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A Study of Co-occurring Health Conditions and Treatment Coordination for Adult Jail Detainees in Residential Psychiatric Treatment

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Final Report Submitted to
The Illinois Criminal Justice Information Authority

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Executive Summary

One of the more robust findings of the National Comorbidity Survey (NCS) and its replication (NCS-R) is that a relatively large number of co-occurring psychiatric and substance use disorders are concentrated in a relatively small but significant number of individuals. Persons with co-occurring substance use and psychiatric disorders (CODs) are also prone to having a variety of serious and related medical conditions. In some instances, co-occurring medical conditions such as hepatitis C, endocarditis, and HIV infection are direct consequences of behaviors associated with chronic substance use such as injection use. In other instances, the causal pathway may be more indirect and related to limited health care access, repeated exposure to infectious diseases such as tuberculosis, engaging in high-risk sexual behaviors, medication nonadherence, or living in impoverished and blighted environments where violence and its traumatic sequelae are relatively common.

Although many studies have documented the increased incidence and prevalence of individual classes of disorders in criminal justice populations, less research has been done to examine the co-occurrence of medical, psychiatric, and substance use disorders among offenders. In order to provide coordinated care that spans institutional and community boundaries as well as treatment and fiscal boundaries, it is necessary to have a clear understanding of the prevalence of co-occurring health conditions, how they interact to sustain illegal and unhealthy behaviors, current treatment utilization patterns, and barriers to treatment access.

This study sought to examine these complex, interrelated issues through conducting extensive, structured interviews with a sample of adult detainees in residential psychiatric treatment at the Cook County Department of Corrections (CCDOC). This population represents those with the most serious psychiatric problems managed by the jail system in Cook County and likely those with very high rates of substance use disorders and, we believe, associated medical conditions. The study was guided by the following primary research questions:

- What are the epidemiologies of psychiatric, substance use, and medical disorders among detainees in psychiatric treatment and is there a specifiable, clinically significant configuration of medical disorders?
- To what extent have detainees been able to access medical and behavioral healthcare services when not incarcerated and what have been the primary barriers to service access?
- What community-based medical and behavioral healthcare services are most needed upon release from the jail?
- How could community-based medical and behavioral healthcare services be best coordinated post-release to improve healthcare outcomes and reduce recidivism for detainees in psychiatric treatment?
- What are the criminal careers of those in psychiatric treatment within the jail and do the number and severity of crimes committed vary by the type of psychiatric disorder and/or the presence of substance use and medical disorders?

To address these questions, we interviewed 459 adult male (304) and female (155) detainees receiving psychiatric care in the residential treatment units at CCDOC. The overall recruitment rate was 67.5 percent among eligible cases. Interviews were conducted between February and October 2007 using a version of the World Mental Health Composite Diagnostic Interview Schedule (WMH-CIDI) adapted for use with an incarcerated population. The WMH-CIDI is a fully structured interview schedule designed for administration by lay interviewers for the purposes of obtaining accurate lifetime and past-year psychiatric diagnoses consistent with DSM-IV and ICD-10 diagnostic criteria. It includes questions on chronic medical conditions as well as on community service access and functional disabilities. The study was also able to locate and collect the electronic arrest history data maintained by the Illinois State Police on 427 of the 459 interviewees. The majority of the analyses were weighted to control for non-coverage and non-response and excluded 28 cases for whom the quality of the interview data was deemed questionable by the interviewer because of inattention or the obvious intrusion of psychiatric symptoms during the interview.

By research question, the main study findings were as follows:

What is the epidemiology of psychiatric, substance use, and medical disorders among detainees in psychiatric treatment and is there a specifiable, clinically significant configuration of medical disorders?

The most common lifetime DSM-IV disorders for all participants were (in order of decreasing prevalence): substance use disorders including alcohol and drug abuse and dependence (81.8%); nicotine dependence (64.5%); conduct disorder (56.5%); anti-social personality disorder (ASP, 47.2%); post-traumatic stress disorder (PTSD, 44%); and major depressive episode (50%). Aggregating across the 4 affective disorders assessed, the lifetime prevalence for a major affective disorder was 61 percent (53.1% for past-year prevalence). Women were more likely than men to meet DSM-IV criteria for a major depressive episode or disorder and for PTSD. Conversely, the men were more likely to meet DSM-IV diagnostic criteria for non-affective psychosis, gambling disorder, and alcohol abuse.

The highest lifetime prevalence rates of chronic medical conditions assessed in the augmented version of the WMH-CIDI used in this study were as follows: dental problems of any kind (53.2%), physical injury (50.8%), frequent and severe headaches (42.7%), back and neck problems (36.8%), and arthritis (29.4%). These results suggest that physical pain and musculoskeletal problems, perhaps secondary to trauma, are among the primary medical concerns for the population of jail detainees in psychiatric treatment. Just below these conditions in terms of prevalence were a mix of disorders that included hypertension (25.8%), allergies (25.7%), asthma (24.4%), and sexually transmitted diseases (STDs) other than HIV/AIDS (21.9%) such as gonorrhea and syphilis.

With one exception, (eye, ear, nose, and throat problems), when there was a statistically significant gender difference in the lifetime prevalence of a chronic medical condition, women had a higher rate than the men. Women were more likely to report frequent or severe headaches, asthma, other chronic lung diseases, cancer, and STDs other than HIV/AIDS. These results are consistent with a recent national study that

compared male and female jail detainees and found that women had higher prevalence rates of all chronic medical and psychiatric disorders measured including drug dependence (Binswanger, Merrill et al., 2009).

For both men and women, symptoms of severe psychological distress (i.e., symptoms of anxiety and depression) indicative of having a serious mental illness (SMI) with moderate to severe functional impairment was associated with an increase in the odds of having a number of medical conditions. For men, severe psychological distress was associated with higher rates of back and neck pain, and frequent and severe headaches, other chronic pain, hypertension, and ulcers. For women, the same five conditions were associated with increased severe psychological distress along with arthritis, stroke, heart disease, other chronic lung disease, and epilepsy and seizures.

The burden of co-occurring medical conditions was not shared evenly among study participants. A latent class analysis of the medical conditions assessed for the study revealed that about thirteen percent of participants fell into what we have termed the “high number of medical conditions” group. These individuals were likely to report multiple medical conditions including respiratory problems such as asthma, allergies, and other chronic lung diseases as well as severe headaches, back and neck pain, and arthritis. These participants tended to be older (> 50 years of age), female, white, and had a lifetime history of alcohol dependence. They were also more functionally impaired as evidenced by higher scores on the Sheehan disability scales.

Larger proportions of those with higher numbers of medical conditions met DSM-IV criteria for lifetime psychiatric disorders than those with fewer medical conditions and the functional impairment due to the psychiatric disorders tended to be more severe. In particular, those with the highest number of medical conditions were more likely to meet DSM-IV criteria for a major depressive disorder, dysthymia, generalized anxiety disorder, PTSD, and substance use disorders (excepting nicotine dependence).

To what extent have detainees been able to access medical and behavioral healthcare services when not incarcerated and what have been the primary barriers to service access?

A total of 331 of 438 participants (75.5% of the weighted sample) reported they had ever been hospitalized in the community for at least an overnight stay for *problems with their emotions, nerves, mental health or use of alcohol or drugs*. Men (78.4%) were slightly more likely to have ever been hospitalized compared to the women (72%) but this difference was not statistically significant. Among those ever hospitalized, the mean number of lifetime psychiatric or substance abuse hospitalizations was 8.3 (women 7.9 hospitalizations, men 8.6 hospitalizations; ns). The average age at first admission was 25.2 years for all hospitalized participants (women 24.1 years, men 26.1 years; ns). In the 12 months preceding detention in the jail, 43.7 percent of the sample reported a psychiatric or substance abuse hospitalization (women 39.5%, men 47.1%; ns).

For most disorders, men and women reported “talking to a professional” at some point in their lives and high proportions reported that they had received “effective” community treatment (using their own definition of effectiveness). The age of reported first effective treatment ranged from 16.5 years for women with attention deficit disorder

(ADD) to 29.8 years for men with a substance use disorder with most reporting receiving some form of effective treatment for their conditions when in their early to mid 20s. Where there were differences in treatment access between men and women, the men were more likely to have received treatment than the women. In some instances, these differences were large. For example, 55.1 percent of the men who had ever talked to a professional reported having ever been hospitalized for a generalized anxiety disorder (GAD) compared with 19.9 percent of the women ($p < .01$). There was a similarly large discrepancy between men and women receiving treatment in the year prior to detention for mania, hypomania, and bipolar disorder that again favored a much higher percentage of the men receiving treatment compared to the women.

Most participants reported having access to a psychiatrist at some point in their lives and a majority of participants (women 50.7%, men 67.6%, $p < .01$) reported seeing a psychiatrist in the past year. Only about a third of participants however, (25.8% women, 35.6% men, ns [non-significant]) saw a psychiatrist in the month prior to their arrest and detention, suggesting that they may have discontinued treatment (and likely medication) some time during the year in which they were most recently arrested.

The use of any other kind of mental health provider was much less than for psychiatrists. For instance, only 42.8 percent reported ever seeing a psychologist, 37 percent a social worker, and 34 percent a mental health counselor. Less than ten percent of participants reported they had seen any mental health providers other than a psychiatrist or other physician (10.8% of the men) in the month prior to arrest, underscoring that in the time immediately preceding their current detention in CCDOC, most participants were not seeing a mental health professional in any discipline for their psychiatric condition. The apparent emphasis on psychiatry in lieu of other professions suggests that obtaining medication and medication management are the primary reasons for getting professional care.

Many participants do not have a regular care physician or have a regular place to go for medical care. Only 54 percent reported having a regular doctor and only 40 percent reported having a regular place to go for routine medical services. Only 35 percent saw a dentist or obstetrician (among women) in the year preceding their arrest. And more participants visited a medical facility for emergency or urgent care (52.5%) than for a scheduled surgery or routine care (17.6%). For most categories, excepting dental and eye care, those with a higher number of medical problems were more likely to have regular care and to use medical services.

A large majority of participants did not have private health insurance and approximately 55 percent had no insurance coverage at all. For those with insurance, the primary coverage was provided by government-funded insurance such as Medicare, Medicaid, and TANF. Given these findings, it could be expected that concern about cost and health insurance coverage would be important reasons why participants would delay seeking treatment. This was not the case, however, as lack of insurance coverage ranked towards the bottom of the list of possible reasons for not seeking or delaying treatment. The primary reason given by a majority of participants who delayed getting treatment for more than four months was that they wanted to handle their problem on their own (81.8%). High percentages of participants indicated that their problem did not bother them much at first (58.6%), they did not think treatment would work (56.6%), they

were unsure where to go or who to see (54.6%), or they thought that the problem would go away by itself (54.2%). Stigma ('concern about what others might think') and loss of personal freedom or control ('scared about being put in a hospital against my will') were also mentioned as reasons for delaying treatment by over 50 percent of participants.

What are the criminal careers of those in psychiatric treatment within the jail and do the number and severity of crimes committed vary by the type of psychiatric disorder and/or the presence of substance use and medical disorders?

We examined the arrest histories of participants to determine if different patterns of offending over the life course could be associated with psychiatric diagnosis or other factors. Although we were able to identify at least six different offense patterns over time, there were few statistically significant associations between the longitudinal pattern of offending and model covariates representing demographic factors and psychiatric diagnoses. Moreover, there was ambiguity in the statistical models as to the how many different offense patterns best fit the data. However, one potentially interesting finding is that the estimated rates of arrest for many participants persisted or even peaked well into middle age whereas the typical criminal career peaks in the mid twenties and declines thereafter. This result may indicate that main influence of having a psychiatric condition (including substance use) might prolonging criminal careers, resulting in persistently higher rates of offending over the life course than is typical.

What community-based medical and behavioral healthcare services are most needed upon release from the jail?

How could community-based medical and behavioral healthcare services be best coordinated post-release to improve healthcare outcomes and reduce recidivism for detainees in psychiatric treatment?

Care in the community upon release needs better coordination across the spectrum of health conditions. However, as priority areas we would identify continuity of care for psychiatric medications and psychotherapy, infectious conditions such as hepatitis, STDs, and HIV, and medical conditions/issues of relatively high prevalence such as asthma, arthritis, dental care, hypertension, headaches/neurological conditions, and chronic pain.

Two priority populations emerged from the data as being in particular need of improved access to health care in the community: detainees over 50 years of age and women. Older detainees reported a disproportionate number of medical conditions relative to other detainees and were more functionally impaired in multiple areas as a result. The women in our study, as in others, reported a higher number of medical conditions relative to men and to a matched cohort of women in the general population even after controlling for severity of psychological symptoms. At the same time, the women also reported having less access to medical and psychiatric care than the men, an issue worth exploring further in future research including further analyses of the data collected for this study.

With respect to the organization of service delivery, we believe that the emerging trend of offering "co-located" services whereby health care for medical, psychiatric, and substance use disorders are delivered in the same location by a coordinated team of

practitioners has promise. The co-location of care model would directly address some of the main concerns related to health care access and use identified by participants. Comprehensive care delivered in a single location would alleviate confusion about where to get care for any given problem and provide individuals in need of care with a regular place for routine medical and psychiatric care as well as a primary-care physician with knowledge of their complete medical history.

Because the provision of services in a co-located care model is not identified as being specific to psychiatric and substance use treatment and as being about general health, stigma associated with receiving behavioral health care could potentially be lessened. In addition, individuals with psychiatric or substance use problems who may not be inclined to seek treatment for these problems, might still be inclined to seek care for their medical conditions, providing the opportunity for health care providers to use evidence-based techniques such as motivational interviewing to encourage them to address their psychiatric and substance use problems.

Because co-located services are an emerging trend, a best-practices model has not yet been identified for the general population let alone for criminal justice populations. In an evaluation of randomized controlled trials of various models for delivering medical care to persons with psychiatric and substance use disorders, the findings for six different models were reviewed (Druss et al., 2006). Each model was evaluated on the dimensions of linkage, quality, outcomes, and cost of care. Findings were that all of the models evaluated were more-or-less equally effective in improving medical care and outcomes for the target population. Among the study's conclusions, the authors write: "Regardless of whether services are co-located, the key element of these collaborative care approaches is that they involve functionally integrated care teams" (p. 150).

In this respect – a functionally integrated care team – a service model for providing coordinated care for a criminal justice sample with mental illnesses known as "Project Link" that uses multidisciplinary teams to access comprehensive services has shown some promise (Weisman et al., 2004). The Project Link model appears to be a hybrid of assertive community treatment, intensive case management, and advocacy rather than providing co-located services per se. Nevertheless, given that no particular model has emerged as demonstrably most effective, any reasonable effort to better coordinate comprehensive care for offenders with mental illnesses is worth exploring at this time.

Literature Review

One of the more robust findings of the National Comorbidity Survey (NCS) and its replication (NCS-R) is that a relatively large number of co-occurring psychiatric and substance use disorders are concentrated in a relatively small but significant number of individuals (Kessler Berglund et al., 2005; Kessler, Chiu, et al., 2005; Kessler, McGonagle et al., 1994). For instance, in the more recent NCS-R study, 40 percent of 12-month cases (i.e., those having any psychiatric disorder including a substance use disorder within the past year) were comorbid for one or more additional disorders. Moreover, disorder severity was strongly associated with comorbidity; that is, persons with two or more disorders tended to have more serious symptomatic manifestations of their disorders than persons with a single disorder (Kessler, Berglund, et al., 2005).

Persons with co-occurring substance use and psychiatric disorders (CODs) are also prone to having a variety of serious and related medical conditions. In some instances, concurrent medical conditions such as hepatitis C, endocarditis, and HIV infection are direct consequences of behaviors associated with chronic substance use such as injection use (e.g., Barbudieri et al., 2005). In other instances, the causal pathway may be more indirect and related to limited health care access, repeated exposure to infectious diseases such as tuberculosis, engaging in high risk sexual behaviors, medication nonadherence, or living in impoverished and blighted environments where violence and its traumatic sequelae are common (Cournos & McKinnon, 1997; De Alba, Samet & Saitz, 2004; Lee, Vlahov & Fruedenberg, 2006; Sokal et al., 2004; Swartz, et al., 1998; Teplin, McLelland, Abra, & Weiner, 2005). In still other instances, medical disorders are a consequence of the treatment of the psychiatric condition as with the increased rates of diabetes, hyperglycemia, and obesity attributable, in part, to use of atypical antipsychotics (Guo et al., 2006).

Over the past 20 years, many studies have documented the increased incidence and prevalence of each individual class of disorders in criminal justice populations. For instance, Teplin and her associates in a series of studies found elevated rates of psychiatric and substance use disorders among jail detainees (Abram & Teplin, 1991; Abram, Teplin, & McClellan, 2003). Studies based on non-national criminal justice samples have consistently found that 50 percent to 75 percent of those with serious mental illnesses have a co-occurring substance use disorder (National GAINS Center, 2002). We have found similar rates of CODs in our own studies with Illinois probationers (Lurigio, Cho, Swartz, et al., 2003), with jail detainees in psychiatric treatment at the Cook County Department of Corrections (CCDOC; JASARC, 2006), and with drug treatment program participants in a men's day reporting center program (Swartz & Lurigio, 1999). A recent series of studies funded by the National Institute of Justice found elevated rates of infectious (Hammett, Harmon & Rhodes, 2002) and chronic diseases such as asthma and heart disease (Hornung, Greifinger & Gadre, 2002) among correctional populations.

By inference, based on these studies of individual classes of disorders, we believe that many people with CODs, particularly those with the most severe manifestations (i.e., in terms of chronicity and functional impairment), are at high risk for repeated involvement with the criminal justice system. This would explain the high prevalences of all of these disorder classes across different criminal justice populations. Support for

this inference comes from findings based on analyses of data obtained from the National Survey on Drug Use and Health (NSDUH), which showed that co-occurring drug use accounted for a high proportion of the elevated risk for arrest among individuals with serious mental illnesses ([SMI], Swartz & Lurigio, 2006). Additionally, because of the association between CODs and medical disorders, we believe that offenders with CODs have extensive health care needs and that many are not treated while in the community. A recent study comparing rates of chronic medical conditions among jail detainees and prison inmates using national survey data found elevated rates of hypertension, asthma, arthritis, cervical cancer, and hepatitis when compared with rates from a national sample derived from the general population and matched demographic and socioeconomic factors (Binswanger, Krueger, & Steiner, 2009). The incarcerate and general population samples did not differ on myocardial infarction, diabetes, or angina but, curiously, the incarcerate sample had lower rates of obesity.

Another recent study of parolees from Washington State prisons found elevated mortality rates relative to the general population with the parolee mortality rate 3.5 times higher than the general population rate during the 2 years post-release (Binswanger, Stern, Deyo et al., 2007). The risk of death was especially acute within 2 weeks post-release with an increased mortality rate of 12.7 times the general population. Drug overdoses, cardiovascular disease, suicide, and homicide were among the leading causes of death for recent parolees.

To the best of our knowledge, there has only been one investigation of the rates of chronic medical conditions among those in the criminal justice system with an SMI; a recent study comparing those with an SMI in King County, Washington disaggregated by history of having or not having been jailed over the four-year study period (Cuddeback, Scheyett, Pettus-Davis, & Morrissey, 2010). Administrative records from Medicaid billings, the local jail and a mental health provider to designate SMI and recent history of jailing were used to compare the prevalence of classes of medical conditions based on use of Medicaid-funded medical services. Principal findings were that those with a history of jail detention had higher rates of infectious diseases, blood and skin diseases, and traumatic injuries and were more likely to have one or more medical problems of any kind after controlling for race, age, gender, and substance use disorders. There were no significant differences found, however, for endocrine disorders, or disorders of the nervous, circulatory, respiratory, digestive, and musculoskeletal system; the medical condition classifications used in the study. Methodological limitations of the study include reliance on administrative records, which because of restricted access to health care services among those with an SMI, may have resulted in underestimates of the prevalence of the medical conditions studied.

Contact with the criminal justice system, particularly within jails and prisons, may ironically represent one of the best opportunities for treating individuals with multiple and complex health care needs. Even adequately addressing one set of conditions, such as primary medical needs, could produce benefits for related cross-class conditions. For instance, one study found that providing adequate primary healthcare to people with substance use disorders reduced addiction severity (Saitz et al., 2005). Similarly, having adequate mental health and substance use treatment pre- and post-release could result in improvements in primary medical conditions. In addition, as some

have argued, providing adequate care would not only directly benefit recipients, it might also have the potential to reduce rates of transmission of infectious diseases (e.g., Hepatitis C) in the general population that can occur when offenders return to their communities post-incarceration (e.g., Hennessey et al., 2009; MacNeil et al., 2005; National Commission on Correctional Health Care [NCCHC], 2002; Restum, 2005).

Despite the clear legal, ethical, and clinical obligations and public health benefits to providing adequate and coordinated care for offenders, many individuals with multiple treatment needs go unidentified and untreated while under the purview of the criminal justice system (NCCHC, 2002; Human Rights Watch [HRW], 2003; Wilper et al., 2009). For instance, in a study of female detainees, Teplin, Abram & McClelland (1997) found that only 25 percent of those meeting the criteria for an SMI received treatment within one week of admission. A recent survey of state correctional facilities designed to identify and describe programs for CODs within the criminal justice system found that only 18 states had such programs (Peters, LeVasseur & Chandler, 2004). The study also found that programming specific to facilitating the transition between prison-based treatment for CODs to community-based treatment on release was, in particular, lacking. Similarly, a comprehensive policy study of correctional systems in the United States found many states with inadequate systems for monitoring the provision of health care to inmates and outdated policies on prevention and treatment for all classes of disorders (NCCHC, 2002).

The failure to provide adequate treatment and case management services to individuals with CODs across virtually the entire criminal justice spectrum from screening, to treatment while incarcerated, to transition planning for community reentry has important repercussions. Following release from supervision whether in prisons, jails or probation, many individuals with untreated CODs fall into what has been described as a “Bermuda Triangle-like void that often exists between hospitals, jails, and the streets” (Lamberti et al., 2001). A study using national survey data from jail detainees and prison inmates found that only 25 percent of federal inmates, 30 percent of state prison inmates and 38 percent of jail detainees with mental illnesses were taking psychiatric medications at the time of their arrest (Wilper et al., 2009). Such individuals bounce from institution to institution, cycling in and out of homelessness thereby taxing the criminal justice, mental health, and medical service systems. Addressing this issue would seem to require that offenders within these institutions are identified and receive adequate care while under the supervision of the criminal justice system and when transitioning back into the community.

