involuntarily commitment. In subsequent years, most states changed their involuntary-commitment statutes to require that an individual be a danger to him- or herself and/or to others, with varying evidentiary requirements, rendering involuntary commitment considerably more difficult (Ross, Rothbard, and Schinnar 1996; Werth 2001).

To the extent that outpatient mental health services are inadequate, deinstitutionalization exposes severely and chronically mentally ill individuals to a number of competing risks. A risk that has received considerable attention concerns the relationship between untreated mental illness and homelessness (Jencks 1994; Torrey 1997). A competing risk that has received less attention concerns the probability of incarceration.

The size of the incarceration risk faced by the untreated mentally ill depends on the degree to which the mentally ill commit crimes. Moreover, whether the mentally ill are incarcerated in jails (where individuals serving sentences of less than a year and those awaiting arraignment and trial are held) or prisons (where those serving time for felonies with sentences of a year or more are held) depends on the severity of offenses committed. Torrey (1997) notes that the mentally ill are often arrested for minor crimes such as shoplifting, engaging in lewd behavior, or failing to pay for a restaurant meal, offenses likely to result in a jail spell. Torrey also cites several instances of local authorities putting the mentally ill in local jails to provide a place for them to stay while awaiting more suitable psychiatric services.

A prison sentence, in contrast, requires being convicted of a serious felony. Several studies address the issue of whether the mentally ill commit violent acts at a higher rate than that observed for the general public. An early review of this research documents the consistent finding that discharged mental patients are arrested and convicted for violent crimes at a rate that exceeds that of the general adult population (Rabkin 1979). The more recent literature reviews provided by Monahan (1992) and Frank and McGuire (2009) arrive at similar conclusions, noting the

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Sharfstein 1983). Moreover, the CMHCs have been criticized as shunning individuals with the most severe and chronic mental health problems (Johnson 1990; Jencks 1994).

robustness of the relationship between mental illness and violence to alternative methodological approaches and model specifications.<sup>3</sup>

## 2.2. How Prevalent Is Mental Illness among Prison and Jail Inmates?

The severely mentally ill are certainly overrepresented among the incarcerated. Moreover, this is true for both prison and jail inmates, which suggests that the criminal justice interactions with the untreated mentally ill extend beyond being jailed for safekeeping. Table 1 presents estimates of the lifetime prevalence of various mental illnesses from the 2004 Survey of Inmates in State and Federal Correctional Facilities (U.S. Department of Justice 2007) and the 2002 Survey of Inmates in Local Jails (U.S. Department of Justice 2012). These estimates are based on questions inquiring whether inmates had ever received a diagnosis of a specific mental illness from a health care professional. For comparison, the table also presents two sets of prevalence estimates for the noninstitutionalized population: estimates for the general adult population by Kessler et al. (2005) from the National Comorbidity Survey Replication and for adult males by Kessler et al. (1994) from the original National Comorbidity Survey. While we could not find comparable estimates for each condition included in the inmate surveys for these larger groups, these studies do provide lifetime prevalence estimates for the most severe mental illnesses.

Lifetime prevalence of mental illness among state prison inmates and local jail inmates is nearly identical, with roughly one-quarter of each indicating at least one diagnosis. The prevalence of severe mental illness (manic depression, bipolar disorder, or a psychotic disorder) among state prisoners and local jail inmates is very high (nearly 15 percent of each population, 3.1–6.5 times the rate observed for all males and for the general adult population). The rates of mental illness among federal prison inmates are somewhat lower. However, as federal prison inmates account for only 13 percent of the total prison population, the overall prison prevalence rates are closer to those for state prisoners.

3. Steadman et al. (1998) assess the violent behavior of a sample of individuals discharged from acute psychiatric facilities. The authors find no differences in the levels of violent behavior of the mentally ill who do not abuse alcohol or drugs and members of the general population with no symptoms of substance abuse. Among substance abusers, however, the mentally ill are relatively more violent, which suggests some interaction between mental illness and substance abuse. Frank and McGuire (2009) cite several studies that similarly find an interaction effect between mental illness and substance abuse on self-reported violent behavior.

**Table 1.** Lifetime Prevalence of Mental Illness

Diagnosis	Prison Inmates, 2004		Jail Inmates, 2002	Noninstitutionalized	
	State	Federal		All Persons 18 and Older, 2000–2002	All Males 15–54, 1990–92
Depressive disorder	.191	.108	.194	.166	.121
Manic depression, bipolar disorder, or mania	.097	.041	.101	.039	.016
Schizophrenia or another psychotic disorder	.046	.020	.046	.007 <sup>a</sup>	.006 <sup>a</sup>
Posttraumatic stress disorder	.057	.033	.051	.068	
Another anxiety disorder such as panic disorder	.071	.046	.071	.057 <sup>b</sup>	.036 <sup>b</sup>
Personality disorder such as antisocial or borderline	.060	.033	.051		
Any other mental or emotional condition	.019	.008	.020		
Any of the above	.248	.144	.250		

**Sources.** Estimates for prison inmates are based on our analysis of U.S. Department of Justice (2007). Estimates for jail inmates are based on our analysis of U.S. Department of Justice (2012). Estimates for the noninstitutionalized English-speaking residents of the United States 18 and older are based on Kessler et al. (2005), which analyzes the National Comorbidity Survey Replication, conducted 2001–3. Estimates for men ages 15–54 are from Kessler et al. (1994), which analyzes the original National Comorbidity Survey, conducted 1990–92, a data set pertaining to all noninstitutionalized persons ages 15–54.

<sup>a</sup>Prevalence is measured for all individuals with a history of nonaffective psychosis, including schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, and atypical psychosis. See Kessler et al. (1994) for details. Note that the figures pertain to the original National Comorbidity Survey and thus measure the lifetime prevalence of nonaffective psychoses as of the early 1990s.

<sup>b</sup>Prevalence is measured for people indicating that they have generalized anxiety disorder.

**Table 2.** Characteristics of State Prison Inmates, 2004

	All Inmates	Diagnosed Mental Illness		
		None	Any	Bipolar, Manic, or Psychotic Disorder
Male	.932	.953	.868	.846
Married	.164	.167	.154	.142
Any children	.555	.558	.546	.555
Homeless prior to arrest	.086	.065	.151	.173
Hispanic	.181	.199	.125	.110
White	.488	.444	.619	.633
Black	.430	.466	.321	.317
American Indian	.252	.047	.067	.075
Offense:				
Murder, homicide, or manslaughter	.139	.139	.140	.123
Sexual assault	.107	.102	.124	.099
Robbery	.127	.129	.120	.135
Assault	.086	.082	.098	.103
Other violent crime	.020	.019	.024	.023
Burglary	.082	.080	.088	.085
Fraud or larceny	.078	.072	.096	.114
Auto theft	.012	.011	.016	.020
Other property crime	.010	.010	.012	.013
Drugs	.213	.230	.161	.155
Weapons	.025	.027	.018	.019
Other	.101	.100	.104	.112
Parent or stepparent served time	.201	.247	.247	.263
Age:				
25th percentile	27	26	27	27
50th percentile	34	34	35	35
75th percentile	42	42	42	42
Age at first arrest:				
25th percentile	15	15	14	14
50th percentile	17	17	17	17
75th percentile	21	21	20	20

Source. Figures are tabulated from U.S. Department of Justice (2007).

Tables 2, 3, and 4 present average characteristics for state prisoners, federal prisoners, and jail inmates, respectively, by mental health status. There are several notable patterns in Table 2. First, while males and racial and ethnic minorities are heavily overrepresented among state prison inmates, this is less the case among mentally ill inmates. For example, while 93 percent of state prisoners are male, approximately 85 percent of severely mentally ill inmates are male. Similarly, whites account for 49 percent of all inmates; they account for 63 percent of seriously mentally ill inmates.

**Table 3.** Characteristics of Federal Prison Inmates, 2004

	All Inmates	Diagnosed Mental Illness		
		None	Any	Bipolar, Manic, or Psychotic Disorder
Male	.929	.943	.847	.834
Married	.259	.266	.221	.167
Any children	.643	.653	.589	.527
Homeless prior to arrest	.037	.026	.100	.154
Hispanic	.249	.261	.179	.112
White	.435	.412	.575	.574
Black	.463	.489	.327	.356
American Indian	.040	.036	.064	.044
Offense:				
Murder, homicide, or manslaughter	.029	.029	.026	.029
Sexual assault	.009	.008	.014	.004
Robbery	.085	.077	.134	.205
Assault	.017	.017	.019	.029
Other violent crime	.006	.004	.013	.015
Burglary	.005	.004	.008	.021
Fraud or larceny	.034	.032	.043	.053
Auto theft	.001	.001	.003	.009
Other property crime	.001	.002	.007	.016
Drugs	.552	.575	.418	.339
Weapons	.110	.099	.175	.192
Other	.150	.151	.140	.089
Parent or stepparent served time	.148	.140	.199	.233
Age:				
25th percentile	29	29	29	27
50th percentile	35	35	36	34
75th percentile	44	44	44	43
Age at first arrest:				
25th percentile	16	16	15	13
50th percentile	18	18	18	17
75th percentile	23	23	22	22

Note. Figures are tabulated from U.S. Department of Justice (2007).

