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**Wood, Donald William**

MENTAL HEALTH, CRIME, AND SOCIAL WELFARE RATES : A VIEW OF  
HUMAN ATTRITION IN ALBERTA, CANADA FROM THE PERSPECTIVE OF  
THE COMMUNITY

*University of Hawaii*

PH.D. 1983

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**Mental Health, Crime, and Social Welfare Rates :  
a view of human attrition in Alberta, Canada  
from the perspective of the community**

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE  
UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT  
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DOCTOR OF PHILOSOPHY

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By

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## ABSTRACT

This study examines human attrition, variously defined, at the community level under differing social contexts. Using Hage (1972) as a basis for the selection of community level attributes, between community differences in levels of human attrition were examined.

Three separate hypotheses were examined and evaluated in terms of the degree of support mustered from data gathered on communities (N = 175) in the Province of Alberta, Canada. These hypotheses posited that : a positive relationship would exist between rates of social change and rates of human attrition; an inverse relationship would exist between indicators of human attrition and indicator's of the community's ability to absorb the shock of social change; and, that the indicators of human attrition would be positively associated with one another.

Social change was found to be negatively associated with measures of human attrition. This finding was explained in light of the normative expectations of this rapidly growing area of Canada, and in terms of the selectivity of immigration existing within the resource development sector. The extent of human attrition was found to be weakly, but negatively, associated with community level indicators. This was taken to indicate that other factors may be more influential than the community in the "buffering" of the negative aspects of rapid social change. Finally, the various measures of human attrition (crime, mental disorder, unemployment, and social service assistance) were not seen to be closely related to one another. This was seen to indicate the multifaceted nature of the concept of human attrition.

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## Introduction

Increasingly over the past two decades, examinations of various aspects of the etiology of mental illness have led researchers to the conclusion that with the exception of certain relatively rare types of disorder, mental illness is a phenomenon based in the cultural, social, and legal systems of society (Dunham, 1976; Szasz, 1974). It constitutes an illness group which, by definition, is behavioral in terms of its manifestation but social in terms of its diagnosis (Mechanic, 1969). In this sense, most mental illness is defined as behavior that deviates from a societal norm (Lemert, 1951).

To some degree, any behavior may, from time to time, be regarded as deviant. The extent to which these deviant behaviors are tolerated by a society or regarded as "severe" enough to warrant intervention will vary from context to context.

There is good cause to assume that, as with other social behaviors, social context is important to the nature of relationships surrounding the mentally ill. In the

examination of other health related behaviors, researchers have found differences attributable to context (Bagley and Jacobson, 1976; Eaton, 1974; Hsu, 1943; Matsumoto, 1970). For example, studies of conditions underlying race riots (Bloombaum, 1968), the adjustment of American soldiers to Army life (Stouffer et al., 1949), and other group behaviors (Homans, 1950; Lemert, 1951) have demonstrated the importance of context to the social phenomena of interest. The entire basis for the assessment of social impacts is predicated on the premise that the effect of innovation will vary according to the context in which it is placed (Finsterbusch, 1980; Newby, 1982).

Two intimately related, yet empirically distinct ideas underlie the concept of social context. Both place and circumstance are often defined as context. The former is the concrete physical space within which a social relationship occurs. The latter may subsume the former, is more abstract, and may include the physical boundary of the relationship. But the circumstance surrounding a given social relationship may also include components of the history, structure, and nature of that relationship. In this sense, context is a "definition of the situation" (Thomas and Znaniecki, 1918) for a given social relationship. The contextual place of a relationship is an empirically distinct entity and, though related, is not equated to the contextual circumstance,

situation, or condition under which the relationship occurs. At the same time, both place and circumstance are components of the concept of social context.

The examination of the effects of social context on social phenomena such as mental illness is a problem that may be examined from two different and distinct approaches. One approach is to study the relationships while controlling for the effects of context (a sort of covariate analysis). The second approach is to make the social context, or some subset of that context, the unit of analysis and to examine the phenomena of interest from that perspective.

This dissertation will employ both strategies in an effort to explain the differences in the rates of mental illness across types of communities and across differing rates of social change. The unit of analysis for the study will be the community (Gartrell, 1982; Newby, 1982; Summers et al., 1971). The circumstance to be used as covariate will be the rate of population change. Examining the rates of mental illness across community types under varying conditions of population growth will allow for an explanation of one set of circumstances under which rates of mental illness may vary.

Sociology has long been interested in the study of mental illness (Roman and Trice, 1974; Rose, 1956; Rosen, 1968). However, most of what sociologists know of mental

illness has been gleaned from studies in which the unit of analysis was the individual (Dohrenwend and Dohrenwend, 1974; 1980; 1981). These studies have tended to focus on the relationships between a series of demographic variables and the existence of any of a number of types of mental disorder (Eaton, 1980). The community in which the individual resides is only occasionally considered as an additional variable in such studies (Eaton, 1974; Matsubara, 1976) although, with increasing regularity, suggestions are found that the environmental milieu of the individual is an important factor in the etiology of mental disorders (Eaton, 1980; Gottlieb et al., 1981; Mechanic, 1969; Szasz, 1974).

This individualistic approach towards the study of mental disorders, due in part to the clinical and small group bias of social psychologists (Dunham, 1976) who performed these studies, appears to have been an important limitation. Sociologically interesting questions such as how the probability of experiencing mental disorders is distributed across and within social structures, how the distribution of mental disorders is related to the distribution of other properties of social collectives, and how the probability of occurrence of mental disorder is related to the occurrence of other indicators of human attrition, are all beyond the scope of studies which focus on the individual.

This latter point is of particular interest for this study. Mental illness is but one aspect of the assessment of mental health. Mental health is an abstraction variously conceived as forms of social and psychological well-being and of the quality of life. However, the assessment of such a concept is usually based in the measurement of the extent to which certain pathologies are absent.

At the community level, human attrition as a concept appears as the antithesis of well-being. Human attrition may be described as the extent to which social disorganization, social deviance, and the lack of social or economic productivity occurs, or in general, that the quality of life is not optimized. Involved in the assessment of this concept is the presence of mental illness, crime and delinquency, unemployment and welfare dependency, and child and family disruptions. This study will view mental health from this larger perspective and will examine mental illness as a proxy indicator for the overall concept of human attrition.

This study of the etiology of mental illness, from the perspective of the community, specifically involves an individual, process relationship that, in recent years, has come under study (Pearlin et al., 1981; Thoits, 1982). Stress and social support are both parts of a series of events that, at least in part, explain variations in the etiology of specific individual mental disorders. In simple

terms, stress may be seen as one catalytic agent in the causal chain of events leading to distress. Social support may be seen as a buffer to this catalyst.

An examination of this same process at the community level is quite a different matter. The mere presence of stressors, or the availability of social resources, both precursors to any sort of social stress - social support model, does not assure that they will come into play. Here, the traditional epidemiological conundrum emerges - why, when everyone is equally exposed to the contagion, do only certain organisms catch the disease ?

Again, from the traditional perspective, this sort of question is best dealt with by way of a probabilistic solution. Some organisms are more vulnerable than others and therefore are more susceptible to disease (Cassel, 1974).

It is a fundamental axiom in the study of nature that events do not just "happen," but occur only under certain conditions. It is customary to distinguish between "necessary" and "sufficient" conditions for the occurrence of an event. A necessary condition for the occurrence of a specified event is a circumstance in whose **absence** the event **cannot** occur.... A **sufficient** condition for the occurrence of an event is a circumstance in whose **presence** the event **must** occur...It is obvious that there may be several **necessary** conditions for the occurrence of an event, and that they must all be included in the **sufficient** condition.  
(Copi, 1961 : 355-356).

In the case of mental illness, or of the larger concept of human attrition, the phenomenon will occur if, and only if, the "contagion" causing such phenomenon is present and there is susceptibility and/or vulnerability towards the phenomenon. Were the phenomenon in question clearly a pathogenic disorder, the necessary and sufficient conditions could be specified more precisely. However, in the case of social phenomena such as mental illness, crime, social disorganization, or human attrition, such clarity is rarely possible.

What is possible is a conception of these social phenomena that is based in social pathogens rather than physical ones. This concept involves the traditional set of sociologically interesting variables (age, sex, education, social class, etc.), as well as a set of equally interesting social psychological variables (strain, stress, self-esteem, social support, personal control, coping strategies, etc.). In addition, to clarify the epidemiological disease paradigm in the social setting, consideration must be given to a series of derivations of demographic variables (population growth, sex ratios, dependency ratios, etc.), and a set of environmental variables (climate, isolation, etc.). Finally, those things that are seen to be related to disease vulnerability, or that appear in conjunction with the disease (other indicators of social disorganization - e.g., crime,

child abuse, public assistance, etc.), should be included to account for situations of comorbidity and social incompetence (Phillips, 1968).

This permits the development of a series of conceptual models that, for the sociologist, are interesting and relevant to the understanding of human attrition under varying social contexts. This explication will be an analysis of the rates of various sorts of human attrition and the series of social and social psychological variables as outlined above, in different social contexts.

The study of the rates of mental disorders across various social contexts is not new to sociology. In fact, the study of various social phenomena under differing contexts has a history dating back to Durkheim's suicide studies (1951). Since one of the major aspects of human attrition dealt with by this dissertation is that of mental disorders, it is important to note the nature and type of studies that have been completed in this area.

The Faris and Dunham studies (1939) of almost a half century ago can provide a framework for current work in this area. Their findings that rates of mental disorders, in particular schizophrenia, could be "arranged into very definite patterns which follow closely the ecological structure of the city " (Faris and Dunham, 1939 : 173), focuses research upon the spatial distribution of mental

disorders in areas other than urban centers such as Chicago. Unfortunately, the completion of the Faris and Dunham studies in 1939 predates many of the most significant and remarkable changes that have occurred in the diagnosis, treatment, and even the concepts and perceptions of mental illness.

Psychoactive medications have a history of use in psychiatry that dates back to the early 1950's. The use of these medications allowed for the rapid control and amelioration of mental disorders in a non-institutional environment. This has resulted in shortening the duration of institutional treatment for the mentally ill, and has also led to a considerable increase in treatment within the community of individuals who, thirty years ago, would have been incarcerated in the asylum (Bloom, 1977).

In addition, the locus of activities surrounding mental illness, at least in the United States, since the implementation of the 1963 Community Mental Health Center Act, the form of treatment, diagnosis and follow-up, has shifted to emphasis on services at the community level rather than at the institutional level (Bloom, 1977; Bolman, 1968). An example of the effect that such administrative and therapeutic changes had on the mentally ill is noted in a 1955 census of the population of institutions for the mentally ill that revealed that, in the United States, nearly 600,000 patients resided in custodial care. By 1974, that

number had been reduced to a total of 216,000. This is not to say that the numbers of mentally ill in the United States declined by 60 % over a 19 year period. Data pertaining to the admissions to mental health programs during the same time period show that the number of persons being categorized as mentally ill and in need of services from mental health programs increased annually from the 1955 figure of 170,000 admissions to the 1974 figure of over 377,000. This emerging shift in the location of treatment illustrates the shift in locus of activities from institution to community (Bloom, 1977).

The studies of the late 1930's and early 1940's are dealing with a social problem that is defined differently today (Green, 1939; Queen, 1940). The mentally ill of the 1930's were deviants who were to be confined, removed and otherwise segregated from society. Today's mentally ill will, in all likelihood, spend most of their lives in their home community with perhaps short sojourns in an institution. The definition of the situation has changed and with it the understanding of what it is to be mentally ill. Thus, the social ecological models of Faris and Dunham may or may not apply to our modern situation. Recent advances in the study of social areas (Rosen, 1979) would indicate that new techniques, also unavailable to Faris and Dunham, can be applied to the broad range of data utilized in social ecological studies.

