

THE UNIVERSITY OF CALGARY

**An Epidemiological Study of Mental Illness in a Remanded Population
and The Relationship Between Mental Condition and Criminality**

by

Julio E. Arboleda-Flórez

A DISSERTATION

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
DEGREE OF PHD

DEPARTMENT OF COMMUNITY HEALTH SCIENCES

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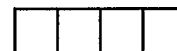
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a dissertation entitled "An Epidemiological Study of Mental Illness in a Remanded Population and the Relationship between Mental Condition and Criminality" submitted by Julio Arboleda-Flórez, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.



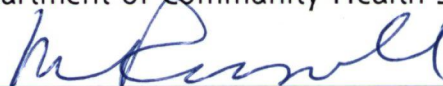
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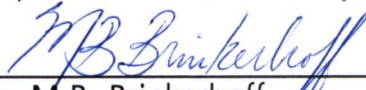
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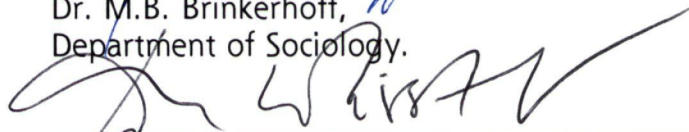
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ABSTRACT

The presence of mental patients in correctional institutions has been, for decades, an issue of concern for justice, correctional, and health authorities. At the level of remand centres, these patients tend to move rapidly in between the justice and the health systems. The prevalence of mental illness and the type of psychiatric disorders among these patients have not been completely elucidated. The relationship between their mental condition and crime remains a matter of debate.

The aims of this descriptive, cross-sectional, research study were to provide estimates on the prevalence of mental illness among a group of individuals who had been remanded to the Calgary Remand and Detention Centre, to establish levels of comorbid conditions, and to explore the relationship between mental illness and crime through the study of socio-demographic and legal factors that may have an effect on their mental condition.

A sex-stratified random sample of 1200 admissions was obtained out of a total of 4770 admissions to the CRDC during the four months of the study. During that period of time, some of these individuals were admitted more than once into the CRDC. For purposes of the study, an individual could be interviewed only twice. 1151 individuals were interviewed; 1102 were interviewed once and 49 were interviewed twice. The 1200 admissions interviewed (111 females and 1089 males)

were compared to 1200 other admissions chosen through a simple random sample and whose records were reviewed for socio-demographic characteristics, clinical information, and crime. The sample was considered to be representative of the inmate population for the period of study.

Four forensic psychiatrists conducted the clinical interviews using the Structured Clinical Interview for DSM-III-R (SCID) and Hare's Psychopathic Checklist. Institutional medical records and computerized correctional records were accessed for clinical and legal information.

A principal diagnosis on either Axis I or Axis II was made in 728 of the 1200 interviewees. The overall one-month prevalence was 60.7% (49.5% for females - 56.0% for males on Axis I, and on Axis II 3.6% for females - 5.5% for males). Substance abuse disorders, including alcohol, was the diagnosis most frequently entered. Few individuals were diagnosed with antisocial personality disorder. Schizophrenia was found in 1.2% (all males). Findings for lifetime prevalence mirrored those for one-month prevalence. Relatively few comorbidities were diagnosed. Factors found to be significantly associated with mental illness included education, ethnicity, previous detentions, and previous forensic assessments.

ACKNOWLEDGEMENTS

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A

Julio el Viejo, Carmen y Fanny

Nelly, Julio el Joven y Mimi

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CHAPTER ONE

INTRODUCTION AND PURPOSE

Planning for mental health services in jails and prisons must take into account the true prevalence rates of mental illness among prisoners in these institutions. Regrettably, published data in this area have varied greatly (Travin, 1989).

1.1 PROLOGUE

This is a descriptive epidemiological study with three primary aims:

- 1) To estimate the prevalence of mental illness among a group of incarcerated individuals.
- 2) To describe the prevalence of comorbid disorders.
- 3) To explore the relationship between mental illness and selected socio-demographic and legal factors.

The study uses legal, sociological, and criminological concepts and factors, but approaches the problem from an epidemiological perspective. The *leit motif* of the study is an interest in unravelling just how this perspective intersects with law, sociology, and criminology.

In the prison, mental patients, especially if their numbers are large, pose innumerable problems to the administration, and to the clinical and correctional staff. As pointed out by the Law Reform Commission of Canada (1975):

The mental problems of most people begin before they come into contact with the criminal process: they bring their mental disorder with them. It is important therefore, that the mentally disordered be identified as early as possible in the process to assure that they will be treated in legally and medically appropriate ways.

The number of these patients and the seriousness of their mental conditions, have been a matter of much controversy. Lack of appropriate information on prevalence and on the severity of mental conditions has seriously hampered both the planning of adequate services for this population of mental patients, and the better understanding of the relationship between crime and mental conditions.

1.2 FIRST AIM:

To obtain reliable estimates of the (a) one month and (b) lifetime prevalence of mental disorders in a remanded population.

Prevalence is defined as "the number of affected individuals in a population at a specific point in time divided by the size of the population under consideration" (Selvin, 1991). For the purposes of this study, prevalence will be the proportion of persons in the sample known to have had a mental condition for at least part of their life or during the last month before being remanded.

Estimates of mental disorders among correctional populations have varied widely.

This could be due to:

- the variety of instruments that have been used to make diagnoses,
- the types of disorders entered in the final calculations of prevalence,
- the type of correctional facility where the studies have been conducted,
- the sample methodologies, and
- the size of samples used.

Based on the literature that deals with the prevalence of mental disorders in correctional populations, it was expected that:

- The prevalence of mental disorders in a remanded population would be greater than the prevalence in the general population.
- The prevalence of Substance Abuse Disorders (SAD) would be greater in a remanded population than in the general population.
- The prevalence of Schizophrenic Disorders in a remanded population will be greater than that of the general population.

1.3 SECOND AIM

To measure the prevalence of comorbid disorders in a remanded population.

Based on the literature, it was expected that there would be a large number of Axis II psychiatric comorbidities (especially Antisocial Personality Disorder) found in the study sample, up to 20% for some combinations (e.g. Abram, 1989). Therefore, an analysis was planned to examine the relationship of comorbid disorders with criminality. It was expected that persons with comorbid disorders would be charged with more serious (i.e. violent) crimes, compared to those with a single disorder or no disorder.

1.4 THIRD AIM:

To explore the relationship between mental illness and selected socio-demographic and legal factors.

Based on previous research, those socio-demographic, clinical, and legal factors that have been considered to be associated with mental illness include:

- Gender
- Age Group
- Ethnicity
- Education
- Previous Forensic Assessment
- Previous Detentions
- Present Charge Type
- Total Charges
- Legal Disposition

CHAPTER TWO

REVIEW OF THE LITERATURE

This chapter reviews the literature on matters that are considered relevant to research issues on mental illness among incarcerated populations. It is based on the understanding that epidemiological research in correctional populations must encompass a combined appreciation of both the health and the justice systems, particularly as they intersect when dealing with the mentally ill offender.

Methodological issues stemming from the literature review are analyzed along the three Aims proposed for the study in Chapter One:

- 1) Studies on the prevalence of mental disorders in correctional institutions (First Aim).
- 2) The issue of comorbidities (Second Aim)
- 3) Factors described in the literature that appear to be associated with both mental illness and crime (Third Aim).

2.1 STUDIES ON THE PREVALENCE OF MENTAL ILLNESS IN CORRECTIONAL INSTITUTIONS

The difficulty in finding answers to such simple questions as the number of individuals afflicted with mental conditions in correctional institutions is a reflection of the multifaceted nature of the problem. An epidemiological approach to study the problem has to be broadly based and has to consider clinical, criminologic, correctional and legal factors. Each of these areas could present methodological problems.

2.1.1 Institutional Issues

2.1.1(i) Remanded Populations Are Different From Prison Populations

In correctional institutions, remanded populations differ from prison populations in many respects. In remand centres there is a high inmate turnover, with some remandees staying only hours or days, while others may remain for months; there is a general mix of offenders (i.e, ages, sexes, type of crime, security levels), and importantly, some inmates may even be innocent of the charges they are facing. In general, remandees are under tremendous pressure because of the newness of the experience for many of them, the sudden dislocation from the immediate environment such as family, friends, work, associations, and hobbies, and because of the legal uncertainties. High turnover, short length of stay, and legal

uncertainties preclude any planning about the future. Foreboding about the legal outcome, guilt and sometimes horror at the enormity of the crime and the consequences, and sudden dislocation from known persons, activities and places breed high levels of tension and anxiety, and may lead to depression or short-lived psychotic reactions (Arboleda-Flórez, 1980). As well, suicide in correctional institutions is highest within the first 72 hours of arrest, that is while the person is held in the remand centre or jail (Danto, 1973; DeHeer and Schweitzer, 1985; Arboleda-Flórez and Holley, 1988a; Holley and Arboleda-Flórez, 1988b; Arboleda-Flórez and Holley, 1989). Dooley (1990) in a study on suicides among remandees and prison populations in England and Wales, concluded that while the remand population was only 11% of all those in custody, they accounted for 47.1% of all suicides during the study period.

Prison populations encompass those inmates who have already been found guilty and are serving a prison sentence for a particular period of time. Prison populations are more stable and are offered more amenities and specialized programs. As inmates are to remain for a while, they consider their cells "home" (where they will live for months, years, or a lifetime), and many take pride in the decor and possessions they could accumulate (Clemmer, 1940; Sykes and Messinger, 1960; Sykes, 1966; Bowker, 1977). Inmates in prison have more time to develop friendships, to join cliques or common interest groups, to obtain the support of their families or friends outside, and to busy themselves with particular activities, including

educational opportunities or hobbies. The populations are usually well segregated within the prison itself or in different kinds of institutions. Even seriously ill inmates (mentally or otherwise) are transferred to hospitals, or are placed in special units within the prison (Bowker, 1977).

In Canada, prison populations have to be differentiated between those populations found in provincial institutions that house offenders serving two years less a day and those found in federal penitentiaries for inmates sentenced to two years plus one day. By definition, provincial institutions are used for inmates who have committed less severe crimes, who are first time offenders, or who offend very sporadically with minor crimes. Usually, provincial institutions are populated by younger inmates whose criminal careers are just starting and to whom, the courts wish to extend leniency in the hope of stimulating any rehabilitation potential. On the contrary, federal penitentiaries are used for inmates serving two years or more, that is, for those inmates who have been found guilty of more severe crimes, or who are repeated offenders. Thus, federal penitentiaries house older inmates, either older on arrival or who have aged in the institution given the long sentences that they are serving.

Remand Centres in Canada (jails in the United Kingdom and United States of America) have been described as "the most important of all our institutions of imprisonment" (Steadman, McCarty and Morrissey, 1986). They are facilities for

holding people for a few hours (usually alcoholics, or inmates in transit from one correctional facility to another), people on "courtesy holds" (a term applied to either an inmate detained while facing hearings in special tribunals such as immigration or parole, or a prisoner of another institution who is held in a remand centre as material witnesses to give testimony no one else can give in somebody else's trial), people awaiting a legal disposition on bail or remand, or while awaiting trial, or finally, inmates serving very short sentences (usually a few days, and usually for misdemeanours). Because of the short stay of the population, facilities at remand centres are usually overcrowded, lack amenities and, in general, are extremely unsettled environments. Unlike prisons, "jails have never had a mandate to rehabilitate inmates or to provide substantial programming opportunities" (Steadman, McCarty and Morrissey, 1986). It could be expected, therefore, that given the different age groups, sexes, levels of security, or the specialization found in correctional institutions, mental pathology would vary accordingly. In conclusion, while both jail and prison populations represent a highly selected, "bias group of offenders" (Pottieger, 1981), jail populations encompass "a broader range of offender types" (Abram, 1989). All these factors may account for reported higher levels of psychiatric pathology in remand centres. Despite these facts, a large number of studies on the prevalence of mental illness in correctional institutions have been carried out in prisons (Table II-1, Appendix One) as opposed to remand centres (Table II-2, Appendix One).

2.1.1(ii) Different Levels of Institutions

Inmates' selection to a particular institution follows specific characteristics such as sex (i.e. prisons for women), age (institutions for young offenders), type of offence (i.e. special institutions for sexual offenders), severity of perceived dangerousness (minimum, medium, maximum security), super-prisons for extremely dangerous offenders, and "lifers" (an inmate sentenced to life in prison - which in Canada means 25 years without possibility of Parole, but possibility of a Court Review - a sentence usually reserved for individuals found guilty of first or second degree murder), or specialized psychiatric-prison hospitals (such as the Regional Psychiatric Centres in Canada). In addition, prisons in Canada are divided between Provincial Institutions (for inmates sentenced to two years less one day), and Federal Penitentiaries (for inmates sentenced to two years and over). Consequently, the prevalence of mental disorders could vary according to the type of institution in which the study was conducted. Thus, more specific pathology could be found in specialized institutions (Gunn, Robertson, Dell and Way, 1978), more antisocial personality disorders (and the old term, psychopathy) in maximum security prisons (Glueck, 1918; Faulk, 1976; James, Gregory, Jones and Rundle, 1980; Côté and Hodgins, 1990), and more general pathology in females prisons, as differential sentencing patterns tend to select the very serious female offenders for imprisonment (Daniel, Robins, Reid and Wilfley, 1988). For example, in regard to antisocial personalities, and the effect that a maximum security institution could have on

prevalence rates¹, the study by Coté and Hodgins (1990) in Quebec is of interest. These authors took a random sample of 650 penitentiary inmates (from several federal penitentiaries in the Province), administered the Diagnostic Interview Schedule (see Section 2.1.2(iv)) and found that 61.5% of the inmates were antisocial personalities.

As there is the possibility of a potential differential effect of the type of prison on the prevalence of specific conditions, those studies that have combined levels of prisons and remand centres may have a bias to underrepresent or overrepresent particular mental conditions. For example, in the study by Bland, Newman, Dyck and Orn (1990), the combination of a remand centre and a provincial prison may have had an effect on the rates for alcoholism and antisocial personality disorder. In 1991, Gunn, Maden and Swinton reported on one of the most ambitious studies to determine the prevalence of mental illness among sentenced inmates. Although the method for selection of prisons was not discussed (possibly clusters), the authors indicate that their study consisted of a "representative sample" for prison type, security levels, and length of sentence of all prisons and juvenile institutions in England and Wales. From these institutions, sixteen adult prisons and nine young

¹ The expression "prevalence rates" may appear from time to time in this work. Technically speaking, however, prevalence estimates are not rates. "A rate is the measure of the rapidity of change associated with a phenomenon. More precisely, a rate is an instantaneous measure of change per unit of time (Selvin, 1991, p.2)."

Although prevalence does depend on time in the sense that it is measured at a particular time interval, its value is not expressed per unit of time as, for example, kilometres per hour. Prevalence is a proportion and proportions are unitless.

offenders institutions, the authors took a random sample of 5% of the population consisting of 1769 inmates, after refusals. Unfortunately, estimates were provided for the adult sample only, but the authors remarked that the results among the young offenders were similar to those of the adults. This study has some methodological problems. Firstly, some of the conditions whose estimates were reported tend to cluster according to age, hence it would have been more appropriate to have provided the estimates for the young offenders, and to have stratified the results according to age and according to institutions. This is important in as much as the length of stay in young offender institutions is usually much shorter than in adult institutions where some inmates may remain for life. Secondly, it is not explained in the report why the contribution to the total sample from each institution varied from 1:2 to 1:8 (this may have been due to the population size of the prison or institution and a decision to uphold, at the local level, the 5% national sample). It is possible, therefore, that the sample would have not been as "representative" as the authors indicate in their paper. In this study inmates were administered a semi-structured interview and were diagnosed according to ICD-9 Codes. The effect of the mixing together of different institutions and ages on prevalence rates in this study was not addressed in the report.

Correctional facilities are not homogeneous institutions, and mental illnesses of different severity may cluster according to the type of institution. Bland, Newman,

Dyck and Orn (1990) state that "Prison populations may differ, as some prisons serve only special groups of offenders".

2.1.1(iii) Different Security Classification

Even within the two levels of institutions, provincial and federal, differentiation in mental pathology could be found aligned to the levels of security at the institution. Inmates are classified as posing minimum, medium or maximum risk according not only to the seriousness or type of crime, but also to the anxiety and the publicity that their crimes have generated in the community. It would, therefore, not be unusual to find a high concentration of major antisocial personality pathology or serious sexual pathology in super maximum security institutions that house the highly dangerous criminals.

2.1.1(iv) The Prison Environment is Pathogenic

Equally, mental illness may develop after the person has been adjudicated a criminal and sentenced to a prison term. It is sometimes extremely difficult to tell whether a mental condition has developed as a result of the stressors of prison life (Morgan, 1981, Gingell, 1991), was pre-existing to imprisonment but made worse by the experience (Prins, 1980), or was present before incarceration. Certainly, deprivation of liberty along with the many others deprivations (friendships, family, sexual

partners, etc.), the brutalization of the environment with the ever present danger of assault (physical and sexual), in some places the abuse at the hands of the jailers, the complete powerlessness and dependency, and finally, the possibility of punishment such as solitary confinement which imposes other kinds of psychological risks because of sensory deprivation, make prison environments harsh and inhospitable. Prison life taxes the best of the coping mechanisms in the personality (Zimbardo, 1972; Gunn, Robertson, Dell and Way, 1978; Arboleda-Flórez, 1983).

2.1.2 Specific Methodological Problems in the Literature

Reported prevalence estimates, regardless of the type of prison where the study was conducted, have ranged widely from 7% (Coid, 1984) to as high as 90% (Bland, Newman, Dyck and Orn, 1990). There are many reasons to explain these extreme variations:

- 1) Different psychiatric classifications have been used throughout the years, i.e. International Classification of Diseases (ICD), the Diagnostic Statistical Manual of Mental Disorders version II, DSM-II or the DSM-III, or its revised version, the DSM-III-R (American Psychiatric Association Committee on Nomenclature and Statistics, 1987).

- 2) Studies conducted in different kinds of institutions are not directly comparable.
- 3) Methods for selection of samples have affected results
- 4) Prevalence rates that have been provided have not been age or sex standardized
- 5) The instruments used have varied from self-reports, to simple clinical interviews, to case-records, and to structured clinical interviews such as the Diagnostic Interview Schedule (DIS).

In addition, prevalence studies using different classifications across time or regions make the findings difficult to compare (Table II-3). For example, Glueck (1918) and Gunn (1977) used ICD, Jones (1976) used DSM-II, Bland, Newman, Dyck and Orn (1990) and Côté and Hodgins (1990) used DSM-III, and others have used special research criteria, such as Feighner's (Guze, 1976). As stated by Monahan and Steadman (1983), "much of the variation in prevalence rates reflects diversity in defining what counts as a 'case' of mental disorder" .

The studies by Gluek (1918), Robinson, Patten, Kerr (1965), and Gunn, Robertson, Dell, Way (1978) exemplify the diagnostic problems just discussed. Gluek's (1918)

study is a case in point. Apart from his sampling procedure (consecutive), and the highly selected sample from a notorious maximum security penitentiary, also famous for its "death-row" wing (Sing Sing), his vocabulary, i.e. "psychotic-like illnesses" or "psychopathic", makes it difficult to interpret his findings.

Robinson, Patten and Kerr (1965) assessed through clinical interviews and review of records, 566 male inmates consecutively admitted to Belfast Prison (Northern Ireland) to serve mixed types of sentences. The authors felt that it was not necessary to break out the diagnostic categories on account of the occurrence of multiple diagnoses, what would now be considered "comorbidities".

On the other hand, the study by Gunn, Robertson, Dell and Way (1978) in the UK (South East Prisons Survey), took a random sample of 106 male prisoners and conducted a standardized clinical interview using ICD Diagnoses.

On a somewhat different vein, some studies have used a large number of raters who may have different professional backgrounds, but the reports do not mention whether inter-rater reliability issues were properly dealt with. Jones (1976) reviewed the records of the entire inmate population of the Tennessee State Penitentiary at Nashville (USA), consisting of 1,040 males. The inmates were then interviewed by psychiatrists and psychologists using DSM-II diagnoses. Inter-rater reliability is not commented upon and the number of raters is not given. In another study, the one

by James, Gregory, Jones and Rundell (1980) at Oklahoma Prison in the USA, 7 psychiatrists and 7 psychologists interviewed, using DSM-III, 174 males. No mention is made about potential inter-rater reliability issues.

Quality of records is suspect in general, but in correctional institutions given multiple reasons such as poorly trained or overworked personnel, poor quality of records is almost the rule. Despite this fact, Toch and Adams' (1989) is one of the best studies, and possibly the largest in the area, using records. These authors, however, did not rely on medical records from the institution, but linked the computer records of 8,379 inmates of both sexes who had been admitted through the New York State Department of Correctional Services over a period of years with the computer records of the State Mental Health Services.

2.1.2(i) Effect of Sample Selection

According to Coid (1984), the major flaws in studies of prevalence in correctional institutions and among those purporting to review the association between mental illness and criminality stem from design errors, poorly chosen samples, and the use of unstandardized instruments and diagnostic techniques. Samples that have been used for the study of prevalence among correctional populations include consecutive admissions (Glueck, 1918; Gingell, 1991), stratified samples (James, Gregory, Jones and Rundle, 1980), systematic samples (Bland, Newman, Dyck and Orn, 1990; Watt,

Tomison, Torpy, 1992), and random samples (Gunn, 1977; Côté and Hodgins, 1990). Toch and Adams (1989) matched criminological and psychiatric records of convicted violent offenders. Different sampling procedures may have had some effects on the estimates for particular disorders. For example, consecutive admissions may bias the sample towards disorders expected to be higher in criminal populations, such as personality and substance abuse disorders. These would tend to arrive at a more steady pace than disorders with a lower representation, which, therefore, may be completely missed. In addition, consecutive admissions might be affected by historical events (i.e. civic celebrations, police raids, riots, etc.).

2.1.2(ii) Standardized Rates

Few studies make appropriate sex and age standardized comparisons. The study by Côté and Hodgins (1990) uses sex-standardized figures (males) from the general population, but fails to indicate whether these comparison figures are for the general male population, or specific to the age population in the sample. Finally, the majority of the studies do not make specific comparisons to the estimated prevalence in the general population (Glueck, 1918; Faulk, 1976; James, Gregory, Jones and Rundle, 1980). In both counts, the study by Bland, Newman, Dyck, Orn (1990) is unique because of the care the authors took to make appropriate comparisons for sex and age, and comparisons to the general population of Edmonton where the study was conducted.

2.1.2(iii) Instruments Not the Same or Not Specified

Disparity in the estimates could be introduced by different instruments and ascertainment methods. Studies of mental disorders in prisons that have utilized clinical interviews (Glueck, 1918; Robinson, Patten and Kerr, 1965; Faulk, 1976; James, Gregory, Jones and Rundle, 1980) typically do not explain the particulars of the interviews, or the kind of interviews used. In this category falls, for example, the study by Faulk (1976), who reported on the results of unstandardized clinical interviews conducted on 76 consecutive inmates scheduled for release after serving a prison term at Winchester Prison (UK). Studies that have been based on a review of case records (Robinson, Patten and Kerr, 1965), self-reports (James, Gregory, Jones and Rundle, 1980), or computer record linkage (Toch and Adams, 1989) may be affected by either the quality of the records (usually very dismal in correctional facilities), or the veracity of the respondents. Finally, other studies have used structured interviews, especially the Diagnostic Interview Schedule (DIS). As this instrument has become standard use for large epidemiological studies, and is now being used in criminological populations, a special review of its adequacy for this kind of population is necessary.

2.1.2(iv) The Diagnostic Interview Schedule (DIS)

The most recent studies on the prevalence of mental conditions in prisons have made extensive use of the DIS (Abram, 1989; Côté and Hodgins, 1990; Bland, Newman, Dyck and Orn, 1990). This instrument was developed by the U.S. National Institute of Mental Health (NIMH) in the U.S.A. in the early 1980's "to enable interviewers to obtain psychiatric diagnosis comparable to those a psychiatrist would obtain", that is, it makes possible the determination of DSM-III diagnostic categories by lay interviewers (Robins, Helzer, Croughan and Ratcliff, 1981). The DIS has made psychiatric case ascertainment more consistent and has become the standard instrument for epidemiological studies in psychiatry (Pulver and Carpenter, 1983; Robins, Helzer, Weissman, Orvaschel, Gruenberg, Burke and Regier, 1984; Bland, 1984, 1988; Helzer, Spitznagel and McEvoy, 1987; Bland, Newman and Orn, 1988; Goldberg, 1989; Hwu, Yeh, and Chang, 1989).

Concern has been expressed, however, about the ability of the DIS to give appropriate estimates in general (Richman, 1991). More specifically, there are concerns about DIS estimates of one month prevalence, and about a possible tendency to miss some major disorders such as paranoid disorder, atypical psychosis and brief reactive psychosis (Anthony, Folstein, Romanoski, Von Korff, Nestadt, Chahal, Merchant, Brown, Shapiro, Kramer and Gruenberg 1985; Helzer, Robins, McEvoy, Spitznagel, Stolzman, Farmer and Brockington, 1985; Wittchen, Semler and

von Zerssen, 1985). In regard to Axis II conditions, apart from antisocial personality, the DIS does not measure the other eleven types of personality disorders described in the DSM-III-R (Spitzer, Williams, Gibbon and First, 1990). These flaws in the DIS could make it irrelevant for use in prevalence studies in correctional settings, especially in remand centres. For example, brief reactive psychoses and short-lived adjustment disorders may be common among remandees, as would be expected in populations that have experienced major life dislocations. Paranoid disorders, atypical psychoses, personality disorders such as borderline and passive-aggressive, impulse control disorders such as intermittent explosive disorders, kleptomania and pyromania may not be that frequent, and possibly, not that important in the general population, but they are of paramount importance in the spectrum of mental conditions seen in corrections.

The possible underrepresentation of these disorders is a major drawback of the DIS given the many problems, clinical, criminological, and correctional, that the affected individuals pose to prison authorities. In addition, the DIS relies heavily on the subject's report of symptoms (Folstein, Romanoski, Nestadt, Chahal, Merchant, Shapiro, Kramer, Anthony, Gruenberg and McHugh, 1985; Escobar, Randolph, Asamen and Karno, 1986). Self-reports, however, may be of dubious validity in a population that counts a large number of individuals diagnosed as suffering from antisocial personalities (Coid 1984; Bland, Newman, Dyck and Orn, 1990; Hodgins and Coté, 1990), or where it is to the individual's advantage to underreport, to

overreport, or to make up any kind of pathology according to the needs of the situation. As pointed out by Alterman and Cacciola (1991) "pathological lying is a feature of APD and, insofar as this is the case, the interviewee's "story" may change depending upon how he/she 'reads' the situation".

Finally, and further to the issue of antisocial personalities, DSM-III and DSM-III-R diagnosis of APD (on which this diagnosis is based in the DIS), has been considered to be unstable, and not entirely reliable, because of over-dependence on observable behavioral units or "behavioral criteria" (the basis for categorical classifications), as opposed to inferred personality constructs or "personality characteristics" as done in dimensional classifications (Hare, 1980, 1985; Gerstley, Alterman, McLellan and Woody, 1990; Alterman and Cacciola, 1991). Feighner and Herbstein (1987, p.131), in addressing the issue of the "categorical versus dimensional controversy", indicate that proponents of the categorical approach to diagnosis agree that the dimensional approach may provide a more accurate picture of mental disorders "particularly of disorders such as personality disorders, which do not represent discrete syndromes". These authors further point out that "the complexities of dimensional diagnostic schemes disregards the pragmatism needed in the world of research". Although this may be a proper approach to diagnostic research in psychiatry, it certainly introduces imponderable factors in epidemiological research when looseness in the diagnostic categories allows elements of other constructs (i.e. criminality) to inflate the estimates of the particular condition being measured. In

the case of APD, for example, the over-reliance on behavioral factors, especially the heavy emphasis on delinquent and criminal behaviours (Hare, 1983), has created a tautological relationship between APD and criminality, so that, despite a DSM-III-R disclaimer to the contrary, the diagnosis of APD is "virtually synonymous with a criminal history" (Arboleda-Flórez and Holley, 1991). As these two authors further indicate, "ten out of twelve criteria of set B and six out of ten in set C in DSM-III-R, pertain to instances of criminal behaviour and of obvious (unlawful and punishable) violations of the rights of others" (Arboleda-Flórez and Holley, 1991). Unless the criminality factors in the diagnosis are taken out, as was done by Abram (1989), DIS diagnoses of APD in corrections are tantamount to just a tally of the number of criminals in the institutions.

2.1.3 Remand Centre Studies Highlighted

Because prevalence studies in remand centres have targeted a similar population to the one reported here, these studies are reviewed more in detail in this Section (Table II-1 and II-2, Appendix One). As the review progresses, it will be obvious that these studies have been affected by similar methodological deficiencies as those already reviewed.

In England, Coid (1988) conducted a retrospective study spanning a period of five years, 1979-83. This author reviewed the records of "all unsentenced men remanded during the five years for reports on their state of mind and health or their fitness to plead". Findings indicate that, even after excluding those with dementia, brain damage or subnormality, 258 of the 334 subjects were floridly psychotic or were experiencing a relapse of chronic mental conditions. The major criticisms of this study relate to the highly selected sample and to the secondary, retrospective nature of the data collected.

As far back as 1977, in what appears to be the earliest prevalence study of mental illness in corrections in Canada, Allodi, Kedward and Robertson (1977) found an alarming increase in the number of mental patients in remand centres. These authors conducted a retrospective review of the records of 3,000 remandees to the Toronto Don Jail for a five year period (1969-1973) and found that the proportion of the population admitted to the Jail Psychiatric Unit with a previous history of psychiatric hospitalization, had increased by 7% between the first and last year of the study. In addition, the authors reviewed the records of 106 inmates remanded by the court to the Jail Psychiatric Unit. Among these, 45% were suffering from personality disorder, and 25% from schizophrenia. Although of interest, as possibly the first reported study of this nature in Canada, the study had many serious methodological problems. Apart from the inherent difficulties of accuracy of data in retrospective studies, the report does not mention how the diagnoses were

ascertained, and it included individuals who had been transferred to the psychiatric unit from another part of the jail because of bizarre or violent behaviour. This group, therefore, may have included inmates with disciplinary problems, but not necessarily mentally ill. Also, the sample included individuals remanded by the court for a psychiatric assessment, implying the possibility that some of them may have not been mentally ill.

Petrich (1976), using a standard diagnostic battery, reported an overall psychiatric morbidity rate of 4.6% among an estimated population of 2,625 individuals. His sample consisted of 200 inmates referred for psychiatric examination, but of whom only 122 were examined. Although his percentages do not add up because of multiple diagnosis, it is noted that 36% of his sample was given a diagnoses of schizophrenia, and 51% were diagnosed as suffering from drug dependencies. The author noticed that "psychosis was diagnosed more frequently and alcoholism, anxiety neurosis, and antisocial personality less frequently" than in similar studies of prison populations. A simple explanation for this finding may be that this study was based on a sample of individuals specifically referred for a psychiatric assessment and, hence, the sample may have been highly selected.

Swank and Winer (1976) reported that of 545 inmates examined, 119 (22%) were "psychotic" and 125 (23%) had a history of long-term or of multiple hospitalizations. Swank and Winer's sample was made up of two groups, one group consisting of 445

inmates was specifically referred for psychiatric evaluation. This sample, as the authors suggest, was "specially selected". The second sample consisted of 100 inmates who were seen for psychiatric evaluation as they entered the jail in daily consignments. This second sample was more representative, and its comparison with the first sample, clearly reflects the selection bias affecting the former. Thus (figures for first subsample bolded), there are major discrepancies among those given the diagnoses of functional disorders (**22.9%** v. 3%), of alcoholism (**11.9%** v. 18%), and of "no diagnosis" (**4.1%** v. 36%). Of interest, however, is the fact that percentages for the other categories were not too dissimilar. Unfortunately, and apart from the selection bias affecting the first sample, these two authors, one psychiatrist and one psychologist, do not give details about the type of clinical interviews conducted, or whether there was any consideration given to potential inter-rater disparities.

Piotrowski, Losacco and Guze (1976) selected 50 persons (4 females included) who had been referred for a pre-trial psychiatric evaluation. A standardized psychiatric interview was conducted and history taken. Twenty-two percent (22%) of these inmates suffered from schizophrenia, 10% from affective disorders and 4% had a diagnosis of brain syndrome. This was a highly selected sample which may explain the high levels of prevalence among some diagnostic categories.

Schuckit, Herrman and Schuckit (1977) reported on a study conducted among 199 male inmates arrested during the previous 24 hours on a felony charge. The authors describe the sample as representative over a 4 month period. The study used a structured interview, with a screen for psychiatric illness, administered by trained lay interviewers. Afterwards a psychiatrist reviewed the interviews and the psychiatric illness screen, and assigned a diagnosis. Forty-eight percent of the subjects fulfilled some diagnostic criteria, with APD being the most frequently found diagnosis (16%). The sample in this study was selected on a criminological dimension, i.e. a *major* (emphasis in the original) charge, and hence is not representative of the population arriving at the jail. The report does not specify the number of interviewers assigned to the project or whether there were inter-rater difficulties. As well, the instrument was a screen for psychiatric illness, rather than an actual diagnostic instrument. Of interest in relation to the study reported here is the fact that 5% of those approached by these authors refused to participate, and that this refusal rate is not too dissimilar from the 4.6% obtained by Abram (1989).

