

**MEDICAID  
INSTITUTE**  
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# New York Medicaid Beneficiaries with Mental Health and Substance Abuse Conditions

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Established in 2005, the Medicaid Institute at United Hospital Fund provides information and analysis explaining the Medicaid program of New York State. The Medicaid Institute also develops and tests innovative ideas for improving Medicaid's program administration and service delivery. While contributing to the national discussion, the Medicaid Institute aims primarily to help New York's legislators, policymakers, health care providers, researchers, and other stakeholders make informed decisions to redesign, restructure, and rebuild the program.

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# New York Medicaid Beneficiaries with Mental Health and Substance Abuse Conditions

PREPARED FOR THE MEDICAID INSTITUTE  
AT UNITED HOSPITAL FUND BY

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THE URBAN INSTITUTE

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## Introduction

Medicaid is a vital source of funding for behavioral health services. In 2003, it was the largest payer for mental health services in the United States and the second largest payer for substance abuse treatment (Mark et al., 2007). Projections are that program spending on mental health and substance abuse will more than double between 2003 and 2014, when Medicaid is expected to be the nation's largest single source of funding for mental health and substance abuse treatment (Levitt et al., 2008).

Although Medicaid plays a critical role in financing mental health (MH) services and substance abuse (SA) treatment, little is known about the spending and utilization patterns for people who use these services. To address this gap, the Urban Institute examined Medicaid administrative claims data of adult beneficiaries who received mental health or substance abuse treatment in New York's Medicaid program. Details on study data and methods are provided in the Appendix.

In this study, we explored the demographic characteristics, program eligibility status, health characteristics, and service use and spending patterns of New York's adult Medicaid population with mental health or substance abuse conditions. Specifically, we conducted the study on adult beneficiaries with MH/SA conditions who were enrolled in New York's Medicaid fee-for-service (FFS) program for all 12 months of 2003 (see Appendix). Since we focused exclusively on beneficiaries in FFS Medicaid, excluding beneficiaries enrolled in managed care at any point during the year, the study population included the most severely mentally ill Medicaid beneficiaries. Although New York now enrolls many Medicaid beneficiaries in managed care, in 2003 beneficiaries with severe and persistent mental illness were largely exempt from it.

To understand the distinct characteristics and spending patterns of the MH and SA populations, we compared the characteristics of beneficiaries with such conditions to other beneficiaries without them. The paper addresses the following questions:

- What are the key characteristics of adult beneficiaries with MH/SA conditions? How do these vary by subgroup within the two study populations? How do the characteristics of MH/SA beneficiaries compare to those of other beneficiaries without MH/SA conditions?
- What are the major health conditions of beneficiaries with MH/SA conditions and how do these compare to those of other Medicaid beneficiaries?
- What are the spending and service use patterns of beneficiaries with MH/SA conditions and how do they compare to other Medicaid beneficiaries?

- What are the hospital readmission rates for beneficiaries with MH/SA conditions? Do readmission rates differ by subgroups within the two study populations? How do readmission rates compare to those of beneficiaries without MH/SA conditions?
- What share of beneficiaries receive ambulatory care follow-up after hospitalization for MH/SA treatment?

## Study Samples

### Mental Health

To identify adult beneficiaries with mental health conditions, we followed the criteria used by the federal Substance Abuse and Mental Health Services Administration (SAMHSA): relying on specific MH primary diagnosis codes (see Appendix Table A) given by a medical professional at any medical encounter (primary care, acute care, or long-term care) during the year, or a record of mental hospital services for the elderly during the year, regardless of the diagnosis on the claim.<sup>1</sup>

### Substance Abuse

Similarly, we followed the SAMHSA strategy that relies on specific primary diagnosis codes (see Appendix Table B) as recorded by a medical professional at any visit during the year to identify beneficiaries with SA conditions.

### Diagnosis Groupings

To examine how Medicaid spending and service use varied by diagnostic category, we developed mutually exclusive diagnostic categories for mental health by applying the following strategy:

- beneficiaries who used inpatient mental health hospitals but had no medical claims with an MH diagnosis were placed in the “No Diagnosis” category;
- beneficiaries with more than one MH diagnosis were placed in the “Multiple Diagnosis” category; and
- beneficiaries with only one type of MH diagnosis throughout the year were placed in that particular diagnostic category.

Several diagnosis categories had a prevalence of 2 percent or less: disorders of conduct, other mental conditions, special symptoms and syndromes, personality conditions, childhood psychoses, hyperkinetic syndrome, emotional disturbances, pregnancy/childbirth conditions, other psychoses, and no diagnosis. We grouped these into one category called “Other.” We developed similarly mutually exclusive diagnostic categories for SA. The “Other” SA category includes drug abuse poisoning and pregnancy/childbirth conditions.

<sup>1</sup> Buck, Teich, and Miller, 2003. We limited mental health hospital use to those 65 and over because under federal Medicaid law, coverage for individuals age 22 to 64 in institutions for mental disease (IMDs)—described as hospitals, nursing homes, or other facilities primarily engaged in providing diagnosis, treatment, or care of people with mental diseases—is precluded. This limitation is referred to as the “IMD exclusion.”

## Findings

### Demographic Characteristics and Medicaid Eligibility

**Beneficiaries with MH Conditions** We found that gender, race, ethnicity, and place of residence of beneficiaries with MH conditions were comparable to those of beneficiaries without MH conditions (Table 1). Beneficiaries with MH conditions, however, were younger and more likely to be eligible for Medicaid because of a disability than beneficiaries not treated for MH. The higher share of beneficiaries with MH conditions on Medicaid because of a disability likely reflects the fact that some mental illnesses are a qualifying health condition to receive Supplemental Security Income (SSI), which in most states (including New York) automatically makes an individual eligible for Medicaid coverage. That more beneficiaries with MH conditions are on Medicaid because of a disability may also reflect their being less healthy overall and having physical health conditions that could also qualify them as disabled (see below).

**Table 1.  
Selected Personal Characteristics and Medicaid Eligibility  
by MH Treatment Status, 2003**

	Beneficiaries with MH Treatment (N=116,982)	Beneficiaries with no MH Treatment (N=215,045)
<b>Age</b>		
22 to 44	46.7%	50.0%
45 to 64	51.3%	44.1%
65+	2.0%	6.0%
<b>Gender</b>		
Male	39.7%	42.4%
Female	60.4%	57.6%
<b>Race</b>		
White, Non-Hispanic	35.7%	31.5%
Black/African-American, Non-Hispanic	21.2%	26.1%
Hispanic/Latino	19.8%	16.1%
Other	1.9%	3.3%
Unknown	21.3%	23.0%
<b>Region</b>		
New York City	67.6%	64.4%
Long Island	4.2%	4.4%
Westchester	2.7%	2.7%
Upstate Metro	11.0%	10.9%
Upstate Rural	13.2%	16.8%
Unknown	1.4%	0.8%
<b>Medicaid Eligibility</b>		
Elderly	2.0%	6.0%
Disabled	76.1%	54.7%
Non-Elderly, Non-Disabled	21.9%	39.3%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Beneficiaries with SA Conditions** For Medicaid beneficiaries with SA conditions, we found their ages were similar to those of the comparison group (Table 2). On the other hand, beneficiaries with SA conditions were more likely to be male and non-Hispanic, African-American. Substance abuse beneficiaries were also more likely to live in New York City but less likely to be eligible for Medicaid due to a disability. That fewer beneficiaries with SA conditions qualify for Medicaid because of a disability probably reflects the fact that drug addiction and alcoholism are not qualifying health conditions for receiving SSI benefits. Even so, 49.4 percent of beneficiaries with SA were eligible for Medicaid because of a co-occurring disability, often mental illness (Kessler et al., 2004).

**Table 2.  
Selected Personal Characteristics and Medicaid Eligibility  
by SA Treatment Status, 2003**

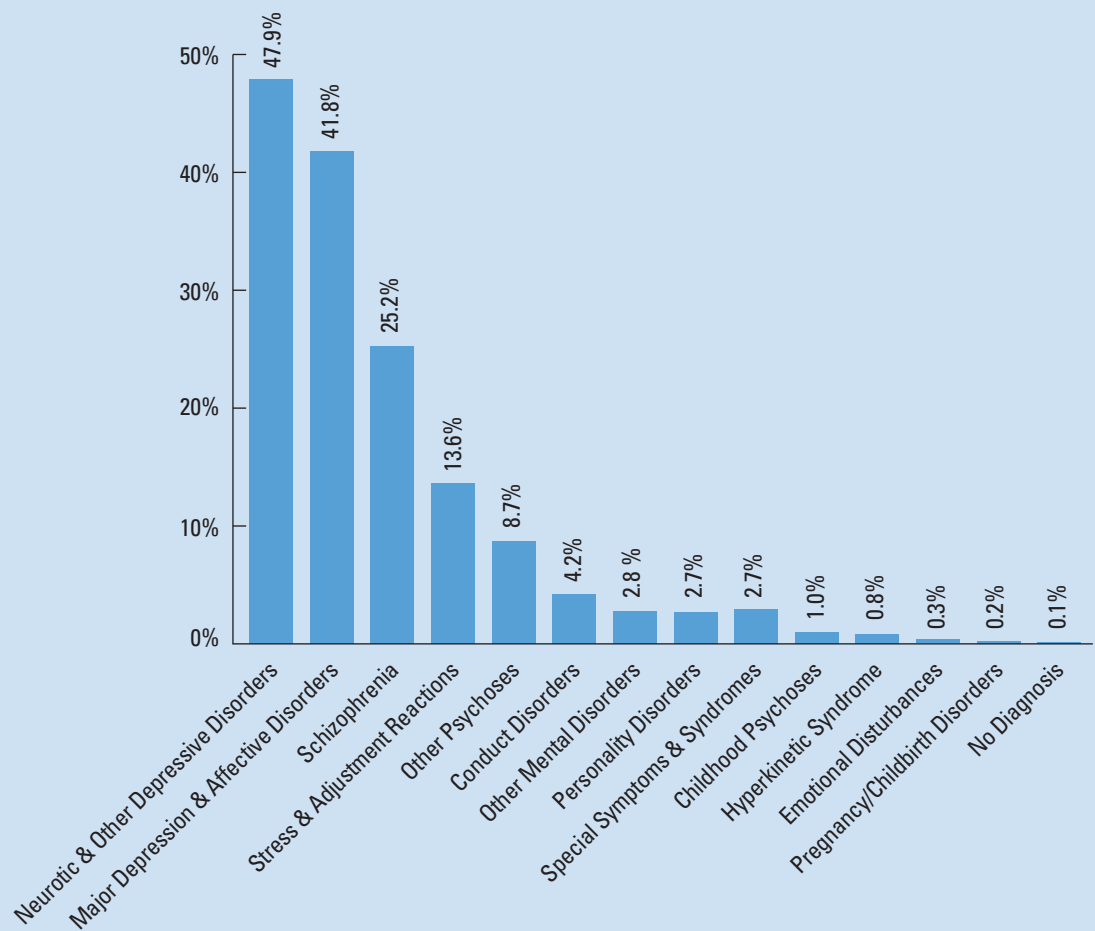
	<b>Beneficiaries with SA Treatment (N=49,688)</b>	<b>Beneficiaries with no SA Treatment (N=322,011)</b>
<b>Age</b>		
18 to 44	55.8%	54.1%
45 to 64	43.7%	41.3%
65+	0.5%	4.6%
<b>Gender</b>		
Male	61.6%	39.2%
Female	38.4%	60.8%
<b>Race</b>		
White, Non-Hispanic	29.2%	33.7%
Black/African-American, Non-Hispanic	36.1%	22.0%
Hispanic/Latino	18.0%	17.0%
Other	1.3%	3.0%
Unknown	15.4%	24.4%
<b>Region</b>		
New York City	72.0%	63.0%
Long Island	3.3%	4.6%
Westchester	2.9%	2.7%
Upstate Metro	11.1%	11.4%
Upstate Rural	10.6%	17.3%
Unknown	0.2%	1.1%
<b>Medicaid Eligibility</b>		
Elderly	0.5%	4.6%
Disabled	49.4%	61.4%
Non-Elderly, Non-Disabled	50.0%	34.0%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