Social ecological studies of the phenomenon of mental illness merge the techniques and approaches of human ecology and demography with those of epidemiology (Dunham, 1976). They have taken as their unit of analysis the social area, or in this case, the community. Diverse bodies of data have been melded into comprehensive data sets dealing with both the censuses of the mentally ill and the population in general. These types of studies represent attempts to address such questions as : "What types of social structures produce greater or lesser rates of mental illness?" "What is the effect of social change on the rates of mental illness in a given area?" "Is the effect of change uniform across all similar areas?" "Do the relationships seen at the individual level of analysis exist in the same magnitude at the aggregate or social area level, or is there a confounding, a multiplier effect or suppression effect, attributable to the aggregation process?"

With regard to the community as a unit of analysis, it must be clearly understood that the community has not been seen as an important variable for consideration in the examinations of mental illness. Researchers' predilection to use the medical model as a guide for analyses has tended to sensitize them to searching for the specific pathogen that may "cause" persons to become mentally ill (Eaton, 1980; Roman and Trice, 1974). The complexity of the notion of a

process type of relationship is less within the realm of familiar experiences, and so is often ignored.

Community sociology has, in recent years, examined sociologically interesting phenomena such as social disorganization as a function of social structure (Whyte, 1969), the effects of rapid social change on the social structure of the community (Wilkinson et al., 1982), the disintegration of the rural way of life (Wild, 1975; Wilkinson et al., 1982; Wirth, 1938), and networks of communication within the community (Fischer, 1982). These studies reflect a change in the way that the community is considered in the social sciences. The Chicago School, with its concentric zones (Park and Burgess, 1925) has been replaced by concepts such as systems theory (Buckley, 1968; Schwab, 1982). However, the application of these study areas to the phenomenon of mental health has, for the most part, not been researched by community sociologists.

These topics are all relevant to this study. This dissertation, however, is not concerned with the dynamic application of some model of community. Rather, the community is of interest only insofar as it is the unit of analysis. As such, the structural properties of the community are useful to differentiate among cases. In this sense, compilations of data relating to the community will tend to focus on many of the structural items mentioned by

Hage (1972). The resources of the community (physical, social, and human), the complexity of the community (seen as institutional completeness and institutional complexity), the environment surrounding the community (including physical, communications and transportation environments), the demographic characteristics of the human resources of the community (sex ratios, dependency ratios, etc.), and the rates of human attrition in the community are the data of interest for this study.

### **Summary**

Mental illness is a social phenomenon that differentially affects populations. One of the major differentiating variables for mental disorders may be that of social context. Mental illness, like many social phenomena appears to be sensitive to the social structures surrounding the disease.

Mental illness is an illness category that for the most part is defined, diagnosed and treated within the community. The history of mental disorders has been a history of a shifting locus of treatment activity from institution to community.

Social ecological studies of mental illness in the community have been done in the past and continue to be a focus for research. However, sociologists have devoted most of their attentions regarding mental illness toward the study of the etiology of specific variations of mental disorders across different types of individuals. The social context within which mental illness occurs appears to be a neglected area. This neglect has led researchers to ignore potentially interesting sociological questions regarding the nature and extent of mental disorders across differing social structures.

In ignoring the question of social context as a variable of importance in the analysis of mental disorders, researchers have, to some extent, failed to examine the necessary and sufficient conditions for the existence of mental disorders. This failure has placed much of the research completed thus far in a vacuum and forces questions regarding the reliability and validity of the research findings.

This dissertation will examine the relationships between mental illness as an indicator of human attrition and the environment by using the community as a unit of analysis. Such an examination will be a contribution to understanding the complex relationships surrounding mental disorder and will also be of practical use in that it will provide a foundation on which to base interventions.

The following chapter will examine current thoughts about the community as an important variable in the etiology of mental illness. The approach to be used will be first, to examine mental illness in general; second, to focus on mental illness as it has been seen from a social ecological perspective; third, to focus on mental illness as seen from the perspective of the social change theorists; and finally to examine how the knowledge emerging from these analyses can be used to focus attention on the research questions of this study.

## **Chapter 2**

### **The Mental Health of the Community : A Review of the Literature**

The literature pertaining to mental health in the community comes from three main sources : 1) the sociology and social psychology of mental disorders; 2) social ecology, human adaptation and mental disorders, and; 3) the sociology of community and deliberate social change (including social impact assessment). This section of this dissertation will first deal with these three bodies of literature separately and then as one body applicable to this study.

#### **The Sociology and Social Psychology of Mental Disorders**

Among the many social problems that concern social scientists in the twentieth century, mental illness , which affects a large portion of the population, is the subject of an intense debate regarding its causes, etiology, and consequences (Eaton, 1980). What was once the exclusive domain of the medical practitioner, or more specifically, the psychiatrist, is now considered within the areas of interest of a broad range of social as well as natural scientists (Cockerham, 1981; Rosengren, 1980).

The change in venue for research in mental disorders has occurred for many reasons. Perhaps the most important reason for the shift away from it being the sole domain of the medical professionals, has been their failure to account for the fact that mental disorders, by and large, do not respond to "germ theory" medicine in the same manner as do other diseases (Szasz, 1974). This failure together with the appearance of Lindemann's (1949) seminal work on crisis intervention and Caplan's (1961) work on community psychiatry generated much interest in the social environment as a causative agent in the etiology of mental disorders.

The acceptance of the "social bases" concept of mental disorders has had several remarkable effects on the diagnosis and treatment of the mentally ill (Mechanic, 1969). One of the more significant has been the shift in the locus of activities surrounding the mentally ill from the "insane asylum" (Goffman, 1961) to the community (Bolman, 1968; Sclar et al., 1981).

Most social definitions of mental disorder have had, as their primary emphasis, some concept of deviance and social control (Erickson, 1962; Kituse, 1962; Lemert, 1951). At the same time, they have tended to attribute causation to some sort of social pathogen and affirm the fact that in many ways, mental illness is merely another type of disease which, if the cause were known, could be cured and prevented in the

same manner as other "germ theory" disorders (Roman and Trice, 1974). In other words, the social sciences have accepted the medical model of mental illness and have adapted it to their own purposes (Eaton, 1980).

Rosen (1968) and Foucault (1968) have provided excellent reviews of the various concepts of mental disorder that have been popularized over the ages. However, it was Szasz (1974) and Scheff (1963; 1966) who developed the idea that mental illness should be considered in terms other than those of the medical model (Eaton, 1980). The importance of society to the etiology of this disease group became an accepted notion in the literature and, for the next decade, was the major focus of social science research into mental disorders.

#### **Mental Illness as Normative Deviance :**

That the mentally ill are "different", that they are "potentially dangerous to themselves and others," that they are deviants who must be "helped", are all descriptive phrases used at one time or another to justify the segregation of the mentally ill from society (Foucault, 1968; Jones, 1972; Rosen, 1968). Sociological conceptions of mental disorders as deviance from societal norms date from the seminal work of Lemert (1951). Deviant acts were seen by Lemert as actions that violate societal norms and receive

negative social sanctions. The original deviant act (primary deviance) may have had a wide range of causes, but the result of that act is a negative social sanction. This "labelling process" results in the deviant becoming resentful towards the sanctioner but not necessarily ceasing the offending acts (which was the intent of the negative social sanction). The continuation of these deviant acts in the face of negative social sanctions over time may result in an acceptance of the deviant role by the offender. At this point, secondary deviance has occurred. Unchecked, the persistence of this sort of behavior may be manifested in the form of neuroses (Gallagher III, 1980).

Societal reaction to the deviant was however, not always as straight forward as the deviant's acceptance of a role. Initially, a normative societal reaction to such deviance resulted in the segregation of the mentally ill in places of asylum (Goffman, 1961; Sclar et al., 1981). Additionally, a societal reaction was seen as a secondary labelling process (Gove, 1970; 1975), which was vested in some notion of social power (Rushing, 1971; 1979). Those with control of, or access to, social resources were able, through the exercise of that control, to avoid, defer, or shorten the effects of negative social sanctions directed towards them as "mentally ill persons" (Gove and Howell, 1974).

The societal reaction approach to the explanation of deviance (Erickson, 1962; Gove, 1975) raised great concerns on the part of practitioners that they should not "label" individuals unnecessarily. It was felt that the label of "mentally ill" had the same effect as the actual existence of mental illness because it justified discriminatory practices on the part of society in the interest of self-protection and in the interest of "helping" the "sick" individual.

The societal reaction theorists (Gove, 1975; Rushing, 1971) failed in one important respect. They never convinced researchers that societal reaction, such as labelling, was an effect of societal reaction to the disease based in the social power base of the society. Other researchers continued to theorize that mental illness was the result of social causation.

#### **Societal Reaction Versus Social Causation :**

Competition for the title of "accepted explanation" of the causes of mental illness across social characteristics of the population came from these "social causation" theorists.

Over the course of the mid 1970's, the social causation - societal selection debate (Robins, 1975; Turner and Gartrell, 1978; Wheaton, 1978) monopolized much of the literature of this area with study after study demonstrating

the merits of one over the other (Gove and Fain, 1975; Gove and Geerken, 1977; Gove and Howell, 1974; Rushing, 1971; 1979). No decisive "winner" emerged from this controversy.

This debate suggests that there is an interpretive conflict regarding the persistent relationships found between psychological disorders and any of a number of social correlates. The two perspectives are best described as the social selection view (wherein the relationship between mental disorders and social status is seen as a consequence of some larger social selection process), and the social causation view (wherein social position, and other social descriptor variables are seen to have direct consequences for the individual with regard to mental disorders). That is, factors in the social milieu such as marital status, social class, etc., may either influence the individual health through a process of social causation or social selection, and thus the level of the disorder, or they may influence the treatment system through preconditioning it to treat certain "types" of individuals in certain similar ways (societal reaction to social power through labelling).

Social causation theories are most closely associated with theories of development and thus are the model preferred by the social psychological researcher. Those theories are incompatible with the societal reaction model because the

units of analysis differ (social causation relates to the individual, whereas societal reaction relates to the society or the mental health system).

The debate, judging from the current state of the literature, may have resolved itself in favor of the social causation perspective. This appears to be the case as the literature now abounds with many theoretical and empirical studies of the processes of mental disorder, clearly adopting some sort of developmental model. Studies of labelling and societal reaction still exist but are no longer the central focus for the explanation of the etiology of mental disorder (Link, 1982).

#### **Social Stress and Social Support :**

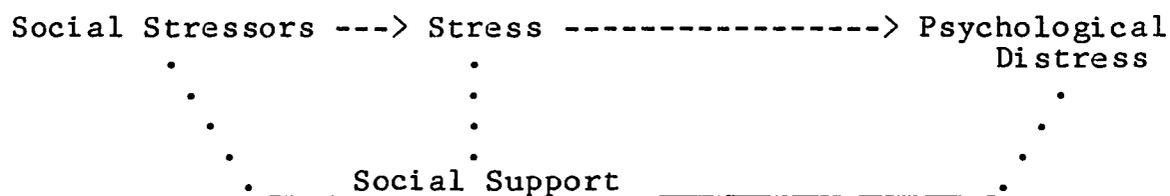
An outcome of the social causation - societal reaction debate was a revival of interest in a much older phenomenon related to mental disorder - stress (Pearlin et al., 1981). The Manhattan studies (Srole et al., 1955) of the late 1950's, developed the idea that the existence of mental disorder was somehow related to the presence of stressors in society. This idea of a stressor is one borrowed from the natural sciences (Hinkle, 1973) and readily adapted to the needs of the social scientists searching for the causes of social disorders (Selye, 1956).

