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Ariel Albertie April 17, 2013

Connectivity, Prison Environment and Mental Illness among First-time Male Inmates in Mexico City, Mexico

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An abstract of
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Abstract

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By Ariel Albertie

Research suggests that prison populations are disproportionately affected by mental illness compared to the general population. However, little research has examined how contextual factors surrounding the prison experience are associated with depression and/or substance use among first-time inmates. Even fewer studies have explored these contextual factors, particularly connectivity and the prison environment, in low- and middle-income country (LMIC) prison settings. The current study examines associations between connectivity, the prison environment, and mental illness, specifically major depression, alcohol use and drug use among first-time male inmates (n=593) in three Mexico City, Mexico prisons. Severe depression (46.2%) and drug use (53.8%) was reported by approximately half of respondents, while alcohol use (7.9%) was less prevalent. Conjugal visits, visitations, prison employment, physical attacks, cellmates and sentence time served were all found to be significantly associated with severe depression or substance use, suggesting that mental illness among inmates is influenced by differential exposures in prison rather than confinement alone. These findings can inform mental health policy regarding adjustment to prison as well as prevention and treatment strategies in prison settings.

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Chapter I: Introduction

As a result of the deinstitutionalization movement among mental health facilities in the 1960s and 1970s, psychiatric hospitals experienced a drastic decrease in patient populations (Adams & Ferrandino, 2008). Thousands of patients were released to communities that had little services or resources to adequately provide support to the mentally ill, many of whom later became involved with the criminal justice system. The effects of this movement are evident today: as of May 2011, more than 10.1 million people were estimated to be imprisoned worldwide, a population that has been rapidly increasing over time and currently equates to a world prison population rate of 146 per 100,000 (Walmsley, 2011; Fazel & Seewald, 2012). Despite the fact that most prisoners today are found in low- and middle-income countries (LMIC), knowledge about the mental health status of these inmates is limited (Fazel & Seewald, 2012). Although a large body of research has provided evidence that the state of imprisonment solely affects the mental health status of inmates, far less research has focused on the influence of multiple contextual factors surrounding the prison experience. Specifically, few researchers have accepted a multi-dimensional approach that emphasizes how imprisonment and mental illness are complexly interrelated with a range of contextual factors—the prison environment, external connectivity or deprivation, and childhood and adult life history among others—and that the confluence of these sources of stress, known throughout the literature as the pains of imprisonment, together determine levels of psychological distress among inmates. As the prevalence of mental illness among prisoners remains high and inadequately treated, a more thorough understanding of the underlying contextual factors is needed in order to address the influences that determine quality of life while incarcerated and provide improved screening and

treatment targeted towards mental ill inmates to ultimately reduce the risk of future maladaptive behaviors.

Objectives and Aims:

The objective of the current study is to examine the relationships between several contextual dimensions of imprisonment and mental health among a population of self-reported first-time male inmates in Mexico City, Mexico. Underlying this objective are numerous aims:

1. To describe the prevalence of self-reported mental health measures, specifically major depression and substance use among first-time male inmates in Mexico City, Mexico.
2. To examine the influence of the prison environment on reported major depression and substance use among first-time male inmates in Mexico City, Mexico.
3. To examine the influence of external connectivity or deprivation on major depression and substance use among first-time male inmates in Mexico City, Mexico.
4. To examine the influence of childhood and adult life history on major depression and substance use among first-time male inmates in Mexico City, Mexico.

Mental Health in Prison Settings:

Mental illness encompasses a wide array of disorders that range in both intensity and duration. Specific estimates of mental illness among prisoners depend heavily on the study sample and location, research methodology and definition of mental illness used (Adams & Ferrandino, 2008). However, it is widely recognized that prison populations house elevated numbers of behaviorally high-risk and mentally ill individuals compared to the general population (Fazel & Danesh, 2002; Fazel & Seewald, 2012). Systematic reviews of literature show that mental illness disproportionately affects prisoners across the world, especially in low- and middle-income countries (Figure 1) (Fazel & Danesh, 2002; Fazel & Seewald, 2012).

According to the American Psychiatric Association (APA) (2004), depression, schizophrenia and bipolar disorder are the most common mental illnesses diagnosed among inmates (APA, 2004; Adams & Ferrandino, 2008). In 2002, the National Commission on Correctional Health Care reported that daily "between 13.1 and 18.6 percent of the inmates have major depression; between 2.3 and 3.9 have schizophrenia or other psychotic disorders; 2.1 to 4.3 percent suffer from bipolar disorder; 22 to 30.1 percent have anxiety disorder; and 6.2 to 11.7 percent have post-traumatic stress disorder" (APA, 2004). Prior research has also indicated that mental illness and substance abuse often co-occur among criminal populations (White, Goldkamp, & Campbell 2006).

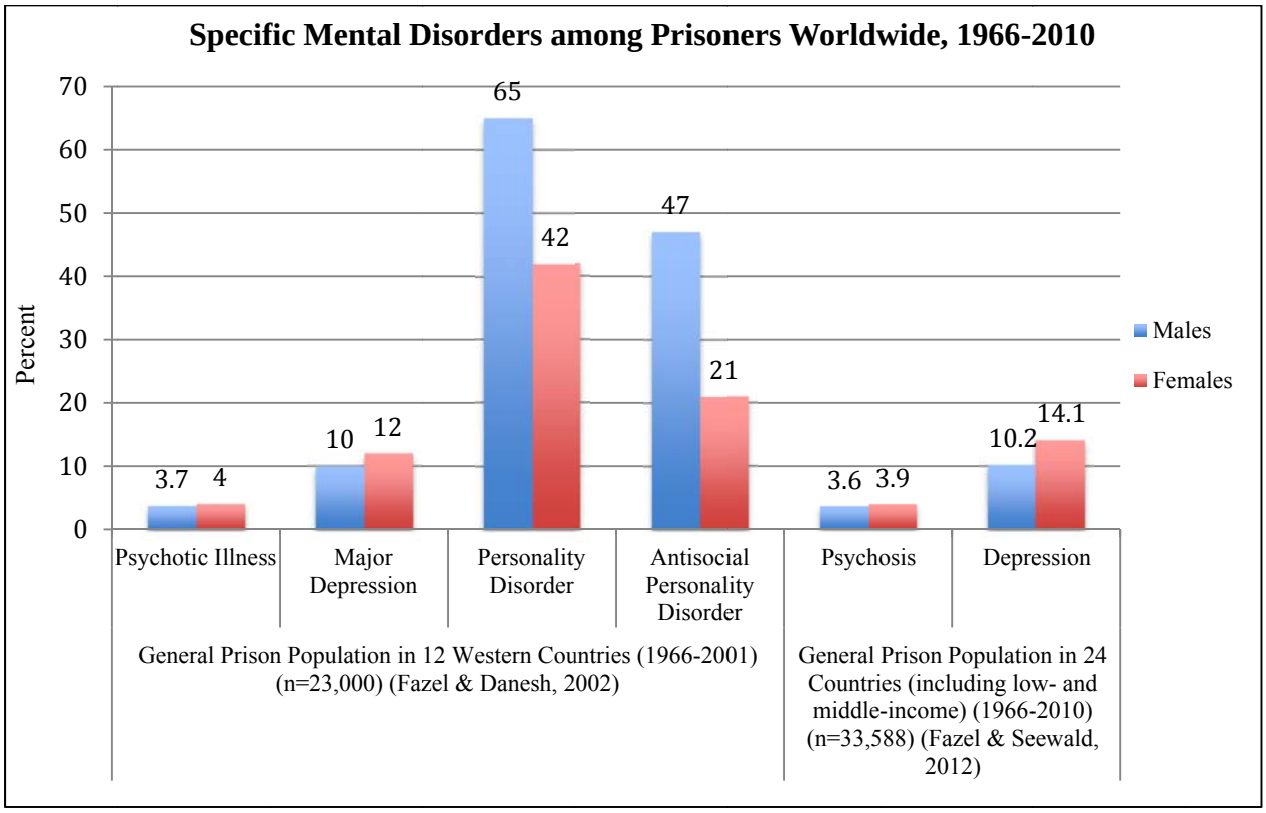

Figure 1. Estimated prevalence of specific mental illnesses among general prison populations worldwide, 1966-2001 & 1966-2010 (Fazel & Danesh, 2002; Fazel & Seewald, 2012)

Additionally, the number of prisoners with mental health issues appears to be increasing (Pearson et al, 2008). In a 1998 report, the Bureau of Justice Statistics (BJS) estimated that

16.2% of U.S. state prison and 7.4% of U.S. federal prison inmates were mentally ill (Ditton, 1999). Between 1998 and 2005, these estimates nearly quadrupled, as a more recent BJS report estimated that 56% of U.S. state prison and 45% of U.S. federal prison inmates were mentally ill (Pearson et al, 2008; James & Glaze, 2006). According to a report published by the American Psychiatric Association (2004), prevalence of mental illness among prison populations is so high that prisons today "have become the primary mental health care facilities" (APA, 2004). Whether prison settings generate new mental disorders or exacerbate existing ones among prisoners is debatable. However, what holds true is that these conditions are often overlooked and left untreated, making prison populations with mental health issues "one of the most vulnerable and treatable populations in our society," as they "are being housed in our more punitive institutions" (APA, 2004).

In general, prisons do not provide recommended levels of mental health care as found in well-structured psychiatric hospitals and mental health care systems. In the United States, nearly all (91.8%) prison facilities report providing any form of mental health screening or treatment to their clientele as a matter of policy (Beck & Maruschak, 2001). Only a third of mentally ill state prisoners and a quarter of mentally ill federal prisoners, however, report receiving any treatment since admission (James & Glaze, 2006). Therefore, the recognition and treatment of mental health disorders in prisons in both developed and developing countries is considered inadequate at best. Often resources are limited, professional training is subpar and interventions are not considered cost-effective measures as they typically reach a very small percentage of those in need (World Health Organization (WHO), 2007). With a general lack of health care infrastructure within prisons and poor quality of care, many mentally ill prisoners are left to

suffer. One subgroup is of particular interest due to their increased risk of developing psychological disorders upon incarceration: first-time inmates.

First-time Inmates:

Prison populations across the world show that first-time inmates account for a significant proportion of total prison populations and past research has revealed that first-time inmates have very different experiences of imprisonment compared to recurrent inmates. According to Jones and Schmid (2000), first-time inmates experience "heightened feelings of fear and concerns of violence," given that they have no prior exposure to the prison environment (Jones & Schmid, 2000; Souza & Dhami, 2010). Compared to repeat offenders, first-time inmates face a harder adjustment upon incarceration, which negatively affects their health. There is evidence that this subpopulation recognizes the deterioration of their health status, as their health in prison has been self-rated on average significantly worse than their health prior to imprisonment compared to recurrent prisoners (Souza & Dhami, 2010). Because coping mechanisms are fragile, the lack of prior experience coupled with a sudden adjustment to a new environment makes first-time inmates more susceptible to poor mental health. While accounting for only 40% of the total prison population (n=225), 20% and 38% of first-time inmates in Norway reported poor mental health and substance abuse, respectively (Kjelsberg & Friestad, 2008). Due to their differential, first-time exposure, novice inmates provide a unique opportunity to examine the effects of and responses to the incarceration.

Prisons in Mexico:

Mexico currently has one of the largest prison populations in Latin America and is the largest among Central American nations. In 2006, it was estimated that there were more than 214,000 prisoners in Mexican penal institutions, corresponding to a national imprisonment rate

of 196 per 100,000 habitants (Walmsley, 2007). These prison populations are rapidly growing, as approximately 222,000 individuals were incarcerated in 2010 (200 per 100,000 individuals) (Walmsley, 2011). These high imprisonment rates are greatly driven by rates of confinement in the nation's capital, Mexico City. According to the Under-Secretary for Penitentiary System of Mexico-City (PSMC), local facilities in Mexico City currently house approximately 41,000 inmates, nearly one-fifth of the total national inmate population, which translates into a local imprisonment rate of 463 per 100,000, based on 2010 Mexico City population estimates (Penitentiary System of Mexico City (PSMC), 2013; Walmsley, 2011). This local figure exceeds national rates for all countries in the Latin American region with available data (Walmsley, 2011) (Figure 2).