The challenge to the criminal justice and treatment communities then is how to best provide coordinated care for the multiple psychiatric, substance use, and chronic medical conditions common among many offenders but especially concentrated in a relatively small, high-risk population with SMI. Coordinated care holds the promise of not only improving the lives of those receiving it, but also has the theoretical potential to reduce criminal recidivism by ameliorating the conditions and behaviors that sustain it. For instance, mental health care coordinated with substance abuse treatment can reduce both drug use and mental health symptoms (Grella & Stein, 2006). Similarly, treatment for chronic medical conditions such as pain can reduce the need to take illegal drugs to self-medicate (Saitz, et al., 2005), etc.

In order to provide coordinated care that spans institutional and community boundaries as well as treatment and fiscal boundaries, it is necessary to have a clear understanding of the prevalence of these conditions, how they interact to sustain illegal and unhealthy behaviors, current treatment utilization patterns, and common barriers to treatment access. This study sought to examine these complex, interrelated issues through conducting extensive, structured interviews with a sample of adult detainees in residential psychiatric treatment at CCDOC. This population represents those with the most serious psychiatric problems managed by the jail system in Cook County and likely those with very high rates of substance use disorders and, we believe, associated medical conditions. The study was guided by the following primary research questions:

- What is the epidemiology of psychiatric, substance use, and medical disorders among detainees in psychiatric treatment and is there a specifiable, clinically significant configuration of medical disorders?
- To what extent have detainees been able to access medical and behavioral healthcare services when not incarcerated and what have been the primary barriers to service access?
- What community-based medical and behavioral healthcare services are most needed upon release from the jail?
- How could community-based medical and behavioral healthcare services be best coordinated post-release to improve healthcare outcomes and reduce recidivism for detainees in psychiatric treatment?
- What are the criminal careers of those in psychiatric treatment within the jail and do the number and severity of crimes committed vary by the type of psychiatric disorder and/or the presence of substance use and medical disorders?

Methods

Context

Cermak Health Services of Cook County (CHS). CHS provides psychiatric and medical care at CCDOC. CHS is housed in a 100,000 square foot facility located within CCDOC. Services provided include primary medical care, dental and mental health services, laboratory work, pharmaceutical dispensing, rehabilitative care, and same-day surgery. Substance abuse treatment is provided separately through subcontracts with independent treatment providers under the authority of the Sheriff's department and is not under the purview of CHS.

At the time of data collection (February through October 2007) the average daily census at the jail ranged from 10,500 to 11,000 detainees with approximately 300 to 350 daily admissions. Every admission is screened for medical and psychiatric problems that might require treatment. Those screening positive for a psychiatric disorder because of a history of such care, because of flagrant psychiatric symptoms (e.g., hallucinations or suicidal ideation), or because they self-report taking prescribed psychiatric medications, are referred to an acute psychiatric care unit in the CHS facility

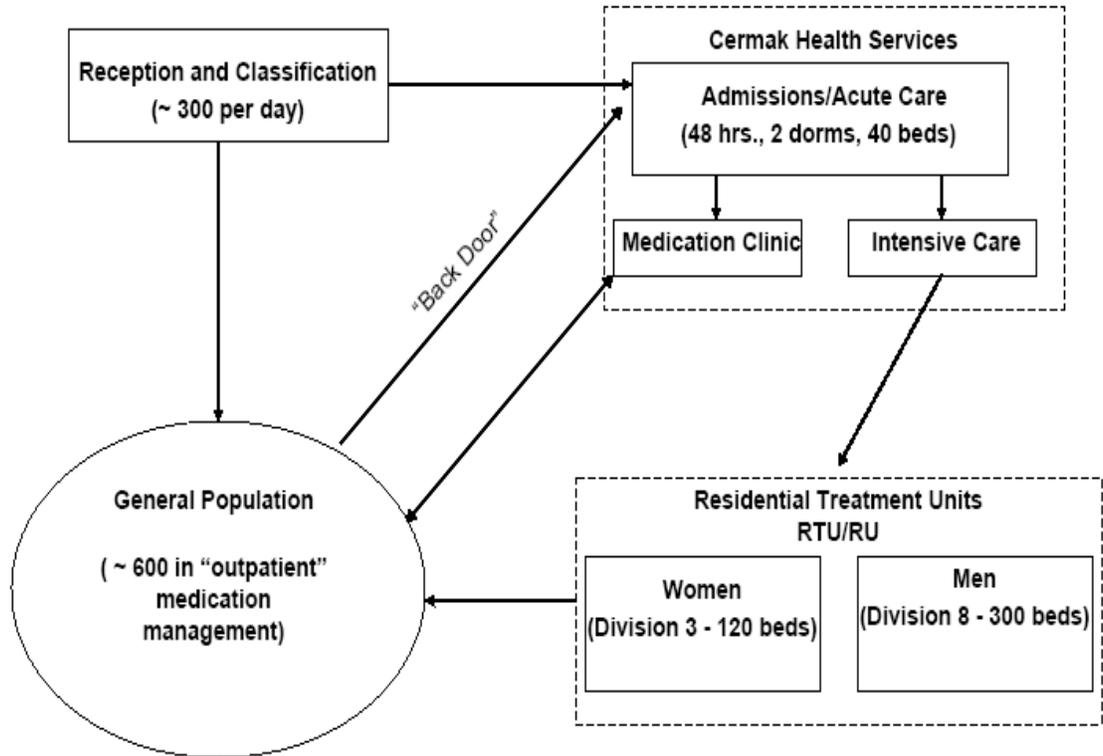
for a diagnostic assessment by a CHS psychiatrist who makes a final determination of treatment need. At times, detainees in the jail's general population —whether they are on medication management or not — may evidence signs of psychological distress not evident at screening and can also be referred to the acute care units for observation; a pathway termed a “back-door” admission at the jail. Figure 1 shows the configuration of psychiatric medical services provided through CHS at the time of the study.¹

Following the acute-care period that for most detainees lasts 1 to 2 weeks, but can extend to as long as 22 weeks (i.e., special needs treatment plans are developed for those needing extended acute psychiatric care and may last the entire period of their detention), those determined to need only medication management are returned to the jail general population. In general population they receive their prescribed drugs, returning to the outpatient clinic on at least a monthly basis for medication monitoring. Detainees in need of more intensive residential care are sent to either the women's or men's residential treatment units (RTU), intermediate care settings operated and staffed by CHS and located on the CCDOC grounds.

The women's RTU had a total daily census of about 120 female detainees housed in Division 3 on 2 sixty-bed living units, while the men's RTU – Division 8 – had a total daily census of about 540 male medical and psychiatric clients of which 300 were mental health detainees. Division 3 included 2 additional sixty-bed tiers for pregnant women, and 2 additional sixty-bed tiers for the elderly female population, and for those females on psychotropic medications not in need of acute or intermediate care. In 2007, there were approximately 2,000 admissions to the men's RTU and approximately 500 admissions to the women's RTU, with an average length of stay of about 50 days (Alaimo, personal communication).

¹ Shortly following the completion of data collection, within the first quarter of 2008, we were informed by the then new CHS Medical Director that the psychiatric residential treatment units from which we sampled participants had been reconfigured and no longer existed as they had during the study. Despite the reconfiguration of service provision at the jail, there is no reason to believe that the detainee population requiring psychiatric treatment is substantially different from the population we sampled at the time of the study. Thus, we believe our findings would still be applicable to the current detainee population in psychiatric treatment in CCDOC even though the physical locations where care is provided and perhaps service configurations have changed.

**Figure 1. Cermak Health Services
Psychiatric Service Flow at CCDOC**



All admissions to CCDOC, including those that eventually receive psychiatric care, are screened for medical problems and undergo testing for sexually transmitted diseases such as gonorrhea, Chlamydia, and syphilis as well as for tuberculosis. HIV testing is offered but on a voluntary basis. Medical care, including dental care is provided as necessary in segregated medical units or in the jail general population depending on problem severity. Those with medical conditions requiring residential care are placed on separate units, some of which include detainees with co-occurring psychiatric disorders (e.g., mixed units). Detainees requiring hospitalization for medical conditions are transported to Stroger Hospital where they are treated for as long as necessary and then returned to the jail when hospitalization is no longer required. Detainees in Division 8 and Division 3 could also receive medical care, as needed, concurrent with their receipt of psychiatric services while in RTU.

Participants

Cook County Jail Department of Corrections Sample. Men and women over 17 years of age and receiving psychiatric services in the CCDOC RTUs composed the target population. We included participants receiving medical care on the mixed use treatment dorms but excluded participants who were not able to comprehend the informed consent process and consent form either because they were not fluent in English and/or because they had cognitive or psychiatric problems that affected their comprehension generally. We also excluded participants who had been in the treatment dorms for longer than a month at the start of the study and only recruited from new admissions to RTU for each month of data collection. This was to avoid having an overrepresentation of longer-staying detainees in the study sample.

National Comorbidity Survey Replication (NCS-R) Comparison Group. To compare lifetime prevalence rates of chronic medical conditions for the jail sample with those of the general population, we used data collected for the NCS-R study. The NCS-R was a national survey of the non-institutionalized adult English-speaking population in the United States ages 18 years and older living in the 48 coterminous states. It was conducted between 2001 and 2002 and was designed to assess the prevalence of DSM-IV mental illnesses and rates of co-occurring disorders in the U. S. general population (Kessler & Merikangas, 2004).

The NCS-R questionnaire is an earlier version of the same questionnaire – the World Health Organization Composite International Diagnostic Interview (WHO-CIDI) – that was used for the present study. Both versions include a subsection with questions on medical conditions that substantially overlap, although we modified this section to expand on the list of conditions covered in the NCS-R. The overlap allowed for direct comparison of the lifetime prevalence rates of 15 chronic medical conditions between the jail psychiatric treatment sample and the NCS-R general population sample.² The comparison sample for this study was composed of the 5,692 NCS-R participants who were administered the second part of the WHO-CIDI that contained the questions on chronic medical conditions. Details on the NCS-R design and procedures as well as sample demographics are available elsewhere (Kessler, Berglund, Chiu et al., 2004).

Measures

World Mental Health – Composite International Diagnostic Interview (WMH-CIDI V20.21). Selected sections of the computerized version of the World Mental Health Survey Initiative version of the Composite Diagnostic Interview (WMH-CIDI) comprised

² In the case of chronic medical conditions, the NCS-R CIDI and the WMH-CIDI we used had 15 conditions in common. The version we used was augmented to ask about 11 other medical conditions not included in the NCS-R CIDI. In addition, because at the time the analyses were run for this study we did not yet have access to the restricted NCS-R data set and instead used the public access version, we were not able to estimate the prevalence of HIV/AIDS for the NCS-R comparison sample.

the main study instrument, allowing us to use a consistent format to collect information on psychiatric, substance use, and medical disorders as well as treatment need, and service access and use for each type of disorder. The WMH-CIDI is a fully structured interview schedule designed for administration by lay interviewers for the purposes of obtaining accurate lifetime and past-year psychiatric diagnoses consistent with DSM-IV (American Psychiatric Association, 2002) and ICD-10 (World Health Organization [WHO], 1990) diagnostic criteria. It is the latest version of a series of instruments derived from the Diagnostic Interview Schedule (DIS), first used in the 1980s in the Epidemiological Catchment Area study (Robins, Helzer, Croughan & Ratcliff, 1981).

There have been numerous reliability and validity studies of the WMH-CIDI that have generally found it to be valid when compared with structured clinical interviews administered by trained clinicians (Kessler & Üstün, 2004; Wittchen, 1994). The version of the WMH-CIDI used for the study included a number of improvements over previous versions to enhance diagnostic validity through increasing question comprehensibility, respondent motivation, and task comprehension (Kessler & Üstün, 2004). The WMH-CIDI, now in its third version, continues in wide use in general population studies in the United States, has been used in the NCS and NCS-R studies (Kessler, McGonagle, et al., 1994; Kessler, Chiu, et al., 2005) and has been administered to over 200,000 respondents in 28 countries worldwide as part of a WHO initiative to assess the prevalence and treatment burden of mental illness worldwide (The WHO World Mental Health Survey Consortium, 2004). The use of the WMH-CIDI in general population studies allows for direct prevalence comparisons with the jail sample assessed in this study.

We used version 20.21 of the WMH-CIDI, the latest version available at the time, and administered it on laptop computers. The full WMH-CIDI is composed of 41 modules and averages 2 hours administration time, though this can vary widely depending on the number of different sections into which a participant screens. The computerized version allowed for greater customization and selection of only those modules of interest to the study. For our purposes, and to reduce participant burden, we selected 21 WMH-CIDI modules as shown in Table 1 with the bolded sections indicating which sections were administered and the non-bolded sections indicating which sections were excluded. Selections were made on clinical relevance of the disorder as well as study goals. For instance, we opted to assess for psychosis, major depression, mania, conduct disorder, and post-traumatic stress disorder because of the prevalence and clinical severity of these conditions. Conversely, we opted not to assess for disorders like neurasthenia, the phobias, bulimia, or intermittent explosive disorder either because they were thought not to be as relevant for a population in psychiatric treatment in a jail program or because of their low expected prevalence. Medical conditions were assessed through the chronic conditions module and another module (services) was used to assess past-year community treatment service use.

The WMH-CIDI was developed for administration to a non-institutionalized, general population sample. As a result, some of the questions are not worded correctly for an institutionalized population such as jail detainees. For instance, in the substance use disorders section, one of the questions is worded as follows:

“Think about the past 12 months. In the past 12 months, how often did you usually have at least one drink – nearly every day, three to four days a week, one to two days a week, one to three days a month, or less than once a month?”

As some study participants had been in jail for part or most of the previous 12 months and had not had access to alcohol (or other drugs), it is not clear whether they would account for their time in detention when they responded. To insure they understood that the intent of the CIDI questions was to ask about the most recent 12-month period during which they were not detained, we revised this and other questions to read as follows:

“Think about the past 12 months prior to your detention in the jail. In the past 12 months when you were living in the community, how often did you usually have at least one drink – nearly every day, three to four days a week, one to two days a week, one to three days a month, or less than once a month?”

As a further anchor to recall, we began each interview by using a variation of the time-line follow-back interview procedure (Sobell & Sobell, 1992) whereby we created a paper-based calendar of the 2 years preceding each participant’s arrest and detention. The calendar-based timeline was constructed to show significant events in each participant’s life such as birthdays, arrests, births, other detentions, imprisonment or hospitalizations, etc. When questions about the time preceding detention were asked, interviewers were instructed to refer the participant to the calendar to insure the participant was responding for the time just preceding their current detention.

Antisocial Personality Disorder and Conduct Disorder. The WMH-CIDI does not provide diagnoses for personality disorders but instead includes only a brief screening section. Because of the potential clinical importance of anti-social personality disorder (ASPD) for a criminal justice population, we augmented the WMH-CIDI with questions from the National Epidemiological Survey on Alcoholism and Related Condition (NESARC) survey instrument to assess for ASPD (Grant et al., 2003). Conduct disorder as manifest in early childhood followed by adult-onset ASPD has been theoretically linked to a more chronic course of criminal offending that lasts well into middle age and which is marked by high rates of CODs as opposed to juvenile onset offending which is theorized as having a more time-limited criminal course and less severe psychopathology (Moffitt & Caspi, 2003). To assess for ASPD, we reprogrammed the WMH-CIDI to include the NESARC ASPD questions, which also included the questions necessary for diagnosing childhood onset conduct disorder.

Table 1. WMH-CIDI Sections

I. Screening and lifetime review	(Required screen)
II. Psychiatric disorders	
Mood	Major Depressive Disorder and Episode, Mania (including Bipolar I and II disorders)
Anxiety	Panic Disorder, Specific Phobia, Agoraphobia, Generalized Anxiety Disorder, Post-Traumatic Stress Disorder , Obsessive-Compulsive Disorder, Social Phobia
Substance abuse	Alcohol Abuse, Alcohol Dependence, Drug Abuse, Drug Dependence , Nicotine Dependence
Childhood	Attention-Deficit/Hyperactivity Disorder , Oppositional-Defiant Disorder, Conduct Disorder , Separation Anxiety Disorder
Other	Intermittent Explosive Disorder, Eating Disorders, Premenstrual Disorder, Non-Affective Psychosis Screen, Pathological Gambling , Neurasthenia, Personality Disorders Screen
III. Functioning and physical disorders	Suicidality, 30-Day Functioning including Psychological Distress, Chronic Conditions (Medical Disorders)
IV. Treatment	Services, Pharmaco-epidemiology
V. Risk Factors	Personality, Social Networks, Childhood Experiences, Family Burden
VI. Socio-demographics	Employment, Finances, Marriage, Children , Childhood Demographics, Adult Demographics
VII. Methodological	Interviewer Observations

Note. Bolded text indicates sections that were administered as part of the study.

Serious Mental Illness Severity. For some of the analyses, as a control for the severity of psychiatric disorder, we used participants' K6-scale scores. The K6 screening scale is embedded in the 30-day symptoms section of the WMH-CIDI, which includes questions about past-year as well as past-month functioning. The K6 was designed to assess symptoms of general psychological distress common to a broad range of psychiatric disorders (Kessler, Andrews, Colpe et al., 2002). Participants respond to the K6 items by indicating the extent to which they experienced each of 6 symptoms in the month they felt the most anxious, depressed or nervous in the preceding 12 months. Scale scores are derived by summing the item scores that range from 0 ("none of the time") to 4 ("all of the time"); hence, scores on the K6 range from 0 to 24. Scores above 12 are associated with severe psychological distress and moderate to severe functional impairment as indicated by a global assessment of functioning score of 60 or lower (APA, 2002). Validation studies of the K6 have shown that the scale's validity (ROC-AUC of about .86) and internal consistency (.89) are quite high, when compared with longer diagnostic screens and assessment instruments (Andrews & Slade, 2001; Kessler, Barker, Colpe et al., 2003).

Stigma and Homelessness. Although not addressed in this report, we augmented the WMH-CIDI with questions to assess stigma related to having a mental illness or to being perceived as mentally ill as well as a few additional detail questions on homelessness prior to incarceration. To assess stigma we included all 21 questions that compose the *Perceived Devaluation and Discrimination Scale* (Link et al., 2002). Sample questions include "Most people would accept a person who once had a serious mental illness as a close friend" and, "If you have ever been treated for a serious mental illness, the best thing to do is to keep it a secret." Each question is responded to using a 4-point Likert scale ranging from "strongly agree" to "strongly disagree". Scoring of the scale involves summing the items after first reverse scoring a few reflected items.

To assess homelessness prior to arrest in more detail than is covered by the WMH-CIDI, we added 6 questions collected from several forms; chiefly from a survey instrument developed by the Survey Research Laboratory at UIC to assess the needs of the homeless population in Chicago (Johnson, Graf, & Owens, 2002). Most of the 6 questions had multiple parts and asked respondents about where they lived most often before being jailed, how many days in the month before jailing they were homeless, and if they spent at least one night in a variety of places where a person without a stable place of residence of their own might stay (e.g., a homeless shelter, an SRO, a drug or detoxification treatment facility, a group home or detention center, etc.)

Criminal History Records (CHR). To assess the involvement of participants with the criminal justice system, we requested CHRs from the Illinois State Police (ISP), through the Authority. We submitted either State Identifier numbers (SIDs) used by the ISP to identify CHR records or the name, birth date, and sex of participants for whom we were not able to find an SID. Matched records were returned in a preliminary file for review by the PI for accuracy and then a final request was submitted for all juvenile and adult arrest records for every matched participant. Using these procedures, we were able to obtain arrest histories for 427 (93.0%) of the 459 interviewed participants.

Mini-Mental State Exam (MMSE). During informed consent, we conducted a check on competence to provide informed consent using a short version of the MMSE (Folstein, Folstein & McHugh, 1975). The full MMSE was developed as a screen for cognitive impairment in medical settings. Scores below threshold (less than 24 points out of 30) indicate confusion, potential memory impairment, and an inability to attend to and complete relatively simple mental tasks. The MMSE has been tested in studies with substance abusing populations and found to be useful for assessing capacity to give informed consent (Smith, Horton, Saitz & Samet, 2006). Other studies have produced a 6-item version of the MMSE (Callahan, Unverzagt, Hui, Perkins & Hendrie, 2002), and have shown it to be nearly as accurate as the full version. To reduce respondent burden, we used the 6-item version of the MMSE to assess mental competence for giving informed consent and for general comprehension.

Medical Records Abstraction. We intended to review the medical records of all participants to validate their self-reported information on diagnosed medical and psychiatric conditions and to obtain any test results for sexually transmitted diseases (STDs) and medications taken while in the jail. We were able to obtain about half of the medical records over the course of the study but found it difficult to locate the remaining half of the records because a record could be kept in a number of locations depending on circumstances such as who was treating the person, where the person was receiving treatment, and how recently the person had been discharged from the jail. Because of the large number of missing cases and uncertainties about the completeness of the information in the records we were able to obtain (e.g., test results and diagnoses may not yet have been collated with the records we could obtain; the availability of historic medical information for participants who had been detained at CCDOC more than once varied), we opted not to include the information obtained from the medical records in the analytic file.

Procedures

All procedures and materials used for this study were reviewed and approved by the UIC and Cook County IRBs. In addition, we obtained a Federal Certificate of Confidentiality from the National Institute on Drug Abuse (NIDA) to protect the information collected for this study from a court subpoena.

Training. Research assistants (RAs) hired for the study had at least a Bachelors degree in the social sciences with several having Master's Degrees in Social Work. Prior to conducting interviews with participants, all RAs underwent a 5-day intensive training at UIC using training manuals developed by the project manager and materials developed by the creators of the WMH-CIDI. The trainings covered informed consent procedures, recruitment, administration of the study instruments, interacting with CCDOC staff, maintaining personal safety at the jail, and interviewing techniques when using structured instruments such as the WMH-CIDI. The training included conducting mock interviews with the WMH-CIDI that were observed by the project manager as well as watching pre-recorded sample interviews. All study staff also completed human subjects training at UIC before having any contact with study participants. The training at UIC was followed with pilot testing of the modified WMH-CIDI at the jail with a sample of 9 participants. Either the PI or the project manager observed these interviews and

critiques were provided as needed to each RA to correct any mistakes made during the pilot interviews. The pilot testing phase of the study also allowed us to test the modified version of the WMH-CIDI for errors in the skip pattern logic or question wording and to make any needed changes prior to the start of data collection. Project staff meetings were held on a weekly or bi-weekly basis throughout the course of data collection to review progress, address any questions the RAs might have, assign new cases, and to download data from their PCs.