The important notion underlying the process of stress is that of vulnerability. As noted earlier, not all persons exposed to the contagion known to cause a disease contract the disease (Cassel, 1974). Those that do manifest the disease are seen as more susceptible or vulnerable to the disease (Dubos, 1965). In the case of mental disorders, these "stressors" impact upon all individuals, yet only for some is the outcome a mental disorder. Indicators of social stressors were primarily described as life events (Dohrenwend et al., 1978; Holmes and Rahe, 1967); that is, occurrences in the course of human endeavor that created potentially stressful situations for individuals. At the individual level, such negative occurrences as the death of a loved one, the loss of a job, a move to a strange location, etc. were specifically identified as stressors (Williams et al., 1981). At the societal level, population density (Cassel, 1974), social disruption, rapid population growth, economic depression (Brenner, 1973; Dooley and Catalano, 1979), or social change (Appell, 1982), were all identified as possible negative occurrences likely to be manifested in terms of stress. Of importance here is the idea that it is negative occurrences and not positive occurrences that are the stressors (Dohrenwend, 1981).

Within this body of research on the stress-illness model of the etiology of mental disorders is a separate and distinct set of research. The "social stress - social

support" literature (Lin et al., 1982; Thoits, 1982) posits that, to a fairly important degree, the presence or absence of individual or life event stressors, social stress, and social support explains variations in levels of psychological distress (Frankel and Nuttall, 1982; Leim and Leim, 1978; Levin, 1982; Thoits, 1982; Turner, 1981).

This relationship has been diagrammed as follows :



Social support, defined as the utilization or ability to utilize social resources for the purposes of fulfilling a core human requirement of affection and caring for self (Cobb, 1976; Lin et al., 1982; Turner, 1981), is viewed as an intervening factor in the relationship between stress and distress. Findings that support has such a mediating or buffering role, have important implications for concepts of mental disorder as well as for the methods of intervention attempted.

The extent to which the presence or absence of social support influences the nature and level of psychological distress, even in the presence of stressors, is the degree to

which social support has buffered the effects of social stress (Thoits, 1982). This "buffering effect" of social support in the stress - distress relationship has important programmatic consequences. Two main kinds of intervention into the stress-distress process may be made at the societal level. The first directs interventions at the actual stressors and attempts to reduce them. This approach has been less than successful and the explanation for its failure lies in part in the nature of the stressors themselves. As has been demonstrated elsewhere (Dohrenwend and Dohrenwend, 1978; Holmes and Rahe, 1967; Masuda and Holmes, 1967), stress is partially the manifestation of negatively construed life events (death, loss, undesirable change) that are largely outside the locus of control of the individual. Thus interventions directed at such random events may be seen as futile. Although some researchers (Brown, 1976) would tend to disagree with this definition of stress, the bulk of empirical research since 1978 would seem to support it (Dohrenwend and Dohrenwend, 1981).

The second type of intervention at the societal level that appears to hold promise for positively altering the stress - distress process is that of social resources. As was previously mentioned, social support occurs with the utilization of social resources for the purpose of fulfilling a core human requirement (affection and a sense of

belonging). The presence of social resources does not assure the utilization of such resources as social support. The absence of social resources, however, precludes their use in any manner at all (i.e., this is a necessary condition). Therefore, it can be seen that the provision of appropriate social resources (Lin et al., 1982) that are readily available to the potentially mentally disordered may make a difference to the outcome of the application of social stressors.

As the social stress - social support paradigm gained support in the literature, a new variation has emerged: the extent to which social support acts as a buffer to social stresses in the etiology of mental disorders is seen as related to the social context in which the social resources and the individual exist (Dohrenwend and Dohrenwend, 1981; Gottlieb, 1981). Interest in this sociologically important variant stemmed from the realization that though life events scales (as the primary measurement tool for stress assessment) often weighted single items to a total score, rarely were contexts considered as potential variation sources for these scales (Brown, 1981). Changes in role relations, proximity to stressors, circumstances of self and significant others, and environmental changes are all seen as factors that may confound, or at least potentially alter the effects of stress.

## **Social Correlates of Mental Disorder :**

As a precursor to social stress - social support research, the social sciences and social epidemiology devoted a great deal of time and energy to the establishment of persistent relationships that have been referred to as the social correlates of mental disorder. Certain demographic characteristics of a population are more often and more strongly associated with the presence of mental disorder than others.

Davis (1938) suggested that the class structure of a society was an important variable in the etiology and likelihood of mental disorder among the lower class population groups. Some twenty years later, his suggestion was affirmed in the New Haven studies (Hollingshead and Redlich, 1958) and since that time has been well replicated (Albronda et al, 1964; Brill and Storrow, 1964; Brown et al, 1975; Carlson et al., 1965; Cooper, 1961; Fletcher, 1968; Goldenberg, 1979; Imber, 1955; Martin, 1976). Even in special population groups (Blackwell, 1967 (upper class); Prince, 1969 (poverty)) the findings that social class and the existence of mental disorder are inversely related appears to be stable. This does not indicate that exceptions have not been found through research. However, where they have appeared, they have been explained by virtue of certain

special characteristics of the population under study (Binder et al., 1981 (Swiss military recruits); Nandi et al., 1980 (Indian castes)).

Another apparent persistent relationship between a demographic variable and the existence of mental disorder occurs with gender. Here, findings seem to point consistently to a relationship between being female and being more likely to be diagnosed as neurotic, and being male and being more likely to be in treatment for shorter periods of time (Binder et al., 1981; Clancy and Gove, 1975; Dohrenwend and Dohrenwend, 1976; Eaton, 1974; Gove and Geerkin, 1977; Horwitz, 1977; Justice et al., 1978; Kessler et al., 1981; Miller, 1967; Phillips, 1969).

The importance of marital status to the existence of mental disorders has been unclear in the studies of the past two or three decades. Some researchers have found that being married seems to be associated with lower rates or a lesser probability of mental disorder (Bernard, 1964; Farina et al., 1963; Norris, 1956). Others have seen this variable in the context of a social resource and thus examined the current status of marriage (Berman and Turk, 1981; Rosen et al., 1971; Turner and Gartrell, 1978). Here, the findings appear to be more convincing in that the specific contribution of current marital status to variations in the levels of mental disorders has been analyzed, rather than specific measurement

of the differences across the ever versus never-married groups.

A wide range of other social demographic factors has been examined over the years and appear to be consistently related to the existence of mental disorders. For example, age (Binder et al., 1981; Eaton, 1974; Gallagher et al., 1957; Gurland, 1976; Rosen et al., 1971; Thoits and Hannan, 1979), religion (Roberts and Myers, 1954), race (Mirowsky III et al., 1981; Singer, 1977; Thoits and Hannan, 1979), retirement (Minkler, 1981), employment or unemployment (Gove and Geerken, 1977; Leim et al., 1982; Turner and Gartrell, 1978), education (Eaton, 1974; Meile, 1976; Rushing, 1971; Turner and Gartrell, 1978), family and/or the presence of children (Gove and Geerken, 1977; Vaughn and Leff, 1976), occupation and/or income (Brooke, 1957; Link, 1982; Thoits, 1982; Thoits and Hannan, 1979), personal attributes (Linsky, 1970), spatial mobility (Tietze et al., 1942), biosocial factors (Feibleman, 1962), and the economy (Brenner, 1973; Ferman and Gordus, 1979), have all been viewed as correlates of mental disorder. Generally, the findings of such analyses have tended to support the idea that a correlation between social correlates and the presence of mental disorders exists. Depending upon the operational definitions used in the specific study and the social context of the relationship being examined, a positive correlation between social correlates and mental disorder can be demonstrated.

## **Problems :**

While it has been informative to note that certain social characteristics are more often associated with the presence of mental illness than others, little knowledge has been gained about the etiology of the disorders themselves. In many ways, the sum total of the social correlate research has been a catalog of social characteristics along dimensions of greater or lesser social resources.

This research has been linked to that of the social stress theorists through the assessment of the extent to which the presence or absence of certain social characteristics (or changes in them) may be associated with variations in the levels of mental disorder. Life events scales have explained some of the possible causative aspects of mental disorders. However, they have failed to explain the fact that not everyone exposed to such stressors becomes mentally ill at all, to the same degree, or at the same time.

Here, notions of social support as a buffer to the effects of social stressors become relevant. If social support is conceived as "things that support the individual emotionally and psychologically" then, to a great extent, these "things" can be seen as external to the individual. However, the mere presence of such "things" in the social milieu surrounding the individual explains little of the effects that they may have on the stress - distress

relationship. What is apparent is that, if supportive resources are not present in the environment surrounding the individual, they cannot be used as buffers against the noxious effects of the social stressors that may be present.

### **Ecological Studies of Mental Disorder**

In many ways, the ecological analysis of a social phenomenon is an analysis of the relationships of events surrounding that phenomenon within varying environments. This is especially appropriate when the environment in question is the context or community within which events related to this phenomenon of interest occur.

In examinations of the literature pertaining to the ecological analysis of mental disorders an important distinction must be made between studies of the "pre Community Mental Health Center era" and those that were completed after this shift in the treatment of the mentally ill.

This distinction is important for several reasons. The advent of the Community Mental Health Center (created through U.S. Federal legislation in 1963 (P.L. 88 - 164)), coincided with increased emphasis on deinstitutionalization (Bassuk and Gerson, 1979) and on increased efforts at providing services to maintain the individual within the community. This change

in the locus of mental health activities established treatment in the community as the primary mode of care in the United States by 1970 (Bloom, 1977). The effect on the definition, diagnosis, and treatment of mental illness that resulted from this shift in emphasis is important to note (Wing and Hailey, 1972). Sclar et al. (1981) in a study of a Community Mental Health Center (C.M.H.C.) catchment area, found that, as a result of the establishment of the Community Mental Health Center network, along with increased emphasis on deinstitutionalization, "mental health care providers today have a wider range of therapeutic alternatives" available to them. The effect on treatment was a marked increase in the number of cases processed by the C.M.H.C.

#### **Pre C.M.H.C. Studies :**

Most notable of the studies of the pre-C.M.H.C. era were those of Faris and Dunham (1939). These studies were based in the Chicago School traditions of Wirth (1938) and Burgess (1925) and treated the metropolis as the context within which to examine variations in the rates of mental illness. The study of Mental Disorders in Urban Areas revealed that the spatial distribution of poverty and mental disorder were similar. Causality was not the issue for these studies; however, as debate proceeded from these studies, the social selection - social causation controversy was fought in this arena as well. For advocates of the social causation

explanation (Brenner, 1973; Robins, 1973), poverty and the relative deprivation associated with poverty was seen as a cause of mental disorders. For those supporters of the social selection explanation (Mechanic, 1969; Cumming and Cumming, 1957), the mentally ill, because of the prejudice and discrimination leveled at them through identification, were forced into states of poverty. The spatial distribution of mental disorders was the result of a "trickle - down" selective chain.

The Faris and Dunham studies were not a revolutionary new approach to the study of mental disorders so much as a refinement of, and application of, the techniques of human ecology to a specific social problem. Lind's studies of social disorganization (1930), Mumford's interest in the culture of cities (1938), and Durkheim's early studies of suicide (1951) all applied the principles of ecological analysis to social problems and set the stage for the Faris and Dunham studies. Nonetheless, it is the Faris and Dunham studies that are remembered and cited as proof that the spatial distribution of mental disorders is associated with the spatial distribution of other indicators of social disorganization.

The result of these initial studies of mental disorders in urban areas is a series of corroborative studies that relate the Faris and Dunham findings to a wide range of

community settings and social areas (Gregory, 1956, 1959a, 1959b; Queen, 1940; Srole et al., 1962). As well, there were challenges to the findings and interpretations of the original studies (Menzel, 1950; Owen, 1941; Queen, 1941; Robinson, 1950).