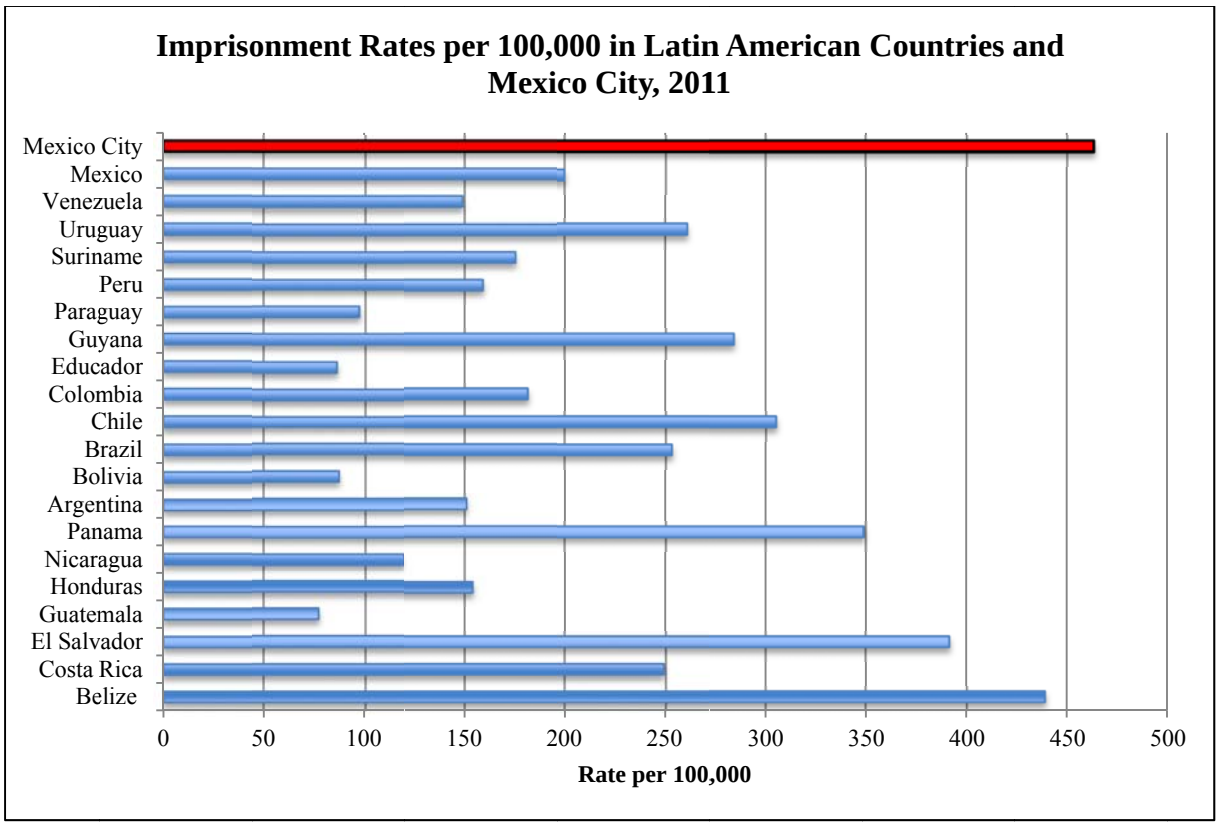

Figure 2. Estimated imprisonment rates of Latin American countries and Mexico City, 2011 (Walmsley, 2011). Red bar: Mexico City's imprisonment rate exceeds that of all other Latin American countries, including Mexico.

Unlike most developed countries that keep organized and electronic records, it is extremely difficult to access accurate and reliable data on Mexican prisons (Dolan, Kite, Black, Aceijas & Stimson, 2007). Hernandez-Cuevas and colleagues (1994) published the most recent and reliable information about Mexican prisons and found that 438 different state and federal correctional facilities are distributed across the country, of which only 8% (n=34) have occupational capacities of 1,000 inmates or more (Table 1) (Olivero, 1998; Hernandez-Cuevas, Cesar, Marquez-Havo, & Torricellas-Rodriguez, 1994).

Table 1. Types, frequency distribution, and population capacities of correctional facilities in Mexico, July 1994 (adapted from Olivero, 1998)

Types of Prisons	**Frequency**
Rehabilitation Centers	124
Prisons	5
Preventive Detention	25
Municipal Prisons	177
District Prisons	86
Regional Prisons	26
Penal Colony	1
Total	438
Population Capacities*	**Frequency**
1 to 50 inmates	253
51 to 500 inmates	143
501 to 1000 inmates	14
> 1000 inmates	34
*Some facilities fall in more than 1 category	

Current literature suggests that the state of Mexican prisons, especially those within Mexico City, is dire. Many inmates originate from vulnerable and marginalized populations and are therefore characterized by poverty, low education, maladaptive behavior and poor mental health status. In addition, living conditions within Mexican prisons are extremely poor, as overcrowding, inadequate sanitation and hygiene and lack of health services are apparent issues,

all of which drastically increase health risks of its occupants. Importantly, wealth often determines the prison experience as "housing, visiting privileges, food, medical care, access to the opposite sex, even drugs and alcohol are purchased" from prison administrators and guards, a practice so common that the exchange of money and goods is not considered corrupt or criminal in nature (Olivero, 1998). As a result, maladaptive behaviors are an ordinary part of the Mexican prison experience. While physical health is often placed at risk due to prison conditions, deteriorating mental health of inmates remains a serious threat as well.

Despite the abundance of mental illness among prisoners worldwide, the majority of studies of prison health have focused on how the mentally ill behave rather than attempt to identify any underlying causes. Of those that have studied indicators for mental illness, most have focused on imprisonment as the sole stressor that determines mental health status in hopes that improving the prison environment alone will improve the prison experience, and ultimately aid prisoner adjustment to incarceration. Very few investigators have studied how the prison experience varies based on multiple contextual factors surrounding an inmate, factors such as the prison environment, connectivity or deprivation, and life history. Emerging literature is beginning to take a multi-dimensional approach by showing that mental illness is influenced by an interaction of several predictors. However, a small number of studies have been conducted in developing countries. Given the lack of information on causes of psychological disorders among inmates, there is a further gap in literature on how interrelated factors relate to specific disorders, particularly depression and substance use.

The current study will address the aforementioned gaps in literature in many ways. It will use a sizable inmate population from several prisons across Mexico City, Mexico. Current rates of both major depression and substance use will be measured among a sample of first-time

inmates using a reliable self-report measure that is known to recognize symptoms and the extent to which they are experienced. The prison environment, connectivity, deprivation, and life history will all be measured and considered indicators for depression and substance abuse. A better understanding of how these contextual factors interact to influence the mental health status of prisoners can raise awareness and lead to improved screening and treatment of specific mental disorders, ultimately improving quality of prison life and reducing the likelihood of future maladaptive behavior.

Chapter II: Literature Review

Psychological Effects of Imprisonment:

The study of mental illness among inmates brings together multiple disciplines including sociology, psychiatry, psychology and criminology. Despite their differing perspectives, there is a consensus across mental health and criminal justice that the prevalence of mental disorders is alarmingly high among prisoners. These conditions are "particularly reflected in diagnoses such as substance use, major depression, bipolar disorder, post-traumatic stress and psychotic disorders" (Bermudez, Mendoza, Ruiz, Durand-Smith, & Hernandez, 2007). Moreover, mental illness among inmates is substantially more excessive and severe when compared to the general population. Brinded and colleagues (2001) found that levels of major psychiatric disorders, particularly major depression and post-traumatic stress disorder were highly elevated among prisoners (Brinded, Simpson, Laidlaw, Fairley, & Malcolm, 2001). Similarly, Cooper and Livingston (1991) reported levels of anxiety and depression among inmates that were significantly higher than the general population (Cooper & Livingston, 1991). Other researchers have found that inmates exhibit high rates of affective disorders, functional psychosis (Smith, O'Neill, Tobin, & Walshe, 1996), personality disorders (Davidson, Leese, & Taylor, 2001) and other mental illnesses. Unfortunately, it is difficult to draw precise conclusions about the prevalence of specific mental disorders from previous research due to the significant heterogeneity in methodology resulting in variations among studies. According to Blaauw and colleagues (2000),

> Many of these variations are due to differing diagnostic instruments and classification systems (e.g., *International Classification of Diseases and Statistical Manual of Mental Disorders*), differing samples (jail or prison inmates, adults or juveniles, mixed populations, etc.), differing scopes (e.g. including or excluding personality disorders or substance-related disorders) and differing

periods of interest (e.g. lifetime prevalence, 1-year prevalence, 1-month prevalence) (Blaauw, Roesch, & Kerkhof, 2000).

Table 2 demonstrates the wide array of prison study designs and portrays the existing state of knowledge of prevalence of different mental disorders among inmates from correctional facilities across the world. While this broad glance highlights differences in reported rates of different disorders, it also reveals consistency throughout the literature. Despite widespread findings, a common interest remains among investigators: how imprisonment influences an individual's psychological health.

Bukstel and Kilmann (1980) defined imprisonment as "the condition of being confined in an institutional setting (regardless of security level or institutional orientation) due to an arrest, criminal conviction or juvenile adjudication" (Bukstel & Kilmann, 1980). Prison is often thought of as one of the most unnatural and uncomfortable environments in which a human can live due to the many 'pains of imprisonment', defined by Sykes (1958) as "deprivations of liberty, goods and services, security, autonomy and heterosexual relationships" (Silverman & Vega, 1991; Sykes, 1958). Consequently, the experience of incarceration is often followed by "feelings of intense and enduring stress," as it presents the need for extreme adjustment to a new environment (Busko, 2001). Since Lazarus and colleagues theorized about individual responses to environmental stressors nearly a half-century ago, a large body of research has been published about inmate behavior related to adaptation and adjustment to prison (Folkman, Schaefer, & Lazarus, 1979; Lazarus, 1993; Lazarus & Folkman, 1984; 1987; 1991). According to the theory, environmental stressors such as imprisonment undermine an individual's effort to adapt and coping mechanisms may act as mediators to ultimately determine immediate and long-term health and behavioral outcomes (Busko, 2001; Folkman et al., 1979). It is now widely accepted that imprisonment has a direct influence on an individual's psychological health, as the ability or

inability to cope with the stress of being incarcerated brought on by the pains of imprisonment impacts mental health (Busko, 2001; Gullone, Jones, & Cummins, 2000).

Table 2. Current state of data on mental illness among prisoners across the world. Definition of mental illness or disorder may vary by study.

Study	Characteristics				Mental Illness Prevalence
Source (Year)	**Sample**	**Location**	**Sampling Method/Design**	**Measurement Instrument**	**Current Illness (%)**
Baillargeon et al, 2008	n= 370,511; all TX Department of Criminal Justice inmates	Texas, United States	Cohort study	Standardized diagnostic interview (DSM-IV criteria)	Any psychiatric disorder (8.4%); Schizophrenia (1.4%); Bipolar disorder (2.1%); Major depression (3%); Schizoaffective disorder (1.3%); Psychotic disorder (0.7%)
Blitz, Wolff & Shi, 2008	n= 7,528; male and female general population inmates from 14 statewide prisons	1 Mid-Atlantic State, United States	Random sampling (to recruit subjects); Cross-sectional	ACASI questionnaire & face-to-face interviews (self-report)	Male: any mental illness (22%); Male: schizophrenia or bipolar (6.6%); Male: other illness (15.7%); Female: any mental illness (57.6%); Female: schizophrenia or bipolar (21.3%); Female: other illness (36.3%)
Brinded, Simpson, Laidlaw, Fairley, & Malcolm, 2001	n= 1247; women, remanded men and sentenced men (all security levels) from every prison in country	New Zealand	Stratified random sampling (to recruit subjects); Cross-sectional	Composite International Diagnostic Interview-Automated (CIDI-A)	Schizophrenia (2.9%); Bipolar affective disorder (1%); Major depression (65%); OCD (43%); PTSD (69%); Alcohol abuse (15%); Cannabis abuse (65%); Other substance abuse (18%)
Falissard et al, 2006	n= 800 incarcerated males from 20 prisons (remand, intermediate and maximum security)	France	Stratified random sampling (to recruit subjects); Cross-sectional	2 separate interviews & diagnoses: Structured clinical interview (DSM-IV criteria) & open clinical interview	Major depressive disorder (24%); Bipolar I or II disorder (3.1%); Manic/hypomanic episode (3.6%); OCD (5.5%); PTSD (14.2%); Alcohol dependence (11.7%); Drug dependence (14.6%); Schizophrenia (6.2%); Schizoaffective disorder (2.6%)
Fazel & Danesh, 2002	n= 22,790 prisoners in general populations in prisons	Worldwide (12 countries-western countries only)	Systematic review; Collected relevant literature published between 1966 and 2001	Validated instruments	Male: Psychotic illness (3.7%); Male: Major depression (10%); Male: Personality disorder (65%); Female: Psychotic illness (4.0%); Female: Major depression (12%); Female: Personality disorder (42%)
Fazel & Seewald, 2012	n=33,588 prisoners from 109 different samples	Worldwide (24 countries)	Systematic review; Collected relevant literature published between 1966 and 2010	Clinical examinations or semi-structured interviews based on DSM or ICD criteria	Male: Psychotic illness (3.6%); Male: Major depression (10.2%); Female: Psychotic illness (3.9%); Female: Major depression (14.1%)

Table 2 (continued). Current state of data on mental illness among prisoners across the world. Definition of mental illness or disorder may vary by study.