## MH/SA Diagnoses and Comorbidities

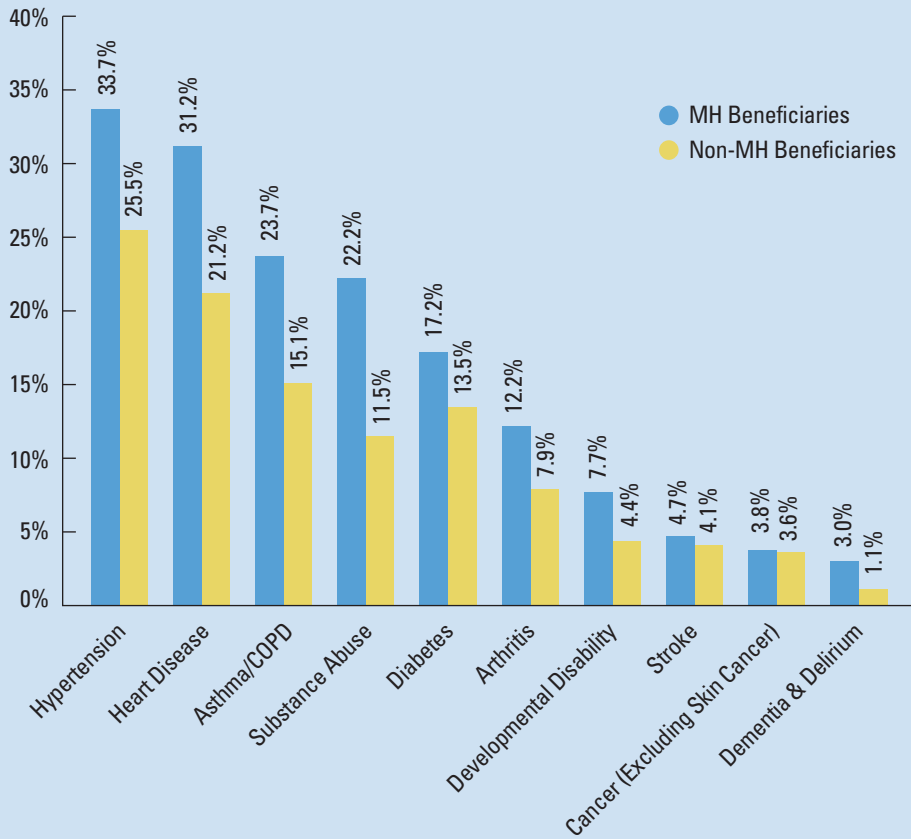
**Beneficiaries with MH Conditions** Figure 1 shows the prevalence of MH conditions among New York Medicaid beneficiaries receiving MH treatment. As expected, the data demonstrate that many in the study population had severe mental illness. Nearly half, 47.9 percent, had neurotic and other depressive conditions such as anxiety states and phobias. Another 41.8 percent had major depression or other affective disorders, including bipolar and manic disorders. A full quarter, 25.2 percent, had schizophrenia, and 13.6 percent had stress and adjustment reactions, which include conduct disturbance and separation conditions. Prevalence rates for the remaining diagnostic groups were much lower, below 10 percent. Nearly two in five beneficiaries (37.0 percent) had multiple mental health diagnoses during the year (data not shown). As discussed below, these beneficiaries make up a particularly vulnerable subgroup of the Medicaid population with MH conditions.

**Figure 1.**  
**Prevalence of Primary Diagnostic Categories among New York Medicaid Beneficiaries with MH Treatment, 2003**



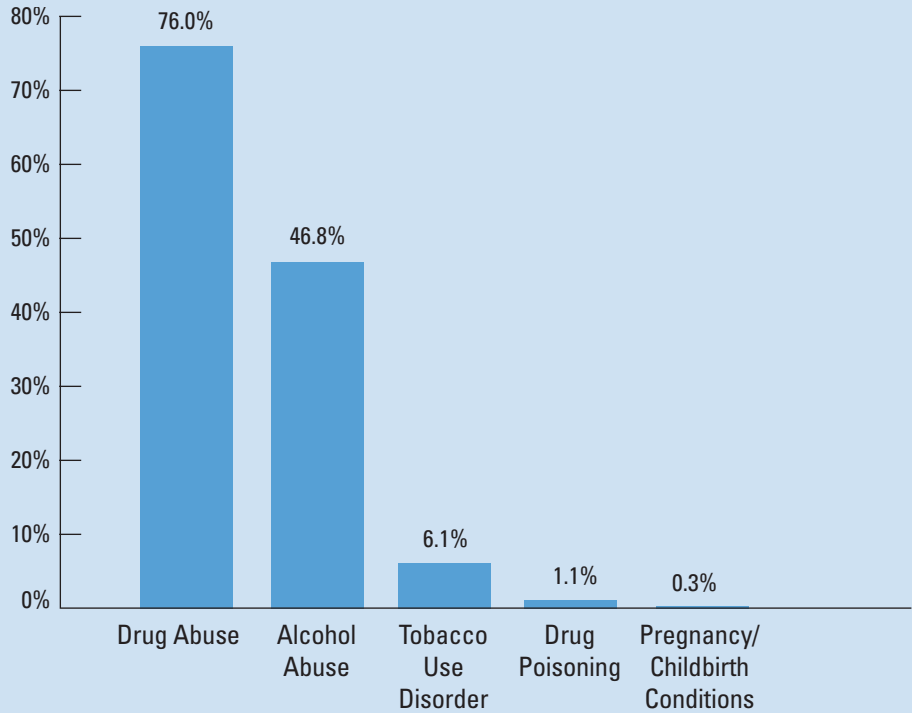
Many beneficiaries with MH conditions had physical medical conditions (comorbidities) including hypertension, heart disease, asthma, chronic obstructive pulmonary disease (COPD), substance abuse, diabetes, arthritis, developmental disability, stroke, cancer, and dementia and delirium. The prevalence of each comorbidity was higher in the MH population than the prevalence in the non-MH population (Figure 2). The prevalence of heart disease, for example, was 47 percent higher among beneficiaries receiving MH treatment (31.2 percent versus 21.2 percent). Similarly, hypertension was 32 percent higher, asthma/COPD was 57 percent higher, diabetes was 27 percent higher, and arthritis was 54 percent higher. Notably, the prevalence of substance abuse was 93 percent higher among beneficiaries who received MH treatment (22.2 percent versus 11.5 percent). More than 1 in 5 beneficiaries with mental illness were also treated for substance abuse during the year, a finding in keeping with other research (USDHHS, 1999).

**Figure 2.**  
**Prevalence of Selected Comorbidities by MH Treatment, 2003**

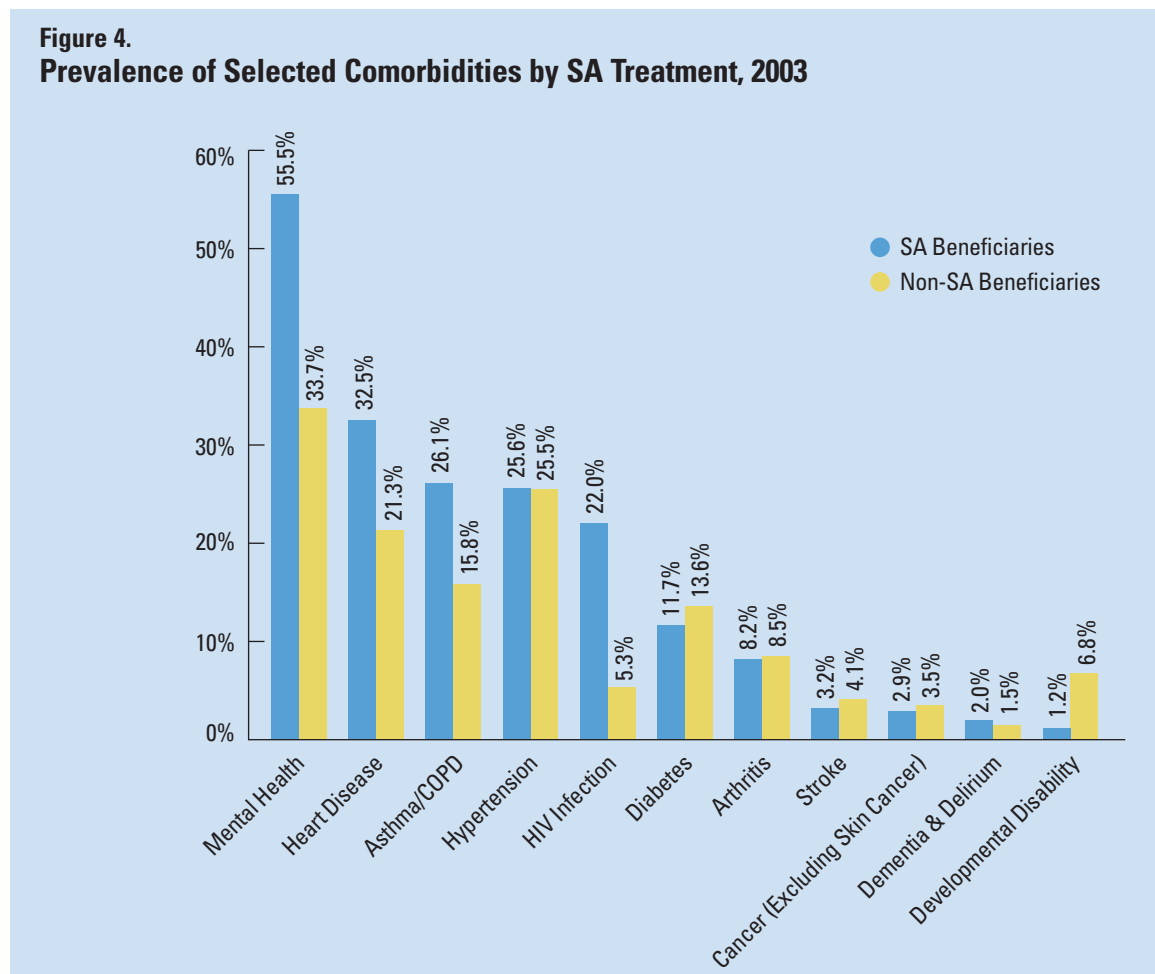


**Beneficiaries with SA Conditions** Among beneficiaries who received treatment for SA, drug abuse was by far the most prevalent condition: 7.6 out of 10 beneficiaries in the population had a diagnosis of drug abuse (Figure 3). The prevalence rates of other SA conditions were much lower—alcohol abuse, tobacco use disorder, drug poisoning, and pregnancy/childbirth conditions were, respectively, 46.8 percent, 6.1 percent, 1.1 percent, and 0.3 percent. About 29 percent of beneficiaries with SA conditions were treated for more than one type of substance abuse during the year (data not shown).