Throughout these studies relatively persistent results emerged : there is a pattern to the spatial distribution of mental disorders, and that pattern is similar to that of the socio-economic distribution of wealth in the community. In other words, areas with poverty appear to be areas with higher than expected rates of mental disorder. Although data limitations, and incomplete case counting have been cited as weaknesses of these studies and, even if they are seen as major factors in the results, the persistence of the relationships (between socio-economic factors and mental health) indicates that these relationships do not occur because of systematic biases in data sources nor do they occur by chance.

## Post C.M.H.C. Studies :

In the era following the advent of the Community Mental Health Centers, ecological studies of mental disorders have not been as frequent, nor on as large a scale, as the studies of the 1930's through the 1960's. Instead, emphasis has been placed on the evaluation of the efficacy of the catchment area concept as well as of the actual Community Mental Health Center itself (Hawks, 1975; Leifer, 1969; MacMahon et al., 1969; McMurray et al., 1976; Sybinsky et al., 1978; Tischler et al., 1969). This situation is probably a result of the demands of the funding agencies for accountability (Thompson, 1975), rather than as a result of some academic interest in the social well-being of the population of a catchment area. The catchment area concept lends itself fairly neatly to the analysis of the spatial distribution and contextual differentiation of mental disorders. A catchment area is established on the basis of a predefined population parameter as well as on the basis of geographical criteria (Bloom, 1977; Tischler et al., 1969). Context, in terms of place and circumstances of their populations, should be of direct relevance to the centers themselves. Nevertheless, the studies that have been completed since the C.M.H.C. act of 1963 have not usually focused on cross-catchment area comparisons, nor even within-catchment area comparisons. The Sclar et al. (1981) study of the Leominster - Fitchberg

catchment area is one of the few where time has been introduced as a relevant variable to assess the impact of change on the area.

#### **Present State of Studies :**

At present, the state of the art of ecological analysis of mental disorders has taken as its focus Social Area Analysis (Rosen, 1979). Here, the merger of diverse data sources that relate to a predefined social area (such as a nation state, a county, a city, or a community) are related to the study of a specific social problem. In many ways what these analyses examine are the social correlates of social problems at the macro level (Linsky and Strauss, 1982). That is, ecological correlations are undertaken by way of gaining an understanding of the contexts within which social problems occur (Menzel, 1950).

These studies have examined crime rates as a spatially distributed phenomena (Linsky and Strauss, 1982), mental health and the environment (Freeman, 1978), suicide variations (Bagley and Jacobson, 1976), attainment and adjustment (Rutter et al., 1974) and assessed differences across areas (Wild, 1974; Jackson et al., 1979). Their findings vary but consistently point to the fact that the context (the nature of the social area), does make a difference to the nature of the relationships observed.

### **The Community, Social Change, and Social Impact Assessment:**

The literature regarding community, social change, and social impact assessment is extremely broad and diverse. For this study however, only a small subset of that literature is of interest.

Conceptions of community as a part of a rural-urban continuum, as a system interacting with its environment, and as a unit of analysis are segments of the sociology of community that are relevant, insofar as they form a structural framework for the study. The literatures of planned and unplanned social change are of interest from two perspectives : both relate to the context to be used as covariate for major analyses to follow; and, more importantly, they provide an analytic framework for the study. The former, planned social change and unplanned consequences, actually comprise the literature of social impact assessment. Where the methods of social impact assessment (Fitzsimmons et al., 1977) are directed towards prospective research, this study is retrospective in focus.

### **The Sociology of the Community :**

Wirth's (1938) seminal work on urbanism set the stage for a series of studies seemingly designed to reify Toennies' (1940) gemeinschaft and gesellschaft, or Durkheim's organic

and mechanical solidarity, and to show that these apparent base concepts in sociology were present in the works of the Chicago School.

The sociology of community has matured and such concepts as the rural-urban continuum have become less important distinctions (Wild, 1975). Modern society is multifaceted with the city and the country a part of what has been termed a "global village". Variations occur within this structure and these are important to the participants. However, distinctions such as "center-periphery", as applied to nation states, or "boom-towns" and "bust-towns" are the current semantical terminology for the age old "city folk and country folk".

The community has not often been considered as the unit of analysis (Gartrell, 1982) but rather, differentiation within the structure of the community, or studies of the core versus the suburbs versus the rural area, has tended to occupy the researches of sociologists. However, the community and the spatial or temporal differentiation between communities are subjects that continue to be studied by sociology of community researchers. Mumford (1938) was concerned with differentiation with regard to cultures; Park and Burgess (1925) with the spatial patterning of communities; and, Laumann and Pappi (1973) with the study of community elites across communities. The cross-community

comparisons, however, have primarily been conducted on the basis of individual associations and not on the basis of aggregate associations.

The study of social problems across communities, using individuals as the units of analysis, is somewhat counter-productive. With this strategy, what is being compared is not the differentiation across communities, but rather the differences in the individuals participating in each community. If the intent is to gain understanding of the conditions under which social problems are manifest, the community is the logical unit for analysis (Gartrell, 1982).

Hage (1972 : 82) outlined a series of conceptually important dimensions that are useful in the analysis of social collectives. He defines social collectives as "(1) certain inputs or resources (2) distributed among individuals (3) who perform different activities (4) which are integrated (5) and who share certain attitudes (6) that have performances and outcomes (7) that occur in certain places and at certain times".

For studies using the community as the unit of analysis such a concept of community or social collectives is particularly useful. It allows for the comparison of communities across a series of indicator groups.

## **The Sociology of Social Change :**

When sociologists speak of change, discussions of power are implicit. Moreover, the ideas of deliberate social change are based in conceptions of the distribution of social resources (Wrong, 1979). Since change is usually thought of in terms of variations from the status quo, or as an effect of some planned or unplanned event, it is the variations in relationships surrounding the event of change that are taken as indicators of change having occurred.

This approach is problematic from several perspectives. The main problem is the lack of congruence between conceptual and operational definitions. Evidence of the existence of the relationship or process is, for the most part, secondary and inferential rather than primary and deductive. The causative nature of change processes is unlikely to be discovered through these means. Rather, what can be discovered are the necessary conditions for the process to operate and, perhaps with some luck and greater sophistication in analytic techniques, a discovery of at least some of the sufficient conditions for the relationships to occur.

At the macro level of analysis, Giddens (1977 : 19) suggested that a series of assumptions tended to be associated with ideas of social change. He listed these assumptions as :

social development is essentially a unified process, in the sense that the "parts" of the society develop in a connected, integrated way, like the parts of the growing body; development is progressive and continuous, without involving a sudden and radical transformation, unless in pathological cases; and maturation and adaptive advantage are synonymous, so that the progression from the "less developed" or "advanced" to "more developed" or "advanced" is sequential.

However, Giddens (p. 20) also suggested that a more adequate theory of change that would be more relevant to modern times would have to recognize the significance of an additional series of notions. Societies do not develop in isolation but rather in association with other societies. These associations may take the form of dependency or domination and may result in an uneven development of segments or sectors of the developing society. Wherever development occurs within a society, dislocations of and between sectors developing at different rates and in different ways will also occur. The existence of critical phases of radical change must be recognized as causative of divergent patterns of development thus possibly exacerbating the dislocations already mentioned. Further, the combination of unevenness in development and these critical phases of radical change may result in a "leapfrog" idea of development " whereby what is 'advanced' in one set of circumstances or period of time may later become a source of retardation upon further development; and vice versa ... "

Nisbet (1970) contributed to the concept of change outlined above. He stated, "the first point to be made about change is that where ever it exists in substantial degree, it is associated with some form of crisis."

The assessment of change as a pathogenic agent has been measured at the individual level by Holmes and Rahe (1967). This scale of "life changes" has been "applied to several different cultures and nationalities around the globe, and has been found generally reliable as a predictor of susceptibility to illness" (Wolf, 1981 : 15). Linsky and Straus (1982) utilized this concept at the macro level to measure stress in social systems.

An awareness of the extent to which three major components of change exist is included in the assessment of change at the macro level. The rate at which change occurs is a relative determination based in the context of occurrence. That is, a rate of change is a calculation of differences between a state of affairs at one point in time and at another point in time. To compare such rates requires that the contexts over which the change is measured also be comparable. The direction of change is also a factor to be considered in the assessment of change. Finally, the nature of change, as planned or unplanned, directed or random, has implications for the assessment of change (Loomis and Beegle, 1975).

Change has been seen as a pathogenic agent in the etiology of a number of disorders (Wolf, 1981). The magnitude of change has been suggested as an indicator of the magnitude of crisis (Loomis and Beegle, 1975; Nisbet, 1970). Thus where human attrition is a crisis response, change may be one factor in a causal chain.

#### **Social Impact Assessment :**

The social impact assessment literature has advanced this perspective for some time (Albrecht, 1978; Gilmore, 1976; Kohrs, 1974). The association between great change, in particular population growth (Freudenberg, 1982) and technological innovation (Summers, 1982) and indicators of human attrition has been suggested but not empirically assessed until recently (Bacigalupi and Freudenburg, forthcoming; Freudenburg, 1982a; Thompson et al., forthcoming; Wilkinson et al., 1982; Wilkinson, forthcoming).

The literature pertaining to the study of social impacts is a subset of the deliberate social change literature. These studies are of a futuristic bent in that they are attempts to predict the likelihood of future occurrences given past performance (Finsterbusch, 1978). Since the importance of context to past performances has been demonstrated as part of the background to social impact

assessment (Fitzsimmons et al., 1977), an understanding of the context in which a change is expected to occur will be crucial to the prediction of possible outcomes.

Social impact assessment is a relatively new development in the field of social change research and the studies completed under the rubric of these assessments are mainly unpublished. A major reason for this is that social impact assessments are usually commissioned studies as opposed to academic researches. Thus they remain the property of their sponsor, who generally has applied uses other than that of publication. Nevertheless, references to such studies and to the techniques of performing such studies are emerging in the literature (Selvik and Summers, 1982; Wilkinson et al., 1982; 1983).

The unit of analysis for social impact assessment is usually the context expected to be impacted upon by the proposed project. That is, they are almost entirely single case studies. Only when these studies are viewed as a body of research can a perspective be formed to allow for an analysis of the research.

Thus it is impossible to enunciate the many and varied types of social impact assessments currently being undertaken. A major portion of these studies, however, are related to two main areas. Resource developments have created situations of rapid social change, particularly

population growth (Freudenburg,1982; Summers et al., 1971). The effects of this phenomenon on the communities being subjected to such developments is not well known. Therefore, social impact assessments have attempted to evaluate the effects of such rapid social change (Summers and Selvik, 1982) with equivocal findings. Some researchers (Albrecht, 1978; Gilmore, 1976; Kohrs, 1974) viewed these changes as having negative consequences. Others (Reynolds et al., 1983; Thompson et al., forthcoming; Wilkinson et al., 1982) suggest that the evidence of such negative consequences just does not exist. Nonetheless, it is known that there are consequences to rapid social change. However, the fact that social impact assessment has dealt with the examination of this problem on a case by case basis has done little to answer the basic research question.

#### SUMMARY

From the review of the literature it is clear that no one area of the literature is likely to provide the theory or methods necessary to address this study's research questions.

Questions with respect to the social correlates of mental disorder as seen from the community perspective are partially answered by the literature of the sociology of

mental disorders. These persistent relationships are discovered at the micro level of analysis - but to what extent, and under what conditions ?

The determination of the necessary conditions under which relationships such as the social stress - social support process will exist are not found in the literature. Moreover, questions regarding the extent to which various indicators of social disorganization are related are partially addressed in the literature. Missing from such discussions is analyses of such associations in light of differing social contexts. Finally, questions regarding the association of mental illness to social context are left unaddressed in the literature in any systematic manner.