Study	Characteristics				Mental Illness Prevalence
Source (Year)	**Sample**	**Location**	**Sampling Method/Design**	**Measurement Instrument**	**Current Illness (%)**
Felson, Silver & Remster, 2012	n=16,285 prisoners from state and federal facilities	United States	Cross-sectional	Computer-assisted personal interviews	Depression (20.4%); Psychosis (4.3%); Anxiety disorders (12.0%)
Gullone, Jones & Cummins, 2000	n=81 sentenced male prisoners from 7 different divisions of prison	Melbourne, Australia	Cross-sectional	Self-report questionnaires (Self-Esteem Inventory, Beck's Depression Inventory, etc)	Moderate depression (38%); Severe depression (6.2%)
Houser, Belenko & Brennan, 2012	n=2,930 female inmates housed in 62 facilities	United States	Stratified random sampling (to recruit subjects); Cross-sectional	ACASI questionnaire	Co-occurring mental & drug disorder (42.7%); Mental health problem only (21.5%); Drug dependence only (16%)
Schneider et al, 2011	n=2,351 male and female from 41 prisons	Queensland and New South Wales, Australia	Random sampling (to recruit subjects); Cross-sectional	Computer-assisted telephone interview; Kessler 6-item Psychological Distress Scale (K6)	Male psychological distress (11.7%); Female psychological distress (18.9%)
Steadman, Osher, Robbins, Case, & Samuels, 2009	n= 822 male and female inmates from five jails	MD & NY, United States	Systematic sampling; cross-sectional	Structured clinical interview (DSM-IV criteria)(SCID)	Male serious mental illness (14.5%); Female serious mental illness (31.0%)
Vaeroy, 2011	n=26 male inmates on preventive detention	Norway	Cross-sectional	Self-report questionnaires (Hospital Anxiety and Depression Scale, the Clinical Anxiety Scale, etc); Face-to-face clinical interviews	Mild depression (46.1%); Any depression (19.2%); Any Anxiety (30.7%)
Watzke, Ullrich & Marneros, 2006	n=415 male and female inmates from 6 prisons	Germany	Cross-sectional	Two structured clinical interviews: Schedules for Clinical Assessment in Neuropsychiatry (SCAN) & International Personality Disorder Examination (IPDE); Based on ICD-10 criteria	Male: Any mental illness (71.6%); Male: Alcohol dependence (46.7%); Male: Drug dependence (20.5%); Male: Schizophrenia (0.3%); Male: Bipolar affective disorder (1.1%); Male: depressive disorder (3.3%); Male: OCD (0.8%); Female: Any mental illness (63.3%); Female: Alcohol dependence (26.5%); Female: Drug dependence (18.4%); Female: Schizophrenia (0.0%); Female: Bipolar disorder (0.0%); Female: Depressive disorder (12.2%); Female: OCD (0.0%)

Among the first studies of the impact of imprisonment on psychological well being have been a series of systematic studies conducted by Heskin and colleagues that examined whether psychological functioning changed over the length of the prison sentence for long-term prisoners (Banister, Smith, Heskin, & Bolton, 1973; Heskin, Bolton, Smith, & Banister, 1974; Bolton, Smith, Heskin & Banister, 1976). A sample of 175 male prisoners serving indeterminate (life imprisonment) and determinate (10 years or more) sentences in English and Welsh prisons were divided into four groups based on the number of collective years spent in prison (i.e. Group 1=0-3 years; Group 2=4-5 years; Group 3=6-8 years; Group 4=8-40 years) and were matched for age. Analysis of the data extracted from an array of cognitive tests and cross-sectional surveys indicated that while long-term imprisonment had no overall effect on intellectual capacity, there was a noticeable reduction in cognitive reaction time which could be attributable to aging (Banister et al., 1973). Furthermore, data revealed significantly lower self-evaluation among men who have experienced longer prison sentences, a finding that supported an earlier study by Heskin and colleagues (1973) in which self-rejection, "guilt and self-directed hostility were found to increase with imprisonment" (Heskin et al., 1974; Heskin et al., 1973). Of the initial sample, 154 men were available for follow-up assessment after 19 months and longitudinal analysis suggested no overall psychological deterioration (Bolton et al., 1976). Overall, this research performed by Heskin and associates indicated limited associations between psychological functioning (including cognition, personality and attitudes) and imprisonment, findings that uncovered the need to examine other potentially moderating variables related to the prison experience (Gullone et al., 2000).

Perhaps the limited evidence of the psychological effects of imprisonment presented by Heskin and colleagues (1973, 1974, 1976) prompted Sapsford (1978) to explore other aspects of

inmate psyche influenced by imprisonment. Using a cross-sectional study design, Sapsford (1978) focused on the "framework out of which [cognitive abilities] are used: motivation, spontaneity, ability to adapt to new situations, interest in the outside world and in one's own future" (Sapsford, 1978). The sample consisted of 60 male prisoners who were convicted of homicide and serving life sentences and were recruited from one maximum-security prison. Subjects were placed into one of three groups depending on time served: "reception" (mean time served= 15 months), "middle" (mean time served= 6 years), and "hard core" (mean time served= 14 years). Unstructured individual interviews, "paper and pencil" tests (e.g. Minnesota Multiphasic Personality Inventory-MMPI), medical records, and prison records were all used to collect psychological data on depression, anxiety, introversion, neuroticism and emotionality, apathy, dependence on staff and routine, motivation, sociability, interest in the outside world and outside contacts, concern with release, orientation in time and general psychiatric state (Sapsford, 1978). Several associations were found to be significant, most notably a "positive association between introversion and time served in prison [and] a negative association between time served and future perspective" (Sapsford, 1978; Gullone et al., 2000). These findings are significant in that contrary to the findings of Heskin and colleagues (1973, 1974, 1976), psychological deterioration was observed among inmates who have faced long-term imprisonment, but were limited to a small unrepresentative sample of prisoners.

Further exploration of the effects of length of time spent incarcerated on mental capacity were carried out on a larger sample by MacKenzie and Goodstein (1985). Measures of psychological adjustment to incarceration including anxiety, depression, psychosomatic-type problems, and self-esteem were collected from 1,270 male inmates serving at least a 12.5-year sentence in three prisons across the United States (MacKenzie & Goodstein, 1985). The sample

was divided into three groups based on length of time served and length of sentence. The group who served 3 years or less of their sentence reported elevated measures of anxiety, depression, psychosomatic illnesses and self-esteem when compared to the group who served at least 6 years. As a result, the authors concluded that findings were consistent with the earlier works of Wormith (1984), who also found that "the early period of imprisonment appeared to be most stressful," as inmates are transitioning from the outside world to prison (Wormith, 1984; MacKenzie & Goodstein, 1985). Collectively, these early studies present clear evidence that imprisonment has an impact on the mental capacity and psychological functioning of inmates. However, there were no clear trends suggested in neither early sociological nor early psychological research that convey to what extent or in what direction the association between imprisonment and mental health exists.

In efforts to clarify the effects of imprisonment, Bukstel and Kilmann (1980) performed an extensive analysis of existing literature examining prisoner adjustment. Ninety different studies that examined the psychological effects of imprisonment on performance, personality and attitudinal variables were reviewed (Bukstel & Kilmann, 1980). Among the 35 studies that examined the impact of imprisonment on performance variables were several studies with sound designs and methodologies from which a few conclusions could be drawn. For example, studies found that institutional characteristics such as solitary confinement and overcrowding partially determined a prisoner's response to imprisonment. On the other hand, Bukstel and Kilmann (1980) deemed the 31 studies that explored personality variables and the 39 studies that examined attitudinal variables less reliable due to methodological shortcomings (Bukstel & Kilmann, 1980). Overall, the literature review revealed "variations in measures, sampling, prison types, time periods, and research designs [that] made it difficult not only to analyze findings but

also to find consistent patterns" (DeRosia, 1998; Bukstel & Kilmann, 1980). The results suggested that imprisonment is not harmful to the psychological health of *all* individuals and led Bukstel and Kilmann (1980) to conclude that there is wide variability in inmate psychological response to confinement, which is ultimately determined by several interrelated factors and not just imprisonment alone (Bukstel & Kilmann, 1980). Johnson & Toch (1982) later agreed with these conclusions and stated,

> "…however widespread certain stresses may be, it has become increasingly obvious that the pains of imprisonment and the suffering of individual prisoners are not uniform or constant…Different personal needs shared by prisoners, in turn, produce different perceptions of prison environments and different reactions to imprisonment" (Johnson & Toch, 1982).

As a result, an intellectual shift emerged in prison literature as investigators began to refocus their attention away from the pains of imprisonment as the sole predictor of psychological distress among inmates. Modern literature has taken a more multi-dimensional approach, as it has accepted that imprisonment and mental illness are complexly interrelated with a range of variables such as "…how an inmate's background characteristics, his/her response to the problems created by imprisonment itself and the interaction of the individual with his/her environment mix together to influence inmate adjustment to prison" (DeRosia, 1998). The effects of imprisonment on psychological health are now viewed as "a complex interaction of factors including individual difference variables, institutional orientation, degree of crowding, phase of sentence, and peer group affiliation seems to influence an individual's response to confinement" (Bukstel & Kilmann, 1980).

Depression:

According to the American Psychiatric Association (2004), depression is one of the most common mental illnesses seen in inmate populations, making it a major concern in correctional

facilities worldwide (APA, 2004). The most widely accepted clinical definitions of depression used in prison studies are found in the Diagnostic and Statistical Manual for Mental Disorders (DSM-IV) and the International Statistical Classification of Diseases and Related Health Problems (ICD-10) (American Psychiatric Association (APA), 2012; World Health Organization (WHO), 2013). Typically, depression varies in intensity from mild or moderate to severe and can occur in single or recurrent episodes. The condition is characterized by some of the following symptoms lasting for two weeks or more: persistent sadness or low mood, loss of interests or pleasure, fatigue or low energy, poor or increased appetite, insomnia or hypersomnia, poor concentration or indecisiveness, guilt or self-blame, agitation or slowing movement, and thoughts of death and/or suicide (APA, 2012; WHO, 2013). In studies involving depression in prison populations, the specific instruments used to determine a diagnosis are left up to the discretion of the researcher. While some studies rely on clinical and structured interviews using standardized diagnostic tools (DSM-IV or ICD-10) to recognize depression (Brinded et al., 2001; Herrman, McGorry, Mills & Singh, 1991), others prefer self-report measurements such as Beck's Depression Inventory (BDI) (Boothby & Durham, 1999; Eyestone & Howell, 1994; Beck, 1974).

Current literature suggests that prevalence rates for depression vary widely and depend on the study sample characteristics and methodology used. However, reported rates across several studies demonstrate that rates among prisoners experiencing depressive symptoms are elevated above the 2% to 9% rates for depression in the general population (Table 2) (Boothby & Durham, 1999; APA, 2004). Although epidemiological prevalence studies of mental illness among prisoners are common in the literature, there are few studies that measure depression in the absence of other psychiatric conditions. Boothby and Durham (1999) performed an epidemiology study and found that a significant number of male and female prisoners self-

reported symptoms of depression (Boothby & Durham, 1999). Data were collected during normal admission procedures across a state prison system, when 1,494 inmates of all custody levels completed the BDI. The authors found a mean score for all participants of 12.67 (SD=8.51) on the BDI, which corresponds to a "mild depression" classification. Overall, 43% of the sample fell in the "minimal depression" range (score of 0-9 on BDI), 30% fell in the "mild depression" range (score of 10-16 on BDI), 22% in the "moderate" range (score of 17-29 on BDI) and 5% in the "severe" category (score above 30 on BDI). Additionally, female inmates, inmate's ≤20 years old, maximum-security inmates, and first-time inmates all produced high mean BDI scores (Boothby & Durham, 1999). Eyestone and Howell (1994) published a similar epidemiology study on the rates of depression among inmates. The BDI was administered to 102 male inmates of all security classifications and major depression was immediately diagnosed in 25.5% of the subjects (Eyestone & Howell, 1994). Although these two studies contributed to the growing body of literature on prevalence rates of depression among prisoners, they were cross-sectional in design, limiting conclusions of associations and causality and failed to screen for indicators other than demographics.

There are a limited number of studies that have performed systematic analyses of multiple factors or predictors that influence depression in inmates. Keaveny and Zauszniewski (1999) published what is among the few correlational studies of depression among female prisoners, finding that the mean level of depression among a convenience sample of 62 female offenders was 31 (range: 3-51; median=32, SD=12) (Keaveny & Zauszniewski, 1999). The authors hypothesized that certain life events, such as a change in residence or incarceration, may place the mental health of women at risk for depression. Major life events, which were characterized by loss 12 months preceding incarceration, were reported by 74% of women.

Importantly, analysis revealed a significant positive correlation between the number of life events and depression ($r=0.24$; $p<0.05$), suggesting that women who experienced more major life events were more likely to be depressed (Keaveny & Zauszniewski, 1999). While this study is significant because it considers factors outside of the prison experience, it is limited in that other potential predictor variables (demographic profile, social support systems, financial support systems) were collected but were not analyzed against the depression outcome. In addition to poor study design, the small sample size and the selection of females as subjects makes the study non-generalizable.

Studies like the Keaveny and Zuszniewski (1999) publication that were limited in the number of indicators analyzed likely inspired more recent research performed by Turney, Wildeman, and Schnittker (2012), who found that secondary stressors are nearly as influential on depression among felons as the primary stress caused by incarceration (Turney, Wildeman, & Schnittker, 2012). A large sample of 3,107 currently incarcerated fathers participated in a longitudinal survey, which revealed that approximately 25% of men were experiencing depression. Using five different well-crafted logistic regression models, multivariate analysis found that factors of economic hardship and family functioning, specifically loss of employment and a change in relationship quality with child's mother, were significantly associated with depression as a function of incarceration (Turney et al., 2012). The authors concluded that "secondary stressors may ultimately be nearly as important as primary stressors in the sense that what happens as a result of incarceration is equally important as the incarceration experience" (Turney et al., 2012). This study was limited in that conclusions were based on the experience of fathers and incarceration may differentially affect males with and without children, making the results non-generalizable. Although Turney, Wildeman, and Schnittker (2012) provided evidence

that secondary stressors are important to consider when measuring depression among inmates, they failed to gather information on other potentially influential indicators such as experiences surrounding the arrest, interactions within prison and frequency of outside contact.

Profoundly, Pinese, Furegato and Santos (2010) were able to demonstrate a wide array of demographic and clinical predictors of depression among inmates through their analytic exploratory research. Among 100 randomly selected Brazilian women, "82 presented indicative signs of depression and 20 of them were considered severe," providing further evidence of high prevalence of depression among prisoners (Pinese, Furegato & Santos, 2010). Using a self-report instrument (BDI), data pertaining to inmate's socio-demographic, clinical and penal experience was collected and assessed. It was found through multivariate analysis that "age, comorbidities, religion, eating habits alterations, and receiving visitors" were significantly associated with light, mild or severe depression (Pinese et al., 2010). More specifically, having comorbidities multiplied the risk for light and severe depression by a factor of 5.43 and 8.81, respectively (Pinese et al., 2010). Whereas not receiving visitors increased the risk of severe depression by a factor of 9.15 and not practicing religion multiplied risk of mild depression by 6.09, age was found to be protective as women over 30 had a reduced risk (0.12) of being severely depressed (Pinese et al., 2010). While Pinese, Furegato and Santos (2010) performed a thorough analysis of the factors that impact depression, their results cannot be generalized because of the extremely small and all female sample.