Recruitment and Interviewing. Participant recruitment and data collection began in February 2007 and concluded in October 2007. Over that time, the monthly rosters of men and women receiving psychiatric treatment in RTU including new admissions each month composed the sampling frame. New admissions to the residential treatment dorms were recruited with certainty. That is, each month, we attempted to recruit and interview all new admissions to the CCDOC RTUs. This was a simpler way of generating a representative sample than the systematic sampling procedure (Levy & Lemeshow, 2008) described in the proposal. However, in the context of recruitment within CCDOC, both procedures have pros and cons.

Selecting all new admissions each month ensured that we would have a full complement of interviews for our research assistants, downtime was minimized, and we were able to obtain the targeted number of cases within the study timeframe allotted for interviewing. However, because we had limited resources in terms of the numbers of interviewers we could hire and because we were only able to use the jail's interview rooms on certain days and at certain times, we were unable to successfully recruit and interview all new admissions each month, mainly because they left the treatment dorms before they could be recruited. This was especially problematic in the women's treatment dorms where turnover among the female detainees was more rapid than with the males and where we had fewer assigned interviewers. This potentially introduces bias into the sample if the recruited participants are different in some way on the variables being measured as compared with those who left the treatment dorms early and were unable to be recruited. Because we have no or very limited data on the cases that left the RTUs prior to recruitment, we cannot determine if this biased the sample and, if so, the extent of the bias. On the other hand, had we used a systematic sampling procedure, we would have ended up with a sample well below our target number and would have also had the problem of being unable to recruit some cases, albeit a small number. Given these two options, we decided to recruit with certainty at the expense of potentially biasing our population estimates. To adjust for and minimize potential bias owing to recruitment issues (i.e., noncoverage), we kept a detailed recruitment log and used the log information to create sample weights as described below.

We followed a two-step process for recruitment. Using the computerized rosters, we identified all new admissions each month, filled out a recruitment form for every new admission, and then submitted the forms to CHS clinical staff for recruitment. The recruitment form included a script to be read to each recruit (see Appendix) that covered important points about study participation and that attempted to insure that potential recruits understood their right to decline participation and any further contact without consequence. Recruits declining to participate at this stage were not contacted further. We recorded in the recruitment log their reason for declining participation, and basic

demographic data from the computerized rosters (e.g., age, sex, race/ethnicity). A recruitment form for the next eligible participant in the sampling frame was then generated and the process repeated until we exhausted the list of potential recruits for that month (in practice, this happened only rarely). For those participants who agreed to be interviewed, a second meeting with one of the study research assistants was scheduled to obtain informed consent and to conduct the interview. Participants who scored below threshold on the 6-item MMSE (i.e., made 3 or more errors) were excluded from the study.

All participants who passed the two-stage screening process (recruitment by CHS staff and the MMSE) were then administered informed consent. Those who consented to be interviewed were walked through generating a time-like follow-back calendar of the two years preceding their arrest and current detention as described above and then administered the CAPI version of the modified WMH-CIDI. Interview times were variable but generally lasted between 2 to 4 hours. A small number of participants had to be interviewed over 2 sessions, as they were too fatigued to complete the interview in 1 session or they had to return to their dorms before their interview was complete. In a few cases interviews were not completed either because the participant decided they no longer wanted to continue in the study or because the interviewer felt they were becoming too emotionally distraught, or because they appeared to not comprehend the interview questions.

All interviews were conducted in private rooms in CHS to assure confidentiality and to increase candidness. All participants who began the interview, regardless of whether they completed the interview or not, were paid a stipend of \$40.00 on their commissary accounts at CCDOC.

Using these procedures, we obtained an overall recruitment rate of 67.5% among eligible cases but this rate varied by gender. For the women: a total of 271 were deemed eligible and were recruited with 155 (57%) completing an interview. Of the cases that were eligible but not interviewed, 71 (60.7%) consented to be interviewed but were discharged before an interview could be done, 39 (33%) refused, 4 (3.5%) were not able or decided not to complete their interview, and 2 (1.7%) did not speak English well enough to understand the informed consent process. For the men: a total of 408 were deemed eligible following recruitment with 305 (75%) completing an interview. Of the cases that were eligible but not interviewed, 44 (42.8%) consented to be interviewed but were discharged before an interview could be done, 42 (40.8%) refused, 13 (12.6%) began the interview but did not complete it either because they or the interviewer stopped the interview, and 4 (3.9%) did not speak English well enough to understand the informed consent process.³

³ This analysis excludes cases lost to the study due to non-coverage (i.e., the case left the treatment dorms before they could be recruited and before eligibility could be determined). We did, however, include these cases in our sample weight calculations to adjust for bias

Data Management. On a weekly or bi-weekly basis, completed recruitment and consent forms were turned in by the RAs to the project manager and kept in locked file cabinets in the study office separated from the monthly computerized rosters of the RTU census and the project link list that connected assigned study IDs with participant names. WMH-CIDI data were downloaded from each interviewer's PC into separate folders onto a flash drive by the PI. The downloaded data were then uploaded to the PI's PC from the flash drive and also uploaded to a password-protected directory on the College's networked server. The latter was done to maintain a secured copy of the study data backed up by a tape drive in case of a hard drive failure. Once they had been successfully uploaded, the files were deleted from the flash drive.

At the conclusion of data collection in October 2007, the interview data from all interviewers were merged into a single file and exported into ASCII format using a data extraction utility provided by the WMH-CIDI developers. A set of scoring programs – diagnostic algorithms - written in SAS and also provided by the WMH-CIDI developers were then run against the ASCII data to generate DSM-IV and ICD-9 diagnoses. The SAS data set containing the scored interview data was then ported to SPSS format and merged with the summarized CHA records provided by the Authority to form the final analytic data set.

Scoring of Non-affective Psychosis. The WMH-CIDI diagnostic algorithms produce diagnoses for all psychiatric disorders covered by the instrument except non-affective psychosis (NAP), which is a general term that includes schizophrenia, schizoaffective disorder, delusional disorder, and psychosis not otherwise specified. The reason for the exclusion is that structured instruments such as the WMH-CIDI have not produced valid results for NAP (Kessler, Birnbaum, Demler, et al., 2005) with follow-up studies indicating errors in the direction of too many false positives (i.e., too many cases classified as having an NAP when they did not). These errors are caused, in part, because some symptoms of NAP can be substance induced, while others may be normal within certain cultural contexts (e.g., having visions attributable to religious experiences). The version of the WMH-CIDI we used included follow-up questions for each of the 6 symptom questions asked in the NAP screening section. The follow-up questions are designed to gain additional detail around the nature of and circumstances surrounding the experience of each symptom and to permit diagnosis by a clinician.

To obtain a diagnosis for NAP, we first flagged all cases that reported at least one lifetime psychotic symptom in the NAP screening section. Two reviewers, the PI, who is a clinical psychologist and an RA with an MSW, independently reviewed the open-ended responses of the flagged cases as well as the number of times the respondent reported having the experience over their lifetime and in the past year, whether a physician or other healthcare provider had diagnosed them as having a psychotic disorder, and the medications they were taking while in CCDOC. Our strategy was to be

attributable to non-coverage but at the expense of including a small number of ineligible cases in the weightings.

conservative and to not diagnose a psychotic disorder unless the clinical evidence in the interview was clear (e.g., the participant reported being diagnosed by a physician or professional health care provider as having schizophrenia, was on meds such as Risperdal typically used to treat psychotic disorders, had not met DSM-IV criteria for bipolar disorder, etc.) The results of the independent reviews were compared and discrepant cases were re-reviewed and discussed until consensus was reached. Any resulting diagnosis was then recorded in the analytic data set. We believe that while these procedures yielded more accurate diagnosis than reliance on the number of reported symptoms, the diagnosis is still at-best provisional and should be interpreted as such.

Arrest History Data. The criminal history data provided by the authority were in ASCII and SPSS format. We used the ASCII data file to create an SPSS file with one arrest event record per client per arrest and then summarized the arrest information by charge type, retaining the dates of the first and last arrests in a second, summary file. We calculated total number of arrests per charge type (e.g., drug-related, violent, property, other) as well as total number of arrests. The summary file, with one record per case for the 427 cases for whom arrest data could be located, was then merged with the CIDI clinical data to form the analytic file.

Sample Weights. To correct for sample bias owing to non-response and non-coverage, we developed a set of weights in accordance with procedures described by Biemer and Christ (2008) using the recruitment log data. Weights for non-response (i.e., participants who refused to be interviewed) were calculated by comparing the distributions of age, gender, and race/ethnicity for study participants to the distributions of these variables among non-respondents. We developed the weights for non-coverage (i.e., participants who left the treatment dorms before they could be recruited) by comparing these same demographic distributions for participants with those we were not able to recruit before they left the treatment dorms. The two weights were then multiplied together to get a final sample weight for use in prevalence analyses and in most of the other statistical models.

Table 2.
Demographic Characteristics by Gender and Weighting

		Males		Females	
		Unweighted (N = 304)	Weighted (N = 611)	Unweighted (N = 155)	Weighted (N = 484)
		%	%	%	%
Race/Ethnicity	White	21.4	26.7	26.7	20.7
	African-American/Black	64.3	56.0	55.9	62.7
	Hispanic	11.0	14.7	14.8	12.7
	Other	3.2	2.6	2.6	3.9
Age group	18-25	12.5	15.2	12.3	13.2
	26-35	24.3	21.3	31.2	33.5
	36-45	30.2	28.2	44.2	33.1
	46+	33.1	35.4	12.3	20.2
	Age in years (Mean)	39.3	39.3	36.6	37.0

Table 2 shows the effects of applying the derived weights for the determining demographic characteristics. Compared with the unweighted sample, the weighted sample has a higher proportion of female cases (44% versus 34%) reflecting the fact that women appeared to cycle in and out of the treatment dorms faster than the men and hence we undersampled female admissions to RTU relative to male admissions owing to our inability to recruit them before they left. The somewhat longer treatment stays for the men meant that we had fewer recruitment issues related to non-coverage. Among the women, the weighted data suggests we undersampled African-Americans and women 46 years of age and older and oversampled whites and women between the ages of 36 to 45. For men, there was minimal sampling bias with respect to age but it appears we oversampled African-Americans and undersampled whites.

Analyses

The main analytic data set contained 459 unweighted cases; 9 cases from the pilot study phase of the project and 450 cases interviewed during the main data collection phase. Table 3 shows the unweighted sample demographics for the main analytic data set disaggregated by gender. African-Americans composed the majority of participants (58.9%), followed by whites (24.1%), and Hispanics (13.8%). On average, study participants were 38 years of age with the men slightly older than the women. Most participants (50.6%) had never been married, and had a high school education or less (70.3%). About nineteen percent of participants reported being homeless for at least part of the month prior to their arrest and about sixty-one percent said they had received public assistance or welfare at some point in their lives with women more likely to indicate they had done so. The average participant had 2 living biological children.

Table 3.
Demographic Characteristics by Gender for CCDOC Participants

	Male (N = 304)		Female (N = 155)		Totals (N = 459)		SIG
	%	(SE)	%	(SE)	%	(SE)	
Race/Ethnicity							
White	26.7	(2.6)	20.8	(3.4)	24.1	(2.1)	
African-American/Black	55.9	(3.0)	62.6	(4.1)	58.9	(2.5)	
Hispanic	14.8	(2.6)	12.6	(2.9)	13.8	(1.9)	
Other	2.6	(1.0)	4.0	(1.8)	3.2	(1.0)	
Age group							
18-25	15.1	(2.5)	13.2	(2.8)	14.3	(1.9)	**
26-35	21.3	(2.3)	33.5	(4.0)	26.7	(2.2)	
36-45	28.2	(2.6)	33.1	(3.7)	30.4	(2.1)	
46+	35.4	(2.8)	20.2	(4.0)	28.7	(2.3)	
Age in years (Mean)	39.3	(0.7)	37.0	(0.9)	38.3	(0.6)	*
Marital status							
Married/cohabitating	24.8	(2.6)	31.1	(3.9)	27.6	(2.2)	
Separated/widowed/divorced	20.7	(2.4)	23.3	(3.7)	21.8	(2.1)	
Never married	54.5	(3.0)	45.7	(4.2)	50.6	(2.5)	
Education (highest grade)							
Less than high school	42.4	(3.0)	47.7	(4.2)	44.7	(2.5)	
High school graduate/ GED	24.3	(2.5)	22.7	(3.7)	23.6	(2.1)	
Some college	23.5	(2.5)	22.4	(3.5)	23.0	(2.1)	
College graduate	9.7	(1.7)	7.2	(2.0)	8.6	(1.3)	
Homeless month before arrest	17.6	(2.2)	20.1	(3.3)	18.8	(1.9)	
Ever received public assistance or welfare	51.6	(3.0)	72.5	(3.8)	60.8	(2.4)	***
Living biological children (Mean)	1.6	(0.1)	2.3	(0.2)	1.9	(0.1)	**

Note. Column N's are based on the unweighted detainee data. Percentages and standard errors are based on data weighted for sampling probabilities. All tests of significance are based on a modified Pearsons chi-square converted to an F statistic using a second order Rao and Scott correction.

*p < .05; **p < .01; ***p < .001

At the conclusion of the clinical interview, the WMH-CIDI contains a section for recording interviewer observations about the environment in which the interview was conducted (e.g., number of distractions, privacy) and about the validity of the interview (e.g., the respondent's understanding of the questions, whether the respondent appeared to be hallucinating or unduly distracted, and the level of the respondent's cooperation). In total, the RAs indicated that 28 participants (6% of the sample) did not appear to understand the questions at all and/or appeared to be hallucinating during the interview and/or were uncooperative. In comparing the resultant DSM-IV diagnoses for the respondent interviews of suspect validity with the diagnoses of the interviews judged as having higher validity, we found that respondent interviews with suspect validity had lower rates of all the DSM-IV disorders assessed, in some instances, substantially so (e.g., 7.1% lifetime prevalence for dysthymia for the cases with invalid interviews versus 17.3% for cases with likely valid interviews). Hence, for most of the analyses, we excluded the 28 participants with likely invalid data, yielding a final analytic sample of 431 participants (149 women and 282 men).

Analyses were conducted using SPSS version 16.0 (SPSS Inc., 2007), Stata version 10.1, and Mplus version 5.2 (Muthén & Muthén, 2008). For simple prevalence estimates standard errors were estimated using the sample weights with stratification on gender. All other analyses employed the sample weights where applicable.

Results

Results are organized by the 5 main analytic questions addressed by the study:

Q1: What is the epidemiology of psychiatric, substance use, and medical disorders among detainees in psychiatric treatment and are there specifiabile, clinically significant configurations of disorders?

Psychiatric and Substance Use Disorders. Tables 4 and 5 show the lifetime and past-year prevalences of the DSM-IV psychiatric disorders assessed for the study, disaggregated for male and female participants. Significant differences in disorder prevalence by gender are reported using likelihood ratio chi-square tests. Given that the sample was drawn from a population in residential psychiatric treatment, almost all of whom were receiving psychiatric medication while detained in the jail, the high lifetime and past-year prevalence rates shown in tables 4 and 5 are not surprising. As the past-year prevalences generally follow the patterns of the lifetime prevalences – excepting drug abuse where the past-year rate was substantially lower than the lifetime rate – we focus our discussion on the lifetime prevalences.

The most common lifetime DSM-IV disorders for all participants were (in order of decreasing prevalence): substance use disorders including alcohol and drug abuse and dependence (81.8%); nicotine dependence (64.5%); conduct disorder (56.5%); ASP (47.2%); PTSD (44%); and major depressive episode (50%). The rates of lifetime and past-year substance use disorders in the sample are consistent with the previously referenced reports in the literature on the high rates of co-occurrence of substance use and psychiatric disorders (Kessler, Berglund, et al., 2005). Also consistent with reports in the literature are the high rates of lifetime and past-year tobacco use among

individuals with serious psychiatric disorders (e.g. Grant, Hasin et al., 2004; Ziedonis et al., 2003) as compared with the general population rate estimated to be 25 percent.

Aggregating across the 4 affective disorders assessed, 61 percent of all participants have had a major affective disorder at some time in their lives (53.1% in the past year). Women were more likely than men to have met the DSM-IV criteria for a major depressive episode or disorder, and for PTSD. Conversely, the men were more likely to have met DSM-IV diagnostic criteria for NAP, gambling disorder, and alcohol abuse.

The ASP prevalence rate for men found in our study (50.0%) falls within the range of ASP prevalence rates reported by Fazel and Danesh (2002) in their review of 62 studies of the rates of SMI in prisons where the average rate for men computed across studies was 47 percent. The average rate of ASP in the studies that included women was 21 percent, substantially lower than our estimate for women (44%). However, studies they reviewed included ones that did not use validated instruments and studies that were done pre-1990, before the DSM-IV had been developed and made available and were done on prison general population samples, not just those incarcerated in psychiatric treatment.

Table 4.
DSM-IV Lifetime Diagnoses by Gender for CCDOC Participants

	Male (N = 282)		Female (N = 149)		Totals (N = 431)		SIG
	%	(SE)	%	(SE)	%	(SE)	
Non-Affective Psychotic Disorder ^a	32.8	(2.8)	21.8	(3.5)	27.8	(2.2)	**
Major Depressive Episode	45.1	(3.1)	55.9	(4.3)	50.0	(2.6)	*
Major Depressive Disorder ^b	27.7	(2.7)	44.8	(4.3)	35.4	(2.4)	***
Dysthymia	15.8	(2.1)	20.2	(3.4)	17.8	(2.0)	
Bipolar Disorder I	19.6	(2.5)	13.6	(3.0)	16.9	(1.9)	
Bipolar Disorder II ^c	--		--		--	--	
Hypomania	8.7	(1.6)	5.8	(1.8)	7.4	(1.2)	
Any Affective Disorder	58.3	(3.1)	64.7	(4.2)	61.2	(2.5)	
Post-Traumatic Stress Disorder	38.1	(3.0)	51.6	(4.3)	44.2	(2.5)	*
Generalized Anxiety Disorder	21.3	(2.4)	25.3	(3.7)	23.1	(2.2)	
Attention Deficit Disorder	28.8	(2.8)	31.7	(4.1)	30.1	(2.4)	
Conduct Disorder ^d	59.9	(3.0)	52.4	(4.3)	56.5	(2.6)	
Antisocial Personality Disorder ^d	50.0	(3.1)	43.8	(4.3)	47.2	(2.6)	
Gambling Disorder	16.4	(2.2)	5.1	(1.9)	11.3	(1.5)	**
Nicotine Dependence	66.0	(4.1)	63.2	(3.0)	64.5	(2.5)	
Alcohol Abuse	61.3	(3.0)	50.4	(4.3)	56.4	(2.6)	*
Alcohol Dependence	33.8	(2.9)	30.5	(3.9)	32.3	(2.4)	
Drug Abuse	66.6	(2.9)	70.3	(4.0)	68.3	(2.4)	
Drug Dependence	44.6	(3.1)	53.4	(4.3)	48.6	(2.6)	
Any Substance Use Disorder	81.3	(2.3)	82.3	(3.4)	81.8	(2.0)	

Note. Column N's are based on the unweighted detainee data, excluding 28 cases with likely invalid data. Percentages and standard errors are based on data weighted for sampling probabilities and stratified by gender. All tests of significance are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction.

^a The diagnosis of nonaffective psychotic disorder includes schizophrenia, schizoaffective disorder, and psychotic disorder not otherwise specified. It is based on clinician reviews of the open-ended responses to the psychotic screen section in the WMH-CIDI.

^b Based on the hierarchy rule for assessing major depressive disorder, which excludes cases that also meet the criteria for bipolar disorder.

^c No cases met the criteria for bipolar disorder II.

^d Based on criteria developed from the National Epidemiological Survey on Alcoholism and Related Conditions interview instrument.

*p < .05; **p < .01; ***p < .001

Table 5.
DSM-IV Past-Year Diagnoses by Gender for CCDOC Participants

	Male (N = 282)		Female (N = 149)		Totals (N = 431)		SIG
	%	(SE)	%	(SE)	%	(SE)	
Non-Affective Psychotic Disorder^a	26.7	(2.6)	19.0	(3.4)	23.2	(2.1)	
Major Depressive Episode	39.6	(3.0)	50.1	(4.3)	44.3	(2.5) *	
Major Depressive Disorder^b	22.8	(2.6)	40.0	(4.2)	30.6	(2.4) ***	
Dysthymia	15.8	(2.1)	20.2	(3.4)	17.8	(1.9)	
Bipolar Disorder I	17.6	(2.3)	13.0	(3.0)	15.5	(1.8)	
Bipolar Disorder II^c	--		--		--	--	
Mania	15.4	(2.1)	13.0	(2.9)	14.3	(1.8)	
Hypomania	6.8	(1.5)	4.2	(1.6)	5.6	(1.1)	
Any Affective Disorder	48.9	(3.1)	57.2	(4.3)	52.6	(2.6)	
Post-Traumatic Stress Disorder	19.7	(2.4)	34.5	(4.1)	26.4	(2.3) **	
Generalized Anxiety Disorder	18.9	(2.3)	23.3	(3.6)	20.9	(2.1)	
Gambling Disorder	9.3	(1.7)	2.9	(1.5)	6.4	(1.2) *	
Nicotine Dependence	43.7	(3.1)	49.2	(4.3)	46.2	(2.6)	
Alcohol Abuse	37.6	(3.0)	26.1	(3.6)	32.4	(2.3) *	
Alcohol Dependence	24.9	(2.7)	18.1	(3.1)	21.8	(2.0)	
Drug Abuse	3.8	(1.1)	5.7	(1.9)	4.7	(1.1)	
Drug Dependence	29.6	(2.8)	44.6	(4.3)	36.4	(2.5) **	
Any Substance Use Disorder^d	47.3	(3.1)	58.7	(4.3)	55.4	(2.6)	

Note. Column N's are based on the unweighted detainee data, excluding 28 cases with likely invalid data. Percentages and standard errors are based on data weighted for sampling probabilities and stratified by gender. All tests of significance are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction.