## **Chapter 3**

### **Methods**

#### **Conceptual Definitions**

The object of this study is the explanation of between community differences in human attrition. Human attrition is a high level abstract construct composed of concepts such as social wastage, loss of social support, loss of social and economic productivity, social disorganization, and social deviance. An explanation of variation is sought in other characteristics of the community, namely, its level of resources, its degree of institutional completeness and institutional complexity, and particularly in the rate of growth of its population.

#### **Human Attrition :**

The extent to which there is wastage or loss of function in the human resources of a community is the degree of human attrition present. In this sense, any sort of loss to the community could be regarded as attrition. The failure to adapt to change, and various forms of social disorganization are all associated with this concept (Phillips, 1968). For human attrition to occur, two distinct components must be present.

There must be a loss of human potential representing a cost to the social collective.

Human attrition may thus be seen as the extent to which socially deviant acts (crime, mental disorder), the loss of social productivity (welfare), the loss of economic productivity (unemployment), and the loss of social support (family breakdown) occur in the community.

Community :

With Hage's (1972) model of the social collective in mind, community is defined as an aggregation of individuals cohabiting a defined physical space who interact with other similarly situated aggregations for resource procurement, and who, within the structure of their aggregated group have certain activities that have performances and outcomes, and that are integrated.

In a less complex form, community is perceived as people living together within a system that is made up of several interacting sub-systems. People need resources to exist. These types of resources are physical, social and human, and they provide the inputs for the operation of the system. Within the system there are activities that process these inputs and occupy the members of the system. Two main features are important here - completeness and complexity.

The former gives an indication of the extent to which the community can perform its system tasks independently. The latter refers to the extent to which there is diversity of social positions available within the community.

The integrating aspect of the community is, for the most part, communications and transportation networks that link member to member and community to community (i.e., internal and external links). Finally, the outputs from the community are of two types - human and physical. The former are of interest to this study because human attrition is viewed as a negative or undesirable output to the community system.

Change :

Change implies that some difference in the status of some measured phenomenon has occurred over a period of time. An example of change would be that of life events at the individual (Holmes and Rahe, 1967) or community level (Linsky and Straus, 1982). Since life events are generally conceived as binary occurrences over a one year period, and since life events are measures of change and are seen as stressors (Dohrenwend and Dohrenwend, 1976), the effects of change, positive or negative, may also be seen as a stressor. The extent to which that change has positive or negative effects is an indicator of the degree of stress associated with the change.

Change for this study is population growth. This phenomenon has been seen both as a stressor and as a support (Fruedenburg, 1982; Wilkinson et al., 1982) at the community level. What appear to be important to such concepts are the rate of change and the direction of change (Loomis and Beegle, 1975).

### **Statement of the Research Problem**

This is a study of contexts. The research problem is one in which the context of certain relationships is seen as important to the nature and magnitude of the relationships themselves.

The contexts of interest are those of change and community. For this study, a community is a dynamic system made up of several sub-systems that are continually undergoing change. These sub-systems are, the community and environment, the community and resources, and the complexity of community structure.

In its clearest form, this study is made up of a dependent variable group - human attrition, and a series of independent variable groupings : the community-environment, the community-resources, and the community-structural complex. The essential research question of this study is to what extent and under what conditions does a relationship

between the independent and the dependent variable groups exist? If the dependent and independent variables are related, are the relationships stable when examined in the light of different contexts (i.e., communities undergoing rapid growth and those undergoing slow population growth)?

An additional set of research questions regarding the dependent variable group also exists. In other research (Phillips, 1968; Wilkinson, forthcoming) indicators of human attrition (crime, welfare, unemployment, and rates of mental disorder) appeared to be related to one another. To what extent and under what circumstances are they so related ?

From these basic research questions several relevant hypotheses may be generated. Those that are under scrutiny for this study all use the community as the unit of analysis.

### **Hypotheses**

Hypothesis 1.0 :

A positive relationship exists between the rate of social change and the rate of human attrition. Attrition will be higher for the rapid social change communities than for the slow social change communities.

This hypothesis is directly related to the suggestion by Wilkinson et al. (1982) and by Murdock and Leistriz (1979; 1983), that the consequences of rapid social change have, according to the literature, been seen as having perverse effects on communities. They also suggested, however, that the statement, though often cited, has little empirical

support. In order to provide support for the assertion that rapid social change has negative effects on the social well-being of the community, the relationship between the dependent and independent variables should be negative and higher for communities with rapid population growth and social change (resource communities), and more positive and lower for stable communities (farming communities).

Hypothesis 1.1 :

Across all contexts an inverse relationship exists between the indicators of human attrition and the indicators of the community's ability to absorb the shock of social change.

This relationship suggests but does not assess the extent to which integration and disorganization are associated. The greater the number of social positions in the community, the lower the rate of human attrition. That is, social resources are inversely related to rates of attrition.

Hypothesis 2.0 :

A positive association exists between indicators of human attrition.

This hypothesis is directed at the multifaceted construct of human attrition. If it is supported, then the construct may be operationalized either through a single indicator (depending on the strength of the correlations) or through the

creation of an internally reliable scale. If the hypothesis is not supported in these data then alternative means of assessing human attrition as a concept will be sought.

### **The Setting for the Study**

This study takes place in the province of Alberta, Canada. Alberta has a total population of 2,237,734 (Census, 1981) and covers a land mass of approximately 638,232 square kilometers.

The population of the province is mainly of western European stock with Anglo-saxons and other Germanics making up the largest of the ethnic categories. The population is almost entirely Caucasian, with a minority representation of native Indians and, most recently, immigrants from third world countries.

The economy of Alberta is based primarily on agriculture and mineral extraction. Since the mid-twentieth century this province has derived most of its wealth from the oil extraction industry. As a result the "boom to bust" phenomena of the frontier has always been a part of life in this province.

The topography of the province is varied, with plains and rolling hills in the east and south, and the Rocky Mountains to the west. Most of the population resides in the southern

one-half of the province and is sparsely concentrated (with the exception of the two major centres - Edmonton and Calgary, which have almost one-half the total population of the province). The average density of the population is 3.5 persons per square kilometer.

The history of the province is relatively short with the attainment of provincial status occurring in 1905.

At present, the government of Alberta is described as being a "free-enterprise" and "conservative" government whose plurality in the legislature is almost total (there are 4 opposition members out of a total representation of 79 members). This situation is not necessarily typical of the western provinces of Canada (Lipset, 1950) but has been the case for Alberta for some time. The center of government activity is in the provincial capital of Edmonton, and though most departments of the government are decentralized throughout the province, decisions are made in Edmonton.

Within the government infrastructure is the Community Health and Social Services Department which has as a mandate the provision of social and health services throughout the province. In partial fulfillment of this mandate, the Mental Health Division provides a majority of the institutional and community mental health services in the province.

The criminal justice system in Alberta involves the provincial government through the Attorney General's department, some municipal governments through local police forces, and the federal government through the Royal Canadian Mounted Police. Enforcement of the Criminal Code of Canada, and provincial and municipal statutes is the function of the police forces. Prosecution and incarceration are provincial functions (except where prison terms exceed two years - these are a federal responsibility). The Attorney General's department of the province collects all crime statistics from all police forces and thus acts in a liaison and coordinating role.

#### **Data Sources**

Data for this study have been obtained from a variety of sources within the province of Alberta. They are almost entirely secondary data as they were collected by the provincial agencies for purposes other than research, and they are riddled with the many pitfalls of these types of data (Cicourel, 1968; Garfinkel, 1967).

#### **Mental Health Data**

Mental health data have been obtained in the form of an individual case by case registry from the Mental Health Division of Community Health and Social Services, Government of Alberta. These data were first masked to protect their

confidentiality, and then geocoded using postal codes to allow for analysis at the community level. Included in this case register are the admissions and discharges to and from the provincial mental health programs from 1975 through 1981. Additional data, specific to each case, have been retained including diagnoses at admission, modes of treatment, age, sex, discharge diagnoses, etc. However, for the purposes of this study, only the geodescriptor, the year of admission and discharge, age at registration, diagnosis, and sex have been retained for the 74000 cases on the file.

Not included in these data are those persons who received treatment and diagnosis from private psychiatrists and physicians and those persons who, although mentally disordered, did not have contact with the system. A study in the neighboring province of Saskatchewan some years prior (Cassel et al., 1970), suggested that the service rate from private practitioners (including private psychiatrists) was less than one treatment per patient and was 47.399 cases per thousand of all types of mental illness. However, it is not known whether or not these persons also had contact with the mental health system, nor was the severity of their disorders discussed.

This gap in the "official records" of the province is not as serious as it might initially seem to be. Private physicians and psychiatrists, though providing active

treatment services to the mentally ill, do not usually provide those services on a long term basis nor are they usually totally independent of the provincial system (Cassel et al., 1970). At some point in the career of the mentally disordered patient contact with the "official" system occurs, either through hospitalization or referral to community clinics. At this point, the case is registered and included in the Mental Health Information System (M.H.I.S.) file. Given the time span of this data source (seven years) and the fact that some 74,482 entries and 59,922 individual cases exist on this file (giving a rate of registration for the period of 30.288 per 1000 population), the magnitude of potential errors of omission is greatly reduced.

For purposes of this study, the rate of admission per capita will be calculated for each community by aggregating all admissions over the seven years covered by the data, and then dividing that figure by the average population of the community for the period.

**Crime Data:**

Another descriptor of the extent to which social disruption exists in Alberta communities is the arrest data which have been obtained from the Attorney-General's Department of the Government of Alberta for the years 1978 through 1981.

These data are aggregated according to the location of the variousoyal Canadian Mounted Police (R.C.M.P.) detachments throughout the province. Thus, not all communities have separate data pertaining directly to them. Since coverage of the province by the R.C.M.P. is complete (though there are data from only 148 detachments) and data do reference the locale of the nearest detachment, it should be possible to attribute crime rates to communities not possessing their own detachment.

Within the data set, crime is disaggregated in terms of its type. Three categories are used : Violent Crimes, Property Crimes and Other Crimes (as defined in the Criminal Code of Canada). For purposes of this study, ratios of the violent crimes per capita, property crimes per capita, and other crimes per capita will be calculated for each of the communities in the file.

**Social Assistance Data :**

The extent of activity in terms of public welfare cases, child welfare cases and family protection cases is recorded by the Social Services Branch of Community Health and Social Services, Government of Alberta. These data are disaggregated by regional office and then again by sub-office for the province. As a result, specific data for each community do

not exist but rather, specific data for each area are available. This information discloses the amount of Social Assistance activity, the amount of Child Welfare activity, and the amount of Family Protection Services activity throughout the province for the years 1977 through 1982.

As with the crime data, these figures represent total provincial coverage and will be attributed to communities without specific data (see Appendix B for listing) by assigning the mean area rate for Social Assistance, Child Welfare, and Family Protection and Support Services to each community.

#### **Demographic Data:**

In order to describe the demographic composition of the various communities in Alberta selected for this study, data have been extracted from three national censuses (1971, 1976, and 1981). These data have been aggregated by the Census Division of Statistics Canada into areas that correspond to the communities. Unorganized areas, and farm and rural area data have not been included in the data set, although they are available for future analysis.

In the course of processing these data considerations of the procedures employed by the Census Division and the effect that these procedures had on the data were considered. The Census Division states :

The figures shown in this report have been subjected to a confidentiality procedure known as "random rounding" to prevent the possibility of associating small figures with any identifiable individual. Under this method, all figures, including totals are randomly rounded (either up or down) to a multiple of "5". This technique provides strong protection against direct, residual or negative disclosures without adding significant error to the census data. However, since the totals are independently rounded, they do not necessarily equal the sum of individual rounded figures in distributions. Also, minor differences can be expected for corresponding totals and cell values in various census reports. Similarly, percentages, which are calculated on rounded figures, do not necessarily add to the total. Percentage distributions and rates for the most part are based on rounded data, while percentage changes and averages are based on unrounded data.