**Figure 3.**  
**Prevalence of Primary Diagnostic Categories among New York Medicaid Beneficiaries with SA Treatment, 2003**



Like beneficiaries with MH conditions, many beneficiaries receiving SA treatment had comorbidities. Of particular note, 55.5 percent had mental illness, 32.5 percent had heart disease, and 22.0 percent had HIV/AIDS,<sup>2</sup> all well above prevalence rates in the comparison population (Figure 4).



While beneficiaries with SA conditions had higher prevalence rates for many of the conditions we examined, for some the rates were lower (e.g., developmental disability) and for others they were similar (e.g., hypertension, diabetes, and arthritis).

The results highlight that beneficiaries who receive MH/SA treatment in New York’s FFS Medicaid program have some of the most serious and debilitating forms of mental illness. We found, for example, that a quarter of beneficiaries with MH had schizophrenia (among the most severe and persistent of mental illnesses), a rate 25 times that of the general U.S. population (USDHHS, 1999). We also found that a high share of both study populations had co-occurring mental and substance-abuse illnesses.

<sup>2</sup> Because beneficiaries who are HIV-positive can opt out of mandatory managed care, the majority of Medicaid beneficiaries with HIV/AIDS are included in our study population, which largely explains the high rates of this comorbidity among beneficiaries with SA conditions.

The data also revealed that both the populations with MH and SA conditions had higher rates of physical health problems than their respective comparison groups for nearly all of the conditions we examined; for the population with MH conditions this was true for all conditions examined. Of particular note: The prevalence of heart disease, hypertension, asthma/COPD, and arthritis among beneficiaries treated for MH was about a third higher than corresponding rates in the comparison group. Similarly, heart disease, asthma/COPD, and HIV/AIDS were much more prevalent among beneficiaries with SA conditions than among those in the comparison group.

The fact that so many beneficiaries with MH/SA conditions have physical and behavioral conditions underscores the need for an integrated care system with coordination among the various providers. Strong coordination and communication are essential between the New York State Medicaid agency and the New York State Office of Mental Health to ensure that medical and mental health services used by beneficiaries with MH and SA conditions are provided in the most integrated and efficient way. Coordinated care could, among other things, help ensure that treatments for the many different health conditions of beneficiaries with MH/SA conditions do not adversely interact with each other or duplicate each other. For example: medication is one of the major components of mental health treatment. It is also central to the treatment of many physical medical conditions. An integrated system of care could help ensure that proper medication as well as medication adherence is followed for both mental and medical conditions. Integrated physical and mental health care also holds the promise of promoting continuity of care, which increases the chances of receiving optimal primary care, could reduce the incidence of physical comorbidities, and could improve the chances for full recovery. Such a system would likely improve quality of care and patient outcomes while potentially reducing Medicaid costs.

There is a strong body of evidence on how well integrated systems of care affect patient outcomes (Bella, Somers, and Llanos, 2009). One recent review of the literature on different integrated MH/SA services and primary care service models, for example, reported that, on balance, integrated care achieves positive outcomes (Butler et al., 2009). There have also been several small studies in which preliminary findings suggest that integrated care systems have a positive influence on patients' mental and physical health and can increase their access to care (Bella, Somers, and Llanos 2009).

In addition to their behavioral and medical needs, past research has shown that beneficiaries with MH/SA illnesses often have significant limitations in a variety of life activities—for example, social interactions or completing basic activities of daily living (USDHHS, 1999). As a result, these beneficiaries also likely receive help and support from other state and local agencies providing other services, such as housing, vocational services, or corrections (Mumola, 1999; Ditton, 1999). Strong and consistent collaboration among the various state and local agencies in New York that are responsible for caring for people with MH/SA illnesses, including Medicaid, is also important.

## Medicaid Service Use and Spending

**Beneficiaries with MH Conditions** We found that the mean Medicaid spending for beneficiaries with MH conditions totaled \$28,451 in 2003, of which 26 percent (\$7,449) was MH-related spending and

**Table 3.**  
**Medicaid Spending and Service Use by MH Treatment Status, 2003**

	Beneficiaries with MH Treatment (N=116,982)			Beneficiaries with no MH Treatment (N=215,045)
	All Services	MH-Related Services	Non-MH Related Services	All Services
<b>Mean Medicaid Spending</b>	\$28,451	\$7,449	\$21,002	\$15,964
<b>Ambulatory Care</b>				
Physician				
Percentage Use	75.3%	19.4%	73.4%	58.9%
Average Medicaid Spending	\$205	\$9	\$196	\$160
Outpatient Hospital				
Percentage Use	76.5%	18.3%	74.6%	61.0%
Average Medicaid Spending	\$997	\$52	\$945	\$732
Prescription Drugs				
Percentage Use	96.5%	83.9%	93.3%	77.5%
Average Medicaid Spending	\$4,980	\$1,900	\$3,080	\$2,581
Clinic				
Percentage Use	42.8%	14.8%	40.8%	27.5%
Average Medicaid Spending	\$808	\$162	\$647	\$409
Psychiatric/Mental Health Services*				
Percentage Use	84.1%	74.2%	30.9%	16.0%
Average Medicaid Spending	\$2,420	\$1,487	\$933	\$450
<b>Hospital Inpatient Care</b>				
Percentage Use	28.1%	10.7%	21.5%	17.8%
Average Medicaid Spending	\$7,017	\$2,282	\$4,734	\$3,629
<b>Hospital Inpatient Care for Ambulatory Care Sensitive Conditions</b>				
Percentage Use	4.2%	—	4.2%	3.3%
Average Medicaid Spending	\$560	—	\$560	\$443
<b>Long-Term Care Services</b>				
Nursing Facility				
Percentage Use	4.6%	0.7%	4.4%	2.9%
Average Medicaid Spending	\$2,114	\$116	\$1,998	\$1,743
Home Health				
Percentage Use	10.2%	1.3%	9.4%	8.3%
Average Medicaid Spending	\$680	\$83	\$597	\$549
Personal Care Services				
Percentage Use	4.0%	0.1%	4.0%	3.3%
Average Medicaid Spending	\$659	\$6	\$653	\$709
Home- and Community-Based Care Waiver Services				
Percentage Use	4.8%	0.2%	4.7%	2.7%
Average Medicaid Spending	\$3,087	\$86	\$3,001	\$1,231

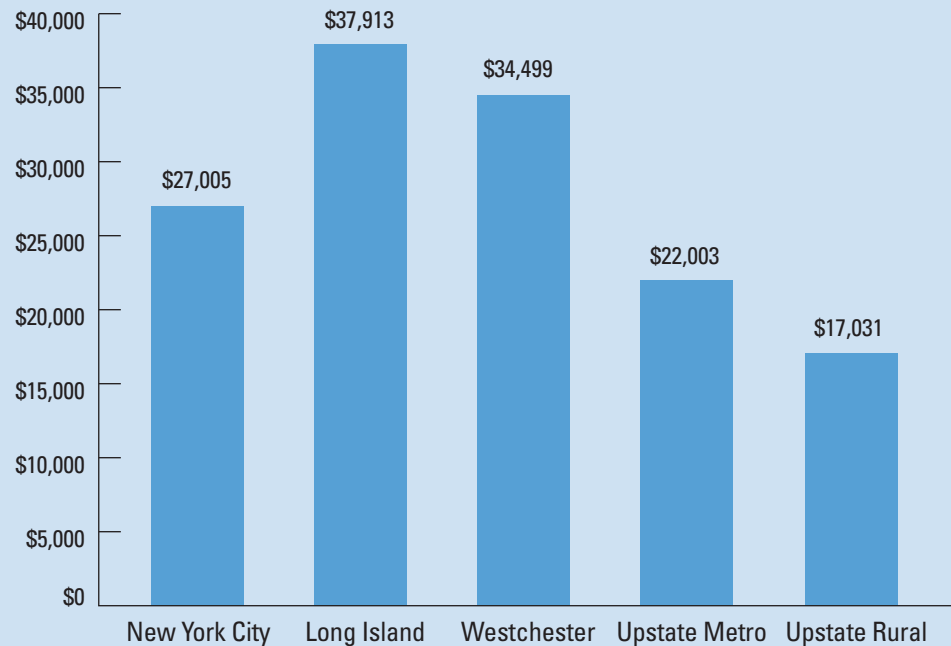
Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

\* Constructed by CMS, this service category groups together a wide range of mental health and substance abuse services, including counseling, residential care, social work, and habilitation.

74 percent (\$21,002) was non-MH-related spending (Table 3). Likely reflecting lower health status and higher prevalence of comorbidities, total mean Medicaid spending for beneficiaries with MH conditions (\$28,451) was nearly twice that of non-mental health beneficiaries (\$15,964). In addition, even non-MH-related spending for beneficiaries with MH conditions was 32 percent higher than it was for the comparison group (\$21,002 compared to \$15,964).

Mean Medicaid spending among beneficiaries with MH conditions did not vary by age but was higher for males and non-Hispanic African Americans, patterns generally consistent with those for the non-MH beneficiaries.<sup>3</sup> Medicaid spending for beneficiaries with MH conditions varied significantly by region (Figure 5). For example, spending for beneficiaries with MH conditions living on Long Island (\$37,913) was more than twice that of spending for beneficiaries with MH conditions living in upstate rural areas (\$17,031).

**Figure 5.**  
**Mean Medicaid Spending by Region among New York Medicaid Beneficiaries with MH Treatment, 2003**



<sup>3</sup> Please refer to Appendix Table F for more details.

Mean annual Medicaid spending per beneficiary also varied significantly by different mental health diagnostic groups (Figure 6), ranging from a low of \$18,068 for beneficiaries with neurotic and other depressive disorders only to a high of \$48,633 for those with diagnoses that fell in the catch-all Other category. The largest subgroup was beneficiaries with multiple diagnoses. With average spending of \$35,518, these beneficiaries accounted for 37 percent of the overall population and 45 percent of spending on the population. While beneficiaries in the Other group had the highest per beneficiary costs, they accounted for only 6.9 percent of the overall population and 11.8 percent of spending on the population.