Whitmer (1980) reported on 500 defendants in Los Angeles who had been sent for a psychiatric evaluation, apparently because they were "in need of treatment". He found that, on average, individuals in this group had had three previous psychiatric hospitalizations. Besides the fact that the sample in this study was highly selected, the report is too sketchy in terms of methodological issues to allow for a more detailed critical review.

Also in Los Angeles, Lamb and Grant (1982) conducted clinical interviews on 102 inmates "randomly selected" from a sample of individuals referred for a psychiatric evaluation. The authors found that 90% had had a previous psychiatric hospitalization, and that 80% exhibited severe, overt psychopathology, to the point that the great majority of them met the criteria for involuntary hospitalization. Selection bias is possibly one of the major flaws of this study. Although it is indicated that the sample had been "randomly selected", the individuals within the sample had in fact, been highly screened prior to selection for inclusion. Thus, excluded from the study were individuals whose primary problems were alcoholism, phencyclidine intoxication, drug addiction, or developmental disability. This may have been one of the reasons why prevalence rates in this study are so high for schizophrenia (75%), or for the major affective disorders (25%).

Krefft and Brittain, (1983) conducted a study at the Orleans Parish Prison (jail) on a random sample of 283 inmates (out of a male population of 2,000) and 149 females (comprising the total number of non-federal incarcerated females) at the time of the study. The authors "screened" the inmates for mental illness by using psychological tests and psychiatric interviews. Psychological testing was conducted with small groups of 6-10 inmates. Following the group testing, inmates were individually interviewed by a psychologist and, afterwards, by a psychiatrist. Altogether fourteen different psychologists and psychological assistants and twenty-six different

psychiatrists were involved. Apart from indicating that "the psychiatric screening was based on an individual mental status examination", the authors do not report on the type of psychological tests administered, the type of clinical interview conducted by the psychologists or by the psychiatrists, or whether there were any inter-rater discrepancies. The report, however, states that 39.7% of the males and 41.6% of the females were in need of mental health services and that "the number of confirmed recommendations for inpatient treatment, in all categories combined, is 6.7% for males inmates and 9.0% for female inmates".

Steadman, McCarty and Morrissey (1986), quoting six different studies, give an estimate of from 1% to 7% of psychotic problems and about 20% for other forms of mental disorders in prisons. They conclude that "the weight of the evidence appears to support the assertion that the true prevalence rate of psychosis among the inmate population does not exceed the true prevalence rate of psychosis among class-matched community populations". Two of these studies have already been reviewed (the one by Swank and Winer, 1976, and the one by Schuckit, Herrman and Schuckit, 1977). Of the other four studies, one appeared in a newspaper, two were in-house publications, and the last one was a U.S. Government publication; it was impossible to obtain them in time for this review. The following reviews about the latter four studies are, therefore, excerpted from Steadman, McCarty and Morrissey (1986).

The first study surveyed 1,084 adult offenders in five California county jails (Arthur Bolton Associates, 1976) and found that 6.7% were psychotic, 9.3% had a non psychotic mental disorder and 21% had a form of "personality disorder".

The second one was conducted in 1978 by the U.S. Department of Justice (National Institute of Justice, 1980). The Institute's National Jail Survey sampled 5,172 inmates throughout the country (94% males). The inmates were asked whether they were experiencing "nervous disorders" (4.1% of the men and 6.4% of the women), "mental problems" (no rates given), "emotional problems" (2.2% of women and 1.6% of men), or "depression" (1.1% of men and 2.4% of women). It is not clear from the quote how the inmates were selected. The diagnostic terms, as presented above, however, are not clinical diagnoses, but rather, popular conceptualizations of mental disorders.

The third study by O'Keefe (1980) reported on 955 inmates in three county jails in Massachusetts; 4.6% were so mentally ill as to be in need of civil commitment, and 6.2% were "noted as exhibiting signs of mental illness by jail personnel".

Finally, the last study was conducted by Bogira (1981). This author reported that in the Cook County (Chicago) Jail 4% of the inmates were classified as "psychotic, suicidal, or in a serious manic depressive or toxic state" or "had serious adjustment problems".

It appears from these excerpts, that these studies had serious methodological deficiencies and were poorly planned and operationalized.

Two authors, (Arboleda-Flórez and Holley, 1988c; Holley and Arboleda-Flórez, 1988) followed-up a sample of arrestees (taken at the moment of arrest) and measured levels of "transmigration" - the movement of mental patients from hospitals to jails - in the city of Calgary. This was not a study of prevalence of mental illness in remand centres, but rather the authors set out to test the hypothesis that police-identified mentally ill offenders were not different than police-identified "normals" in characteristics other than the arresting officer's perception of "abnormality" at arrest time. About 25% of their sample of 350 were deemed by the police to be exhibiting disturbed or bizarre behaviour. The major flaw of this study is that the police were asked to rate disturbed or bizarre behaviour at arrest time, when the emotions of both the arresting officers and the offenders could be expected to be very high, hence the possibility that the rates may have been overinflated. Also, this study relied on laymen's (police) perception of abnormal behaviour, which is not exactly the same as a psychiatric diagnosis of mental disorder.

Abram (1989) studied mental disorders in a stratified (by category of charge, 50% felons, 50% misdemeanours) random sample of 728 inmates at the Cook County Department of Corrections in Chicago, a facility used for pretrial detention or for misdemeanour charges. Three psychologists administered the DIS. Although

Abram's study was primarily aimed at unravelling interactions among alcoholism, drug use, and antisocial personality that could be used to predict criminal activity, estimates of prevalence for these three disorders can be obtained from the results. Thus, alcohol disorders would amount to 41.4%, antisocial personality disorders 43.0%, drug use disorders 26.0%, and any other disorders apart from these three 26.0%. Comments made about the DIS (*vide supra*) apply to this study as well.

Freeman and Roesch (1989) make the point that results from studies in prisons cannot be extrapolated to situations found in remand centres. Thus, there is some problem in the classification (whether prison or remand centre), or the interpretation of the results of the study by Bland, Newman, Dyck and Orn (1990). These authors sampled from two types of institutions, a prison and a remand centre in the city of Edmonton. (Although the authors do not indicate in their report which two institutions they used for their study, it was ascertained during a personal communication with Dr. Ron Dyck, one of the co-authors, that samples had been taken from the Edmonton Remand Centre and from the Fort Saskatchewan Correctional Centre, a provincial institution housing inmates sentenced to up to two years less a day). The results of this study were not presented stratified per level of institutions. As the estimates are presented for both types of institutions together, it is not possible to tease out the contribution made by each type. The study reports on a systematic sample (termed simple random sample in another section of the report) of 180 provincial inmates who were administered the DIS by trained

interviewers. Limitations of the DIS for this type of population, or potential problems with systematic samples, were not addressed in the report. The results give a prevalence of 2.2% for schizophrenia, 9.4% for obsessive-compulsive, 22.8% for affective disorders (of whom 4.4 % manic, 16.7 % major depression, and 10.6% dysthymia), 15.6% for anxiety and somatoform disorders, 78.9% for alcohol disorder, 50.6% for drug disorder, 56.7% for antisocial personality and 1.1% for cognitive impairment. Despite the methodological issues identified, this study is of major importance for correctional authorities in Alberta as it is the only one conducted in the Province up to now.

Teplin (1990) took a stratified random sample of 728 urban jail males (1/2 felons and 1/2 misdemeanants) and had them examined by psychologists who administered the DIS. In her sample, 3.7% were schizophrenics, 5.8% suffered from major depression, and 2.5% suffered from mania. Most of Teplin's sample (87%) consisted of black males, but this author concluded that, controlling for age and ethnicity, there were no major differences between her estimates and those in the ECA studies for the general population. Teplin does not make any reference to inter-rater reliability issues, or to the limitations of the DIS.

The study by Gingell (1991) was conducted with the specific aim at finding "the nature and extent of mental illness found in remanded prisoners". This author used a non-representative sample of 317 consecutive admissions to the Vancouver city jail,

and took a stratified random sample of 107 inmates from the regular population in the jail. After obtaining mental health and criminological information, he administered the Brief Psychiatric Rating Scale (BPRS), and then proceeded to use the DIS on a "selected group of inmates" from the first group, whom the author identified as being those who "had a high probability of having a mental illness" based on the results of the BPRS and a history of mental illness, and to all inmates in the second group. Gingell found that in his first group, 8% in his sample suffered from schizophrenia and 15% from an affective disorder. In his second group 13% were schizophrenic and 43% had an affective disorder. A large proportion of those suffering from an affective disorder had an alcohol/drug disorder and/or an antisocial personality disorder. Apart from the comments already made about the use of the DIS among forensic populations, it is obvious that there are sampling problems in this study in regard to the use of consecutive admissions, and more importantly, on the peculiar selection of those inmates in the first group. Selection bias is not only evident, but the method left open the possibility for strong subjective bias.

In 1992, Watt, Tomison and Torpy reported a "pilot study" on the prevalence of psychiatric morbidity among a male remand population of 31 subjects selected through a systematic sample in a "typical English" jail. The pilot population was too small, and the details contained in the report too sketchy to provide an appropriate critique of this study at this time.

2.1.4 Summary

Table II-3 brings into focus not only the widths in the ranges, but also the differences in estimates in prevalence studies for some selected conditions between studies in prisons and those in remand centres.

TABLE II-3
Comparison Across the Studies

Disorders	Range of Prevalence	
	Prisons	Remand Centres
Schizophrenia	1% to 8%	2% to 75%
Affective Disorder	0.3% to 21%	3% to 35%
Antisocial Pers. Disorder	5.5% to 75%	13% to 57%
Alcoholism	2.2% to 67%	15% to 41%
Drug Dependency	3% to 49%	12% to 50%
Organic Disorder	0.8% to ?	2% to 4%

This table demonstrates the disparities in the prevalence rates for different conditions as provided by these studies. Prison-based prevalence studies of mental illness provide estimates that do not align with those provided by studies in remand centres. Legally defined mentally ill inmates, correctional decisions and diversion policies may affect prevalence rates at different levels of the justice system. Studies in prisons may miss the most serious pathology arriving at the correctional system (Freeman and Roesch, 1989; Gingell, 1991). On the other hand, it is noticed that

despite methodological problems, a pattern emerges in relation to broad diagnostic categories: most of the pathology is due to either personality disorders or alcohol and drug dependency problems, not psychotic conditions.

The answer to the question of how many mentally abnormal offenders are there in correctional institutions varies "according to the definitions, the group among whom you do your study, and the methods of detection" (Smith, 1984).

2.2 THE ISSUE OF COMORBIDITIES

There is controversy surrounding the issue of comorbidities. It is not clear whether, diagnostically, some comorbidities are discreet entities, i.e. different conditions, or manifestations of the underlying main diagnosis (Brawman-Mintzer, Lydiard, Emmanuel, Payeur, Johnson, Roberts, Jarrell, Ballenger, 1993; Costa, De Fazio, Luzzago, 1992; Nurnberg, Raskin, Levine, Pollack, Siegel, Prince, 1991; Gilger, 1991; Torgersen, 1990; Tyrer, 1989) Comorbidities, however, are very important to understand some associations between mental disorders and crime. Whether as discreet entities or as manifestations of the underlying condition, comorbidities may have an effect in increasing the risk to criminal offending.

One major problem with prevalence estimates in corrections is that the rates that have been provided deal with diagnoses, not people (Abram, 1989). Because of the

high frequency of comorbidities found in psychiatry (e.g. antisocial personality plus alcohol, schizophrenia plus drug abuse, brief psychotic reactions plus borderline personality disorder plus drug abuse, etc.) the probability that one single inmate may have more than one diagnosis is, according to some authors, very high (67% in the study by Daniel, Robins, Reid and Wilfley, 1988).

In regard to mental illness and crime, there seems to be an association between paraphilias and obsessive-compulsive disorders. Individuals suffering from borderline personality often suffer from depression. Substance dependence has been reported associated with drug-induced psychosis, and among these, some cannot be distinguished from schizophrenia (Chiles, von Cleve, Janelka, Trupin, 1990). Nestor (1992), indicates that a history of substance abuse disorder is often associated with psychotic conditions among older adult offenders and among the young, in those with learning disabilities and conduct disorders. The association of the comorbidity between antisocial personality disorder and alcoholism and crime has been reported by several authors. Schuckit (1986) found that alcoholism type II (early onset alcoholism. i.e. before the age of 15) was more related to antisocial personality disorder (hence a high potential for law-breaking) and childhood criminality than type I alcoholism (late onset). Collins, Schlenger and Jordan (1988) found that, among white subjects, those presenting with a combination of antisocial personality disorder (APD) and substance abuse disorder (SAD) tended to exhibit more serious behavioral pathology.

Finally, Abram (1989) found a relationship between APD and three levels of prior criminality: violent crime, felony property crime, and "other" crime (usually misdemeanours), and a relationship between SAD and two levels of prior criminality: felony property crime, and "other" crime (misdemeanours). Yet, intriguingly, and contrary to many reports in the literature, this author did not find an association between alcoholism, or "drug disorders", and criminality, "once controlling for age and co-disorders", usually APD. This finding by Abram somewhat echoes the statement made by Monahan and Steadman's (1983) that "no relation or, at best, a much weaker relation is found" between crime and mental disorder once controlling for demographic and life-history factors.

Prevalence studies are often used to plan services. For purposes of planning clinical services in correctional institutions, counting all diagnoses including comorbidities, could convey the false impression that a large proportion of the population in prisons consists of mentally ill individuals in need of treatment or hospitalization.

2.3 FACTORS ASSOCIATED WITH MENTAL ILLNESS

2.3.1 General

When serious and bizarre crimes come to the attention of the public and the courts, it is not unusual that mental illness is suspected as one of the reasons for the crime. Knowledge of the characteristics of the crime could help understand potential associations between mental illness and criminality, or as "marker" to infer the presence of a mental condition. In these circumstances, the accused is referred for an assessment either to a forensic unit outside of the legal system, i.e. in a hospital controlled by the health authorities, or within the prison system itself, to a nursing unit or psychiatric annex. Some of these individuals may be mentally ill. Yet, by virtue of the referral to a psychiatric facility, all those referred may be counted as psychiatric casualties. This could overinflate the number of individuals within the system considered to be mentally ill, and lower the percentage of those with specific diagnoses.

That mental patients commit crimes may not be unusual; patients of any kind could commit crimes. Mental illness, however, is expressed through behavioural manifestations and affects the cognitive, the emotional, and the volitional aspects and functions of the personality. These are the very functions that the law considers essential to assess in order to adjudicate guilt, label the accused a criminal, and profer a sentence. When a mental illness is suspected in relation to a crime, the

unstated assumption is that the mental condition preceded the crime. Yet, the clinician, and the epidemiologist conducting prevalence studies and assessing the association between mental illness and crime, have to keep in mind that often, mental illness may develop after a crime has been committed. For example, crimes of passion or crimes committed during an intoxicated state of mind may be followed, once the person regains full control of the cognitive faculties, by adjustment reactions, or by major mental conditions such as serious depression, or psychotic reaction (Arboleda-Flórez, 1980).

The study of the relationship between mental illness and criminal offenses (defined as unlawful acts, by commission or omission, leading to an arrest) is difficult (Joukamaa, 1993). Much work remains to be done before clear patterns emerge. Hodgins (1992), in a 30 year follow-up study of a birth cohort in Sweden on the relationship between crime and mental disorder and between crime and intellectual deficiency, reported that "men with mental disorders were 2.5 times more likely than men with no disorder or handicap to be registered for a criminal offense and four times more likely to be registered for a violent offense".

Mental conditions, in general, seem to be related to crime (Prins, 1980), a fact that is acknowledged in law. Monahan and Steadman (1983) put this very succinctly: "Contemporary public policy, no less than historical legal doctrine, is premised on

the assumption that a population exists in which mental disorder and criminal behaviour converge".

The problem, however, is not the fact that the two elements converge, but the degree of relatedness, or convergence, between the two. For example, some mental conditions have a criminological definition as part of their semiography. According to DSM-III "consensus" diagnosis, some mental conditions cannot be understood in other but criminological terms. The diagnosis depends on the presence of unlawful behaviour and the mental condition is defined as a crime for which the person, if apprehended, could be found guilty. Thus, with mental disorders such as paraphilias (paedophilia, exhibitionism, voyeurism, frotteurism, zoophilia, necrophilia, etc), pyromania, kleptomania, and some others, the manifestations of the symptoms constitutes *ipso facto* a crime, and entering the diagnosis is tantamount to labelling the person a criminal. (American Psychiatric Association Committee on Nomenclature and Statistics, 1987). In these disorders, therefore, the association between the mental disorder and a criminal offence is one to one. Other mental disorders, such as antisocial personality disorder (APD), borderline personality disorder (BPD), and the impulse control disorders including intermittent explosive disorder and pathological gambling carry, as well, a criminological element in their definition (American Psychiatric Association Committee on Nomenclature and Statistics, 1987), but the degree of relatedness is

not one to one, in that their symptoms could be expressed without necessarily breaking the Law.

Alcoholism carries a high risk of law-breaking (Pihl and Peterson, 1993) in the form of victimization at the time of intoxication. Other substance dependencies are known to lead to income-generating crime in order to finance the habit. Swanson, Holzer III, Ganju and Jono (1990) found higher rates of depression, suicide attempts, and aggressive tendencies among a group of alcoholics compared to rates among non-alcoholics. Hare and Hart's (1993) research suggests that psychopathy is strongly associated with a high risk for criminal and violent behaviour.

Toch and Adams (1989) found that 13.8% of inmates without a psychiatric history or history of substance abuse (presumably these authors made distinct categories out of these two entities) had a history of recent and remote violence vs. 17% of inmates with a psychiatric history or history of substance abuse. Percentages for the same two groups in regard to remote violence were 30.9 and 51.1, respectively. Furthermore, 5.8% of inmates with the same combination (psychiatric history and substance abuse) committed unmotivated violent acts, compared to only 1.2% among inmates without psychiatric history or history of substance abuse. This observation is supported to some extent by Yarvis (1990) who, in a series of 100 murderers, found that 29% of them had a diagnosis of "Psychosis" (schizophrenia 21% and affective disorders 8%), and 35% a diagnosis of substance abuse. Yarvis

concluded that "when the interplay of demographic and other relevant variables is examined, clusters with complex but distinct diagnostic patterns emerge". Still, the relationship between these conditions and criminal offenses is not one to one.

The relationship becomes less and less straightforward when other mental conditions are considered. Otnow Lewis (1981) pointed out a clinically frequent association in children between delinquency and psychotic, schizophrenic-like disorders. It is also known that individuals suffering from schizophrenia may get involved either in minor law-breaking or in serious unexplainable violent crime (Mackay and Wight, 1984) while others who suffer, for example, from serious depressions, may display violent behaviour either against self or against others (Goodwin and Jamison, 1990, Taylor, 1993). In fact, dangerousness, that is, the potentiality to cause grievous bodily harm to self or others, is the main criterion for civil commitment in many jurisdictions (Hodgins, 1993; Mental Health Act-Province of Alberta, 1988; Arboleda-Flórez, 1990; Arboleda-Flórez and Ramsey, 1994).

Finally, the one domain that is most difficult to capture in research of this kind is the contextual one: the triggers to a criminal offense in a particular situation (Steadman, Monahan, Clark Robbins, Appelbaum, Grisso, Klassen, Mulvey, Roth, 1993). Law-breaking often depends on the immediate social context, such as the breaking point in a psychotic condition in which a highly cathected object (*cathexis* - concentration of psychic energy on a single goal, to hold fast (Hanks, P, Collins Dictionary, 1990))

may become the victim of attack. This is also the case in intoxication-related victimizations. Otherwise, law-breaking may be less immediate. Drug addicts, for example, may have to break the law depending on whether their financial situation allows them to afford the habit.

In summary, although mental conditions and criminal behaviour may be associated, the degree of association and the factors that mediate the relationship need further study. The following sections review some factors that have been considered of importance to understand such a relationship.

2.3.2 Gender

Criminality seems to be the purview of males, at least to judge from rates of arrest and number of incarcerated individuals (Statistics Canada, 1991). Males figure prominently in any statistics on crime in general, or in specific categories. An association between plasma testosterone levels and violent crime among males has been noted. Sexual crimes, especially violent sexual crimes, are generally a male type of crime. Male children display greater aggressiveness than female children, even before social learning could have an effect. This has been noted cross-culturally and as well in other species such as male chimpanzees (Mednick, Pollock, Volavka, Gabrielli, 1986).

Among females who commit homicides a large number are reported suffering from mental disorders (Oyebode, Wolstenholme, Crispin, Graham, 1993). Gender, however, may have an effect on differential rates of arrest, pretrial decisions and final dispositions (including withdrawal and staying of the charges when a female is involved), or at plea bargaining (Nagel and Hagan, 1983). Unless police use extraordinary discretionary powers at time of arrest to screen females from further prosecution, males definitely are overly represented in any crime statistics, and are considered, therefore, to have an increased risk for criminality.

2.3.3 Age

Learning disabilities tend to develop into adult antisocial personality disorder, which, in turn has been considered to be highly associated with criminality (Bloomingtondale, 1990). Similarly, learning disabilities and a history suggestive of childhood conduct disorder among the young, and psychotic disorders among the adults, were found to be important diagnostic correlates of violent crime (Nestor, 1992).

Although crime is not the exclusive domain of the young, even without counting young offenders (in Canada, children younger than 12 years of age are considered incapable of having the legal requisites necessary to commit a criminal offence; thus a young offender is defined as a person between the ages of 12 and 18 - Young Offender Act, Watt and Fuerst Tremeeear's Criminal Code, 1994), most criminal

populations involve people in their late teens, and in the second and third decades of life. Many reasons have been advanced to explain the overinvolvement of young people in criminal activities. Those that have been considered include: hypothesized levels of emotional immaturity and developmental organic cerebral delay, psychoendocrine factors in young males, peer pressures, learning disability and childhood learning disorders (Nestor, 1992), plain physical prowess that gives an advantage in the commission of a crime, and lack of time for antisocial personality disorders to "burn out" (Arboleda-Flórez and Holley, 1991; Hare, 1988). In regard to the last reason, "burn out", this term has been used as a prognostic benchmark for antisociality whereby it is assumed that among individuals suffering from an antisocial personality disorder "...after age 30, the more flagrantly antisocial behaviour may diminish, particularly sexual promiscuity, fighting, and criminality" (American Psychiatric Association, 1987). According to Guze (1976), apart from other factors, age is a major prognostic factor for recidivism. Research on "criminal careers" indicates that a majority of these careers "begin in the early to mid teens" (Petersilia, 1980). Age is also related to type of psychiatric disorder. Daniel (1988), for example, found that schizophrenia was more common in a younger group of inmates, whereas major depression and phobias were more prevalent among the older group.

2.3.4 Ethnicity

In the USA, the population in juvenile correctional facilities is mostly composed of non-white youths (McGarell, 1993). Otnow Lewis and Shanok (1981) have presented clinical and epidemiological evidence of discriminatory practices towards racial minorities (black children) in the diagnosis, disposition, and treatment of aggressive, psychiatrically disturbed adolescents. Arboleda-Flórez, Holley, Williams, Crisanti (1994) have pointed out a differential access to particular court systems detrimental to the Canadian native population. In the Province of Alberta, native Canadians who make up about 2% of the total population, are overly represented at about 12% among incarcerated populations (Bland, Newman, Dyck, Orn, 1990). Ethnicity is unlikely to be a contributing factor to criminality, but rather social circumstances affecting ethnic minorities may be at the root of racial differences in crime statistics.

2.3.5 Socio-economic Status (Education)

More offenders are raised in families on social assistance (Hodgins, 1992). Greene (1993) states that there is a relationship between exposure to poverty and violent crime. Marxist Criminology propounds that there is a relationship between social structures, the economic systems, and the criminalization of certain behaviours (Sparks, 1980). Although mental illness does not exclude people according to socio-economic status, mental patients tend to congregate in the lower rungs of the social

ladder. A downward drift was proposed by Hollingshead and Redlich (1986). Mental disorders (schizophrenia, substance abuse, alcoholism, mental retardation, paraphilias, etc), however, tend to appear at an early age when the young person has not had a time to develop skills to succeed in life. Thus, although occupation may be the best single predictor of social status, individual income and educational attainment have been found to be highly correlated with occupational ranks (Miller, 1991, p. 327). Hollingshead's (1986, pp. 109-132) Two-Factor Index of Social Position, for example, considers education and occupation as the major predictors of social position. It may be, therefore, that rather than a downward drift, mental illness prevents young patients to advance, thwarts their expectations, and holds them to a level of subsistence often depending on social assistance. Many of these patients, especially those suffering from substance dependence, tend to gravitate into criminal activities.

2.3.6 Previous Forensic Remand

Deinstitutionalization (a set of legislative policies that set out the transfer of patients from mental hospitals into the community), has been blamed for the revolving door phenomenon and for the "criminalization of the mentally ill". Whether this is the case, a recurrent fact emerges when dealing with mental patients who end up in trouble with the law: many have had a previous admission to psychiatry, and many had been previously "diverted" from the criminal system to the mental health

system. Prins (1993), for example, calls attention to the uncritical espousing of diversion for some of these patients. Among patients who had been previously admitted to special hospitals in England, Bailey and MacCulloch (1993) and MacCulloch, Bailey, Jones, and Hunter (1993) found reconvictions and rehospitalizations of up to 50% among those suffering from mental illness and who had obtained an absolute discharge, and reconvictions of 78.6% among those diagnosed as personality disorders and given absolute discharges. In the same paper these authors point out about levels of "serious reoffending" among patients discharged from a Special Hospital in England, and wonder whether these "failures" could be attributed to the system.

These studies seem to confirm the claim made by Menzies (1989, p.236) that after an assessment at a Forensic Unit in Toronto, criminal defendants emerged "in a worse condition than they entered, as measured by their prospects for freedom, by their identities as criminals or psychiatric deviants, and by their vulnerability to the intervention of carceral and therapeutic controls agents". Webster and Menzies (1993) expressed a similar concern. The problem, however, may not be that a forensic remand leads to more institutionalizations, but that, by virtue of the seriousness of further criminality and of the mental conditions, or else, failures in the system, i.e. follow-up, housing, etc, these individuals have nowhere to go but back to an institution (Arboleda-Flórez, 1991).

2.3.7 Previous Adult Detentions

Mednick and Finello (1983) defined chronic offenders as those with a history of five or more arrests. They identified a subsample of about 6% of males considered chronic offenders, as per their definition, and found that these males accounted for 56% of the total offenses recorded by the whole group. Research in criminal careers indicates that the probability of further contacts with the police is extremely high once more than three contacts had been recorded, and that, in addition, these types of offenders do not have any crime specialization (Petersilia, 1980). According to Moore, Estrich, McGillis, Spelman (1984), "a vastly disproportionate number of crimes are committed by a relatively small number of very active offenders". These authors subscribe to the view that there exist distinct patterns of offenders, especially a particular group of "violent predators" most of whom would be young. On the other hand, some literature on the subject indicates that chronic mental patients tend to commit lesser level crimes such as obtaining food by fraud, disturbing the peace, resisting arrest, shoplifting, etc. (Arboleda-Flórez and Chato, 1985). This may be the group of patients whom deinstitutionalization has failed, and who could be dealt with through mechanisms other than criminal sanctions.

2.3.8 Present Charges

Contrary to earlier reports (Steadman, 1973; Coccozza and Steadman, 1978; Steadman and Coccozza, 1979), more recent publications seem to indicate that mental patients are at a higher risk of committing criminal offenses, and that a re-thinking of the risk represented by mental patients is in order (Hodgins, 1993; Taylor, 1993). It is not clear, however, what kind of risk in terms of specific offenses do mental patient pose to others. As previously indicated, there is a direct relationship between mental conditions and crime for those mental disorders whose semiology connotes a breach of the law (i.e. paraphilias, kleptomania, pyromania, etc), but the relationship becomes harder to understand when other mental disorders are considered. There is no clear relationship between a specific mental condition and a specific form of crime.

2.3.9 Legal Disposition of Instant Charge(s)

Very seldom is a person charged with a single offence following a criminal event². Thus, a Case Number (identification number given by the police to the event) may

² "An event is an occurrence which (a) causes its being reported to the police by one or more persons and, when investigated by the police, is found to contain at least one violation of the law; or (b) is discovered, directly or indirectly, by the police during patrol and found to contain at least one such violation" (Sellin and Wolfgang, 1971). By definition, therefore, an event may contain more than one violation of the law.

include a variety and number of charges. The type, severity, and number of charges have an effect on the type of disposition at sentencing. In regard to mental patients, under the Mental Health Act of Alberta (1988), the Police have the authority to "divert" mental patients from the Justice system to hospitals at the time of arrest. Those patients who are detained, however, may be remanded for a forensic assessment. The effect of these type of assessments on length of detention prior to trial or final legal dispositions is not too well known (Prins, 1992), but some studies point towards a lengthening of the pre-trial stage, an increase of "diversion", and possibly an increased of time to be served (Arboleda-Flórez, Holley, Crisanti, Rose, 1993). Whether legal dispositions play a role on further criminality of mental patients is a factor that needs further elucidation.

CHAPTER THREE

METHODS AND PROCEDURES

3.1 INTRODUCTION

The study proceeded in two phases. The first phase, the primary data collection, began on July 27, 1992 and was completed on December 10, 1992. The second phase of the study, the secondary data collection, started in February, 1993 and was finished in November, 1993.

3.2 THE SETTING

The study occurred at the Calgary Remand and Detention Centre (CRDC). This is a correctional facility operated by the Division of Corrections of the Department of Justice, Alberta. Its mandate is to hold, in secure confinement, a variety of inmates who are awaiting trial.

The inmate population object of this study could be described in terms of four groups. The first and largest was composed of individuals who had been arrested and ordered detained pending appearance the following day in Provincial Court. The second group consisted of inmates ordered "remanded" for a period of time pending arraignment for bail, or if denied bail, pending trial. The third group

included persons sentenced to short periods of imprisonment (usually no more than a few weeks), or fine defaulters (serving time in lieu of paying the sentence and usually on weekends). Finally, a fourth group of inmates at the CRDC consisted of prisoners who were on "courtesy hold", or "in-transit" between institutions, or who were brought back to face further charges or to appear as witnesses in somebody else's trial.

The CRCD holds between 350 and 400 inmates of both sexes. Under normal circumstances, all are adults (legally over the age of 18). The CRDC does not house young offenders, defined as below the age of 18, because by law, they cannot be mixed with adults. They are detained in a different institution. It is only when a young offender is "raised to adult court" (usually because of extremely serious charges) that a person below 18 could appear in the roster of the CRDC. The CRDC serves the needs of the courts and some correctional needs (i.e. jail or as a half-way station) of the City of Calgary and environs, a metropolitan area of about 1,000,000 people.

3.3 PHASE ONE - PRIMARY DATA COLLECTION

3.3.1 Design

In Phase One, a descriptive, cross-sectional design was used (Feinstein, 1985; Rothman, 1986). The main purpose was to obtain diagnoses that could be used to

estimate (a) the one-month prevalence of mental disorders, defined as the proportion of inmates who have had the disorder within the month prior to the examination (MacMahon and Pugh, 1970), and, (b) the lifetime prevalence defined as the proportion of inmates known to have had the disease for at least a part of their life (Last, 1988).

3.3.2 Sampling Plan and Data Collection Procedures

Forty seven hundred and seventy persons were admitted into the CRDC during the months of the study. A random sample of 1200 inmates composed the study group (see Figure 3.1).