These patterns are consistent with the research documenting differences in the prevalence of mental illness across demographic groups. In their review of 50 years of research on this topic, Frank and Glied (2006) find relatively comparable lifetime prevalence rates of severe mental illness for men and women and for different racial groups. While adults of low socioeconomic status are overrepresented among the mentally ill, it is difficult to rule out a reverse causal effect of mental illness on

**Table 4.** Characteristics of Jail Inmates, 2002

	All Inmates	Diagnosed Mental Illness		
		None	Any	Bipolar, Manic, or Psychotic Disorder
Male	.883	.913	.792	.781
Married	.161	.169	.142	.124
Any children	.552	.552	.554	.546
Homeless prior to arrest	.127	.102	.207	.228
Hispanic	.184	.208	.114	.105
White	.500	.462	.614	.617
Black	.430	.456	.337	.336
American Indian	.045	.041	.057	.053
Reason held:				
Awaiting arraignment	.109	.114	.096	.097
Awaiting trial	.259	.244	.302	.309
Awaiting parole or probation hearing	.095	.096	.095	.099
For safekeeping	.005	.003	.010	.009
As a witness	.002	.001	.005	.002
For contempt of court	.014	.014	.001	.016
Awaiting sentencing	.109	.103	.128	.114
Serving a sentence	.353	.362	.325	.302
Awaiting transfer	.072	.071	.075	.085
Other	.067	.068	.064	.066
Defining offense:				
Violent	.082	.079	.090	.149
Property	.251	.261	.218	.183
Violation for financial gain	.068	.065	.076	.076
Drug	.032	.035	.025	.016
Public order	.568	.560	.591	.575
Parent or stepparent served time	.212	.192	.272	.289
Age:				
25th percentile	23	23	24	24
50th percentile	31	30	32	32
75th percentile	39	39	40	40
Age at first arrest:				
25th percentile	15	16	15	15
50th percentile	18	18	17	17
75th percentile	21	22	21	20

Note. Figures are tabulated from U.S. Department of Justice (2012).

socioeconomic status.<sup>4</sup> Regardless, as mental illness does not discriminate, it is noteworthy that the demographics of the incarcerated mentally

4. While one might contend that socioeconomic status based on parental characteristics takes care of this problem, there is a strong intergenerational correlation between the mental health of parents and their offspring (Gottesman 1991).

ill are closer to the demographics of the general adult population than to the incarcerated overall.

Mentally ill state prisoners are only slightly more likely to be serving time for a violent crime (50.6 percent of all mentally ill compared to 47.1 percent of inmates without a diagnosis). The severely mentally ill are also considerably more likely (by 6 percentage points) to be serving time for a property crime and are considerably less likely to be doing time for a drug offense. Finally, mentally ill prison inmates are more likely to indicate that they suffered a spell of homelessness in the year preceding the arrest leading to their current incarceration. While 17.3 percent of inmates with severe mental illness experienced homelessness prior to their current arrest, the comparable figure for inmates with no diagnosed mental illness is 6.5 percent.

We observe similar demographic patterns for federal prison inmates, with a lower proportion who are male, a higher proportion who are white, and lower proportions who are Hispanic or black among the severely mentally ill. We also observe a strong relationship between mental illness and the likelihood of being homeless prior to arrest. Mentally ill federal inmates are considerably more likely to be held for violent crime than are inmates with no diagnosis and considerably less likely to be serving time for a drug crime. One pattern that is unique to the federal system concerns the proportion serving time for a weapons violation. Inmates with severe mental illness are 8 percentage points more likely to be held for a weapons violation than are inmates with no diagnosed mental illness. Under federal law, individuals who have been “adjudicated mentally defective” or “committed to a mental health institution” are prohibited from purchasing firearms (Daly 2008). This differential treatment of the mentally ill under federal law may explain this disparity.

The comparisons for jail inmates largely conform to the patterns observed for state and federal prison inmates. We see similar patterns with regard to gender and race. Over one-fifth of severely mentally ill inmates were homeless prior to arrest. Severely mentally ill inmates are also nearly twice as likely to have been arrested for a violent crime than are inmates with no such diagnosis. One interesting finding that jumps out is the relatively small proportion of severely mentally ill inmates who were being held for safekeeping. Only half a percent of all inmates are described in this manner. While this is three times the comparable value for inmates with no diagnosed mental illness, it is still remarkably low.

### 2.3. Prior Research on the Transinstitutionalization of the Mentally Ill

Several studies directly correlate prison populations with the mental hospital population. Penrose (1939) was probably the first to raise the issue. Data on 18 European countries revealed a negative correlation between the sizes of the prison and mental hospital populations. On the basis of this inverse correlation, Penrose advanced what he labeled the “balloon theory”: assuming a stable population in need of institutionalization, squeezing the population of one institution (for example, closing mental hospitals) will cause a ballooning of the other. By modern standards the study is flawed,<sup>5</sup> but it is interesting to note that the inverse relationship observed in Figure 1 existed in a different time and place.

A more recent study provides a simple time-series analysis of aggregate national data for the United States between 1926 and 1987 (Palermo, Smith, and Liska 1991), revealing significant negative correlations between the sizes of the mental hospital population and prison and jail populations. No attempt is made to control for other possibly important variables or to assess the direction of causality. Nonetheless, the correlations are strong (the Pearson correlation coefficients for various time periods range from  $-.4$  to  $-.5$ ) and highly statistically significant.

### 3. PUTTING AN UPPER BOUND ON THE POSSIBLE CONTRIBUTION OF DEINSTITUTIONALIZATION TO PRISON AND JAIL POPULATION GROWTH

The research findings regarding the relationship between severe mental illness and criminal activity, combined with the overrepresentation of the mentally ill behind bars, suggest that deinstitutionalization may be an important contributor to U.S. prison population growth during the last few decades of the twentieth century. However, a careful analysis of the characteristics of those in mental hospitals during the peak period of use reveals large differences between the characteristics of those who were subsequently deinstitutionalized and those who experienced large increases in incarceration rates.

To be specific, prison and jail inmates in the United States are overwhelmingly male, disproportionately minority, and relatively young. The same cannot be said for mental patients at midcentury. In Table 5, we

5. There is no attempt to control for other determinants of the institutionalized population and no attempt to net out common trends—that is, the panel aspects of the data analyzed are not fully exploited.

**Table 5.** Distribution of Institutionalized and Noninstitutionalized Populations, 1950-80

	1950				1960				1970				1980			
	Mental Hospitals		Prisons and Jails		Mental Hospitals		Prisons and Jails		Mental Hospitals		Prisons and Jails		Mental Hospitals		Prisons and Jails	
		NI		NI		NI		NI		NI		NI		NI		NI
Age group:																
<10	.85	19.51	.84	19.51	.43	22.03	.03	22.03	.57	18.48	.15	18.48	.73	14.77	.04	14.77
10-17	1.06	11.51	1.10	11.51	1.66	14.21	2.85	14.21	3.59	16.18	3.43	16.18	6.26	2.23	2.23	13.69
18-25	5.31	27.54	12.13	27.54	5.03	9.86	30.01	9.86	9.09	12.76	39.67	12.76	14.63	43.15	43.15	14.80
26-30	6.32	17.28	8.19	17.28	4.30	6.13	16.38	6.13	6.13	6.43	16.67	6.43	9.18	21.66	21.66	8.41
31-35	8.02	12.88	7.54	12.88	5.94	6.73	13.76	6.73	5.75	5.50	11.24	5.50	9.02	12.90	12.90	7.41
36-40	8.40	8.69	8.69	8.69	7.36	6.90	11.86	6.90	6.50	5.51	9.15	5.51	6.91	7.65	7.65	5.97
41-45	8.34	7.23	7.23	7.23	8.32	6.39	8.39	6.39	8.04	5.85	6.69	5.85	6.95	4.60	4.60	5.06
46-50	11.16	5.24	5.24	5.24	6.08	5.89	6.40	5.89	8.02	5.90	5.34	5.90	5.81	2.67	2.67	4.91
51-55	11.69	4.08	4.08	4.08	10.11	5.28	4.78	5.28	9.00	5.28	3.29	5.28	7.76	2.41	2.41	5.20
56-64	18.54	3.25	3.25	3.25	18.61	7.71	4.50	7.71	18.33	8.11	3.35	8.11	12.52	1.63	1.63	8.54
≥65	20.30	1.88	1.88	1.88	28.72	8.88	1.03	8.88	24.99	10.00	1.03	10.00	20.24	1.06	1.06	11.24
Race or ethnicity:																
White	87.62	62.20	62.20	62.20	85.03	86.63	58.86	86.63	82.80	85.52	54.67	85.52	79.40	47.14	47.14	81.50
Black	10.52	33.40	33.40	33.40	12.73	10.47	35.57	10.47	15.45	11.03	40.29	11.03	17.15	42.65	42.65	11.65
Other	.43	1.26	1.26	1.26	1.00	.89	1.87	.89	.93	1.18	1.82	1.18	1.95	5.14	5.14	3.41
Hispanic	1.43	3.14	3.14	3.14	1.24	2.01	3.69	2.01	.82	2.27	3.23	2.27	1.50	5.07	5.07	3.45
Gender:																
Male	52.55	90.79	90.79	90.79	53.23	49.01	95.10	49.01	55.95	48.45	94.84	48.45	60.79	94.10	94.10	48.37
Female	47.45	9.21	9.21	9.21	46.77	50.99	4.90	50.99	44.05	51.55	5.16	51.55	39.21	5.90	5.90	51.63
Population estimate (1,000s)	621	315	315	315	698	178,247	356	178,247	440	202,257	341	202,257	246	461	461	226,024