Substance Use:

The concept of *substance use disorder* is a blanket term recognized and accepted by DSM-IV, ICD-10 and practitioners worldwide that encompasses dependence on and abuse of drugs and alcohol (APA, 2012; WHO, 2013). These disorders are considered voluntary maladaptive behaviors that lead to significant and often repeated distress or impairment.

Historically, substance use and abuse have been known to be commonplace, often more prevalent and severe, among prison populations in comparison to the general population. In a thorough literature review of 24 abstracts, Kanato (2008) found substance use and multiple substance use to be significantly associated with prison populations. While a majority of research involving substance use and inmates has focused on substance use as a trigger for additional adverse consequences, a few investigators interested in prevention have studied the causes underlying the disorder instead. Overall, there is disagreement throughout the literature regarding predictive factors for substance use among prisoners, which can be attributed to differences in individual experiences. "In fact, not all prison inmates face the same problem. The individual characteristics of inmates may affect drug use behavior among this subpopulation" (Kanato, 2008). For example, Plant and Taylor (2012) found age to be a significant predictor of substance use during imprisonment, as 70% of male prisoners aged 18-20 (n=94) reported drinking more than twice a week compared with 58% of prisoners 21 and over (n=148) (Plant & Taylor, 2012). Similar to the Plant and Taylor (2012) study, many researchers have utilized cross-sectional surveys, though few studies are analytical, and most have evaluated only one indicator for substance abuse. Furthermore, like depression, substance use is rarely studied apart from other psychological disorders, making the pool of existing literature about multiple factors associated with substance use among prisoners extremely small.

A study of importance was conducted by Gillespie (2005) using a sample of 1,054 inmates from 30 state correctional facilities across three different states in the U.S. (Gillespie, 2005). Using a sophisticated multi-level modeling technique, both inmate and prison level predictors were analyzed for associations with drug abuse, accounting for both alcohol and illegal drug use in the past 12 months while incarcerated. Theory of individual differences

determining substance use were confirmed as 90.6% of drug abuse in prison varied at the individual level and only 9.4% varied by prison level predictors (Gillespie, 2005). Specifically, drug use "was positively associated with youth, white race, years incarcerated, nonparticipation in prison religious services, prior history of selling drugs on the street, rule-violating prison friends, and negative definitions of the rules" (Gillespie, 2005). Interestingly, an interaction was found between reported prior street drug use and prison crowding, meaning that "inmates who reported a history of using drugs on the street prior to incarceration are especially likely to engage in drug abuse inside crowded prisons" (Gillespie, 2005). This finding confirms theory that psychological response, drug use in this case, depends on an intricate and complex mixture of both individual and prison environmental factors. Missing from this analysis are several other predictors, as only 10 were included, needed to comprehensively evaluate influences on substance use behavior of inmates.

Perhaps in response to Gillespie (2005), Nevarez-Sida, Constantino-Casas and Castro-Rios (2012) explored elements of demographics, childhood and adult experiences, criminal history, and prison conditions in a study of prison drug consumption. Data was utilized from a cross-sectional survey completed by 1223 prisoners recruited by systematic sampling in Mexico City, Mexico. Results revealed that 7.4% of the sample consumed at least one drug in the past month in prison (Nevarez-Sida, Constantino-Casas, & Castro-Rios, 2012). Preparatory school or higher, being employed, and having children were all found to be protective factors while male gender, childhood home shared with adults who consumed illegal drugs, abandoning childhood home and having previous prison sentences were found to be negatively associated with habitual drug consumption prior to incarceration (Nevarez-Sida et al., 2012). In turn, inmates who were estimated to have prior habitual drug consumption had 29.877 (95% CI: 10.087, 88.512) the odds

of consuming drugs while incarcerated compared to inmates who did not have a prior drug habit (Nevarez-Sida et al., 2012). In addition, negative prison conditions (OR: 3.654; 95% CI: 2.026, 6.589) and time spent serving sentence (OR: 1.006; 95% CI: 1.001, 1.01) were found to be significantly associated with drug consumption in prison (Nevarez-Sida et al., 2012). Although Nevarez-Sida, Constantino-Casas and Castro-Rios (2012) compiled an excellent list of explicative factors for substance use in prison, only a few were directly included in the model and all others were used to estimate a intermediate variable, making claims of causality impossible.

Connectivity and Deprivation:

Durkheim (1951) provides what is among the earliest insights into the link between social relationships and psychological harm (Durkheim, 1951). According to this early theory, social relationships are beneficial and believed to be protective in that they provide essential emotional and material needs, shielding individuals from potential psychological harm (Durkheim, 1951; Lindquist, 2000). Since these early observations, research has consistently explored the many associations between social support, psychological harm, and mental disorders. Interpersonal relationships, especially those that offer support from close friends and family, have been consistently considered advantageous, particularly for the mental health of an individual, as they help to "buffer the effects of stressors…and lower the risk of psychological disturbance in response to stress exposure" (Biggam & Power, 1997). In other words, social support acts as "coping assistance in an individual's attempts to manage a stressful situation" (Biggam & Power, 1997).

Although well studied among mainstream society, the relationship between social relationships and mental well-being has been less examined in the context of imprisonment. Prison environments are filled with what Sykes (1958) described as "deprivations", or stressors

such as separation from loved ones that adversely affect inmates (Sykes, 1958; Johnson & Toch, 1982). Upon incarceration, inmates become isolated from valued social support from family, friends and associates outside the prison. The sudden sparse contact and inability to maintain "connectivity"—connections with social relationships external to prison—can affect an inmate's adjustment to the stress of imprisonment and play a major role in the experience of psychological distress. Johnson and Toch (1982) suggested that connectivity is important to an inmate because "support from significant others may help absorb the shock of confinement and provide necessary tangible benefits" (Johnson & Toch, 1982). However, the implications of connectivity or lack thereof among prison populations are unknown. Although the link between social support and mental health is well understood in society, it is more difficult for discern under conditions of confinement.

Biggam and Power (1997) were able to demonstrate the importance of social support as predictors of psychological distress during incarceration (Biggam & Power, 1997). Among 125 incarcerated young (aged 16-21 years old) male offenders, clinical levels of anxiety, depression and hopelessness were measured against amounts of actual, perceived and desired external support from mothers, fathers, siblings, close friends and girlfriends. While depressed inmates reported significantly less support from their mothers and closest friends, clinically hopeless inmates reported significantly less support from their girlfriends (Biggam & Power, 1997). Overall, distressed inmates were found to be deficient in the amount of social support received as participants who reported higher levels of psychological distress were found to "desire a higher ideal level of both emotional and practical support" from social networks (Biggam & Power, 1997). Although this study was limited in that the sample focused on young men, who may naturally require more support because of their age and level of maturity, it provided support for

the argument that removal or disconnection from supportive social groups may precipitate psychological distress among prisoners.

Galvan and colleagues (2006) presented similar findings among another vulnerable group of prisoners—alcohol and drug abusing female inmates (Galvan et al., 2006). The presence and absence of social support through social networks as a key factor for mental well being was measured among a small convenience sample of 212 women from Mexico City, Mexico. When visits from significant figures (partners or children) were linked to self-perception of health, it was found that women who had not received any visits over the past month evaluated their mental health significantly more negatively (47.8%) than those who received visits (45.3%) (Galvan et al., 2006). Further, women who had not received recent visits experienced more depressive episodes (72.7% compared to 61.1%), differences that were considered insignificant and should be interpreted with caution, as existing substance abuse and depression are known comorbidities (Galvan et al., 2006). Brown and Day (2008) presented similar findings from a sample of 60 Australian inmates (Brown & Day, 2008). Prisoners who scored higher on a measure of loneliness, a stressor associated with imprisonment and lack of connectivity to social networks, reported higher levels of depression and hopelessness (Brown & Day, 2008). Despite the unrepresentative nature of these samples due to their small size and characteristics, studies by both Galvan and colleagues (2006) and Brown and Day (2008) provide further evidence that lack of connectivity to supportive relationships is detrimental for the mental health of inmates.

Whereas previous research has suggested that connectivity is beneficial and deprivation inflicts harm, data presented by Lindquist (2000) suggests that external support and connections are detrimental to the mental health of prisoners. The impact of marital status, parental status and social support of 198 male and female inmates were examined and results indicated that rather

than promoting mental well being, social relationships, especially marriage, outside of the correctional facility were associated with higher levels of depression and anxiety (Lindquist, 2000). The results of this study suggest that connectivity is not necessarily beneficial to a deprived inmate. Additional research is needed to gain a better understanding of the association between external connectivity and psychological well being among prisoners.

Prison Environment:

The literature is replete with studies that examine the impact of prison environment on inmate mental health. Research from multiple related disciplines now agrees "social contexts like prisons can shape and transform the people who enter them" (Haney, 2006). According to Haney (2006), "when prison environments become unduly painful, they also become harmful, and prisoners carry the effects or consequences of that harm…prisons are not only unpleasant or uncomfortable; they can be destructive as well" (Haney, 2006). Studies examining the psychological effects of imprisonment have typically focused on specific, harmful conditions of the environment due to how often these issues occur among correctional facilities worldwide. Specifically, issues such as overcrowding (Huey & Mcnulty, 2005; Haney, 2006), physical assaults (Wolff & Shi, 2009; Schneider et al, 2011), time spent in prison (Sapsford, 1978; MacKenzie & Goodstein, 1985; Dhami, Ayton, & Loewenstein, 2007) and prison activities (Cooper & Berwick, 2001) have been extensively examined throughout the literature.

Due to widespread influx of prisoners and increasing rates of incarceration, overcrowding has reach unprecedented levels in prisons worldwide. Although many of the lowest prison population rates occur in developing countries, occupancy levels in those nations are some of the highest: Mexican prisons have an occupancy level of 124.3% based on official estimates (International Centre for Prison Studies, 2013). Contrary to popular belief, overcrowding in prison "is measured by more than just the ratio of prisoners to rated capacity; it also includes the

extent to which a prison, or prison system, houses more prisoners than its infrastructure can humanely accommodate" (Haney, 2006). There is little reason to doubt the plethora of empirical evidence demonstrating that overcrowding significantly makes existing adverse prison conditions worse. Not only does the literature suggest that overcrowding reduces the quality of prison life, but that it negatively affects the mental health of inmates by increasing the complexity of social interaction and levels of uncertainty, and decreasing availability of resources thereby creating individual cognitive strain (Haney, 2006). A study by Huey and Mcnulty (2005) demonstrated that overcrowding was consistently linked to suicidal behavior in prisons across the U.S., indicating that "the stress of crowding—and the accompanying struggles for resources, space, and person autonomy—create atmospheres that impede inmate adaptation to prison life" and increase the likelihood of mental illness (Huey & Mcnulty, 2005).

Studies on physical violence and mental health have generally focused on how inmates with existing psychological conditions are disproportionally victimized by other prisoners. For example, Blitz and colleagues (2008) and Young and associates (2004) both identified mental illness as a risk factor for assault in prison (Blitz, Wolff, & Shi, 2008; Young, Justice & Erdberg, 2004). Fewer studies, however, have examined the alternative directionality: how physical assaults in prison affect an inmate's psychological health. Wolff and Shi (2009) recently found that 20.2% of a large adult male inmate population (n=7,221) reported physical assault from another inmate in the past 6 months, of which 63.7% feared for their future safety (Wolff & Shi, 2009). Further, 23.7% reported any physical assault during the entirety of incarceration and over half (53.1%) feared for their safety, indicating the importance of addressing physical violence among inmates (Wolff & Shi, 2009). More recently, Schneider and colleagues (2011) provided evidence that the threat of physical violence leads to psychological disturbance. Among a

random sample of 2,426 Australian prisoners, 34% of men and 24% of women reported experiences of physical assault in prison and multivariate analysis revealed that prisoners who scored higher on scales of psychological distress were more likely to report previous physical assault (OR: 1.55; 95% CI: 1.15-2.08; $p<0.004$) (Schneider et al, 2011). Overall, there is a need for a better understanding of how issues such as overcrowding and physical assault among other aspects of the prison environment such as time spent, involvement in prison activities, time remaining impact the mental health of inmates.

Gaps in the Literature:

A substantial portion of prison literature has been dedicated to the study of mental illness among inmates. However, a significant amount of research has focused on how prisoners with existing mental illnesses behave, thereby neglecting the study of how those conditions arose in the first place as a response to the pains of imprisonment. Therefore, scientific knowledge regarding the psychological effects of imprisonment requires more attention. One of the most significant shortcomings in existing literature lies in the fact that definitions of mental illness vary among researchers. Mental illness is an umbrella term that may include some psychological conditions and not others. While some studies included substance use in their definition of mental illness, others did not. Similarly, some investigators chose to include alcohol use in their definitions of substance use while others left it out. The lack of standardization used to define both mental illness and substance use limits the ability to make comparisons and draw definitive conclusions about inmate mental health throughout prison literature. This limitation likely explains the wide range of prevalence rates of all types of mental illnesses found throughout the literature. Despite this, several studies have utilized these vague definitions rather than focusing their studies on specific disorders such as depression, drug use and alcohol use in the absence of other psychiatric conditions.

Overall, prison literature lacks studies that utilize multivariate analysis in the study of mental illness among prisoners, especially in developing countries such as Mexico. Many studies have explored the associations between imprisonment and mental health without consideration for external stressors such as the prison environment and connectivity that make individual responses to incarceration unique. Therefore, connections between contextual factors and mental illness among prisoners are not well understood and the magnitude of their influence is unknown. Further, although associations between individual factors and mental illness have been observed, many researchers operate under the assumption that predictors are detrimental rather than beneficial to inmate mental health. The beneficial influence of contextual factors on mental health of inmates is extremely understudied.