The sampling frame was developed from the "booking list". As individuals arrive at CRDC, identifying information is entered into an on-going typed listing by the "Booking Officer". The identifying information includes name, date, location within the Centre (dormitory), charges, and, if known, date of next court appearance. No inmate is officially accepted who has not been "booked" first. "Booking" forms the basis for "inmate counts" conducted at regular intervals throughout the day, and "inmate counts" are the basis of the security system. For example, calling a "missing inmate" code alerts the security apparatus in the Institution that something has gone wrong. "Bookings", therefore, have to be accurate. Given the method of booking, i.e. on arrival, the possibility of systematic bias, which might have occurred if the

identifying information had been entered alphabetically, by kind of crime, by age, or sex, was non-existent. The following Sampling Plan was then implemented:

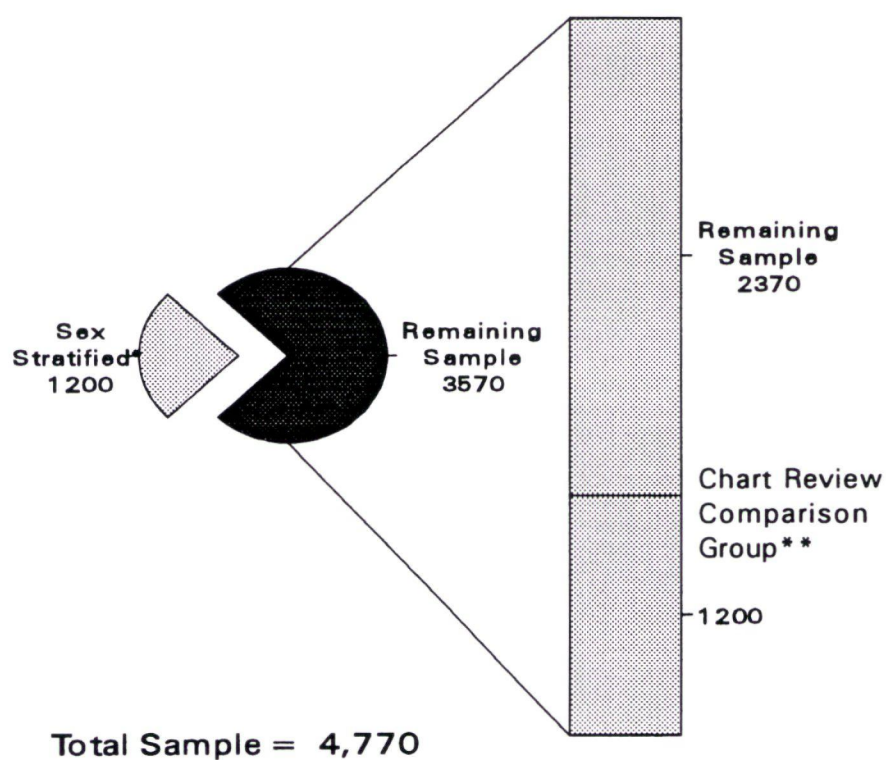
- 1) Every morning at 600 hours the research assistant collected the "booking list" for the previous 24 hours.
- 2) To ensure that sufficient number of females were sampled, the research assistant stratified the "booking list" by sex. Based on previously known proportions of males and females arriving at the CRDC, it was decided that females should make about 10% of the total sample.
- 3) Because the numbers of daily admissions to the CRDC vary from day to day, the application of a standard sampling fraction would have resulted in different sampling probabilities each day. To guarantee an equal probability of selection, each sex stratified list was then divided into blocks of nine and each name within the block was assigned a number from one to nine. Incomplete blocks of nine on any day were also numbered within the block. Eligible inmates who, because of logistical or language reasons could not be interviewed, or who refused, were replaced by the next numbered individual within the same block (Henry, 1990).

- 4) Based on a calculated daily average of 40 admissions, five sets of random numbers between one and nine were generated for each day (Minitab Statistical Software, 1989). The random numbers were, then, applied to each block of nine names to identify those four inmates to be approached for the study. Because it was impossible to carry over names from one day to the next as inmates could be released or transferred, partial blocks were sampled each day. For example, if a day had a remaining incomplete block of five, random numbers were prepared for that block size to select the potential interviewees, and on the following day the first block would be a block of four.
- 5) A designated Guard was, then, given the list of selected individuals. It was the duty of this Guard to go to the dormitories, call them out and assemble them. The Guard would then escort the inmates to meet the Research Assistant at the research area previously assigned to the investigation team.
- 6) If any inmate had to be omitted because of logistical reasons (i.e. Court, lawyers, very early transfers) the Guard was given a replacement list of names.

- 7) On greeting the inmates, the Research Assistant checked for exclusions, advised the inmates about the nature of the research and obtained their written Informed Consent, a copy of which was retained by the inmate.
- 8) Ineligible persons (because of a language barrier or who had been interviewed within the past two weeks), or those who refused, were replaced by the next numbered inmate provided within the block, as in the computerized number list.
- 9) Those inmates who agreed to proceed were asked to fill out the SCID Axis II Overview questionnaire (described below).
- 10) Once the questionnaires were filled out, the Research Assistant assigned each inmate, in order, to the next available psychiatrist. This system prevented any psychiatrist from choosing who he would interview. This procedure was changed on weekends when only one psychiatrist was available.
- 11) To allow the research and institutional staff a short training period, interviews were conducted on July 27 and 28, 1992, but were considered to be pilot data and not counted. Interviews counted for

the study, and the tally of the total number of inmates arriving at CRDC to be included in the sampling frame, commenced on July 29, 1992.

FIGURE 3-1
Sampling Scheme and
Sampling Frame of Admissions (N = 4770)



* Groups of Nine ** Out of 3570 Charts

3.3.3 Exclusions, Omissions, Refusals

3.3.3(i) Exclusions

There were two reasons for exclusion: (1) a language barrier and (2) having been interviewed within the past two weeks.

- 1) A language barrier was defined as "not possessing the English language and, therefore, unable to communicate in this language".
- 2) Some inmates were admitted to the CRDC more than once during the study period. On the assumption that mental pathology could develop over a short period of time following release and affect one month prevalence rates, "repeaters" were eligible for inclusion a second time, provided that at least two weeks had lapsed since their initial interview.

3.3.3(ii) Omissions

From time to time it became necessary to omit an inmate because of logistic circumstances such as court appearances, consultations with officers of the court, or with counsels, or institutional regulations. However, through arrangements with the Office of the Crown Attorney, court clerks, institutional authorities, and CAPS (Court

and Prison Security agents), every effort was made not to omit any inmate who was otherwise eligible. Inmates were only omitted when it was practically impossible to postpone a higher demand on their time. The usual case involved an inmate who had to be transported very early in the morning, either to another institution, or to the Court of Queen's Bench (located some kilometres away) for consultations with counsels prior to court appearance.

3.3.3(iii) Refusals

Following a general introduction of the research project in which the names of the investigators and their roles were mentioned, the Research Assistant answered questions (most often about confidentiality) and, then, invited the inmates to participate in the project. The inmates were advised that their participation was voluntary and that they were free to withdraw at any time without compromising their legal status or circumstances in the institution. No inducements of any kind were offered.

Previous studies have reported refusal rates of 4.6% among paid subjects (Abram, 1989) and 5% among volunteer subjects (Schuckit, Herrman, Schuckit 1977). Given that in this study no incentives were offered, that interviews started very early in the morning, and that inmates had just gone through the experience of arrest, possibly

traumatic for many of them, to err on the conservative side, a refusal level of 10% was considered in calculating the sample size.

As noted earlier in Section 3.3.2, for each inmate excluded, or omitted, or who refused to participate, the next inmate in the sequence of random numbers within the block was approached to volunteer as a replacement.

3.3.4 Instruments

Inmates who agreed to participate were asked to complete the Overview for Personality Disorders Section of the Structured Clinical Interview for DSM-III-R, SCID II (Spitzer, Williams, Gibbon, First, 1990). The inmate, then, participated in a semi-structured clinical interview (SCID and SCID II) conducted by a forensic psychiatrist. When an inmate was diagnosed as suffering from an Antisocial Personality Disorder in the SCID II, the forensic psychiatrist proceeded to administer the Hare's Psychopathic Checklist, PCL (Hare, 1980, 1983, 1985).

3.3.4(i) SCID II Overview

This self-administered Section of the SCID II is designed to gauge general trends in the personality. The Overview instructions state: "These questions are about the kind

of person you generally are, that is, how you usually have felt or behaved over the past several years". Responders are asked to circle two potential answers, Yes or No. The questions in the Personality Overview follow those in the SCID II and serve as a screen to alert the psychiatrist to particular personality types on which to concentrate during the interview. By itself the Overview is not diagnostic; the diagnosis is made by the psychiatrist during the interview.

3.3.4(ii) SCID

Four forensic psychiatrists conducted the interviews using the SCID-NP (Structured Clinical Interview for DSM-III-R), Non-Patient edition. The choice of the Non-Patient edition was important because these subjects were not originally identified as psychiatric patients. The NP edition of the SCID is the same as the SCID-P (patient edition), but differs from it in two ways (a) the introductory overview section makes no assumption of a chief complaint, and (b) instead of Module B (psychotic and associated symptoms), and Module C (psychotic disorders-differential diagnosis) found in the SCID-P, it has a psychotic screen where these two modules have been collapsed. For those individuals found to be psychotic in the screen, however, the two modules B and C from SCID-P were added.

The SCID-NP was complemented, when the psychiatrist thought that it was necessary (based on the Overview and his diagnostic hypotheses as the interview proceeded), with the special module SCID-II.

The SCID was developed through an NIMH grant to serve as the basis for a semi-structured clinical interview to make Axis I and Axis II, DSM-III-R diagnoses. It includes an introductory overview followed by nine modules, seven of which pertain to the major Axis I diagnostic categories and two to eating and adjustment disorders for a total of 34 diagnoses. The SCID II is used for diagnosis of the 12 personality disorders described in DSM-III-R, plus self-defeating personality. In addition, the SCID allows the clinician to make other diagnoses, if they are not included in the list. Unlike the DIS, clinicians using the SCID do not rate the respondent's answer to the question automatically, but are asked to challenge the respondent in any question and make a clinical judgement (Reich, 1992, p.184-5).

The SCID has been carefully tested and considered to be reliable and valid with kappa coefficients for test-retest studies of .61 for current and .68 for lifetime diagnoses; which are similar to other structured diagnostic instruments. The kappa coefficients for SCID II are similar to test-retest reported for other instruments used for personality assessments (Spitzer, 1990).

The SCID has to be administered by a trained clinician familiar with DSM-III-R classification and diagnostic criteria. It follows a decision tree approach to guide the clinician in the testing of diagnostic hypothesis as the interview proceeds. The diagnosis given by the clinician is, therefore, the "gold-standard".

"The output of the SCID is a record of the presence or absence of each of the disorders being considered, for current episode (past month) and for lifetime occurrence" (Spitzer, Williams, Gibbon, First, 1992, p. 624).

In addition, the SCID has a subthreshold category for those subjects who may have only some of the symptoms of a particular condition and who, therefore, cannot be so diagnosed.

Spitzer, Williams, Gibbon, and First (1992) state that, in research, the SCID has been used in three ways : (a) to select distinct and "pure" study populations. For example, among patients who suffer from panic disorders, so that clinical trials could be carried out to measure effectiveness of treatments (Coryell and Noyes, 1988; Ballenger, Burrows, DuPont, Lesser, Noyes, Pechnold, Rifkin, Swinson, 1988), (b) to screen healthy volunteers for control subjects (Gaffney, Fenton, Lane, Lake, 1988), and (c) as an appropriate instrument for use in community surveys, and "to characterize a study sample in term of current and past psychiatric diagnosis" (Pitman, Altman, Macklin, 1989; Buydens-Branchey, Branchey, Noumair, 1989; Spitzer, Willimas, Gibbon, First, 1990).

3.3.4(iii) PCL

Alluded to above, is the issue of the instability of DSM-III and DSM-III-R diagnosis of Antisocial Personality Disorder (APD), because of its circularity with criminality and its overreliance on "behavioural" manifestations, on which both the DIS and the SCID are based to make this diagnosis. To deal with this, subjects who received a diagnosis of APD in the SCID were administered the Psychopathic Checklist (PCL) originated by Hare (1980, 1983, 1985). The PCL is used to make a diagnosis of "psychopathy" and is based on "personality characteristics" as opposed to the "behavioral criteria" of DSM diagnosis of APD. Thus, its use overcomes the tautological problem between APD and criminality described above. The PCL is a widely used instrument which has been carefully tested, and which has been considered reliable and valid (Hare, 1980, 1983, 1985).

3.3.5 Training and Inter-rater Reliability

Four highly trained forensic psychiatrists conducted the interviews at CRDC: Dr. Kenneth O'Brien³, Director of Forensic at Adelaide (New South Wales, Australia), Dr. Kenneth Hashman, Director of the Forensic Unit at the Calgary General Hospital in Calgary, Dr. Yekeen Aderibigbe, then a second year fellow in Forensic Psychiatry at

³ Dr. O'Brien did not arrive on time to participate in either the reliability study or the first two months of data collection, but received the same training on the SCID and PCL once he joined.

The University of Calgary Forensic Division⁴, and Dr. J. Arboleda-Flórez, Professor and Head, Forensic Division, Department of Psychiatry, The University of Calgary.

In preparation for the reliability study, three of the four interviewers read materials on the SCID and PCL, discussed details among themselves, watched training videos on the use of the SCID, and conducted interviews using the instruments. They were, therefore, fully trained in the use of both instruments prior to the beginning of the reliability study. Even so, and to cope with logistics problems, the first three cases observed and rated for the reliability study were excluded. Inter-rater reliability (Dunn, 1989) was tested by three of the interviewers on a sample of 20 patients in the Forensic Unit of the Calgary General Hospital, using an α of 0.05 and a β of 0.20 (Donner and Eliasziw, 1987).

Patients at the Unit were, in the great majority, about 92%, transferred to the Unit from the CRDC for a forensic assessment (Calgary General Hospital, 1993). As such, they were considered to be from the same population object of the study at the CRDC. Following Fleiss (1986, p.1), Cohen's (1960) Kappa statistic was chosen as the appropriate measure of agreement.

⁴ Dr. Yekeen Aderibigbe is now with the Department of Psychiatry, Medical College of Virginia, Richmond, VA, USA.

TABLE III-1

Partial Kappa Coefficients* for Diagnoses Recorded During Reliability Study

Diagnoses	Partial kappa Coefficients
Other DSM-III-R Axis I Disorder	.7321
No Diagnosis	.7321
Drug	.4828
Abuse(Sedative/Hypnotic/Anxiolytic)	.8500
Major Depression	.5148
Alcohol Dependence	1.000
Bipolar Disorder	.6765
Polysubstance Dependence	1.000
Cannabis Dependence	1.000
Schizophrenia	.0169
Other Drug Disorder	

*Fleiss, J.L. (1981), p. 230

The partial kappa coefficients for nine different diagnoses recorded on the 20 patients examined for the reliability study and a code for no diagnosis are presented in Table III-1. Partial kappas ranged from .0169 (one partial result for a specific diagnosis given by one rater on a hallucinogenic drug) to 1.00 (three partial results). **Overall kappa was .7774**, a respectable agreement that could have been much higher were it not for the outlier low partial kappa of .0169.

In addition to the inter-rater reliability study at the beginning of the project, periodic checks were conducted at intervals of 200 cases on the variability of diagnostic findings among the four raters. These extra-precautions helped detect "drift" among interviewers.

3.3.6 Mental Disorders Targeted

The SCID provides diagnoses for 34 psychiatric disorders and the SCID II for all personality disorders classified in DSM-III-R. Based on estimates of prevalence of mental disorders in correctional populations, as obtained from the literature in the field, it was to be expected that some disorders would not be represented in sufficient numbers to make appropriate statistical analyses. However, from the literature review it is known that, among the mentally disordered, Antisocial Personality Disorder (APD) and Substance Abuse Disorder (SAD) stand out as being more frequently related to crime, especially when they appear as a comorbidity. For this reason, in order to explore the relationship between mental disorders and criminal offenses, the comorbidity APD and SAD will be paid particular attention. In the event that not enough comorbidity cases were found, the relationship will be explored using all cases of mental illness together.

3.4 PHASE TWO - SECONDARY DATA COLLECTION

3.4.1 Introduction

During the second Phase, a review of the records (medical and criminal) of the 1200 inmates who had been interviewed was conducted. In addition, a Comparison Group was chosen and their records were examined, as well. It was reasoned that such a group was necessary in order to determine whether selection bias had occurred

because either types of mentally ill individuals, or particular groups of criminals, had refused to participate. In addition, this group was reviewed as a measure of "missed pathology" by the clinical staff at CRDC. This last reason was considered of importance if the study results were to be of some use to correctional authorities for program planning.

3.4.2 Sampling Plan

Records of individuals in the Comparison Group were chosen from a simple random sample, stratified by sex, taken from all the records of inmates (4770) who had been received into the CRDC during the months of the study minus the 1200 who had been interviewed.

3.4.3 Sources of Data

3.4.3(i) Medical Records

The policy at the CRDC is that once an inmate is officially entered into the roster, the Nurse proceeds to do a "cursory medical", which includes observations on mental status and questions regarding previous mental problems, including suicidal potential. The "cursory medical" is designed to identify any inmate presenting with

any kind of health problem on entrance at the Centre. If the " cursory medical" is positive and the Nurse has concerns about the inmate's condition, the Nurse could refer the inmate to the physician the following day. In turn, the physician could request a consultation with the institutional psychologist or to the consultant psychiatrist. It was expected, therefore, that the medical records would contain usable clinical information.

Two items of information were extracted from these records:

- 1) Previous or present diagnoses of mental illness ascribed to the inmate while in custody in any correctional institution in Alberta, and
- 2) Transfers to any of the two forensic facilities in the Province (the Alberta Hospital Edmonton Forensic Unit or the Calgary General Hospital Forensic Unit).

3.4.3(ii) Computer Records

The computer records at the Department of the Attorney General of the Province of Alberta - the Criminal Justice Information System (CJIS), and of the Division of Corrections (then the Department of the Solicitor General of the Province of Alberta) - the Correctional Management Information System (COMIS) were accessed for

routine demographic information, and for legal and criminological information. From the information compiled in the computer records, the following items were extracted:

- 1) COMIS number (correctional ID number).
- 2) Name.
- 3) Date of Admission (date inmate received into the CRDC).
- 4) Gender (anatomical sex: male, female).
- 5) Age (defined from date of birth).
- 6) Ethnic Origin
- 7) Education (last grade obtained).
- 8) Previous Forensic Remands (yes/no)
- 9) Case Number (total number of Provincial detentions)
- 10) Charge(s).
- 11) Legal Disposition (federal time, provincial time, probation/fine/other, and unknown).

3.4.3(iii) COMIS Number

This computerized number is given to the inmate on entrance into the system and does not change, regardless of number of times, or of different correctional institutions in Alberta, that the person may have been admitted. COMIS numbers,

therefore, are unique identifiers, and were used to relate the records from the different files and sections of the study.

COMIS Numbers range from four to six digits. For purposes of identifying within the study those inmates who had already been seen (repeater), the letter "R" was added to the COMIS Number. Thus, in order to relate the records, an alphanumeric record with seven potential spaces was created for all inmates in the Study and the Comparison groups.

3.4.3(iv) Age

COMIS provides the age as date of birth (DOB). Age, therefore, was calculated, using a special feature of Epi Info (Dean, Dean, Burton, Dicker, 1990), by subtracting DOB from Date of Admission (DOA). The samples were stratified using eight age groups as shown in Table III-2.

TABLE III-2

Age Groups

1	2	3	4	5	6	7	8
(17-19)	(20-24)	(25-29)	(30-34)	(35-39)	(40-44)	(45-49)	(50-99)

3.4.3(v) Education

Education was chosen as an indicator of socio-economic status (Hollinghead, 1986). This factor was easy to extract as it was given in the records by the highest grade or qualification obtained. After reviewing the frequency distributions within the Study and Comparison groups, the study samples were stratified by grades of schooling into four categories (Table III-3).

TABLE III-3

Educational Groups

Highest Grade	Equivalent
1 (3-8)	Public School
2 (9-11)	Some High School
3 (12-13)	Completed High School
4 (> 13)	Post-secondary (Technical/University)

3.4.3(vi) Ethnic Origin

COMIS provides 13 ethnic groups, but these are not exhaustive or exclusive. They are mixed with nationalities, minor socio-political jurisdictions, or administrative subgroups (i.e. non-registered indian). To solve this difficulty, ethnic groups were

re-grouped into three major categories and given numbers 1 to 3 for coding (Table III-4).

TABLE III-4

Ethnic Origin

Group Numbers	Ethnic Equivalent
1	Caucasian (Europeans and Arabic peoples)
2	Aboriginal (American Indians)
3	Others

3.4.3(vii) Charge(s) and Classification of Offenses

Considerable attention has been paid over the last century to the issue of development of appropriate crime classification systems. Some of these systems are based on a search for criminal types or on taxonomic dimensions similar to medical classifications (Farr and Gibbons, 1990; Sellin and Wolfgang, 1964). For purposes of this work, offenses have been counterchecked for their significance in the Criminal Code of Canada (Watt and Fuerst, Tremear's, 1994) and then have been classified into three categories as per the system used by Statistics Canada (1991). A similar system was used by Abram (1989). This classification is simple and practical (Table III-5).

TABLE III-5**Classification of Charges**

Coding Number	Categories of Offenses
1	Against Persons
2	Against Property
3	Others

3.4.3(viii) Case Number

A Case Number refers to the times an inmate has been detained (admitted) into any of the correctional institutions in the Province. COMIS keeps an on-going tally of these admissions. For purposes of this study, the Case Number is the number of Previous Detentions. These detentions were coded as shown in Table III-6.

TABLE III-6**Case Number (Previous Detentions)**

Number	Equivalent
0	No previous detention
1	One previous detention
2	Two to five previous detentions
3	Six to ten previous detentions
4	Eleven or more previous detentions

3.4.3(ix) Type of Disposition

The term "disposition" has been chosen over the term sentence to indicate a final court decision on a particular charge. Disposition has a broader meaning than sentence, which is often used to mean "time in prison". Rarely is a person charged with one single offense. The usual way for the police and the Office of the Crown Attorney is to proceed with several charges. This allows for a certain amount of plea-bargaining and adjustments as the legal case proceeds.

Ordinarily at disposition time, the Court sentences a person on the major charge first and then, proffers sentences on the other charges on a "concurrent" basis (for example, "ten years for rape and eight years for break and enter with intent to be served concurrently"). Therefore, dispositions were taken hierarchically, meaning that only the disposition for the major, or most serious, charge was entered. Dispositions were classified into three groups as shown in Table III-7.

A fourth group termed "Unknown" had to be added at the time of the analysis when it was realized that some inmates had not been sentenced yet, or that the disposition had not been entered into the criminological records (COMIS).

TABLE III-7

Court Disposition of Offenses

Category of Disposition	Equivalent Sentence
1 Federal	Two years plus a day
2 Provincial	Two years less a day
3 Probation/Fine/Other	Probation/Community work. Fines, regardless of amount. Other, meaning absolute or conditional discharge.
4 Unknown	Sentence pending/Not entered yet

3.5 STATISTICAL CONSIDERATIONS**3.5.1 Sample Size**

The lifetime prevalence rate for schizophrenia in the general population is estimated to vary from 1% (Myers, Weissman, Tischler, Holzer, Leaf, Orvaschel, Anthony, Boyd, Burke, Kramer, and Stolzman, 1984) to 1.9% (Robins, Helzer, Weissman, Orvaschel, Gruenberg, Burke, and Regier, 1984). That is, among the major mental disorders, schizophrenia is one of the rarest.

If the estimates given in the literature for prevalence for all mental disorders in remand centres are accepted, then it could be expected that these estimates will exceed the rates in the general population (i.e. Schizophrenia up to 75% v. 1%,

Substance Abuse Disorder about 40% v. 13%, or Antisocial Personality Disorder about 50% v. 3%), and that a large proportion of inmates in the sample will meet SCID criteria for some kind of mental disorder. On the other hand, because of the instability of estimates obtained from past studies and as already discussed, at least for schizophrenia, the possibility exists that the prevalence rate could be less than that of the general population.

With regard to comorbidities, their prevalence is also considered high among criminal populations. The literature indicates, for example, that antisocial personality plus substance abuse approximates 23% (Collins, Schlenger and Jordan, 1988), antisocial personality plus affective disorder is about 11% (Coté and Hodgins, 1990), and substance abuse disorder plus affective disorder is given as 50% (Coté and Hodgins, 1990).

With respect to assessing the prevalence of mental conditions, it was necessary (a) to have an idea of the prevalence in such a population, (b) to specify an acceptable maximum discrepancy between the prevalence in the sample and the prevalence in the population, and (c) to indicate some level of confidence that the discrepancy was within those limits. If, on the assumption that a rare-occurring disorder such as schizophrenia will be harder to find in the sample than other more frequently occurring disorders, and if it is further assumed, to be on the conservative side, that the prevalence of this disorder in the remanded population is the same as in the

general population, then the rate of 1% for a major mental disorder such as schizophrenia could be taken as a signpost for estimates of mental disorders in the remanded population. If furthermore, a discrepancy of no more than ± 0.50 at 95% confidence is specified, then the sample size required will be 1069 subjects (Table III-8).

TABLE III-8
Sample Size Calculations¹

Population Size Expected Frequency Worst Acceptable	3600 1,00% 0,50%
Confidence Level 80% 90% 95% 99% 99.9% 99.99%	Sample Size 551 826 1,069 1,519 1,957 2,249

¹ Sample Size = $n/(1-(n/\text{population}))$
 $n = Z^2 P(1-P)/(D^2 D)$ Kish, 1965

It was thought, however, that considerably more subjects would be needed in order to accommodate a potential refusal level of 10% as previously stipulated. Using Kish's (1965) adjustment formula for refusals, the sample size became 1187, which was rounded up to 1200 subjects. As studies on the prevalence of mental disorders in remand centres have used sample sizes that have ranged from 180 (Bland, Newman, Dyck and Orn, 1990) to 728 (Abram, 1989), the sample size calculated here will rank this study as the largest one undertaken on this problem up to now.

Following calculations on the movement of individuals at the CRDC for the previous year, sample size was calculated on the assumption that 3600 potential admissions into the CRDC would be required in order to have 1200 persons interviewed, and that it would take about four months to process them, counting exclusions, those omitted and refusals.

With respect to looking at factors in the relationship, and as per the third aim of this study, **to explore the relationship between mental illness and selected socio-demographic and legal factors**, Abram's (1989) study affords a basis for a decision on sample size. In a sample of 728 inmates this author was able to obtain enough subjects (single or comorbid) to carry out comparisons on the relationship between mental disorders and criminal behaviours. Abram's criminal categories (violent, property and other) compare to the ones used in this study.

3.5.2 Data Management

Study data were entered onto a microcomputer and coding was done in a standard database software package, Epi Info from the Centre for Disease Control in Atlanta and the World Health Organization (Dean, Dean, Burton, Dicker, 1990). Editor and range checking features were used to minimize entry errors.

3.5.3 Exploratory Analysis

Once the data were cleaned, exploratory analytical techniques were used to examine the basic nature of the data using frequency distributions for the chosen variables and classifying into 2 x 2 tables to assess relationships.

3.5.4 Planned Analysis

Prevalence estimates for one-month and lifetime were developed for each specific diagnostic group. It was intended to compare these estimates to age and sex standardized prevalence rates provided in the studies by Bland in Edmonton (Bland, Newman and Orn, 1988). In addition, prevalence distributions were examined stratified for sex (males, females), ethnicity (caucasian, native canadian, other), and crime category (persons, property, others). In order to accommodate age-related mental conditions and age-related criminality forms, the distributions were examined across stratified age subgroups of five years each, except for the first group which started at age 17 (17-19), and the last composed of inmates over 50.

Two methods were used to calculate 95% confidence intervals. When cell sizes were small (e.g. 5-10), Fisher's exact method was calculated using "Exactbin" Software (Staehling and Sullivan, 1989). Otherwise, the normal approximation to the binomial was used (Daly, Bourke, McGilvray, 1991).

3.5.5 Statistical Modelling

The relationship between mental disorders and crime, controlling for demographic factors considered of importance in relation to mental illness and criminality, was explored through logistic modelling. EGRET, Revision 3, an epidemiological software package, was used for this purpose (SERC, Statistics and Epidemiology Research Corporation, 1992).

3.6 ETHICAL CONSIDERATIONS

3.6.1 Approvals and Consent

Approvals for this study were obtained from the Research and Development Committee of the Calgary General Hospital and the Conjoint Bioethics Committee of the University of Calgary, as well as from the Office of the Crown Attorney, Department of Justice, Province of Alberta, and from the then Department of the Solicitor General, Province of Alberta. The Calgary Police Department approved the review of the Police Reports. Inmates who agreed to participate were asked to sign a Consent Form copy of which they kept for their own records (Appendix Two).

3.6.2 Inducements

Concerns about potential abuse when doing research on captive and vulnerable populations (Arboleda-Flórez, 1991, 1993) dictate that these subjects (a) not be offered incentives or inducements and (b) be reassured that there would be no consequences for refusing to participate, or for withdrawing from the study at a later date.

3.6.3 Confidentiality Issues

Collected data have been stored under lock and key at the Department of Psychiatry, Calgary General Hospital, and is accessed only by personnel involved in the research project. Identifying data, especially legal data, have been kept in separate files in the Principal Investigator's computer files in his office. Data from this research project are not part of the official records of any organization and cannot be used for any other purposes than those of the research project. Only the COMIS numbers used as the unique identifier, and ID numbers assigned by the Principal Investigator have been used. When published, only aggregate statistical material will be presented.

3.6.4 Issues of Incompetence

The possibility of finding a subject who does not have the intellectual, emotional, or mental capacity and is, therefore, incompetent is always present in research of this type. Capacity and incompetence cannot be determined prior to an examination. Since this was an examination on entrance into the institution, it was felt that the few subjects that may be found lacking in capacity, and incompetent, would benefit if identified so early. Similarly, the medical authorities within the CRDC would also benefit when advised that a mentally ill and incompetent subject had been admitted.

CHAPTER FOUR

RESULTS

4.1 INTRODUCTION

The purpose of this chapter is threefold:

- 1) To describe the study sample in order to give a clear picture of the population under study. This will, then, form the basis for the analysis of prevalence rates and sets the stage for the analysis of factors considered of importance in understanding the relationship between mental illness and crime.
- 2) To present one-month and lifetime prevalence estimates of mental illness.
- 3) To explore the relationship between selected socio-demographic factors and mental illness.

4.2 DESCRIPTION OF THE STUDY SAMPLE

This section describes the study and comparison groups. In addition, it presents a comparison of the study group with the total number of admissions to the CRDC during the months of the study.

The CRDC admitted 4770 persons during the months of the study. Some of these persons may have been admitted more than once, but all of them were eligible for inclusion. To achieve a sample size of 1200, 1559 persons were approached for consent to be interviewed. In the group of 1200 interviewed are included 49 inmates who were seen twice ("repeaters"), so that the actual number of "persons" examined was 1151. 359 were approached, but were not interviewed.

4.2.1 Exclusions

The 359 inmates who were eligible for interview, but who were not seen, were distributed among three groups:

- 1) 14 inmates (0.9% out of an eligible sample of 1559 inmates) - 13 males and 1 female, were omitted because of insurmountable logistical difficulties. Logistical difficulties occurred whenever correctional or justice demands could not be postponed without

causing major disruption to the ends of justice. These included very early court appearances or consultations with counsels. In addition, some inmates had to be transferred out of the institution very early, prior to the arrival of the research staff at 0600 hours.

- 2) 19 (1.2% out of 1559 inmates approached) - 16 males and 3 females, were excluded due to a language barrier.

- 3) 326 inmates (20.9% out of 1559 inmates approached) - 287 males and 39 females, refused to participate. Inmates were asked to give the research assistant a reason for refusing to participate in the study. The reasons given are presented in Table IV-1. The characteristics of this group are analyzed in further detail below.

4.2.2 Refusals

A total of 1376 male inmates were approached to consent to an interview. Of these 287 (20.9%) refused to participate. Age was missing for three men. Of those whose ages were known (N=284) most were in the age groups 20 to 24 (68, 23.9%) or 25 to 29 (63, 22.2%). Among the 150 females who were asked to participate, 39 (26.0%) refused. The majority of these were in the age groups of 20 to 24 (7, 17.9% of 39) and 25 to 29 (13, 33.3% of 39). A number of reasons for refusing

were given. However, the main reason for refusal, given by 137 (42% of 326) was that they were "not interested". Table IV-1 presents all of the reasons given.

TABLE IV-1
Reason for Refusal

Reason for Refusal	Frequency	Percent
Not interested	137	42.0%
Preoccupied with court	63	19.3%
Too tired	54	16.6%
Has been asked before (repeater)	30	9.2%
Fine defaulter, does not want involvement	27	8.3%
Does not like doctors or psychiatrists	15	4.6%
Total	326	100%

Comparison of percentages by age group and sex of inmates who agreed to participate (admissions), and those who refused (refusals), reveals no major differences between the two groups. The similarity of the two groups holds both for the subtotals as well as for the individual cells for sex and age groups (Table IV-2).