^a The diagnosis of nonaffective psychotic disorder includes schizophrenia, schizoaffective disorder, and psychotic disorder not otherwise specified. It is based on clinician reviews of the open-ended responses to the psychotic screen section in the WMH-CIDI.

^b Based on the hierarchy rule for assessing major depressive disorder, which excludes cases that also meet the criteria for bipolar disorder.

^c No cases met the criteria for past-year or lifetime bipolar disorder II.

*p < .05; **p < .01; ***p < .001

Chronic Medical Conditions. The lifetime prevalence rates of chronic medical conditions, assessed in our augmented version of the WMH-CIDI are shown in table 6, disaggregated for men and women. Dental problems (53.2%), physical injury (50.8%), frequent and severe headaches (42.7%), back and neck problems (36.8%), and arthritis (29.4%) were among the most commonly reported conditions by participants. These results suggest that physical pain and musculoskeletal problems, perhaps secondary to trauma, are among the primary medical concerns among the population of jail detainees in psychiatric treatment.⁴ Just below these conditions in terms of prevalence are a mix of disorders that include hypertension (25.8%), allergies (25.7%), asthma (24.4%), and STDs other than HIV/AIDS (21.9%). These latter results are consistent with those of a study of community outpatients with CODs in comparison to national samples whereby the outpatient groups – those with schizophrenia and affective disorder – had elevated rates of asthma, emphysema, chronic bronchitis, and arthritis (Sokal et al., 2004) and are also consistent with frequently co-occurring conditions reported in a review of psychiatric and somatic illnesses (Iacovides & Siamouli (2008).

All except one (eye, ear, nose, and throat problems) of the statistically significant differences between the male and female participants were due to a higher percentage of women reporting ever had a chronic medical condition as compared with the men. Women were more likely to report frequent or severe headaches, asthma, other chronic lung disease, cancer, and STDs other than HIV/AIDS. It is not possible to determine from the data whether the consistent direction of these findings is due to women being more willing to admit having medical problems, to their being more aware of the problems they have, or to a real difference in prevalence. However, these results are consistent with a recent national study that compared male and female jail detainees and found that women had higher prevalence rates of all chronic medical and psychiatric disorders measured including drug dependence (Binswanger, Merrill et al., 2009). Although not compared statistically because they reflect different conditions among men and women, many more women reported having “female problems”

⁴ The question on dental problems was worded as follows: “Have you ever had dental problems such as infected teeth, cavities, and gum disease?” The question on physical injuries was asked as follows: “Have you ever had physical injury such as broken bones, concussions, and gunshot or knife wounds resulting from violence or sexual assault?” Other STDs included the following: syphilis, gonorrhea, Chlamydia, and venereal warts.

Table 6.
 DSM-IV Lifetime Medical Conditions by Gender for CCDOC Participants

	Male (N = 282)		Female (N = 149)		Totals (N = 431)	
	%	(SE)	%	(SE)	%	(SE)
Arthritis or rheumatism	25.7	(2.7)	33.8	(4.1)	29.4	(2.4)
Back or neck problems	35.4	(2.9)	38.4	(4.2)	36.8	(2.5)
Frequent or severe headaches	35.4	(3.0)	51.4	(4.3)	42.7	(2.5) **
Epilepsy or seizures	13.1	(2.0)	12.2	(2.8)	12.7	(1.7)
Physical injury	52.8	(3.1)	48.5	(4.3)	50.8	(2.6)
Any other chronic pain	11.4	(1.9)	15.4	(3.1)	13.2	(1.7)
Seasonal allergies/hay fever	22.0	(2.6)	30.3	(3.8)	25.7	(2.2)
Asthma	16.8	(2.2)	33.5	(4.0)	24.4	(2.2) ***
Tuberculosis	5.7	(1.4)	5.8	(2.1)	5.7	(1.2)
Other chronic lung disease	4.4	(1.3)	22.4	(3.5)	12.5	(1.7) ***
Stroke	5.5	(1.4)	5.4	(1.9)	5.4	(1.2)
Heart attack	5.0	(1.3)	8.0	(2.5)	6.3	(1.4)
Heart disease	5.6	(1.4)	8.9	(2.6)	7.1	(1.4)
Hypertension	24.7	(2.6)	27.2	(3.9)	25.8	(2.3)
Diabetes or high blood sugar	10.4	(1.8)	14.6	(3.2)	12.3	(1.8)
Liver problems	8.0	(1.7)	11.1	(2.5)	9.4	(1.4)
Ulcers	9.9	(1.8)	10.1	(2.6)	10.0	(1.5)
Other digestive problems	7.4	(1.6)	12.6	(2.7)	9.7	(1.5)
Cancer (any kind)	3.1	(1.1)	9.6	(2.8)	6.0	(1.4) **
Eye, ear, nose or throat problems	24.1	(2.7)	13.9	(3.1)	19.5	(2.0) *
Dental problems	51.3	(3.1)	55.6	(4.3)	53.2	(2.6)
Skin problems	12.5	(2.0)	14.9	(3.0)	13.6	(1.7)
HIV or AIDS	3.0	(1.0)	5.2	(1.7)	4.0	(0.9)
Other STDs	14.7	(2.1)	30.7	(4.0)	21.9	(2.1) ***
Male problems	5.4	(1.4)	--		--	
Female problems	--		38.2	(4.2)	--	

Note. Column N's are based on the unweighted detainee data, excluding 28 cases with likely invalid data. Percentages and standard errors are based on data weighted for sampling probabilities and stratified by gender. All tests of significance are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction.

*p < .05; **p < .01; ***p < .001

(38.2%) as compared with the percentage of men (5.4%) who reported having “male problems”.⁵

To determine if any of the reported rates of chronic medical conditions for the CCDOC sample were elevated relative to general population rates, we compared the jail sample’s chronic medical condition prevalences against the general population sample of NCS-R participants. To control for sample differences on demographic and clinical characteristics that could influence the odds of having a disorder, we included the following covariates in the logistic models: age in years; gender; race/ethnicity (white, African-American/black; or Hispanic/other); educational level (less than high school, high school graduate/GED, at least some college); DSM-IV lifetime alcohol abuse or dependence (absent/present); DSM-IV drug abuse or dependence (absent/present); and ever having one or more than one (i.e., co-occurring) of the following DSM-IV psychiatric conditions: major depressive episode or disorder, dysthymia, bipolar disorder, generalized anxiety disorder (GAD), post-traumatic stress disorder (PTSD), hypomania, and attention deficit disorder (ADD). For each logistic model we examined potential interaction effects for study sample (CCDOC vs. NCS-R), gender, and the presence of one or more psychiatric disorders. We also examined the effects of squaring age to assess for non-linear, quadratic effects that would indicate either increasing or decelerating affects of age over time. The results of these comparisons for the reduced set of 15 chronic medical conditions included in both the CCDOC and the NCS-R surveys are shown in table 7.

Results of the multivariate comparisons of the odds of having a chronic medical condition between the jail and NCS-R samples controlling for sociodemographic and clinical factors are presented in table 7 for men and table 8 for women. The results shown are for the main effects only models; significant interactions are discussed below. In the present context the main interest is in the results comparing the odds of having a chronic medical condition contingent on being in the jail-based or NCS-R general population-based sample. Across statistical models, five of the sixteen comparisons yielded a statistically significant difference in the odds of having a condition between the two groups. In four of the five instances the jail sample had higher odds of having the condition: frequent or severe headaches (OR = 1.62, $p < .001$), stroke (OR = 2.67, $p < .001$), other chronic lung disease (OR = 4.49, $p < .01$) and epilepsy or seizures (OR = 5.83, $p < .001$). In the remaining instance, participants in the jail sample had lower odds of having a seasonal allergy (OR = 0.58, $p < .001$) relative to participants in the NCS-R sample.

Among the covariates included in the models, age showed the most consistent association, and in the expected direction, whereby the odds of ever having a chronic

⁵ “Male problems” include an enlarged prostate, urinary tract infection, and erectile dysfunction. “Female problems” includes menstrual period problems, breast or cervical cancer, cysts, and vaginal or urinary tract infections such as yeast infections.

medical condition increased with each additional year of age for 12 of the 15 assessed conditions and for having any chronic condition. Statistically significant and negative curvilinear effects for age were obtained for arthritis, hypertension, and diabetes, suggesting that the effects of increasing age on the probabilities of having one of these conditions decreases gradually over time with our models indicating the linear changes in the log odds moderate after age 50.

Paralleling the bivariate findings, where there were statistically significant gender differences, women (in both samples) most often had higher odds of having a given chronic medical condition as compared with the men: arthritis or rheumatism (OR = 1.48, $p < .001$), frequent or severe headaches (OR = 1.62, $p < .001$), allergies (OR = 1.31, $p < .01$), asthma (OR = 1.62, $p < .001$), and other chronic lung disease (OR = 5.53, $p < .001$). Lifetime alcohol abuse or dependence was associated with increased odds of having heart disease (OR = 2.97, $p < .001$), hypertension (OR = 3.27, $p < .001$), and other chronic lung disease (OR = 3.27, $p < .001$). Women had lower odds for only one condition, heart attacks (OR = .59, $p < .01$).

Among other model covariates, having ever had two or more of the assessed DSM-IV lifetime psychiatric disorders was associated with higher odds for 11 medical conditions and for having any medical condition. Lifetime alcohol abuse or dependence was more strongly associated with increases in the odds of having a chronic medical condition (6 statistically significant associations) than lifetime drug abuse or dependence (2 statistically significant associations). Being African/American or black as associated with an increase in the odds of having only two conditions relative to whites: hypertension and diabetes while resulting in decreased relative odds of having any form of cancer or diabetes. No statistically significant effects were found for Latino participants. Education level was significant in only one instance; those having less than a high school education were more likely to have arthritis relative to participants who reported having attended at least some college.

These same patterns generally held for the model assessing the associations among the covariates and the odds of having ever had one or more of the 15 chronic medical conditions excepting that comparison group (jail versus NCS-R sample) were not significant. Age (OR = 1.04, $p < .001$), gender (OR = 1.47, $p < .001$) and having one (OR = 2.26, $p < .001$) or more than one lifetime psychiatric disorder (OR = 2.45, $p < .001$) were all associated with increased odds of having any disorder. Race/ethnicity, education level, and, more surprisingly, lifetime substance abuse and dependence were not statistically significant, although lifetime alcohol abuse and dependence did reach significance at the conventional $p < .05$ level.

The interactions tested (not shown in table 7) included a term for gender by group to test if there were differential gender affects contingent on being in the jail or general population sample and terms for group by having one or more than one lifetime psychiatric diagnoses among those assessed. There were six conditions for which the gender by group interaction was significant: other chronic lung disease, diabetes, cancer, hypertension, heart disease, and other chronic pain. There was also a significant gender by group interaction for having any chronic medical condition.

Although the exact pattern of the effects varied, all were in the direction of an increase in the log odds of having a condition for women in the jail sample relative to men in the jail sample relative to the difference between women and men in the general population (i.e., a difference in differences). In other words, the odds of women in the jail sample having a medical condition were greater compared to jailed men beyond the gender differences in the general population sample.

The interaction effects for having one and more than one lifetime psychiatric disorder and comparison group were fewer and more varied across medical conditions than the interaction effects obtained for gender and comparison group. Three conditions – heart diseases, hypertension, and epilepsy or seizures had significant interactions for psychiatric disorder by group. The general direction for these effects was for the jail sample to have increased log odds only when two or more psychiatric conditions were present versus for the general population sample whereby having one psychiatric disorder tended to be associated with increased odds of having these three medical conditions. These effects were not as large or as consistent as the interaction effects for gender and comparison group and they were not significant in the logistic model with any chronic medical condition as the dependent variable. Our interpretation of these findings is that having one or more psychiatric disorders is associated with an increase in having numerous chronic medical conditions that does not vary for most conditions and does not vary by criminal justice status.

Classification of Medical Conditions. To determine if there was a way of classifying participants according to their self-reported chronic medical conditions that had potential clinical usefulness, we conducted a latent class analysis (LCA) of the data. LCA is a way of analyzing data to determine if study participants can be grouped in ways that explain the variation in the assessed medical conditions. Such analyses are sometimes called “mixture models” because the observed covariation in the indicator variables (i.e., in this case the medical conditions) is attributed to unobserved heterogeneity (the mixture) in the sample of participants (Muthén, 2004). In this instance, we used LCA to determine if there were different classes of participants in the study sample with respect to their medical conditions. For the purposes of these analyses, we again examined the 15 medical conditions captured in the original WMH-CIDI questionnaire.

Table 7.
Comparison of the Odds of Having a Chronic Medical Condition for Jail and NCS-R Participants and Selected Covariates

Chronic Medical Condition	Arthritis or rheumatism		Back or neck problems		Frequent or severe headaches		Other Chronic Pain		Seasonal Allergy/Hay Fever		Stroke		Heart Attack		Heart Disease	
	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig	OR	(95% CI) Sig
Age in years	1.07	(1.06 - 1.08) ***	1.02	(1.02 - 1.03) ***	0.99	(0.98 - .99)	1.02	(1.01 - 1.02) ***	1.00	(0.99 - 1.00)	1.06	(1.05 - 1.08) ***	1.07	(1.06 - 1.09) ***	1.07	(1.06 - 1.08) ***
Jail sample (NCS-R sample = reference)	0.95	(0.79 - 1.14)	0.93	(0.81 - 1.07)	1.62	(1.35 - 1.94) ***	0.76	(0.50 - 1.16)	0.58	(0.44 - 0.75) ***	2.67	(1.72 - 4.13) ***	1.50	(0.32 - 7.14)	1.80	(0.89 - 3.63)
Gender (Males = reference)	1.48	(1.27 - 1.73) ***	1.09	(0.93 - 1.28)	2.19	(1.93 - 2.48) ***	1.03	(0.83 - 1.28)	1.31	(1.13 - 1.52) **	0.74	(0.53 - 1.04)	0.59	(0.41 - 0.86) **	0.84	(0.66 - 1.06)
Race/ethnicity																
African-American/Black	1.09	(0.88 - 1.33)	0.70	(0.56 - 0.86) **	0.84	(0.69 - 1.02)	0.86	(0.62 - 1.18)	0.70	(0.59 - 0.83) ***	1.39	(0.65 - 3.00)	1.40	(0.79 - 2.47)	0.88	(0.49 - 1.57)
Hispanic/Other (White = reference)	1.60	(0.78 - 1.37)	0.98	(0.79 - 1.24)	0.92	(0.73 - 1.15)	0.80	(0.56 - 1.13)	0.80	(0.65 - 0.99)	1.34	(0.91 - 1.97)	1.44	(0.70 - 2.94)	1.54	(0.95 - 2.50)
Education level																
< High school	1.60	(1.32 - 1.94) ***	1.22	(0.94 - 1.57)	1.29	(0.92 - 1.79)	1.22	(0.91 - 1.63)	0.61	(0.48 - 0.77) ***	1.24	(0.84 - 1.84)	1.58	(0.99 - 2.53)	0.93	(0.68 - 1.25)
High school graduate/GED (Some college or higher = reference)	1.16	(0.93 - 1.46)	1.14	(0.97 - 1.33)	1.19	(0.89 - 1.59)	0.99	(0.78 - 1.25)	0.62	(0.53 - 0.72) ***	0.89	(0.58 - 1.37)	1.12	(0.75 - 1.68)	1.00	(0.74 - 1.34)
Lifetime alcohol abuse or dependence (No abuse/dependence = reference)	1.13	(0.92 - 1.38)	1.33	(1.14 - 1.55) **	1.24	(1.06 - 1.46) **	1.13	(0.83 - 1.52)	0.97	(0.80 - 1.19)	0.92	(0.66 - 1.28)	1.40	(0.60 - 3.28)	2.06	(1.31 - 3.22) **
Lifetime drug abuse or dependence (No abuse/dependence = reference)	1.55	(1.11 - 2.15) **	1.33	(1.02 - 1.72)	0.93	(0.76 - 1.15)	1.48	(1.03 - 2.11)	1.13	(0.88 - 1.44)	1.01	(0.59 - 1.72)	1.69	(1.24 - 2.28) **	0.90	(0.60 - 1.35)
DSM-IV lifetime psychiatric disorder ^a																
One	1.65	(1.25 - 2.19) ***	1.83	(1.50 - 2.24) ***	2.28	(1.77 - 2.93) ***	2.37	(1.70 - 3.30) ***	1.33	(1.02 - 1.74)	1.62	(0.95 - 2.74)	1.93	(0.91 - 4.11)	1.55	(1.08 - 2.21)
Two or more (No lifetime disorder = reference)	1.81	(1.57 - 2.09) ***	2.38	(1.98 - 2.86) ***	2.95	(2.54 - 3.43) ***	2.92	(2.33 - 3.66) ***	1.54	(1.31 - 1.81) ***	1.85	(1.41 - 2.42) ***	1.60	(0.98 - 2.63)	1.89	(1.05 - 3.42)
Model Statistics																
Main Effects Model ^b		49.94 ***		46.41 ***		77.55 ***		25.69 ***		29.12 ***		24.81 ***		31.81 ***		29.55 ***
Squared Residual ^c		-3.83 ***		-1.91		0.28		0.49		-1.16		-0.55		-1.37		-1.90
Likelihood ratio test ^d		1.02		2.09		1.44		2.96 **		9.00 **		2.48		2.03		6.00 ***

Table 7. (continued)

Comparison of the Odds of Having a Chronic Medical Condition for Jail and NCS-R Participants and Selected Covariates

Chronic Medical Condition	Hypertension		Asthma		Other Chronic Lung Disease			Diabetes		Ulcers/Stomach Problems		Epilepsy or Seizures		Cancer		Any Chronic Medical Condition					
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	Sig	OR	(95% CI)	Sig	OR	(95% CI)	Sig	OR	(95% CI)	Sig	OR	(95% CI)	Sig		
Age in years	1.06	(1.05 - 1.06) ***	0.99	(0.98 - 1.00)	1.05	(1.03 - 1.07) ***		1.05	(1.04 - 1.05) ***		1.02	(1.01 - 1.03) ***		1.01	(0.99 - 1.02)		1.05	(1.05 - 1.07) ***		1.04	(1.04 - 1.05) ***
Jail Sample (NCS-R sample = reference)	1.00	(0.59 - 1.71)	1.41	(0.85 - 2.36)	4.49	(1.83 - 11.04) **		1.34	(0.67 - 2.68)		0.69	(0.51 - 0.92)		5.83	(3.92 - 8.68) ***		2.01	(0.79 - 5.09)		0.92	(0.51 - 1.63)
Gender (Males = reference)	0.85	(0.74 - 0.98)	1.62	(1.31 - 2.00) ***	3.27	(2.29 - 4.67) ***		1.04	(0.80 - 1.35)		0.99	(0.81 - 1.20)		1.12	(0.87 - 1.44)		1.43	(1.086 - 1.89)		1.47	(1.23 - 1.75) ***
Race/Ethnicity																					
African-American/Black	1.89	(1.48 - 2.41) ***	1.07	(0.72 - 1.60)	0.77	(0.21 - 2.81)		2.07	(1.44 - 2.98) ***		0.86	(0.62 - 1.18)		0.77	(0.44 - 1.35)		0.45	(0.32 - 0.63) **		0.78	(0.58 - 1.05)
Hispanic/Other (White = reference)	1.01	(0.75 - 1.33)	0.79	(0.47 - 1.33)	1.89	(1.21 - 2.95)		1.23	(0.85 - 1.80)		0.81	(0.60 - 1.11)		0.98	(0.47 - 2.03)		0.84	(0.60 - 1.18)		0.61	(0.48 - 0.78)
Education Level																					
High school graduate/GED	0.84	(0.63 - 1.13)	1.20	(0.92 - 1.55)	2.15	(1.18 - 3.93)		0.98	(0.67 - 1.44)		1.33	(1.04 - 1.71)		0.90	(0.57 - 1.41)		1.02	(0.67 - 1.56)		0.92	(0.64 - 1.32)
Some college or college graduate (< high school graduate = reference)	1.14	(0.81 - 1.59)	0.91	(0.70 - 1.18)	1.31	(0.69 - 2.47)		1.40	(1.01 - 1.94)		1.11	(0.91 - 1.36)		0.94	(0.45 - 1.99)		1.11	(0.79 - 1.55)		0.79	(0.64 - 0.97)
Lifetime Alcohol Abuse or Dependence (No abuse/dependence = reference)	1.39	(1.24 - 1.56) ***	1.17	(0.98 - 1.40)	2.63	(1.65 - 4.19) ***		0.92	(0.75 - 1.14)		1.71	(1.23 - 2.40) **		1.34	(1.09 - 1.66) **		1.15	(0.91 - 1.46)		1.25	(1.05 - 1.48)
Lifetime Drug Abuse or Dependence (No abuse/dependence = reference)	1.00	(0.78 - 1.23)	1.54	(1.16 - 2.04) **	1.39	(0.67 - 2.88)		1.24	(0.70 - 2.19)		1.05	(0.69 - 1.62)		1.44	(1.03 - 2.00)		1.06	(0.36 - 3.12)		1.15	(0.94 - 1.40)
DSM-IV Lifetime Psychiatric Disorders^a																					
One	1.09	(0.87 - 1.36)	1.19	(0.90 - 1.56)	1.71	(0.99 - 2.96)		1.24	(0.70 - 2.19)		1.79	(1.13 - 2.84) **		1.05	(0.67 - 1.63)		1.11	(0.60 - 2.04)		2.26	(1.71 - 2.98) ***
Two or more (No lifetime disorder = reference)	1.50	(1.18 - 1.91) **	1.27	(1.02 - 1.59)	2.32	(1.53 - 3.53) ***		1.40	(1.13 - 1.72) **		1.97	(1.53 - 2.51) ***		1.37	(1.06 - 1.77)		1.53	(1.19 - 2.00) **		2.45	(2.00 - 3.00) ***
Model Statistics																					
Main Effects Model^b	41.98	***	32.14	***	46.32	***		39.16	***		17.83	***		24.75	***		33.75	***		29.77	***
Squared Residuals^c	-5.08	***	0.30		4.74	***		-3.53	**		0.22			1.61			-3.73	**		-0.15	
Likelihood ratio test^d	12.76	***	8.45	***	6.63	***		7.33	***		1.19			5.79	***		10.86	***		7.83	***

Note. The jail sample is based on data from 431 participants interviewed while detained and in residential psychiatric treatment. The NCS-R sample was drawn from the full weighted sample of 5,692 participants that completed the second part of the WHO-CIDI survey. Both samples were weighted and variables reflecting design effects owing to stratification and clustering were used to estimate model standard errors. Reference categories are as indicated in the table.