The current study will contribute to emerging prison literature in several ways. Data was obtained from male prisoners, with representation from several of the largest prisons across Mexico City, Mexico allowing for a sample that was demographically diverse and representable of prisoners nationwide. Only responses by first-time inmates were included, as their adaptation to confinement is viewed as more difficult, making their mental health more impressionable and the influence of the prison experience more compelling to observe. Recall of experiences of depression and substance use (including alcohol use) were limited to one-week prior and one-month prior, respectively, in order to limit recall bias. The most significant contribution offered by this study, however, is the examination of an abundance of variables associated with multiple contextual factors including prison environment and connectivity, and their relationship with specific mental disorders, especially depression and substance use.

Chapter III: Manuscript

Connectivity, Prison Environment and Mental Illness among First-time Male Inmates in Mexico City, Mexico

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The following manuscript is the product of a secondary data analysis performed by the student. The student did not participate in development of the study protocol, surveys and measurement tools or any data collection. However, the student was solely responsible for analysis of the data, construction of relevant tables and figures and all writing under the direct advisement of the thesis advisor.

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Abstract

Research suggests that prison populations are disproportionately affected by mental illness compared to the general population. However, little research has examined how contextual factors surrounding the prison experience are associated with depression and/or substance use among first-time inmates. Even fewer studies have explored these contextual factors, particularly connectivity and the prison environment, in low- and middle-income country (LMIC) prison settings. The current study examines associations between connectivity, the prison environment, and mental illness, specifically major depression, alcohol use and drug use among first-time male inmates (n=593) in three Mexico City, Mexico prisons. Severe depression (46.2%) and drug use (53.8%) was reported by approximately half of respondents, while alcohol use (7.9%) was less prevalent. Conjugal visits, visitations, prison employment, physical attacks, cellmates and sentence time served were all found to be significantly associated with severe depression or substance use, suggesting that mental illness among inmates is influenced by differential exposures in prison rather than confinement alone. These findings can inform mental health policy regarding adjustment to prison as well as prevention and treatment strategies in prison settings.

Keywords: prison, first-time inmates, prison environment, connectivity, depression, substance use, adjustment to incarceration

Background:

Currently, there are approximately 242,754 individuals incarcerated in Mexican prisons, equating to a national imprisonment rate of 209 per 100,000 habitants, placing Mexico among countries with the largest prison populations in Latin America (International Centre for Prison Studies, 2013). Although prison population rates vary considerably across and within different regions of the world, 78% of countries have documented significant growth in imprisonment rates in recent years: Mexico's prison population rate increased by 12% between 2004 and 2012 (International Centre for Prison Studies, 2013). Studies show that many growing prison populations are disproportionally made up of behaviorally high-risk and mentally ill offenders compared to the general population; many prisons populations today are comparable to the makeup of some primary mental health and psychiatric facilities (Adams & Ferrandino, 2008; American Psychiatric Association (APA), 2004; Brinded, Simpson, Laidlaw, Fairley, & Malcolm, 2001; Fazel & Danesh, 2002; Fazel & Seewald, 2012; Kanato, 2008; World Health Organization (WHO), 2007). The literature is replete with evidence of high prevalence of a variety mental disorders among specific subgroups of prison populations, including male inmates (Blitz, Wolff, & Shi, 2008; Busko, 2001; Falissard et al., 2006; Gullone, Jones, & Cummins, 2000), female inmates (Blitz et al., 2008; Brinded et al., 2001; Galvan et al., 2006; Houser, Belenko, & Brennan, 2012), general populations (Fazel & Danesh, 2002; Fazel & Seewald, 2012) and maximum-security inmates (Falissard et al., 2006; MacKenzie & Goodstein, 1985; Sapsford, 1978) among others.

Many studies have investigated major depression (Bermudez, Mendoza, Ruiz, Durand-Smith, & Hernandez, 2007; Boothby & Durham, 1999; Brinded et al., 2001; Busko, 2001; Eyestone & Howell, 1994; Falissard et al., 2006; Felson, Silver, & Remster, 2012; Gullone et al.,

2000; Keaveny & Zauszniewski, 1999; Pinese, Furegato, & Santos, 2010; Turney, Wildeman, & Schnittker, 2012; Værøy, 2011) and substance use (Bermudez et al., 2007; Brinded et al., 2001; Falissard et al., 2006; Gillespie, 2005; Houser et al., 2012; Kanato, 2008; Nevarez-Sida, Constantino-Casas, & Castro-Rios, 2012; Plant & Taylor, 2012) among prisoners specifically as they have been consistently identified as two of the most common mental illnesses diagnosed in prison settings (APA, 2004). Findings show that not only are these disorders more excessive when compared to the general population, but that they are often more severe as well (Brinded et al., 2001; Fazel & Danesh, 2002; Fazel & Seewald, 2012; Gullone et al., 2000; Kanato, 2008; Watzke, Ullrich, & Marneros, 2006). The inflated amounts of mental illness seen among prisoners worldwide may be explained by evidence suggesting that incarceration presents innumerable stressors, known as "pains of imprisonment", to which individuals must abruptly adapt (Bukstel & Kilmann, 1980; Busko, 2001; Johnson & Toch, 1982; Sykes, 1958). Research indicates that first-time inmates find adjustment to prison especially difficult as they lack any previous experience with the environment (Jones & Schmid, 2000; Souza & Dhami, 2010). Importantly, investigators today recognize that mental health issues are not responses to the act of confinement alone; rather, the onset of psychological distress upon incarceration is determined by a confluence of contextual factors surrounding the prison experience. Studies have explored a variety of interrelated demographic, clinical, social and penal factors among other secondary stressors for associations with major depression and substance use among prisoners, though few have examined them comprehensively.

Connectivity—the preservation of interpersonal relationships with family and friends outside of prison—is one factor proven to be influential on inmate mental health. Research shows that prisoners who display a lack of connectivity through reported deficiencies in social

support (Biggam & Power, 1997), fewer visitations from close family and friends (Galvan et al., 2006), and higher measures of loneliness (Brown & Day, 2008) are significantly more likely to be psychologically distressed while incarcerated, supporting claims that connectivity is beneficial in that it acts as coping assistance while inmates adjust to the stress of imprisonment, ultimately protecting them from mental illness (Biggam & Power, 1997; Brown & Day, 2008; Galvan et al., 2006; Johnson & Toch, 1982). Other studies, however, provide contradictory evidence showing that maintaining connectivity is associated with higher levels of distress during imprisonment and is therefore detrimental to the mental health of inmates (Lindquist, 2000). In addition, researchers have frequently investigated aspects of the prison environment for associations with major depression and substance abuse among inmates, particularly overcrowding (Haney, 2006; Huey & Mcnulty, 2005), physical assaults (Schneider et al., 2011; Wolff & Shi, 2009), time spent in prison (Banister, Smith, Heskin, & Bolton, 1973; Bolton, Smith, Heskin, & Banister, 1976; Dhami, Ayton, & Loewenstein, 2007; Heskin, Bolton, Smith, & Banister, 1974; Heskin, Smith, Banister, & Bolton, 1973; MacKenzie & Goodstein, 1985; Sapsford, 1978) and prison activities (Cooper & Berwick, 2001). However, this research has been limited in that it is unclear whether some or all of these factors are beneficial or detrimental to inmate efforts of adaptation to the prison experience and resulting mental health.

While the number of studies investigating links between depression, substance use and contextual factors surrounding the prison experience is growing, the majority have been conducted in developed, high-income countries where prison systems are more advanced. Few, if any, studies have investigated indicators of psychological distress among inmates in low- and middle-income countries (LMIC). The current study intends to fill the gap by examining multiple contextual factors, particularly the prison environment and connectivity, and their relationship

with depression and substance use among a representative sample of first-time inmates from several large prisons across Mexico City, Mexico.

Study Design and Methods:

This study was reviewed and approved by the National Public Health Institute of Mexico, or El Instituto Nacional de Salud Pública (INSP), and two contracting government agencies in Mexico (the Ministry of Health and the Penitentiary System). This study involved research on incarcerated persons and complied with international standards of research permissible with involuntarily incarcerated persons. In addition, the study procedures were overseen by the local Human Rights Commission in order to ensure no more than minimal risk and inconvenience and to protect the rights of the prisoners.

The data for this study were collected from male inmates in correctional facilities across Mexico City, Mexico between June and December 2010. The total prison population was composed of 26,110 adult male prisoners, all of whom were distributed across three prisons. Although none of the correctional facilities were maximum-security prisons, some prisoners required special supervision and were confined in areas with restricted access because of their criminal background and potential for aggressive behavior. Procedures were taken to guarantee access to the study for all inmates and were established on a facility-by-facility basis upon agreement and in collaboration with the relevant authorities.

All inmates were invited to participate in the study. Inmates were eligible for participation if they could understand both written and spoken Spanish. Participants were recruited through collective pre-test counseling, in which researchers presented the project to groups of inmates and provided them with detailed information regarding the study process. Interested prisoners watched an informative video that covered topics such as the consent form,

all diagnostic testing and the self-report questionnaire. In addition, the video explained all the rights they have as participants of a research study including voluntary participation, right to withdraw consent, and confidentiality. All interested inmates were informed that no monetary compensation would be provided out of safety concerns. Rather, "personal care kits" were offered.

Inmates who consented were randomized into groups using weighted randomization: biomedical testing only (~90%) and biomedical testing combined with self-report measure (~10%). This resulted in a total of 3,772 inmates who were eligible and randomized into the combined biomedical testing and survey study arm. These inmates were given an ACASI questionnaire covering environmental, socio-economic, behavioral and attitudinal factors in and out of prison. The questionnaire required approximately 40-60 minutes to complete and was divided into the following five sections: demographics and socio-economic background, childhood and violence background, HIV/STI risk behaviors (inside and outside of prison), diet and physical activity, and mental health and attitudinal correlates of health-risk.

Of the 3,772 participants who took the survey, 60.31% (n=2,275) either failed to report or reported that they had been previously incarcerated and were therefore excluded from the current analysis. A total of 593 (15.72% of all surveyed inmates) first time inmates had complete data for all covariates and were included in the final analysis.

Measures and Analysis:

Depression: Depression was measured using the standard Beck Depression Inventory (BDI) scale. The BDI consisted of twenty-one questions that asked participants to select one statement that best described how they were feeling during the week preceding the survey. Each question contained a set of four answer choices that ranged in intensity (0= I do not feel sad to

3=I feel so sad and unhappy that I cannot stand it). Each participant was assigned a value of 0 to 3 for each answer and all twenty-one values were summed to a total score. In order to determine the severity of depression, each total score was compared to a key. A total score of 0-29 was suggestive of non-severe depression and a score of 30-63 indicated severe depression.

Substance Use: Participants were asked to report the frequency of drug consumption in prison during the month preceding the survey: how often they consumed marijuana, inhalants (e.g. thinner, adhesive, glue-sniffer or any stimulant), crack or cocaine, and/or prescription pills. Prisoners were considered heavy drug users if they reported 'frequent consumption' (every day, three times a week or once a week) of one or more drugs. Any drug use in prison was defined as 'frequent consumption' or 'some consumption' (once every two weeks or once a month) of one or more drugs.

The same criteria were used to measure reported alcohol use in prison. Participants were asked to report the frequency with which they consumed alcohol during the last month: whether they consumed alcohol every day, three times a week, once a week, once every two weeks, once a month, or not at all. Prisoners were considered heavy alcohol drinkers if they reported 'frequent consumption'. Any alcohol use in prison was defined as 'frequent consumption' or 'some consumption'.

Background Characteristics: Data were collected for age, educational attainment and previous employment status. Age was classified into three discreet groups: 18-24 years old, 25-34 years old, and ≥35 years. Education was categorized as never studied or primary school, secondary school, and above secondary. Employment status was defined as unemployed before imprisonment and employed before imprisonment.

Data for the number of lifetime arrests, prior alcohol and drug use, childhood violence and type of crime committed at last arrest were collected to determine the life history of each inmate. Respondents were asked to report the number of times they have been arrested in their lifetime, including their most recent arrest. Responses were categorized into three strata: 1 arrest, 2 arrests, and 3 or more arrests. Participants were also asked to report the frequency of drug and alcohol consumption during the six months preceding their most recent arrest. Both alcohol and drug use were defined as no use, some use (once every two weeks, once a month, or less than once a month), and frequent use (every day, three times a week, or once a week). Type of crime was classified as violent, non-violent, and other. Reported crimes including criminal homicide, manslaughter, kidnapping, assault, sexual crimes and aggravated robbery were considered violent. Reported drug-related crimes, burglary, carrying illegal weapons, robbery, and fraud or embezzlement were considered non-violent crimes.

Connectivity: Marital status was classified as single, married or living with someone, and divorced, separated or widowed. Respondents were asked to report whether they had any children, whether they have ever received a conjugal visit while imprisoned and the number of regular visits they had in the week preceding the survey.

Prison Environment: Respondents were asked to report any current employment and participation in activities inside prison such as workshops or organized sports teams. In addition, they were asked about violence inside prison, measured by the reported number of physical attacks that caused severe injuries. Responses were categorized into three groups: no attacks since last arrest, one attack, and two or more attacks. Participants were also asked to report the number of people with whom they shared a cell in the week preceding the survey. Responses were grouped into four discreet categories: ≤6 cellmates, 7-12 cellmates, 13-18 cellmates and

>18 cellmates. In addition, respondents were asked to report how long they have been an inmate in prison and how much time was left to complete their sentence. Both responses were classified as <12 months, 1 to 3 years, 3 to 5 years, and ≥5 years.

All data was analyzed using STATA 12 (StataCorp 2011). Outcomes of interest were separated into three categories: severe depression, alcohol use in prison and drug use in prison. Both alcohol use and drug use consisted of two subgroups: any use and heavy use. A total of five separate logistic regression models were fitted for each of the five binary outcomes: severe depression, any alcohol use, heavy alcohol use, any drug use and heavy drug use. Key covariates of interest were external connectivity and prison environment. All models controlled for demographics and life history measures known to influence mental illness in prison including depression, alcohol use and drug use.