**Figure 6.**  
**Mean Medicaid Spending by Diagnostic Category among New York Medicaid Beneficiaries with MH Treatment, 2003**

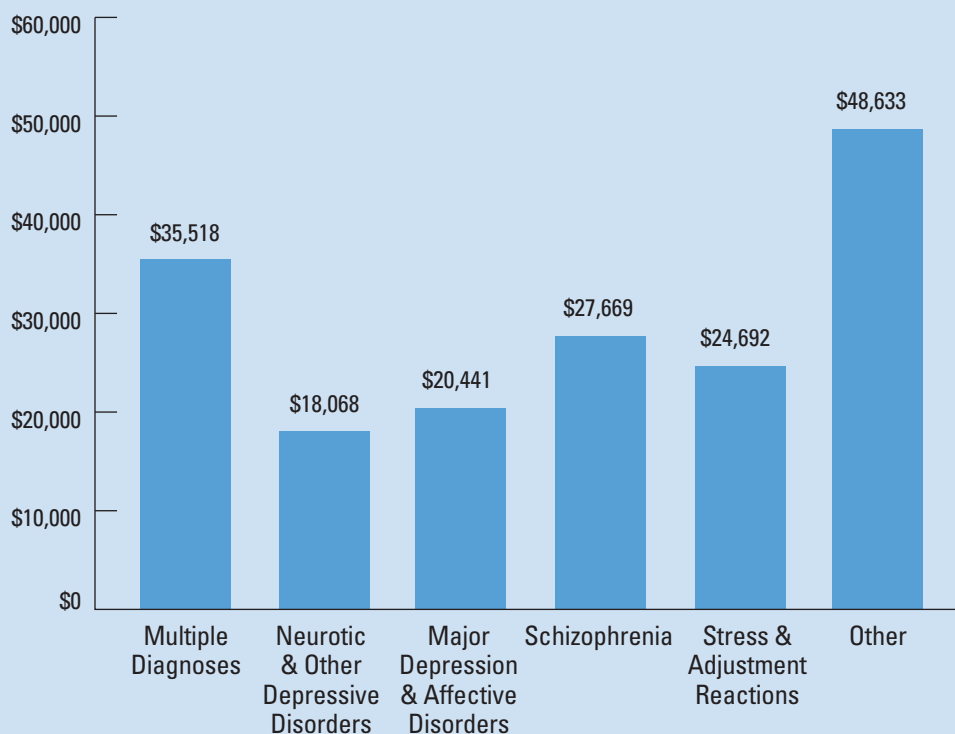


Table 3 also breaks out total Medicaid spending by selected services. The three main cost drivers for mental health spending for beneficiaries with MH conditions were inpatient hospital care (\$2,282)<sup>4</sup>, prescription drugs (\$1,900), and psychiatric services (\$1,487). (“Psychiatric services” includes counseling, residential care, social work, habilitation, and many other services.) Together these three categories accounted for 76 percent of spending for MH-related services.

<sup>4</sup> Some beneficiaries with MH conditions have inpatient admissions for MH services that are not covered by Medicaid, because federal Medicaid law, in general, prohibits federal contributions for the cost of care provided to Medicaid beneficiaries ages 21-64 in institutions for mental disease (IMD). As a result of this federal policy—often called the IMD exclusion—New York’s Medicaid program generally does not cover admissions to state psychiatric centers and other freestanding psychiatric hospitals. Mental health admissions covered by Medicaid, therefore, undercount mental health admissions, as well as overall hospital admissions, for beneficiaries with MH conditions.

For non-MH-related spending, beneficiaries with MH conditions had higher spending and use than the comparison group on all the services we examined, except for personal care services. Major components that contributed to the difference in non-MH-related services between beneficiaries with MH conditions and the comparison group were inpatient hospital care (\$4,734 versus \$3,629), prescription drugs (\$3,080 versus \$2,581), psychiatric services (\$933 versus \$450), and home- and community-based waiver services (\$3,001 versus \$1,231). Thus, apart from spending for their behavioral health treatment, beneficiaries with mental illness incurred higher Medicaid costs for treatment of their physical health conditions for all types of care.

**Beneficiaries with SA Conditions** In 2003, mean total Medicaid spending for beneficiaries with SA conditions was \$27,839, of which \$6,786 was SA-related (Table 4) and \$21,053 was non-SA-related. The mean total Medicaid spending for beneficiaries with SA conditions (\$27,839) was 54 percent higher than the spending of beneficiaries without any SA treatment (\$18,051). In addition, non-substance abuse-related spending for beneficiaries with SA conditions (\$21,053) was 17 percent higher than for the comparison group (\$18,051). The higher spending for non-SA-related health care likely reflects the fact that beneficiaries with SA conditions, like those with MH conditions, have a high prevalence of some of the most severe comorbidities examined, including heart disease and HIV/AIDS.<sup>5</sup>

<sup>5</sup> Please refer to Appendix Table K for more details.

**Table 4.**  
**Medicaid Spending and Service Use by SA Treatment Status, 2003**

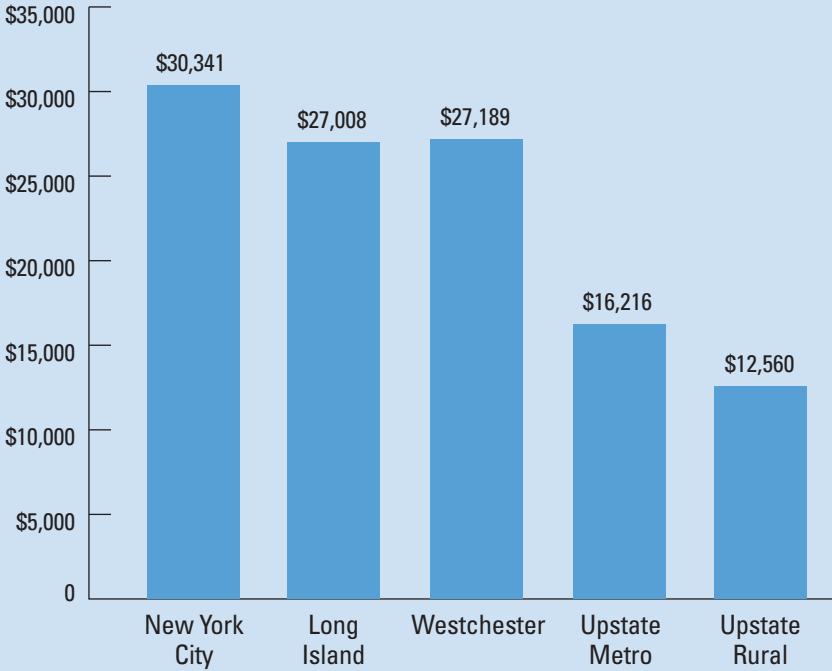
	Beneficiaries with SA Treatment (N=49,688)			Beneficiaries with no SA Treatment (N=322,011)
	All Services	SA-Related Services	Non-SA-Related Services	All Services
<b>Mean Medicaid Spending</b>	\$27,839	\$6,786	\$21,053	\$18,051
<b>Ambulatory Care</b>				
Physician				
Percentage Use	73.7%	25.0%	70.0%	68.3%
Average Medicaid Spending	\$180	\$17	\$162	\$168
Outpatient Hospital				
Percentage Use	77.8%	18.0%	75.4%	69.8%
Average Medicaid Spending	\$911	\$42	\$869	\$759
Prescription Drugs				
Percentage Use	90.3%	1.8%	90.3%	89.9%
Average Medicaid Spending	\$4,887	\$6	\$4,881	\$2,878
Clinic				
Percentage Use	47.3%	11.9%	46.1%	33.6%
Average Medicaid Spending	\$656	\$75	\$580	\$501
Psychiatric/Mental Health Services*				
Percentage Use	82.9%	69.6%	42.7%	35.7%
Average Medicaid Spending	\$3,709	\$2,838	\$871	\$702
<b>Hospital Inpatient Care</b>				
Percentage Use	44.6%	25.4%	31.8%	18.4%
Average Medicaid Spending	\$11,738	\$3,733	\$8,005	\$3,301
<b>Hospital Inpatient Care for Ambulatory Care Sensitive Conditions</b>				
Percentage Use	6.5%	—	6.5%	3.2%
Average Medicaid Spending	\$936	—	\$936	\$366
<b>Long-Term Care Services</b>				
Nursing Facility				
Percentage Use	3.7%	0.2%	3.7%	3.4%
Average Medicaid Spending	\$1,536	\$16	\$1,520	\$1,724
Home Health				
Percentage Use	6.6%	0.1%	6.6%	9.9%
Average Medicaid Spending	\$376	\$3	\$373	\$576
Personal Care Services				
Percentage Use	1.4%	—	1.4%	4.0%
Average Medicaid Spending	\$177	—	\$177	\$722
Home- and Community-Based Care Waiver Services				
Percentage Use	0.4%	0.0%	0.4%	4.5%
Average Medicaid Spending	\$165	\$2	\$163	\$2,081

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

\* Constructed by CMS, this service category groups together a wide range of mental health and substance abuse services, including counseling, residential care, social work, and habilitation.

Like Medicaid spending for people with MH conditions, spending for beneficiaries with SA conditions varied considerably by region (Figure 7). However, the high- and low-spending regions were different. Mean Medicaid spending was highest for beneficiaries living in New York City, where spending was more than twice that of beneficiaries with SA conditions living in upstate rural areas of the state (\$30,341 versus \$12,560). We also found that Medicaid spending varied by diagnostic group (Figure 8): spending for beneficiaries with multiple SA diagnoses was 2.6 times that of beneficiaries with tobacco use disorder only (\$33,812 versus \$13,024). Average spending was highest for those in the Other category: \$50,500. Much of the high spending in the Other category was driven by the small number of beneficiaries (86) treated for drug abuse poisoning (data not shown). Average Medicaid spending for this diagnostic group was \$62,279.

**Figure 7.**  
**Mean Medicaid Spending by Region among New York Medicaid Beneficiaries with SA Treatment, 2003**



**Figure 8.**  
**Mean Medicaid Spending by Diagnostic Category among New York Medicaid Beneficiaries with SA Treatment, 2003**

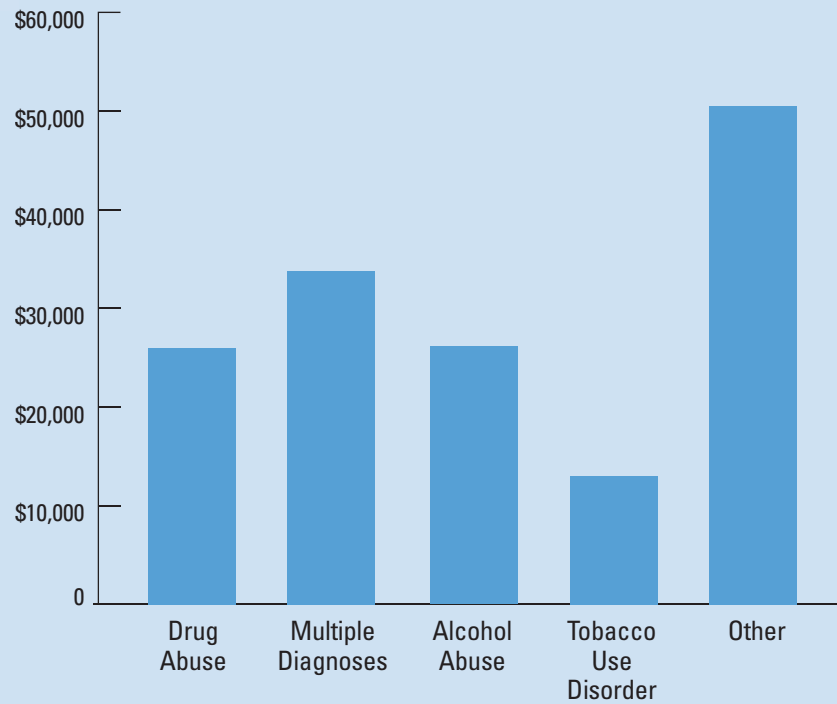


Table 4 shows the major components of SA-related services. Of particular note is the high use of inpatient hospital services—nearly half of the population with SA conditions used acute inpatient care. Spending for inpatient care also accounted for nearly half of the population’s total spending. For SA-related services, inpatient hospital care (\$3,733) and psychiatric services (\$2,838) were the two major cost drivers. Relatively few beneficiaries with SA conditions received SA treatment from physicians, outpatient hospital departments, or clinics—25.0 percent, 18.0 percent, and 11.9 percent, respectively. Spending for these services was also comparatively low. However, beneficiaries’ use of ambulatory care treatment of their SA condition may be captured in the catch-all category of psychiatric services, which includes crisis intervention, counseling, methadone treatment, detoxification, and several other services. More than two-thirds of beneficiaries with SA conditions used SA-related services in the psychiatric services category and mean spending was \$2,838 per beneficiary. Finally, as expected, given the limited drug treatment available for SA, SA-related spending on prescription drugs was low.