^a DSM-IV lifetime disorders include the following diagnoses: major depressive episode or disorder, dysthymia, bipolar disorder, generalized anxiety disorder, post-traumatic stress disorder, hypomania, and attention deficit disorder.

^b Reflects an F statistic testing improvement in model fit with included parameters versus a model with only the constant term. Significance indicates a statistically reliable improvement in model fit with inclusion of the parameter estimates. Degrees of freedom for the F-test were 11, 33.

^c Reflects a t-test of the squared residuals term after fitting the main effects model. Significance indicates unexplained residual variance for the main effects only model. Models with significant residual square terms were re-analyzed by including a quadratic term for the effects of age.

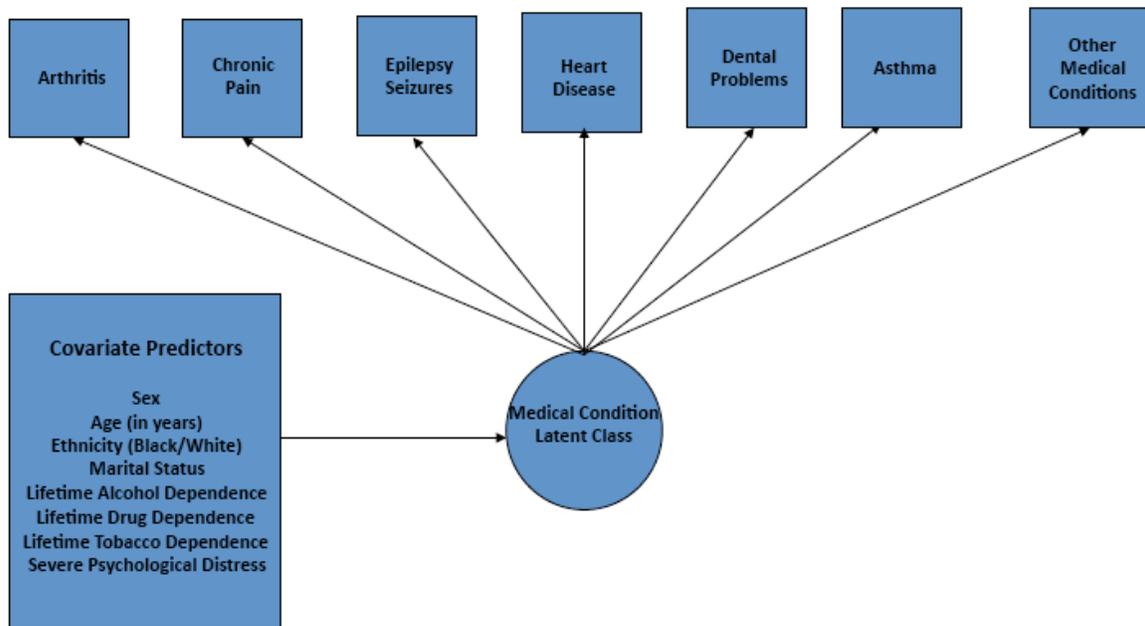
^d Reflects an F statistic using seemingly unrelated estimates comparing the interaction effects model with the main effects only model. Significance indicates inclusion of the interaction effects resulted in a statistically reliable change in the main effects parameter estimates. Models with significant results were re-analyzed by including interaction terms for group, gender, and lifetime psychiatric disorders.

p < .01; *p < .001

The LCA proceeded by exploring models ranging from 2 to 5 classes and then reviewing the fit statistics generated for each model to determine the optimum number of classes. The statistics reviewed include: the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), a version of the BIC optimized by sample size, and the log-likelihood ratio chi-square test (see Nylund et al., 2007). In the case of each statistic, lower scores indicate a better model fit, although there is no absolute score that provides a minimum threshold for an acceptable fit such as with statistical significance testing (e.g., $p < .05$). We also examined another statistical measure available for LCA models, entropy, which indicates how well the model classifies participants. Entropy scores range in value from 0 to 1, with higher values indicating better classification results. A value of 1 indicates that every participant can be placed into one of the latent classes with zero probability that individual is in any of the other latent classes. Decreasing scores indicate increasing ambiguity in the classification scheme.

Once the best fitting latent class model had been determined, we added a set of covariate predictors to examine the relationships between being in a given latent class and the predictors. In our model, we included the following covariates: sex, age (in years), two dummy variables to represent ethnicity (Black/African-American and White as compared with not African-American and not White); a single dummy variable to represent marital status (married compared with not married); lifetime drug dependence; lifetime alcohol dependence, lifetime tobacco dependence; and the severity of psychological distress as indicated by the score on the K6 scale, from 0 through 24. A multinomial logistic regression was then run regressing latent medical class on each of these predictors using the group with the lowest number of reported medical conditions as the reference category. Odds ratios higher than 1 for a given predictor indicate an increased probability of being in one of the groups with a higher number of medical conditions while odds ratios lower than 1 indicate decreased probabilities. Figure 2 depicts the conceptual relationships among the indicator variables (the chronic medical conditions), the latent classes, and the covariate predictors for the latent class model estimated in these analyses. Arrows going from the latent class variable to the medical conditions indicate those variables are regressed on the latent class variable that, in turn, was regressed on the covariate predictor variables.

Figure 2. Latent Class Model of Chronic Medical Conditions and Covariate Predictors for CCDOC Detainees



Model fit statistics are shown in table 8. All fit statistics decrease going from the 2- to the 3-class model, indicating that the 3-class model provides a better fit to the data than the 2-class model. For the 4-class model, 2 of the indicators, the BIC and likelihood ratio chi-square test increase while the AIC and sample-size adjusted BIC decrease. This suggests the 4-class model may not fit the data better than the 3-class model. However, the 4-class model exhibits a slightly higher entropy score than the 3-class model, suggesting participants are classified more accurately in the 4-class model. The 5-class model has higher (i.e., worse) fit statistic scores for several indicators compared to the 3-class models excepting for the AIC statistic, lower scores (i.e., better) on 2 other indicators and has the best entropy score among all of the models.

Different results for the fit statistics, excluding entropy, which is not used to evaluate model fit, are not uncommon in which case it is up to the researcher to evaluate the overall model for clinical relevance and parsimony. Reviewing these data as well as the actual groupings that result from the different models, we selected the 3-class model as the one that best fits the data. Our reasoning is that the 3-class model is most parsimonious, can be interpreted in a straightforward manner, and does not sacrifice much by way of participant classification (entropy score) over the 4- and 5-class models. Addition of the covariates to the model (the last line in table 8) improves model fit for 3 of the 4 fit statistics, excepting the likelihood ratio chi-square, which is the least reliable among these statistics, indicating that the covariates as a group improve the classification of participants.

Table 8. Fit Statistics for 2 to 5 Class Mixture Models of Latent Medical Class

Model Classes	AIC	Bayesian (BIC)	Sample-Size Adjusted BIC	Likelihood	
				Chi-square	Entropy
2-class	5282.7	5408.74	5310.36	889.45	0.69
3-class	5227.5	5418.64	5269.49	827.37	0.76
4-class	5206.3	5462.51	5262.58	828.18	0.79
5-class	5191.7	5512.89	5262.19	873.61	0.84
3-class with covariates	5103.7	5367.95	5161.68	846.24	0.78

Note. All latent class analyses are based on the unweighted detainee data, excluding 28 cases with likely invalid data.

The estimated probability of having a medical condition given membership in one of the latent classes (i.e., “conditional” probabilities because they are dependent or conditional on being in a given class), are shown in figure 3. Higher points on each line indicate an increased likelihood that participants in that class would have the corresponding medical conditions. According to this model, just over thirty two percent of CDDOC participants can be classified as having a low number of medical conditions, fifty five percent have a moderate number of conditions and about thirteen percent (12.9%) have a high number of medical conditions. For those with the highest number of medical conditions, figure 3 indicates that they are most likely to report respiratory conditions such as asthma, allergies, and other chronic lung diseases and to report severe headaches, back and neck pain, and arthritis (relative to other participants). Those with a moderate number of medical conditions were more likely to report, relative to those reporting few or no medical conditions, arthritis, back or neck problems, severe headaches and hypertension. The main distinctions between the high and moderate number medical conditions groups thus appears to be – aside from an overall general increased likelihood of reporting any condition – a propensity for respiratory illnesses and an especially high likelihood of experiencing severe headaches in the group with the highest number of medical conditions. Overall, those in the highest number of medical conditions group reported an average of 10.9 medical conditions; those in the moderate group reported an average of 5.3 conditions; and those in the lowest group reported an average of 1.7 conditions ($F_{(2,430)} = 335.59$ $p < .001$).

To further test the validity of the latent class model, we compared the latent class groups on their Sheehan disability scale scores for chronic medical conditions (Sheehan, Harnett-Sheehan, & Raj; 1996), calculated according to an algorithm provided with the WMH-CIDI materials. Higher scores indicate greater functional impairment attributable to medical problems. Using ANCOVA and controlling for the effects of age in the model, we found a statistically significant difference among the groups ($F_{(3,427)} = 6.7$, $p = .001$) and in the predicted direction with those in the high number of medical conditions group having the highest Sheehan disability scale score (1.066) followed by those in the moderate conditions group (.756) and those in the low number of medical conditions group (.367).

Analysis of the covariates included in the latent class model provides additional insight into which CCDOC detainees are more likely to have more complex medical profiles marked by multiple disorders. Table 9 shows the multinomial logistic regression results after regressing medical latent class on the selected covariates. Significant results indicate that a covariate was associated with increased or decreased odds of being in the high or moderate number of medical conditions latent class relative to the low number of medical conditions. None of the covariates were significant for the moderate number of medical conditions class. However, increasing age, lifetime alcohol dependence, and more severe psychological distress were all associated with being in the high number of medical problems latent class (odds ratios greater than 1.00). Being male and being black/African American (as opposed to Hispanic or white) were both associated with a lower likelihood of being in the high number of medical conditions class (odds ratios less than 1).

Figure 3. Latent Class and Estimated Medical Probabilities

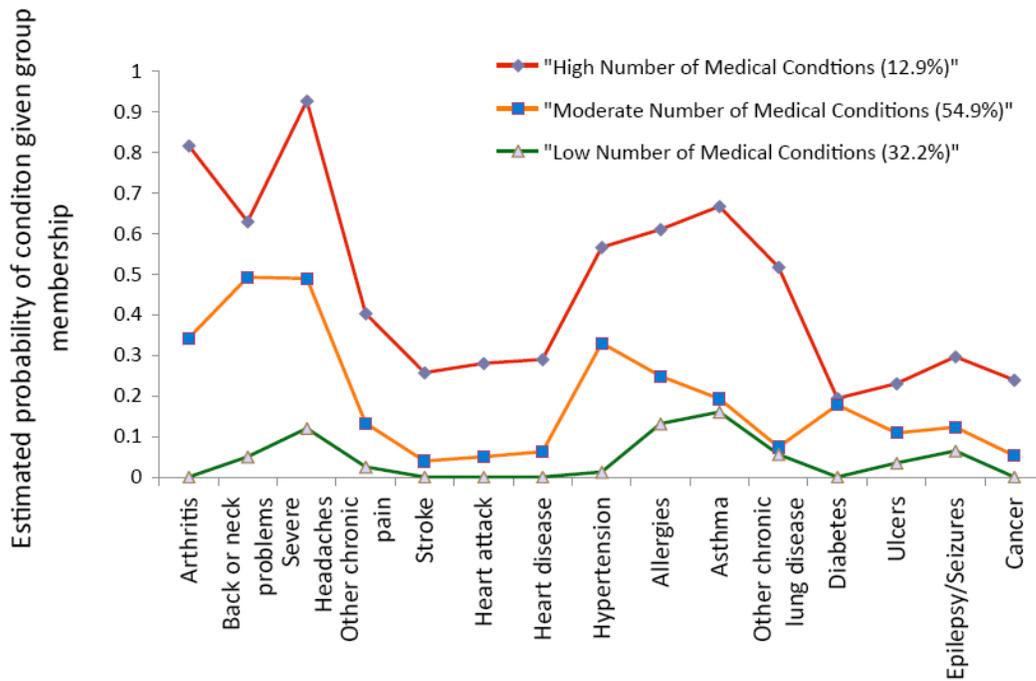


Table 9.
Multinomial Logistic Regression Results for Covariates by Latent Medical Class

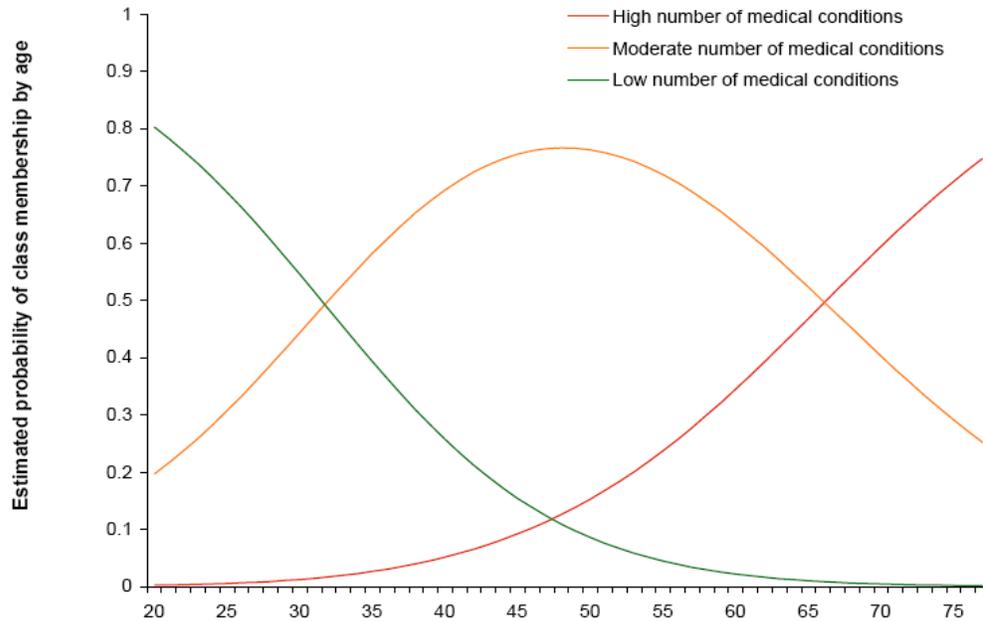
	High number of medical problems			Medium number of medical problems		
	OR	(95% CI)	Sig	OR	(95% CI)	Sig
Sex (female = reference category)	0.05	(0.01 - 0.33)	***	0.24	(0.03 - 1.85)	
Age	1.25	(1.15 - 1.36)	**	1.13	(1.06 - 1.19)	
Black/African-American	0.08	(0.01 - 0.77)	*	0.48	(0.06 - 3.96)	
White (All other ethnicities = reference category)	0.22	(0.03 - 1.74)		0.56	(0.07 - 4.57)	
Married (Unmarried = reference category)	1.16	(0.15 - 9.16)		0.84	(0.15 - 4.80)	
Lifetime alcohol abuse/dependence	4.57	(1.17 - 17.81)	*	2.00	(0.80 - 4.81)	
Lifetime drug abuse/dependence	2.66	(0.72 - 9.81)		1.06	(0.50 - 2.24)	
Lifetime tobacco abuse/dependence	0.61	(0.15 - 2.42)		0.94	(0.25 - 3.55)	
Severity of psychological symptoms past-year	1.15	(1.03 - 1.28)	*	1.08	(0.98 - 1.19)	

Note. Multinomial logistic regression analyses are based on the unweighted detainee data, excluding 28 cases with likely invalid data. Odds ratios reflect the increase or decrease in being in a latent class relative to being in the latent class reflecting the lowest number of medical conditions. Severity of psychological symptoms were assessed per the K6 screening scale. Substance use disorders assessed per DSM-IV criteria.

*p < .05; **p < .01; ***p < .001

Figure 4 depicts the strong association between age and latent medical class showing the estimated probabilities of group membership for each latent class by age in years. The probability of being in the low number of medical problems latent class was highest for participants 20 through 30 years of age, with the odds of being in the moderate number of medical conditions group increasing sharply, peaking at about age 50. After the age of 50, the odds of being in the highest number of medical problems class increase. By the age of 65, participants have the highest probability of being in the high number of medical conditions class. This finding supports the intuitive conclusion that the number (and functional severity) of medical problems increases with age. Older detainees – particularly those 65 years of age and older but beyond 50 years of age as well – are the most likely to have the highest number of medical problems relative to other detainees; those between 30 and 50 years of age are the most likely to have a moderate or intermediate number of medical conditions; and the youngest detainees, on average, have the lowest number of medical problems. The straightforward clinical implication is that community-based aftercare for medical problems on release from the jail is most important for detainees 50 years of age and older who suffer with relatively high rates of respiratory, musculoskeletal, and neurological conditions (i.e., severe headaches) and who are among those most in need of continuing medical attention.

Figure 4. Estimated Probabilities of Latent Medical Class by Age



One caveat to these findings is that the data do not include infectious diseases such as HIV/AIDS, other sexually transmitted diseases (STDs) and tuberculosis, which could be expected to be more prevalent among younger detainees and of particular concern because of their potential transmission to the general population. Post hoc analyses of the LCA data for the prevalence of HIV/AIDS, and past-year STDs and tuberculosis mostly support this contention but the differences did not reach statistical significance. Those in the moderate number of medical conditions group reported the highest rate of HIV/AIDS (5.6%) as compared with those in the low (1.5%) and high number (3.4%) of medical conditions groups ($\chi^2_{(2)} = 4.45, p = .118$). A higher proportion of those in the moderate number of medical conditions (4.2%) also reported being currently infected with an STD as compared with those in the high (2.9%) and low (1.2%) number of medical conditions groups ($\chi^2_{(2)} = 3.14, p = .275$). As only 6 participants reported past-year tuberculosis, we examined the lifetime rates. The trend was the same as for HIV and STDs and bordered on statistical significance; those in the moderate number of medical conditions group had the highest lifetime prevalence of tuberculosis (7.9%) followed by those in the high (3.3%) and low (3.0%) number of medical conditions groups ($\chi^2_{(2)} = 4.81, p = .07$). Although not statistically significant, these results suggest that middle-aged jail detainees in psychiatric treatment – those between the ages of 30 and 50 years old - tend to have higher rates of infectious diseases than younger and older detainees but the effect size is small. All groups have higher rates of infectious diseases, particularly HIV/AIDS than in the

general population and hence represent a potentially important transmission vector warranting medical attention (see also Hennessey et al., 2009).

The last issue we examined in relation to the first research question was the relationship between latent medical class and psychiatric disorders to determine if those with more medical problems also had a higher number of and/or more severe psychiatric conditions. The results of these analyses (Table 10) indicate they do and in the predicted direction; larger proportions of those with higher numbers of medical conditions met the criteria for DSM-IV lifetime psychiatric disorders than those with fewer medical conditions and the functional impairment due to the psychiatric disorders tends to be more severe. In particular, those with the highest number of medical conditions are more likely to meet DSM-IV criteria for a major depressive disorder, dysthymia, GAD, PTSD, and substance use disorders (excepting nicotine dependence). Moreover, the relationship between medical conditions and psychiatric disorders was linear for the conditions where the relationship was statistically significant; those with the highest number of medical conditions had the highest proportion with a given psychiatric condition, those with a low number of medical conditions had the smallest proportion with a given psychiatric condition, and those with the intermediate number of medical conditions were in between. Multi-morbidity was also associated with medical class. Those in the highest number of medical conditions group met DSM-IV criteria for 4.0 lifetime disorders; those in the medium number met DSM-IV criteria for 3.2 lifetime disorders; and those in the low number of medical conditions met DSM-IV criteria for 2.4 lifetime disorders ($F_{(3,427)} = 17.0, p < .001$). The same pattern pertained with respect to the severity of psychological distress in the past year as measured by the K6 as those with the highest number of medical conditions having the most psychological distress (mean K6 score = 15.4), those with a moderate number of medical conditions having moderate (but still severe) psychological distress (mean K6 score = 13.5) and those with the lowest number of medical conditions having the lowest K6 score (mean = 10.6; $F_{(3,427)} = 15.2, p < .001$).

Hence, there appears to be a strong association between medical conditions and psychiatric disorders, although the cross-sectional data limits our ability to discern the nature of the association (i.e., which set of disorders increases the chances of which or if there is mutual causation). A recent study that examined the relationship between lifetime exposure to trauma and PTSD on chronic medical conditions using NCS-R data reported similar findings with those exposed to a higher number of PTSD-related trauma experiencing a higher number of chronic medical conditions (Sledjeski, Speisman & Dierker, 2008). The possible clinical implication of these findings – that those with more severe or simply more psychiatric disorders also have more medical disorders – is considered further in the discussion section of the report.

Table 10.
DSM-IV Psychiatric and Substance Use Diagnoses by Medical Disorder Latent Class

	Number of Medical Problems						
	Low (N = 150)		Medium (N = 234)		High (N = 47)		Sig
	%	(SE)	%	(SE)	%	(SE)	
Non-Affective Psychotic Disorder^a	26.4	(3.5)	27.9	(3.1)	31.4	(7.4)	
Major Depressive Episode	34.4	(4.0)	53.7	(3.5)	72.9	(7.2)	***
Major Depressive Disorder^b	23.9	(3.6)	37.6	(3.4)	54.5	(7.8)	***
Dyathymia	10.8	(2.6)	18.3	(2.7)	33.0	(7.2)	**
Bipolar Disorder I	14.5	(3.2)	19.3	(2.7)	12.4	(4.6)	
Hypomania	9.2	(2.3)	5.5	(1.4)	9.7	(1.2)	
Any Affective Disorder	49.1	(4.4)	64.6	(3.4)	76.6	(6.9)	**
Post-Traumatic Stress Disorder	30.6	(3.9)	46.3	(3.5)	69.2	(6.9)	***
Generalized Anxiety Disorder	15.0	(2.9)	25.2	(3.0)	34.5	(7.4)	*
Attention Deficit Disorder	22.7	(3.6)	34.3	(3.3)	30.8	(7.5)	
Conduct Disorder	11.0	(2.5)	13.5	(2.3)	16.8	(6.2)	
Antisocial Personality Disorder	24.9	(3.9)	26.3	(3.1)	40.8	(7.7)	
Gambling Disorder	10.5	(2.4)	12.4	(2.2)	8.4	(3.7)	
Nicotine Dependence	60.5	(4.3)	68.1	(3.3)	58.9	(7.7)	
Alcohol Abuse	49.2	(4.3)	58.5	(3.5)	65.3	(7.5)	
Alcohol Dependence	19.9	(3.3)	34.7	(3.2)	53.1	(7.8)	***
Drug Abuse	59.6	(4.3)	70.2	(3.2)	81.7	(5.9)	*
Drug Dependence	37.3	(4.2)	50.2	(3.5)	69.8	(6.9)	***
Any Substance Use Disorder	76.4	(3.6)	81.9	(2.8)	94.4	(3.2)	*

Note. Column N's are based on the unweighted detainee data, excluding 28 cases with likely invalid data. Percentages and standard errors are based on data weighted for sampling probabilities and stratified by gender. All tests of significance are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction. All diagnoses except conduct disorder and antisocial personality are past-year.