**Note.** Tabulations are from the Public Use Microdata Sample files of the 1 percent sample of demographics for people and housing units from the U.S. Census of Population and Housing for 1950, 1960, 1970, and 1980. NI = noninstitutionalized.

characterize mental hospital inpatients, prison and jail inmates, and the noninstitutionalized with data from the Public Use Microdata Samples (PUMS) of the U.S. Census of Population and Housing for the years 1950–80.<sup>6</sup> Beginning with tabulations for 1950, there are several notable differences between the inpatient and correctional populations. First, the mental hospital population is considerably older, with larger proportions over 40 and a population 65 and older that is more than 10 times the comparable figure for the correctional population. Second, the proportion who are black or Hispanic is not appreciably larger than the comparable proportion for the noninstitutionalized population, while minorities are very much overrepresented in prisons and jails. One of the most pronounced disparities is the gender composition. Nearly half of the mental hospital population is female, while in 1950 only 9 percent of those in prison or jail were women.

Between 1950 and 1980, the mental hospital inpatient population became younger, more minority, and more male, although the elderly and women still constitute larger proportions of mental hospital inpatients than of prison and jail inmates. These changes suggest that deinstitutionalization proceeded in a nonrandom fashion, with institutionalization rates declining first for those who are perhaps the least likely to be transinstitutionalized (for example, women and/or the elderly), followed by subsequent declines in mental hospital institutionalization among groups who subsequently experienced increases in incarceration (young men and racial and ethnic minorities). While we cannot measure further changes in the composition of the mental hospital population after 1980, as this is the last year that the census separately identified mental hospital inpatients, we know from aggregate statistics that by 2000 the mental hospital population became trivially small. Hence, the 1980 mental hospital population largely represents the demographics of those deinstitutionalized over the subsequent 2 decades.

These demographic differences between prison and jail inmates and mental hospital patients suggest that the potential impact of deinstitutionalization on prison population growth is substantially less than what might be inferred from comparisons of aggregate time series. While decline in mental hospital institutionalization rates between 1950 and 2000 is of magnitude comparable to the late-century increase in incarceration—a fact that may lead to the belief that we are simply rehousing

6. For each of the census years, those in mental hospitals can be distinguished from those in correctional institutions by using the detailed group-quarters variable.

the mental patients of 1950 in current prisons and jails—the demographic dissimilarities in Table 5 suggest caution in drawing such an inference.

To illustrate the importance of these compositional differences, we pose the following two questions. First, how has the overall institutionalization risk (either in mental hospitals or in prisons or jails) for someone who is institutionalized in 2000 changed since 1950? Second, how did the institutionalization risk for someone institutionalized in 1950 change over the subsequent half century? If we have simply transferred the same types of people from one institution to another, the 2000 institutionalization risk of the currently institutionalized should resemble their comparable institutionalization risks at midcentury. Similarly, the institutionalization risk in 2000 of those institutionalized in 1950 should equal their institutionalization risk in 1950.

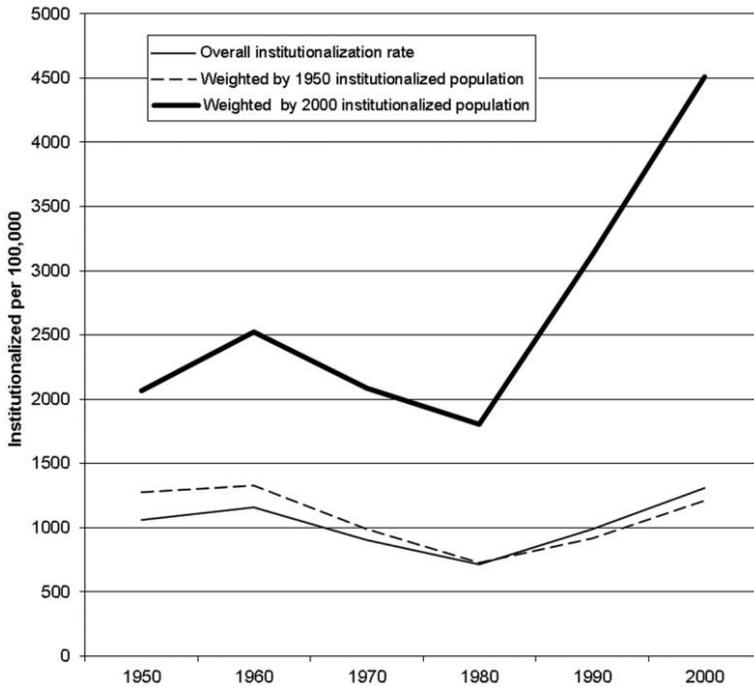
To answer these questions, we calculate the following weighted average institutionalization risks. Let  $i$  index the eight age groups of adults 18–64 listed in Table 5,  $r$  index the four mutually exclusive race or ethnicity groups,  $g$  index gender, and  $t$  index the year. Furthermore, define  $w_{girt}$  as the proportion of the institutionalized population in year  $t$  that is of gender  $g$ , age group  $i$ , and race or ethnicity group  $r$ , and define  $I_{girt}$  as the corresponding institutionalization rate for this group. Taking the product of the group-specific institutionalization rate and the group institutionalization share and summing over all dimensions gives the institutionalization risk for someone with demographic characteristics that mirror those of the average institutionalized person. For example, this institutionalization risk in 2000 for those institutionalized in 2000 is

$$\text{IR}_{2000}^{2000} = \sum_g \sum_i \sum_r w_{girt2000} I_{girt2000}. \quad (1)$$

The value in equation (1) of course exceeds the overall institutionalization rate, as it is a weighted average with higher weights placed on those demographic groups that disproportionately constitute the institutionalized population.

To answer the two questions posed above, we calculate the institutionalization risk for each analysis year for the institutionalized population from a specific year. For example, the institutionalization risk in 1950 for someone with demographic characteristics that resemble those of the institutionalized in 2000 is given by the equation

$$\text{IR}_{1950}^{2000} = \sum_g \sum_i \sum_r w_{girt2000} I_{girt1950}. \quad (2)$$



**Figure 2.** Institutionalization rates and risks for adults 18–64 years of age, 1950–2000

To the extent that we are institutionalizing the same people in 2000 as we did in 1950, the alternative risk measures in equations (1) and (2) should be of comparable magnitude.