Beneficiaries with SA conditions spent much more than their counterparts on several non-SA-related services. Most prominently, inpatient hospital spending was 2.4 times as high for beneficiaries with SA conditions (\$8,005 versus \$3,301). Prescription drug spending for beneficiaries with SA conditions was also substantially higher (\$4,881 versus \$2,878), as was spending for inpatient care for ambulatory sensitive conditions (\$936 versus \$366). By contrast, spending was less for personal care

services (\$177 versus \$722) and home- and community-based waiver services (\$163 versus \$2,081), but comparable for nursing home care (\$1,520 versus \$1,724).

Many factors may contribute to these spending patterns. For regional spending differences, the supply of health care providers, for example, could play a role. Numerous studies have documented substantial geographic variation in health care utilization and spending, and research generally has found a strong positive relationship between the supply of health care providers and health care utilization and spending (Gold, 2004). The number of hospital beds and the supply of specialty physicians, for instance, are strongly associated with regional health care utilization and spending (Welch, 1993; Cutler and Sheiner, 1999; Fisher et al., 2000; MedPAC, 2003).

Provider supply has been found to influence the use of mental health services. One Medicaid analysis reported that rural program beneficiaries had significantly lower utilization of mental health services than urban beneficiaries; the difference was largely explained by the variation in the supply of specialty mental health providers. Rural Medicaid beneficiaries had rather limited access to specialty mental health providers and instead relied more on their primary care providers for mental health services than urban beneficiaries (Lambert and Agger, 1995).

In the current analysis, the availability of specialty providers willing to treat Medicaid beneficiaries with MH/SA conditions may be lower in New York's upstate areas, which could explain the lower spending per beneficiary we found there. For example, in 2003, the number of community mental health centers per 1,000 population was twice as high in New York City as in the Upstate Metro region, while the number of office-based psychiatrists per 1,000 population was nearly four times as high.<sup>6</sup>

The distribution and type of MH/SA providers across the state may also contribute to the regional differences we observed. For example, beneficiaries in more urban areas of the state may use more hospital services because of limited availability of ambulatory care for MH/SA treatment. Regional spending variation could also be explained by underlying differences in the health status or conditions of beneficiaries across the state. For instance, it could be that the most severely mentally impaired beneficiaries with MH conditions live in New York City, increasing average spending for this region. Similarly, a higher share of those with the most severe comorbidities may live in the city. Further research is needed to disentangle the reasons behind the geographic variation in spending for MH/SA treatment seen across New York.

More work is also needed to understand the racial and ethnic differences we found. For example, why did the non-Hispanic, African-American cohort account for greater Medicaid spending, despite less utilization of services? After adjusting for health status, do these differences persist? If they do,

<sup>6</sup> Urban Institute analysis of the 2003 Area Resource File.

further research is needed to determine why. Is it because of differences in cultural patterns of seeking care, limited access to specialty services, or other reasons?

Another area that warrants further probing is the extent to which MH/SA illnesses contribute to Medicaid spending differences. For both study populations we found that non-MH/SA spending was greater than that of the comparison groups. Is this higher spending related to complications because of MH/SA illness or for other reasons? Targeted quality improvement programs for people with MH/SA illness who also have comorbid medical conditions may be a policy direction that could lead to improved treatment and outcomes while potentially saving Medicaid funds.

Also worthy of investigation is inpatient hospital use among beneficiaries with MH/SA conditions, a major cost driver for both study populations. Are there particular factors (e.g., MH/SA diagnosis, health condition, place of residence) that elevate the risk of an inpatient stay for MH or SA treatment? What is the relationship between those with an inpatient stay for MH/SA treatment and use of ambulatory care for MH or SA? Do those who receive more ambulatory care have less hospital use?

Finally, for both populations we found that those with multiple diagnoses of MH or SA had considerably higher spending than many of those with a single diagnosis, indicating that these populations are especially costly. More work is needed to understand who these beneficiaries are and to further examine their Medicaid spending and service use.

### Hospital Readmission and Ambulatory Care Follow-Up

Given the substantial inpatient hospital use and spending among beneficiaries with MH and SA conditions, there may be opportunities to reduce avoidable hospital admission in the population, which could lead to lower health care costs and better quality of care. In this section we examine hospital readmission and ambulatory care follow-up after a hospital inpatient stay. High rates of hospital readmissions are viewed as “indicators of poor care or missed opportunities to better coordinate care” (MedPAC 2007). Ambulatory care follow-up after a hospital inpatient stay for mental health is similarly viewed as a quality of care indicator. Indeed, ambulatory follow-up after an inpatient stay for mental health is one of several measures included in the Healthcare Effectiveness Data and Information Set (HEDIS), which is used by many health care purchasers, including New York State Medicaid, to assess the quality of care provided to plan enrollees.<sup>7</sup>

<sup>7</sup> The HEDIS measures of mental health quality developed by the NCQA are used by health care purchasers and regulators, among others, to monitor the performance of managed care plans. See <http://www.fchp.org/NR/rdonlyres/4C912948-B861-4233-B157-6CE064F96FDD/0/2009HEDISmeasures.pdf>.

## Hospital Readmission

**Beneficiaries with MH Conditions** Among beneficiaries with mental illness, hospital readmission was much more prevalent compared to the non-MH group (Table 5). Among those with a hospital inpatient stay, the readmission rate within seven days for beneficiaries with MH conditions was about 60 percent higher than that of the non-MH group, 15.2 percent compared to 9.5 percent. This higher level persisted in the fifteen-day and the thirty-day observation periods. Within thirty days, 28.8 percent of beneficiaries with MH who had a hospital inpatient stay experienced a hospital readmission.

**Table 5.**  
**Hospital Readmission Rate and Spending for Readmissions**  
**by Beneficiaries' MH Treatment Status and Primary MH Diagnosis, 2003**

	Readmission Within								
	7 Days			15 Days			30 Days		
	Percent	\$/ Beneficiary	Total \$ (millions)	Percent	\$/ Beneficiary	Total \$ (millions)	Percent	\$/ Beneficiary	Total \$ (millions)
<b>MH Population</b>									
Share of Beneficiaries with Any Readmission	15.2%	\$20,190	\$99.3	21.9%	\$23,277	\$162.8	28.8%	\$25,869	\$232.2
<u>By Primary Diagnosis</u>									
Multiple Diagnoses	19.0%	\$21,135	\$66.7	26.5%	\$24,275	\$105.5	34.3%	\$26,569	\$146.5
Neurotic & Other	11.2%	\$17,126	\$10.6	16.9%	\$21,211	\$19.8	23.0%	\$24,004	\$29.6
Depressive Disorders									
Major Depression & Affective Disorders	10.7%	\$17,937	\$7.7	16.8%	\$19,636	\$13.2	22.0%	\$23,692	\$20.5
Schizophrenia	8.9%	\$17,281	\$4.2	13.1%	\$18,659	\$6.5	18.2%	\$21,857	\$10.4
Stress & Adjustment Reactions	13.7%	\$22,320	\$4.7	19.9%	\$27,808	\$8.3	26.1%	\$29,910	\$11.6
Other	14.1%	\$20,749	\$5.4	21.6%	\$23,896	\$9.4	27.8%	\$27,103	\$13.6
Share with Any Readmission for MH	10.2%	\$19,312	\$24.4	15.6%	\$20,582	\$39.6	21.2%	\$22,122	\$56.9
Share with Any Readmission for Non-MH	14.0%	\$18,848	\$65.7	20.1%	\$22,278	\$110.3	26.4%	\$25,354	\$161.2
<b>Non-MH Population</b>									
Share with Any Readmission	9.5%	\$16,915	\$60.8	14.7%	\$19,978	\$109.9	20.1%	\$23,159	\$171.7

Source: Urban Institute analysis of 2003 Medicaid Analytic eExtract (MAX).

The chances of hospital readmission varied by diagnostic group. Again highlighting their particular vulnerabilities, beneficiaries with multiple MH diagnoses had the highest rate of readmission: Nearly one out of every five beneficiaries with multiple MH diagnoses who had a hospital stay had a readmission within seven days. Within thirty days, 34.3 percent of these beneficiaries were readmitted to the hospital. Beneficiaries with schizophrenia had the lowest rate of readmission—8.9 percent of this sub-group experienced a readmission within seven days; 18.2 percent within thirty days. Total Medicaid spending for all readmissions within seven days amounted to \$99.3 million in 2003; for all readmissions within thirty days, spending totaled \$232.2 million.

Beneficiaries with MH conditions also had a high readmission rate for non-MH-related hospitalization within seven days: 14.0 percent, 47 percent higher than the 9.5 percent readmission rate of the non-MH population. This difference suggests that the comorbidity of mental illness elevates the risk of readmission for physical medical conditions.