^a The diagnosis of nonaffective psychotic disorder includes schizophrenia, schizoaffective disorder, and psychotic disorder not otherwise specified. It is based on clinician reviews of the open-ended responses to the psychotic screening section of the WMH-CIDI.

^b Based on the hierarchy rule for assessing major depressive disorder, which excludes cases that also meet the criteria for bipolar disorder.

*p < .05; **p < .01; ***p < .001

Q2: To what extent have detainees been able to access medical and behavioral healthcare services when not incarcerated and what have been the primary barriers to service access?

The WMH-CIDI questionnaire asks a large number of questions about lifetime and past-year service access spread across multiple sections of the instrument. For each psychiatric condition assessed, a series of questions ask if the respondent has ever received services for that condition(s), when, and if the services have been effective. Similarly, the chronic conditions section assesses access to medical care. There is, in addition, a separate services section that asks about access to psychiatric services generally and obtains details on the types of service providers seen, when they were seen, and whether the respondent completed treatment for the most recent services used. This section also asks about insurance coverage and barriers to accessing services expressed as reasons for delaying seeking services for more than a month. To address the second primary research question, we selected questions from all of the above sections. Again, although not a particular focus of this study, we compared men and women on service use, access, and barriers and report on statistically significant differences.

Use of community-based psychiatric services. A total of 331 of 438 participants (75.5% of the weighted sample) reported that they had ever been hospitalized in the community for at least an overnight stay for *problems with their emotions, nerves, mental health or use of alcohol or drugs*. Men (78.4%) were slightly more likely to have ever been hospitalized as compared with women (72%) but this difference was not statistically significant. Among those ever hospitalized, the mean number of lifetime psychiatric or substance abuse hospitalizations was 8.3 (women 7.9 hospitalizations, men 8.6 hospitalizations; ns). The average age of first admission was 25.2 years for all hospitalized participants (women 24.1 years, men 26.1 years; ns). In the 12 months preceding detention in the jail, 43.7 percent of the sample reported a psychiatric or substance use hospitalization (women 39.5%, men 47.1%; ns).

As shown in table 11, for most disorders, men and women reported “talking to a professional” at some point in their lives and high proportions reported that they had received “effective” community treatment. The age of reported first effective treatment ranged from 16.5 years for women with ADD to 29.8 years for men with a substance use disorder with most reports in the early to mid 20s. Interestingly, where there were differences in treatment access between men and women, the men were more likely to have received treatment than the women. In some instances, the differences were large. For example, 55.1 percent of the men who had ever talked to a professional reported having ever been hospitalized for GAD compared with 19.9 percent of the women ($p < .01$). There was a similarly large discrepancy between men and women receiving treatment in the year prior to detention for mania, hypomania, and bipolar disorder that again favored a much higher percentage of the men accessing treatment compared to the women.

Our findings indicate treatment access varies by condition. In particular, only a minority with PTSD reported having ever talked to a professional specifically about their PTSD-related symptoms. And just over 13 percent (13.4%) of the women who reported ever talking to a professional about their PTSD-related symptoms received any

treatment for PTSD in the year prior to detention. It is unclear why so few participants have received treatment for PTSD relative to other conditions given how pervasive PTSD and trauma-related symptoms appear to be in this population. It could be that the symptoms of PTSD such as withdrawal, sleeplessness, emotional blunting, etc. are overlooked relative to the more flagrant symptoms of other conditions such as bipolar disorder or they are attributed to other conditions such as major depressive disorder. Whatever the explanation, the need for more diagnosis and treatment of PTSD in this population is clear, particularly among women.

Most participants (Table 12) reported having had access to a psychiatrist at some point in their lives and a majority of participants (women 50.7%, men 67.6%, $p < .01$) reported seeing a psychiatrist in the past year. Only about a third of participants however, (25.8% women, 35.6% men, ns) saw a psychiatrist in the month prior to their arrest and detention, suggesting that they had discontinued treatment (and likely medication) some time over the course of the year in which they were arrested most recently. The use of any other kind of mental health provider was much less than for psychiatrists. For instance, only forty three percent reported ever seeing a psychologist, thirty seven percent a social worker, and thirty four percent a mental health counselor. Less than ten percent of participants reported they had seen any mental health providers other than a psychiatrist or other physician (10.8% of the men) in the month prior to arrest, further underscoring that in the time immediately preceding their current detention in CCDOC, most participants were not seeing a mental health professional in any discipline for their psychiatric condition. The apparent emphasis on psychiatry in lieu of other professions suggests that obtaining medication and medication management are the primary reasons for getting professional care, but this is speculative as the questionnaire does not include questions as to why one type of professional was seen over another.

Table 11.
Community Treatment History by DSM-IV Disorder and Gender for CCDOC Participants

		Ever Talk to a Professional ^a		Ever Hospitalized ^b		Ever Receive Effective Community Treatment ^b		Age First Received Effective Treatment ^c		Received Treatment 12 Months Pre-Detention ^b	
		%	(SE)	%	(SE)	%	(SE)	(Mean)	(SE)	%	(SE)
Major Depressive Episode/Disorder/Dysthymia	Men	86.0	(3.1)	83.2	(6.2)	70.9	(5.9)	23.2	(1.5)	77.9	(4.5)
	Women	81.9	(4.4)	70.0	(6.2)	72.2	(5.9)	22.0	(1.3)	65.4	(6.3)
Bipolar Disorder I/Mania/Hypomania	Men	72.1	(5.0)	72.0	(5.9)	78.8	(5.3) *	25.9	(2.4) *	68.4	(6.6) *
	Women	74.4	(8.5)	52.7	(11.3)	49.1	(11.3) *	19.0	(1.8) *	37.5	(11.2) *
Generalized Anxiety Disorder	Men	79.6	(5.1)	55.1	(7.1) **	69.2	(6.7)	26.1	(1.9)	70.7	(6.9) **
	Women	68.2	(7.9)	19.9	(8.4) **	67.2	(9.5)	25.1	(3.5)	35.5	(10.2) **
Post-Traumatic Stress Disorder	Men	30.5	(5.8)	4.9	(4.8)	45.3	(11.2)	24.2	(3.5)	21.1	(7.7)
	Women	31.1	(6.7)	8.2	(7.8)	73.1	(10.9)	23.6	(4.3)	13.4	(6.5)
Attention Deficit Disorder	Men	36.3	(7.1)	34.7	(11.6)	48.5	(12.2)	21.7	(3.5)		
	Women	20.3	(8.2)	44.5	(23.1)	66.0	(20.9)	16.5	(2.2)		
Any Substance Use Disorder	Men	54.5	(3.5)	-	-	78.3	(3.7)	29.8	(1.0)	47.3	(5.4)
	Women	61.8	(4.5)	-	-	68.0	(5.6)	28.0	(1.5)	39.0	(6.8)

Note. The N's for each row vary by the number of participants meeting DSM-IV lifetime diagnosis for a given disorder or group of disorders and excluding 28 cases with likely invalid data. Statistical comparisons are based on likelihood ratio chi-square tests on the weighted data, controlling for stratification on gender.

^a Percentages based on the subset of cases meeting lifetime DSM-IV criteria for a particular disorder or disorders.

^b Percentages based on the subset of cases reporting they had ever talked to a medical professional about their particular symptoms or condition.

^c Percentages based on the subset of cases reporting they had ever received effective treatment however the participant defined effective.

*p < .05; **p < .01

Table 12.
Treatment Use by Provider, Time Frame, and Gender for CCDOC Participants

		Time Frame					
		Ever		Past-Year		Past-Month	
		%	(SE)	%	(SE)	%	(SE)
Psychiatrist	Men	86.2	(2.3)	67.6	(3.3) **	35.6	(3.2)
	Women	79.6	(3.9)	50.7	(4.8) **	25.8	(4.1)
Other Physician	Men	28.5	(3.1)	21.1	(2.8)	10.8	(2.1) *
	Women	29.1	(4.4)	16.6	(3.6)	4.6	(1.9) *
Psychologist	Men	42.9	(3.4)	25.8	(2.9)	9.8	(2.0)
	Women	42.7	(4.7)	18.0	(3.6)	7.2	(2.1)
Social Worker	Men	35.4	(3.3)	22.1	(2.8)	9.9	(1.9)
	Women	38.9	(4.7)	17.1	(3.7)	7.6	(2.6)
Counselor	Men	32.4	(3.3)	17.2	(2.5)	9.0	(1.9)
	Women	36.6	(4.5)	16.7	(3.5)	9.2	(2.6)
Other Mental Health Professional ^a	Men	18.8	(2.7)	11.6	(2.1)	5.9	(1.5)
	Women	26.4	(4.2)	10.5	(2.9)	5.7	(2.0)
Other Health Professional ^b	Men	6.9	(1.7)	5.0	(1.4)	2.5	(1.0)
	Women	8.3	(2.5)	4.1	(1.7)	2.5	(1.2)
Religious or Spiritual Advisor	Men	16.5	(2.5)	8.0	(1.8)	3.2	(1.1)
	Women	13.6	(3.4)	7.3	(2.6)	2.8	(1.7)

Note. Analyses are based on the subpopulation of 349 cases that met DSM-IV criteria for any lifetime disorder excluding substance use disorders and 28 cases with likely invalid data. Statistical comparisons are based on likelihood ratio chi-square tests on the weighted data and controlling for stratification on gender.

^a Other mental health professional includes psychotherapist and mental health nurse.

^b Other health professional includes nurses and occupational therapists.

*p < .05; **p < .01

We attempted to explore reasons why participants were not seeing a mental health professional of any kind by asking them about their insurance coverage (Table 13) and reasons they might have for delaying treatment (Table 14). A large majority of participants do not have private health insurance and approximately fifty percent have no insurance coverage at all with the primary means of insurance being any type of government insurance such as Medicare, Medicaid, and insurance coverage available through TANF.

Given these findings, it could be expected that concern about cost and health insurance coverage would be important reasons participants might delay getting treatment. This was not the case, however, as these reasons ranked towards the bottom of the list of possible reasons for not seeking treatment. The primary reason given by a majority of participants who delayed getting treatment for more than four months was that they wanted to handle their problem on their own (81.8%). High percentages of participants indicated that their problem did not bother them much at first (58.6%), they did not think treatment would work (56.6%), they were unsure where to go

Table 13.
Insurance Coverage by Gender for CCDOC Participants

	Male (N = 262)		Female (N = 149)		Totals (N = 431)		sig
	%	(SE)	%	(SE)	%	(SE)	
Private health insurance directly from insurer	5.1	(1.5)	3.6	(1.5)	4.4	(1.1)	
Private health insurance from current/former employer	4.3	(1.2)	0.7	(0.7)	2.7	(0.8)	*
Private health insurance from spouse's employer	2.1	(0.8)	4.1	(1.6)	3.0	(0.8)	
Any type of government insurance	46.2	(3.1)	41.7	(4.2)	44.2	(2.6)	
Other kind of health insurance	1.3	(0.9)	3.5	(1.1)	2.5	(0.7)	

Note. Column N's are based on the unweighted detainee data excluding substance use disorders and 28 cases with likely invalid data. Statistical comparisons are based on likelihood ratio chi-square tests on the weighted data and controlling for stratification on gender.

*p < .05

Table 14.
Reasons for Delaying Tx by Gender for CCDOC Participants

	Male (N = 136)		Female (N = 78)		Totals (N = 214)		sig
	%	(SE)	%	(SE)	%	(SE)	
Wanted to handle on my own	81.4	(3.6)	82.4	(5.0)	81.8	(3.0)	
Did not bother much at first	53.5	(4.6)	64.7	(5.9)	58.6	(3.7)	
Did not think treatment would work	56.9	(4.6)	56.2	(6.2)	56.6	(3.8)	
Unsure where to go or who to see	49.9	(4.6)	60.2	(6.1)	54.6	(3.7)	
Thought problem would go away by itself	59.9	(4.5)	47.6	(6.0)	54.2	(3.7)	
Concerned what others would think if in treatment	48.8	(4.6)	56.3	(6.2)	52.3	(3.8)	
Scared about being put in a hospital against my will	52.7	(4.7)	48.4	(6.2)	50.8	(3.8)	
Thought it would take too much time or be inconvenient	41.5	(4.5)	49.9	(6.2)	45.4	(3.8)	
Received treatment before and it did not work	38.7	(4.5)	44.8	(6.2)	41.5	(3.7)	
Had problems with transportation and scheduling	33.3	(4.2)	42.9	(6.2)	37.7	(3.6)	
Health insurance would not cover	37.0	(4.4)	32.7	(5.7)	35.0	(3.6)	
Concerned about cost	34.2	(4.3)	29.7	(5.6)	32.1	(3.5)	
Not satisfied with available services	25.0	(4.0)	17.6	(4.9)	21.6	(3.1)	
Could not get an appointment	12.1	(2.8)	15.6	(4.6)	13.7	(2.6)	

Note. Column N's are based on the unweighted detainee data excluding 28 cases with likely invalid data and including cases that said they delayed seeking help or did not seek help for their psychiatric or substance use problems in the year prior to their detention in the jail. None of the statistical comparisons for gender were significant.

or whom to see (54.6%), or they thought that the problem would go away by itself (54.2%). Stigma ('concern about what others might think') and loss of personal freedom or control ('scared about being put in a hospital against my will') were also mentioned as reasons for delaying treatment by over fifty percent of participants.

These findings indicate that the related issues of treatment access and use are complex and not simply a matter of making treatment more affordable or convenient. Participants have doubts about treatment effectiveness, want to exercise a high degree of personal control over their lives, are concerned about forced hospitalizations, and

about how others might perceive them. This is not to say that increasing insurance coverage and affordability of mental health care are not important – having insurance might provide more choice in which providers or facilities are accessed – but clearly perceptions about treatment effectiveness and having greater input into treatment decisions and self-determination must also be addressed if the rates of treatment access and use are to be improved.

Use of community-based medical services. Because co-occurring medical conditions were an important aspect of this study, we examined the set of WMH-CIDI questions that asked about access to medical care. These included questions about whether a participant had a primary care physician and/or a regular place to go for medical problems, their use of emergency medical services versus regular medical services, and access to dentists and opticians. These data were disaggregated by latent medical class and are shown in Table 15. Many participants do not have a regular care physician or have a regular place to go for medical care. Across latent class groups, only fifty four percent of all participants reported having a regular doctor and only forty percent reported having a regular place to go for routine medical services. Only thirty five percent saw a dentist or obstetrician (among women) in the year preceding their arrest. And more participants visited a medical facility for emergency or urgent care (52.5%) than for a scheduled surgery or routine care (17.6%). For most categories, excepting dental and optometric care, those with a higher number of medical problems were more likely to have regular care and to use medical services (further validating the latent class model).

Table 15.
Medical Treatment Use by Medical Disorders Latent Class

	Number of Medical Problems					
	Low (N = 150)		Medium (N = 234)		High (N = 47)	
	%/Mean	(SE)	%/Mean	(SE)	%/Mean	(SE)
Have regular doctor when routine medical care needed?	37.3	(4.3)	61.3	(3.3)	63.3	(7.5) ***
Have regular place to go when need routine medical care?	34.7	(5.0)	42.4	(5.3)	50.4	(13.1)
Doctor visits in past year?						
Any (%)	51.5	(4.3)	68.2	(3.3)	83.3	(5.7) ***
Mean	1.7	(0.2)	4.4	(0.7)	5.3	(1.1) **
Visits to dentist or optician past year?						
Any (%)	32.2	(4.1)	34.0	(3.3)	44.6	(7.7)
Mean	0.7	(0.1)	1.0	(0.2)	1.0	(0.3)
Visits to a medical clinic for urgent care past year?						
Any (%)	32.2	(4.0)	51.3	(3.5)	66.2	(7.2) ***
Mean	0.8	(0.2)	2.1	(0.4)	3.1	(0.6) ***
Visits to a medical clinic for surgeries or scheduled care past year?						
Any (%)	6.3	(2.0)	18.7	(2.7)	37.6	(7.8) ***
Mean	0.2	(0.1)	0.7	(0.2)	1.9	(1.1)

Note. Column N's are based on the unweighted detainee data. Percentages and standard errors are based on data weighted for sampling probabilities and stratified by gender. Tests of significance of proportions are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction. Tests of mean scores are based on an F statistic and adjusted Wald test of significance.

* p < .05; ** p < .01; ***p < .001

This pattern of findings indicates that most participants did not have access to or did not use routine medical services, particularly younger detainees, and instead relied on

more expensive emergency services. As with psychiatric and substance use care, improvements are needed to increase access to routine primary care and decrease reliance on expensive emergency care services.

Q3: What community-based medical and behavioral healthcare services are most needed upon release from the jail?

Q4: How could community-based medical and behavioral healthcare services be best coordinated post-release to improve healthcare outcomes and reduce recidivism for detainees in psychiatric treatment?

These two questions do not require additional analyses beyond those already presented and instead require summation and discussion. Hence, we address these questions in the discussion section of the report.

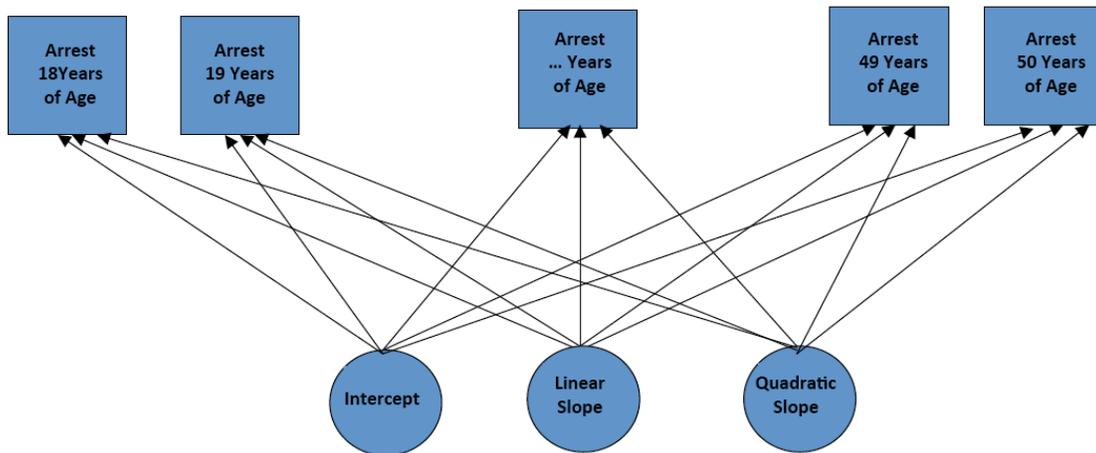
Q5: What are the criminal careers of those in psychiatric treatment within the jail and do the number and severity of crimes committed vary by the type of psychiatric disorder and/or the presence of substance use and medical disorders?

To examine the first part of this question, we employed a statistical modeling technique called latent class growth analysis (LCGA). Like the LCA model presented earlier that identified latent classes of participants based on patterns of medical conditions, LCGA also identifies groupings of participants based on the variance-covariance patterns among a set of observed indicator variables. A main difference between LCA and LCGA is that LCGA is used to analyze longitudinal data (i.e., the “growth” part of the analysis) whereas LCA is used for cross-sectional data. LCGA identifies groups of participants based on differences in their trajectories over time by estimating intercepts (starting points), linear change over time and, if applicable, quadratic and higher order factors for curvilinear changes over time (see Muthén, 2004; Muthén & Muthén, 2000). As with LCA models, parsimony, fit statistics, consideration of theory, and substantive knowledge are used to determine the best fitting model and number of latent trajectory groups.

Figure 5 shows the conceptual model for the LCGA analysis. Arrest information based on the ISP arrest history data were dichotomized by year for each participant based on their age at the time of arrest. For instance, for a participant arrested one or more times at age 23, the dichotomous arrest indicator would be set at 1 for that age. If there were not arrested again until they were 32, the indicators for ages 24 through 31 would be set to 0 and the indicator for 32 years of age would be set to 1. We created dichotomous indicators for each year of age from 18 through 50, beyond which there were too few older participants to generate reliable estimates of the probabilities of arrest. For participants younger than 50 years of age, we set the arrest indicator variables for all years between their age and 50 years to missing. This does not affect the overall N in the analyses as LCGA does not delete cases with missing data (i.e., listwise deletion). Instead, the models make use of all available data from each case to generate parameter estimates. Each latent class in the final model has a unique intercept, slope, and if applicable, higher order term that defines that classes’ trajectory. The decision to model arrests as a dichotomous event means that multiple arrests per

year were collapsed into one category and hence, the models do not distinguish between participants arrested once and more than once in a given year. This is because for most years, the probability of arrest was very low (near or at zero) and hence the data were very skewed. We believe it would not have been analytically appropriate to model this observed distribution at the interval level, although ordinal models (zero, one, more than one arrest) are worth exploring to assess if significant differences emerge between participants with multiple and one arrest per year. One additional caveat is that the models do not account for the seriousness of the arrest offense and treat each arrest, whether for robbery or loitering, as equivalent. This is another avenue worth exploring further analytically.