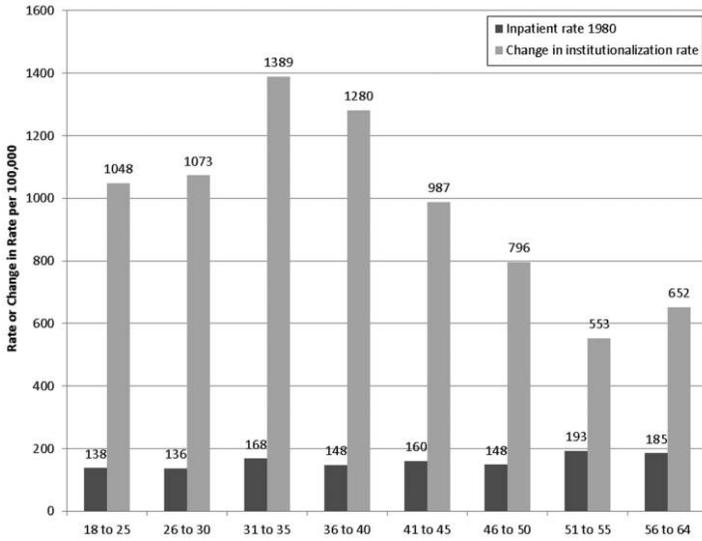
Figure 2 depicts the overall institutionalization rate for adults 18–64 years of age for each year 1950–2000 as well as the institutionalization risk in each year for those who resemble the 2000 institutionalized population and those who resemble the 1950 institutionalized population. The overall institutionalization rate exhibits a pattern comparable to that in Figure 1: a substantial decline 1960–80, from 1,156 per 100,000 residents to 716 per 100,000 residents, followed by a more than offsetting increase to 1,309 per 100,000 residents in 2000. The institutionalization risk for those resembling the 1950 institutionalized population exceeds the overall rate in the peak year of 1960 by about 14 percent. However, by 2000 the institutionalization risk for this group falls short of the overall institutionalization rate by approximately 7

percent. Moreover, relative to the 1960 peak, this weighted institutionalization risk declines by nearly 9 percent.

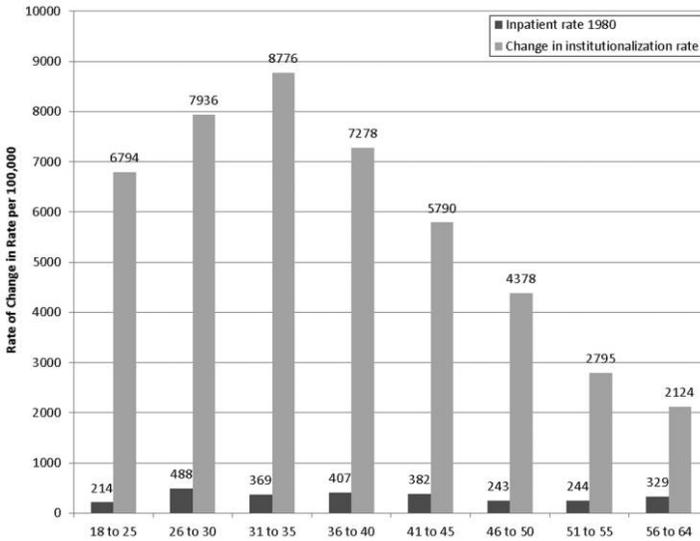
By contrast, the institutionalization risk weighted by the 2000 institutionalized population exhibits a sharp increase 1950–2000. Relative to the peak year of 1960, the institutionalization risk for this group increased nearly 80 percent, from 2,521 per 100,000 residents to 4,512 per 100,000 residents. In conjunction, these two series suggest real declines in the institutionalization risks for those who would have been institutionalized in the past (both absolutely and relative to overall trends) and real, particularly large increases in institutionalization risks for those who are most likely to be institutionalized today.

The dissimilarities between those in mental hospitals and those in prisons and jails as well as the limits of the potential contribution of deinstitutionalization to prison population growth become particularly salient when we take a close look at the period 1980–2000. Note that nearly 92 percent of the growth in U.S. incarceration rates occurring 1950–2000 happens during this latter period, with most of the remaining 8 percent occurring during the latter half of the 1970s. Figures 3–6 present comparisons of mental hospitalization rates in 1980 to the change in incarceration rates 1980–2000 for white and black males (Figures 3 and 4) and white and black females (Figures 5 and 6). Each figure provides comparisons for eight age groups of adults 18–64. Note that we would ideally wish to compare the change in mental hospital institutionalization rates over this period to the corresponding changes in incarceration rates. However, the census does not separate the incarcerated from mental hospital inpatients in PUMS data after 1980. Nonetheless, we know that by 2000 the overall population of state and county mental hospitals had declined to below 60,000 people and declined in all states. Thus, if one assumes for the sake of argument that the mental hospital population zeroes out by 2000, the change in incarceration can be measured by the difference between the 2000 institutionalization rate and the 1980 incarceration rate, while the change in the mental hospital inpatient rate simply equals  $-1$  times the inpatient rate for the base year 1980. The base mental hospital population rate can be thought of as providing an upper-bound estimate of the potential contribution of deinstitutionalization to incarceration growth.

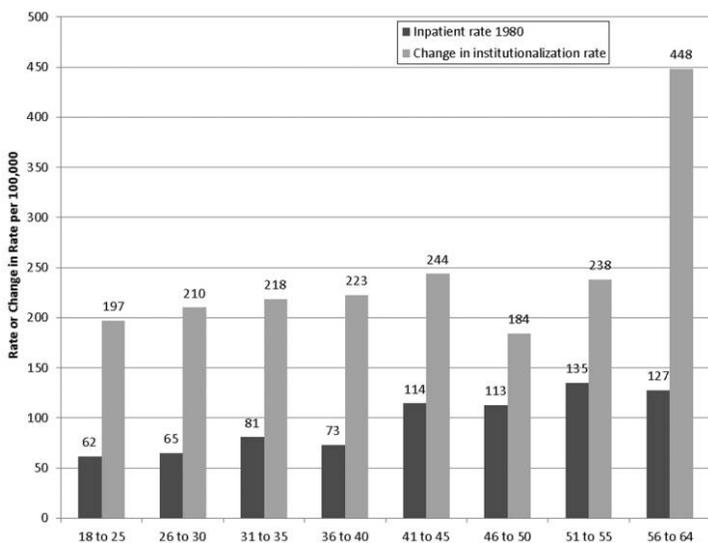
For most white males, the mental hospital inpatient rate in 1980 was roughly 12–17 percent of the change in incarceration rates occurring 1980–2000, with larger percentage figures for older groups of males. For black males, the comparable figures are considerably smaller. For



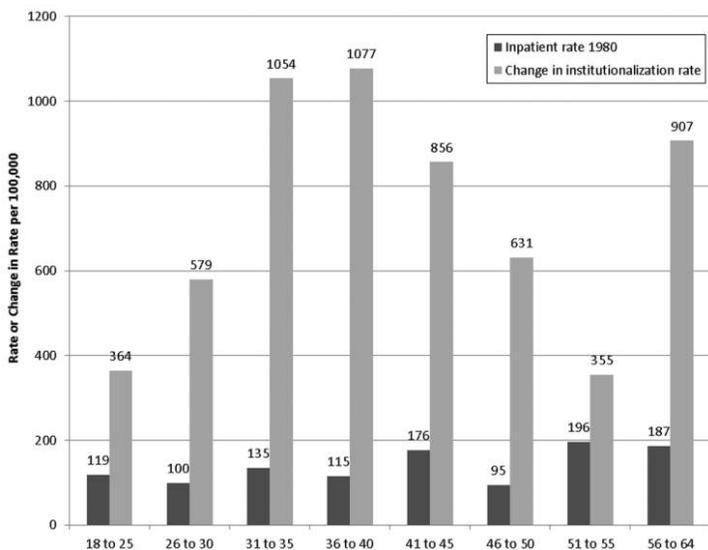
**Figure 3.** Changes in institutionalization rates compared with 1980 mental hospital inpatient rates: white males.



**Figure 4.** Changes in institutionalization rates compared with 1980 mental hospital inpatient rates: black males.



**Figure 5.** Changes in institutionalization rates compared with 1980 mental hospital inpatient rates: white females.



**Figure 6.** Changes in institutionalization rates compared with 1980 mental hospital inpatient rates: black females.

relatively young black males (under 40), the base mental hospital inpatient rates range from 3 to 6 percent of the change in incarceration occurring over the subsequent 2 decades. Similar to those for white males, the comparable figures for older groups of black males are higher, though never exceeding 20 percent of the actual change. For white women, base mental hospitalization rates constitute relatively larger proportions of the subsequent change in incarceration (30–60 percent), while for black females the comparable figures range from about 10 to 30 percent across nearly all age groups.

These comparisons can be used to calculate an upper bound of the potential contribution of deinstitutionalization to incarceration growth as well as several estimates of the impact of deinstitutionalization under alternative transinstitutionalization rates between mental hospitals and prisons. To do so, we first tabulate what the incarceration rate would have been in 2000 for demographic groups defined by gender, race or ethnicity, and age, assuming that the mental hospitalization rate did not decline from the 1980 value and that each one-person change in the mental hospitalization rate causes a one-person change in the incarceration rate of opposite sign. We then use actual 2000 population shares across the gender-race-age groups to tabulate a hypothetical overall incarceration rate in 2000. Comparing actual growth to counterfactual growth toward this hypothetical rate provides our upper-bound estimate.