(Census of Canada, 1981)

As a result, the largest aggregate possible of the data point has been used for calculations.

Included in the 1971 and 1976 censuses are data pertaining to the labour force composition and participation as well as fairly detailed data regarding housing types in the community. The comparable 1981 census data have not yet been released. For all census years, data regarding the age and sex composition of the communities, their educational composition, family sizes, and the nature of ownership of housing have been collected.

## **Community - Environment Data :**

In assessing the relationship between the community and the outside world, data collected from the Municipal Affairs Department and from the Tourism and Small Business Development Department of the Government of Alberta will be used. These data relate to two major environments - physical and transportation.

### **Physical Environment:**

The physical description of the community describes the environment surrounding the community, for example, the distance from major centers of the province, the climatic conditions of the community, the elevation of the community, etc. In this way, a global description of the community as it relates to its physical environment is assembled for comparison with other communities.

### **Transportation Environment:**

Transportation to and from the community is assessed in terms of whether or not there are air, bus, and highway services in the community. Communications between the community and the outside environment are measured in terms of the number of daily papers delivered in the community and the number of television channels available in the community. This is once again a global assessment for comparison across communities.

## Community Resources Data

The assessment of the resource base of the community involves measurement of three aspects : the physical resources; the social or human resources; and the degree of wealth or poverty.

### Physical Resources :

The measurement of the physical resources available to the community uses data obtained from the Small Business Development Branch. These data provide counts of the numbers of resources such as financial institutions, schools, hospitals, police, fire departments, and service industries.

### Social or Human Resources :

Here, census data are the main sources of information regarding the educational levels in the community (the proportion of the population with university level education, the proportion of the population with senior matriculation, etc.). As well, this construct is seen to be measured in part by such indicators as the presence and numbers of senior citizens homes, nursing homes, day care centers, the presence of service clubs, and the availability of social support services such as social service counselling.

## Wealth and Poverty :

Only the 1971 Census and the yet to be released 1981 Census have data related to the socio-economic status of the community (income levels by individual and household). The 1971 data could be useful as baseline data against which to measure change, but are of little relevance as specific data points for this study. Thus, no measure of the extent of wealth existent in the communities is available. An indication of the absence of wealth, namely poverty, is included in the data. The social service data referred to above, contain a measure of the number of social assistance cases by community area. Since poverty is a necessary prerequisite for social assistance, this will act as a negative measure of the wealth of the community.

## Community Structural Complexity Data

In measuring this construct two major types of data are utilized: those pertaining to the institutional completeness of the community; and, those pertaining to the institutional complexity of the community.

### Institutional Completeness :

The emphasis here is on an assessment of the number of social positions available in the community. Therefore, counting such items as the number of different types of

institutions present in the community will compose the relevant data. That is, whether or not the community has ten schools and thirty hospital beds is not as important here as the fact that it has at least one school or one hospital bed.

Data from the Alberta Tourism and Small Business Development publications "Alberta Locations" were the bases of these variables.

#### Institutional Complexity :

Here, the number of organizations (rather than the diversity of types of organizations) in the community are used as indirect measures of the number of social positions available in the community. A count of the number of schools, financial institutions, retail and service outlets, etc., will make up the data. Since another aspect of this construct is the extent to which the community is able to support and does support this structure, data regarding employment participation rates and unemployment will be assessed here.

#### **The Unit of Analysis**

In all instances, the unit of analysis is the community. Data pertaining to the community may have been collected initially at the individual level; however, for all variables data have been aggregated to the level of the community.

Data regarding social services provision and crime were not uniformly available for all communities. Social service data were collected on the basis of social service regions and areas. These 34 geographically defined areas are listed in Appendix B, together with the corresponding communities included in the areas. Crime data were collected on the basis of the 148 police detachment areas of the province. In both instances, data have been attributed to those communities not having social service or police detachment offices but included in the respective coverage areas. In other words, if social service or police detachment area A is based in community A, all other communities in area A will have values of zero (0) for actual numbers of social service provisions or crimes. The rate of crime per capita, or rate of social service provision per capita, will be attributed to all communities in the given area. This will tend to overestimate the crime and social service activity in each study community. The effect of this overestimate on the correlations to be considered as evidence is not seen as overly significant a bias to the results of the study.

Other data, when missing have not been included in calculations of rates, means or correlations.

## A Note Regarding the "Ecological Fallacy"

This study is an ecological analysis of a phenomenon (human attrition). Thus, the warnings of Robinson's (1950) famous "ecological fallacy" should be kept in mind. However, the task of the study is not to derive ecological correlations for inference to the individual level. Rather, the study is of communities, and differences are to be analyzed across the communities and not across community residents.

The utility of this approach was demonstrated in the following comment on Robinson's article by Menzel (1950 : 674) :

Mr. Robinson's own illustration - the state-by-state correlation of the percent population Negro and percent population illiterate - retains its value even after it is recognized that the corresponding individual correlation is much lower. It points to the fact that identical historical circumstances and aspects of economic development have caused certain states both to (a) import and retain a large Negro population and (b) neglect their school system.

In the present study the outcomes will be conclusions regarding the effect of differing rates of population change on the community and on rates of crimes, welfare and mental disorder within the community. No individual level conclusions will be drawn or implied.

## **Adequacy of Data**

The data available on the province of Alberta are extremely diverse and not systematically collected within the province. The northern region of the province, under the supervision of the Northern Alberta Development Council, is the most complete in its collection of data regarding activities at both the economic and the community levels (Co-West Associates, 1981; Northern Alberta Development Council, 1980). Unfortunately, the southern portion of the province cannot boast such completeness. As a result, a broad range of data sources has been consulted. With this in mind, it is believed that one of the most complete data bases on the province of Alberta with an emphasis on community level activities has been assembled for this study. There are gaps in the data base but it is both flexible, insofar as it can be easily updated, and current, in that the most up-to-date information has been included (eg., 1981 census, 1981 MHIS records, 1982 crime and social service data, etc.).

## **Manipulations of the Data**

As much as possible, the data set has been kept in its original state. Some minimal manipulations have been made to the data by its collectors (eg., census rates calculated by Statistics Canada, community level aggregations calculated by the various agencies collecting data, etc).

For purposes of this study, manipulations of the data will also be minimal. Rather than using the raw data, many of the data points will be converted to rates. Where this is done, conventional numerators and denominators will be used (eg., sex ratio will be taken to mean the ratio of males per one hundred females, etc.). In all instances, the rates will be based to the nearest multiple of ten that allows for whole numbers (eg., per hundred, per thousand, or per hundred thousand).

### **Operational Definitions**

In developing a model of the manner that the environment affects the community's mental health, prior reference has been made to several concepts that must now be operationalized so as to allow for an assessment of the adequacy of this model.

#### **Human Attrition :**

Obviously a need for some indicators of the level of mental health in the community exists. Instead of viewing mental health as a narrow concept (diagnostically categorized illness), a broader view is being used. Mental illness is defined, for this study, as the extent to which the community is experiencing human attrition. The less the attrition, the greater the mental health.

In assessing human attrition, several constructs have been employed. One of these is the extent to which mental illness is present in the community. Another aspect of this concept is that of social wastage in the community. Here, the extent to which the community supports poverty and experiences the negative social consequences of child abuse and neglect comprise the data related to social wastage. The greater the provision of social assistance in the community the greater the community experience of poverty. The greater the provision of child welfare services the greater the community experience with child abuse and neglect. In both these instances, the greater the frequency of occurrence, the greater the human attrition. Loss of social support in the community is measured in terms of the extent of family breakdown. The greater the amount of family protection services provided the greater the human attrition. Social or economic loss to the community in the form of unemployment, is measured by the unemployment rate.

Finally, in the assessment of this dependent variable is the concept of social disruption. Here, the extent to which disruptive activities are occurring in the community makes up the data point. This concept has been measured by the examination of data relating to violent and property crimes in the community. The greater the frequency of these types of disruptions, the greater the attrition.

## Demographic Data :

For purposes of this study, the standard demographic descriptions used in the Canada Census 1971, 1976 and 1981 were used. From these data, several rates were computed. These rates are, by and large, conventional insofar as common demographic comparisons are concerned and relate mainly to the demographic structures of the communities. Sex ratios, dependency ratios, literacy rates, proportions of the population falling into various employment, housing, and age/sex categories all provide data with which to compare and contrast different communities.

Demographic data have been used as denominators for the calculation of rates pertaining to community resources and complexity.

The basic denominator for community level rate calculations is :

$$\text{Population 1976-81} = \frac{(\text{Population 1976} + \text{Population 1981})}{2}$$

Sex ratios were calculated for each census year as :

$$\text{Sex Ratio} = ((\text{Number of Males})/(\text{Number of Females})) * 100$$

Dependency ratios were also computed for census years using the following formula :

$$\text{Dependency Ratio} = \frac{(\text{Population 0-14 years} + \text{Population 65+ years})}{(\text{Population 15-64 years})} * 100$$

Literacy rates were calculated for the available census years of 1971 and 1976 using the following formula :

$$\text{Literacy Rate} = \frac{\text{Number with } < \text{ grade 5}}{\text{Population over 14 years}}$$

The unemployment rate was calculated for 1976 (most current census data on employment) using the following formula :

$$\text{Unemployment Rate} = \frac{(\text{Total Labor Force} - \text{Total employed})}{\text{Total Labor Force}} * 100$$

#### **Community-Environment:**

Each and every community in this study has a place in the ecosystem that makes up Alberta. As such, the relationship of the community to its specific environment is an important facet in the description of the community. In other words, a community has bounds and interacts with other communities.

The boundaries of the community are to some extent defined by the physical environment surrounding the community. The spatial distribution of communities is in part determined by the physical environment. Temperature, rainfall, snowfall, elevation, proximity to other communities are all indicators that may be used to compare communities. This is measured by a series of ecological indicators - elevation, average rainfall and snowfall, average temperature and annual number of hours of sunshine; and, indicators of the extent to which the community interacts with other communities and is integrated within its environment - distance from major centers, number of television stations, number of daily newspapers, and the presence of bus service, rail service and air service.

**Community-Resources:**

Another aspect of a community that is important to differentiation among communities is that of resources. Three main areas are important to the concept of community in use in this study - the physical, social or human, and material resources of the community. These resources are, in a sense, some aggregated measure of the socio-economic status of the community. They indicate to what extent the community may be considered as wealthy or poor, to what extent the community may be seen to have a sufficient resource base to absorb the shock of sudden social change, and to what extent the community may be seen as a place of progress or decline.

### Physical Resources:

Indicators such as the cost of an average three bedroom home, the per capita debt load, the dollar value of building permits issued annually, all contribute to a formulation of how prosperous the community appears to be. The physical resources of the community relate closely to other facets of the concept of community. The number of resources (schools, fire departments, police departments, hospitals, etc.) existing in the community and the comparison of those resources across communities allows for the evolution of a gross typology of communities. The "haves" and the "have nots" emerge by virtue of what they have or do not have.

### Social or Human Resources:

An overlap with the physical resource component of the Community - Resource concept occurs when social or human resources are considered. The number of physicians and dentists are all a part of the physical resources of the community but are also indicators of the human resource base which is present. The idea of the literate or educated versus the non-educated provides some evaluation of the human resource potential in the community as also does the proportion of those educated beyond matriculation versus the total educated in the population. Indicators of social or

human resources are the ratio of doctors to population, the ratio of dentists to population, the ratio of illiterates (< grade 5 education) to all educated, and the ratio of better educated (> grade 12) to all educated.