**Beneficiaries with SA Conditions** For beneficiaries with SA conditions, the hospital readmission rate was higher still (Table 6). Within seven days, 20.8 percent of SA beneficiaries who had a hospital stay experienced a readmission. Within thirty days, 37.4 percent had been readmitted to the hospital. Rates

**Table 6.**  
**Hospital Readmission Rate and Spending for Readmissions**  
**by Beneficiaries' SA Treatment Status and Primary SA Diagnosis, 2003**

	Readmission Within								
	7 Days			15 Days			30 Days		
	Percent	\$/ Beneficiary	Total \$ (millions)	Percent	\$/ Beneficiary	Total \$ (millions)	Percent	\$/ Beneficiary	Total \$ (millions)
<b>SA Population</b>									
Share of Beneficiaries with Any Readmission	20.8%	\$18,776	\$85.1	29.1%	\$22,258	\$139.6	37.4%	\$25,184	\$198.3
<b>By Primary Diagnosis</b>									
Drug Abuse	12.1%	\$18,595	\$18.3	19.0%	\$21,272	\$32.7	26.4%	\$24,807	\$51.6
Multiple Diagnoses	30.8%	\$19,444	\$54.9	40.8%	\$23,355	\$86.3	50.2%	\$26,057	\$116.5
Alcohol Abuse	16.4%	\$16,754	\$11.1	24.1%	\$20,027	\$19.3	31.6%	\$22,803	\$28.1
Tobacco Use Disorder	8.3%	\$8,493	\$0.3	13.7%	\$12,941	\$0.6	16.7%	\$16,199	\$0.9
Other	24.2%	\$16,850	\$0.4	27.8%	\$24,949	\$0.7	38.6%	\$35,382	\$1.2
Share with Any Readmission for SA Treatment	15.6%	\$12,128	\$23.8	22.4%	\$14,144	\$39.0	28.8%	\$15,727	\$54.8
Share with Any Readmission for Non-SA	13.2%	\$19,240	\$39.6	20.2%	\$22,339	\$69.3	27.6%	\$25,687	\$106.5
<b>Non-SA Population</b>									
Share with Any Readmission	8.0%	\$18,496	\$77.7	12.5%	\$21,061	\$138.1	17.3%	\$23,746	\$213.1

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

Note: The following diagnoses are included in the Other category: drug abuse poisoning and pregnancy/childbirth disorders.

for the comparison population were 8.0 percent and 17.3 percent, respectively. Beneficiaries with multiple diagnoses of SA problems had the highest rate of readmission. Within seven days, 30.8 percent of these beneficiaries were readmitted to the hospital, with average spending totaling \$19,444. Within thirty days, more than half, 50.2 percent, of these beneficiaries had been readmitted to the hospital. Conversely, beneficiaries with tobacco use disorder had the lowest readmission rate (8.3 percent) and spending per beneficiary (\$8,493) for readmissions occurring within seven days. The Medicaid spending for all readmissions within seven days among beneficiaries with SA conditions totaled \$85.1 million; within thirty days total Medicaid spending associated with readmission for this subpopulation was \$198.3 million.

### Ambulatory Follow-Up to Inpatient Stay for MH or SA Treatment

**Beneficiaries with MH Conditions** Among beneficiaries with a hospital stay for MH treatment, about half received ambulatory care follow-up within seven days of discharge from the hospital and almost two-thirds received ambulatory care follow-up within thirty days (Table 7). The follow-up rates varied significantly by diagnostic category, ranging from 53.5 percent within seven days for those with multiple MH diagnoses to 13.1 percent within seven days for those in the Other category. Despite being more likely to have follow-up ambulatory care, those with multiple MH diagnoses still experienced the highest rate of hospital readmission, suggesting again that these beneficiaries are at particular risk.

**Table 7.**  
**Ambulatory Visit Follow-Up to Hospital Inpatient Stay for MH Treatment, 2003**

	Ambulatory Visit Within	
	7 Days	30 Days
<b>Percentage of Hospital Inpatient Stays with Any Follow-Up Visit</b>	51.4%	65.3%
<b>By Primary Diagnosis</b>		
Multiple Diagnoses	53.5%	67.9%
Neurotic & Other Depressive Disorders	31.0%	37.4%
Major Depression & Affective Disorders	43.0%	54.2%
Schizophrenia	43.7%	55.8%
Stress & Adjustment Reactions	14.0%	23.6%
Other	13.1%	18.5%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Beneficiaries with SA Conditions** Among beneficiaries with an inpatient hospital stay for SA treatment, the rates of ambulatory care follow-up were somewhat lower. About 45 percent of beneficiaries received ambulatory care follow-up within seven days of being discharged from a hospital for SA treatment and 55 percent received ambulatory care follow-up within thirty days (Table 8). Consistent with our findings for the population with MH conditions, the follow-up rates varied by diagnostic category, ranging from a high of 47.3 percent within seven days for beneficiaries with multiple SA diagnoses to 1.6 percent within seven days for those with diagnoses in the Other category.

**Table 8.**  
**Ambulatory Visit Follow-Up to Hospital Inpatient Stay for SA Treatment, 2003**

Percentage of Hospital Inpatient Stays with Any Follow-Up Visit	Ambulatory Visit Within	
	7 Days	30 Days
<b>By Primary Diagnosis</b>		
Drug Abuse	36.5%	43.7%
Multiple Diagnoses	47.3%	58.3%
Alcohol Abuse	37.9%	47.5%
Tobacco Use Disorder*	—	—
Other	1.6%	3.3%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

\* There was no SA-related hospitalization for beneficiaries with Tobacco Use Disorder.

Note: The following diagnoses are included in the Other category: drug poisoning and pregnancy/childbirth disorders.

The findings on hospital readmission and ambulatory care follow-up raise many questions that require further investigation. For example, we look only at total hospital readmissions, but it is essential to determine which of these may be avoidable and which may not be. Avoidable readmissions, which arise from many causes, including a lack of follow-up care coordination, have the potential to be addressed with policy measures. Our findings on ambulatory follow-up to an inpatient stay for either mental health or substance abuse treatment highlight the importance of investigating the relationship between readmission and follow-up care.

Other issues that warrant further examination are what patient-level factors (e.g., age, race, health condition) influence readmission. A closer look at those with multiple diagnoses for mental health or substance abuse, who we found had particularly elevated readmission rates, would be useful. Other work should look at whether readmission rates vary across regions of the state or by hospital after controlling for patient characteristics and case-mix. What factors contribute to those differences? If, for example, particular hospitals demonstrate low readmission rates, key questions regarding differences in discharge planning protocols and targeted care management initiatives would need to be pursued. Furthermore, New York Medicaid could examine ways to encourage such practices.

## Conclusion

This study provides a detailed profile of the mental health and substance abuse population in New York State, including demographic characteristics, program eligibility status, health status, and service use and spending patterns. New York Medicaid is caring for many individuals with severe mental health and substance abuse disorders that frequently overlap, as well as complicating physical conditions.<sup>8</sup> Their many complex health needs make them costly to care for. We also found significant geographic variation in Medicaid spending, which could be related to regional differences in the supply of health care providers.

Our findings for the MH and SA populations in New York State—co-occurring behavioral and physical conditions, high inpatient costs and readmission rates, and limited ambulatory care following acute inpatient events—suggest the need to improve coordination of Medicaid services for these at-risk populations. Evidence is now emerging that care coordination (for example, between primary care providers and behavioral health providers) could help raise the quality of care and reduce Medicaid costs.<sup>9</sup> While Medicaid is essential to getting health care services to individuals with MH and SA, it alone cannot provide the wide range of services needed by many in these populations, nor was it ever intended to do so. To fully support the needs of individuals with MH/SA disorders, Medicaid needs to work in close collaboration with other local and state agencies that are also responsible for providing services to these individuals to create a cohesive system of care.

This study provides a first look at the MH/SA populations in the New York Medicaid program. Further research on the many different subgroups within the MH/SA population and the specific health care services provided to them is needed to help inform targeted policy designs that could improve quality of care and control program costs.

## Acknowledgments

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<sup>8</sup> This finding is consistent with those of other studies in other states: Jeffrey Buck, "Medicaid Mental Health Services: Current Trends and Policies," Presented at the NASMHPD's National Research Institute Conference, Washington DC, 2009.

<sup>9</sup> Butler et al., "Integration of Mental Health /Substance Abuse and Primary Care (Rockville, MD: Agency for Healthcare Research and Quality, 2008); The Health Access and Integration Project; The Primary Care Access, Referral and Evaluation Study; The In Shape Program; Melanie Bella, Stephen Somers and Karen Llanos (2009), "Providing Behavioral Health Services to Medicaid Managed Care Enrollees: Options for Improving the Organization and Delivery of Services," prepared for the Medicaid Institute at United Hospital Fund.

## Appendix: Data and Methods

### Data Sources

The primary data source for the study was Medicaid Analytic eXtract (MAX) data for 2003, the most recent year available when the study began.<sup>10</sup> The MAX data system, developed and maintained by the Centers for Medicare and Medicaid Services (CMS), comprises data sets with person-level files on, among other things, Medicaid eligibility, basic demographic characteristics, managed care enrollment, service use, and payment. MAX data provide detailed information on service claims, including conditions and treatments such as ICD-9 Diagnostic Codes and National Drug Codes.

An important shortcoming of MAX data is the limited availability of data on Medicaid beneficiaries enrolled in managed care. When a beneficiary is enrolled in managed care, MAX data do not include detail on services and payment for care provided by health plans. Because of this limitation, we restricted our analysis sample to beneficiaries enrolled in fee-for-service (FFS) Medicaid (see below).

### Study Samples

**Mental Health** To identify beneficiaries with mental health, we followed the Substance Abuse and Mental Health Services Administration (SAMHSA) strategy that relies on specific primary diagnosis codes (Appendix Table A) of mental health recorded by a medical professional at any medical encounter (primary care, acute care, or long-term care) during the year or any use of mental hospital services for the elderly during the year, regardless of the diagnosis on the claim (Buck, Teich, and Miller, 2003). We limited mental health hospital use to those 65 and over because under federal Medicaid law, coverage for people ages 22 to 64 in institutions for mental disease (IMDs)—described as hospitals, nursing homes, or other facilities primarily engaged in providing diagnosis, treatment, or care of people with mental diseases—is precluded. This limitation is referred to as the “IMD exclusion.”

Since MAX does not have full spending and use information when beneficiaries are enrolled in managed care, we limited the study sample to beneficiaries enrolled in Medicaid FFS for all 12 months of 2003. For the same reason, we also excluded beneficiaries who were dually enrolled in Medicaid and Medicare. Finally, owing to different eligibility standards and services provided to children and adults, we limited our sample to beneficiaries age 22 and older. Our final study sample included 116,982 beneficiaries with a mental health diagnosis or a record of mental health service use.

For context, we also constructed a comparison sample with the following criteria: no medical claim that included selected mental health diagnoses or use of any mental hospital services for the elderly; enrolled in FFS Medicaid for all 12 months of 2003; 22 years of age or older; and not dually enrolled in Medicare. The comparison sample included 215,045 beneficiaries.

<sup>10</sup> Please refer to [http://www.resdac.umn.edu/Medicaid/file\\_descriptions.asp](http://www.resdac.umn.edu/Medicaid/file_descriptions.asp) for a detailed description of the MAX data system.

**Substance Abuse** Similarly, we followed the SAMHSA strategy that relies on specific primary diagnosis codes (Appendix Table B) as recorded by a medical professional at any visit during the year to identify beneficiaries with substance abuse. In addition, the substance abuse study sample only included beneficiaries who were enrolled in Medicaid FFS for all 12 months of 2003 and were not dually enrolled in Medicare. We also limited our sample to beneficiaries age 18 and older. The final sample contains 49,688 beneficiaries with substance abuse conditions. The SA sample is considerably smaller than the MH sample because there is more churning for the SA population. That is, beneficiaries with substance abuse issues tend to churn on and off Medicaid and therefore are less likely to be enrolled continuously for 12 months.

The SA comparison sample consists of beneficiaries with the following characteristics: no medical claim with selected substance abuse diagnoses; enrolled in FFS Medicaid for 12 months; 18 years of age or older; and not dually enrolled in Medicare. The comparison sample includes 322,011 beneficiaries.