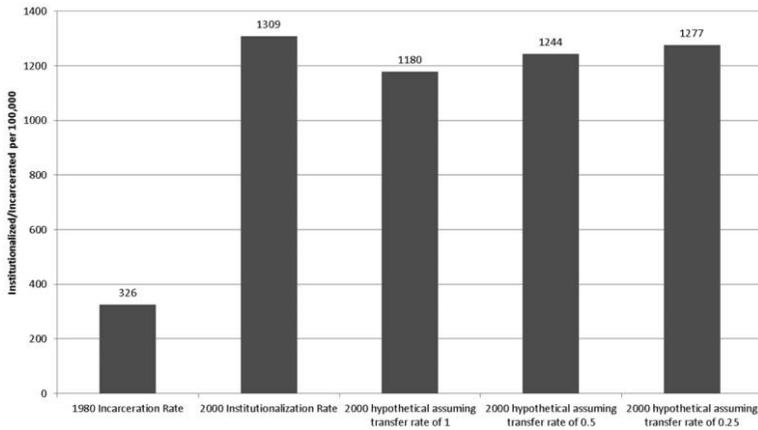
Table 6 provides some of the intermediate inputs for this tabulation (to conserve space, we do not provide the age-specific tabulations). In addition to the actual incarceration rate in 1980 and the actual institutionalization rate in 2000, it shows the hypothetical incarceration rate for each group, assuming a one-for-one transinstitutionalization rate, a .5 rate, or a .25 rate and assuming a change in mental hospital inpatient rates equal to  $-1$  times the base rate in 1980.

The results of this exercise reveal the likely modest contribution of deinstitutionalization to incarceration growth. For black males, these tabulations indicate that deinstitutionalization contributed at most 331 persons per 100,000 residents to the change in the incarceration rate of 5,842 persons per 100,000 residents experienced by black males (less than 6 percent of growth). For white males, the tabulations suggest that deinstitutionalization could be culpable for at most 17 percent of incarceration growth. The comparable figure for Hispanic males is 4 percent. Among women, the upper-bound estimates suggest that deinstitutionalization may be a proportionally more important contributor to incarceration growth (39 percent for white women, 19 percent for black

**Table 6.** Institutionalization and Incarceration Rates

	Actual 1980 Incarceration Rate	Actual 2000 Institutionalization Rate	Hypothetical 2000 Incarceration Rate		
			Transinstitutionalization Rate = 1	Transinstitutionalization Rate = .5	Transinstitutionalization Rate = .25
<b>Males:</b>					
White	356	1,285	1,127	1,206	1,246
Black	2,625	8,467	8,136	8,301	8,384
Other	980	1,398	1,250	1,324	1,361
Hispanic	1,000	2,919	2,833	2,876	2,897
<b>Females:</b>					
White	18	265	169	217	241
Black	144	852	716	784	818
Other	54	217	191	204	211
Hispanic	60	265	212	239	252

**Note.** Hypothetical incarceration rates assume a contribution of deinstitutionalization to the overall 2000 institutionalization rate equal to the mental hospital inpatient rate in 1980 multiplied by the transinstitutionalization parameter. Average institutionalization rates within gender-race groups are calculated by averaging the age-specific estimates using the 2000 population shares within gender-race groups as weights. The hypothetical tabulations assume complete deinstitutionalization 1980–2000; that is, the simulations assume no mental hospital inpatients in 2000.



**Figure 7.** Hypothetical incarceration rates, 2000

women, 16 percent for other women, and 26 percent for Hispanic women). Naturally, when we assume lower transinstitutionalization rates, the tabulated contribution of deinstitutionalization to prison population growth falls.

Of course, our upper-bound estimate of the overall contribution of deinstitutionalization to prison growth over this latter time period will more closely reflect the group-specific estimates for demographic groups that constitute disproportionate shares of the prison population. That is to say, the overall impact will be closer to that of males and, in particular, to that of black and Hispanic males. Figure 7 displays the actual incarceration rate for 1980, the actual institutionalization rate in 2000, and several hypothetical overall incarceration rates in 2000 assuming no deinstitutionalization 1980–2000 and 1, .5, and .25 transinstitutionalization rates. The hypothetical 2000 incarceration rate assuming a one-for-one transfer rate is roughly 90 percent of the actual institutionalization rate for that year. Growth between 1980 and this hypothetical rate amounts to 87 percent of the actual growth in incarceration rates occurring 1980–2000. In other words, these tabulations indicate that deinstitutionalization over this period can account for no more than 13 percent of the corresponding growth in incarceration. To be sure, the estimated contributions to incarceration growth are smaller when we assume lower transinstitutionalization rates (7 percent assuming a transfer rate of .5 and 3 percent assuming a transfer rate of .25).

While the potential contribution to overall incarceration growth is relatively modest, the potential contribution to growth in incarceration levels of the mentally ill is much larger. In Table 1, we presented estimates from inmate surveys finding that 14.3 percent of state prison inmates, 6.1 percent of federal prison inmates, and 14.7 percent of local jail inmates had a prior diagnosis of severe mental illness. Combining these lifetime prevalence rates with 2000 correctional population totals suggests that in 2000 there were roughly 277,000 incarcerated severely mentally ill individuals (66 percent of whom were in state or federal prison). The hypothetical estimate in Figure 7 assuming a one-for-one transfer rate suggests that deinstitutionalization contributed a maximum of 129 persons per 100,000 residents to the adult incarceration rate in 2000. With approximately 108 million adults ages 18–64 in 2000, this contribution translates into 140,000 additional prisoners (roughly half of the population of incarcerated persons with severe mental illness). Moving beyond upper-bound estimates requires that we generate more precise estimates of the transinstitutionalization rate. We turn next to this estimation challenge.

#### 4. ESTIMATING THE TRANSFER RATE FROM MENTAL HOSPITALIZATION TO INCARCERATION

There are a number of reasons to suspect that the empirical relationship between the mental hospital inpatient rate and the incarceration rate should be heterogeneous, with a stronger empirical association in latter years and perhaps a stronger association for certain demographic subgroups. Given the differences between the forces driving early deinstitutionalization (new drug therapies and the incentives created by Medicare) and the forces driving latter declines (legal challenges to involuntary commitments), it is likely that deinstitutionalization followed a chronologically selective path, with the least ill and perhaps the least prone to felonious behavior deinstitutionalized first. This alone suggests that the impact of declining inpatient populations on prison population growth may be larger during the latter decades of the twentieth century.

Beyond selective deinstitutionalization, the impact of declining hospitalization rates on prison counts should interact with the degree of stringency in sentencing policy. In other words, a one-person decline in the mental hospitalization rate will have a larger impact on incarceration the more likely society is to incarcerate a criminal offender and the longer

the effective prison sentence. A further concern is the possibility that increases in incarceration may reverse cause declines in the mental hospital population, to the extent that the mentally ill get caught up in correctional systems or if corrections expenditures displace expenditures on mental health services.<sup>7</sup> Both suspicions are plausible, as the likelihood of being sent to prison conditional on committing a crime has increased,<sup>8</sup> as has the share of state budgets devoted to operational and capital correctional expenditures. In our empirical estimate, we can rule out the possibility of a reverse-causal effect of prison population growth on the pace of deinstitutionalization by exploiting variation in this pace occurring across demographic groups within states. However, a reverse-causal effect operating through a higher competing risk of incarceration for the mentally ill in recent years will qualify the causal interpretation of the estimates below.

In the remainder of Section 4, we present a series of estimates of the transinstitutionalization rate between mental hospitals and prisons that attempt to account for some of these factors. We first estimate the empirical relationship during the early phases of deinstitutionalization (1950–80). We then present estimates for the period 1980–2000.

#### 4.1. Estimates for 1950–80

To estimate the transinstitutionalization rate for this early phase of deinstitutionalization, we employ data from the PUMS files for the 1 percent sample of demographics for people and housing units from the U.S. Census of Population and Housing for the years 1950, 1960, 1970, and 1980. Again, the data from these census years permit separate identification of those institutionalized in mental hospitals and those institutionalized in jails or prisons. For each year, we estimate the proportion in mental hospitals and the proportion incarcerated for demographic subgroups defined by state of residence, gender, the eight age groups of adults 18–64 listed in Table 5, and our four mutually exclusive race or ethnicity groups. We estimate a series of models in which the dependent variable is the group-specific intercensus change in the incarceration rate and the key explanatory variable is the corresponding change in the mental hospitalization rate.

7. Indeed, Ellwood and Guetzkow (2009) find that correctional expenditures displace spending on budget items usually covered by state health services departments.