#### Wealth and Poverty:

Another measure of community well-being is the extent to which inequality of opportunity has manifested itself within the community structure. Ideally, assessments of the proportion of the population in various income strata as well as tax strata would be used to assess this aspect of the concept of community. However, an equally defensible approach is to measure the extent to which wealth is not present in the community. Here, the proportion of the population in receipt of social assistance (a needs-tested income source) provides a measure of the concept.

#### Community-Structural Complexity:

The community is an aggregation of various social roles. As such it is important that any model of community include the extent to which these roles are a complete set, and the extent to which they provide the necessary social positions for the social and human resources to act out (and utilize) the community resources available to them.

### **Institutional Completeness:**

The concept of completeness is mainly focused on magnitude. That is, the operational question answered by this concept is, given the infinite number of social positions available within a social collective (community) how many does this community have ? Whether or not these social positions are different is not relevant to this aspect of the concept of community. Therefore, a non-redundant count of the institutions in a community is the data making up this indicator.

### **Institutional Complexity:**

However, for institutional complexity as a concept, the question changes from one of magnitude to one of differentiation. In others words, given a number of social positions in a community, how are they distributed and how are they different? The focus of interest for the measurement of this concept is the number of different types of social positions available within the community.

### **Social Change :**

For the purposes of this study, social change is seen as a negative stressor that manifests itself as population shifts. As such, it is variously measured throughout the data

set. The indicators of this concept are the population growth, change in the sex ratios, change in the dependency ratios, change in the age compositions, and change in the educational compositions of the population.

### **Social Stress:**

For the purposes of this study, stress is an unmeasured concept. Stress is assumed to follow as a consequence of social change. Population growth over short time periods, is thought to possibly lead to social disruption. Social disruption, a part of human attrition, is a symptom of social stress. The operational constraint on such data is that, in keeping with the Holmes and Rahe (1967), and Dohrenwend and Dohrenwend (1981) premises of life events - the events must have occurred in the recent past, as opposed to the historical past, and that the event is construed as stressful by those affected by it.

### **Analytic Techniques to be Employed**

The actual strategies for analyzing the data are quite straightforward. Initially, descriptive statistics will be used to illustrate the differences between Alberta and all of Canada, and between the study population and the population of the province.

Univariate statistics will be computed on the dependent and independent variables to allow for descriptions of these variables. Bivariate correlations among the dependent variables will be used to ascertain if any positive associations among these variables exists. Similarly, bivariate correlations will be performed among the independent variables to assess for possible multicollinearity. The dependent variables will also be assessed through a procedure in the statistical package SPSS known as Reliability. In an effort to reduce the data, this procedure will examine the extent to which the the dependent variables may be considered an additive scale. The correlation matrix from the Reliability procedure will also be entered into a Smallest Space Analysis (from the statistical package OSIRIS) and the underlying structure of the data examined.

Finally, the hypotheses will be examined. To do so requires the use of additional multivariate techniques. Having calculated rates and differences in rates, a Pearson correlation of the human attrition indicators along with the series of independent variables, which are the various community indicators (community resources, community complexity variables, and demographic indicators), will be undertaken. After the entire sample of all communities is used as the data set, the data will be disaggregated into two separate sets for entry into the Pearson correlation

programs. These will be defined as communities with high/rapid population growth, and those with low/stable population growth. Here, the factor of population growth is seen as one of the most important indicators of social change.

Since the capacity of a community to absorb the shock of social change has been seen as a function of the community complexity, it is expected that these variables will be highly associated with rates of human attrition.

An intercorrelation of the indicators of human attrition will be the primary analysis used to examine hypothesis 2.0. This intercorrelation will also be assessed for the effects of the aggregating variable (community) on the intercorrelations.

## CHAPTER 4

### ALBERTA AND ATTRITION The Descriptive Results

This is the first of two chapters dealing with the results of this study. Each chapter deals with a separate though interrelated topic. In this chapter, descriptions of the sample, comparisons of that sample to the province as a whole, and to Canada will be presented. All major variables in the study will be described - in terms of their univariate distributions, their relationship to other major variables, and their role in the analytic strategies to be employed in the remainder of the dissertation.

The second chapter of results will deal specifically with the hypotheses described in the previous section of this paper. The hypotheses will be described and the sufficient proofs for affirmation or rejection detailed. The analytic strategies for the analyses will be described and the results presented.

## Comparison of the Population of Alberta and Canada

As can be seen from the map in Appendix A, the 175 communities used in this study cover the entire geographic area of the province of Alberta. All census districts, Social Service regions, and Health Regions of the province are represented and most organized communities with a 1981 population of at least 200 are included. Appendix A also contains a list of the communities included as well as a list of most communities in the province. The discrepancy between the two lists is primarily a reflection of convenience in gathering data. Since the data set includes 78.5 percent of the total population of the province, the omission of these communities does not appear to constitute a bias on the overall results. Tables 1 through 3 show comparisons of the province of Alberta to the nation as a whole for the years 1971, 1976, and 1981. As can be seen by viewing all three tables, the population of the province of Alberta accounts for nearly 9 percent of the total population of Canada by 1981. However, in 1971 the proportion of the population of Canada resident in Alberta was only about 7 percent. Further variations in the population distributions by age and sex are apparent in the older categories and especially in the older female age-groups. It appears that older persons (older than 55 years) and particularly older females are unlikely to reside in Alberta. Though the total population of Alberta

Table 1

Comparisons of the Population of Canada and Alberta  
1971 CENSUS

Age Groups	Males			Females		
	Canada	Alberta	Alta/Can	Canada	Alberta	Alta/Can
Totals	10795370	827785	0.0767	10772940	800085	0.0743
0 - 4	929605	89735	0.0965	886550	85810	0.0965
5 - 9	1152430	108335	0.0940	1101580	103895	0.0943
10 - 14	1181450	113235	0.0958	1129285	109065	0.0966
15 - 19	1074430	81970	0.0763	1039915	78920	0.0759
20 - 24	941775	70575	0.0749	947625	71690	0.0757
25 - 34	1461580	110630	0.0757	1427960	108040	0.0757
35 - 44	1285820	100860	0.0690	1240580	92300	0.0744
45 - 54	1132305	81750	0.0722	1159270	80820	0.0697
55 - 64	854100	59415	0.0696	877635	57660	0.0657
65 - 69	296050	21840	0.0738	323905	20160	0.0622
70 +	485820	37640	0.0775	638630	39110	0.0612

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971  
Census of Canada, Service and Supply, Ottawa Canada, 1972.

Table 2

Comparisons of the Population of Canada and Alberta  
1976 CENSUS

Age Groups	Males			Females		
	Canada	Alberta	Alta/Can	Canada	Alberta	Alta/Can
Totals	11449525	932370	0.0814	11543080	905665	0.0785
0 - 4	888640	78375	0.0882	843355	74550	0.0884
5 - 9	966725	83510	0.0864	921080	79490	0.0863
10 - 14	1164645	95565	0.0821	1111730	91645	0.0824
15 - 19	1195975	98960	0.0827	1149280	94255	0.0820
20 - 24	1065770	94580	0.0887	1068040	91425	0.0856
25 - 34	1823210	150035	0.0823	1797335	143955	0.0801
35 - 44	1314915	106015	0.0806	1282090	99810	0.0778
45 - 54	1226190	93190	0.0759	1246840	90200	0.0723
55 - 64	928050	66395	0.0715	996390	68155	0.0684
65 - 69	338520	23925	0.0707	382295	24555	0.0642
70 +	536885	41820	0.0779	744640	47630	0.0639

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1976  
Census of Canada, Service and Supply, Ottawa Canada, 1977.

Table 3

Comparisons of the Population of Canada and Alberta  
1981 CENSUS

Age Groups	Males			Females		
	Canada	Alberta	Alta/Can	Canada	Alberta	Alta/Can
Totals	12068285	1143220	0.0947	12274890	1094505	0.0892
0 - 4	914450	96680	0.1057	868925	91285	0.1051
5 - 9	911940	89300	0.0979	864920	84850	0.0981
10 - 14	984735	92125	0.0936	936130	87430	0.0934
15 - 19	1182015	109705	0.0928	1132875	104725	0.0924
20 - 24	1174290	137025	0.1167	1169515	127305	0.1089
25 - 34	2105890	227690	0.1081	2110295	207865	0.0985
35 - 44	1496965	134190	0.0896	1471195	125130	0.0851
45 - 54	1256370	106085	0.0844	1242460	97645	0.0786
55 - 64	852970	76190	0.0893	1128465	79110	0.0701
65 - 69	390580	27005	0.0691	453745	30420	0.0670
70 +	620280	47235	0.0762	896365	58725	0.0655

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1981  
Census of Canada, Service and Supply Canada, 1982.

is approximately 9 percent of the Canadian population, for the over 55 population, Alberta has less than 7 percent of the population in these age - sex categories.

The actual population composition of Alberta has shifted over time. In 1971 (Table 1) the modal categories for both males and females were the age groups from 0-4 years through 10-14 years; by 1981 (Table 3) the modal categories had changed to the 25-34 year old group. This represents a twenty year shift in modal age group over a ten year period. When examining the intercensal data (1976) it is noted that no particularly outstanding age group is apparent, though the 20-24 year old group comprises a major population group of the province (Table 2).

Of greatest interest in this comparison is the shift in Alberta / Canada age ratios over time. In 1971 the under 15 year age groups were the largest in terms of the percentage of the Canadian population residing in Alberta. By 1981 that situation had changed and the 20-34 year old groups were the largest in terms of the percentage of the Canadian population. The most plausible explanation for this result is that immigration to Alberta from elsewhere in Canada is occurring.

Calculations and discussions of dependency ratios for the Alberta and Canadian data as well as the examinations and comparison of these ratios will be presented later. However,

it is interesting to note that the age groups older than 65 years are in almost every case the least represented in the Alberta / Canada population comparisons. Whether this is a situation of the elderly leaving the area for "warmer climates" upon retirement, or an artifact of the sparse population the province has had for years and the seemingly rapid influx of younger workers cannot be determined with these data.

#### **Marital Status and Educational Levels :**

Other data that are of interest in the description of the population of the province of Alberta, in comparison to the population of Canada, are those related to the marital status and the educational levels of its residents. Tables 4 through 6 detail the marital status of Alberta residents as compared to the nation. As with the preceding set of tables, they cover the time period of 1971 through 1981.

#### **Marital Status :**

Tables 4 through 6 show that over the ten year period from 1971 to 1981, most of the population of Alberta over the age of 15 years was married although the proportion of those who had never married had increased slightly over time (from 35.8 percent in 1971 to 39.2 percent in 1981). Of more interest, is the shift within the ever married group. In 1971, approximately 2.6 percent of the ever married

**Table 4**

**Comparison of Marital Status Groups - Alberta and Canada  
1971 Census**

Group	Canada	Alberta	Alta/ Can
Never Marr. >15	4290680	293315	0.0684
Married	9777605	737480	0.0754
Widowed	1135154	61285	0.0540
Divorced	175110	21290	0.1216
Totals	21568310	1627875	0.0755

**Table 5**

**Comparison of Marital Status Groups - Alberta and Canada  
1976 Census**

Group	Canada	Alberta	Alta/ Can
Never Marr. >15	4776420	366140	0.0767
Married	10973905	865470	0.0789
Widowed	1043565	69410	0.0665
Divorced	302535	33890	0.1120
Totals	16796425	1334910	0.0794

**Table 6**

**Comparison of Marital Status Groups - Alberta and Canada  
1981 Census**

Group	Canada	Alberta	Alta/ Can
Never Marr. >15	5255110	477280	0.0908
Married	11949165	1083225	0.0907
Widowed	1157670	79235	0.0684
Divorced	500130	56320	0.1126
Totals	18862075	1696060	0.0899

**Sources:** Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971, 1976 and 1981, Census of Canada, Service and Supply, Ottawa Canada, 1972, 1977, and 1982.

population of Alberta were divorced, by 1981 that proportion had become 4.6 percent. In 1971 the widowed made up 7.5 percent of this group and by 1981, the widowed had declined to 6.5 percent of the ever married group.