## Methods

**Diagnosis Groupings** To examine how Medicaid spending and service use varied by diagnostic category, we developed mutually exclusive diagnostic categories for mental health by applying the following strategy:

- beneficiaries who used inpatient mental health hospitals but had no medical claims with a mental health diagnosis were placed in the “No Diagnosis” category;
- beneficiaries with more than one mental health diagnosis were placed in the “Multiple Diagnoses” category; and
- beneficiaries with a single recorded mental health diagnosis throughout the year were placed in that diagnostic category.

For diagnosis categories with a prevalence of 2 percent or less, we combined them into an “Other” category. Specific diagnoses in this category: other psychoses, conduct conditions, other mental conditions, special symptoms and syndromes, personality conditions, childhood psychoses, hyperkinetic syndrome, emotional disturbances, pregnancy/childbirth conditions, and no diagnosis.

We developed similarly mutually exclusive diagnostic categories for substance abuse. The “Other” substance abuse category combines drug abuse poisoning and pregnancy/childbirth conditions.

**Identifying Comorbidities** To further characterize the health status of mental health beneficiaries, we also examined the prevalence of selected comorbidities. In particular, we chose prevalent chronic conditions (hypertension, heart disease, asthma/COPD, diabetes, arthritis, stroke, and cancer [excluding skin cancer]) or conditions that tend to be associated with the mental health population—namely, substance abuse, developmental disability, and dementia and delirium (Finkelstein et al., 2004; Koike, Unutzer, and Wells, 2002). Substance abuse was defined using the SAMHSA diagnosis codes listed in Appendix Table B and developmental disability was defined based on diagnosis codes in Appendix Table C. Remaining comorbidities were defined using the clinical classification system developed by the federal Agency for Healthcare Research and Quality (HCUP, 2007). For the purposes of identifying comorbidities, all diagnosis codes in a claim were used, not just the primary diagnosis code.

Selected comorbidities for substance abuse include mental health, heart disease, asthma/COPD, hypertension, HIV infection, diabetes, arthritis, stroke, cancer (excluding skin cancer), dementia and delirium, and developmental disability.

**Identifying Spending for Mental Health and Substance Abuse** To separate out spending for mental health treatment, we classified each medical claim during the year as MH or non-MH based on primary diagnosis; spending on use of mental hospital services for the elderly was included as mental health spending. To classify spending for prescription drugs as mental health or not, we relied on National Drug Codes (Zuvekas, 2005). The five therapeutic classes of prescription drugs we classified as treatment for mental health: anxiolytic/sedative/hypnotic, not elsewhere classified; psychotherapeutic, antidepressant; psychotherapeutic, tranquilizer/antipsychotic; stimulant, amphetamine type; and stimulant, non-amphetamine type. Prescription drugs classified for substance abuse treatment: buprenorphine hydrochloride, buprenorphine hydrochloride/naloxone hydrochloride, disulfiram, methadone hydrochloride, naltrexone, and naltrexone hydrochloride.<sup>11</sup>

**Hospital Readmission and Ambulatory Care Follow-Up** Using the MedPAC definition, hospital readmission within seven days was defined as any readmission within seven days of the initial admission.<sup>12</sup> Hospital readmission for MH-related readmission within seven days was defined as any admission for mental health within seven days of the initial MH admission. Hospital readmission for non-MH -related readmission within seven days was defined as any admission for non-MH within seven days of the initial non-MH admission. If the initial admission occurred in the last six days of 2003, readmission status was defined as unknown in calculating readmission rate to account for the possibility that we did not observe whether a hospital readmission occurred because of data truncation. Readmissions within fifteen days and thirty days were defined similarly. Medicaid spending associated with readmission was defined as the total spending for all hospital readmissions.

<sup>11</sup> Communication with Samuel Zuvekas at the Agency for Healthcare Research and Quality.

<sup>12</sup> A similar definition was used by MedPAC in its 2007 Report to Congress. See [http://www.medpac.gov/document\\_search.cfm?ResearchArea=1](http://www.medpac.gov/document_search.cfm?ResearchArea=1).

The same methods were used in the hospital readmission analysis among those with substance abuse conditions.

Ambulatory care follow-up to inpatient stays for mental health within seven days was defined as any physician visit, hospital outpatient visit, clinic visit, or use of psychiatric services within seven days of the initial hospital stay. Ambulatory follow-up within thirty days was similarly defined. The truncation issue for ambulatory care follow-up was addressed in the same manner as that used for hospital readmission. The same methods were used in the substance abuse analysis.

**Appendix Table A.  
SAMHSA Diagnosis Codes to Identify Mental Health Population**

<b>Diagnostic Category</b>	<b>First Three Digits of ICD-9-CM Diagnosis Code</b>	<b>Example Conditions included within Diagnostic Category</b>
Schizophrenia	295	Chronic and acute schizophrenic conditions
Major Depression and Affective Conditions	296	Manic, depressive, and bipolar conditions
Other Psychoses	297, 298	Paranoid states, delusional conditions, and reactive psychoses
Childhood Psychoses	299	Infantile autism, disintegrative conditions, and childhood-like schizophrenia
Neurotic and Other Depressive Conditions	300, 311	Anxiety states; phobic, obsessive-compulsive, and other neurotic conditions; and unspecified depressive conditions
Personality Conditions	301	Affective, schizoid, explosive, histrionic, antisocial, dependent, and other personality conditions
Other Mental Conditions	302, 306, 310	Sexual deviations, physiological malfunction arising from mental factors, and non-psychotic mental conditions due to organic brain damage
Special Symptoms and Syndromes	307	Eating conditions, tics and repetitive movement conditions, sleep conditions, and enuresis
Stress and Adjustment Reactions	308, 309	Acute reaction to stress, depressive reaction, separation conditions, and conduct disturbance
Disorders of Conduct	312	Aggressive outbursts, truancy, delinquency, kleptomania, impulse control condition, and other conduct disorders
Emotional Disturbances	313	Overanxious condition, shyness, relationship problems, and other mixed emotional disturbances of childhood or adolescence such as oppositional condition
Hyperkinetic Syndrome	314	Attention deficit with or without hyperactivity, and hyperkinesis with or without developmental delay
Pregnancy/Childbirth Conditions	648.40-648.44	Mental conditions associated with pregnancy or childbirth

Source: Buck, Teich, and Miller, 2003.

**Appendix Table B.  
SAMHSA Diagnosis Codes to Identify Substance Abuse Population**

<b>Diagnostic Category</b>	<b>First Three Digits of ICD-9-CM Diagnosis Code</b>	<b>Example Conditions included within Diagnostic Category</b>
Alcohol Abuse	291, 303, 305.0	Alcoholic psychoses
Drug Abuse	292, 304, 305.2–305.9	Drug psychoses and mood conditions, drug dependence
Tobacco Use Disorder	305.1	Tobacco use disorder
Pregnancy/Childbirth Conditions	760.71, 648.3-648.34, 779.5	Substance abuse-related pregnancy or childbirth
Drug Poisoning	965.00-965.09	Poisoning by opium, heroin, methadone, or other opiates

Source: Buck, Teich, and Miller, 2003.

**Appendix Table C.  
Diagnosis Codes to Identify Developmental Disability**

<b>Diagnostic Category</b>	<b>First Three Digits of ICD-9-CM Diagnosis Code</b>
Autism	299
Mild Mental Retardation	317
Moderate/Severe/Profound Mental Retardation	318
Unspecified Mental Retardation	319
Congenital Anomalies	742
Down Syndrome	758

Source: Braddock, Hemp, Fujura, Bachelder, and Mitchell, 1990.

**Appendix Table D.  
Prevalence of Primary Diagnostic Categories among New York Medicaid Beneficiaries with MH Treatment, 2003**

<b>Primary Diagnostic Category</b>	<b>Prevalence</b>
	(N=116,982)
Multiple Diagnoses	37.0%
Neurotic & Other Depressive Disorders	22.6%
Major Depression & Affective Disorders	17.1%
Schizophrenia	11.1%
Stress & Adjustment Reactions	5.3%
Other	6.9%
Other Psychoses	1.7%
Conduct Disorders	1.3%
Other Mental Disorders	1.3%
Special Symptoms & Syndromes	1.0%
Personality Disorders	0.6%
Childhood Psychoses	0.4%
Hyperkinetic Syndrome	0.2%
Emotional Disturbances	0.1%
Pregnancy/Childbirth Disorders	0.1%
No Diagnosis	0.1%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Appendix Table E.  
Major Combinations of Primary Diagnostic Categories among New York Medicaid Beneficiaries with Multiple MH Diagnoses, 2003**

<b>Combinations within Multiple Diagnoses</b>	<b>Prevalence</b>
	(N=43,229)
(Major Depression & Affective Disorders) and (Neurotic & Other Depressive Disorders)	9.74%
(Schizophrenia) and (Major Depression & Affective Disorders)	3.29%
(Schizophrenia) and (Neurotic & Other Depressive Disorders)	2.02%
(Neurotic & Other Depressive Disorders) and (Stress & Adjustment Reactions)	2.41%
(Schizophrenia) and (Neurotic & Other Psychoses)	1.43%
More than Two Primary Diagnostic Categories	18.06%

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Appendix Table F.  
Mean Medicaid Spending by Selected Personal and Health Care Characteristics  
and MH Treatment Status, 2003**

	<b>Beneficiaries with MH Treatment (N=116,982)</b>	<b>Beneficiaries with no MH Treatment (N=215,045)</b>
<b>Mean Medicaid Spending</b>	<b>\$28,451</b>	<b>\$15,964</b>
<b>Age</b>		
22 to 44	\$30,653	\$15,297
45 to 64	\$25,987	\$17,116
65+	\$40,563	\$13,040
<b>Gender</b>		
Male	\$35,827	\$20,194
Female	\$23,605	\$12,849
<b>Race</b>		
White, Non-Hispanic	\$26,445	\$14,284
Black/African-American, Non-Hispanic	\$33,574	\$17,332
Hispanic/Latino	\$22,799	\$14,244
Other	\$25,743	\$10,240
Unknown	\$32,221	\$18,747
<b>Region</b>		
New York City	\$27,005	\$15,194
Long Island	\$37,913	\$15,334
Westchester	\$34,499	\$15,055
Upstate Metro	\$22,003	\$11,705
Upstate Rural	\$17,031	\$7,193
Unknown	\$216,427	\$331,629
<b>Eligibility</b>		
Non-Dual Elderly	\$40,520	\$13,037
Non-Dual Disabled	\$31,676	\$23,425
Non-Elderly, Non-Disabled	\$16,191	\$6,030
<b>Primary Diagnostic Category</b>		
Multiple Diagnoses	\$35,518	—
Neurotic & Other Depressive Disorders	\$18,068	—
Major Depression & Affective Disorders	\$20,441	—
Schizophrenia	\$24,692	—
Other	\$48,633	—
<b>Comorbidities</b>		
Hypertension	\$31,516	\$21,253
Heart Disease	\$39,678	\$30,297
Asthma/COPD	\$31,839	\$22,090
Substance Abuse	\$35,377	\$25,491
Diabetes	\$37,179	\$25,283
Arthritis	\$30,739	\$23,425
Developmentally Disabled	\$97,724	\$106,060
Stroke	\$64,257	\$56,073
Cancer (Excluding Skin Cancer)	\$41,079	\$31,630
Dementia & Delirium	\$75,454	\$77,881