8. Raphael and Stoll (2009) demonstrate that between 1984 and 2002 the admissions rates into U.S. prisons increased sharply, as did the expected value of time served conditional on the conviction offense.

The model specification that we estimate for each gender is given by

$$\Delta\text{Incarceration}_{tsgra} = \alpha_{tsg} + \beta_{sgr} + \delta_{sga} + \gamma_g \Delta\text{Hospitalization}_{tsgra} + \varepsilon_{tsgra}, \quad (3)$$

where  $t$  indexes specific 10-year periods,  $s$  indexes states,  $g$  indexes gender,  $r$  indexes race or ethnicity,  $a$  indexes age groups,  $\Delta\text{Incarceration}_{tsgra}$  is the intercensus change in the incarceration rate for a specific 10-year period in state  $s$  for the gender-race-age group, and  $\Delta\text{Hospitalization}_{tsgra}$  is the corresponding change in the mental hospitalization rate. The terms  $\alpha_{tsg}$ ,  $\beta_{sgr}$ ,  $\delta_{sga}$ , and  $\gamma_g$  are parameters to be estimated, and  $\varepsilon_{tsgra}$  is a random error term.

Note that the key parameter of interest,  $\gamma_g$ , is permitted to vary by gender. We expect a priori that this coefficient should be negative for both genders but perhaps larger in absolute value for men than for women. The specification includes decade-state-gender fixed effects to control for any corrections policy changes that may vary across decades and have differential impacts on gender groups. These fixed effects also control for a possible reverse-causal impact of incarceration growth on hospitalization rates operating through state budgetary displacement, assuming that the impact of such budgetary pressures is the same within gender. The state-gender-race fixed effects adjust both series for average differences in 10-year changes in incarceration and hospitalization rates that vary by state, gender, and race, while the state-gender-age fixed effects account for similar differences along groups defined by this triple interaction. In addition, we also estimate equation (3) separately for each of the four racial or ethnic groups, effectively interacting all of the fixed effects with race and permitting the gender-specific transinstitutionalization parameter to vary for each racial or ethnic group. All models are weighted by the number of observations used to compute the incarceration rate in the starting year of the change observation. Finally, in calculating standard errors for our parameters, we cluster on gender-race-state-age cells.

Table 7 presents estimation results for the period 1950–80. The table reports estimates of the transinstitutionalization parameter for various groups from several alternative specifications. There is essentially no evidence of a negative relationship between incarceration and hospitalization rates during this early period. The coefficients are relatively small and statistically insignificant, and few have the theoretically expected sign. Thus, we conclude that during the early phases of deinstitution-

**Table 7.** Effect of Changes in Mental Hospitalization Rates on Changes in Incarceration Rates, 1950–80

	(1)	(2)	(3)	(4)
<b>Men:</b>				
All	.044 (.030)	.005 (.031)	.011 (.032)	–.001 (.032)
White	.078 (.029)	.034 (.034)	.057 (.036)	.066 <sup>+</sup> (.036)
Black	.034 (.069)	–.040 (.069)	–.060 (.075)	–.068 (.074)
Other	–.045 (.037)	–.053 (.046)	–.031 (.053)	–.025 (.051)
Hispanic	.193 (.144)	.162 (.143)	.106 (.130)	.187 (.151)
<b>Women:</b>				
All	.002 (.006)	.001 (.007)	.001 (.007)	–.002 (.007)
White	.003 (.005)	.003 (.005)	.001 (.006)	–.001 (.006)
Black	.008 (.013)	.008 (.013)	.007 (.015)	.008 (.015)
Other	–.014 (.015)	–.030 (.015)	–.069 (.040)	–.055 (.042)
Hispanic	–.056 (.040)	–.062 (.048)	–.037 (.063)	–.014 (.061)

**Note.** Each coefficient comes from a regression of the interdecade change in the incarceration rate on the corresponding interdecade change in the mental hospital inpatient rate. Specification (1) includes no controls. Specification (2) includes year, age, race, and state effects. Specification (3) adds year  $\times$  state terms to specification (2). Specification (4) adds age  $\times$  state and race  $\times$  state terms to specification (3). Rates are calculated for cells defined by the interaction of states, 10 age groups (18–64), four race or ethnicity groups, four years (1950, 1960, 1970, 1980), and gender. Standard errors are in parentheses and are calculated assuming clustering in the error variance–covariance matrix within gender–race–age–state cells.

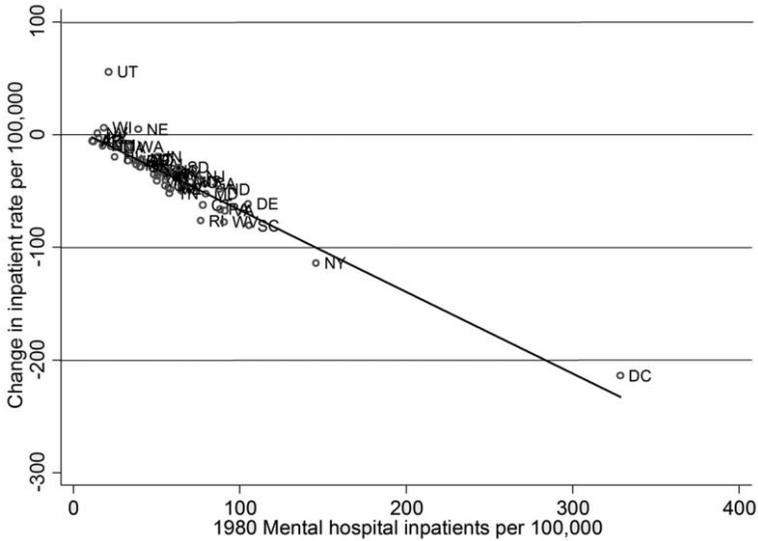
<sup>+</sup> $p = .10$ .

alization, there is no evidence that the declining mental hospital population counts contributed to prison population growth.<sup>9</sup>

#### 4.2. Estimating the Transinstitutionalization Parameter for 1980–2000

Beginning with the 1990 census, the PUMS data stopped separately identifying mental hospital inpatients and prison and jail inmates: all are lumped together as residing in institutional group quarters. Hence,

9. We also estimated models separately by decade to test for possible heterogeneity along this dimension. As is the case for the results in Table 7, we found little evidence of a transinstitutionalization effect.



**Figure 8.** Scatterplot of the changes in the mental hospital inpatient rate by state, 1980–2000

the exact equation that we estimate for the earlier phase of deinstitutionalization cannot be estimated for this latter phase. However, the ability to separately identify mental hospital inpatients in 1980, coupled with the fact that the mental hospital population declined to very low levels by 2000 (despite substantial population growth over this time period), does allow us to construct a proxy for the actual change in hospitalization rates occurring within demographic groups.

To be specific, we gauge the change in hospitalization rates 1980–2000 by  $-1$  times the base hospitalization level in 1980. This approximation would be exact if the mental hospital population declined to zero by 2000. As this is not the case, however, we sought corroborating evidence on the suitability of our proxy in state-level data on state and county mental hospital populations for this time period. Figure 8 presents a state-level scatterplot of the change in mental hospital inpatients per 100,000 residents 1980–2000 against the mental hospital inpatient rate in 1980. As is evident in the figure, the base level in 1980 is a very strong predictor of the overall change in hospitalization rates over the subsequent 2 decades. The slope coefficient on the bivariate regression line fitted to the data is near  $-1$  ( $-.73$ , with a standard error of  $.04$ ), and the explanatory power of this simple regression is quite high ( $R^2 =$

.87). Hence, the 1980 hospitalization value provides a strong proxy for the subsequent change in hospitalization rates through 2000.<sup>10</sup>

For the period 1980–2000, we thus estimate the equation

$$\Delta \text{Incarceration}_{gsra} = \alpha_{gsr} + \beta_{gsa} + \gamma_g \text{Hospitalization}_{1980}_{gsra} + \varepsilon_{gsra}, \quad (4)$$

where all dimensions and variables are as defined above and where we have substituted the base mental hospitalization rate for the actual change. There are a few differences between this model and that specified for the earlier period that bear mentioning. First, since we observe only one change per demographic group (following from the fact that we cannot observe hospitalization rates for 1990), we dropped the time term and all interactive fixed effects with time. Second, since we cannot separately identify the incarcerated from mental hospital inpatients in 2000, we effectively assume that all adults within our age range of study who are in institutional group quarters in 2000 are incarcerated in prisons or jails. Hence, the change in incarceration for each group is measured by the overall institutionalization rate in 2000 for that group minus the proportion incarcerated in 1980. Similar to the results for the earlier period, we also estimate equation (4) separately for each racial or ethnic group. The one necessary change when we estimate separate models by race or ethnicity is that we must drop the gender-state-age interactions since there is only one observation per age group in each state. Again, all models are weighted by the number of observations used to compute the incarceration rate in the starting year of the change observation. We estimate the model in equation (4) using data from the PUMS files for the 5 percent sample of demographics for people and housing units from the U.S. censuses for 1980 and 2000.