TABLE IV-2

Comparison of Interviewees and Refusals by Sex and Age Group

Age Group	Sex					
	Interviewees			Refusals		
	Females	Males	Subtotal	Females	Males	Subtotal
1 (17-19)*	8 6.6% 7.2%	114 93.4% 10.5%	122 10.2%	2 6.7% 5.1%	28 93.3% 9.9%	30 9.3%
2 (20-24)	34 9.1% 30.6%	338 90.9% 31%	372 31.0%	7 9.3% 17.9%	68 90.7% 23.9%	75 23.2%
3 (25-29)	31 12.9% 27.9%	210 87.1% 19.3%	241 20.1%	13 17.1% 33.3%	63 82.9% 22.2%	76 23.5%
4 (30-34)	12 6.3% 10.8%	180 93.8% 16.5%	192 16.0%	9 15.3% 23.1%	50 84.7% 17.6%	59 18.3%
5 (35-39)	16 13.7% 14.4%	101 86.3% 9.3%	117 9.8%	4 11.4% 10.3%	31 88.6% 10.9%	35 10.8%
6 (40-44)	3 3.7% 2.7%	79 96.3% 7.3%	82 6.8%	4 16.7% 10.3%	20 83.3% 7.0%	24 7.4%
7 (45-49)	6 14.6% 5.4%	35 85.4% 3.2%	41 3.4%	0 0.0% 0.0%	13 100% 4.6%	13 4.0%
8 (50-99)	1 3.0% 0.9%	32 97.0% 2.9%	33 2.8%	0 0.0% 0.0%	11 100% 3.9%	11 3.4%
Total	111 9.3%	1089 90.8%	1200	39 12.1%	284* 87.9%	323*

In all cells, Line 1 = N, Line 2 = % of 'Subtotal', Line 3 = % of 'Total'

*Three missing values for age

A χ^2 analysis was done to determine whether demographic differences between the group of interviewees (as admissions and as persons) and the group of refusals were greater than could be expected by chance. This is shown in Tables IV-3 and IV-4 for sex and Tables IV-5 and IV-6 for age.

TABLE IV-3

Interviewees and Refusals by Sex

Sex	Interviewees N(%)	Refusals N(%)
Females	111 (9.2%)	39(12.0%)
Males	1089(90.7%)	287(88.0%)

1200

326

 χ^2 on 1 df = 2.13, p-value=0.1445

TABLE IV-4

"Persons" and Refusals by Sex

Sex	"Persons" N(%)	Refusals N(%)
Females	106(9.2%)	39(12.0%)
Males	1045(90.8%)	286(88.0%)

1151

325*

 χ^2 on 1 df = 2.24, p-value=0.1342

*One value missing

TABLE IV-5

Interviewees and Refusals by Age Group

Age Group	Interviewees N(%)	Refusals N(%)
1 (17-19)	122(10.2%)	30(9.3%)
2 (20-24)	372(31.0%)	75(23.0%)
3 (25-29)	241(20.1%)	76(23.5%)
4 (30-34)	192(16.0%)	59(18.3%)
5 (35-39)	117(9.7%)	35(10.8%)
6 (40-44)	82(6.8%)	24(7.4%)
7 (45-49)	41(3.4%)	13(4.0%)
8 (50-99)	33(2.7%)	11(3.4%)

1200

323*

 $\chi^2 = 8.77$, 7df, p-value=0.2699; *Three values missing for age.

TABLE IV-6

Persons and Refusals by Age Group

Age Group	Persons N(%)	Refusals N(%)
1 (17-19)	116(10.1%)	30(9.3%)
2 (20-24)	351(30.8%)	75(23.2%)
3 (25-29)	235(20.4%)	76(23.5%)
4 (30-34)	184(16.0%)	59(18.3%)
5 (35-39)	111(9.6%)	35(10.8%)
6 (40-44)	81(7.0%)	24(7.4%)
7 (45-49)	40(3.5%)	13(4.0%)
8 (50-99)	33(2.9%)	11(3.4%)

1151

323*

 $\chi^2 = 7.55$, 7df, p-value=0.3742; *Three values missing for age.

Despite the high refusal rate, the several analyses shown above reveal that there were no statistically significant differences between interviewees (1200) and refusals (326) for sex (χ^2 on 1df = 2.13, $p=0.1445$) or for age (χ^2 on 7df = 8.77, $p=0.2699$). Similarly, comparing refusals to the "persons" interviewed (1151) (excluding repeaters), showed no statistically significant differences for sex (χ^2 on 1df = 2.24, $p=0.1342$) or age (χ^2 on 7df = 7.55, $p=0.3742$). Therefore, for sex and age, no selection bias affected the study sample because of refusals.

4.2.3 Description of the Sub-populations

There were two sub-populations according to the number of times an individual was examined. A total of 1102 inmates were examined once. Forty-nine inmates were examined twice, giving 1151 individuals participating in the study, and 1200 interviews conducted.

4.2.4 Description of the 1200 Admissions Interviewed.

Table IV-7 presents a description of the total number of admissions interviewed, by sex. As expected, 90.8% (1089) were males and 9.8% (111) females. In both sexes most were young, clustering in the age groups 20-24 (males, 31.0%, females,

30.6%) and 25-29 (males, 19.3%, females, 27.9%). In both sexes, admissions to CRDC decreased rapidly as age advanced. The ethnic group most frequently admitted, in both sexes, was caucasian (76.1% for males and 58.6% for females). Aboriginals accounted for 20.3% of all admissions. The percentage of aboriginal females was twice (36.9%) that of males (18.6%). The great majority of admissions had some High School (57.0%) or had completed High School (29.1%).

In order to observe any potential effect of season or historical events on the admission rates into the CRDC, Table IV-7 also presents percentages of admissions per month. If the three days of the month of July are taken out, the table shows that admissions for both males and females came at a steady pace every month.

TABLE IV-7
Study Population(Interviewees)
Social Characteristics by Sex

Factor	Male N (% of 1089)	Female N (%of 111)	Total N (% of 1200)*
AGE GROUP:			
• 17 - 19	114 (10.5%)	8 (7.2%)	122 (10.2%)
• 20 - 24	338 (31.0%)	34 (30.6%)	372 (31.0%)
• 25 - 29	210 (19.3%)	31 (27.9%)	241 (20.1%)
• 30 - 34	180 (16.5%)	12 (10.8%)	192 (16.0%)
• 35 - 39	101 (9.3%)	16 (14.4%)	117 (9.7%)
• 40 - 44	79 (7.3%)	3 (2.7%)	82 (6.8%)
• 45 - 49	35 (3.2%)	6 (5.4%)	41 (3.4%)
• 50 - 99	32 (2.9%)	1 (0.9%)	33 (2.7%)
ETHNIC BACKGROUND:			
• Caucasian	829 (76.1%)	65 (58.6%)	894 (75.5%)
• Aboriginal	203 (18.6%)	41 (36.9%)	244 (20.3%)
• Other	57 (5.2%)	5 (4.5%)	62 (5.2%)
EDUCATION (Grade):			
• 3 - 8	93 (8.5%)	20 (18.0%)	113 (9.4%)
• 9 - 11	630 (57.9%)	54 (48.6%)	684 (57.0%)
• 12 -13	317 (29.1%)	32 (28.8%)	349 (29.1%)
• > 13	48 (4.4%)	5 (4.5%)	53 (4.4%)
MONTH OF INTERVIEW:			
• July (3 days)	16 (1.5%)	0 (0.0%)	16 (1.3%)
• August	219 (20.1%)	23 (20.7%)	242 (20.2%)
• September	245 (22.5%)	24 (21.6%)	269 (22.4%)
• October	265 (24.3%)	33 (29.9%)	298 (24.8%)
• November	249 (22.9%)	25 (22.5%)	274 (22.8%)
• December (10 days)	95 (8.7%)	6 (5.4%)	101 (8.4%)

*All partial and total percentages have been rounded. There may be an occasional missing value.

4.3 COMPARISON OF INTERVIEWEES AND COMPARISON GROUP

In order to judge the representativeness of the sample with respect to selected socio-demographic, clinical, and legal factors, a comparison group was obtained from a simple random sample of all charts from all admissions to the CRDC (less the 1200 admissions seen in interview) for the months of the study (see Figure 3-1, p. 60). Socio-demographic characteristics are contained in Table IV-8. Compared to Table IV-7, percentages are not appreciably different for these factors between members of the comparison group and interviewees.

TABLE IV-8
Comparison Group
Social Characteristics by Sex

Factor	Male N (% of 1080)	Female N (% of 120)	Total N (% of 1200)*
AGE GROUP:			
• 17-19	120 (11.1%)	8 (6.7%)	128 (10.7%)
• 20-24	287 (26.6%)	31 (25.8%)	318 (26.5%)
• 25-29	209 (19.4%)	32 (26.7%)	241 (20.1%)
• 30-34	181 (16.8%)	23 (19.2%)	204 (17.0%)
• 35-39	121 (11.2%)	14 (11.7%)	135 (11.3%)
• 40-44	79 (7.3%)	8 (6.7%)	87 (7.3%)
• 45-49	36 (3.3%)	1 (0.8%)	37 (3.1%)
• 50-99	47 (4.4%)	3 (2.5%)	50 (4.2%)
ETHNIC BACKGROUND:			
• Caucasian	773 (71.6%)	69 (57.5%)	842 (70.2%)
• Aboriginal	212 (19.6%)	40 (33.3%)	254 (21.0%)
• Other	95 (8.8%)	11 (9.2%)	106 (8.8%)
EDUCATION (Grade):			
• 3 - 8	130 (12.1%)	20 (16.7%)	150 (12.5%)
• 9 -11	585 (54.2%)	53 (44.2%)	637 (53.2%)
• 12 -13	306 (28.4%)	36 (30.0%)	342 (28.5%)
• > 13	58 (5.4%)	11 (9.2%)	69 (5.8%)
MONTH OF INTERVIEW:			
• July (3 days)	22 (2.0%)	4 (3.3%)	26 (2.2%)
• August	258 (23.9%)	33 (27.5%)	291 (24.3%)
• September	304 (28.1%)	21 (17.5%)	325 (27.1%)
• October	293 (27.1%)	32 (26.7%)	325 (27.1%)
• November	179 (16.6%)	25 (20.8%)	204 (17.0%)
• December (10 days)	24 (2.2%)	5 (4.2%)	29 (2.4%)

*All partial and total percentages have been rounded. There may be an occasional missing value.

X^2 analysis to compare the interviewees with the comparison group, on sex and age was done because these factors are known to be associated with the prevalence of mental disorders. The analysis shows that there were no statistically significant

differences between the two groups for these two factors. These is demonstrated in Table IV-9 for sex and IV-10 for age.

TABLE IV-9

Comparison of Interviewees and Comparison Subjects by Sex

Sex	Interviewees N(%)	Comparison Subjects N(%)
Females	111(9.3%)	120(10.0%)
Males	1089(90.8%)	1080(90.0%)
	1200	1200

χ^2 on 1 df = 0.39, p-value=0.5333

TABLE IV-10

Comparison of Interviewees and Comparison Subjects by Age

Age Group	Interviewees N(%)	Comparison Subjects N(%)
1 (17-19)	122(10.1%)	128(10.7%)
2 (20-24)	372(31.0%)	318(26.5%)
3 (25-29)	241(20.1%)	241(20.1%)
4 (30-34)	192(16.0%)	204(17.0%)
5 (35-39)	117(9.8%)	135(11.3%)
6 (40-44)	82(6.8%)	87(7.3%)
7 (45-49)	41(3.4%)	37(3.1%)
8 (50-99)	33(2.8%)	50(4.2%)
	1200	1200

χ^2 = 9.85,7df, p-value=0.1969

Unfortunately, given lack of information in the medical records from the CRDC, the two groups could not be compared on diagnosis. Diagnoses in the records were more descriptive than taxonomic, i.e. pain, psychotic, suicidal, or personality. Although highly retrospective and without the hindsight of the examining clinician, these descriptive diagnoses were grouped into general categories in order to discern some trends in pathology among this group of inmates. Table IV-11 gives a general idea on this issue in the sense that the great majority of inmates had "no diagnoses", and only a small proportion had diagnoses related to psychoses, affective disorders, or even substance abuse disorders including alcohol.

TABLE IV-11

Broad Diagnostic Categories in Comparison Subjects

Diagnostic Category	Frequency	Percents
0 - No Diagnosis	971	81.3%
1 - Psychotic Disorders	28	2.3%
2 - Affective Disorders	28	2.3%
3 - Substance Abuse (Alcohol/Drugs)	130	10.9%
4 - Personality Disorders	1	0.1%
5 - Epilepsy	10	0.8%
6 - Unclassifiable	27	2.3%

Table IV-12 presents a comparison by number of crimes, at three levels of frequency, for each of the three categories. As could be observed, there is no major difference in the percentages between the groups.

TABLE IV-12

Type of Instant Crime Among Interviewees and Comparison Subjects

Counts per Type of Crime	Interviewees	Comparison Subjects
Person:		
0 - 1	1071 (89.5%)	1076 (90.3%)
2 - 5	116 (9.7%)	104 (8.6%)
> 5	10 (0.8%)	12 (1.1%)
Property:		
0 - 1	898 (75.0%)	928 (77.9%)
2 - 5	220 (18.3%)	196 (16.5%)
> 5	79 (6.7%)	68 (5.6%)
Victimless Crime:		
0 - 1	618 (51.6%)	671 (56.3%)
2 - 5	434 (36.2%)	392 (32.8%)
> 5	145 (12.6%)	129 (11.0%)

In summary, comparisons of the percentages for ethnic, education, month of admission, and crime between the group of interviewees and the Comparison group showed no major differences between the groups. Comparison between the group of Interviewees and the Comparison group demonstrated that there was no statistically significant difference between the two groups for sex (χ^2 on 1df = 0.39, $p=0.5333$) or for age (χ^2 on 7df = 9.85, $p=0.1969$).

4.4 INTERVIEWEES COMPARED TO CRDC ADMISSIONS

As already indicated, there were 4770 admissions to the CRDC during the months of study. Some of these admissions were repeats, sometimes more than twice.

The interest for this particular analysis was to compare the total number of admissions (4770) to the CRDC to the 1200 admissions interviewed. Comparative data were missing for sex on 65 subjects (Table IV-13) and age on 69 (Table IV-14).

TABLE IV-13

**Comparison Between CRDC Admissions
and Interviewees by Sex**

Sex	CRDC Admissions N(%)	Interviewees N(%)
Females	460(9.8%)	111(9.3%)
Males	4245(90.2%)	1089(90.7%)

4705 1200
 χ^2 on 1 df = 0.30, p-value=0.5814

TABLE IV-14**Comparison Between CRDC Admissions
and Interviewees by Age Group**

Age Group	CRDC Admissions N (%)	Interviewees N (%)
1 (17-19)	479(10.2%)	122(10.1%)
2 (20-24)	1300(22.7%)	372(31.0%)
3 (25-29)	950(20.2%)	241(20.1%)
4 (30-34)	815(17.3%)	192(16.0%)
5 (35-39)	514(11.0%)	117(9.8%)
6 (40-44)	327(7.0%)	82(6.8%)
7 (45-49)	159(3.4%)	41(3.4%)
8 (50-99)	157(3.3%)	33(2.8%)

4701

1200

 χ^2 on 7 df = 7.10, p-value=0.4189

A comparison between the group of interviewees and the group of admissions to CRDC demonstrated that there was no statistically significant difference between the two groups for sex (χ^2 on 1df = 0.30, p=0.5814) or for age (χ^2 on 7df = 7.10, p=0.4189).

To summarize this Section, and based on the foregoing analysis, the study group was not affected, on sex or age, by selection bias because of refusals. In addition, the study group was considered to be representative of the population of the CRDC with respect to age group, sex, ethnicity, education, crime, and month of admission.

4.5 PREVALENCE

This Section provides results on the prevalence of principal Axis I and Axis II, DSM-III-R/SCID diagnoses. A "principal diagnosis" has been defined as (a) the only condition present, or, (b) when more than one condition was present, the most important condition, defined as the one that would give the most difficulty. Therefore, for the purposes of this analysis, each individual has been assigned hierarchically, to only one diagnostic category. These are examined by sex and age group.

Any additional clinical entity which was found to coexist with the principal diagnosis has been defined as a comorbidity (Feinstein, 1970). These are assessed in a separate section (Section 4.5.3).

4.5.1 One-Month Prevalence

For the 1200 interviews, a principal diagnosis on either Axis I or Axis II was made in 728 (60.7%) (Table IV-15).

TABLE IV-15

Principal Diagnosis on Axis I and Axis II

Disorders	Prevalence	
	N=1199 (% of Total Admissions)	N=728** (% of Prevalence)
Any Axis I Disorder	664 (55.4%)	664(92.2%)
Any Axis II Disorder	64 (5.3%)	64(8.8%)
Persons with No Diagnoses	471 (39.3%)	
Total	1199 (100%)	

*One case excluded because of uninterpretable data

**60.7% of 1200

Tables IV-16 and IV-17 present one-month prevalence estimates with 95% confidence intervals for hierarchical principal Axis I diagnoses, by age group for females and males respectively.

TABLE IV-16

**One-Month Prevalence of Mental Disorders
Hierarchical Principal Axis I Diagnoses - Females**

DISORDERS	FEMALES (N = 111)								
	Prevalence by Age Group N(%)								
	17-19 8(7.2)	20-24 34(30.6)	25-29 31(27.9)	30-34 12(10.8)	35-39 16(14.4)	40-44 3(2.7)	45-49 6(5.4)	>50 1(0.9)	All Age Groups CI**
• Any Disorder	8 (100.0)	15 (44.1)	13 (41.9)	8 (66.7)	7 (43.7)	2 (66.7)	2 (33.3)	0 (0.0)	55(49.5) 40.2,58.9
• Bipolar	1 (12.5)	0 (0.0)	0 (0.0)	0 (0.0)	1 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	2(1.8) .7,4.3
• Major Depress	0 (0.0)	1 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.9) .85,2.7
• Dysthymia	0 (0.0)	0 (0.0)	1 (3.2)	1 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2(1.8) .7,4.3
• Psychot Dis NOS*	0 (0.0)	1 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.9) .85,2.7
• Alcohol	4 (50.0)	10 (29.4)	5 (16.1)	4 (33.3)	4 (25.0)	0 (0.0)	2 (33.3)	0 (0.0)	29(26.1) 18.0,34.3
• Cannabis	1 (12.5)	1 (2.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2(1.8) .85,2.7
• Opiod	1 (12.5)	0 (0.0)	1 (3.2)	2 (16.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	4(3.6) .1,7.1
• Cocaine	1 (12.5)	0 (0.0)	1 (3.2)	0 (0.0)	1 (6.3)	0 (0.0)	0 (0.0)	0 (0.0)	3(2.7) .3,5.7
• Poly Drug	0 (0.0)	2 (5.9)	2 (6.5)	1 (8.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5(4.5) .6,8.4
• Panic Disorder	0 (0.0)	0 (0.0)	1 (3.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.9) .7,4.3
• Simple Phob	0 (0.0)	0 (0.0)	2 (6.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2(1.8) .85,2.7
• Gen Anxiety Dis	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (33.3)	0 (0.0)	0 (0.0)	1(0.9) .7,4.3
• Adjustment Dis	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (6.3)	1 (33.3)	0 (0.0)	0 (0.0)	2(1.8) .85,2.7
Total	8(7.2)	34(30.6)	31(27.9)	12(10.8)	16(14.4)	3(2.7)	6(5.4)	1(0.9)	111-100%

*NOS=Not Otherwise Specified.;

**95% confidence intervals for proportion of females with disorder

TABLE IV-17

**One-Month Prevalence of Mental Disorders
Hierarchical Principal Axis I Diagnoses - Males**

DISORDERS	MALES (N = 1088)								
	Prevalence by Age Group N(%)								
	17 - 19 114 (10.5)	20 - 24 338 (31.1)	25 - 29 210 (19.3)	30 - 34 179 (16.5)	35 - 39 101 (9.3)	40 - 44 79 (7.3)	45 - 49 35 (3.2)	>50 32 (2.9)	All Age Groups CI**
• Any Diagnosis	61 (53.5)	163 (48.2)	113 (53.8)	109 (60.9)	72 (71.3)	50 (63.3)	24 (68.6)	7 (53.1)	609 (56.0) 53.0,59.0
• Bipolar Dis	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.3)	1 (2.9)	1 (3.1)	4(0.4) .008,.73
• Major Depress	2 (1.8)	9 (2.7)	5 (2.4)	8 (4.5)	4 (4.0)	3 (3.8)	3 (8.6)	2 (6.3)	36(3.3) 2.3,4.4
• Dysthymia	2 (1.8)	3 (0.9)	3 (1.4)	1 (0.6)	1 (1.0)	0 (0.0)	1 (2.9)	0 (0.0)	11(1.0) .4,1.6
• Schizophrenia	1 (0.9)	4 (1.2)	1 (0.5)	1 (0.6)	1 (1.0)	2 (2.5)	1 (2.9)	2 (6.3)	13(1.2) .5,1.8
• Psych Dis NOS	0 (0.0)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.1) .09,.3
• Alcohol	29 (25.4)	73 (21.6)	65 (31.0)	68 (38.0)	47 (46.5)	37 (46.8)	16 (45.7)	10 (31.3)	345(31.7) 29.0,34.5
• Sedatives	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.1) .09,.3
• Cannabis	14 (12.3)	35 (10.4)	22 (10.5)	10 (5.6)	8 (7.9)	2 (2.5)	1 (2.9)	0 (0.0)	92(8.5) 6.8,10.1
• Stimulant	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1(0.1) .09,.3
• Opiod	0 (0.0)	0 (0.0)	1 (0.5)	2 (1.1)	1 (1.0)	1 (1.3)	0 (0.0)	0 (0.0)	5(0.5) .06,.9
• Cocaine	2 (1.8)	3 (0.9)	3 (1.4)	4 (2.2)	2 (2.0)	2 (2.5)	0 (0.0)	1 (3.1)	17(1.6) .8,.3
• Hall/PCP*	0 (0.0)	3 (0.9)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3(0.3) .04,.6
• Poly Drug	9 (7.9)	20 (5.9)	6 (.9)	7 (3.9)	3 (3.0)	0 (0.0)	1 (2.9)	0 (0.0)	46(4.2) 3.0,5.4
• Other Drug	0 (0.0)	0 (0.0)	0 (0.0)	1 (0.6)	2 (2.0)	0 (0.0)	0 (0.0)	0 (0.0)	3(0.3) .04,.6

*Hallucinogenic/PCP=Phencyclidine;

**95% confidence intervals for proportion of males with disorder

TABLE IV-17 CONTINUED

**One-Month Prevalence of Mental Disorders
Hierarchical Principal Axis I Diagnoses - Males**

DISORDERS	MALES (N = 1088)								
	Prevalence by Age Group N(%)								
	17 - 19 114 (10.5)	20 - 24 33 8(31.1)	25 - 29 210 (19.3)	30 - 34 179 (16.5)	35 - 39 101 (9.3)	40 - 44 79 (7.3)	45 - 49 35 (3.2)	>50 32 (2.9)	All Age Groups CI**
• Panic Dis	0(0.0)	1(0.3)	2(1.0)	2(1.1)	0(0.0)	1(1.3)	0(0.0)	0(0.0)	6(0.6) .1,1.0
• Agoraphobia & Panic	0(0.0)	1(0.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .09,.3
• Social Phobia	0(0.0)	0(0.0)	1(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .09,.3
• Simple Phobia	0(0.0)	3(0.9)	2(1.0)	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(0.6) .1,1.0
• Gen Anxiety Dis	1(0.9)	2(0.6)	1(0.5)	0(0.0)	0(0.0)	1(1.3)	0(0.0)	1(3.1)	6(0.6) .1,1.0
• Somatization Dis	0(0.0)	0(0.0)	0(0.0)	1(0.6)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .09,.3
• Adjustment Dis	1(0.9)	4(1.2)	0(0.0)	1(0.6)	3(3.0)	0(0.0)	0(0.0)	0(0.0)	9(0.8) .29,1.4
• Other DSM-III-R	0(0.0)	0(0.0)	1(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .09,.3
Total	114 (10.5)	338 (31.1)	210 (19.3)	179 (16.5)	101 (9.3)	79 (7.3)	35 (3.2)	32 (2.9)	1088

*Hallucinogenic/PCP=Phencyclidine

**95% confidence intervals for proportion of males with disorder

Regarding Table IV-16, the prevalence of mental illness (Any Disorder) was 49.5% and this varied by age-group from 0% in the oldest group to 100% in the youngest group. However, between the ages of 20 and 49, no obvious age trend was noted. In the youngest group, most of the pathology was accounted for by alcohol/substance abuse. In this group there was one person with an affective disorder, but otherwise these disorders (including bipolar disorders, major depression, dysthymia) did not figure prominently. The opposite was the case for alcohol/substance abuse disorders, which for the youngest group, accounted for

almost half of mental disorders. In summary, for females, while alcohol and drugs were mostly restricted to the young, no obvious age patterns emerged. In addition, the prevalence of panic disorders, simple phobia, generalized anxiety disorder and adjustment disorder was negligible and there was no case of schizophrenia found in this group.

Mental illness (Any Disorder) was found to be slightly more frequent among males (56.0%) than among females (49.5%). No discernible age pattern was observed across the age groups for this general category. To the contrary, both major depression and schizophrenia were observed more often among the two oldest groups, and drugs of any kind, except alcohol, appeared more frequently among the young groups. Alcohol is spread almost evenly across all age groups. As was the case with females, over half the pathology was accounted for by alcohol and substance abuse (Table IV-17).

For both, males and females, there was a paucity of hierarchical diagnoses on Axis II personality disorders. As there were only 4 females (3.6%) who received a principal diagnosis of personality disorder, no table is presented for them. Normal approximation was not valid for confidence intervals, given the small numbers, but 2-sided Fisher's Exact 95% confidence intervals were 0.99, 9.0. The four females obtained a principal diagnosis of dependent personality, histrionic personality,

borderline personality, and personality disorder not otherwise specified (for each 0.9% and 95% CI = .02, 4.9).

TABLE IV-18

Hierarchical Principal Axis II Diagnoses - Males

DISORDERS	MALES (N = 1088)								TOTAL N=1088 CI*
	Age Groups N(%)								
	17-19 114 (10.5)	20-24 338 (31.1)	25-29 210 (19.3)	30-34 179 (16.5)	35-39 101 (9.3)	40-44 79 (7.3)	45-49 35 (3.2)	>50 32 (2.9)	
• Any Diagnosis	8(7.0)	20(5.9)	12(5.7)	9(5.0)	2(2.0)	5(6.3)	2(5.7)	2(6.3)	60(5.5) 4.2,7.0
• Avoidant	1(0.9)	0(0.0)	0(0.0)	0(0.0)	2(2.0)	0(0.0)	1(2.9)	0(0.0)	4(0.4) .1,,9
• Dependent	2(1.75)	1(0.3)	1(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	4(0.4) .1,,9
• Obs-Compulsive	0(0.0)	0(0.0)	1(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .002,,5
• Self-Defeating	0(0.0)	0(0.0)	0(0.0)	1(0.6)	0(0.0)	0(0.0)	0(0.0)	1(3.1)	2(0.2) .02,,7
• Paranoid	0(0.0)	1(0.3)	1(0.5)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(0.2) .02,,7
• Schizotypal	0(0.0)	1(0.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .002,,5
• Histrionic	1(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.1) .002,,5
• Narcissistic	0(0.0)	1(0.3)	2(0.9)	2(1.1)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	5(0.5) .1,1.1
• Borderline	0(0.0)	5(1.48)	1(0.5)	0(0.0)	0(0.0)	1(1.3)	0(0.0)	0(0.0)	7(0.6) .3,1.3
• Antisocial	1(0.9)	3(0.9)	3(1.4)	1(0.6)	0(0.0)	1(1.3)	1(2.9)	1(3.1)	11(1.0) .5,18.0
• NOS	3(2.63)	8(2.38)	3(1.4)	5(2.8)	0(0.0)	3(3.8)	0(0.0)	0(0.0)	22(2.0) 1.3,3.0

*Fisher's Exact binomial. 95% C.I.'s for Proportions.

For males, a principal diagnosis on Axis II was obtained in only sixty subjects (5.5%, with 95% CI = 4.2, 7.0). These sixty cases were mostly concentrated among the antisocial, the borderline and the personality disorders not otherwise specified with no discernible patterns across the age groups. Table IV-18 above shows the details.

4.5.1(1) Collapsed Diagnostic Groups

Because of small numbers in specific categories, disorders were collapsed into categories of major diagnostic groups so that meaningful associations could be analyzed by selected factors. Disorders were recoded on all principal diagnoses into six groups:

- Any Disorder.
- Affective Disorders (bipolar disorders, major depression, dysthymia, and depressive syndromes superimposed on chronic psychotic disorders).
- Psychoses (schizophrenia, delusional disorder, brief reactive psychosis, and psychotic disorder not otherwise specified).
- Alcohol/Substance Abuse (alcohol, sedatives/hypnotic/anxiolytics, cannabis, stimulants, opioids, cocaine, hallucinogenic/PCP, polydrugs, and other drugs).
- Personality Disorders (all Axis II diagnoses).
- Other (all other disorders in DSM-III-R).

This analysis is presented in Table IV-19.

TABLE IV-19

**One-Month Prevalence of Hierarchical Mental Disorders
by Diagnostic Groups and Selected Socio-Demographic Factors (N = 1199)**

FACTORS	COLLAPSED CATEGORIES OF DISORDERS						
	No Disorder N=471 (39.3)	Affect Dis N=56 (4.7)	Psychoses N=15 (1.3)	Alc/Subs Abuse N=556 (46.4)	Pers Disord N=64 (5.3)	Other DSM- III-R N=37 (3.1)	Any Disorder N (%) CI*
● GENDER							
Male	419(38.5)	51(4.7)	14(1.3)	513(47.2)	60(5.5)	31(2.8)	669(61.5) 58.6, 64.4
Female	52(46.8)	5(4.5)	1(0.9)	43(38.7)	4(3.6)	6(5.4)	59(53.2) 43.9, 62.4
● AGE GROUP							
17 - 19	45(36.9)	5(4.1)	1(0.8)	61(50.0)	8(6.6)	2(1.6)	77(63.1) 54.6, 71.7
20 - 24	172(46.2)	14(3.8)	6(1.6)	147(39.5)	22(5.9)	11(3.0)	200(53.8) 48.7, 58.8
25 - 29	102(42.3)	9(3.7)	1(0.4)	106(44.0)	13(5.4)	10(4.1)	139(57.7) 51.4, 63.9
30 - 34	65(34.0)	10(5.2)	1(0.5)	101(52.9)	9(4.7)	5(2.6)	126(66.0) 59.2, 72.6
35 - 39	36(30.8)	6(5.1)	1(0.9)	68(58.1)	2(1.7)	4(3.4)	81(69.2) 60.9, 77.6
40 - 44	25(30.5)	4(4.9)	2(2.4)	42(51.2)	5(6.1)	4(4.9)	57(69.5) 69.5, 79.4
45 - 49	12(29.3)	5(12.2)	1(2.4)	20(48.8)	3(7.3)	0(0.0)	29(70.7) 56.8, 84.7
> 50	14(42.4)	3(9.1)	2(6.1)	11(33.3)	2(6.1)	1(3.0)	19(57.6) 40.7, 74.4
● EDUC**							
3 - 8	25(22.1)	6(5.3)	0(0.0)	70(61.9)	10(8.8)	2(1.8)	88(77.9) 70.2, 85.5
9 - 11	261(38.2)	30(4.4)	10(1.5)	335(49.0)	32(4.7)	15(2.2)	422(61.8) 58.1, 65.4
12 - 13	151(43.3)	19(5.4)	5(1.4)	138(39.5)	19(5.4)	17(4.9)	198(56.7) 51.5, 61.9
> 13	33(62.3)	1(1.9)	0(0.0)	13(24.5)	3(5.7)	3(5.7)	20(37.7) 24.7, 50.8
● ETHNIC							
Caucasian	350(39.2)	44(4.9)	14(1.6)	392(43.9)	60(6.7)	33(3.7)	543(60.8) 57.6, 64.0
Aboriginal	82(33.6)	9(3.7)	1(0.4)	148(60.7)	3(1.2)	1(0.4)	162(66.4) 60.5, 72.3
Other	39(62.9)	3(4.8)	0(0.0)	16(25.8)	1(1.6)	3(4.8)	23(37.1) 25.1, 49.1

*95% confidence intervals for proportions calculated using the normal approximation to the binomial;

** 1 missing value

TABLE IV-19 CONTINUED

**One-Month Prevalence of Hierarchical Mental Disorders by
Diagnostic Group and Selected Legal Factors (N= 1199)**

FACTORS	COLLAPSED CATEGORIES OF DISORDERS						
	No Disorder N=471 (39.3)	Affect Dis N=56 (4.7)	Psychoses N=15 (1.3)	Alc/Subs Abuse N=556 (46.4)	Pers Disord N=64 (5.3)	Other DSM-III-R N=37 (3.1)	Any Disorder N(%) C.I.*
● PRV FORENS ASSESSMT*	12(22.6)	9(17.0)	5(9.4)	19(35.8)	5(9.4)	3(5.7)	41(77.4) 66.1, 88.6
● PREV DET**	135(51.3)	12(4.6)	3(1.1)	90(34.2)	9(3.4)	14(5.3)	128 (48.7) 42.6, 54.7
1 - 5	226(40.4)	24(4.3)	6(1.1)	257(45.9)	30(5.4)	17(3.0)	334 (59.6) 55.6, 63.7
6 - 10	56(29.5)	10(6.3)	1(1.1)	86(54.2)	15(7.9)	1(1.1)	134 (70.5) 64.0, 77.0
> 10	54(29.3)	9(3.8)	5(2.2)	122(57.1)	10(5.4)	5(2.2)	130 (70.7) 64.1, 72.2
● CG TYPE Person	113(35.4)	20(6.0)	2(0.6)	148(46.1)	24(7.5)	14(4.4)	206 (64.6) 59.3, 69.8
Property	174(41.8)	21(5.0)	4(1.0)	177(42.5)	29(7.0)	11(2.6)	242 (58.2) 53.4, 62.9
Victimless	184(39.8)	15(3.2)	9(1.9)	231(50.0)	11(2.4)	12(2.6)	278 (60.2) 55.7, 64.6
● T IN CH***	156(42.3)	15(4.1)	6(1.6)	163(42.4)	17(4.6)	12(3.3)	213(57.7) 252.7, 62.8
2	96(43.0)	8(3.6)	4(1.8)	98(43.9)	9(4.0)	8(3.6)	127(57.0) 50.4, 63.5
3	50(32.9)	7(4.6)	0(0.0)	86(55.6)	5(3.3)	4(2.6)	102(67.1) 59.3, 74.6
4 - 10	125(35.3)	19(5.4)	5(1.4)	168(47.5)	27(7.6)	10(2.8)	229(64.7) 59.7, 69.7
> 10	44(44.4)	6(6.1)	0(0.0)	40(40.4)	6(6.1)	3(3.0)	55(55.6) 45.8, 65.3
● DIS****	186(39.7)	15(3.2)	5(1.1)	236(50.3)	13(2.8)	14(3.0)	283(60.3) 55.9, 64.8
Prob/Fine/Oth	182(38.6)	3(4.9)	1(1.7)	28(45.6)	32(6.8)	3(2.5)	290(61.4) 57.1, 65.8
Province	38(44.7)	23(3.5)	8(1.2)	215(32.9)	12(14.1)	12(3.5)	47(55.3) 44.7, 65.9
Federal	65(38.0)	14(8.2)	1(0.6)	76(44.4)	7(4.1)	8(4.7)	106(62.0) 54.7, 69.3
Unknown							

*95% confidence intervals calculated using the normal approximation to the binomial;

Previous Forensic Assessment (3 Missing); *Previous Detention (3 Missing);

****Total Instant Charges (3 Missing); *****Disposition (3 Missing)

The prevalence of mental illness was slightly lower among females (53.2%) compared to males (61.5%), especially for alcohol and substance abuse disorders where the prevalence for females is 38.7% compared to 47.2% for males. The only disorder category in which the prevalence for females was higher was in other DSM-III-R diagnoses (5.4% compared to 2.8%, respectively).