Results:

Severe depression was reported by nearly half (46.21%) of the respondents. While any drug use in prison (53.79%) was the most commonly reported disorder, only 45.7% reported heavy drug use. In contrast, alcohol use was less prevalent among the study sample, with 7.93% reporting drinking any alcohol in prison and 2.36% reporting heavy drinking.

Differences in outcome variables by background characteristics are summarized and presented in Table 1. Severe depression varied significantly by the type of crime committed at last arrest ($p<0.051$), witnessing childhood violence ($p<0.001$), and experiencing childhood violence ($p<0.003$). With the exception of employment, heavy drug use varied by all background characteristics including age ($p<0.001$), education level ($p<0.030$), number of lifetime arrests ($p<0.001$), previous alcohol use ($p<0.003$), previous drug use ($p<0.001$), witnessing childhood violence ($p<0.039$), and experiencing childhood violence ($p<0.017$). Significant variation in any

drug use was found for age ($p<0.001$), number of lifetime arrests ($p<0.001$), previous alcohol use ($p<0.004$), previous drug use ($p<0.001$), and witnessing childhood violence ($p<0.033$). Neither any alcohol use nor heavy alcohol use significantly varied by any background characteristic.

Severe depression and drug and alcohol use varied significantly by several prison environment exposures and connectivity variables (Table 2). Experiencing physical attacks in prison ($p<0.001$), marital status ($p<0.031$), and recent visits ($p<0.001$) were found to be significantly associated with severe depression. Significant variation in heavy drug use was found for having a prison job ($p<0.004$), experiencing physical attacks ($p<0.017$), sentence time served ($p<0.005$), sentence time remaining ($p<0.001$), marital status ($p<0.001$), having children ($p<0.007$), conjugal visits ($p<0.010$), and recent visits ($p<0.001$). Any drug use varied by having a prison job ($p<0.011$), experiencing physical attacks ($p<0.032$), having cellmates ($p<0.012$), time served ($p<0.007$), time remaining ($p<0.001$), marital status ($p<0.039$) and having children ($p<0.031$). Any alcohol use only varied by conjugal visits ($p<0.005$). No significant variation was found for heavy alcohol use across prison environment or connectivity strata and participation in activities in prison did not significantly vary by any outcome.

The odds ratios (ORs) and 95% confidence intervals for modeled outcomes are summarized and presented in Table 3 and Table 4. A negative association was found between age and the use of drugs in prison. Men aged 25-34 years old (OR: 0.51, 95% CI: 0.31, 0.84) and men aged 35 or older (OR: 0.27, 95% CI: 0.14, 0.52) had lower odds of engaging in heavy drug use when compared to younger men aged 18-24. Respondents who reported being arrested three or more times in their lifetime had odds of engaging in heavy alcohol use and any alcohol use in prison that were 2.06 (95% CI: 1.13, 3.75) and 2.30 (95% CI: 1.24, 4.28) times the odds of respondents who reported only one arrest, respectively. Men who reported frequent drug use

before imprisonment had odds of any alcohol use, heavy drug use, and any drug use in prison that were 2.67 (95% CI: 1.03, 6.87), 2.78 (95% CI: 1.69, 4.58) and 2.91 (95% CI: 1.79, 4.71) times the odds of men who reported no drug use before imprisonment, respectively.

Having a job in prison was found to be protective against engaging in drug use in prison, with men who have a job having lower odds of heavy drug use (OR: 0.48, 95% CI: 0.32, 0.74) and any drug use (OR: 0.52, 95% CI: 0.34, 0.79) compared to men who do not have a job. A significant positive association was found between time served in prison and drug use. For example, respondents who report being in prison for five or more years had odds of engaging in any drug use that were 2.55 (95% CI: 1.21, 5.41) times the odds of respondents who have spent twelve months or less in prison. Similarly, cellmates and drug use were found to be significantly associated. Respondents who reported having more than eighteen cellmates had higher odds (OR: 2.53, 95% CI: 1.40, 4.60) of using any drugs in prison compared to respondents who had less than six cellmates.

Furthermore, while conjugal visits were found to be protective against any drug use in prison, the opposite occurred against any alcohol use in prison. Specifically, respondents who reported ever having a conjugal visit while in prison had lower odds of any drug use (OR: 0.64, 95% CI: 0.41, 1.00) and higher odds of any alcohol use (OR: 2.35, 95% CI: 1.11, 4.97) compared to respondents who reported never having a conjugal visit while imprisoned. However, having visits was protective against severe depression among respondents. Men who reported 2 or more visits had 47% (95% CI: 0.33, 0.86) lower odds of experiencing severe depression compared to men who reported no visits. Respondents who reported being physically attacked in prison 2 or more times had odds of severe depression that were 2.25 times the odds of respondents of who reported never being attacked.

Discussion:

The current study provides strong evidence in support of claims that levels of major depression and substance use are elevated among prison populations compared to the general population in low- and middle-income countries. Several prison environment and connectivity factors were found to be significantly associated with levels of depression and/or substance use among first-time inmates, supporting the hypothesis that contextual factors are influential in shaping the mental health of prisoners. Conjugal visits, for example, were found to be significantly associated with alcohol and drug use, and visitations were linked with severe depression. Additionally, physical attacks were found to have significant associations with severe depression. Other prison environment factors, such as employment in prison, having cellmates and amount of time served were strongly associated with levels of drug use as well. Younger inmates and inmates who had a history with the criminal justice system having been arrested on three or more occasions in their lifetime were more likely to use drugs in prison, often more heavily, and prisoners who reported frequent drug use before incarceration were more likely to use drugs, use drugs heavily and use alcohol.

The observed prevalence of severe depression reported by the current sample is significantly higher than estimates from previous studies, but this is likely attributable to the nature of the vulnerable population at hand. Given that they have no prior exposure to or experience with prison, first-time inmates are placed at a greater risk for mental illness as they face a more difficult adjustment upon incarceration, making them more likely to report heightened and more severe feelings of depression (Jones & Schmid, 2000; Souza & Dhami, 2010). Additionally, while the prevalence of drug use is considerably higher than what has been previously reported in the literature and the prevalence of alcohol use is lower than what is often

observed, few studies actually distinguish between the two disorders when defining substance use disorders. Therefore, direct comparisons of reported substance use to previous findings are limited due to the lack of consistency throughout the literature. Despite these considerations, nearly half of the sample self-reported severe depression and/or drug use, alarming findings that should call attention to the ongoing problem of mental illness among inmates.

Overall, the results are consistent with previous findings that demonstrate relationships between connectivity and mental illness of inmates. However, heterogeneity among studies limits the ability to draw precise comparisons. Strong associations were found between recent visitations and severe depression, similar to those found by Galvan et al (2006) and Pulido-Criollo et al (2009), demonstrating a pivotal link between connectivity and mental illness among prisoners: inmates who feel more connected to their interpersonal relationships outside of prison through the use of frequent visitations are less likely to experience psychological harm, especially first-time inmates, as social support provides assistance with adjustment to prison (Galvan et al., 2006; Pulido-Criollo, Rodriguez-Landa, & Colorado-Martinez, 2009). These findings support assertions by Johnson and Toch (1982) that connectivity is critical to an inmate because "support from significant others may help absorb the shock of confinement" and conclusions by Biggam and Power (1997) that supportive interpersonal relationships are advantageous in that they help to "buffer the effects of stressors…and lower the risk of psychological disturbance in response to stress exposure" (Biggam & Power, 1997; Johnson & Toch, 1982). The associations between conjugal visits and mental illness, however, were unclear and warrant further investigation. Findings show that conjugal visits were protective of drug use, yet were also associated with increased alcohol use, supporting claims by McConnell (1999) that conjugal visits are not effective rehabilitative measures for inmates (McConnell, 1999).

Although it is not unusual for prisoners to report feelings of abandonment, loneliness and overall distress due to deprivation, forced separation and unwanted reordered relationships with family and friends upon incarceration, no associations were found between having children, being married and depression and/or substance use. The result of no association between having children while incarcerated and depression disputes the findings of Pulio-Criollo et al (2009), who found that inmates with children score higher on measures of depression (Pulido-Criollo et al., 2009). The finding of no association between marriage and depression and/or substance use supports findings of some studies (Pulido-Criollo et al., 2009) and disputes the findings of others (Lindquist, 2000). Perhaps the common use of both visitations and conjugal visits among the sample supplements the separation felt by inmates and their families, explaining the lack of association between mental illness, marriage and children and providing evidence that structured visitations are beneficial for the mental health of prisoners.

Several prison environment factors were associated with reports of severe depression and drug use. Experiences of physical attacks were positively associated with severe depression among the sample, confirming findings presented by Schneider et al (2011) and other researchers like Wolff and Shi (2009) who provide evidence that inmate psych is negatively affected by physical violence in prison (Schneider et al., 2011; Wolff & Shi, 2009). Although participation in prison activities had no association with neither severe depression, alcohol use, nor drug use, disputing findings by Cooper and Berwick (2001), having a job in prison was found to be protective of drug use, suggesting that meaningful employment in prison and other constructive programming are positive distractions; they can be utilized to discourage maladaptive behaviors by redirecting attention towards positive extracurricular activities during incarceration, ultimately promoting favorable mental health (Cooper & Berwick, 2001). Having cellmates was

positively associated with drug use among the sample, illustrating the negative effects of overcrowding and confirming the abundance of literature that suggests that overcrowding is detrimental to inmate health. Finally, the finding of an association between the amount of sentence time served and drug use supports evidence provided by Nevarez-Sida et al (2012) and disagrees with claims presented by Bermudez et al (2007), making it unclear whether less time served or more time served is associated with higher levels of mental illness among inmates (Nevarez-Sida et al., 2012; Bermudez et al., 2007). No prison environment factors were found to be significantly associated with alcohol use, which is likely attributable to the overall low prevalence among the sample and suggestive of limited access to alcohol in prison.

There are several limitations to consider when interpreting the results of the current study, primarily concerning the methodology used. First, causality cannot be established due to the fact that a cross-sectional survey was utilized to collect data from inmates. Whether contextual factors surrounding the prison experience, for example, cause the onset of severe depression and/or substance use or if the initial presence of severe depression and substance use result in poor prison conditions and a lack of connectivity cannot be concluded. Additionally, many inmates were excluded from the analysis due to the fact that some surveys were considered incomplete; only inmates who responded completely to questions relevant to the study question were selected for analysis. Misreporting is likely among this sample as many inmates fear for their safety and privacy and have a general distrust of perceived outsiders. All data are self-reported, which may explain the unusually high prevalence of severe depression and substance use due to social desirability bias, as inmates may have enhanced their responses to gain attention. Since no clinical verification of diagnoses took place, the self-reported responses should be interpreted with caution. Furthermore, it is possible that self-reported experiences

among inmates are influenced by the amount of time spent imprisoned. For example, prisoners who have served less than one year of their prison sentence may report strong connectivity, while inmates who have been imprisoned for over five years may have lost all connectivity, resulting in very different mental health outcomes. However, no analysis of interactions between exposures and time served was conducted as it was deemed beyond the scope of the study.

Despite these limitations, this study addresses several gaps in the literature. Specific measurable disorders, specifically severe depression, alcohol use and drug use were the focus of this study, rather than generalized measures of psychological distress, allowing for more precise conclusions. Whereas the majority of studies examine prison environment and connectivity factors and their relationships with mental health outcomes individually, this study examines a comprehensive list of exposures. Controlling for a several background characteristics, both demographics and life history factors, known to influence mental health outcomes, minimized prevailing bias from the study. To the author's knowledge, this study is among the few that uses both bivariate and multivariate analysis to comprehensively examine relationships between contextual factors, severe depression and substance use among prisoners in a LMIC.

Above all, this study illustrates the significant burden of mental illness among prison populations in Mexico, and how small variations in contextual factors can ultimately influence mental health outcomes. The high prevalence of depression and substance use reported in this study indicates a pressing need for the greater public health community to raise awareness and recognize mental illness among prisoners in developing countries as a significant issue. Mental health screening and treatment should be incorporated into routine health assessments in prison settings in order to improve prevention and minimize burden. Prisons in Mexico should aim to improve prison environments by addressing factors such as overcrowding and physical violence

in addition to assist in the improvement of the quality inmate-family relationships by providing adequate social support as needed.