Table 8 presents the results from this analysis. The first column presents estimates of the coefficient on the 1980 hospitalization rate<sup>11</sup> when no other controls are added to the model. The second column presents estimates of the transinstitutionalization effect from estimating the complete specification in equation (4). There is considerably stronger evidence of transinstitutionalization during this latter period, especially for

10. We also produced similar graphs using specific demographic cohorts for early decades for which we can observe mental hospitalization for both the beginning and ending years (for example, the change from 1970 to 1980 in the Public Use Microdata Samples data). These analyses produced similar results—that is, base-level institutionalization rates are strong predictors of the actual changes occurring within specific demographic groups.

11. Before estimating the regression, we multiplied the base hospitalization rate by  $-1$ . With this transformation, evidence of a transinstitutionalization effect would require a negative statistically significant coefficient on the pseudochange in hospitalization.

**Table 8.** Regression of the 1980 to 2000 Change in Institutionalization Rates on the 1980 Mental Hospital Inpatient Rate

	No Controls	Additional Covariates <sup>a</sup>
Men:		
All	-4.272** (.313)	-.383** (.136)
White	1.358** (.314)	-.928** (.276)
Black	-.447 (.565)	-.501 (.329)
Other	-.369* (.171)	.013 (.156)
Hispanic	.148 (.320)	.019 (.251)
Women:		
All	-.592** (.083)	-.110+ (.068)
White	-.494** (.131)	-.157 (.121)
Black	-.228 (.190)	-.184 (.175)
Other	-.056 (.096)	-.008 (.095)
Hispanic	-.109 (.131)	.008 (.132)

**Note.** Each coefficient is the result from a regression of the 2000 institutionalization rate minus the 1980 incarceration rate on the 1980 mental hospital inpatient rate. Each change is measured by state, sex, race or ethnicity (four groups), and age (10 groups). Standard errors are in parentheses.

<sup>a</sup>Specifications for all men and all women include a full set of race-state and age-state fixed effects. Specifications by race include full sets of race-specific state and age effects.

+ $p = .10$ .

\* $p = .05$ .

\*\* $p = .01$ .

men. The bivariate regression estimate for all men pooled yields an implausible large statistically significant negative coefficient. After adding the complete set of fixed effects in equation (4), the coefficient attenuates considerably yet remains statistically significant at the 1 percent level of confidence. The estimate suggests that each 1 percent change in the male hospitalization rate 1980–2000 resulted in a .4 increase in the corresponding male incarceration rate.

The results for men by race and ethnicity reveal further heterogeneity in this relationship. The bivariate regression for white males gives a large positive and statistically significant effect of changes in mental hospi-

talization on incarceration. The corresponding result from the complete specification, however, yields a statistically significant (at the 1 percent level) negative impact for white males. In fact, the estimate suggests a near one-for-one transfer rate from mental hospitals to prisons for white men over this time period. For black males, the bivariate estimate is negative yet statistically insignificant, while the estimate from the complete specification is negative ( $-.501$ ) yet imprecisely estimated. The  $p$ -value on this coefficient is .130. For other men and Hispanic men, there is no evidence of transinstitutionalization.

The results for women indicate that the relationship between the hospitalization rate and the incarceration rate is substantially weaker than that observed for men. For women overall, the coefficient estimate on the pseudochange in hospitalization is statistically significant and negative in both the bivariate model and the complete specification (at the 1 percent and the 10 percent levels, respectively). The magnitudes of these estimates, however, are substantially lower than those observed for men. While there are several negative coefficients in the race- or ethnicity-specific estimate for women, none of the estimates from the complete model specification are statistically significant.

Thus, we do find evidence of transinstitutionalization for the latter phases of deinstitutionalization but not for the first few decades of the process. This pattern is in line with expectations, as deinstitutionalization proceeded in a chronologically selective manner and since those deinstitutionalized after 1980 (either literally through release or effectively by not being admitted to a mental hospital when in the past they would have been) were subject to increasingly harsh penalties for criminal activity.

### **4.3. Did Stiffer Sentencing Policies Drive the Decline in Mental Hospital Inpatient Populations?**

In the introduction to Section 4, we raised two potential alternative interpretations of a negative relationship between mental hospitalization and incarceration rates, both in which changes in the incarceration rate are reverse causing the decline in the mental hospital inpatient population (the opposite of what we are hypothesizing). First, budgetary pressures caused by an increasing prison population may force states to pare back resources allocated to state mental hospitals. We believe that our empirical methodology addresses this particular threat to internal validity by the inclusion of state fixed effects in our change regressions and the analysis of multiple demographic groups within states.

The second reverse-causal explanation operates through an enhanced risk of incarceration due to sentencing changes enhancing the competing risk of incarceration for the mentally ill. Policies that increase the extensiveness and intensity of the use of prison as punishment will increase the likelihood that an untreated mentally ill person gets caught up in the criminal justice system, perhaps precluding an involuntary commitment to a mental hospital. The qualitative interpretation of the large mentally ill population currently behind bars is substantially different under this alternative scenario. Rather than deinstitutionalization effectively hoisting the mentally ill into state corrections systems, a more aggressive sentencing structure is capturing and punishing the mentally ill with incarceration, effectively diverting these individuals away from state mental health systems.

While this subtle difference in interpreting an inverse relationship may appear to be splitting hairs, the importance of this distinction extends beyond mere semantics. If deinstitutionalization post-1980 is responsible for this inverse relationship, then it must necessarily be the case that the reduction in the likelihood of a mental health intervention has resulted in more crime, and by extension more victims of crime, than the nation would have experienced had this change not occurred. On the other hand, if newly aggressive sentencing is driving the inverse relationship, then the criminal justice system is simply more likely to incarcerate (and perhaps incarcerate for longer periods) those among the mentally ill who commit felonies. Under such circumstances, crime may actually decrease because of greater incapacitation.

One way to address this more subtle identification problem would be to find a third factor that affects mental hospitalization rates but affects prison populations only indirectly through its impact on hospitalization. With such a variable, we could reestimate the models in Tables 7 and 8 and use instrumental variables rather than ordinary least squares estimation. We were unable to identify such a variable that varies at the level of demographic groups that we employ in this paper. One possibility that we explored in detail is to use interstate differences in the stringency of laws pertaining to the involuntary commitment of the mentally ill and reestimate our model using state-level data on incarceration and hospitalization. The intuition here is that states with more stringent standards should have exogenously lower mental hospital populations. Quantifying these standards across states and over time, however, proved to be quite difficult. First, the language of state statutes is quite similar, and thus it is difficult to identify differences that in practice would result

in differences in hospitalization rates. For example, all states allow for the involuntary civil commitment of those who, as a result of their illnesses, pose a danger to themselves or others. The primary existing differences pertain to whether someone who is “gravely ill” (unable to care for oneself) can be involuntarily committed and the evidentiary requirements stipulated in the legislation (Ross, Rothbard, and Shinnar 1996). We were unable to find a strong first-stage effect of this statutory variation on hospitalization rates.<sup>12</sup>

Second, the existing body of state case law plays an important role in determining how easy or hard it is to commit someone involuntarily (Brakel, Parry, and Weiner 1985; LaFond and Durham 1992). Given that this case law is not necessarily reflected in the language of state statutes and given the enormity of the task of categorizing the body of cases related to involuntary commitment proceedings, using variation in state precedents does not appear to be a viable identification strategy.

In light of this potential identification problem, we must place a qualification on the interpretation of our estimation results. Essentially, the negative partial correlation between incarceration and hospitalization rates that we observe for some demographic groups for the period 1980–2000 may reflect both causal effects of deinstitutionalization on prison populations and stiffer sentencing policies increasing the likelihood that the competing risk of prison wins out over that of mental hospitals for the mentally ill. While a causal impact of deinstitutionalization must necessarily result in additional crime and victimization to generate the imprisonment increase, a causal effect in the opposite direction likely prevents crime through the earlier and perhaps longer incapacitation of the criminally active mentally ill. That being said, both causal stories imply that more mentally ill persons serve time in prisons and jails instead of receiving treatment in mental hospitals as a result of these policy shifts.