Figure 5. Latent Class Growth Analysis Model of Arrest History Data



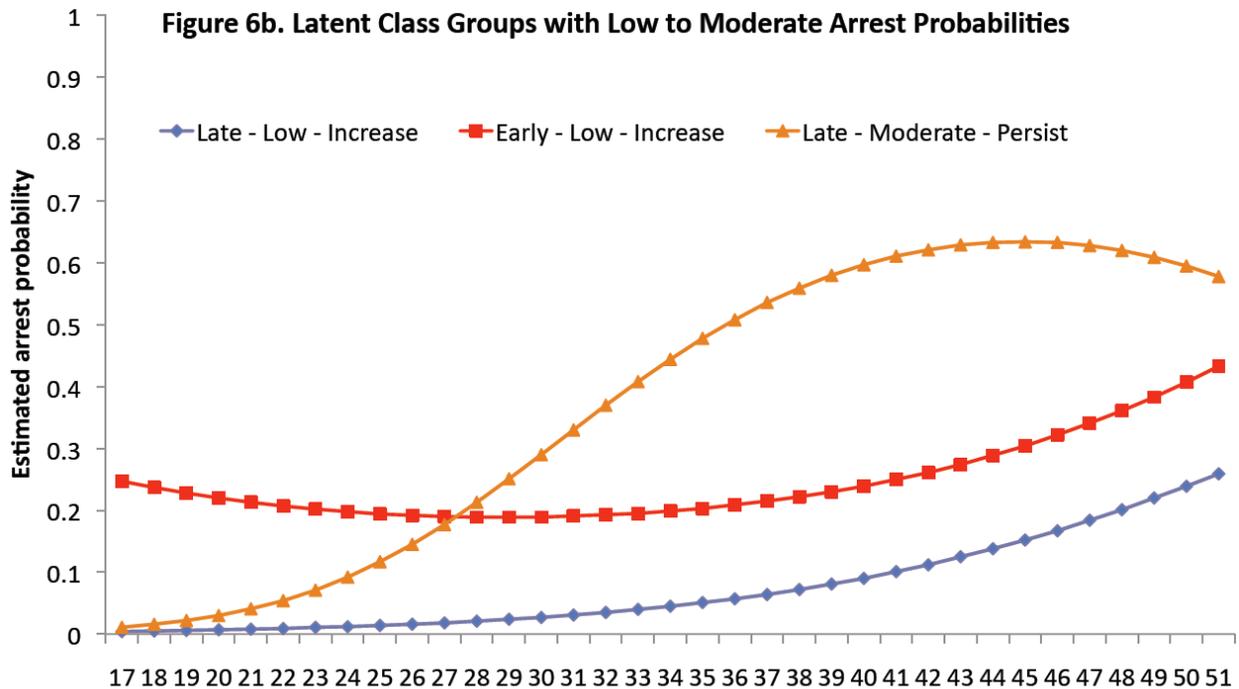
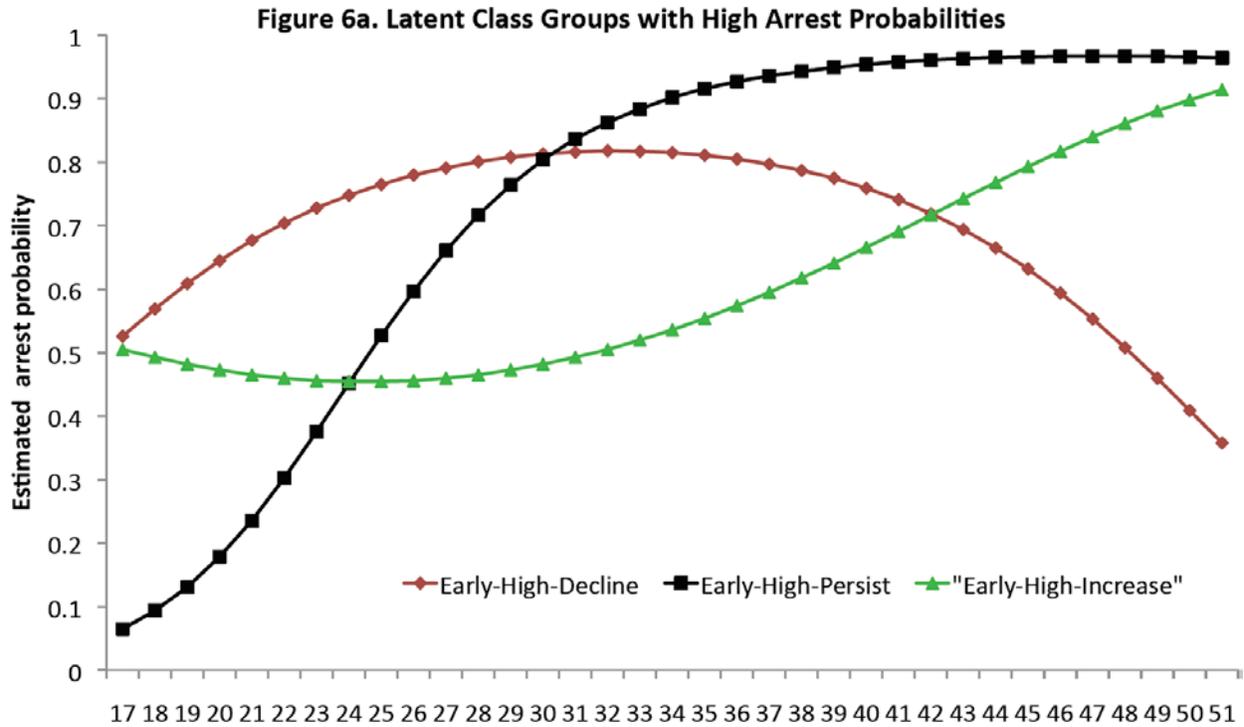
Fit statistics for LCGA models with 2 through 8 classes are shown in table 16. As with the LCA model, there was ambiguity in terms of model selection. The statistics indicate steadily improving fit up through the 7-class model. The BIC statistics for the 8-class model and the relatively small amount of improvement over the 7-class model for the AIC and sample-size adjusted BIC statistics suggest that fewer than 8 latent classes are needed to characterize different arrest history trajectories. While an argument can be made for either the 7-class or even 5-class models, we selected the 6-class model. The 7-class model creates a very small group (5 percent of participants) in one trajectory class and the fit statistics do not suggest a big improvement over the 6-class model whereas the 6-class mode does appear to provide a more substantial improvement over the 5-class model without the creation of very small groups of participants.

Table 16. Fit Statistics for 2 to 8 Class Latent Growth Mixture Models of Arrest Histories

Model Classes	Akaike (AIC)	Bayesian (BIC)	Sample-Size Adjusted BIC	Entropy
2-class				
3-class	10577.74	10621.68	10588.77	0.8
4-class	10505.49	10565.40	10517.80	0.76
5-class	10422.83	10498.72	10438.43	0.71
6-class	10389.01	10480.87	10407.89	0.71
7-class	10364.88	10472.72	10387.04	0.71
8-class	10344.06	10467.88	10369.51	0.71

Note. All latent class analyses are based on the unweighted detainee data, excluding 38 cases with likely invalid data and 21 additional cases with no matching arrest history data. The likelihood ratio chi-square statistic was not calculated because the chi-square tables were too large for estimation.

To aid in interpreting the data, we divided the resulting 6 classes of participants into 2 super-ordinate groups based on the pattern of their trajectories. Specifically, trajectories were characterized by when arrests began occurring (early versus late onset with early onset marked by arrests during the teenage years through the early twenties); the overall level of arrests (relatively higher probability of arrests during the peak years of offending defined as a probability $\geq .6$ versus moderate to low probability of arrests); and whether the arrest probability decreased, increased, or persisted throughout the life course. For presentation purposes, we divided the six groups into the three with the relatively highest rates of offending over the life course and the three with the relatively lowest rates of offending. High arrest rate groups are shown in Figure 16a; the low to moderate arrest rate groups are shown in Figure 16b. In both graphs, the groups are labeled by their arrest history onset – peak probability of an arrest – and duration of arrests. The percentages of participants among the three high arrest probability groups were as follows: Early-High-Divide (N = 24, 5.2%), Early-High-Persist (N = 123, 26.8%), Early-High-Increase (N = 65, N = 14.2%). The percentages among the low to moderate arrest probability groups were: Early-Low-Increase (N = 48, 10.5%), Late-Low-Increase (N = 92, 20.0%), Late-Moderate-Persist (N = 48, 10.5%). Hence, about 55 percent of participants were classified in one of the three high arrest probability groups and 45 percent in the low to moderate arrest probability groups.



The striking thing about the latent group arrest patterns is how the criminal career trajectories of many participants persist or peak into later years. The “typical” criminal career peaks in the late teenage years to mid twenties and then declines thereafter to decreasing rates of arrests and offending as the person ages out of their thirties

(Blumstein et al., 1986). However, it appears that many if not most of the participants evidence arrest rates that peak and persist past their fourth decade (and beyond). The arrest probabilities trajectory for only a small minority of participants (5.2%), those in the early-high-decline group, approximates the typical criminal career trajectory.

There are (at least) a number of possible explanations for these atypical findings. One explanation is simply that those with mental illnesses have criminal careers that start later and persist longer than is typical. Although symptoms of many mental illnesses begin in childhood and adolescence, diagnoses does not usually occur until much later, in early adulthood, when the symptoms are more florid. It could be that the downward spiral into impoverished and difficult life circumstances that can occur with SMIs may also lead to engagement in crimes and arrests. As mental illnesses such as schizophrenia and bipolar disorder persist throughout the life course, it could be that associated criminal activity also persists beyond what is usual.

Caution is urged, however, in speculating on such an interpretation of these findings. There are a number of limitations to the data that could also explain the atypical criminal career trajectories. The computerized arrest history database maintained by the ISP may not have accurate or complete data on the early arrest histories of older participants in particular because their arrests when they were young would not have been paired with the fingerprint records necessary to accurately catalog their full arrest histories. As computerization of the arrest history proceeded, and finger printing became more common and the arrest data became more accurate, the data would show an increase in arrest rates nearer the current time (i.e., at older ages) as reflected in the LCGA trajectory groups. To examine this possibility, we re-analyzed the data using only participants aged 40 and younger and arrest information for a period of 28 years (i.e., from the time they were 12 years old until they were 40 years old). Running the LCGA for a 6-class model produced a very similar set of findings with 4 of the 6 latent class groups showing an increase in the probabilities of arrest at a later onset that increased or persisted well into their late 30s. These results suggest that the findings of later onset and persistent offending are robust, at least with respect to age cohort.

There are several other issues that may have affected the findings. One is that the data do not account for periods of incarceration. Since a person cannot (typically) be arrested while incarcerated, significant periods of incarceration for participants could have influenced the trajectory estimates and suppressed offending rates. Our assumption in generating the data vectors based on the arrest histories was that a year in which no arrest was found indicated that the person had been in the community in that year but was simply not arrested. Clearly, because of the multiple arrests of most participants, many had likely been in jail or prison for varying periods of time throughout their lives. To the extent this was the case, our estimates understate the arrest probabilities. To the extent there may have been a pattern to when and who was more or less likely to have been incarcerated the estimates may be biased. Despite these important concerns and data limitations, we believe the finding that there are different arrest trajectories over the life course for offenders with mental illnesses will hold after further analysis and that the life course pattern of arrests is likely to be atypical from that

described in the criminology literature; specifically, that their criminal careers may begin later but persist longer than is the case for offenders without mental illnesses.

In the last set of analyses to be presented, we compared the 6 trajectory groups on demographics, psychiatric diagnoses, and substance use diagnoses to determine if any of these variables could be used to distinguish participants in each group. The results of these analyses are presented in Table 17. Among the demographic variables included in the analysis, only age was statistically significant. Those in the early-high-decline group were younger (mean age = 25.6 years) than participants in other groups while those in the early-low-increase group were older (mean age = 49.6 years) than other participants at the time of the jail interviews. Among the psychiatric diagnoses examined, only ASP and substance abuse or dependence were statistically significant and the importance of the pattern of results is hard to discern. For example, the two groups with the highest lifetime rates of substance abuse or dependence were the early-high-persist group and the late-low increase group, suggesting perhaps that substance abuse and dependence is associated with higher arrest rates at older ages. On the other hand, the role of ASP is less clear, having its highest association with the Late-Moderate-Persist and Early-High-Divide groups. More analytic work on these models is needed to make the nature of these relationships, if any, clearer.

Table 17.
Demographics, Substance Use and Psychiatric Diagnoses by Arrest Trajectory Group

		Low to Moderate Lifetime Arrest Rates			High Lifetime Arrest Rates		
		Late-Low-Increase (N = 92)	Early-Low-Increase (N = 48)	Late-Moderate-Persist (N = 46)	Early-High-Dedline (N = 24)	Early-High-Persist (N = 123)	Early-High-Increase (N = 65)
		% (SE)	% (SE)	% (SE)	% (SE)	% (SE)	% (SE)
Gender	Female	46.7 (5.0)	45.8 (7.5)	58.4 (8.8)	28.9 (10.8)	43.5 (4.3)	38.2 (8.3)
Race/Ethnicity	White	18.6 (3.8)	43.8 (7.8)	32.7 (7.8)	7.4 (5.1)	20.8 (3.7)	24.3 (5.2)
	African-American/Black	83.6 (5.8)	37.7 (7.5)	47.1 (7.7)	77.9 (9.1)	62.3 (4.7)	60.3 (8.4)
	Hispanic	18.1 (5.2)	12.5 (5.3)	18.4 (5.8)	14.7 (8.2)	11.8 (3.4)	13.6 (4.8)
	Other	1.7 (1.7)	6.0 (3.4)	3.7 (2.8)	0.0 (0.0)	5.1 (2.5)	1.8 (1.8)
Age group	18-25	32.4 (5.7)	0.0 (0.0)	5.0 (3.4)	71.6 (9.5)	10.5 (3.3)	0.0 (0.0)
	26-35	33.4 (5.2)	8.7 (4.8)	18.9 (8.0)	18.6 (8.0)	32.6 (4.5)	24.1 (5.9)
	36-45	29.0 (4.7)	20.0 (5.8)	38.0 (7.1)	3.7 (3.8)	35.0 (4.3)	35.0 (5.9)
	46+	5.2 (2.8)	71.3 (8.7)	38.2 (7.8)	8.1 (5.8)	21.9 (4.4)	40.9 (8.4)
	Age in years (Mean)	31.1 (1.1)	49.8 (1.2)	41.8 (1.4)	25.8 (2.1)	37.1 (1.0)	42.8 (1.1)
DSM-IV Diagnoses	Non-Affective Psychosis	25.5 (4.8)	20.0 (8.2)	33.5 (7.2)	31.2 (9.7)	28.2 (4.1)	37.7 (8.3)
	Major Depressive Episode	55.3 (5.8)	48.1 (7.7)	48.2 (7.8)	25.1 (9.2)	56.2 (4.8)	48.4 (8.5)
	Dysthymia	19.1 (4.3)	24.3 (8.9)	14.2 (5.4)	7.3 (5.0)	19.5 (3.7)	13.8 (4.4)
	Bipolar I	13.8 (3.8)	10.7 (4.2)	15.0 (5.2)	20.2 (9.1)	20.0 (4.0)	22.4 (5.7)
	Hypomania	8.4 (2.7)	4.9 (2.8)	13.7 (4.7)	0.0 (0.0)	7.1 (2.2)	4.2 (2.4)
	Generalized Anxiety Disorder	18.2 (4.0)	34.3 (7.3)	28.5 (7.1)	25.1 (9.2)	18.2 (3.7)	27.2 (5.8)
	PTSD	43.3 (5.8)	31.0 (7.8)	48.2 (7.7)	34.8 (10.2)	47.9 (4.8)	52.9 (8.5)
	ADHD	33.1 (5.3)	19.7 (5.9)	28.9 (8.8)	31.1 (10.0)	27.3 (8.1)	28.9 (8.9)
	Conduct Disorder	18.9 (4.1)	10.4 (4.7)	5.4 (3.1)	7.3 (5.0)	13.4 (3.1)	17.1 (5.3)
	Antisocial Personality Disorder	33.5 (5.4)	12.5 (4.9)	44.7 (7.8)	38.9 (10.4)	23.3 (4.1)	21.0 (5.7)
	Alcohol or Drug Abuse/Dependence	80.8 (2.9)	69.7 (7.4)	87.9 (7.2)	74.3 (9.4)	86.7 (3.1)	80.9 (5.0)

Note. Column N's are based on the unweighted database data. Percentages and standard errors are based on data weighted for sampling probabilities. All tests of significance are based on a modified Pearson's chi-square converted to an F statistic using a second order Rao and Scott correction. Sample N excludes 20 cases with likely invalid data and 31 cases without matching arrest data.

p < .01; *p < .001

Discussion and Conclusions

The current study sought to examine co-occurring psychiatric, substance use, and medical conditions among adult detainees in psychiatric treatment in a large urban jail. Data from past and current research suggested that this population would have high rates of CODs and that their access to and use of medical care while in the community would be limited. With some caveats and qualifications, both of these hypotheses were born out. The men and women participating in this study self-reported high rates of dental problems, physical injuries, headaches, and arthritis. The large majority also met DSM-IV criteria for substance use disorders. Consistent with other studies, which have surveyed medical illnesses more narrowly among those with SMI, they also reported high rates of hypertension, allergies, asthma, and STDs (cf., Iacovides & Siamouli, 2008). In particular, the women in our study had higher percentages of many of these disorders compared with the men.

Although the reported rates of these conditions for both men and women are elevated relative to general population rates, sociodemographic factors and severity of psychological symptoms appear to account for at least some of the disparity. After controlling for age, race, education level, marital status and severity of psychological symptoms, many of the disparities in prevalence diminish to non-significance. Nevertheless, our study found that those with serious mental illnesses, who are disproportionately represented in jails and prisons, especially women, have higher rates of a variety of medical disorders than those who do not. The fact that they (the detainees) also have higher rates of infectious conditions such as STDs, HIV, and hepatitis has the further implication that effective medical care for incarcerated populations represents an intervention point with broad public health implications. To the extent incarceration represents an opportunity to successfully treat infectious conditions, the benefits to those treated extend to the general population with which they interact on release (Restum, 2005).

The exact reasons why individuals with psychiatric disorders, regardless of their degree of criminal justice involvement, have higher rates of co-occurring medical conditions are not clear. There are likely multiple pathways such as: lack of access to regular medical care, poor lifestyle choices, poor adherence to treatment regimens, iatrogenic effects from the psychiatric medications, etc. Those in the criminal justice system in particular as evidenced by the high rates of PTSD found in this study - are also frequently exposed to trauma and to witnessing traumatic events such as domestic violence, beatings, and shootings. The combination of disorders ultimately affects mortality rates. As reported by Druss et al. (2006), for instance, individuals with schizophrenia have life expectancies 13 years shorter than a person who does not have schizophrenia. Across all SMIs, life expectancy is thirty percent shorter than for the general population (Fagliolini & Goracci, 2009). Moreover, as already noted, the transition period from incarceration to release represents a period of especially high risk for mortality (Binswanger, 2007). Hence, we would argue that a key point for providing health care for incarcerates with co-occurring psychiatric and medical disorders is during the first several months post-release.

Unfortunately, transition planning and care for community re-entry, while a recent area of research and service focus (Wilson & Draine, 2006) has not yet translated into stable, comprehensive systems of care for reentering detainees and prisoners. For instance, a study of Texas prisoners with HIV/AIDS who received antiretroviral medications while in prison, found that only a small minority of prisoners, five percent, filled their prescriptions within ten days post-release to avoid treatment interruption (Baillargeon, Giordano et al., 2009). Similarly, a PBS Frontline documentary on Ohio prisoners with psychiatric disorders found that upon release, they are given only fourteen days worth of medication and yet it can take as long as a month before they are able to requalify for benefits that would allow them to renew their prescriptions post-release (REF). As a result, repeat incarcerations among those with serious mental illnesses are common and higher than the recidivism rates of those without serious mental illnesses (Baillargeon, Binswanger et al., 2009; Weisman, Lamberti et al., 2004).

The burden of co-occurring medical conditions was not shared evenly among study participants. A latent class analysis of the medical conditions assessed for the study revealed that about thirteen percent of participants fell into what we have termed the “high number of medical conditions” group. These individuals were likely to report multiple medical conditions including respiratory problems such as asthma, allergies, and other chronic lung diseases as well as severe headaches, back and neck pain, and arthritis. These participants tended to be older (> 50 years of age), female, white, and had a lifetime history of alcohol dependence. They were also more functionally impaired as evidenced by higher scores on the Sheehan disability scale. These results argue, in a straightforward way for improved medical care for older inmates.

We also found that access to and use of psychiatric and medical care when in the community are limited. One of the more striking findings with respect to medical care was that about three times as many participants visited a medical facility for emergency or urgent care (52.5%) rather than for a scheduled surgery or routine care (17.6%). Only about half of participants reported having a primary care physician and only forty percent said they had a regular place to go for routine medical care.

With respect to care for psychiatric conditions specifically, about three-fourths of participants had ever been hospitalized with the average participant reporting 8 prior hospitalizations. Most participants also reported having received “effective” community treatment but men more likely to report receiving treatment-specific care than the women and treatment access (or use) varied by condition. In particular, PTSD, a relatively common disorder in this population appears to be only rarely addressed, especially for the women. With respect to access to providers working in specific disciplines, psychiatrists were the most commonly accessed treatment professional in the community, suggesting that most of the psychological care received probably involved medication management as opposed to counseling.

On the surface, these findings would seem to suggest that access to psychiatric/psychological care has not historically been a problem for these participants. However, we have no detailed measures of the quality and adequacy of services received. It is possible that the psychiatric hospitalizations were brief, lasting only long

enough to manage the person symptomatically, and that there was inadequate transition planning or service access on release from the hospital. Although many participants reported receiving effective care in the community, such care appears to be intermittently accessed. Particularly concerning is that only a third of participants – most of whom were receiving psychiatric medications while in CCDOC – reported seeing a psychiatrist in the month prior to their arrest. As we have already noted, this would seem to indicate that psychiatric medication had been discontinued sometime during or before the period immediately preceding arrest and their current detention in CCDOC. It is possible, although we do not have data to evaluate this claim, that the discontinuation of medication was causally linked to arrest and detention in the jail.⁶

Although many participants did not have insurance coverage, the ability to pay for health care was not one of the main reasons participants reported delaying or not receiving psychiatric services in the community. This was a surprising finding because high unemployment and low incomes likely make the expense of private health care coverage prohibitive for many if not most participants. Those engaged in the criminal justice system face additional hurdles owing to “collateral consequences” of their convictions and incarceration that make them ineligible for federal programs and benefits, housing, and erect restrictions that make finding employment more difficult on reentry (see Travis, 2002). Lacking employment, stable housing, and public health benefits would seem to be important constraints on accessing care. Ability to pay for care and concerns about insurance coverage were indicated as reasons for delaying treatment by about a third of participants, but given that only half indicated they had health insurance of any kind, why these were not more important concerns is puzzling.