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Appendix: Tables

Table 1. Percent Distribution of Background Characteristics

	N (%)	Severe Depression	Heavy Alcohol Use	Any Alcohol Use	Heavy Drug Use	Any Drug Use
Demographics						
Age						
18-24 years old	144 (24.3)	49.31	2.78	9.72	59.03*	68.75*
25-34 years old	311 (52.5)	46.3	1.93	7.4	45.66*	53.38*
≥ 35 years old	138 (23.3)	42.75	2.9	7.25	31.88*	39.13*
Educational Attainment						
Never studied/Primary	127 (21.4)	50.39	4.72	7.87	55.12*	58.27
Secondary	269 (45.5)	42.38	1.12	5.95	45.35*	55.02
Above Secondary	197 (33.2)	48.73	2.54	10.66	40.1*	49.24
Employment (before incarceration)						
Unemployed	70 (11.8)	44.29	4.29	7.14	48.57	51.43
Employed	523 (88.2)	46.46	2.1	8.03	45.32	54.11
Life History (Pre-Imprisonment)						
Number of Arrests (including current)						
1 arrest	287 (48.4)	43.55	1.74	8.71	37.63*	46.69*
2 arrests	216 (36.4)	48.15	2.78	6.94	50.46*	56.48*
≥ 3 arrests	90 (15.2)	50	3.33	7.78	60*	70*
Alcohol Use						
No Use	67 (11.1)	48.48	1.52	4.55	33.33*	39.39*
Some Use	156 (26.3)	44.87	1.28	5.13	38.46*	48.08*
Frequent Use	371 (62.6)	46.36	2.96	9.7	50.94*	58.76*
Drug Use						
No Use	151 (25.5)	41.06	1.32	4.64	26.49*	32.45*
Some Use	76 (12.8)	46.05	1.32	6.58	27.63*	44.74*
Frequent Use	366 (61.7)	48.36	3.01	9.56	57.38*	64.48*
Witnessed Childhood Violence						
No	327 (55.1)	40.06*	2.14	7.03	41.90*	49.85*
Yes	266 (44.9)	53.76*	2.63	9.02	50.38*	58.65*
Experienced Childhood Violence						
No	342 (57.7)	40.94*	2.05	7.31	41.52*	50.58
Yes	251 (42.3)	53.39*	2.79	8.76	51.39*	58.17
Type of Crime (at last arrest)						
Violent	236 (39.8)	41.95*	2.54	10.59	42.37	52.54
Non-Violent	293 (49.4)	51.19*	2.05	6.14	49.49	56.31
Other	64 (10.8)	39.06*	3.13	6.25	40.63	46.88
Total	**593 (100)**	**46.21**	**2.36**	**7.93**	**45.7**	**53.79**

Percentages with * indicate statistically significant associations at α=0.05. Fisher's Exact test used where observed values <5.

Table 2. Percent Distribution of Connectivity and Prison Environment Covariates

	N (%)	Severe Depression	Heavy Alcohol Use	Any Alcohol Use	Heavy Drug Use	Any Drug Use
Connectivity						
Marital Status						
Single	245 (41.2)	51.43*	2.45	8.16	54.69*	60*
Married/Living with Someone	290 (48.9)	40.69*	2.07	7.93	39.31*	49.66*
Divorced, Separated, or Widowed	58 (9.8)	51.72*	3.45	6.9	39.66*	48.28*
Children						
Doesn't have children	200 (33.7)	51	1.5	7	53.50*	60*
Has children	393 (66.3)	43.77	2.8	8.4	41.73*	50.64*
Conjugal Visits						
No	399 (67.3)	48.87	2.26	5.76*	49.37*	56.39
Yes	194 (32.7)	40.72	2.58	12.37*	38.14*	48.45
Visitors in Past Week						
None	169 (28.5)	58.58*	2.37	7.1	54.44*	58.58
1 visit	205 (34.6)	44.39*	2.93	8.29	48.29*	55.61
≥ 2 visits	219 (36.9)	38.36*	1.83	8.22	36.53*	48.4
Prison Environment						
Current Employment						
Unemployed	223 (37.6)	49.78	3.14	5.83	53.36*	60.54*
Employed	370 (62.4)	44.05	1.89	9.19	41.08*	49.73*
Participation in Activities						
No	107 (18)	50.47	4.67	7.48	46.73	52.34
Yes	486 (82)	45.27	1.85	8.02	45.47	54.12
Physical Attacks						
No	399 (67.3)	41.10*	2.26	8.27	43.11*	51.38*
Yes, once	102 (17.2)	51.96*	3.92	6.86	44.12*	51.96*
Yes, 2 or more times	92 (15.5)	61.96*	1.09	7.61	58.70*	66.3*
Number of Cellmates						
≤ 6 people	165 (27.8)	44.85	3.03	6.67	46.67	52.12*
7-12 people	167 (28.2)	43.71	2.4	10.18	46.11	52.69*
13-18 people	135 (22.8)	44.44	1.48	7.41	38.52	45.93*
> 18 people	126 (21.3)	53.17	2.38	7.14	51.59	65.87*
Sentence Time Served						
< 12 months	103 (17.4)	47.57	1.94	3.88	30.10*	38.83*
1 to 3 years	184 (31)	51.09	2.17	7.07	49.46*	58.15*
3 to 5 years	157 (26.5)	45.86	1.91	7.01	50.96*	58.6*
≥ 5 years	149 (25.1)	39.6	3.36	12.75	46.31*	53.69*
Sentence Time Remaining						
< 12 months	95 (16.0)	50.53	3.16	4.21	55.79*	58.95*
1 to 3 years	165 (27.8)	43.03	2.42	10.3	51.52*	60.61*
3 to 5 years	121 (20.4)	52.89	2.48	5.79	46.28*	52.89*
≥ 5 years	152 (25.6)	42.11	0.66	9.21	42.11*	54.61*
Not yet sentenced	60 (10.1)	45	5	8.33	21.67*	26.67*
Total	**593 (100)**	**46.21**	**2.36**	**7.93**	**45.7**	**53.79**

Percentages with * indicate statistically significant associations at α=0.05. Fisher's Exact test used where observed values <5.

Table 3. Logistic Regression Adjusted Odds Ratios (aORs) and 95% Confidence Intervals for Background Characteristics and Five Modeled Outcomes					
	Severe Depression	**Heavy Alcohol Use**	**Any Alcohol Use**	**Heavy Drug Use**	**Any Drug Use**
Demographics					
Age					
18-24 years old	1.0	1.0	1.0	1.0	1.0
25-34 years old	1.01 (0.64, 1.61)	0.54 (0.10, 2.87)	0.46 (0.20, 1.08)	***0.51 (0.31, 0.84)***	***0.43 (0.26, 0.71)***
≥ 35 years old	0.86 (0.48, 1.53)	0.97 (0.14, 6.89)	0.38 (0.13, 1.18)	***0.27 (0.14, 0.52)***	***0.21 (0.11, 0.40)***
Educational Attainment					
Never studied/Primary	1.0	1.0	1.0	1.0	1.0
Secondary	0.69 (0.43, 1.10)	***0.20 (0.04, 0.96)***	0.76 (0.31, 1.87)	***0.59 (0.35, 0.97)***	0.78 (0.47, 1.29)
Above Secondary	1.06 (0.64, 1.76)	0.85 (0.21, 3.56)	1.56 (0.63, 3.83)	0.69 (0.40, 1.19)	0.90 (0.52, 1.54)
Employment (before incarceration)					
Unemployed	1.0	1.0	1.0	1.0	1.0
Employed	1.28 (0.74, 2.23)	0.50 (0.10, 2.51)	1.35 (0.47, 3.90)	1.52 (0.85, 2.73)	1.76 (0.98, 3.18)
Life History (Pre-Imprisonment)					
Number of Arrests (including current)					
1 arrest	1.0	1.0	1.0	1.0	1.0
2 arrests	1.04 (0.68, 1.59)	1.77 (0.40, 7.89)	0.92 (0.41, 2.05)	1.45 (0.92, 2.28)	1.25 (0.79, 1.96)
≥ 3 arrests	0.94 (0.53, 1.64)	1.89 (0.32, 11.28)	1.01 (0.37, 2.75)	***2.06 (1.13, 3.75)***	***2.30 (1.24, 4.28)***
Alcohol Use					
No Use	1.0	1.0	1.0	1.0	1.0
Some Use	0.72 (0.38, 1.38)	1.22 (0.09, 17.03)	1.48 (0.35, 6.38)	1.15 (0.56, 2.35)	1.16 (0.58, 2.33)
Frequent Use	0.70 (0.38, 1.28)	2.06 (0.19, 21.88)	2.13 (0.58, 7.79)	1.42 (0.73, 2.76)	1.44 (0.76, 2.74)
Drug Use					
No Use	1.0	1.0	1.0	1.0	1.0
Some Use	1.33 (0.73, 2.45)	0.88 (0.05, 16.15)	1.57 (0.45, 5.54)	0.99 (0.50, 1.96)	1.59 (0.84, 2.99)
Frequent Use	1.21 (0.77, 1.92)	2.49 (0.41, 15.32)	***2.67 (1.03, 6.87)***	***2.78 (1.69, 4.58)***	***2.91 (1.79, 4.71)***
Witnessed Childhood Violence					
No	1.0	1.0	1.0	1.0	1.0
Yes	1.44 (0.95, 2.18)	0.77 (0.19, 3.20)	1.08 (0.50, 2.34)	0.97 (0.62, 1.50)	1.07 (0.69, 1.67)
Experienced Childhood Violence					
No	1.0	1.0	1.0	1.0	1.0
Yes	1.11 (0.73, 1.70)	2.46 (0.56, 10.73)	1.43 (0.66, 3.12)	1.48 (0.94, 2.75)	1.27 (0.81, 2.00)
Type of Crime (at last arrest)					
Violent	1.0	1.0	1.0	1.0	1.0
Non-Violent	1.46 (0.99, 2.17)	0.75 (0.20, 2.86)	0.61 (0.30, 1.24)	1.44 (0.95, 2.19)	1.21 (0.80, 1.84)
Other	0.93 (0.50, 1.72)	1.07 (0.16, 7.24)	0.63 (0.19, 2.06)	1.46 (0.76, 2.80)	1.26 (0.66, 2.40)

Bold italics indicate statistically significant odds ratios at α=0.05

Table 4. Logistic Regression Adjusted Odds Ratios (aORs) and 95% Confidence Intervals for Connectivity, Prison Environment and Five Modeled Outcomes					
	Depression	**Heavy Alcohol Use**	**Any Alcohol Use**	**Heavy Drug Use**	**Any Drug Use**
Connectivity					
Marital Status					
Single	1.0	1.0	1.0	1.0	1.0
Married/Living with Someone	0.87 (0.53, 1.43)	0.48 (0.09, 2.42)	0.79 (0.13, 1.12)	1.05 (0.62, 1.78)	1.34 (0.78, 2.27)
Divorced, Separated, or Widowed	1.31 (0.65, 2.64)	1.46 (0.18, 12.10)	1.08 (0.28, 4.15)	0.87 (0.40, 1.88)	1.08 (0.50, 2.31)
Children					
Doesn't have children	1.0	1.0	1.0	1.0	1.0
Has children	0.84 (0.52, 1.35)	3.30 (0.58, 18.65)	1.58 (0.65, 3.82)	0.83 (0.50, 1.38)	0.83 (0.50, 1.38)
Conjugal Visits					
No	1.0	1.0	1.0	1.0	1.0
Yes	0.95 (0.62, 1.44)	2.38 (0.55, 10.36)	***2.35 (1.11, 4.97)***	0.65 (0.41, 1.02)	***0.64 (0.41, 1.00)***
Visitors in Past Week					
None	1.0	1.0	1.0	1.0	1.0
1 visit	***0.63 (0.40, 0.99)***	1.89 (0.42, 8.48)	1.32 (0.56, 3.12)	0.92 (0.57, 1.49)	0.97 (0.60, 1.59)
≥ 2 visits	***0.53 (0.33, 0.86)***	1.10 (0.19, 6.34)	1.02 (0.41, 2.52)	0.74 (0.44, 1.24)	0.91 (0.55, 1.52)
Prison Environment					
Current Employment					
Unemployed	1.0	1.0	1.0	1.0	1.0
Employed	0.70 (0.48, 1.03)	0.70 (0.18, 2.82)	1.59 (0.74, 3.41)	***0.48 (0.32, 0.74)***	***0.52 (0.34, 0.79)***
Participation in Activities					
No	1.0	1.0	1.0	1.0	1.0
Yes	0.82 (0.51, 1.34)	0.30 (0.07, 1.35)	0.87 (0.34, 2.19)	0.91 (0.53, 1.56)	1.02 (0.60, 1.76)
Physical Attacks					
No	1.0	1.0	1.0	1.0	1.0
Yes, once	***1.62 (1.01, 2.61)***	2.07 (0.50, 8.50)	0.81 (0.33, 2.02)	0.95 (0.57, 1.59)	1.00 (0.60, 1.65)
Yes, 2 or more times	***2.25 (1.34, 3.78)***	0.46 (0.05, 4.15)	0.63 (0.24, 1.62)	1.61 (0.94, 2.75)	1.63 (0.94, 2.82)
Number of Cellmates					
≤ 6 people	1.0	1.0	1.0	1.0	1.0
7-12 people	1.07 (0.67, 1.73)	0.95 (0.20, 4.55)	1.44 (0.61, 3.43)	1.62 (0.97, 2.70)	1.56 (0.94, 2.58)
13-18 people	1.16 (0.68, 1.97)	0.71 (0.10, 5.14)	1.30 (0.47, 3.61)	1.74 (0.98, 3.10)	***1.78 (1.02, 3.13)***
> 18 people	1.40 (0.81, 2.40)	0.65 (0.10, 4.16)	1.37 (0.48, 3.95)	1.54 (0.86, 2.76)	***2.53 (1.40, 4.60)***
Sentence Time Served					
< 12 months	1.0	1.0	1.0	1.0	1.0
1 to 3 years	1.48 (0.79, 2.80)	4.95 (0.37, 67.02)	3.50 (0.68, 18.04)	***2.45 (1.13, 3.75)***	***1.98 (0.99, 3.96)***
3 to 5 years	1.26 (0.64, 2.46)	3.28 (51.26)	3.73 (0.67, 20.65)	***3.08 (1.46, 6.51)***	***2.54 (1.22, 5.28)***
≥ 5 years	0.89 (0.45, 1.77)	6.02 (0.40, 91.10)	6.53 (1.22, 34.84)	***3.04 (1.41, 6.57)***	***2.55 (1.21, 5.41)***
Sentence Time Remaining					
< 12 months	1.0	1.0	1.0	1.0	1.0
1 to 3 years	0.83 (0.48, 1.45)	0.58 (0.10, 3.35)	2.68 (0.81, 8.92)	1.08 (0.60, 1.94)	1.35 (0.75, 2.43)
3 to 5 years	1.42 (0.77, 2.63)	0.70 (0.09, 5.12)	1.25 (0.32, 4.97)	1.03 (0.54, 1.96)	1.02 (0.54, 1.95)
≥ 5 years	1.01 (0.55, 1.85)	0.14 (0.10,1.77)	1.74 (0.48, 6.33)	0.94 (0.50, 1.76)	1.34 (0.71, 2.52)
Not yet sentenced	1.10 (0.46, 2.61)	4.44 (0.28, 69.45)	10.91 (1.61, 73.75)	0.45 (0.17, 1.22)	0.45 (0.17, 1.16)

Bold italics indicate statistically significant odds ratios at α=0.05

Chapter IV: Recommendations

Public Health Implications:

The results of this study support previous findings that mental illnesses, specifically severe depression and the use of drugs and alcohol, among prisoners are alarmingly high. This study is among the few that present findings showing that a variety of contextual risk factors, particularly connectivity and the prison environment, shape the mental health status of prisoners in low- and middle-income countries (LMIC). Despite the growing body of evidence that suggests that major depression and substance use among inmates is problematic, the greater public health community has yet to recognize mental illness among prisoners in developing countries like Mexico as a significant issue (Fazel & Seewald, 2012; Patel, 2007). Public health research is in dire need of studies that comprehensively examine multiple factors that influence the mental health status of inmates rather than individual predictors, especially in low-middle-income settings where rates of imprisonment are increasing and mental health services are likely deficient.