In regard to age group, the prevalence of mental illness increased between the ages of 20 to 49 years. For individuals suffering from affective disorders or personality disorders, the highest prevalence occurred in the 45 to 49 age group (12.2% and 7.3%, respectively). Among psychoses, the highest prevalence was noted in the over 50 age group (6.1%) and among substance abusers, the highest prevalence was in the 35 to 39 age group (58.1%). Finally, other disorders were most common in the 40 to 44 age group (4.9%).

The highest prevalence of mental illness (77.9) was found among the lowest educated group (3 to 8 years of schooling), however, this was accounted for by alcohol/substance abusers (61.9%) and those with personality disorders (8.8%). No obvious educational difference was noted among affective disorders or psychoses. However, other DSM-III-R disorders were most prevalent among individuals in the higher educated group (those who had completed some post-secondary education).

While the overall prevalence of mental illness was highest among aboriginal (66.4%), the prevalence of other disorders was lowest in this group (0.4%). The high overall prevalence was accounted for by a high prevalence of alcohol/substance abuse (60.7%). Personality disorders were most prevalent among caucasians (6.7%). No ethnic differences were noted with respect to the prevalence of psychoses or affective disorders.

Seventy-seven percent of persons previously referred for a forensic psychiatric assessment in the Province of Alberta were suffering from a mental illness. The group accounting for the highest percentage of referrals was the alcohol/substance abusers (35.8%).

The prevalence of mental illness appeared to be positively related to the number of previous detentions. Thus, those with greater than 10 prior detentions had the highest prevalence of illness (70.7%). This trend was largely accounted for by alcohol/substance abuse disorders. Otherwise, no obvious pattern was discernable among the other diagnostic categories.

There was no difference in the prevalence of mental illness by crime type. The prevalence of mental illness among individuals charged with a crime against the person was only slightly higher (64.6%) compared to those charged with crimes

against property (58.2%) or victimless crimes (60.2%). No striking differences were noted among any of the diagnostic categories.

There was no obvious trend in prevalence according to total number of instant charges and this was true for all diagnostic categories.

The prevalence of mental illness was slightly lower among individuals who were given a disposition of federal time, 55.3%, compared to a range of 60.3% to 62.0% among the other dispositional types. Personality disorders were most prevalent among individuals sentenced to federal time (14.1%). Alternatively, the prevalence of alcohol/substance abuse disorders was lowest among those receiving federal time.

4.5.2 Lifetime Prevalence

Estimates of Lifetime Prevalence have been calculated for persons rather than admissions as was previously the case. Forty-nine repeat admissions have been excluded from this analysis to prevent counting lifetime disorders twice for these people. Therefore, the analysis was based on 1151 inmates (106 females or 9.2% and 1045 males or 90.8%). When examining one-month prevalence estimates it was clear that numbers were very small for individual disorders. Because of this, diagnoses were grouped into larger categories for examination of socio-demographic

factors. Therefore, with respect to lifetime prevalence, Table IV-20 presents socio-demographic information by diagnostic groups rather than discrete diagnoses.

Patterns noticed with respect to lifetime prevalence mirrored those already presented (Table IV-19) for one-month prevalence.

The lifetime prevalence of mental illness was slightly lower among females (55.7%) compared to males (61.6%) except for those diagnosed with other disorders where the prevalence for females was higher (5.7% compared to 2.9%).

TABLE IV-20

**Lifetime Prevalence of Hierarchical Mental Disorders by Diagnostic Groups
Selected Socio-Demographic Factors (N = 1151)**

FACTORS	No Disorder N=448(38.9)	COLLAPSED CATEGORIES OF DISORDERS					
		Affect Dis N=53 (4.6)	Psychoses N=15 (1.3)	Alc/Subs Abuse N=535 (46.5)	Person Dis N=64 (5.6)	Other DSM-III-R N=36 (3.1)	Any Disorder N(%) C.I.*
• GENDER							
Male	401(38.4)	48(4.6)	14(1.3)	492(47.1)	60(5.7)	30(2.9)	644 (61.6) 58.7, 64.6
Female	47(44.3)	5(4.7)	1(0.9)	43(40.6)	4(3.8)	6(5.7)	59 (55.7) 46.2, 65.1
• AGE GROUP							
17 - 19	44(37.9)	5(4.3)	1(0.9)	56(48.3)	8(6.9)	2(1.7)	72 (62.1) 53.2, 70.9
20 - 24	161(45.9)	14(4.0)	6(1.7)	138(39.3)	22(6.3)	10(2.8)	190 (54.1) 26.2, 35.9
25 - 29	98(41.7)	9(3.8)	1(0.4)	104(44.3)	13(5.5)	10(4.3)	137 (58.3) 52.0, 64.6
30 - 34	60(32.6)	9(4.9)	1(0.5)	100(54.3)	9(4.9)	5(2.7)	124 (67.4) 60.6, 74.2
35 - 39	34(30.6)	5(4.5)	1(0.9)	65(58.6)	2(1.8)	4(3.6)	77 (69.4) 60.8, 77.9
40 - 44	25(30.9)	4(4.9)	2(2.5)	41(50.6)	5(6.2)	4(4.9)	56 (69.1) 59.1, 79.2
45 - 49	12(30.0)	4(10.0)	1(2.5)	20(50.0)	3(7.5)	0(0.0)	28 (70.0) 55.8, 84.2
> 50	14(42.4)	3(9.1)	2(6.1)	11(33.3)	2(6.1)	1(3.0)	19 (57.6) 40.7, 74.4
• EDUCATION							
3 - 8	24(21.6)	6(5.4)	0(0.0)	69(62.2)	10(9.0)	2(1.8)	87 (78.4) 70.7, 86.0
9 - 11	248(37.9)	29(4.4)	10(1.5)	320(48.9)	32(4.9)	15(2.3)	406 (62.1) 58.4, 65.8
12 - 13	146(43.3)	18(5.3)	5(1.5)	133(39.5)	19(5.6)	16(4.7)	191 (56.7) 51.4, 62.0
> 13 ^o	29(60.4)	0(0.0)	0(0.0)	13(27.1)	3(6.3)	3(6.3)	19 (39.6) 25.7, 53.4
• ETHNIC							
Caucasian	332(38.5)	41(4.8)	14(1.6)	382(44.3)	60(7.0)	33(3.8)	530 (61.5) 58.2, 64.7
Aboriginal	79(34.2)	9(3.9)	1(0.4)	138(59.7)	3(1.3)	1(0.4)	152 (65.8) 59.7, 71.9
Other	37(63.8)	3(5.2)	0(0.0)	15(25.9)	1(1.7)	2(3.4)	21 (36.2) 23.8, 48.6

*C.I.'s calculated using the normal approximation to the binomial

^oOne value missing in education

TABLE IV-20 CONTINUED

**Lifetime Prevalence of Hierarchical Mental Disorders
by Diagnostic Groups and Selected Legal Factors (N=1151)**

FACTORS	No Disorder N=448(38.9)	COLLAPSED CATEGORIES OF DISORDERS					
		Affect Dis N=53 (4.6)	Psychoses N=15 (1.3)	Alc/Subs Abuse N=535 (46.5)	Person Dis N=64 (5.6)	Other DSM-III-R N=36 (3.1)	Any Disorder N (%) C.I.*
● PREV FORENS ASMT*** ¹	10(19.6)	9(17.6)	5(9.8)	19(37.3)	5(9.8)	3(5.9)	41 (80.4) 69.5, 91.3
● PRE DET**** 0	133(51.0)	12(4.6)	3(1.1)	90(34.5)	9(3.4)	14(5.4)	128 (49.0) 43.0, 55.1
1 - 5	216(40.0)	22(4.1)	6(1.1)	249(46.1)	30(5.6)	17(3.1)	324 (60.0) 55.9, 64.1
6 - 10	54(29.7)	11(6.0)	2(1.1)	99(54.4)	15(8.2)	1(0.5)	128 (70.3) 63.7, 77.0
> 10 ¹	45(27.1)	7(4.2)	4(2.4)	96(57.8)	10(6.0)	4(2.4)	121 (72.9) 66.1, 79.7
● CG TYPE Person	107(35.1)	18(5.9)	2(0.7)	141(46.2)	24(7.9)	13(4.3)	198 (64.9) 59.6, 70.3
Property	162(41.1)	21(5.3)	4(1.0)	167(42.4)	29(7.4)	11(2.8)	232 (58.9) 54.0, 63.7
Victimless ¹	179(39.8)	13(2.9)	9(2.0)	226(50.2)	11(2.4)	12(2.7)	271 (60.2) 55.7, 64.7
● T IN CH**** 1	152(42.1)	14(3.9)	6(1.7)	160(44.6)	17(4.7)	12(3.2)	209 (57.9) 52.8, 63.0
2	94(43.3)	7(3.2)	4(1.8)	95(43.8)	9(4.1)	8(3.7)	123 (56.7) 50.1, 63.3
3	49(33.1)	7(4.7)	0(0.0)	83(56.1)	5(3.4)	4(2.7)	99 (66.9) 59.3, 74.5
4 - 10	116(34.8)	18(5.4)	5(1.5)	158(47.4)	27(8.1)	9(2.7)	217 (65.2) 60.0, 70.3
> 10 ¹	37(41.1)	6(6.7)	0(0.0)	38(42.2)	6(6.7)	3(3.3)	53 (58.9) 48.7, 69.1
● DISP Prob/Fine/Oth	184(40.4)	13(2.9)	5(1.1)	227(49.9)	13(2.9)	13(2.9)	271 (59.6) 55.1, 64.1
Province	165(37.0)	22(4.9)	8(1.8)	206(46.2)	32(7.2)	13(2.9)	281 (63.0) 58.5, 67.5
Federal	36(43.9)	3(3.7)	1(1.2)	27(32.9)	12(14.6)	3(3.7)	46 (56.1) 45.4, 66.8
Unknown ¹	63(38.0)	14(8.4)	1(0.6)	74(44.6)	7(4.2)	7(4.2)	103 (62.0) 55.7, 69.4

*C.I.'s calculated using the normal approximation to the binomial; **Previous Forensic Assessment;

Previous Detentions; *Total Instant Charges; ¹Two values missing for criminological information.

With respect to age group, the lifetime prevalence of mental illness increased between the ages of 20 to 49 years. For individuals suffering from affective disorders or personality disorders, the highest prevalence occurred in the 45 to 49 age group (10.0% and 7.5%), respectively. Among psychoses, the highest prevalence was noted in the over 50 age group (6.1%) while among substance abusers, the highest prevalence was in the 35 to 39 age group (58.6%). Finally, other disorders were most common in the 40 to 44 age group (4.9%).

The highest prevalence of mental illness (78.4%) was found among the lowest educated group (3 to 8 years of schooling), which was mostly accounted for by alcohol/substance abuse (62.2%) and personality disorders (9.0%). No person in the highest educational group suffered from an affective disorder. Otherwise, the lifetime prevalence did not differ by educational group. No obvious difference was noted among individuals suffering from psychoses with respect to education. The highest prevalence of other DSM-III-R disorders (6.3%) was found in the higher educated group (those who had completed some post-secondary education).

Overall, the lifetime prevalence of mental illness was highest among aboriginal (65.8%), but the prevalence of other disorders was lowest in this ethnic group (0.4%). The high lifetime prevalence was accounted for by a high prevalence of alcohol/substance abuse (59.7%). Personality disorders were most prevalent among

caucasians (7.0%). No ethnic differences were noted with respect to the lifetime prevalence of psychoses or affective disorders.

Eighty percent of persons previously referred for a forensic psychiatric assessment in the Province of Alberta were suffering from a mental illness. Alcohol/substance abuse was the group with the highest proportion of previous forensic assessments (37.3%).

The lifetime prevalence of mental illness appeared to be positively related to the number of previous detentions. Thus, those with greater than 10 prior detentions had the highest lifetime prevalence of illness (72.9%). This trend is largely accounted for by alcohol/substance abuse disorders. Otherwise, no obvious pattern was discernable among the other diagnostic categories.

There was no difference in the lifetime prevalence of mental illness by crime type. The lifetime prevalence of mental illness among individuals charged with a crime against a person was only slightly higher (64.9%) compared to those charged with crimes against property (58.9%) or victimless crimes (60.2%). No striking differences were noted among any of the diagnostic categories.

There was no obvious trend in lifetime prevalence according to total number of instant charges and this was true for all diagnostic categories.

The lifetime prevalence of mental illness was slightly lower among individuals who were given a disposition of federal time, 56.1%, compared to a range of 59.6% to 63.0% among the other dispositional types. Personality disorders were most prevalent among individuals sentenced to federal time (14.6%). Alternatively, the prevalence of alcohol/substance abuse disorders was lowest among those receiving federal time (32.9%)

4.5.3 Comorbidities

Table IV-21 presents diagnostic comorbidities measured over a one-month period. As previously stated, a comorbidity was defined as a diagnostic entity coexisting with the principal diagnosis (Fienstein, 1970). The first column shows whether the comorbidity existed between Axis I or Axis II conditions. Comparing the first to the second column, there were 90 interviewees with an Axis I by Axis I comorbidity, reflecting a prevalence of 7.5% (of 1199). One hundred and eighty-seven had comorbid Axis I by Axis II conditions, reflecting a prevalence of 15.6% (of 1199). Six hundred and thirty-eight interviewees (53.2% of 1199) were diagnosed with one single condition, 574 (90.0% of 638) on Axis I, and the remainder, 64, (10.0% of 638) on Axis II. There were no comorbidities within Axis II. Finally, the 728 interviewees accounted for a total of 1015 diagnoses, 764 of these on Axis I (75.2% of 1015), and 251 (24.8% of 1015) on Axis II.

TABLE IV-21

Prevalence of Diagnostic Comorbidities (N=1199)

Comorbidity	Interviewees With Comorbid Axis I Diagnoses (N=277)	Interviewees With A Single Diagnosis (N=638)	Total Interviewees With Any Diagnosis (N=728)	Total Diagnoses (N=1015)
AXIS I	90	574	664	764
AXIS II	187	64	64	251

As the number of interviewees with Axis I comorbidities was small (N = 90), no table is presented for them. Most of these comorbidities were found among 79 males (87.8% of 90). The most frequent of these were as follows:

- 1) 35 with psychotic disorders (schizophrenia and psychosis NOS) and substance abuse disorders (2.9% of 1199),
- 2) 35 with somatoform disorder and substance abuse disorders (2.9% of 1199).
- 3) 15 with affective disorders and substance abuse disorders (1.3% of 1199), and
- 4) 15 with anxiety disorder and substance abuse disorders (1.3% of 1199).

With regard to the comorbidities in Axis II, Tables IV-22 (for females) and IV-23 (for males) present any Axis II diagnoses, where an Axis II personality disorder was diagnosed either as principal diagnosis, or as a comorbidity.

TABLE IV-22
One-Month Prevalence of Any Axis II Disorder
Females

DISORDER	FEMALES (N = 111)								
	Age Groups N(%)								Total (N=111) CI*
	17-19 7(9.6)	20-24 20(27.4)	25-29 23(31.5)	30-34 8(11.0)	35-39 9(12.3)	40-44 2(2.7)	45-49 4(5.5)	> 50 0(0.0)	
• Any Diagnosis	3(42.9)	6(30.0)	8(34.8)	3(37.5)	2(22.2)	0(0.0)	2(50.0)	0(0.0)	24(21.6) 14.4,30.4
• Avoidant	0(0.0)	0(0.0)	1(4.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.9) .02,4.9
• Dependent	0(0.0)	0(0.0)	0(0.0)	1(12.5)	0(0.0)	0(0.0)	1(25.0)	0(0.0)	2(1.8) .2,6.4
• Obs-Comp	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
• Self-Defeating	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
• Paranoid	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
• Schizotypal	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)
• Schizoid	0(0.0)	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.9) .02,4.9
• Histrionic	0(0.0)	1(5.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.9) .02,4.9
• Narcissistic	0(0.0)	0(0.0)	1(4.3)	0(0.0)	1(11.1)	0(0.0)	0(0.0)	0(0.0)	2(1.8) .2,6.4
• Borderline	1(14.3)	2(10.0)	3(13.0)	2(25.0)	1(11.1)	0(0.0)	1(25.0)	0(0.0)	10(9.0) 4.4,15.9
• Antisocial	1(14.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.9) .02,4.9
• NOS	1(14.3)	2(10.0)	3(13.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	6(5.4) 2.0,11.4

*95% confidence intervals for proportions calculated using Fisher's Exact binomial.

TABLE IV-23

**One-Month Prevalence of Any Axis II Disorder
Males**

DISORDER	MALES (N = 1089)								
	Age Groups N(%)								TOTAL N=1089 CI*
	17-19 79(11.0)	20-24 228 (31.8)	25-29 141 (19.7)	30-34 111 (15.5)	35-39 69 (9.6)	40-44 48 (6.7)	45-49 20 (2.8)	>50 21 (2.9)	
• Any Diagnosis	31(39.2)	71(31.1)	46(32.6)	39(35.1)	16(23.2)	12(25.0)	6(30.0)	6(28.6)	227(20.8) 18.5,23.4
• Avoidant	1(1.3)	4(1.8)	1(0.7)	4(3.6)	3(4.3)	0(0.0)	1(5.0)	1(4.8)	15(1.4) .8,2.3
• Dependent	2(2.5)	2(0.9)	2(1.4)	2(1.8)	0(0.0)	1(2.1)	0(0.0)	1(4.8)	10(0.9) .4,1.7
• Obs-Comp	0(0.0)	1(0.4)	2(1.4)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(0.3) .06,.8
• Self-Defeating	0(0.0)	0(0.0)	0(0.0)	1(0.9)	1(1.4)	0(0.0)	0(0.0)	1(4.8)	3(0.3) .06,.8
• Paranoid	0(0.0)	1(0.4)	1(0.7)	1(0.9)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(0.3) .06,.8
• Schizotypal	0(0.0)	1(0.4)	0(0.0)	1(0.9)	0(0.0)	0(0.0)	0(0.0)	1(4.8)	3(0.3) .06,.8
• Schizoid	0(0.0)	0(0.0)	1(0.7)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(4.8)	2(0.2) .02,.7
• Histrionic	1(1.3)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	1(0.09) .002,.5
• Narcissistic	1(1.3)	2(0.9)	4(2.8)	2(1.8)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	9(0.8) .004,1.6
• Borderline	3(3.8)	11(4.8)	13(9.2)	8(7.2)	7(10.1)	2(4.2)	1(5.0)	0(0.0)	45(4.1) 3.0,5.5
• Antisocial	10(12.7)	22(9.6)	8(5.7)	7(6.3)	0(0.0)	2(4.2)	3(15.0)	1(4.8)	53(4.9) 3.7,6.3
• NOS	13(16.5)	27(11.8)	14(9.9)	13(11.7)	5(7.2)	7(14.6)	1(5.0)	0(0.0)	80(7.3) 5.9,9.1

*95% confidence intervals calculated using Fisher's Exact binomial..

Even, when measured non-hierarchically, the prevalence of personality disorders remained low. Only 24 females (21.6%) were diagnosed as having a Personality

Disorder of any kind. Borderline personality disorders were the most frequently occurring among females (9.0%). Similarly, the prevalence of personality disorders among males was low, 21.8% with the highest prevalence being those with a personality disorder not otherwise specified (7.3%) followed by antisocial personalities (4.9%), and borderline personalities (4.1%).

TABLE IV-24

**Prevalence of Comorbid Axis I Disorders with
Antisocial Personality Disorder (APD) and
Borderline Personality Disorder (BPD)**

DISORDERS	FREQUENCIES (of 1199)	PERCENT (of 728 Mentally Ill)
APD Only	15	2.1
APD + AD	2	0.3
APD + SAD	33	4.5
APD + AD + SAD	4	0.6
BPD Only	9	1.2
BPD + AD	1	0.1
BPD + SAD	36	5.0
BPD + AD + SAD	9	1.2

Several expectations on comorbidities, which, if realized, could have been tested as hypotheses, were articulated in the first Chapter of this study. Table IV-24 above presents comorbidities in relation to antisocial personality disorder and borderline personality disorder. As could be observed from the table, comorbidities were found

rather sparsely in this study. Therefore, the expectations/hypotheses announced in Chapter One could not be tested.

4.6 RELATIONSHIP BETWEEN MENTAL ILLNESS AND SELECTED FACTORS

This section examines the relationship between selected socio-demographic and criminological/legal factors to the presence or absence of mental illness. For purposes of this analysis mental illness was defined as any principal SCID Axis I or Axis II diagnosis reflecting one-month prevalence. This is considered to reflect current pathology which would be expected to be associated with the factors under consideration.

4.6.1 Bivariate Relationships

Table IV-25 presents bivariate relationships between selected demographic and legal factors and mental illness for the 1151 persons interviewed. Repeat admissions were excluded from this analysis because the socio-demographic and legal characteristics under study were unlikely to have changed from one admission to the next.

TABLE IV-25

**Bivariate Relationships Between Selected Factors
and Mental Illness**

Factor	No Mental Illness N (% of 448)	Mental Illness N (% of 703)	Total N (% of 1151)
GENDER: Male Female χ^2 on 1 df = 1.19, p = .275	401 (89.5) 47 (10.5)	644 (91.6) 59 (8.4)	1045 (90.8) 106 (9.2)
AGE GROUP: 17 to 19 20 to 24 25 to 29 30 to 34 35 to 39 40 to 44 45 to 49 50 + χ^2 on 7 df = 17.95, p = .012	44 (9.8) 161 (35.9) 98 (21.9) 60 (13.4) 34 (7.6) 25 (5.6) 12 (2.7) 14 (3.1)	72 (10.2) 190 (27.0) 137 (19.5) 124 (17.6) 77 (11.0) 56 (8.0) 28 (4.0) 19 (2.7)	116 (10.1) 351 (30.5) 235 (20.4) 184 (16.0) 111 (9.6) 81 (7.0) 40 (3.5) 33 (2.9)
EDUCATION : Grades 3 to 8 Grades 9 to 11 Grades 12 to 13 Grade > 13 χ^2 on 3 df = 26.34, p = .000008	24 (5.4) 248 (55.5) 146 (32.7) 29 (6.5)	87 (12.4) 406 (57.8) 191 (27.2) 19 (2.7)	111 (9.7) 654 (56.9) 337 (29.3) 48 (4.2)
ETHNICITY: Caucasian Aboriginal Other $\chi^2 = 17.32$ on 2 df, p = .0002	332 (74.1) 79 (17.6) 37 (8.3)	530 (75.4) 152 (21.6) 21 (3.0)	862 (74.9) 231 (20.1) 58 (5.0)
PREV. FORENSIC ASSESSMENT: Yes No χ^2 on 1 df = 7.60, p = .006	10 (2.2) 438 (97.8)	41 (5.8) 660 (94.2)	51 (4.4) 1098 (95.6)
PREVIOUS DETENTIONS: None 1-5 6-10 > 10 χ^2 on 3 df = 32.44, p = .0000004	133 (29.7) 216 (48.2) 54 (12.1) 45 (10.0)	128 (18.3) 324 (46.2) 128 (18.3) 121 (17.3)	261 (22.7) 540 (47.0) 182 (15.8) 166 (14.4)
CHARGE TYPE: * Person Property Victimless χ^2 on 2 df = 2.82, p = .244	107 (23.9) 162 (36.2) 179 (40.0)	198 (28.2) 232 (33.1) 271 (38.7)	305 (26.5) 394 (34.3) 450 (39.2)
TOTAL INSTANT CHARGES: 1 2 3 4-10 > 10 χ^2 on 4 df = 7.92, p = .095	152 (33.9) 94 (21.0) 49 (10.9) 116 (25.9) 37 (8.3)	209 (29.8) 123 (17.5) 99 (14.1) 217 (31.0) 53 (7.6)	361 (31.4) 217 (18.9) 148 (12.9) 333 (29.0) 90 (7.8)
DISPOSITION: Probation/Fine/Other Provincial Time (2YL) Federal Time (2Y+) Unknown χ^2 on 3 df = 2.05, p = .561	184 (41.4) 165 (36.8) 36 (8.0) 63 (14.1)	271 (38.7) 281 (40.1) 46 (6.6) 103 (14.7)	455 (39.6) 446 (38.8) 82 (7.1) 166 (14.4)

*Individuals with multiple charges were assigned hierarchically

The sex distributions between those with and without mental illness were similar with approximately 90.0% males in each group. A greater proportion of individuals without mental illness were below the age of 25 years, 45.7% compared to 37.2%. A X^2 analysis across all eight age categories showed that this difference was greater than what was expected by chance (X^2 on 7 df = 17.95, $p=.012$). A significantly greater proportion of those with mental illness were in the lower educational echelons (X^2 on 3 df = 26.34, $p < .001$).

The proportion of caucasians was the same in both groups, about 75.0%. However, the proportion of aboriginal was slightly more among those with mental illness (21.6% compared to 17.6%). A larger difference was noted for those of other ethnic background where they accounted for 8.3% among the non-mentally ill compared to 3.0% among the mentally ill. This difference was statistically significant (X^2 on 2 df = 17.32, $p<.001$). A greater proportion of mentally ill individuals had previously been remanded to a forensic facility in the Province of Alberta (X^2 on 1df = 7.60, $p=.006$). In regard to previous detentions, mentally ill persons had a greater proportion of multiple detentions, six or more (X^2 on 3 df = 32.44, $p<.001$). No important differences were noted in regard to type of charge, total charges, or legal dispositions.

4.6.2 Logistic Regression Modelling

Logistic regression was used to explore further the simultaneous relationships of these factors to mental illness. Factors were entered in a forward fashion with a single factor of interest being modelled first. Then, the model was extended one factor at a time until all of the factors had been entered. In order to interpret the model extensions, subsets of data without missing values were used. Three individuals on whom data were missing were excluded. This ensured that the Likelihood Ratio Statistics were comparable across the models (Selvin, 1991). However, in line with the exploratory nature of this analysis, the initial emphasis will be on the interpretation of the Odds Ratios and their 95% confidence intervals.

Tables IV-26 to IV-34 provide odds ratios (OR's), 95% confidence intervals (CI), Likelihood Ratio Statistics (LRS), and p-values for the models tested. Each table focuses on a different factor and examines its relationship to mental illness across the various model extensions (i.e as each additional factor was entered). For example, Table IV-26 summarizes changes in the OR's for females compared to males across the eight model extensions. Changes in the OR's from model to model was considered to be evidence of confounding by the specific factor entered into the model extension. A 95% confidence interval spanning the value of 1 was interpreted to reflect no association between the factor studied and mental illness controlling for other variables in the model.

In these tables, the LRS can be used to compare each successive model with respect to the importance of the factor being entered. Large drops in deviance from model to model indicates a significant relationship between the factor being entered and mental illness while controlling for all other factors in the model. The statistical significance of the size of the drops in deviance is measured by the p-values in the bottom row of the tables.

TABLE IV-26

**Logistic Regression Results for the Association of Gender with Mental Illness
Odds Ratio (95% Confidence Interval), Likelihood Ratio Statistic (LRS),
and P Value for the LRS**

Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Detent- ions	+ Previous Forensic	+ Charge Type	+ Total Charges	+ Disposi- tion
.77 (0.5, 1.2)	.77 (0.5, 1.1)	.70 (0.5, 1.1)	.68 (0.5, 1.1)	.73 (0.5, 1.1)	.73 (0.5, 1.1)	.74 (0.5, 1.1)	.73 (0.5, 1.1)	.72 (0.5, 1.1)
LRS = 1.626 1DF	LRS = 17.805 7DF	LRS = 31.856 3DF	LRS = 12.475 2DF	LRS = 22.740 3DF	LRS = 5.199 1DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p = .202	p = .013	p < .001	p = .002	p < .001	p = .023	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for females compared to males (baseline) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

Table IV-26 shows that female inmates were at no higher risk than males of being mentally ill. This is reflected in 95% CI's that range between .5 and 1.2. This finding was consistent from model to model regardless of the factors entered. Large and statistically significant drops in deviance were associated with the addition to the model of:

- age group controlling for gender,
- education controlling for gender and age group,
- ethnicity controlling for gender, age group and education,
- previous detention controlling for gender, age group, education, and ethnicity,
- previous forensic assessment controlling for gender, age group, education, ethnicity, and previous detention.

Finally, factors which did not appear to be associated with mental illness when all of the demographic factors have been controlled were charge type, total number of charges and disposition.

Table IV-27 presents a similar analysis focusing on age group. In all age groups, the confidence interval includes 1.0 indicating that there is no relationship between age group and mental illness. The addition sequentially of the other factors consistently demonstrated the lack of relationship between age and mental illness.

TABLE IV-27

Logistic Regression Results for the Association of Age Group with Mental Illness Odds Ratio (95% Confidence Interval), Likelihood Ratio Statistic (LRS), and P Value for the LRS

Age Group	+ Gender	+ Education	+ Ethnicity	+ Previous Detentions	+ Previous Forensic	+ Charge Type	+ Total Charges	+ Disposition
.71 (0.5, 1.1)	.72 (0.5, 1.1)	.76 (0.5, 1.2)	.72 (0.5, 1.1)	.64 (0.5, 1.0)	.64 (0.4, 1.0)	.64 (0.4, 1.0)	.62 (0.4, 1.0)	.64 (0.4, 1.0)
.85 (0.5, 1.3)	.86 (0.5, 1.4)	.95 (0.6, 1.5)	.87 (0.5, 1.4)	.70 (0.5, 1.1)	.70 (0.4, 1.1)	.69 (0.4, 1.1)	.69 (0.4, 1.1)	.71 (0.4, 1.2)
1.3 (0.8, 2.0)	1.3 (0.8, 2.0)	1.4 (0.9, 2.3)	1.3 (0.8, 2.1)	.97 (0.6, 1.6)	.97 (0.6, 1.6)	.95 (0.6, 1.6)	.96 (0.6, 1.6)	.97 (0.6, 1.7)
1.4 (0.8, 2.4)	1.4 (0.8, 2.4)	1.6 (0.9, 2.8)	1.4 (0.8, 2.6)	1.2 (0.7, 2.1)	1.2 (0.6, 2.1)	1.1 (0.6, 2.1)	1.2 (0.6, 2.1)	1.2 (0.7, 2.2)
1.4 (0.7, 2.5)	1.3 (0.8, 2.5)	1.6 (0.9, 2.9)	1.4 (0.8, 2.7)	1.2 (0.6, 2.3)	1.2 (0.6, 2.3)	1.2 (0.6, 2.3)	1.2 (0.6, 2.2)	1.2 (0.6, 2.3)
1.4 (0.7, 3.1)	1.4 (0.7, 3.1)	1.7 (0.9, 3.8)	1.6 (0.7, 3.6)	1.3 (0.6, 3.0)	1.3 (0.6, 3.0)	1.3 (0.6, 3.0)	1.3 (0.6, 2.9)	1.3 (0.6, 2.9)
.82 (0.4, 1.8)	.81 (0.4, 1.8)	.72 (0.3, 1.6)	.65 (0.3, 1.5)	.57 (0.2, 1.3)	.55 (0.2, 1.3)	.53 (0.2, 1.2)	.52 (0.2, 1.2)	.53 (0.2, 1.2)
LRS = 17.882 7DF	LRS = 1.549 1DF	LRS = 31.856 3DF	LRS = 12.475 2DF	LRS = 22.740 3DF	LRS = 5.199 1DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p = .013	p = .213	p < .001	p = .002	p < .001	p = .023	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for successive age groups (20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50+) compared to baseline (17-19) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

An analysis focusing on education is presented on Table IV-28. In general there appears to be an inverse relationship between education and mental illness; the higher the educational level achieved the lower the risk. None of the confidence intervals in this model contains 1, signifying the relationship between education and mental illness is statistically significant. A comparison of the confidence intervals obtained for those with some secondary school to those who had completed secondary school showed little difference. Therefore, these two categories could be collapsed in subsequent analysis.