12. We estimated several alternative two-stage least squares models using a single year of cross-sectional state observations and two alternative characterizations of state involuntary-commitment laws. In the first model, we used data from the 1980s and a classification scheme developed by Ross, Rothbard, and Shinnar (1996). While we did find a weak first-stage relationship, the standard errors from the two-stage least squares model for our parameter of interest were too large to draw any conclusive inferences. For the second model, we used a classification scheme constructed by the American Bar Foundation (Parry 1994) characterizing state laws as of 1994, but we found no first-stage relationship. The two classification schemes are sufficiently different to prevent their combination to form a 2-year panel.

## 5. DISCUSSION

The estimation results from Section 4 can be used to estimate the proportion of prison population growth attributable to those who in years past would likely have been mental hospital inpatients. Using the gender-specific transinstitutionalization parameter estimates for the 1980–2000 period, our estimates suggest that such individuals account for 4 percent of the incarceration growth during this period. Employing the transinstitutionalization parameters estimated separately by gender and race, our models suggest that the incarceration of those who would have formerly been hospitalized accounts for 7 percent of the prison population growth between 1980 and 2000. Thus, despite the impressions created by the juxtaposition of aggregate trends, deinstitutionalization is not the smoking gun behind the tremendous growth in incarceration rates. While a significant contributor, mental health policy is of second-order importance when compared with the contribution by shifts in sentencing policy occurring in most states.

Nonetheless, it is certainly the case that a relatively high proportion of the currently incarcerated mentally ill would not have been incarcerated in years past and would likely be receiving inpatient treatment in a mental health facility. For the year 2000, our estimates indicate that there are 40,000–72,000 incarcerated individuals who in years past would likely have been mental hospital inpatients. Relative to a population of 277,000 severely mentally ill persons, this increase constitutes 14–26 percent of the mentally ill incarcerated population.

Certainly, it would be preferable from the viewpoints of the mentally ill and of crime victims to intervene prior to the commission of a felony. There is research evidence that mental health interventions impact violent crime levels, suggesting that the criminal activity associated with mental illness could be prevented through channels other than the criminal justice system. Perhaps most relevant to the present paper, Harcourt (2006) finds significant relationships between total institutionalization rates inclusive of mental hospital inpatients and state-level homicide, suggesting that the withdrawal of service in the form of the shuttering of mental hospitals leads to more crime. A more positive development concerns the findings of Marcotte and Markowitz (2009). The authors demonstrate a negative association between increases in prescriptions for antidepressants and attention deficit hyperactivity disorder medication and violent crime. Both papers suggest that the current criminal

activity attributable to the mentally ill is not a necessary a consequence of their illnesses.

In addition, interventions that prevent incarceration among those with severe mental illness would certainly benefit those diverted from prisons and jails. The regimented, often predatory, environment common in U.S. prisons is not an ideal setting for treating mental illness. It is likely the case that the mentally ill are at elevated risk for assault and victimization while incarcerated and likely receive insufficient mental health services.

## REFERENCES

- Brakel, Samuel J., John Parry, and Barbara A. Weiner. 1985. *The Mentally Disabled and the Law*. 3rd ed. Chicago: American Bar Foundation.
- Daly, Rich. 2008. People with Mental Illness Target of New Gun Law. *Psychiatric News* 43(3):1.
- Ellwood, John W., and Joshua Guetzkow. 2009. Footing the Bill: Causes and Budgetary Consequences of State Spending on Corrections. Pp. 207–38 in *Do Prisons Make Us Safer? The Benefits and Costs of the Prison Boom*, edited by Steven Raphael and Michael Stoll. New York: Russell Sage Foundation.
- Foley, Henry A., and Steven S. Sharfstein. 1983. *Madness and Government: Who Cares for the Mentally Ill?* Washington, D.C.: American Psychiatric Press.
- Frank, Richard G., and Shelly Glied. 2006. *Better but Not Well: Mental Health Policy in the United States Since 1950*. Baltimore: Johns Hopkins University Press.
- Frank, Richard G., and Thomas G. McGuire. 2009. Mental Health Treatment and Criminal Justice Outcomes. Working Paper No. 15858. National Bureau of Economic Research, Cambridge, Mass.
- Gottesman, Irving I. 1991. *Schizophrenia Genesis: The Origins of Madness*. New York: W. H. Freeman.
- Harcourt, Bernard. 2006. Should We Aggregate Mental Hospitalization and Prison Population Rates in Empirical Research on the Relationship between Incarceration and Crime, Unemployment, Poverty, and Other Social Indicators? Public Law and Legal Theory Working Paper No. 114. University of Chicago Law School, Chicago.
- James, Doris J., and Lauren E. Glaze. 2006. *Mental Health Problems of Prison and Jail Inmates*. Report No. NCJ 213600. Washington, D.C.: Office of Justice Programs, U.S. Bureau of Justice Statistics.
- Jencks, Christopher. 1994. *The Homeless*. Cambridge, Mass.: Harvard University Press.

- Johnson, Braden Ann. 1990. *Out of Bedlam: The Truth about Deinstitutionalization*. New York: Basic Books.
- Kessler, Ronald C., Patricia Berglund, Olga Demler, Robert Jin, Kathleen R. Merikangas, and Ellen E. Walters. 2005. Lifetime Prevalence and Age of Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62:593–602.
- Kessler, Ronald C., Katherine A. McGonagle, Shanyang Zhao, Christopher B. Nelson, Michael Hughes, Suzann Eshleman, Hans-Ulrich Wittchen, and Kenneth S. Kendler. 1994. Lifetime and 12-Month Prevalence of DSM-III-R Psychiatric Disorders in the United States. *Archives of General Psychiatry* 51:8–19.
- LaFond, John Q., and Mary L. Durham. 1992. *Back to the Asylum: The Future of Mental Health Law and Policy in the United States*. New York: Oxford University Press.
- Marcotte, Dave E., and Sarah Markowitz. 2009. A Cure for Crime? Psychopharmaceuticals and Crime Trends. Working Paper No 15354. National Bureau of Economic Research, Cambridge, Mass.
- Mechanic, David, and David A. Rochefort. 1990. Deinstitutionalization: An Appraisal of Reform. *Annual Review of Sociology* 16:301–27.
- Monahan, John. 1992. Mental Disorder and Violent Behavior: Perceptions and Evidence. *American Psychologist* 47:511–21.
- Palermo, George B., Maurice B. Smith, and Frank J. Liska. 1991. Jails versus Mental Hospitals: A Social Dilemma. *International Journal of Offender Therapy and Comparative Criminology* 35:97–106.
- Parry, John. 1994. Survey of Standards for Extended Involuntary Commitment. *Mental and Physical Disability Law Reported* 18:329–36.
- Penrose, Lionel. 1939. Mental Disease and Crime: Outline of a Comparative Study of European Statistics. *British Journal of Medical Psychology* 18:1–15.
- Rabkin, Judith Godwin. 1979. Criminal Behavior of Discharged Mental Patients: A Critical Appraisal of the Research. *Psychological Bulletin* 86:1–27.
- Raphael, Steven. 2000. The Deinstitutionalization of the Mentally Ill and Growth in the U.S. Prison Population: 1971 to 1996. Unpublished manuscript. University of California, Goldman School of Public Policy, Berkeley.
- Raphael, Steven, and Michael Stoll. 2009. Why Are So Many Americans in Prison? Pp. 27–72 in *Do Prisons Make Us Safer? The Benefits and Costs of the Prison Boom*, edited by Steven Raphael and Michael Stoll. New York: Russell Sage Foundation.
- Ross, Ruth E., Aileen B. Rothbard, and Arie P. Schinnar. 1996. A Framework for Classifying State Involuntary Commitment Statutes. *Administration and Policy in Mental Health* 23:341–56.
- Steadman, Henry J., Edward P. Mulvey, John Monahan, Pamela Clark Robbins, Paul S. Applebaum, Thomas Grisso, Loren H. Roth, and Eric Silver. 1998. Violence by People Discharged from Acute Psychiatric Inpatient Facilities and

- by Others in the Same Neighborhoods. *Archives of General Psychiatry* 55:393–401.
- Torrey, E. Fuller. 1997. *Out of the Shadows: Confronting America's Mental Illness Crisis*. New York: John Wiley & Sons.
- U.S. Department of Justice. Bureau of Justice Statistics. 2007. Survey of Inmates in State and Federal Correctional Facilities, 2004. Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor).
- . 2012. Survey of Inmates in Local Jails, 2002. Ann Arbor, Mich.: Inter-university Consortium for Political and Social Research (distributor).
- Werth, James L. 2001. U.S. Involuntary Mental Health Commitment Statutes: Requirements for Persons Perceived to Be a Potential Harm to Self. *Suicide and Life-Threatening Behavior* 31:348–57.