Several action steps are recommended to address this lack of understanding about the mental health of prisoners. Responses should resemble efforts seen in high-income nations such as the United States and the United Kingdom, where investigators from a variety of disciplines—psychology, sociology, and criminology—work together to develop multi-faceted approaches in order to address mental health issues in prison settings. In accordance with recommendations outlined in the 2007 Mental Health and Prison Report, published by the World Health Organization, the following provisions can be taken to improve the detection, prevention and treatment of mental disorders within prisons, even in LMIC (WHO, 2007).

1. *Raise awareness of mental illness in LMIC prison settings through education and training.*

The slogan "no health without mental health," which summarizes the belief that mental disorders substantially contribute to global burdens of disease, was originally proposed by the World Health Organization and has since been adopted by the World Federation of Mental Health among other influential organizations (Prince et al, 2007). Unfortunately, no such belief resonates throughout many prison systems worldwide. Many people at all levels of involvement with prisons, including prisoners themselves, are not adequately educated on the nature of mental illnesses. Therefore, the increased use of education and training are appropriate strategies to provide individuals with the relevant information, resources and tools regarding the definition, onset and severity of different disorders, varying diagnostic and screening instruments as well as appropriate treatment options in order to increase mental health literacy and promote widespread advocacy in LMIC.

Connectivity and prison environmental factors are both proven in this study to determine depressive and substance use outcomes, suggesting that several contextual factors influence the mental health status of inmates. Thus, raised awareness is needed at all levels: prisoners and their families, penal administrators and staff, and government agencies overseeing the prison system should all be properly educated on mental health. Specifically, prisoners and their families should receive adequate education and resources including but not limited to information about the onset and severity of different disorders in order to better understand how different individuals respond to imprisonment. Training is recommended for all prison staff including administrators, guards, and health workers and should aim to strengthen their ability to recognize and respond to mental disorders among inmates and the factors that cause them. Campaigns to raise awareness among federal and state agencies on the impact of mental health are essential as

well as they are responsible for equipping prisons with the capacity to respond to mental health issues.

Spreading awareness and information about mental health is beneficial for several reasons. Knowledge provides inmates and their families with the tools to develop practical strategies on how to cope with the stress of imprisonment, minimize effects of mental disorders and seek care if needed. Furthermore, an increase in mental health promotion can lead to a reduction in stigma and discrimination often faced by inmates with mental illnesses, ultimately improving the quality of life of both the mentally ill and prison populations as a whole. Lastly, increased awareness can lead to the recognition of mental health as an integral component of health care in prison systems, thereby leading to improved mental health care services in prison.

2. *Adopt mental health legislation that protects the human rights of prisoners in LMIC*

Both the United Nations (UN) and the World Health Organization (WHO) have established international standards to which criminal justice systems are expected to abide by in order to protect the rights of prison clientele (WHO, 2007). According to the standards set forth, prisoners with and without mental disorders have the right to be treated humanely while incarcerated. Although these policies and plans set standards regarding the human rights of prisoners that are strongly encouraged, they are rarely implemented in LMIC.

In 2008, Mexican government passed several constitutional and legislative reforms in response to widespread public criticism about the lack of efficacy observed throughout the criminal justice system (Shirk, 2010; Human Rights Watch, 2013). While elements of the reform addressed a lack of respect for fundamental human rights in prisons, there was no mention of mental health, particularly mentally ill prisoners. Yet, despite this neglect exhibited by Mexican government, the World Health Organization (2007) insists, “policies and/or plans should

encompass the mental health needs of the prison population. Where policies and plans fail to do so it may be necessary to advocate for their inclusion" (WHO, 2007).

The adoption of legislation in LMIC should be two-fold: not only should governments ensure that mentally ill prisoners are included in national criminal justice and mental health policies, but they should also go beyond encouraging prisons to implement legislation and use enforcement. According to the World Health Organization (2007), "the development of legal provisions that address [the mental health needs of the prison population] can help to promote the rights of prisoners, including the right to quality treatment and care, to refuse treatment, to appeal decisions of involuntary treatment, to confidentiality, to protection from discrimination and violence, and to protection from torture and cruel, inhuman and degrading treatment (including abusive use of seclusion, restraints and medication, and non-consensual scientific or medical experimentation), among others" (WHO, 2007). Therefore, international prison standards and national legislation should be utilized as powerful tools to protect the rights of mentally ill prisoners.

3. *Screen inmates for mental disorders upon entry into prison and routinely throughout stay, especially during general health assessments.*

In the United States and other high-income countries with developed justice systems, mental health care in state and federal prisons is well documented. For example, a report by Beck and Maruschak (2001) highlighted that nearly 70% of state prisons reported screening inmates for mental illness at intake and 65% reported conducting psychiatric assessments (Beck & Maruschak, 2001). However, data on the mental health of prisoners from LMIC—Mexico among them—are scarce or unavailable with the exception of epidemiological studies, suggesting a lack of mental health screening and assessment within the prison system itself.

The high prevalence of both depression and substance use seen in this study reveals a pressing need for mentally ill inmates to be thoroughly screened for psychological distress. Prisons in LMIC are encouraged to screen and diagnose mental disorders upon inmate admission into prison, as inmates often undergo general health assessments at that time. The incorporation of mental health screening into general health assessments is recommended as a way to normalize the procedure in prison settings and ultimately reduce stigma and negative views of mental illness. Assessing mental health at intake also encourages early detection. In addition, prisons should perform routine screening for mental disorders, as the conditions of imprisonment that influence mental health often change throughout length of stay.

A variety of screening tools are available for immediate use in LMIC prisons that have been developed and tested to ensure sensitivity and specificity. Prison staff and health care providers should be adequately trained and educated on how to properly screen for specific disorders using appropriate screening instruments. Epidemiological findings such as those revealed in this study as well as background knowledge on the typologies of different disorders should be included in the education provided for screeners so that they better understand who is most susceptible to certain illnesses to screen more effectively.

4. *Provide prisoners in LMIC with access to mental health support and services, especially treatment and care.*

The high prevalence of depression and substance use found in this study support previous claims regarding the alarming rates of mental disorders seen among populations in LMIC. Despite the fact that mental disorders "account for 11.1% of the total burden of disease" in LMIC, mental health resources are scarce and limited where available, often accounting for less than 1% of the health budget of many LMIC (Patel, 2007). Consequently, individuals affected by

mental disorders do not receive adequate evidence-based care (Patel, 2007). This is especially the case in LMIC prison settings.

According to the World Health Organization (2007), "access to assessment, treatment and (when necessary) referral of people with mental disorders, including substance abuse, should be an integral part of general health services available to all prisoners. The health services provided to prisoners should, as a minimum, be of an equivalent level to those in the community" (WHO, 2007). Prisons in Mexico and other LMIC should ensure that inmates have access to any necessary psychosocial support and treatment including medication. This may be achieved by either sending community mental health teams to prisons or by providing access to health services outside of the prison setting. All mental health workers should be adequately trained providers and specialists should be available when needed.

5. *Improve inmate quality of life and overall performance of prison systems by addressing overcrowding, physical violence and lack of meaningful work opportunities*

According to the International Covenant on Civil Rights and Political Rights (ICCPR), a treaty established by the UN, "persons deprived of their liberty shall be treated with humanity and with respect for the inherent dignity of the human person," indicating that correctional facilities worldwide are expected to preserve humane environments for their clientele (Wolff & Shi, 2009). This international standard, however, is rarely upheld in many LMIC prison systems. In fact, Mexico's National Human Rights Commission (CNDH) regularly fails to address the "inhumane, unsanitary and dangerous conditions" found among correctional facilities throughout Mexico (Human Rights Watch, 2013). The associations between prison environmental factors, specifically overcrowding and physical violence, and mental illness found in this study illuminate an urgent need for improved prison conditions.

Prisons should immediately address levels of overcrowding, as it is a pivotal aspect of the prison environment that has known negative effects on overall inmate well being and facility functioning. Currently, Mexican prisons face an estimated occupancy level of 124% due to the fact that collectively they house 40,000 convicts over capacity (International Centre for Prison Studies, 2013). The expansion of existing correctional facilities and the building of new prisons are recommended as long-term solutions to reduce excessive amounts of overcrowding. In addition, prison systems should discourage the overuse of pre-trial detention; correctional facilities are filled with inmates who have never been convicted of a crime and are sent to prison for years awaiting trial, contributing to overcrowding and overall poor prison conditions (Human Rights Watch, 2013).

Reducing levels of physical violence among inmates should also be prioritized by those overseeing prison systems in LMIC. Although addressing overcrowding in prison has the potential to alleviate problems with prison violence, a variety of other short-term solutions are available. Violence often occurs as a result of violent and non-violent criminal interactions. Therefore, prisons should capitalize on what little space is available by separating the living quarters of minimum, medium and maximum-security inmates. Improved security and surveillance measures throughout prison facilities are also recommended.

Additionally, investing in prison programs and meaningful activities such as employment, workshops and organized sports teams for inmates is a simple approach that can be used to discourage maladaptive behaviors by redirecting attention towards positive extracurricular activities during incarceration. However, little to no work programs are utilized by inmates across Mexican prisons, as only inmates with financial support have the means to purchase supplies needed to engage in work environments (Human Rights Watch, 1991). Consequently,

prisons in LMIC are housing large idle workforces, whose lack of activity contributes to poor conditions, maladaptive behaviors and resulting mental illnesses among prison populations (Human Rights Watch, 1991). Prisons in LMIC should take accountability for the lack of constructive programming and invest in meaningful work and needed service opportunities to provide a rehabilitative prison environment for their clientele.

6. *Provide prisoners and their families with structured programming in the form of visitations, support groups and counseling, both inside and outside of prison settings*

In agreement with previous research, this study provides evidence that social support from family and friends is positively associated with inmate psychological well being, as it provides assistance with adjustment to prison. Inmates and their families commonly maintain social support through the use of visitations and conjugal visits, practices that are accepted in some prisons and not others depending most often on cultural norms, law and what is considered socially accepted in a particular country. In Mexican prisons, visitation and conjugal visits are considered normal, acceptable operations and have been upheld since rights to practice were established by law in 1971. Despite the proven benefits of connectivity and the common use of visitations in Mexico, many mental disorders persist among inmates suggesting that a problem lies within the quality of social support received rather than the quantity. It is not unusual for prisoners to report feelings of abandonment and loneliness upon deprivation from their social relationships, while families typically experience distress due to forced separation and unwanted restructured relationships. To supplement visitations and conjugal visits, prisoners and their families should be provided with structured programming that provides support while adjusting to imprisonment, most desirably in the form of organized family programs and activities, external support groups for families, internal support groups for inmates and inmate-family

counseling, all of which foster positive familial relationships. These support groups and counseling are needed to provide an open and honest space for individuals to talk about their feelings and develop solutions that may ultimately deter mental illness. Trained coordinators and therapists should conduct these programs and be able to response to the needs of both inmates and family members as they face the stress of separation due to confinement. Additionally, correspondence should continue to be permitted upon request in the form of letters, phone calls, visitations and conjugal visits on a regular basis. Addressing these gaps in social support seen among inmate-family relationships will ultimately improve the quality of relationships and protect those involved from psychological harm.

7. *Encourage interdisciplinary collaboration on the study of mental illness in prisons found in LMIC*

Bringing together the expertise of multiple disciplines has solved many public health issues worldwide. This strategy has been applied and proven successful in the study of mental illness in prison settings, albeit only in high-income countries. According to Patel (2007), "there is a substantial evidence base on the efficacy of pharmacological, psychological and social treatments for specific mental disorders from rich countries; however, vast variations in social, cultural and health system factors limit the generalizability of this evidence to [LMIC]" (Patel, 2007). Further, innovative and collaborative discourse on mental health in prisons in LMIC is extremely scarce. Psychology, criminology, sociology and psychiatry are among the relevant fields of study that can provide expert insight into the problem at hand. Stakeholders from each discipline among others should collaborate to discuss and assess mental health in prisons and plan appropriate responses relevant to LMIC settings.

This multifaceted approach in response to mental illness among prisoners in LMIC—raising awareness of mental illness in prison settings, adopting legislation that protects the rights

of mentally ill inmates, screening inmates for mental illness at intake and routinely throughout sentence, providing adequate treatment and services, addressing poor prison conditions, providing supplemental support and counseling to foster close relationships and encouraging interdisciplinary collaboration—will begin to address the issues faced by inmates by creating safeguards similar to ones provided in wider communities. Continued research is recommended to create a larger evidence base for this vulnerable population and ultimately redirect public health attention to these issues.

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