The desire for greater self-determination, feeling that treatment was ineffectual and minimizing the severity and chronicity of their psychiatric conditions were among the more important factors that participants said limited their use of psychiatric services. Most participants (81.8%) said they wanted to handle their problems themselves or that their problem did not bother them very much or they thought it would go away. Concern about the stigma associated with being perceived as having a mental illness was also a barrier to care. We have interpreted these findings as meaning that improving access to and use of community-based psychiatric and psychological services is not simply about

⁶ Medication adherence is an acute problem among people with psychiatric conditions that are treated pharmaceutically. A recent landmark study – the Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) – found very high rates of nonadherence among participants with schizophrenia being treated with atypical antipsychotics (Manschreck, 2007). About seventy five percent discontinued taking their prescribed medication within a year of entering the study. The atypicals as well as other drugs used to treat psychiatric disorders have very unpleasant side effects that, in part, lead to the high nonadherence rates. We believe that our participant reports of not seeing a psychiatrist or other health care professional in the month prior to arrest may be related to high non-adherence rates as are their concerns about treatment not being effective.

insurance and the ability to pay. Participants seem to want more say in their care and do not want to lose personal freedom or control of their lives. Recent efforts to provide services whereby participants do have more say in their treatment (e.g., self-directed care, supported housing, supported employment) are promising in this regard as they embody models of care and services that maximize freedom of choice and independent living although they do require significant financial investment (Bond, et al., 2008; Cook et al., 2008; Nelson et al., 2007). A last factor of some importance was that, lacking a regular health care provider, about half of participants said they simply did not know where to go for treatment.

In the last analyses done for this report, we examined the arrest histories of participants to determine if different patterns of offending over the life course could be associated with psychiatric diagnosis or other factors. Although we were able to identify different offense patterns over time, there were relatively few clear statistically significant associations among various demographics and psychiatric diagnoses. The finding that does bear the most interest from these analyses, in our view, is that the estimated rates of arrest for many participants persisted or even peaked well into middle age whereas the typical criminal career peaks in the mid twenties and declines thereafter. This result may indicate that while specific psychiatric conditions may not be related to specific trajectories of offending over the life course, the main effect of psychiatric conditions, including substance use, may be that they prolong criminal careers and result in higher persistence and rates of offending over the life course than is typical. We want to underscore the tentativeness of this conclusion given that we could not account for time incarcerated in our analytic models. Planned revisions to the analytic model also include factoring in the onset of psychiatric disorders. We have already noted above model limitations and the need for further analyses to account for multiple arrests per year and the seriousness of the arrest offense.

Earlier in the report we deferred addressing two related questions: what community-based medical and behavioral healthcare services are most needed upon release from the jail and how could community-based medical and behavioral healthcare services be best coordinated post-release to improve healthcare outcomes and reduce recidivism for detainees in psychiatric treatment. Several of the findings just discussed directly bear on our response to these questions. There is no question that care in the community upon release needs to be better coordinated across the spectrum of health conditions. However, as priority areas we would identify continuity of care for psychiatric medications and psychotherapy, infectious conditions such as hepatitis, STDs, and HIV, and medical conditions/issues of relatively high prevalence such as asthma, arthritis, dental care, hypertension, headaches/neurological conditions, and chronic pain.

Two priority populations emerged from the data as being in particular need of improved access to health care in the community: detainees over 50 years of age and women. Older detainees reported a disproportionate number of medical conditions relative to other detainees and were more functionally impaired in multiple areas as a result. The women in our study, as in others, reported a higher number of medical conditions relative to men and to a matched cohort of women in the general population even after controlling for severity of psychological symptoms. At the same time, the

women also reported having less access to medical and psychiatric care than the men, an issue worth exploring further in future research including further analyses of the data collected for this study. We highlight again the very small percentage of women with PTSD who reported getting any treatment at all for this condition.

Given these priority areas and populations, the question remains as to how best to deliver care in the community to most effectively meet the identified needs of these priority populations as well as the needs of detainees with psychiatric disorders generally. We believe that the emerging trend of offering “co-located” services whereby health care for medical, psychiatric, and substance use disorders are delivered in the same location by a coordinated team of practitioners has great promise. The co-location of care model would directly address some of the main concerns related to health care access and use identified by participants. Comprehensive care delivered in a single location would alleviate confusion about where to get care for any given problem and provide individuals in need of care with a regular place for routine medical and psychiatric care as well as a primary-care physician with knowledge of their medical history. Because the provision of services in a co-located care model is not identified as being specific to psychiatric and substance use treatment and as being about general health, stigma associated with receiving behavioral health care could potentially be lessened. In addition, individuals with psychiatric or substance use problems who may not be inclined to seek treatment for these problems, may still be inclined to seek care for their medical conditions, providing the opportunity for health care providers to use evidence-based techniques such as motivational interviewing to encourage them to address their psychiatric and substance use problems.

Because co-located services are an emerging trend, a best-practices model has not yet been identified for the general population let alone for criminal justice populations. In an evaluation of randomized controlled trials of various models for delivering medical care to persons with psychiatric and substance use disorders, the findings for six different models were reviewed (Druss et al., 2006). Examples of the variations in service delivery for each model include onsite delivery of medical care in a methadone clinic to an onsite primary care provider, nurse practitioner, and nurse case manager providing and managing medical care in a VA mental health clinic. Each model was evaluated on the dimensions of linkage, quality, outcomes, and cost of care. Findings were that all of the models evaluated were more-or-less equally effective in improving medical care and outcomes for the target population. Among the study’s conclusions, the authors write: “Regardless of whether services are co-located, the key element of these collaborative care approaches is that they involve functionally integrated care teams” (p. 150).

In this respect – a functionally integrated care team – a service model for providing coordinated care for a criminal justice sample with mental illnesses known as “Project Link” that uses multidisciplinary teams to access comprehensive services has shown some promise (Weisman et al., 2004). The Project Link model appears to be a hybrid of assertive community treatment, intensive case management, and advocacy rather than providing co-located services per se. Nevertheless, any reasonable effort to better

coordinate comprehensive care for offenders with mental illnesses is worth exploration at this point in time.

At various points in the report, we have noted study limitations, particularly with respect to the analyses of the arrest history information. Other important limitations include our undersampling of detainees who cycled in and out of the jail's psychiatric treatment units rapidly before they could be interviewed. Although we weighted the data to correct for any bias owing to this problem with coverage, bias in the sample may remain. Most of the data analyzed are based on participant self-report, sometimes of events that happened many years prior to the interview, introducing the possibility of recall bias. In addition, the fact that most participants had serious mental illnesses may have affected their ability to recall events, diagnoses, and symptoms accurately although all the analyses presented here excluded participants who were assessed as being confused, possibly hallucinating, or unable to comprehend or attend to the interview questions. The diagnosis of non-affective psychosis was done based on our analyses of screening questions and medication histories and is, at best, provisional and suggestive only. A full clinical interview and careful review of the participant's psychiatric history would be needed to make a definitive diagnosis.

As the first draft of this report was being written, the nation was engaged in a wide-ranging and sometimes contentious debate about the future of the health care system and the need for comprehensive reform. The passage of federal legislation (the "Affordable Care Act") signed into law March 23rd 2010 by President Obama, extends health insurance to a majority of Americans (an estimated 32 million of the 50 million who are uninsured would be covered), expands Medicaid, and subsidizes health insurance for the poor. These substantial policy changes hold the promise of improving the affordability of health care for criminal justice populations such as jail detainees. In the context of these changes on the continuing national debate in their wake, we believe it is important to underscore that the large majority of our participants lacked private insurance to provide for their health care needs. Even those with publicly funded insurance such as Medicaid or Medicare have their coverage eligibility provided by these programs interrupted by incarceration, requiring they reapply for benefits on release. Such disruptions in coverage are not trivial for those requiring regular medication to manage their (multiple) disorders. In the case of those requiring medication for conditions such as HIV, the disruptions can be life threatening. Although lack of insurance was not cited as one of the main reasons for medical or psychiatric care inaccessibility and treatment delay, it could well be an underlying reason why many participants said they lacked a primary care physician, a routine place to go for medical care, or did not even know where to go for services. Because they are part of the estimated fifty million Americans without health insurance prior to the passage of the health care reform legislation, providing basic health care coverage for a majority of Americans could be an important step in addressing the multiple medical, psychiatric, and substance abuse treatment needs of offenders with SMI, thereby reducing the substantial burden on jails and prisons to provide such care, and instigating the development of effective, community-based models of co-located care to serve this population.

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Appendices

**Recruitment script/Contact Agreement form
“Study of Co-occurring Disorders and Treatment Services”**

I want to ask if you would be interested in being contacted to participate in a study that is being done at the jail. Research staff from the University of Illinois at Chicago want to interview people in the jail who are receiving treatment for emotional problems to find out if they also have problems with drugs and alcohol and other medical problems. If you give your permission today, someone from the research staff will contact you within the next few days to explain more about the study and to see if you want to participate. Your agreement today is just to allow them to contact you. It does not mean that you are agreeing to be in the study. You will make that decision with the research staff after they explain the study more fully to you. You do not have to participate in the research and you do not have to agree to be contacted. Whether you decide to be contacted or not will not affect your treatment at the jail or the status of your case now before the court.

[Ask Participant: Do you understand what I have just read to you?]

[Ask Participant: Can you explain back to me what you are agreeing to today?]

[Ask Participant: May I have your permission for the research staff to contact you? If yes, have the participant sign below. If no, thank them for their time and tell them they will not be contacted. In the signature line, record “Refused” and note the date.]

Signature

Date

Printed Name

Signature of Staff

Date (must be same as participant's)

University of Illinois at Chicago
Authorization To Use And Disclose Health Information For Research
“A Study of Co-occurring Conditions and Treatment Coordination for Jail Detainees”

You are being asked to permit James Swartz, Ph.D., from the Jane Addams College of Social Work at the University of Illinois at Chicago and his research staff to use and disclose protected health information (PHI) that identifies you for the research purposes described below. You are also being asked to permit your doctors and other health care providers to disclose PHI to these Researchers for the purposes described below. The privacy law [45 CFR Parts 160 and 164], Health Insurance Portability and Accountability Act (HIPAA) provides additional protections for PHI. You must sign this authorization if you wish to allow your PHI to be used or disclosed for this research.

Description of protected health information to be used and disclosed

The protected health information that may be used and disclosed includes all protected health information in your medical records that is related to the research including illnesses and hospitalizations that occur while you are participating in the research, as described in the Consent for Participation in Research entitled *A Study of Co-occurring Conditions and Treatment Coordination for Jail Detainees*. CCDOC medical records include medical diagnoses given while participants were detained (during the current or any previous jailings) and the results of diagnostic tests that may have been administered. The potential diagnostic test results include the following conditions: hepatitis, gonorrhea, syphilis, Chlamydia, HIV, tuberculosis, and diabetes and the results of any dental examinations.

The protected health information that may be used and disclosed includes the information as described above, which is collected and maintained by your physicians and other healthcare providers which are identified below:

Cermak Health Services, Cook County Department of Corrections, Chicago, IL

Research use of your protected health information

- The Researchers can use and share your protected health information to conduct the research;
- The Researchers can disclose your protected health information to representatives of government agencies (i.e., Food and Drug Administration) where required by law; and
- The Researchers can disclose your protected health information to the University of Illinois Medical Center at Chicago and University of Illinois at Chicago representatives including the Institutional Review Board.
- Once the Researchers disclose your information to anyone outside of the study, it may be re-disclosed and may no longer be protected by this Authorization and the federal privacy regulations.

Protection of your health information

The Researchers and the Illinois Criminal Justice Information Authority agree to protect your health information by using and disclosing it only as permitted by you in this Authorization or as is directed by state and federal law. Further, no publication about the research will reveal your identity without your express written permission. These limitations continue even if you decide to revoke (take back) this Authorization.

Removal of your identifying information (De-Identification)

Once the information that identifies you is removed, the information that remains is no longer Participant to this Authorization or to HIPAA. The remaining information may be used and disclosed by the Researchers as permitted by law and may be used and disclosed for other research purposes.

Inclusion of your protected health information in a database or data repository

Your protected health information is being collected and maintained as part of a database or data repository and, therefore, this Authorization will not expire at the end of the research study unless you revoke (take back) your Authorization before the research study ends.

Your options

You do not have to sign this Authorization, but if you do not, you will not be allowed to participate in this research study. However, if you decide not to sign this authorization it will not affect your treatment, payment or enrollment in any health plans or affect your eligibility for benefits.

Expiration of Authorization

This Authorization does not expire, but can be terminated if you decide to withdraw your permission.

Withdrawal or removal from the study

You may change your mind and revoke this Authorization at any time. To revoke this Authorization, you must write to: Dr. James Swartz, University of Illinois Chicago, Jane Addams College of Social Work, 1040 W. Harrison St., M/C 309, Chicago, IL 60607. However, if you revoke this Authorization, you may no longer be allowed to continue participation in the research study. Furthermore, even if you revoke this Authorization, the Researchers may still use and disclose health information they already have obtained as necessary to maintain the reliability of the research and to report any adverse effects (bad events) that may have happened to you.

Contact information for questions about my rights under HIPAA

If you have questions or concerns regarding your privacy rights under HIPAA, you should contact the University of Illinois at Chicago Privacy Officer at Ph: (312) 996-2271.

If you have not already received a copy of the Notice of Privacy Practices, you should request one. You will be given a copy of this Authorization after it has been signed to keep for your records.

A. Signature of Participant or Legally Authorized Representative

I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I authorize the use and disclosure of my protected health information for this research.

Signature of Participant

Date

Printed Name of Participant
(must be same as Participant's)

Signature of Parent / Guardian or
Legally Authorized Representative of Participant

Date

Printed name of Parent / Guardian or
Legally Authorized Representative of Participant

Describe relationship to Participant including the legal authority this individual has to act on behalf of the Participant.

Signature of Witness

Date

Printed name of Witness

Describe why a witness signature is required and the relationship to the Participant.

University of Illinois at Chicago
Consent for Participation in Research
“Study of Co-occurring Disorders and Treatment Services”

Why am I being asked?

You are being asked to participate in a research study about the use of health care services, drug use, medical problems, and emotional problems conducted by Dr. James Swartz of the University of Illinois at Chicago. The study is being funded by the Illinois Criminal Justice Authority. You have been asked to participate in this research because you are receiving treatment for emotional problems in the Cook County Jail. We ask that you read this form and ask any questions you may have before agreeing to be in the research. The interviewer will also ask you questions to make sure you understand the study and what your involvement would mean.

Why is this research being done?

Many people detained in the jail have problems with their emotions and nerves. They may also use alcohol and other drugs to help with their emotional or physical problems. The combination of emotional problems and drug use can also often lead to medical problems as well such as hepatitis and other kinds of serious infections. In this study, we want to find out how many people in psychiatric treatment in the jail use alcohol and other drugs and what medical problems they may have. We also want to find out how often you receive treatment for your emotional, drug use, and medical problems when you are not in jail or prison and what problems you may have getting the treatment you need. We hope this information will help us better understand how to organize treatment for people who have more than one kind of problem and who may need more than one kind of treatment at the same time.

What procedures are involved?

If you agree to be in this research, you would be part of a group of about 450 people who will be interviewed. Based on past experience, we expect the interview to last from 3 to 4 hours. We will try and complete the interview in one session but if you feel tired or want to stop for any reason, we can come back a second time to complete the interview. During the interview, you will be asked many questions, including some very personal ones. These questions will ask about your emotional problems, whether you use illegal drugs or alcohol and how often you use them, your use of medical services, any past treatments you may have had for emotional or drug use problems, and any medical conditions you have now or in the past. We will also be asking your permission to review your medical records and your criminal history records so we will ask you for identifying information such as your name, birth date, and social security number. This study does not involve any more interviews beyond the one we do in the jail. However, we may be applying for additional funding to do follow-up interviews after you leave the jail. To help us find you for a follow-up interview, we will be asking you for contact information such as your phone numbers and addresses and the names, phone numbers, and addresses of your relatives and friends. Your agreement today does not obligate you to participate in any follow-up study. You can decide whether you want to participate in any further interviews at a later time.

What are the potential risks and discomforts?

The study has several risks: You may become uncomfortable when answering questions of a personal nature or you may be upset if some of the questions cause you to remember difficult experiences and times in your life. If this happens, or if you want to stop the interview for any other reason, you may do so at any time without any consequences. Withdrawing from the study or declining to participate in the study will in no way affect your receipt of treatment services, your case before the courts, the outcome of your case, or how long you will be in the jail. We have also instructed our interviewers to stop the interview if they see you are becoming upset and to make sure you are seen by someone on the jail's clinical staff. Again, there will be no consequences to you if the interviewer decides to stop the study.

Another risk is that you will be providing the research staff with personal information about your life, including drug use, medical problems, emotional problems, and arrest information. Every attempt will be made to ensure the confidentiality of the information you give us.

Are there benefits to taking part in the research?

There are no direct benefits to you for participating in the study though you may find it interesting to talk about your problems and treatment with the interviewer.

What about privacy and confidentiality?

Although jail staff will know if you decide to participate in this research, because they are involved in arranging for you to meet with research staff who conduct the interviews, nothing that you say in the interviews will be shared with jail staff. We will conduct the interviews in private interview rooms at the jail to protect the confidentiality of your responses.

To help us protect your privacy, we have obtained a Certificate of Confidentiality from the National Institutes of Health. With this Certificate, the researchers cannot be forced to disclose information that may identify you, even by a court subpoena, in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. The researchers will use the Certificate to resist any demands for information that would identify you, except as explained below.

You should understand that a Certificate of Confidentiality does not prevent you or a member of your family from voluntarily releasing information about yourself or your involvement in this research. If an insurer, employer, or other person obtains your written consent to receive research information, then the researchers may not use the Certificate to withhold that information.

No information about you or provided by you during the interview will be disclosed to others without your written permission, except:

- *if necessary to protect your rights or welfare (for example, if you are injured and need emergency care or when the University of Illinois at Chicago Institutional Review Board monitors the research or consent process); or*
- *if required by law; or*

- if you indicate to the interviewer that you are a danger to your self or to others through verbal or non-verbal responses, we will immediately stop the interview and make a referral to the Mental Health Services Crisis Team at the jail.

In order to make sure you are paid for participating in the study, we will record your name and jail ID. Your name and jail ID will be kept on a separate form from the ones used to collect the interview information so that no one can link your name or jail ID with your interview responses, your medical records, or your arrest histories. However, we will have to reveal your name and jail ID to the accounting departments at the University and at the jail so that they can create a check in your name and have that check deposited in the correct commissary account at the jail. The people in these departments will only know that you are being paid for being in a research study but they will not know why you have been selected to be in the study, nor will they have any access to the information you provide during the interview.

We will also have to reveal your name to the Illinois Criminal Justice Information Authority to get your arrest history records. Authority staff know about the study and why you have been selected because they are funding the study. However, we will not share with them your interview information or your medical records information.

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. If we publish or present our findings at scientific conferences, we will only present such information for the group of people we interview and will not present information for any single person.

We are required to keep your signed consent form on file. We will keep this form in a locked cabinet at the University of Illinois offices of Dr. Swartz in a locked room. No one outside the research team will have access to these forms and they will be kept separate from the interview forms, which will have no identifying information on them. When the study is complete and the data have been analyzed, sometime within the next two years, we will destroy the consent and interview forms. If we do obtain money for a follow-up study, we will keep your contact information on file but keep it separately from your interview results in a locked file cabinet at the University.

What are the costs for participating in this research?

There are no costs to you for participating in this research.

Will I be reimbursed for any of my expenses or paid for my participation in this research?

If you agree to participate in this study, you will be paid \$40.00 for your time, to be placed into your commissary allowance at the jail. We will attempt to put this money into your account as soon as possible, but because of the processing time to create the check to pay you, the money may not be on your account for up to four weeks after your interview depending on administrative procedures at the jail and at the University. If you should happen to leave the jail before the money is deposited in your name, you may return to the jail to obtain the money deposited for you at any time.

Can I withdraw or be removed from the study?

You can choose to withdraw from the study and you can also be removed from the study. You may withdraw from the study at any time for any reason without any consequences. Your withdrawal will not affect your status at the jail, your receipt of payment for your participation, your receipt of treatment services, your court case, your sentencing, or how long you stay in the jail. The interviewer may remove you from the study if: you present a clear danger to the interviewer; you are visibly upset or otherwise unwilling to participate in the research; or other requirements at the jail such as the need to appear in court or consult with your lawyer prevent you from completing the interview in a timely manner. You can refuse to answer some of the questions during the interview and remain in the study. However, if it becomes clear that you are declining to answer many or most of the questions, we will stop the interview and your participation in the study will end. If the interviewer terminates the interview for any reason, this will also not affect your status at the jail, your receipt of treatment services, your court case, your sentencing, or how long you stay in the jail.

Who should I contact if I have questions?

If you have any questions about your rights as a research subject, you may call the Office for Protection of Research Subjects (OPRS) at the University of Illinois at Chicago at 312-996-1711. For questions about the study itself, or to discuss any problems, or concerns you have related to the study, you may contact the Principal Investigator, Dr. James Swartz of the University of Illinois at Chicago by calling collect at 312-996-8560. You may also ask your interviewer any questions you have about the study or your rights as a research subject.

Remember: Your participation in this research is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University, with the Cook County Department of Corrections, the Cook County Court, the Illinois Department of Corrections, or Cermak Health Services. If you decide to participate today, you are also free to withdraw at any time without affecting these relationships.

You will be given a copy of this form for your information and to keep for your records.

Signature of Subject or Legally Authorized Representative

I have read (or someone has read to me) the above information. I have been given an opportunity to ask questions and my questions have been answered to my satisfaction. I agree to participate in this research. I have been given a copy of this form.

Signature

Date

Printed Name

Signature of Researcher

Date (must be same as subject's)

Printed Name