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Appendix Table G.  
Selected Characteristics of Beneficiaries with MH Treatment by MH Diagnosis, 2003**

	Primary Diagnostic Category						
	Beneficiaries with MH Treatment	Multiple Diagnoses	Neurotic & Other Depressive Disorders	Major Depression & Affective Disorders	Schizophrenia	Stress & Adjustment Reactions	Other
	(N=116,982)	(N=43,229)	(N=26,439)	(N=20,055)	(N=13,021)	(N=6,163)	(N=8,075)
<b>Age</b>							
22 to 44	46.7%	50.7%	45.1%	34.1%	43.5%	57.2%	59.4%
45 to 64	51.3%	48.2%	52.6%	62.8%	54.7%	41.2%	37.7%
65+	2.0%	1.1%	2.3%	3.1%	1.9%	1.6%	2.9%
<b>Gender</b>							
Male	39.7%	41.1%	31.8%	29.2%	57.0%	35.1%	59.1%
Female	60.4%	58.9%	68.2%	70.9%	43.0%	65.0%	40.9%
<b>Race</b>							
White, Non-Hispanic	35.7%	32.7%	40.6%	40.5%	28.2%	39.9%	33.0%
Black/African American, Non-Hispanic	21.2%	23.3%	17.2%	14.9%	28.2%	24.6%	25.1%
Hispanic/Latino	19.8%	21.4%	21.6%	23.9%	10.0%	16.9%	13.7%
Other	1.9%	1.9%	1.6%	1.7%	3.1%	1.5%	2.0%
Unknown	21.3%	20.6%	18.9%	19.1%	30.6%	17.2%	26.3%
<b>Region</b>							
New York City	67.6%	70.7%	64.0%	74.4%	65.2%	56.6%	58.3%
Long Island	4.2%	4.1%	3.4%	3.7%	6.7%	3.8%	5.2%
Westchester	2.7%	2.5%	2.3%	2.5%	4.2%	2.5%	2.9%
Upstate Metro	11.0%	10.0%	12.3%	7.9%	13.6%	13.7%	13.7%
Upstate Rural	13.2%	11.4%	17.6%	11.1%	8.3%	22.8%	13.8%
Unknown	1.4%	1.4%	0.5%	0.4%	2.1%	0.8%	6.1%
<b>Eligibility</b>							
Non-Dual Elderly	2.0%	1.1%	2.3%	3.1%	1.9%	1.6%	2.9%
Non-Dual Disabled	76.1%	77.8%	66.5%	78.4%	94.0%	63.4%	73.8%
Non-Elderly, Non-Disabled	21.9%	21.1%	31.2%	18.5%	4.1%	35.0%	23.3%
<b>Comorbidities</b>							
Hypertension	33.7%	33.5%	33.9%	41.6%	29.4%	27.7%	25.5%
Heart disease	31.2%	34.8%	31.2%	32.8%	21.1%	28.4%	26.4%
Asthma/COPD	23.7%	26.4%	24.4%	24.2%	17.0%	22.4%	17.8%
Substance Abuse	22.2%	29.4%	20.7%	15.2%	14.4%	20.5%	19.5%
Diabetes	17.2%	17.5%	15.7%	20.1%	18.5%	15.3%	13.0%
Arthritis	12.2%	12.4%	13.6%	16.3%	6.1%	10.2%	8.1%
Developmentally Disabled	7.7%	9.4%	4.2%	2.2%	4.2%	9.2%	29.0%
Stroke	4.7%	4.9%	4.5%	4.3%	2.6%	5.8%	7.1%
Cancer (Excluding Skin Cancer)	3.8%	3.5%	4.2%	4.7%	2.3%	4.6%	3.3%
Dementia & Delirium	3.0%	4.0%	1.7%	1.7%	1.9%	2.2%	7.0%

Source: Urban Institute Analysis of 2003 Medicaid Analytic eXtract (MAX).

**Appendix Table H.  
Prevalence of Primary Diagnostic Categories among New York  
Medicaid Beneficiaries with SA Treatment, 2003**

<b>Diagnostic Category</b>	<b>Prevalence</b>
	(N=49,688)
Drug Abuse	47.4%
Multiple Diagnoses	28.9%
Alcohol Abuse	19.4%
Tobacco Use Disorder	3.9%
Other	0.3%
Drug Abuse Poisoning	0.2%
Pregnancy/Childbirth Disorders	0.1%

Source: Urban Institute analysis of 2003 Medicaid Analytic eExtract (MAX).

**Appendix Table I.  
Major Combinations of Primary Diagnostic Categories among New York Medicaid  
Beneficiaries with Multiple SA Diagnoses, 2003**

<b>Combinations within Multiple Diagnoses</b>	<b>Prevalence</b>
	(N=14,384)
(Alcohol Abuse) and (Drug Abuse)	25.69%
(Drug Abuse) and (Tobacco Use Disorder)	1.00%
(Drug Abuse) and (Drug Abuse Poisoning)	0.43%
(Drug Abuse) and (Pregnancy/Childbirth Disorders)	0.11%
(Alcohol Abuse) and (Tobacco Use Disorder)	0.34%
More than Two Primary Diagnostic Categories	1.38%

Source: Urban Institute analysis of 2003 Medicaid Analytic eExtract (MAX).

**Appendix Table J.**  
**Mean Medicaid Spending by Selected Personal and Health Care Characteristics**  
**and SA Treatment Status, 2003**

	Beneficiaries with SA Treatment (N=49,688)	Beneficiaries with no SA Treatment (N=322,011)
<b>Mean Medicaid Spending</b>	\$27,839	\$18,051
<b>Age</b>		
18 to 44	\$25,158	\$17,560
45 to 64	\$31,163	\$18,826
65+	\$35,700	\$16,863
<b>Gender</b>		
Male	\$29,083	\$22,732
Female	\$25,840	\$15,030
<b>Race/Ethnicity</b>		
White, Non-Hispanic	\$24,729	\$17,311
Black/African-American, Non-Hispanic	\$29,410	\$19,151
Hispanic/Latino	\$30,320	\$14,576
Other	\$28,149	\$12,623
Unknown	\$27,125	\$21,158
<b>Region</b>		
New York City	\$30,341	\$16,477
Long Island	\$27,008	\$21,388
Westchester	\$27,189	\$20,370
Upstate Metro	\$16,216	\$14,473
Upstate Rural	\$12,560	\$9,319
Unknown	\$723,603	\$268,260
<b>Eligibility</b>		
Non-Dual Elderly	\$35,700	\$16,863
Non-Dual Disabled	\$36,425	\$25,439
Non-Elderly, Non-Disabled	\$19,278	\$4,895
<b>Primary Diagnostic Category</b>		
Drug Abuse	\$25,985	—
Multiple Diagnoses	\$33,812	—
Alcohol Abuse	\$26,143	—
Tobacco Use Disorder	\$13,024	—
Other	\$50,500	—
<b>Comorbidities</b>		
Mental Health	\$34,211	\$27,317
Heart Disease	\$44,593	\$31,725
Asthma/COPD	\$37,440	\$23,006
Hypertension	\$37,817	\$23,649
HIV Infection	\$48,184	\$38,505
Diabetes	\$41,858	\$28,539
Arthritis	\$40,334	\$24,786
Stroke	\$64,739	\$58,443
Cancer (Excluding Skin Cancer)	\$49,507	\$32,529
Dementia & Delirium	\$79,541	\$75,359
Developmentally Disabled	\$143,628	\$93,016

Source: Urban Institute analysis of 2003 Medicaid Analytic eXtract (MAX).

**Appendix Table K.  
Selected Characteristics of Beneficiaries with SA Treatment by SA Diagnosis, 2003**

	Beneficiaries with SA Treatment (N=49,688)	Primary Diagnostic Category				
		Drug Abuse (N=23,564)	Multiple Diagnoses (N=14,384)	Alcohol Abuse (N=9,653)	Tobacco Use Disorder (N=1,952)	Other (N=135)
<b>Age</b>						
18 to 44	55.8%	53.5%	63.6%	50.0%	53.3%	65.9%
45 to 64	43.7%	46.2%	36.0%	48.8%	45.7%	33.3%
65+	0.5%	0.3%	0.4%	1.3%	1.0%	0.7%
<b>Gender</b>						
Male	61.6%	60.4%	65.8%	64.1%	35.8%	31.9%
Female	38.4%	39.6%	34.2%	35.9%	64.2%	68.1%
<b>Race/Ethnicity</b>						
White, Non-Hispanic	29.2%	23.1%	28.8%	40.1%	50.4%	36.3%
Black/African-American, Non-Hispanic	36.1%	36.2%	41.8%	30.9%	20.4%	26.7%
Hispanic/Latino	18.0%	24.4%	13.3%	10.5%	12.3%	14.1%
Other	1.3%	1.2%	1.2%	1.6%	1.4%	0.7%
Unknown	15.4%	15.1%	15.0%	16.8%	15.4%	22.2%
<b>Region</b>						
New York City	72.0%	81.6%	71.7%	55.0%	42.8%	55.6%
Long Island	3.3%	3.2%	3.0%	4.3%	1.6%	3.7%
Westchester	2.9%	2.4%	3.8%	3.2%	0.8%	2.2%
Upstate Metro	11.1%	7.7%	12.2%	16.2%	17.1%	18.5%
Upstate Rural	10.6%	5.0%	9.2%	20.7%	37.2%	19.3%
Unknown	0.2%	0.1%	0.1%	0.5%	0.5%	0.7%
<b>Eligibility</b>						
Non-Dual Elderly	0.5%	0.3%	0.4%	1.3%	1.0%	0.7%
Non-Dual Disabled	49.4%	50.6%	40.3%	57.3%	62.3%	63.0%
Non-Elderly, Non-Disabled Adults	50.0%	49.1%	59.3%	41.5%	36.7%	36.3%
<b>Comorbidities</b>						
Mental Health	55.5%	51.7%	63.1%	53.9%	53.9%	60.0%
Heart Disease	32.5%	27.7%	41.0%	32.3%	27.3%	51.9%
Asthma/COPD	26.1%	24.6%	29.2%	23.7%	31.5%	35.6%
Hypertension	25.6%	23.9%	25.8%	29.3%	26.4%	32.6%
HIV Infection	22.0%	29.0%	21.5%	9.1%	3.9%	17.8%
Diabetes	11.7%	12.2%	10.5%	12.0%	11.9%	20.0%
Arthritis	8.2%	7.4%	8.1%	9.5%	10.0%	17.0%
Stroke	3.2%	2.8%	2.9%	4.6%	3.6%	9.6%
Cancer (Excluding Skin Cancer)	2.9%	2.8%	2.3%	3.2%	5.5%	12.6%
Dementia & Delirium	2.0%	1.5%	2.2%	3.4%	0.8%	5.2%
Developmentally Disabled	1.2%	0.7%	1.1%	1.9%	3.0%	8.9%

Source: Urban Institute analysis of 2003 Medicaid Analytic eExtract (MAX).

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