TABLE IV-28

**Logistic Regression Results for the Association of Education
with Mental Illness, Odds Ratios (95% Confidence Intervals),
Likelihood Ratio Statistic (LRS), and P Value for the LRS**

Education	+ Gender	+ Age Group	+ Ethnicity	+ Previous Detent- ions	+ Previous Forensic	+ Charge Type	+ Total Charges	+ Disposi- tion
.45 (0.3, 0.7)	.43 (0.3, 0.7)	.45 (0.3, 0.7)	.46 (0.3, 0.8)	.48 (0.3, 0.8)	.48 (0.3, 0.8)	.48 (0.3, 0.8)	.47 (0.3, .08)	.47 (0.3, 0.8)
.36 (0.2, 0.6)	.34 (0.2, 0.6)	.33 (0.2, 0.6)	.35 (0.2, 0.6)	.40 (0.2, 0.7)	.39 (0.2, 0.7)	.39 (0.2, 0.7)	.38 (0.2, 0.7)	.39 (0.2, 0.7)
.18 (0.09, 0.4)	.17 (0.08, 0.4)	.15 (0.07, 0.3)	.16 (0.08, 0.4)	.17 (0.08, 0.4)	.17 (0.08, 0.4)	.17 (0.08, 0.4)	.17 (0.08, 0.4)	.17 (0.08, 0.4)
LRS = 27.126 3DF	LRS = 2.705 1DF	LRS = 21.456 7DF	LRS = 12.475 2DF	LRS = 22.740 3DF	LRS = 5.199 1DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p < .001	p = .100	p = .003	p = .002	p < .001	p = .023	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for successive educational groups (Some secondary school, grades 9-11; Completed Secondary School, grades 12-13; Technical or University, > grade 13) compared to baseline (Some public school, grades 3-8) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

Table IV-29 describes the relationship of ethnicity to mental illness. A comparison between aboriginal and caucasian shows OR's ranging from 0.86 to 1.2 depending on the model, with all confidence intervals including the value of 1. Therefore, these two ethnic groups are similar, indicating that they could be examined together in a subsequent analysis. Furthermore, there is no association with mental illness and these two ethnic groups. However, compared to these two groups, Non-white/Non-aboriginal appear to be at a significantly lesser degree of risk, with OR's ranging from 0.34 to 0.38 and 95% confidence intervals between 0.02 and 0.7.

TABLE IV-29

**Logistic Regression Results for the Association of Ethnicity
with Mental Illness Odds Ratios (95% Confidence Intervals),
Likelihood Ratio Statistic (LRS), and P Value for the LRS**

Ethnicity	+ Gender	+ Age Group	+ Education	+ Previous Detent- ions	+ Previous Forensic	+ Charge Type	+ Total Charges	+ Disposi- tion
1.2 (.09, 1.6) .35 (.02, 0.6)	1.2 (.09, 1.7) .36 (0.2, 0.6)	1.2 (0.9, 1.7) .36 (0.2, 0.6)	1.1 (0.8, 1.5) .38 (0.2, 0.7)	.88 (0.6, 1.2) .34 (0.2, 0.6)	.91 (0.6, 1.3) .35 (0.2, 0.6)	.90 (0.6, 1.3) .35 (0.2, 0.6)	.88 (0.6, 1.2) .35 (0.2, 0.6)	.86 (0.6, 1.2) .34 (0.2, 0.6)
LRS = 16.598 2DF	LRS = 2.155 1DF	LRS = 17.487 7DF	LRS = 27.523 3DF	LRS = 22.740 3DF	LRS = 5.199 1DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p < .001	p = .142	p = .015	p < .001	p < .001	p = .023	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for ethnic groups (Aboriginal; Other (i.e. Non-white/Non-Aboriginal) compared to baseline (Caucasian) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

An analysis of the models focusing on previous detentions is presented in Table IV-30. Previous detentions was associated with mental illness. Compared to those with No detentions, those who had experienced between 1 and 5 detentions were at about a 1.5 times the risk. 95% confidence intervals range from 1.0 to 2.1 for this group indicating that this difference was greater than could be expected by chance. Compared to those with no detentions, those with 6 to 10 detentions were at between 2.2 to 2.5 times the risk of mental illness, and those with more than 10 detentions were at between 2.3 and 2.8 times the risk. Confidence intervals for these two latter groups were largely overlapping indicating that these two groups could be collapsed.

TABLE IV-30

**Logistic Regression Results for the Association of
Previous Detentions With Mental Illness
Odds Ratios (95% Confidence Intervals), Likelihood Ratio Statistic
(LRS), and P-Value for the LRS**

Previous Deten- tions	+ Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Forensic	+ Charge Type	+ Total Charges	+ Disposi- tion
1.5 (1.1, 2.0)	1.6 (1.2, 2.1)	1.6 (1.2, 2.1)	1.5 (1.1, 2.0)	1.5 (1.1, 2.0)	1.5 (1.1, 2.0)	1.5 (1.1, 2.0)	1.4 (1.0, 2.0)	1.4 (1.0, 2.0)
2.4 (1.6, 3.6)	2.5 (1.7, 3.7)	2.5 (1.7, 3.8)	2.2 (1.5, 3.4)	2.4 (1.5, 3.6)	2.3 (1.5, 3.5)	2.3 (1.5, 3.5)	2.2 (1.5, 3.5)	2.3 (1.5, 3.6)
2.8 (1.8, 4.2)	2.8 (1.8, 4.1)	2.7 (1.7, 4.0)	2.4 (1.6, 3.8)	2.6 (1.6, 4.1)	2.3 (1.6, 3.7)	2.4 (1.5, 3.9)	2.3 (1.4, 3.8)	2.4 (1.5, 3.9)
LRS = 32.245 3DF	LRS = 1.532 1DF	LRS = 14.690 7DF	LRS = 24.961 3DF	LRS = 13.075 2DF	LRS = 5.199 1DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p < .001	p = .216	p = .040	p < .001	p = .001	p = .023	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for successive episodes of previous detentions (1-5; 6-10; > 10) compared to baseline (No previous detentions) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

TABLE IV-31

**Logistic Regression Results for the Association of A Previous Forensic
Assessment with Mental Illness
Odds Ratios (95% Confidence Intervals), Likelihood Ratio Statistic
(LRS), and P-Value for the LRS**

Previous Forensic	+ Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Detent- ions	+ Charge Type	+ Total Charges	+ Disposi- tion
.37 (0.2, 0.7)	.37 (0.2, 0.7)	.40 (0.2, 0.8)	.39 (0.2, 0.8)	.37 (0.2, 0.8)	.45 (0.2, 0.9)	.46 (0.2, 1.0)	.46 (0.2, 1.0)	.45 (0.2, 0.9)
LRS = 9.202 1DF	LRS = 1.458 1DF	LRS = 16.445 7DF	LRS = 31.837 3DF	LRS = 13.050 2DF	LRS = 19.711 3DF	LRS = 2.329 2DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p = .002	p = .227	p = .021	p < .001	p = .001	p < .001	p = .312	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for persons with a prior forensic assessment (baseline) compared to those with no prior forensic assessment for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

Table IV-31 above highlights previous forensic assessment. Using this, with a prior forensic assessment as the baseline, those with no prior forensic assessment were less likely to be mentally ill (OR's ranging from 0.37 to 0.46). This finding was consistent across all the models and statistically significant (95% CI's ranging from 0.2 to 1.0).

Table IV-32 provides the results when charge type is highlighted. There were no differences between those individuals who had been charged with a persons offense and those charged with property offenses or victimless crimes. For property offenses, compared to offenses against the person the OR's ranged from 0.76 to 0.80 and 95% confidence intervals from 0.5 to 1.1. For those charged with victimless crimes, the OR's ranged from 0.81 to 0.94 and 95% confidence intervals from 0.6 to 1.4. Examining charge type in Tables IV-26 to IV-31 and Tables IV-33 and IV-34, this variable accounted for small and non-significant drops in deviance when other factors were controlled.

TABLE IV-32

Logistic Regression Results for the Association of Charge Type with Mental Illness, Odds Ratios (95% Confidence Intervals), Likelihood Ratio Statistic (LRS), and P Value for the LRS

Charge Type	+ Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Detentions	+ Previous Forensic	+ Total Charges	+ Disposition
.78 (0.6, 1.1)	.78 (0.6, 1.1)	.80 (0.6, 1.1)	.80 (0.6, 1.1)	.79 (0.6, 1.1)	.76 (0.5, 1.0)	.78 (0.6, 1.1)	.76 (0.6, 1.1)	.76 (0.5, 1.1)
.81 (0.6, 1.1)	.82 (0.6, 1.1)	.84 (0.6, 1.1)	.85 (0.6, 1.2)	.83 (0.6, 1.1)	.85 (0.6, 1.2)	.88 (0.6, 1.2)	.93 (0.7, 1.3)	.94 (0.6, 1.4)
LRS = 2.742 2DF	LRS = 1.424 1DF	LRS = 17.309 7DF	LRS = 31.752 3DF	LRS = 12.870 2DF	LRS = 23.214 3DF	LRS = 4.720 1DF	LRS = 6.782 4DF	LRS = 3.114 3DF
p = .254	p = .233	p = .016	p < .001	p = .002	p < .001	p = .030	p = .148	p = .374

This table displays the odds ratios and 95% confidence intervals for charge types (Crimes against property; Victimless Crimes) compared to baseline (Crimes against Persons) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

Table IV-33 focuses on the number of total charges for the current episode of detention. No association was observed between this factor and mental illness. OR's were close to 1 at every level and confidence intervals indicated no statistical significant differences. Small drops in deviance were associated with this factor throughout the analysis (Tables IV-26 to IV-32 and Table V-34).

TABLE IV-33

Logistic Regression Results for the Association of Total Charges with Mental Illness, Odds Ratios (95% Confidence Intervals), Likelihood Ratio Statistic (LRS), and P-Value for the LRS

Total Charges	+ Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Detentions	+ Previous Forensic	+ Charge Type	+ Disposition
.96 (0.7, 1.4)	.95 (0.7, 1.3)	.94 (0.7, 1.3)	.94 (0.7, 1.3)	.91 (0.6, 1.3)	.87 (0.6, 1.2)	.86 (0.6, 1.2)	.86 (0.6, 1.2)	.85 (0.6, 1.2)
1.5 (1.0, 2.2)	1.5 (1.0, 2.2)	1.5 (1.0, 2.2)	1.5 (1.0, 2.2)	1.4 (0.9, 2.1)	1.3 (0.9, 2.0)	1.3 (0.9, 2.0)	1.3 (0.9, 2.0)	1.4 (0.9, 2.0)
1.4 (1.0, 1.9)	1.4 (1.0, 1.9)	1.4 (1.0, 2.0)	1.4 (1.0, 1.9)	1.4 (1.0, 1.9)	1.3 (0.9, 1.8)	1.3 (0.9, 1.7)	1.3 (0.9, 1.8)	1.3 (0.9, 1.9)
1.0 (0.7, 1.7)	1.0 (0.6, 1.7)	1.1 (0.7, 1.8)	1.2 (0.7, 1.9)	1.2 (0.7, 1.9)	.94 (0.6, 1.6)	.93 (0.6, 1.5)	.97 (0.6, 1.6)	1.0 (0.6, 1.8)
LRS = 7.762 4DF	LRS = 1.626 1DF	LRS = 19.234 7DF	LRS = 31.433 3DF	LRS = 12.156 2DF	LRS = 20.428 3DF	LRS = 5.228 1DF	LRS = 2.947 2DF	LRS = 3.114 3DF
p = .101	p = .202	p = .007	p < .001	p = .002	p < .001	p = .022	p = .229	p = .374

This table displays the odds ratios and 95% confidence intervals for successive groupings of number of current charges (2, 3, 4-10, > 10) compared to baseline (one charge) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

Finally, Table IV-34 focuses on legal disposition. Individuals who are mentally ill received similar legal dispositions compared to those who were not mentally ill. The OR's were similar across all categories of the factor and this was consistent across all the models. OR's were close to 1.0 and confidence intervals were overlapping across the levels of this factor and were non-significant.

TABLE IV-34

Logistic Regression Results for the Association of Disposition with Mental Illness, Odds Ratios (95% Confidence Intervals), Likelihood Ratio Statistic (LRS), and P-Value for the LRS

Disposi- tions	+ Gender	+ Age Group	+ Education	+ Ethnicity	+ Previous Admission	+ Previous Forensic	+ Charge Type	+ Total Charges
1.2 (0.9, 1.5) .87 (0.5, 1.4) 1.1 (0.8, 1.6)	1.2 (0.9, 1.5) .85 (0.5, 1.4) 1.1 (0.8, 1.6)	1.1 (0.9, 1.5) .83 (0.5, 1.4) 1.1 (0.8, 1.6)	1.1 (0.9, 1.5) .82 (0.5, 1.3) 1.2 (0.7, 1.6)	1.1 (0.9, 1.5) .84 (0.5, 1.4) 1.1 (0.8, 1.6)	1.1 (0.8, 1.4) .75 (0.5, 1.2) 1.2 (0.8, 1.7)	1.0 (0.8, 1.4) .73 (0.4, 1.2) 1.2 (0.8, 1.7)	1.0 (0.8, 1.4) .72 (0.4, 1.2) 1.1 (0.8, 1.7)	1.0 (0.7, 1.4) .70 (0.4, 1.2) 1.2 (0.8, 1.8)
LRS = 2.110 3DF	LRS = 1.703 1DF	LRS = 17.781 7DF	LRS = 31.619 3DF	LRS = 12.410 2DF	LRS = 23.237 3DF	LRS = 5.302 1DF	LRS = 2.557 2DF	LRS = 7.209 4DF
p = .550	p = .192	p = .013	p < .001	p = .002	p < .001	p = .021	p = .278	p = .125

This table displays the odds ratios and 95% confidence intervals for legal dispositions (Provincial Time (2YL); Federal Time (> 2Y); Disposition Unknown) compared to baseline (Probation/Fine/Other) for a series of sequential models. Reading across the table, left to right, the likelihood ratio statistics (LRS) and p-values compare each successive model to the model containing all previous terms.

4.6.3 Final Logistic Regression Model

To summarize the analysis to this point, education, ethnicity, previous detentions, and previous forensic assessments appear to be associated with mental illness. Factors which were not associated with mental illness included gender, age group, charge type, total charges, and legal disposition. No confounding was noted in the model.

Table IV-35 explores the potential 2-way statistical interactions among those factors found to bear an important association with mental illness. The table presents LRS, df's, and p-values comparing separate models with the interaction term of interest

included to a model containing education, ethnicity, previous detentions, and previous forensic assessment. Small drops in deviance associated with the inclusion of the interaction term was considered to reflect lack of statistical interaction. When data were sparse as in the case of previous forensic assessment, models did not converge. This table shows that no statistical interactions were present.

TABLE IV-35

**Evaluation of 2-Way Statistical Interaction
In a Model Containing Education, Ethnicity, Previous Detentions
and Previous Forensic Assessments**

Interaction Terms	Likelihood Ratio Statistic (LRS) and Degrees of Freedom (DF)	P Value
+ Education x Ethnicity	LRS 6 DF = 5.586	.471
+ Education x Prev. Detentions	LRS 9 DF = 11.656	.233
+ Education x Prev. Forensic Assessment	No Convergence	n/a
+ Ethnicity x Prev. Detentions	LRS 6 DF = 3.942	.684
+ Ethnicity x Prev. Forensic Assessment	LRS 2 DF = 1.037	.595
+ Prev. Detentions x Prev. Forensic Assessment	No Convergence	n/a

Table IV-36 summarizes the final logistic regression model. Based on the foregoing exploration, this table reflects the most parsimonious model. Only those factors that showed a consistent and important relationship to mental illness have been included. In addition, where appropriate, categories of factors have been collapsed.

TABLE IV-36

**Final Logistic Regression Model Comparing
Selected Factors to Mental Illness
Odds Ratios (OR) and 95% Confidence Intervals (95% CI)**

Factor	OR	95% CI
Education (Baseline: Public School-Grades 3 to 8)		
Secondary School (Grades 9-13)	.47	.23, .75
Post-Secondary School	.21	.10, .44
Ethnicity (Baseline: Non-caucasian/non-aboriginal)		
Caucasian and Aboriginal	2.78	1.6, 5.0
Previous Detention (Baseline: None)		
1-5	1.5	1.1, 2.0
> 5	2.3	1.6, 3.3
Previous Forensic Assessment (Baseline: No)		
Yes	2.3	1.1, 4.8
LRS on 7 DF = 128.149, p < .001		
Note: Factors Excluded from the Model as unrelated to the presence of mental illness were Gender, Age Group, Charge Type, Total Charges, and Legal Disposition		

When controlling for ethnicity, previous detentions, and previous forensic assessment, those with secondary school education were at 0.47 times the risk of being mentally ill compared to those with only public school education (95% CI = 0.23,0.75). Those with post-secondary school education were at 0.21 times the risk (95% CI = 0.10,0.44), indicating an inverse relationship between the prevalence of mental illness and education.

When controlling for education, previous detentions, and previous forensic assessment, caucasian and aboriginal were at 2.78 the risk of being mentally ill (95% CI = 1.6,5.0) compared to those who were non-caucasian/non-aboriginal.

Controlling for education, ethnicity, and previous forensic assessment, those with 1 to 5 previous detentions were at 1.5 times the risk of being mentally ill compared to those with no previous detentions (95% CI = 1.1,2.0), and those with more than 5 episodes of previous detentions were at 2.3 times the risk of being mentally ill (95% CI = 1.6,3.3).

Finally, when controlling for education, ethnicity, previous detention, and previous forensic assessment, the risk of mental illness was 2.3 times higher for those who had all these factors compared to those who had none (95% CI = 1.1,4.8).

Table IV-37 compares the fitted prevalence of mental illness based on the estimated logistic coefficients for each combination of characteristics from the final regression model to the observed prevalence (based on the data) for the same combination of factors. The final model fits well when cell sizes were large (eg. greater than 15 subjects). Otherwise, the variability stemming from the small cell sizes in the observed data resulted in moderate to large discrepancies in the fit. This was interpreted to reflect a limitation in the stratified analysis rather than a poor fitting model.

TABLE IV-37

Comparison of Fitted and Observed Prevalences

Characteristics	Fitted Prevalence	Observed Prevalence (N)
Public School, Aboriginal/Caucasian, > 5 Previous Detentions, & Previous Forensic Assessment	92.2%	80.0% (5)
Public School, Aboriginal/Caucasian, 1-5 Previous Detentions, & Previous Forensic Assessment	88.1%	100.0% (1)
Secondary School, Aboriginal/Caucasian, > 5 Previous Detentions, & Previous Forensic Assessment	84.7%	88.9% (18)
Public School, Aboriginal/Caucasian, > 5 Previous Detentions, & No Previous Forensic Assessment	83.6%	82.9% (41)
Secondary School, Aboriginal/Caucasian, 1-5 Previous Detentions, & Previous Forensic Assessment	77.6%	72.7% (22)
Public School, Aboriginal/Caucasian, 1-5 Previous Detentions, & No Previous Forensic Assessment	76.2%	75.0% (48)
Post-Secondary, Aboriginal/Caucasian, > 5 Previous Detentions, & Previous Forensic Assessment	71.1%	100.0% (1)
Secondary School, Aboriginal/Caucasian, > 5 Previous Detentions, & No Previous Forensic Assessment	70.4%	71.1% (256)
Public School, Aboriginal/Caucasian, No Previous Detentions, No Previous Forensic Assessment	68.9%	76.9% (13)
Secondary School, Non-Aboriginal/Non-Caucasian, > 5 Previous Detentions, & Previous Forensic Assessment	66.4%	50.0% (2)
Public School, Non-Aboriginal/Non-Caucasian, > 5 Previous Detentions, & No Previous Forensic Assessment	64.7%	100.0% (2)
Post-Secondary School, Aboriginal/Caucasian, 1-5 Previous Detentions, & Previous Forensic Assessment	60.7%	100.0% (1)
Secondary School, Aboriginal/Caucasian, 1-5 Previous Detentions, & No Previous Forensic Assessment	59.8%	59.1% (423)
Secondary School, Non-Aboriginal/Non-Caucasian, 1-5 Previous Detentions, & Previous Forensic Assessment	55.3%	100.0% (1)
Post-Secondary School, Aboriginal/Caucasian, > 5 Previous Detentions, & No Previous Forensic Assessment	51.5%	42.9% (14)
Secondary School, Aboriginal/Caucasian, No Previous Detentions, & No Previous Forensic Assessment	50.5%	51.4% (220)
Secondary School, Non-Aboriginal/Non-Caucasian, > 5 Previous Detentions, & No Previous Forensic Assessment	46.0%	33.3% (9)
Public School, Non-Aboriginal/Non-Caucasian, No Previous Detentions, & No Previous Forensic Assessment	44.0%	0.0% (1)

TABLE IV-37 CONTINUED**Comparison of Fitted and Observed Prevalences**

Characteristics	Fitted Prevalence	Observed Prevalence (N)
Post-Secondary School, Aboriginal/Caucasian, 1-5 Previous Detentions, & No Previous Forensic Assessment	39.9%	53.8% (13)
Secondary School, Non-Aboriginal/Non-Caucasian, 1-5 Previous Detentions, & No Previous Forensic Assessment	34.8%	40.7% (27)
Post-Secondary School, Aboriginal/Caucasian, No Previous Detentions, & No Previous Forensic Assessment	31.3%	21.4% (14)
Secondary School, Non-Aboriginal/Non-Caucasian, No Previous Detentions, & No Previous Forensic Assessment	26.8%	18.2% (11)
Post-Secondary School, Non-Aboriginal/Non-Caucasian, 1-5 Previous Detentions, & No Previous Forensic Assessment	19.2%	25.0% (4)
Post-Secondary School, Non-Aboriginal/Non-Caucasian, No Previous Detentions, & No Previous Forensic Assessment	14.0%	100.0% (1)

The fitted prevalences range from 14.0% in the lowest risk group to 92.2% in the group with lowest education (public school), who were aboriginal or caucasian, with more than 5 previous detentions, and a history of a previous forensic assessment.

4.7 SUMMARY OF RESULTS

A description of the populations identified in the study showed that there were no statistically significant differences for sex, age group, and criminality between the study group, the comparison group, and the general inmate population. Therefore, the study sample was considered to be representative of the population of inmates admitted to the CRDC during the months of the study.

Regarding one-month prevalence, findings indicate that the prevalence for any disorder for males was 56% of which alcohol accounted for the largest proportion (31.7% of all disorders). One-month prevalence for any disorder for females was 49.5% with alcohol again accounting for the largest proportion (26.1% of all disorders). An examination of the major diagnostic groupings by selected social and criminological factors showed no consistent age-related trends within specific diagnostic group although an increasing prevalence in any disorder was noticed between the ages of 20-49. For both sexes, the bulk of pathology was composed of alcohol/substance abuse disorders. The prevalence of schizophrenia was low among males (1.2%) and non-existent among females. Factors that appeared to be associated with mental illness included low education, ethnicity, previous forensic assessment, and previous detentions. Similar trends were noted with respect to lifetime prevalence estimates.

The relationship of these factors to mental illness was explored in more detail using logistic regression. Results showed that gender, age group, charge type, total charges, and legal dispositions were not associated with the prevalence of mental illness when education, ethnicity, previous detention and previous forensic assessment were controlled. The prevalence of mental illness decreased with education and increased with previous detention and previous forensic assessment. There was no difference in the prevalence of mental illness between caucasian and aboriginal, but those who were non-caucasian/non-aboriginal had a lower prevalence

of mental illness compared to caucasian and aboriginal. Based on the logistic model, the highest estimated prevalence (92.2%) occurred among those who had public school education, who were aboriginal or caucasian, with more than five previous detentions and with a history of a previous forensic assessment.

CHAPTER FIVE

DISCUSSION

This Chapter (1) enunciates the strengths and limitations of the study, (2) reviews the results along the three dimensions stipulated in the Aims and in relation to a broader scientific context, and (3) comments on the implications of the findings and direction for future studies.

5.1 STUDY STRENGTHS

5.1.1 Diagnoses Made by Forensic Psychiatrists

In psychiatric epidemiology, the diagnoses made by clinicians using specially designed structured or semi-structured interview schedules (such as the SCID) are considered to be the gold standard. To save time and money, diagnostic instruments have been developed for lay interviewers. Great care has been extended to insure that these approach the quality of clinicians' diagnoses.

This study employed four forensic psychiatrists using a semi-structured instrument. Forensic psychiatrists are physicians well versed in psychiatric clinical science, with specialized knowledge of syndromes where crime and mental illness relate, and are deeply cognizant of the intricacies and interactions between the justice and health systems. Therefore, diagnoses made by forensic psychiatrists using appropriate

structured or semi-structured instruments could be considered to be the gold standard for epidemiological studies in correctional populations. In addition, for this study, the forensic psychiatrist-interviewers received additional training in the use of the diagnostic instruments chosen and participated in inter-rater reliability tests. Reliability for diagnoses, measured by the overall kappa statistic, was high (.78).

5.1.2 Study Design

5.1.2(i) Population Studied and Sampling Plan

A carefully thought out sampling strategy, based on a gender stratified random sample from all admissions to the CRDC during the months of the study, was implemented. Using secondary data, comparisons of the demographic and legal characteristics of the study sample with (a) a randomly chosen comparison group, and (b) all admissions to the CRDC during the months of the study showed that the sample was free of selection bias and representative of the inmate population admitted during the study months. In addition, this study sampled new admissions (within 24 hours) to the centre. Therefore, there was no possibility that mentally ill offenders, once admitted into the CRDC, could have been diverted from the system prior to interview. Also, results were not confounded by incident mental illness arising from the correctional environment.

With respect to the above points, it is important to understand the human flow in the Justice/Correction system in order to appreciate the extent of bias that can be introduced into epidemiological studies of prevalence in correctional populations. Police contact is the point of entrance into the justice system. From this point the justice system follows a regular pattern: remand (for those who are held in custody while awaiting trial), trial, sentencing (for those found guilty), and parole (for those who were sentenced to time in prison and who are released prior to serving the total length of the sentence (Figure 5-1, Appendix Three). A police officer has three basic options once contact has been established with a citizen following a complaint. The police officer may choose not to proceed, a citizen who displays behaviour resembling a mental condition may be escorted to a hospital emergency (diverted to the mental health system), or the citizen may be charged with a criminal offence in which case the police officer brings the person to the attention of a Justice of the Peace. It is up to the Justice of the Peace to make a decision on releasing the person pending a future appearance in court, or on ordering detention (Figure 5-2, Appendix Three). By law, initial detention should be decided upon within 24 hours, or "without unreasonable delay" (Watt and Fuerst, Tremear's, 1994, Section 503[1], p.768). Within that period of time a Provincial Judge has to decide whether to release the person by dismissing the charge, to keep the charge but allow the person to go on bail, to remand the person for a forensic assessment, or to order the person to remain in custody while awaiting trial.

The two last stages of the justice process involve the trial and the sentencing stages. Because innocent individuals could be accused and arrested, final adjudication does not take place until a finding of guilt has been entered by a court of law. The justice system is powerless in regard to criminals whose crimes are not reported or who are not arrested. Once a policeman detains a citizen, a series of consequences develop. Regarding the mentally ill person, and taking into account the seriousness of the accusation, an officer could "divert" the person into the mental health system and, apart from a cursory police report, no record would exist of the encounter. These cases would be lost to the epidemiologist.

Because of the flow of mentally disordered offenders through the system prevalence rates of general or specific mental conditions in different correctional institutions may be affected by a berksonian-like bias (Berkson, 1946) that hinges on the stage of the legal process studied. This study recognized the importance of distinguishing between different correctional populations, based on their position within the stages of the legal process. It was argued that prevalence rates measured among sentenced prisoners would not apply to remanded populations. In an oft-quoted statement, Gunn (1977) has suggested that "the best way to determine the level of psychiatric disturbance in a criminal population is to examine a consecutive group of people *convicted of criminal offence* (emphasis added) at a particular court or series of courts". However, sampling sentenced prisoners following their conviction would exclude mentally disorder offenders diverted from the justice system because of their

illness, prior to sentencing (e.g. civil commitments, unfit to stand trial). In addition, the study of post-conviction populations may also exclude those found guilty but sentenced to probation. In addition, mental pathology may also develop in correctional environments *de novo*. This newly developed pathology represents the incidence of mental illness attributable to incarceration. Thus, this study is based on a principle of recency of criminal event, that to understand the true impact of mental illness in the justice system and the relationship between crime and mental illness, prevalence estimates should best be taken among a group of individuals newly detained. Unless samples are obtained **on entrance** (i.e. as soon as possible after detention by the Justice of the Peace) they will be systematically biased. It should be noted that even at this early point, some mentally ill individuals may have already been diverted by the arresting police office, or not detained by the justice of the peace. However, given that these individuals have not been detained, they could best be considered to remain part of the general population and beyond the scope of institutionally-based studies.

5.1.2(ii) Instruments

It was argued that the DIS under-represents particular forensic conditions (such as adjustment reactions and paraphillias) and over-represents other conditions such as antisocial personality disorder. The use of the clinician's interviews using the semi-structured SCID in conjunction with the Hare PCL avoided these deficiencies.

5.2 STUDY LIMITATIONS

5.2.1 Level of Refusals

The large percentage of inmates who refused to participate (21.4%) may be the major limitation of this study. This figure is higher than the 4.6% rate in the study by Schuckit, Herrman, Schuckit (1977), or the 5% in Abram's study (1989). While there is no explanation for the low level of refusals in the former study, Abram used paid volunteers. According to current Canadian ethical guidelines, this study offered no incentives. In addition, most of the sample consisted of pre-arraignment cases among whom the turnover is high and the window of opportunity to interview is, consequently, very small. This could explain a higher refusal rate. Comparisons of refusals with those interviewed on the basis of social and legal characteristics showed no obvious selection biases on these factors. However, there is still a possibility that there is a difference in mental status or prevalence of mental illness among those refusing.

5.2.2. Cross-Sectional Design

The cross-sectional design employed by this research can be used only to examine associations between factors. With the exception of the relationship between mental illness and legal disposition (for which data were collected following a prospective

course) assumptions of causality cannot be made (Flanders, Lin, Pirkle, Caudill, 1992; Petitti, 1991).

5.2.3 Missing Dispositional Data

Dispositional data were missing for 166 persons, 103 (14.6% of 703) with mental illness and 63 (14.0% of 448) without. Missing data could occur if an offender were released directly from court (COMIS is updated only upon entrance) or if the individual had not been sentenced at the time of data collection. However, logistic regression showed that disposition was not associated with mental illness. Therefore, it is thought that no systematic bias resulted from this deficiency.

5.3 STUDY LOGISTICS

This study required interviews to be conducted with newly detained inmates, daily, for a four month period in an institution that is totally geared to maintaining security. Facilities for research and for the integration of the research team with correctional personnel and the normal routines of the institution required considerable support from the Justice systems. The cooperation obtained from those systems across three different Government Departments, two police forces (City and Federal), and access to two major computer databases, and two major institutions

(the Calgary General Hospital and the CRDC) made for a smooth research operation. Few subjects had to be excluded due to logistical difficulties (0.9%).

Despite the support, a study of this type cannot be conducted without some difficulty. One major problem pertained to the assemblage of medical records. According to Departmental policies, the medical record is separate from the institutional record and follows the person from admission to admission, and from place to place while the person is incarcerated anywhere in Alberta. Tracking these records was a time consuming effort. Inactive records (on ex-inmates) are kept in storage places and can only be retrieved with special permission from the Department of the Solicitor General, in small batches, given issues of cost and transportation. Active records (for inmates serving time) are in the institution holding the inmate. Cost and transportation, and the fact that the record could not be separated from the inmate for a long period of time, accounted for inordinate delays in secondary data collection.

The human factor was another important consideration. The study could not have been carried on without the willingness and cooperation of administrators and correctional officers at the institution. As the months of the study dragged on, morale sagged from time to time. This was more so in mornings when the correctional officer assigned to the study had double-duty because of extra demands caused by heavy bookings or unexpected movement of inmates.

A major logistical issue with important ethical implications surfaced in the first week of the study. In remand centres inmates are awaiting resolution of their legal problems. Therefore it was necessary to insure that the psychiatric research assessment was not construed by the inmate or legal counsel as a legal assessment for court purposes. Despite information about the purposes of this research, one counsel requested access to the information for use in legal proceedings. This was denied.

5.4 SUMMARY OF PREVALENCE FINDINGS

The First Aim of this study was to obtain reliable estimates of the (a) one-month and (b) lifetime prevalence of mental disorders in a remanded population. The prevalence of mental disorders in a remanded population was expected to be higher than in the general population. Table V-1 compares the sex-specific lifetime and one-month prevalence from this study with estimates from community surveys.

TABLE V-1

Comparison of Study Findings with Lifetime and One-Month Prevalence Estimates from Community Surveys, Percents (95% Confidence Intervals)

Place	Comparison		Current Study	
	Males	Females	Males	Females
Lifetime Prevalence - Any Disorder				
Edmonton, AB ^a	40.7 (37.8, 43.6)	26.8 (24.6, 29.0)	61.6 (58.7, 64.6)	55.7 (46.2, 65.1)
ECA, New Haven, CO. ^b	30.6 (28.1, 33.1)	27.3 (24.7, 29.8)		
ECA, Baltimore, MA ^b	39.6 (37.0, 42.1)	36.7 (33.9, 39.4)		
ECA St. Louis, MO. ^b	37.0 (33.3, 40.7)	25.7 (23.0, 28.4)		
One-Month Prevalence - Any Disorder				
ECA, (5 Sites) ^c	14.0 (13.9, 14.1)	16.6 (15.6, 17.6)	61.5 (58.6, 64.4)	53.2 (43.9, 62.4)
a = Bland, Orn, Newman, 1988. b = Robins, Helzer, Weissman, Orvaschel, Gruenberg, Burke, & Regier, 1984. c = Regier, Boyd, Burke, Rae, Myers, Kramer, Robins, George, Karno, Locke, 1988. ECA = Epidemiological Catchment Area Studies				

Lifetime prevalence for any disorder in the community for the males ranged from 37.0% in St. Louis to 40.7% in Edmonton and for the females, the prevalence ranged from 25.6% in St. Louis to 36.7% in Baltimore. All of these prevalences are lower than those found in this study (males 61.6% and females 55.7). Regarding one-month prevalence, the combined results of five ECA sites (14.0% for males and 16.6% for females) also show striking differences from the estimates for the current study (61.5% for males and 53.2% for females). Lifetime and one-month

prevalence rates of Any Disorder are much higher for the remanded population reported in this study than for the general population in the Edmonton and the ECA studies.

Table V-2 shows a similar comparison for (a) lifetime prevalence between the results of this study and those of the Edmonton prison study (for males only), (b) the lifetime prevalence from Quebec, and (c) the one-month prevalence from Quebec.

TABLE V-2

Comparison of Study Findings with Lifetime and One-Month Prevalence Estimates from Correctional Surveys, Percents (95% Confidence Intervals)

Place	Comparison		Current Study	
	Males	Females	Males	Females
Lifetime Prevalence - Any Disorder				
Edmonton, AB ^a	91.7 (87.6, 95.8)	N/A	61.6 (58.7, 64.6)	55.7 (46.2, 65.1)
Quebec ^b	76.9 (73.9, 79.9)	N/A		
One-Month Prevalence - Any Disorder				
Quebec ^b	62.4 (58.8, 66.0)	N/A	61.5 (58.6, 64.4)	53.2 (43.9, 62.4)

a = Bland, Newman, Dyck, & Orn, 1990
b = Hodgins, 1990.

Results indicate that lifetime prevalence of Any Disorder for males, obtained for this study (61.1%) is much lower than that in the Edmonton study (91.7%) or in the

Quebec study (76.9%). On the other hand, one-month prevalence was almost the same as for the Quebec study (62.4%) and the study reported here (61.5%).

It is likely that the above comparisons are confounded by differences in the age distribution of the populations being compared. Unfortunately, age and sex standardization cannot be carried out. The Edmonton community study does not provide prevalence rates for age-by-sex categories and does not report one-month estimates (Bland, Orn, Newman, 1988). The Edmonton prison study (Bland, Newman, Dyck, and Orn, 1990) did not collect data on females and did not provide an age breakdown. The ECA studies report prevalence rates for one-month, six-month and lifetime (Regier, Boyd, Burke, Rae, Myers, Kramer, Robins, George, Karno, Locke, 1988; Robins, Helzer, Weissman, Orvaschel, Gruenberg, Burke & Regier, 1984). One-Month prevalence for the five sites combined are provided for age group by sex. A similar age by sex breakdown for lifetime prevalence was not available. The age categories provided for the one-month prevalence estimates from the ECA studies were too coarse to be appropriately applied to the younger remand population studied here. Table V-3 applies the ECA age groups to the current findings for any Axis I Diagnosis and compares these to the more discrete age groups used in this study.

TABLE V-3

**Application of ECA Age Groups to Present Study for Axis I Diagnosis
for Any Disorder**

STUDY POPULATION			Findings Using ECA Age Groups		
Age Group	Total	Any Dig N % Total	Age Group	Total	Any Dig N % Total
17 - 19	122	77 63.1%	18 - 24	494	277 56.1%
20 - 24	372	200 53.8%			
25 - 29	241	139 57.7%	25 - 44	631	403 63.9%
30 - 34	191	126 66.0%			
35 - 39	117	81 69.2%			
40 - 44	82	57 69.5%			
45 - 49	41	29 70.7%	> 45	74	48 64.9%
> 50	33	19 57.6%			
Total	1199	728 60.7%	Total	1199	728 60.7%

When the ECA age groups are applied to this study population, the categories used would collapse subgroups with prevalences as dissimilar as 57.6% (age group > 50) and 70.7% (age group 45 to 49), presenting their combined prevalence as 64.9%. Such comparisons were considered to be both inappropriate and misleading. More specifically, such a comparison would be affected by serious residual bias for important criminological age groups (Feinstein, 1985, p.326).

As Tables V-1 and V-2 illustrate, lifetime prevalence and one-month prevalence are practically identical in the Calgary study. A similar finding was reported in the Quebec study (76.9 for lifetime prevalence and 62.4 for one-month prevalence), suggesting that new pathology is less of an issue in correctional populations.

It was expected that substance abuse disorders would be greater in a remanded population than in the general population. These disorders contributed to the bulk of the pathology in this study, 556 of the 728 (76.4%) individuals diagnosed with a mental disorder in the month prior to their interview. The crude one-month prevalence was 46.4% (47.2% for males and 38.7% for females). Lifetime prevalence was 46.5% (47.1% for males and 40.6% for females). Crude rates for DIS-diagnosed substance abuse reported in the ECA (five sites) for the general population were much lower, 3.8% for one-month prevalence (6.3% for males, and 1.6% for females) (Regier, Boyd, Burke, et. al, 1988). In an earlier report from the same study Robins, Helzer, and Weissman, et. al, (1984) report a lifetime prevalence of 16.4, but these estimates were not reported by sex. Lifetime prevalence for substance abuse disorders in the Edmonton community survey were lower than the results found in this research, 20.6% for the general population with 32.5% for males and 8.6% for females (Bland, Orn, Newman, 1988). The Edmonton Correction survey (Bland, Newman, Dyck, Orn, 1990) reported a lifetime prevalence for males only to be 87.2%, much higher than the prevalence noted in this study.

This difference could be explained by the fact that the DIS diagnoses are non-hierarchical so prevalence estimates reflect the prevalence of diagnoses given, rather than the prevalence of individuals. The non-hierarchical approach is likely to overestimate any specific disorder.

With respect to schizophrenia, it was expected that the prevalence of this disorder in a remanded population would be greater than that of the general population. Based on sex-specific comparisons, it would appear that the prevalence of schizophrenia in this study sample is approximately twice that found in the general population for males. In this study, one-month and lifetime prevalences were identical at 1.2% for males. No cases of schizophrenia were found among females in this study. The ECA studies report one-month prevalence of schizophrenia for males and females to be 0.6%.

The high prevalence of mental disorders among remand populations is generally considered to be a result of deinstitutionalization policies. Deinstitutionalization is a general term used to indicate the outcome of a series of legislative policies and administrative changes that have set up a process whereby patients have been discharged from mental hospitals on the expectation that treatment and community alternatives would be more beneficial and more humane. Deinstitutionalization has prompted the closure of many mental hospital beds. It is the end result of mental health policies specifically introduced as part of the Community Psychiatry Movement

of the 1950's and early 60's in the United States and Canada. Different social, legal and clinical issues coalesced at that time to propel changes from what was considered to be an oppressive, institutionally-based psychiatric system. In fact, "powerful forces were aligned to indict mental hospitals as loci of pathology", and to make of deinstitutionalization a social and philosophical movement instead of a rationally and scientifically-based departure from the then prevailing system for the provision of mental health services (Arboleda-Flórez, 1993).

Mentally disordered prisoners, and the issue of how services are organized to provide them with appropriate treatment, has long been a matter of much concern for prison medical services and correctional authorities (Howard, 1929, Goldstein, 1983). Of late, this concern has become more acute as an ever increasing number of mental patients seem to find their way into correctional institutions (Allodi, 1977; Orr, 1978; Teplin, 1983, 1984; Jemelka, Trupin and Chiles, 1989). Several reasons have been advanced to explain this phenomenon, for example: - shorter length of stay in psychiatric units (Holley and Arboleda-Flórez, 1988), lack of adequate social services resulting from a general economic downturn (Lamb and Talbott, 1986; Roth and Bean, 1986; Dear and Wolch, 1987; Talbott, 1991), and especially, policies of deinstitutionalization.

These policies have been singled out as the most important factor driving the increase on the number of mental patients found in correctional institutions. Penrose

(1939) described an administrative relationship between prisons and mental hospital populations. His "balloon" theory, that "as a general rule, if the prisons services are extensive, the asylum population is relatively small and the reverse is also true", purports to demonstrate that countries with a large prison population tend to have small mental hospital populations, and vice versa. Penrose's theory has been advanced as a possible model to explain why policies of deinstitutionalization may be at the root of this "criminalization of the mentally ill" (Arboleda-Flórez, 1980; Mills and Cummins, 1982; Gralnick, 1983, 1985; Teplin, 1983, 1984; Hoehne, 1985, Arboleda-Flórez and Holley, 1988; Brinded, 1989; Durham, 1989; Johnson, 1990).

These new policies resulted in a massive discharge of mental patients from the state-hospital system. The net effect of these policies has been well documented in Canada where 34,000 patients were discharged from mental institutions during the period between 1961 and 1976 (Statistics Canada, 1991). The magnitude and complexity of the change "have produced a host of other problems" (Gudeman and Shore, 1984) such as lack of community acceptance of former patients, inadequate housing, vocational and social rehabilitation, and substandard or lack of community psychiatric services.

Unfortunately, deinstitutionalization has been concerned less with reducing the number of people consuming human services "but (concerned) more with

transferring clients out of traditional service settings" (Dear and Wolch, 1987). Patients who are discharged from the mental hospital system either swell up the ranks of the homeless or find their way into other systems, notably prisons (Lamb, 1984). Gudeman and Shore (1984) state that when deinstitutionalization is pushed to its limits "a number of patients remain whose needs cannot be met by the full range of acute psychiatric treatments coupled with community alternatives to hospitalization". These, in fact, may be the cases that end up in prisons. Coid (1988a), for example, found that in the United Kingdom, increasing numbers of mentally abnormal offenders are sent to prison as a result of rejection by consultants from the National Health Services (NHS). Most of these prisoners suffered from mental handicaps, organic brain damage, or chronic psychotic illnesses that rendered them unable to cope independently in the community and, hence, "run the risk of being criminalized" (Coid, 1988b).

In Canada, Webster and Menzies (1993) followed a cohort of 195 patients discharged from the Metropolitan Toronto Forensic Services, METFORS (an assessment unit in Toronto) for six years. Only 8% of these patients did not go to prison or to hospital during the follow-up period. Eleven percent had further hospitalizations, but 42% had been incarcerated several times and the remaining 39% had been going back and forth between hospitals and prisons. Menzies (1989) makes the point that pre-trial psychiatric assessments, rather than helping, snare patients in a cycle of institutionalizations. Unfortunately, Menzies did not explore

other reasons why these patient/inmates had fallen into this cycle (Arboleda-Flórez, 1991).

In the United States, between 1955 and 1974, the mental hospital population declined by 62 percent (Rose, 1979). Palermo, Smith and Liska (1991), after conducting a study of national data in the United States from 1904 to 1989, point out that their analysis reveals the existence of a negative linear relationship between mental health admissions and jail census data. They concluded that "the mentally ill have assumed, again, the inappropriate status of criminal offenders, overcrowding the jails without receiving proper psychiatric care". Although this kind of study has not been done in Canada, Dear and Wolch (1987) have described a similar trend in relation to the emptying of mental hospitals in this country.

Deinstitutionalization, as Lamb (1988) has pointed out, may be at the crossroads. In regard to the increase of mental patients in corrections, a general term understood as encompassing the administration, operations, and institutions of a correctional service such as Canada Corrections or the Department of Justice-Alberta, the fact is that because of their large number, correctional institutions, and most significantly remand centres, have become virtual parts, and active components, of the mental health system (National Coalition for Jail Reform, undated). Furthermore, they have been experiencing, much like psychiatric units in general hospitals, a

revolving door phenomenon whereby mentally ill inmates keep reappearing after only a few days of their release (Hiday and Scheid-Cook, 1991).

5.5 SUMMARY OF COMORBIDITY FINDINGS

Given estimates from the literature, comorbidities were expected to reach 20%. Abram (1988) reported that, among 728 subjects, a total of 73.8% had some mental condition, and of these, 52.7% had a diagnoses of antisocial personality disorder, alone plus comorbid, and APD alone being 12.0%. This figure is almost the same as that of 56.7% found by Bland, Newman, Dyck and Orn (1990). The latter group of investigators did not report on comorbidities. Abram's study (1988) which was carried out specifically for this purpose, found comorbidities involving APD and SAD of 39.5%; furthermore, figures for specific comorbidities were APD+Alcohol 14.6%, and APD+Drugs of 12.5%.

In this study, using the total sample as the denominator (1199), APD alone was found in only 1.3% individuals (N=15). If the number of those found with any form of disorder is used as the denominator (N=728), then APD alone was found to be 2.1%. When considered as a percent of all disorders, APD was found comorbidly in 7.5% (APD+AD, APD+SAD, and APD+AD+SAD). Among Axis II disorders, the most common comorbidity was BPD+SAD which occurred in 5.0% of the cases (of 728), followed by APD+SAD in 4.5% (of 728).

These results are disappointing, but not surprising. Disappointing, because a portion of the planned analyses could not be carried out. Not surprising, however, because the point was clearly made about the instability and overinclusiveness of APD diagnosis in DSM-III-R which form the basis for the DIS. It was previously argued that the diagnosis of APD in the DIS and in the SCID (both based on DSM-III-R) amount to no more than a tally of criminals, given the tautology and circularity between the mental condition and criminality. This was the rationale for approaching the diagnosis of APD from both the SCID and the PCL (Hare, 1980). The low prevalence of APD in this study population should urge a rethinking of the way Antisocial Personality Disorder is diagnosed among criminals.

The low prevalence of comorbidities found in general in this study are likely a result of the method of case ascertainment. The SCID is designed to yield a primary diagnosis and counts comorbidities only when additional, discrete clinical conditions exist. Closely related conditions, such as depressive and anxiety disorders, would result in a single diagnosis, most likely depression. This would reduce the number of comorbidities identified.

5.6 SUMMARY OF THE RELATIONSHIP BETWEEN SELECTED FACTORS AND MENTAL ILLNESS

The goal of this phase of the analysis was to explore the relationships between socio-demographic, clinical, and legal factors to mental illness. Bivariate relationships indicated that, of the nine factors explored (gender, age group, education, ethnicity, previous forensic assessment, previous detentions, charge type, total instant charges, and disposition), only five (age group, education, ethnicity, previous forensic assessment and previous detentions) were significantly associated with mental illness. Logistic regression was undertaken to assess and control for confounding and to examine the simultaneous effects of these factors in association with mental illness. Factors found to be significantly associated with mental illness included education, ethnicity, previous detentions, and previous forensic assessment. No confounding was noted and statistical interactions were not observed among these factors. The final model indicates that, when controlling for education, ethnicity, previous detentions, and previous forensic assessment, the risk of mental illness was 2.3 times higher for those who had all these factors compared to those who had none. Individuals with the highest prevalence of mental illness were those with the lowest education, who were aboriginal or caucasian, with more than five previous detentions, and with a history of forensic assessment. These individuals had an observed prevalence of mental illness of 80.0%, and a fitted prevalence, based on the results of the logistic regression model, of 92.2%.

Factors that were unrelated to mental illness included gender, age group, charge type, total instant charges, and disposition. While the relationship between criminological variables and mental illness has been controversial, results from this study support the view expressed by Monahan and Steadman (1983) that "no relation, or at best, a much weaker relation is found" between crime and mental disorder once controlling for socio-demographic and life-history factors. This study also supports their view that "the analytic framework of epidemiology can be used to study the relation between crime and mental disorder" (Monahan and Steadman, 1983).

5.7 IMPLICATIONS OF FINDINGS

Findings of this study have implications at the level of services within the institution, and regarding larger scientific issues on the matter of the prevalence of mental illness in correctional institutions and of the relationship between mental illness and crime.

5.7.1 Institutional Issues

At the level of the institution, the implications relate to the number of mentally ill individuals admitted to the CRDC and the type of mental problem that they present. Clearly, the major problem occurs among individuals affected by substance abuse

disorders, especially alcohol. Many of these individuals are found guilty and sentenced to further periods of imprisonment in correctional institutions across the Province. Once identified on entrance counselling services could be organized with local Alcohol and Substance Abuse rehabilitation agencies.

Although, proportionately not a large group, individuals suffering from functional mental disorders (schizophrenia, affective disorders, and others) would constitute a sizable number within a given year. For example, in one single year the CRDC may expect to admit up to 45 individuals suffering from schizophrenia. This is a large number for an institution and a system not geared to treatment or rehabilitation, but to correctional control. Given trends in the delivery of service for chronic mental patients in the community, unless they are reversed, the CRDC may expect to continue receiving the same, if not larger number of these patients in the future. Many of these patients may require active treatment.

5.8 DIRECTIONS FOR FUTURE RESEARCH

Larger scientific issues relate to the problem of ascertaining prevalence in correctional institutions and the matter of the relationship between mental illness and crime. In regard to prevalence, it seems that the discrepancies noted pertain to the system of counting diagnoses, whether hierarchical as done in this study, or by comorbidities as provided by the DIS. The DIS may not be the best instrument to

use for case ascertainment in corrections because it over-represents antisocial personality disorder.

With respect to this study, a future goal should be to request data from the ECA and Edmonton studies suitable for age by sex standardization. Secondly, this study should be enlarged to look, prospectively, at future levels of law-breaking, and use of medical services among those diagnosed with a disorder and those with no disorder. Further controlled studies should be conducted to examine factors related to mental illness among incarcerated populations.

Hier stehe Ich, Ich kann nicht anders (Luther)

REFERENCES

Abram, K.M. (1989). The Effect of Co-occurring Disorders on Criminal Careers: Interaction of Antisocial Personality, Alcoholism, and Drug Disorders. *International Journal of Law and Psychiatry*, 12:133-148.

Allodi, F., Kedward, H.B., Robertson, M. (1977). Insane But Guilty: Psychiatric Patients in Jail. *Can Ment Health*, 25(2):3-7.

Alterman, A.I. and Cacciola, J.S. (1991). The Antisocial Personality Disorder in Substance Abusers: Problems and Issues. *The Journal of Nervous and Mental Disease*, 179(7):401-409.

American Psychiatric Association Committee on Nomenclature and Statistics: (1987) *Diagnostic and Statistical Manual of Mental Disorders - DSM-III-R*. Washington, DC: American Psychiatric Association Press.

Anthony, J.C., Folstein, M., Romanoski, A.L., Von Korff, M.R., Nestadt, G.R., Chahal, R., Merchant, A., Brown, C.H., Shapiro, S., Kramer, M., Gruenberg, E.M. (1985). Comparison of the Lay Diagnostic Interview Schedule and a Standardized Psychiatric Diagnosis. *Arch Gen Psychiatry*, 42: 667-675.

Arboleda-Flórez, J. (1980). Post-homicide Psychotic Reaction. *International Journal of Offender Therapy and Comparative Criminology*, 24:47-52.

Arboleda-Flórez, J. (1983). The Ethics of Psychiatry in Prison Society. *Canadian Journal of Criminology*, 25(1):47-54.

Arboleda-Flórez, J. and Chato, F. (1985): Issues Regarding Admissions From a Correctional Facility to a Hospital Forensic Unit. *International Journal of Offender Therapy and Comparative Criminology* 29(1):13-22.

Arboleda-Flórez, J. and Holley, H.L. (1988a). Criminalization of the Mentally Ill: Part II. Initial Detention. *Canadian Journal of Psychiatry*, 33:87-95.

Arboleda-Flórez, J. and Holley, H.L. (1988b). Development of a Suicide Screening Instrument for Use in a Remand Centre Setting. *Canadian Journal of Psychiatry*, 33:81-86.

Arboleda-Flórez, J. and Holley, H.L. (1989). Predicting Suicide Behaviours Among Incarcerated Offenders Awaiting Trial. *Canadian Journal of Psychiatry*, 34:668-674.

Arboleda-Flórez, J. (1990). Two Solitudes: Mental Health and Law. *The Journal of Forensic Psychiatry*, 1 (2):143-165.

Arboleda-Flórez, J., Holley, H.L. (1991). Antisocial Burnout: An Exploratory Study. *Bull Am Acad Psychiatry and Law*, 19,2:173-183.

Arboleda-Flórez, J. (1991): Ethical Issues Regarding Research on Prisoners. Associate Editor's Editorial. *International Journal of Offender Therapy and Comparative Criminology*, 35(1):1-5.

Arboleda-Flórez, J. (1991): Survival of the Sanest (by Menzies, R.J.) - Book Review. *Canadian Journal of Criminology*, 33(2):215-220.

Arboleda-Flórez, J., Crisanti, R., Rose, R., Holley, H. (1993): Forensic Evaluation and Legal Outcome - Paper presented to the Annual Meeting of the American Academy of Psychiatry and the Law, San Antonio (Texas).

Arboleda-Flórez, J. (1993): Methodological and Ethical Concerns Regarding Forensic Psychiatry Epidemiological Studies (Associate Editor's Editorial). *International Journal of Offender Therapy and Comparative Criminology*, 37(2);95-98.

Arboleda-Flórez, J.(1993): Deinstitutionalization and forensic issues: are we flogging the wrong horse? *Canadian Psychiatric Association Bulletin*, 25(6):29-31.

Arboleda-Flórez, J. and Ramsey, M. (1994): *Mental Health Law*. Toronto: Carswell (in press).

Arboleda-Flórez, J., Holley, H., Williams, J., Crisanti, A. (1994): An Evaluation of Legal Outcome Following Pretrial Forensic Assessment. *Canadian Journal of Psychiatry* (in press).

Arthur Bolton Associates (1976). A Study of the Need for and Availability of Mental Health Services for Mentally Disordered Jail Inmates and Juveniles in Detention Facilities. Report prepared for the California Department of Health, Sacramento. Cited in Steadman, H.J., McCarty, D.W. and Morrissey, J.P. (1986). *Developing Jail Mental Health Services: Practice and Principles*. Rockville, Maryland: National Institute of Mental Health.

Bailey, J. and MacCulloch, M.J. (1992): Patterns of Reconviction In Patients Discharged Directly to the Community from a Special Hospital: Implications for After-care. *Journal of Forensic Psychiatry* 3(3):445-461.

Ballenger, J.C., Burrows, G.D., DuPont, R.L., Lesser, I.M., Pechnold, J.C., Rifkin, A., Swunson, R.P. (1988): Alprazolam in panic disorder and agoraphobia: results from a multicentre trial. *Arch Gen Psychiatry*, 45:413-422.

Berkson, J. (1946): Limitations of the application of fourfold table analysis to hospital data. *Biometrics* 2:47.

Bland, R.C. (1984). Long Term Mental Illness in Canada: An Epidemiological Perspective on Schizophrenia and Affective Disorders. *Can J Psychiatry*, 29: 242-246.

Bland, R.C. (1988). Prevalence of Mental Illness. *Annals RCPSC*, 21: 89-93.

Bland, R.C., Newman, S.C., Orn, H. (1988). Epidemiology of Psychiatric Disorders in Edmonton. *Acta Psychiatry Scand*, (Suppl 338) 77: 7-71.

Bland, R.C., Orn, H., Newman S.C. (1988): Lifetime Prevalence of Psychiatric Disorders in Edmonton. *Acta psychiatr. scand.*, 77(suppl 338):24-42.

Bland, R.C., Newman, S.C., Dyck, R.J., Orn, H. (1990). Prevalence of Psychiatric Disorders and Suicide Attempts in a Prison Population. *Can J Psychiatry*, 35: 407-413.

Bloomingdale, L.M. (1990): Attention-Deficit Hyperactivity Disorder to Antisocial Personality Disorder. *American Journal of Forensic Psychiatry*, 11(4):63-71.

Bogira, S., (1981). Psych team. *Chicago Reader (April 10)*. Cited in Steadman, H.J., McCarty, D.W. and Morrissey, J.P. (1986). *Developing Jail Mental Health Services: Practice and Principles*. Rockville, Maryland: National Institute of Mental Health.

Bowker, L.H. (1977). *Prisoner Subcultures*. Toronto: D.C. Heath and Co.

Brawman-Mintzer, O., Lydiard, R.B., Emmanuel, N., Payeur, R., Johnson, M., Roberts, J., Jarrell, M.P., Ballenger, J.C. (1993): Psychiatric Comorbidity in Patients With Generalized Anxiety Disorder. *Am J Psychiatry*, 150(8):1216-1218.

Brinded, P. (1989). Prisons, Institutions, and the Mentally Abnormal. *Current Opinion in Psychiatry*, 2:729-733.

Buydens-Branchey, L., Branchey, M.H., Noumair, D. (1990): Age of alcoholism onset, I: relationship to psychopathology. *Arch Gen Psychiatry*, 46:225-230.

Chiles, J., von Cleve, E., Janelka, R., Trupin, E. (1990): Substance Abuse and Psychiatric Disorders Among Prison Inmates. *Hospital and Community Psychiatry*, 41:1132-1134.

Clemmer, D. (1940). *The Prison Community*. New York: Holt, Reinhart and Winston.

Cocozza, J.J. and Steadman, H.J. (1978): Prediction in psychiatry: An example of misplaced confidence in experts. *Social Problems* 25:265-276.

Cohen, J. (1960): A coefficient of agreement for nominal scales. *Educ. Psychol. Meas.*, 20:37-46.

Coid, J. (1984). How Many Psychiatric Patients in Prisons?. *British Journal of Psychiatry*, 145, 78-86.

Coid, J.W. (1988a): Mentally abnormal prisoners on remand: I - Rejected or accepted by the NHS? *British Medical Journal*, 296:1779-1782.

Coid, J.W. (1988b): Mentally abnormal prisoners on remand: II - Comparison of services provided by Oxford and Wessex regions. *British Medical Journal*, 296:1779-1782.

Collins, J.J., Schlenger, W.E., Jordan, B.K. (1988). Antisocial Personalities and Substance Abuse Disorders. *Bull Am Acad Psychiatry Law*, 16:187-198.

Costa, N., De Fazio, F., Luzzago, A. (1992): La distruttività come correlato della depressione negli stati-limita. *Quaderni di Psichiatria Forense*, 1:152-158.

Coté, G., Hodgins, S. (1990). Co-Occurring Mental Disorders Among Criminal Offenders. *Bull Am Acad Psychiatry Law*, 18 (3):271-281.

Cryell, W., Noyes, R. (1988): Placebo response in panic disorder. *Am J Psychiatry*, 145:1138-1140.

Daly, L.E., Burke, G.J., McGilvray, J. (1991): *Interpretation and Uses of Medical Statistics* (4th ed.), Boston: Blackwell Scientific Publications.

Daniel, A.E., Robins, A.J., Reid, J.C., Wilfley, D.E. (1988). Lifetime and Six Months Prevalence of Psychiatric Disorders Among Sentenced Female Offenders. *Bull Am Acad Psychiatry Law*, 16, 4:333-342.

Danto, B.L. (1973). The Suicidal Inmate. In Danto, B.L. (ed.) *Jail House Blues*. Orchard Lake: Epic Publications.

Dean, A.G., Dean, J.A., Burton, A.H., Dicker, R.C. (1990): *Epi Info, Version 5*, Stone Mountain, GA: USD, Incorporated.

Dear, M. and Wolch, J. (1987). *Landscapes of Despair - From Deinstitutionalization to Homelessness*. Princeton (N.J.): Princeton University Press.

DeHeer, N.D. and Schweitzer, H.S. (1985). Suicide in Jail: A Comparison of Two Groups of Suicidal Inmates to Jail Suicide Victims. *Corrective and Social Psychiatry*, 31:71-6.

Donner, A. and Eliasziw, M. (1987). Sample Size Requirements for Reliability Studies. *Statistics in Medicine*, 6:441-448.

Dooley, E. (1990): *Prison Suicide in England and Wales, 1972-87*, *British Journal of Psychiatry*, 156:40-45.

Dunn, G. (1989). *Design and Analysis of Reliability Studies*. New York: Oxford University Press.

Durham, M.L. (1989). The Impact of Deinstitutionalization on the Current Treatment of the Mentally Ill. *International Journal of Law and Psychiatry*, 12:117-131.

Eaton, W.W., Kramer, M., Anthony, J.C., Dryman, A., Shapiro, S., Locke, B.Z. (1989). The Incidence of Specific DIS/DSM-III Mental Disorders: Data From the NIMH Epidemiologic Catchment Area Program. *Acta Psychiatr Scand*, 79:163-178.

Eichelman, B. (1992): Aggressive Behaviour: From Laboratory to Clinic - Quo Vadit? *Arch Gen Psychiatry*, 49:488-492.

Escobar, J.I., Randolph, E.T., Asamen, J., Karno, M. (1986). The NIMH-DIS in the Assessment of DSM-III Schizophrenic Disorder. *Schizophrenia Bulletin*, 12: 187-194.

Farr, K.A. and Gibbons, D.C. (1990). Observations on the Development of Crime Categories. *International Journal of Offender Therapy and Comparative Criminology*, 34(3):223-237.

Faulk, M. (1976). A Psychiatric Study of Men Serving a Sentence in Winchester Prison. *Medicine, Science and the Law*, 16(4):244-251.

Feighner, J.P. and Herbstein, J (1987): Diagnostic Validity. In C.G. Last and M. Hersen (Eds.) *Issues in Diagnostic Research*, New York: Plenum Press.

Feinstein, A.R. (1970): The Pretherapeutic Classification of Comorbidity in Chronic Disease. *Journal of Chronic Disease* 23:455-468.

Feinstein, A.R. (1985): *Clinical Epidemiology - The Architecture of Clinical Research*, Toronto: W. B. Saunders Company.

Flanders, W.D., Lin, L., Pirkle, J.L., Caudill, S.P. (1992): Assessing the Direction of Causality in Cross-sectional Studies. *American Journal of Epidemiology*, 135(8):926-935.

Fleiss, J.L. (1981): *Statistical Methods for Rates and Proportions*, New York: John Wiley and Sons.

Folstein, M.F., Romanoski, A.J., Nestadt, G., Chahal, R., Merchant, A., Shapiro, S., Kramer, M., Anthony, J., Gruenberg, E.M., McHugh, P.R. (1985). Brief Report on the Clinical Reappraisal of the Diagnostic Interview Schedule Carried Out at the Johns Hopkins Site of the Epidemiological Catchment Area Program of the NIMH. *Psychological Medicine*, 15:809-814.

Freeman, R.J. and Roesch, R. (1989). Mental Disorder and the Criminal System: a Review. *International Journal of Law and Psychiatry*, 12:105-115.

Gaffney, F.A., Fenton, B.J., Lane, L.D., Lake, L.R. (1988): Hemodynamic, ventilatory, and biochemical responses of panic patients and normal controls with sodium lactate infusion and spontaneous panic attacks, *Arch Gen Psychiatry*, 45:53-60.

Gerstley, L.J., Alterman, A.I., McLellan, A.T. and Woody, G.E. (1990). Antisocial Personality Disorder in Patients with Substance Abuse Disorders: A Problematic Diagnosis? *Am J Psychiatry*, 147(2):173-178.

Gilger, J.W. (1991): Comment on Analysis of Psychiatric Comorbidity in Twins. *Am J Psychiatry*, 148(10):1412-1413.

Gingell, C.R. (1991): *The Criminalization of the Mentally Ill: An Examination of the Hypothesis*, Burnaby, BC: Simon Fraser University.

Glueck, B. (1918). A Study of 608 Admissions to Sing Sing Prison. *Mental Hygiene*, 2:85-151.

Goldberg, D. P. (1989). Screening for Psychiatric Disorder. In Williams P., Wilkinson G., Rawnsley K. (Eds.); *The Scope of Epidemiological Psychiatry* (pp. 108-127). London: Routledge.

Goodwin, F.K. and Jamison, K.R. (1990). *Manic-Depressive Illness*. New York: Oxford University Press.

Gralnick, A. (1983). Deinstitutionalization: Origins and Signs of Failure. *American Journal of Social Psychiatry*. 111(4):8-12.

Gralnick, A. (1985). Build a Better State Hospital: Deinstitutionalization Has Failed. *Hospital and Community Psychiatry*. 36(7):738-741.

Greene, M.B. (1993): Chronic Exposure to Violence and Poverty: Interventions That Work for Youths. *Crime and Delinquency*, 39(1):106-124.

Gudeman, J.E. and Shore, M.F. (1984): Beyond deinstitutionalization: a new class of facilities for the mentally ill. *New England Journal of Medicine*, 311:832-836.

Gunn, J. (1977). Criminal Behaviour and Mental Disorder. *British Journal of Psychiatry*, 130:317-29.

Gunn, J., Robertson, G., Dell, S., Way, C. (1978). *Psychiatric Aspects of Imprisonment*. London: Academic Press.

Gunn, J., Maden, A., Swinton, M. (1991): Treatment Needs of Prisoners with Psychiatric Disorders. *British Medical Journal*, 303:338-41.

Guze, S.B. (1976). *Criminality and Psychiatric Disorders*. New York: Oxford University Press.

Hanks, P. (Ed.) (1990). *Collins Dictionary of the English Language*, London: Collins.

Hare, R. (1980). A Research Scale for the Assessment of Psychopathy in Criminal Populations. *Personality and Individual Differences*. 1:111-119.

Hare, R.D. (1983): Diagnosis of antisocial personality disorder in two prison populations. *Am J Psychiatry*, 140:887-890.

Hare, R. (1985). Comparison of Procedures for the Assessment of Psychopathy. *J Consult Clin Psychol*, 53:7-16.

Hare, R.,D. and Hart, S.D. (1993): Psychopathy, Mental Disorder, and Crime. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Helzer, J.E., Robins, L.N., McEvoy, L.T., Spitznagel, E.L., Stolzman, E.K., Farmer, A., Brockington, I.F. (1985). A Comparison of Clinical and Diagnostic Interview Schedule Diagnosis. *Arch Gen Psychiatry*, 42: 657-666.

Helzer, J.E., Spitznagel, E.L., McEvoy, L. (1987). The Predictive Validity of Lay Diagnostic Interview Schedule Diagnoses in the General Population. *Arch Gen Psychiatry*, 44: 1069-1077.

Hiday, V.A. and Scheid-Cook, T.L. (1991). Outpatient Commitment for "Revolving Door" Patients: Compliance and Treatment. *The Journal of Nervous and Mental Disease*. 179(2):83-88.

Hodgins, S. and Coté, G. (1990). Prevalence of Mental Disorders Among Penitentiary Inmates in Quebec. *Canada's Mental Health*, 38(1):1-4.

Hodgins, S. (1992): Mental Disorder, Intellectual Deficiency, and Crime - Evidence From a Birth Cohort. *Arch Gen Psychiatry*, 49:476-483.

Hodgins, S.:(1993): The Criminality of Mentally Disordered Persons. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Hoehne, K.A. (1985). Deinstitutionalization and the Criminalization of the Mentally Ill. *The American Journal of Social Psychiatry*, V(3):39-44.

Holley, H.L. and Arboleda-Flórez, J. (1988a). Criminalization of the Mentally Ill: Part I. Police Perceptions. *Canadian Journal of Psychiatry*, 33:81-6.

Holley, H.L. and Arboleda-Flórez, J. (1988b). Hypernomia and Self-Destructiveness in Penal Settings. *International Journal of Law and Psychiatry*, 11:167-178.

Hollingshead, A.B. (1986): Social Class and Mental Illness. In M.M. Weissman, J.K. Myers, C.E. Ross (eds), *Community Surveys of Psychiatric Disorders*, New Brunswick: Rutgers University Press.

Hwu, H.G., Yeh, E.K., Chang, L.Y. (1989). Prevalence of Psychiatric Disorders in Taiwan Defined by the Chinese Diagnostic Interview Schedule. *Acta Psychiatry Scand*, 79: 136-147.

James, J.F., Gregory, D., Jones, R.K., Rundell, O.H. (1980). Psychiatric Morbidity in Prisons. *Hospital and Community Psychiatry*, 31(10):674-77.

Jemelka, R., Trupin, E., Chiles, J.A. (1989). The Mentally Ill in Prisons: A Review. *Hospital and Community Psychiatry*, 40(5):481-491.

Johnson, A.B. (1990). *Out of Bedlam. The Truth About Deinstitutionalization*. New York: Basic Books (Harper/Collins).

Jones, D.A. (1976). *The Health Risks of Imprisonment*. Lexington, Massachusetts: Lexington Books.

Joukamaa, M. (1993): Mental Health of Finish Prisoners. *The Journal of Forensic Psychiatry*, 4(2):261-271.

Kish, L. (1965). *Survey Sampling*. New York: John Wiley & Sons, Inc.

Kreffft, K.M. and Brittain, T.H. (1983). A Prisoner Assessment Survey: Screenings of a Municipal Prison Population. *International Journal of Law and Psychiatry*, 6(1):113-124.

Lamb, H.R., Grant, R.W. (1982): The Mentally Ill in an Urban County Jail. *Arch Gen Psychiatry*, 39:17-22.

Lamb, H.R., Grant, R.W.(1983): Mentally Ill Women in a County Jail. *Arch Gen Psychiatry*, 40:363-368.

Lamb, H.R. (1984): Deinstitutionalization and the Homeless Mentally Ill. *Hospital and community Psychiatry*, 35(9):899-907.

Lamb, H.R. and Talbott, J.A. (1986). The Homeless Mentally Ill. -The Perspective of the American Psychiatric Association. *Jama*, 256(4):498-501.

Last, J.M. (1988). *A Dictionary of Epidemiology*. Toronto: Oxford University Press.

Law Reform Commission of Canada (1975). Report: The Criminal Process and Mental Disorder (Working Paper 14). Ottawa: Information Canada, pg. 23.

Mackay, R.D., Wight, R.E. (1984). Schizophrenia and Anti-social (Criminal) Behaviour - Some Responses from Sufferers and Relatives. *Med. Sci. Law*, 24(3):192-198.

MacMahon, B., Pugh, T.F. (1970). *Epidemiology - Principles and Methods*. Boston: Little, Brown and Company.

MacCulloch, M., Bailey, J., Jones, C., Hunter, C. (1993): Nineteen male serious reoffenders who were discharged direct to the community from a Special Hospital: I. General characteristics. *The Journal of Forensic Psychiatry* 4(2): 237-248.

McGarrell, E.F. (1993): Trends in Racial Disproportionality In Juvenile Court Processing: 1985-1989. *Crime and Delinquency*, 39(1):29-48.

Mednick, S.A. and Finello, K.M. (1983): Biological Factors and Crime: Implications for Forensic Psychiatry. *International Journal of Law and Psychiatry* 6:1-15.

Mednick, S.A., Pollock, V., Volavka, J., Gabrielli Jr, W.F. (1982): Biology and Violence. In M.E. Wolfgang and N.A. Weiner (Eds), *Criminal Violence*, Newbury Park: Sage Publications.

Mental Health Act (1988). Province of Alberta - Ch M-13.1. Edmonton: Queen's Printer.

Menzies, R.J. (1989): *Survival of the Sanest - Order and Disorder in a Pre-trial Psychiatric Clinic*. Toronto: University of Toronto Press.

Miller, D.C. (1991): *Handbook of Research Design and Social Measurement*. Newbury Park: Sage Publications.

Mills, M.J. and Cummins, B.D. (1982). Deinstitutionalization Reconsidered. *International Journal of Law and Psychiatry*, 5:271-84.

Monahan, J. and Steadman, H.J. (1983). Crime and Mental Disorder: An Epidemiological Approach. In M. Tonry and N. Morris (Eds.) *Crime and Justice. An Annual Review of Research (Vol 4)*, (pp. 145-189). Chicago: The University of Chicago Press.

Moore, M.H., Estrich, S.R., McGillis, D., Spelman, W. (1984): *Dangerous Offenders - The Elusive Target of Justice*. Cambridge: Harvard University Press.

Morgan, C. (1981): Developing mental health services for local jails. *Crim Justice Behav*, 8:259-273.

Myers, J.K., Weissman, M.M., Tischler, G.L., Holzer III, C.E., Leaf, P.F., Orvaschel, H., Anthony, J.C., Boyd, J.H., Burke, J.D., Kramer, M., Stolzman, R. (1984). Six-Month Prevalence of Psychiatric Disorders in Three Communities. *Arch Gen Psychiatry*, 41:959-967.

Nagel, I.H. and Hagan, J. (1983): *Gender and Crime: An Epidemiological Approach*. In M. Tonry and N. Morris (Eds) *Crime and Justice - An Annual Review of Research*. Chicago: The University of Chicago Press.

National Coalition for Jail Reform (undated). *Jail-The New Mental Institution*. Washington, D.C.: The Coalition.

Nestor, P.G. (1992): Neuropsychological and Clinical Correlates of Murder and Other Forms of Extreme Violence in a Forensic Psychiatric Population. *The Journal of Nervous and Mental Diseases*, 180(7):418-423.

Nurnberg, H.G., Raskin, M., Levine, P.E., Pollack, S., Siegel, O., Prince, R.(1991): The Comorbidity of Borderline Personality Disorder and Other DSM-III-R Axis II Personality Disorders. *Am J Psychiatry*, 148(10):1371-1377.

O'Keefe, J. (1980) *Department of Mental Health Correctional Study*. Report prepared by the Massachusetts Department of Mental Health, Boston. Cited in Steadman, H.J., McCarty, D.W. and Morrissey, J.P. (1986). *Developing Jail Mental Health Services: Practice and Principles*. Rockville, Maryland: National Institute of Mental Health.

Orr, J.H. (1978). The Imprisonment of Mentally Disordered Offenders. *Brit. J. Psychiatr*, 133:194-199.

Otnow-Lewis, D (1981): *Vulnerabilities to Delinquency*, New York: SP Medical & Scientific Books.

Oyebode, O., Wolstenholme, J., Crispin, Z., Graham., F. (1993): A profile of female murderers in the early phase of a life sentence, *The Journal of Forensic Psychiatry*, 4(2):273-283.

Palermo, G.B., Smith, M.B., Liska, F.J. (1991). Jails Versus Mental Hospitals: A Social Dilemma. *International Journal of Offender Therapy and Comparative Criminology*, 35(2):97-106.

Petersilia, J. (1980): Criminal Career Research: A Review of recent Evidence. In N. Morris and M. Tonry (Eds) *Crime and Justice - An Annual Review of Research*. Chicago: The University of Chicago Press.

Petitti, D.B. (1991): Associations are not Effects. *American Journal of Epidemiology*, 133(2): 101-102.

Petrich, J.,(1976). Rate of Psychiatric Morbidity in a Metropolitan County Jail Population. *Am J Psychiatry*, 133:1439-1444.

Pihl, R.O. and Peterson, J.B. (1993): Alcohol/Drug Use and Aggressive Behaviour. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Piotrowski, K.W., Losacco D., Guze S.B. (1976). Psychiatric Disorders and Crime: A Study of Pretrial Psychiatric Examinations. *Dis Nerv Syst*, 37:309-311.

Pitman, R.K., Altman, B., Macklin, M.L. (1989): Prevalence of posttraumatic stress disorder in wounded Vietnam veterans. *Am J Psychiatry*, 146:225-230.

Pottieger, A.E. (1981). Sample Bias in Drug/Crime Research: An Empirical Study. In J.A. Inciardi (Ed.), *The Drugs-Crime Connection* (pp. 207-237). Beverley Hills, CA: Sage Publications.

Prins, H.A. (1980). Mad or Bad - Thoughts on the Equivocal Relationship Between Mental Disorder and Criminality. *International Journal of Law and Psychiatry*, 3:421-433.

Prins, H.A. (1992): The diversion of the mentally disordered: some problems for criminal justice, penology and health care. *The Journal of Forensic Psychiatry*, 3(3):431-443.

Pulver, A.E., Carpenter, W.T. (1983). Lifetime Psychotic Symptoms Assessed With the DIS. *Schizophrenia Bulletin*, 9:377-382.

Regier, D.A., Boyd, J.H., Burke, J.D., Rae, D.S., Myers, J.K., Kramer, M., Robins, L.N., George, L.K., Karno, M., Locke, B.Z. (1988). One-Month Prevalence of Mental Disorders in the United States - Based on Five Epidemiological Catchment Areas. *Arch Gen Psychiatry*, 45:977-986.

Reich, W. (1992): Structured and Semistructured Inventories. In K.G. Hsu and M. Hersen (Eds), *Research in Psychiatry- Issues, Strategies, and Methods*, (p. 185), New York:Plenum.

Richman, A (1991). Is Everyone Sick? How Credible Are the Results of the DIS? Paper presented to the Annual Meeting of the Canadian Psychiatric Association, Saskatoon.

Robins, L.N., Helzer, J.E., Croughan, J., Ratcliff, K.S. (1981). The NIMH Diagnostic Interview Schedule: Its History, Characteristics and Validity *Archives General Psychiatry*, 38:381-389.

Robins, L.N., Helzer, J.E., Weissman, M.M., Orvaschel, H., Gruenberg, E., Burke, J.D., Regier, D.A. (1984). Lifetime Prevalence of Specific Psychiatric Disorders in Three Sites. *Arch Gen Psychiatry*, 41:949-958.

Robinson, C.B., Patten, J.W., Kerr, W.S. (1965). A Psychiatric Assessment of Criminal Offenders. *Medicine, Science and the Law*, 5:140-146.

Rose, S. M. (1979). Deciphering Deinstitutionalization: Complexities in Policy and Program Analysis. *Milbank Memorial Fund Quarterly*, 57:429-460.

Roth, D. and Bean, G.J. (1986). New Perspectives On Homelessness: Findings from a Statewide Epidemiological Study. *Hospital and Community Psychiatry*, 37:712-19.

Rothman, K.J. (1986): *Modern Epidemiology*, Toronto: Little, Brown and Company.

Schuckit, M.A. (1986). Genetic and Clinical Implications of Alcoholism and Affective Disorders. *Am J Psychiatry*, 143:140-147.

Schuckit, M.A., Herrman, G., Schuckit, J.J. (1977). The Importance of Psychiatric Illness in Newly Arrested Prisoners. *The Journal of Nervous and Mental Disease*, 165(2):118-125.

Sellin, T. and Wolfgang, M.E., (1964). *The Measurement of Delinquency*. New York: John Wiley and Sons, Inc.

Sellin, T. and Wolfgang M.E., (1971). Weighting Crime. In L. Radzinowicz and M.E. Wolfgang (Eds.), *Crime and Justice - Volume One: The Criminal in Society*. New York: Basic Books, Inc., Publishers.

Selvin, S. (1991): *Statistical Analysis of Epidemiologic Data*, Oxford: Oxford University Press

SERC (1991): *EGRET Revision*, Seattle: Statistics and Epidemiology Research Corporation.

Smith, R. (1984). The Mental Health of Prisoners. I-How Many Mentally Abnormal Prisoners? *British Medical Journal*, 288:308-310.

Sparks, R.F. (1980): A Critique of Marxist Criminology. In N. Morris and M. Tonry (Eds) *Crime and Justice - An Annual Review of Research*. Chicago: The University of Chicago Press.

Spitzer, R.L., Williams, J.B.W., Gibbon, M., First, M.B. (1990.) *Structured Clinical Interview for DSM-III-R*. Washington D.C.: American Psychiatric Press.

Spitzer, R.L. (1990): *Structured clinical interview for DSM-III-R multi-site test retest*. Unpublished Manuscript. Cited in (1992) L.K.G. Hsu and M. Hersen (Eds) *Research in Psychiatry- Issues, Strategies, and Methods*, (p. 185), New York:Plenum.

Spitzer, R.L., Williams, J.B.W., Gibbon, M., First, M.B. (1992): The Structured Clinical Interview for DSM-III-R (SCID) - I: History, Rationale, and Description. *Arch Gen Psychiatry*, 49:624-629.

Staehling, N. and Sullivan, K.M. (1989): *Exact Binomial Confidence Interval for Proportions, Version 1.01*. Atlanta, GA: Centers for Disease Control.

Statistics Canada (1991): *Canadian crime statistics 1991*. Ottawa: Canadian Centre for Justice Statistics.

Steadman, H.J (1973): Some evidence of the inadequacy of the concept and determination of dangerousness in psychiatry and law. *Journal of Psychiatry and Law*, 1:409-426.

Steadman, H.J. and Cocozza, J.J. (1979): The dangerousness standard and psychiatry: A cross national issue in the social control of the mentally ill. *Sociology and Social Research*, 63:649-670.

Steadman, H.J., McCarty, D.W., Morrissey, J.P. (1986). *Developing Jail Mental Health Services: Practice and Principles*. US Department of Health and Human Services. Rockville, Maryland, DHHS Publication No. (ADM) 86-1458.

Steadman, H. J., Monahan, J., Robbins, P.C., Appelbaum, P., Grisso, T., Klassen, D., Mulvey, E. P., Roth, L.(1993): From Dangerousness to Risk Assessment: Implications for Appropriate Research Strategies. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Swank, G.E. and Winer, D. (1976). Occurrence of Psychiatric Disorder in a County Jail Population. *Am J Psychiatry*, 133:1331-1333.

Swanson, J.W., Holzer, III, C.E., Ganju, V.K., Jono, R.T. (1990). Violence and Psychiatric Disorder in the Community: Evidence from the Epidemiologic Catchment Area Surveys. *Hospital and Community Psychiatry*, 41:761-770.

Sykes, G. and Messinger, S.L. (1960). The Inmate Social System. In R. Cloward (Ed.), *Theoretical Studies in the Social Organization of the Prison*. New York: Social Sciences Research Council.

Sykes, G. (1966). *The Society of Captives*. New York: Athenaeum.

Talbott, J.A. (1991). Seeking Asylum. *The Sciences*, September/October 1991:44-49.

Taylor, P.J. (1993): Schizophrenia and Crime: Distinctive Patterns in Association. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Teplin, L.A. (1983). The Criminalization of the Mentally Ill: Speculation in Search of Data. *Psychological Bulletin*, 94(1):54-67.

Teplin, L.A. (1984). Criminalizing Mental Disorder - The Comparative Arrest Rate of the Mentally Ill. *American Psychologist*, July, 1984:794-803.

Teplin, L.A.(1990): The prevalence of severe mental disorder among male urban jail detainees: Comparison with the Epidemiologic Catchment Area. *AJPH*, 80(6):663-669.

Toch, H. and Adams, K. (1989). *The Disturbed Violent Offender*. New Haven: Yale University Press.

Torgersen, A.R. (1990): DSM-III personality disorders among patients with major depression, anxiety disorders, and mixed conditions. *J. Nerv Ment Dis*, 178:693-698.

Travin, S. (1989). A National Perspective on Mental Health Services to Corrections. In R. Rosner and R.B. Harmon (Eds.): *Correctional Psychiatry*. New York: Plenum Press.

Tyrer, P. (1989): *Classification of Neurosis*, New York: Wiley.

U.S. Department of Justice, National Institute of Justice (1980). *Profile of Jail Inmates, Socio-demographic Findings From the 1978 Survey of Inmates of Local Jails*. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off. Cited in Steadman, H.J., McCarty, D.W. and Morrissey, J.P. (1986). *Developing Jail Mental Health Services: Practice and Principles*. Rockville, Maryland: National Institute of Mental Health.

Watt, D. and Fuerst, M. (1993): Tremmear's Criminal Code. Toronto: Carswell.

Watt, F., Tomison, A., Torpy, D. (1993): The prevalence of psychiatric disorder in a male remand population: a pilot study. *Journal of Forensic Psychiatry*, 4(1):75-83.

Webster, C.D. and Menzies, R.J. (1993): Supervision in the Deinstitutionalized Community. In S. Hodgins (Ed) *Mental Disorder and Crime*, Newbury Park: Sage Publications.

Whitmer, G.E.(1980): From Hospitals to Jails: The Fate of California's Deinstitutionalized Mentally Ill. *Amer. J. Orthopsychiat.* 50(1):65-75.

Wittchen, H.U., Semler, G., von Zerssen, D. (1985). A Comparison of Two Diagnostic Methods. *Arch Gen Psychiatry*, 42:677-684.

Yarvis, R.M. (1990). Axis I and Axis II Diagnostic Parameters of Homicide. *Bull Am Acad Psychiatry Law*, 18(3):249-269.

Zimbardo, P.G. (1972). Pathology of Imprisonment. *Society*, 9:4-8.

APPENDIX ONE**Table II-1 Prevalence Studies in Prisons****Table II-2 Prevalence Studies in Remand Centres (Jails)**

TABLE II-1
PREVALENCE STUDIES IN PRISONS

STUDY	PLACE	SAMPLE	METHOD	FINDINGS
Glueck (1918)	Sing Sing Prison (USA)	608 males/consecutive admissions	Clinical Interview	Dementia Praecox 5.9%, M-D Psych .3%, Psychopathy 18.9%, Ment. Subn. 28%, Syphilis 2%
Robinson et al (1965)	Belfast Prison (Northern Ireland)	566 males/consecutive/mixed sentences	Clin Interviews. Case Records	Alcoholism 55.6% Subnormal 24%
Faulk (1976)	Winchester Prison (UK)	72 males/consecutive releases/mixed sentences	Clinical Interview	Psychotic 3%. Alcohol & Personality Disorder 75%. Previous Psychiatric Treatment 40%
Jones (1976)	Tennessee State Penitentiary, Nashville, U.S.A.	1,040 males (entire population)	Screened for previous illness, case notes, DSM II.	Pers. Dis. 5.5%, Psychotic 4%, Subnormal 2.3% Alc Dependence 2.2%
Gunn et al (1978)	South East Prisons Survey (UK)	106 males/ Random Sample	Clinical Interview 10 Maudsley trained psychiatrists ICD Diag	Pers. Dis. 22%. Alcoh 13%. Neurosis 9%. Drug Dependence 3%. Affective Disorder 1%. Schizoph 1%
James et al (1980)	Oklahoma Prison (USA)	174 males. Stratified Sample	Clinical Interview. Self Report Score	Pers. Dis. 35%. Schizophrenia 5%
Toch & Adams (1989)	New York State Department Correctional Service (USA)	8,379/ both sexes. Record linkage.	Computer Records Linkage	22% Previous Contact with M.H.S (66% Forensic Contact).
Cote & Hodgins (1990)	Penitentiaries in Quebec	650 males. Random Sample	DIS	Schizophr. 8%. Affective Dis. 21%. Antisoc. Pers. 61.5%. Alcohol. 67%. Drug Dep. 49%
Gunn, Maden, Swinton (1991)	16 adult prisons and 9 young offenders instit., representative sample of all institutions (UK)	1769 sentenced males, 1365 adults, 404 young offenders 5% random sample	Semi-structured interview, ICD-9 Code	Psychosis 1.9% (schizo 1.2%, affect 0.4%, paranoid 0.3%), Neurosis 5.9%, Person Dis 10%, Sexual Dev 2.1%, Subs Misuse 23%, Organic Dis 0.8%, Uncertain Diag 1%, No Diagnosis 63%

TABLE II-2
PREVALENCE STUDIES IN REMAND CENTRES (JAILS)

STUDY	PLACE	SAMPLE	METHOD	FINDINGS
Allodi (1973)	Don Jail. Toronto (Canada)	106 inmates (sex?) referred to psychiatric unit of the jail	Chart Review	Pers. Dis. 45%. Schizophr. 25%.
Petrich (1976)	King County Jail. Seattle (USA)	122 inmates (both sexes) referred for psychiatric examination	Clinical Interviews.	Overall rate of psychiatric illness 4.6%. Depression 35%. Schizophr. 25%. Antisoc. Per. 33%. Alcohol. 30%
Swank & Winer (1976)	Denver County Jail. Denver (USA)	445 inmates (sex?)referred for psychiatric evaluation	Clinical Interview	Psychosis 26%. Pers. Dis. 35%. Neurosis 2.5%
Piotrowski et al (1976)	Forensic Service, Malcolm Bliss Mental Health Centre	50 persons selected from those referred for pretrial psychiatric evaluation. St. Louis, Missouri (USA)	Clinical Interview	Bipolar Affective 10%. Schizophr. 22%. Organ. Brain Syn. 4%
Schuchitt, Herrman & Schuchitt (1976)	USA	199 white male felons arrested in previous 24 hrs. Consecutive sample.	Structured interview & chart review	Overall pathology 48% Schizophr 2.5% Antisoc Person 16% Alcoholism 15% Drug Abuse 12% Affect Disorder 3% Organic Brain Synd 2%
Whitmer (1980)	Los Angeles County (USA)	500, apparently nonrandom persons(sex?) "in need of treatment"	Clinical Interview.	Averaged 3 prior psychiatric hospitalizations
Lamb & Grant (1982)	Los Angeles County central Men's Jail (USA)	102 male inmates. Random selection from those referred for a psychiatric evaluation	Clinical interview	Schizophr. 75%. Affectiv. Dis. 22%. Organ. Brain Syn. 2%. Adjust. Dis 2%
Kreftt & Brittain (1983)	Orleans Parish Prison (local county jail). New Orleans (USA)	283 male inmates random sample and all, 149, female available subjects	"Screening" via tests and clinical interviews	39.7% of males and 41.6% of females in need of mental health services. 6.7% of males and 9% of females in need of inpatient treatment

TABLE II-2, CONTINUED
PREVALENCE STUDIES IN REMAND CENTRES (JAILS)

STUDY	PLACE	SAMPLE	METHOD	FINDINGS
Abram (1989)	Cook County Department of Corrections. Chicago (USA)	767 male detainees. Random sample.	DIS	Alcohol Disorders 41%. Antisoc. Pers. 43%. Drug Use Disorders 26%. All other disorders 26%
Teplin (1990)	USA	728 males. Stratified random sample.	DIS	Schizophrenia 3.7% Major Depression 5.8% Mania 2.5%
Bland, et al. (1990)	Two provincial institutions (one being a Remand Centre) in Edmonton, Canada.	180 males. Systematic sample.	DIS	Lifetime Prevalence Any Disorder 92% Sub Abuse (incl Alcohol) 87% Antisoc Person 57% Affect Disorders 23% Anxiety 16% Schizophrenia 2%
Gingel (1991)	Vancouver City Jail	317 consecutive admissions & 107 stratified random sample from prison population.	BPRS DIS	Schizophrenia 8% Affect Disorders 15%
Watt, Thomison, Torpy (1993)	Bristol (UK) local jail, Pilot Study	Systematic (every 5th new remandee) sample for 20% of total population, 31 inmates	Semi- structured interview, ICD-9 code	Psychosis 3% Personality Disorder 13% Substance Abuse 50%

APPENDIX TWO

Consent Form

MAY I ASK FOR YOUR PARTICIPATION:

PROJECT: An Epidemiological Study of Mental Illness in a Remanded Population and the Relationship Between Mental Condition and Criminality.

INVESTIGATOR: J. Arboleda-Flórez, MD.

FUNDING AGENCY: Calgary General Hospital and Solicitor General of Alberta

This consent form, a copy of which has been given to you, is only a part of the process of informed consent. It should give you the basic idea of what the research project is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

My three associates and I are psychiatrists at the Calgary General Hospital and the University of Calgary. I am presently conducting a research project on issues of emotional and mental conditions here at the Calgary Remand Centre. This project will help me fulfil the requirements for a graduate degree. The aims of the project are: (a) to gain knowledge about the extent to which persons presently remanded to the centre are affected by emotional problems and mental conditions, and (b) to find out whether there is any relationship between these conditions and the offense that has caused the person to be remanded to the Centre.

I am asking you to take part in this project. Even if you do not consider yourself to be suffering from any emotional distress, or be affected by any mental illness, your participation will be invaluable: it will allow me to compare persons who are well with those who are having problems. If you are willing to participate, I will ask you first to fill out some questionnaires, and then to join my associates or myself for an interview at a special area designated for this purpose here at the Centre. The interview will last between one hour and one hour and a half. If you get tired during the interview, you could indicate so to the psychiatrist who is interviewing you and a period of rest could be arranged. During the interview you will be asked questions about yourself, and questions aimed at exploring aspects of your personality in order to rule out emotional problems or mental conditions. If you object to any question you will not have to answer it, or if you wish to withdraw from the interview at any time, you will be free to do so. If you do have problems, you may be referred for appropriate help if you so wish. If you are well, you may not gain any personal benefit from the interview. There is much to be gained, however, from learning about these problems at the Centre. For example, better services could be organized for those who have problems, and we all will gain from this.

The information gathered at the time of the interview will be kept in absolute confidence in my files. This information will not form part of your record in the Centre. Nobody will have access to it other than myself. Any description of the results will not identify you as a person. Only statistical summaries will be used.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate as a subject. In no way does it waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation. If you have further questions concerning matters related to this research, please contact:

J. Arboleda-Flórez, at 268-9202

If you have any questions concerning your rights as a possible participant in this research, please contact the Office of Medical Bioethics, Faculty of Medicine, The University of Calgary, at 220-7990.

If you are willing to take part in this study, please indicate by signing here:

Name of Participant

Signature of ParticipantDate.....

Name of Witness:

Signature of WitnessDate.....

A copy of this consent will be given to you. Please keep it for your records and future reference.

May I thank you for helping me with this work.

Yours sincerely,

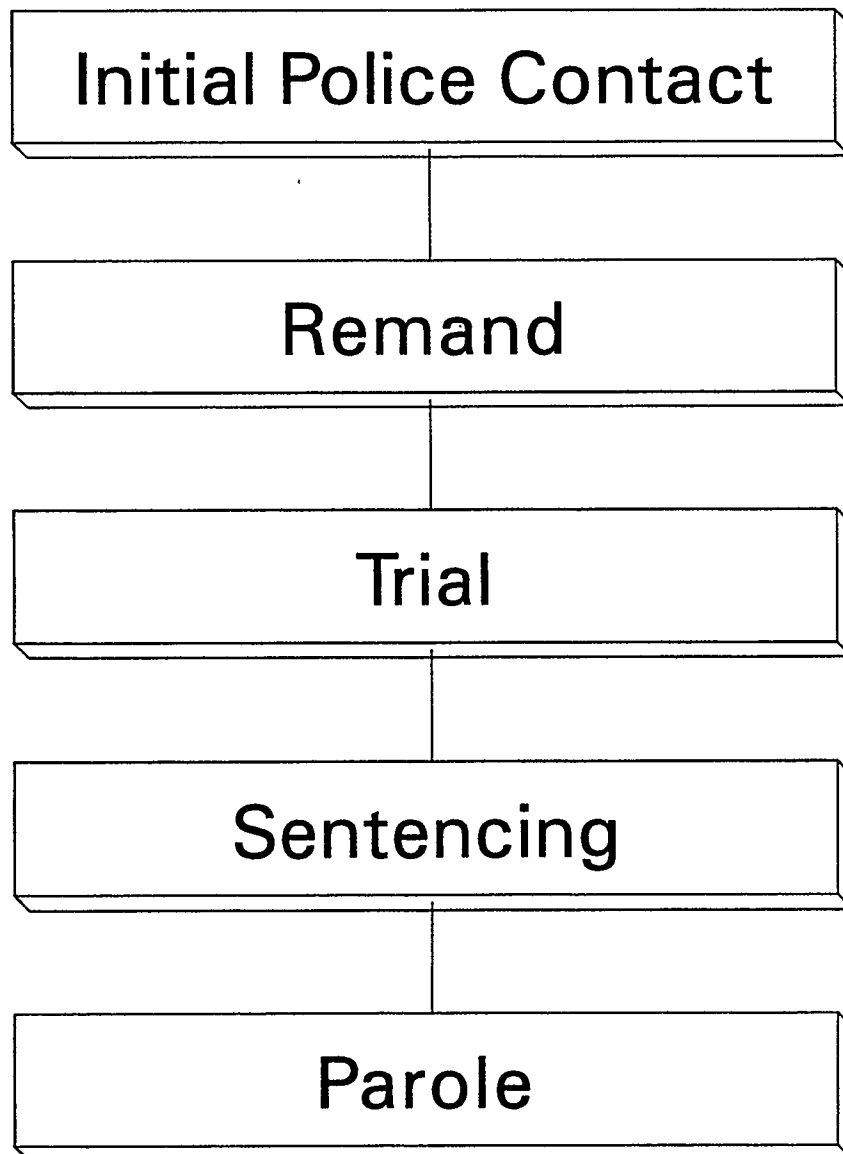
J. Arboleda-Flórez, MD.

APPENDIX THREE

Figure 5-1 Steps in the Criminal Justice System

Figure 5-2 Police Stage

**Figure 5-1:
Steps in the Criminal Justice System**



**Figure 5-2:
Police Stage**