Shifts among the categories can be readily observed from an examination of the three tables. In 1971 some 12.2 percent of all divorced Canadians resided in Alberta. This remained relatively constant through to 1981 when 11.3 percent of all divorced people lived in Alberta. At the same time, however, the proportion of married Canadians residing in Alberta increased from 7.5 percent in 1971 to 9.1 percent in 1981. The only aspect of the data regarding marital status of individuals residing in Alberta that has not increased as a proportion of the Canadian population, is that of the persons under the age of 15 years and not married. In 1971 this figure was 15.1 %, in 1976 it was 8.5 %, and in 1981 it was 13.8 % of all Canadians under 15. Given the increase in population of the province, this seemingly insignificant decline in proportion may in fact be important.

#### Educational Level :

The most recent data regarding the educational levels of Albertans are not yet released (Census,1981) and, as a result, only the years 1971 and 1976 are available for comparison. An examination of these data shows that as with the marital status, age, and sex data, change in the

Table 7

Educational Level by Sex - Alberta and Canadian Data  
1971 Census

Grade	Males			Females		
	Canada	Alberta	Alta/Can	Canada	Alberta	Alta/Can
< Gr 5	480920	26615	0.0553	434570	24225	0.0557
Gr 5 - 8	1797055	113950	0.0634	1861580	94035	0.0505
Gr 9 -10	1106070	111040	0.1004	1302070	113390	0.0871
Gr 11-13	1103505	128120	0.1161	1496665	155670	0.1040
Post Sec	1180791	106070	0.0898	1112575	100970	0.0908
Some Uni	355065	38945	0.1097	433710	40235	0.0928
Grad Uni	419970	40315	0.0959	193815	19885	0.1026

Source: Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971  
Census of Canada, Service and Supply, Ottawa Canada, 1972.

Table 8

Educational Level by Sex - Alberta and Canadian Data  
1976 Census

Grade	Males			Females		
	Canada	Alberta	Alta/Can	Canada	Alberta	Alta/Can
< Gr 5	441655	23215	0.0525	421040	23200	0.0551
Gr 5 - 8	1772920	108265	0.0611	1789750	88760	0.0496
Gr 9 -10	1627365	129410	0.0795	1705035	127590	0.0748
Gr 11-13	1889675	167780	0.0888	2266560	199095	0.0878
Post Sec	1109275	116225	0.1047	1318825	121185	0.0919
Some Uni	880610	67090	0.0762	784690	64270	0.0819
Grad Uni	708025	62945	0.0880	381010	35885	0.0942

Source: Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1976  
Census of Canada, Service and Supply, Ottawa Canada, 1977.

educational distribution of the province is occurring, apparently in the direction of technical and trades training. In the 1971 census (Table 7), the group of individuals having attended at least some university was an important subgroup of the overall population (representing some 9 to 10 percent of the Canadian population in this category) however, by 1976, that subgroup had declined to between 7 and 8 percent of the Canadian population in that category. On the other hand, those in the post secondary, non-university category increased from 8 to 9 percent of the Canadian population in 1971 to between 9 and 10 percent of the population in 1976 (Table 8).

Given the nature of development in Alberta (resource and technology based), such shifts are not surprising. Migration in Canada has traditionally been westward from Ontario. It would be assumed that the trend will have continued through the 1981 Census and that, when those data are made available, it will be seen that the province will have a disproportionately high number of persons with post secondary (non-university) training once again.

#### **Comparisons of the Population of Alberta and the Study**

The study population represents between 72.6 percent of the 1971 Alberta population and 80.6 percent of the 1981 census population for the province of Alberta. Of the 19.4%

to 27.4% of the census population not covered by the study, the data collection criteria would suggest that most of this group will be residents of unorganized areas and hamlets of less than 200 population in 1981.

In 1971 (Table 9) for both males and females, the older age groups (55 - 64 for males and 70 + for females) were under-represented in the study data. The 20 - 24 year old age groups of males and females are over-represented categories. By 1976 (Table 10) the under-represented age group were those in the 10 - 14 year old range whereas the older age groups were over-represented, particularly for females. The 1981 data (Table 11) show yet another shift with the under-represented groups being the 5 to 9 year old females and the 10 to 14 year old males and the over-represented categories being the 20 to 24 year old age group for males and the 70 + age group for females.

These data do not suggest that, in terms of absolute numbers of persons, the population is necessarily shifting towards the communities represented by this study. Rather, what is being suggested is that in proportion to the overall population of the province, the shifts for the groups mentioned seem to be occurring.

Given that the shifts shown in the Alberta - Canada comparisons are not reflected in these data and given that the communities of residence are held constant throughout

**Table 9**

**Comparisons of the Population of Alberta and Study Population  
1971 CENSUS**

Age Groups	Males			Females		
	Alberta	Study	Stdy/Alta	Alberta	Study	Stdy/Alta
Totals	827785	600765	0.7258	800085	590977	0.7386
0 - 4	77610	56640	0.7298	74015	55035	0.7436
5 - 9	92085	64805	0.7038	88670	62850	0.7088
10 - 14	93410	64835	0.6941	88720	62045	0.6993
15 - 19	81970	57105	0.6967	78920	57910	0.7338
20 - 24	70575	56450	0.7998	71885	60025	0.8350
25 - 34	110630	86005	0.7774	108035	84750	0.7845
35 - 44	100855	74430	0.7380	92300	70395	0.7627
45 - 54	81750	57420	0.7024	80820	59920	0.7414
55 - 64	59420	40220	0.6769	57660	43565	0.7555
65 - 69	21835	14830	0.6792	20160	11326	0.5618
70 +	37645	28025	0.7445	39110	23156	0.5921

**Source :** Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971 Census of Canada, Service and Supply Canada, 1972.

Table 10

Comparisons of the Population of Alberta and Study Population  
1976 CENSUS

Age Group	Males			Females		
	Alberta	Study	Stdy/Alta	Alberta	Study	Stdy/Alta
Totals	932370	689164	0.7392	905665	690441	0.7624
0 - 4	78375	55645	0.7099	74550	53981	0.7241
5 - 9	83510	58735	0.7033	79490	56034	0.7049
10 - 14	95565	66105	0.6917	91645	64121	0.6997
15 - 19	98960	71650	0.7240	94255	70900	0.7522
20 - 24	94580	76645	0.8104	91425	76420	0.8359
25 - 34	150035	117935	0.7860	143955	112345	0.7804
35 - 44	106015	78005	0.7358	99810	74940	0.7508
45 - 54	93190	67565	0.7250	90200	68645	0.7610
55 - 64	66395	47505	0.7155	68155	53015	0.7779
65 - 69	23925	17385	0.7266	24555	19800	0.8064
70 +	41820	31989	0.7649	47630	40240	0.8448

Source : Statistics Canada, Census of Canada, General Population,  
Housing, Household, Family and Labour Force Data,  
1976 Census of Canada, Service and Supply, Ottawa Canada, 1977.

Table 11

Comparisons of the Population of Alberta and Study Population  
1981 CENSUS

Age Group	Males			Females		
	Alberta	Study	Stdy/Alta	Alberta	Study	Stdy/Alta
Totals	1143220	873769	0.7643	1094505	881993	0.8058
0 - 4	96680	72225	0.7471	91285	68085	0.7459
5 - 9	89300	64175	0.7186	84850	61125	0.6696
10 - 14	92125	64720	0.7025	87430	61620	0.7048
15 - 19	109705	80555	0.7343	104725	79500	0.7591
20 - 24	137025	114835	0.8381	127305	108475	0.8521
25 - 34	227690	186414	0.8187	207865	167584	0.8062
35 - 44	134190	100610	0.7498	125130	94450	0.7548
45 - 54	106085	78165	0.7368	97645	74335	0.7613
55 - 64	76190	55485	0.7282	79110	61905	0.7825
65 - 69	27005	19835	0.7345	30420	24789	0.8149
70 +	47235	36750	0.7780	58725	50125	0.8536

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1981 Census of Canada, Service and Supply Canada, 1982.

this time period, some actual population shifts are occurring. The direction of the shifts would appear to be towards the larger centers (i.e., urbanization). The elderly appear to be gravitating towards the larger centers and the young (20-24 year olds) seem to also be gravitating in the same direction.

This finding is not particularly surprising as the literature on rural to urban shifts supports the idea that the young move towards the "action centers" for jobs. The literature on aging suggests that the elderly gravitate towards centers of greater care resources.

#### Marital Status :

Tables 12, 13 and 14 show the changes that have occurred from 1971 to 1981 in the distribution of marital status categories across the study group and the province as a whole. In examining these tables it is interesting to note that the category that is always over-represented in the communities of this study is the divorced. This may be a result of an urban bias that may exist in the sample. Additionally, it would appear that there is a general shift among the married population towards the larger centers that is greater than the shift of other categories. The exceptional under-representation of widowed in the 1971 study group is unexplained. The only explanation available from

Table 12

Comparison of Marital Status Groups - Alberta and Study Group  
Census 1971

Group	Alberta	Study	Study/Alta
Never Marr. >15	293310	215320	0.7341
Married	737485	472685	0.6409
Widowed	61285	30215	0.4930
Divorced	21290	19080	0.8962
Totals	1113370	737300	0.6622

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971 Census of Canada, Service and Supply Canada, 1972.

this data set is found by comparing the population groups of females for this year and the widowed group. It is noted that there are fewer older females in the province in 1971 than in subsequent years. Given that females more frequently live longer than males, and that the widowed are more often older than younger, it is possible that this figure is an artifact of the age-sex distribution rather than of importance in its own right.

Table 13

Comparison of Marital Status Groups - Alberta and Study Group  
Census 1976

Group	Alberta	Study	Study/Alta
Never Marr. >15	366140	282175	0.7707
Married	865470	742370	0.8578
Widowed	69410	57298	0.8255
Divorced	33890	30390	0.8967
Totals	1334910	1112233	0.8332

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1976 Census of Canada, Service and Supply, Ottawa Canada, 1977.

Table 14

Comparison of Marital Status Groups - Alberta and Study Group  
Census 1981

Group	Alberta	Study	Study/Alta
Never Marr. >15	477280	381285	0.7989
Married	1083225	951425	0.8783
Widowed	79235	66950	0.8449
Divorced	56320	50265	0.8925
Totals	1696060	1449925	0.8549

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1981 Census of Canada, Service and Supply Canada, 1982.

Education Levels :

Table 15

Educational Level by Sex - Alberta and Study Data  
1971 Census

Grade	Males			Females		
	Alberta	Study	Stdy/Alta	Alberta	Study	Stdy/Alta
< Gr 5	26615	16355	0.6145	24225	17355	0.7164
Gr 5 - 8	113950	68800	0.6038	94035	64880	0.6899
Gr 9 -10	111040	75290	0.6780	113390	82430	0.7270
Gr 11-13	128120	98765	0.7709	155670	124040	0.7968
Post Sec	106040	86205	0.8129	100970	85345	0.8453
Some Uni	38945	33145	0.8511	40235	32295	0.8027
Grad Uni	40315	36700	0.9103	19885	18020	0.9062

Source : Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1971 Census of Canada, Service and Supply, Ottawa Canada, 1972.

As with the data pertaining to the Alberta/Canada comparisons, only 1971 and 1976 data are available for comparison of the study group and the census population of Alberta for the variable of education. Tables 15 and 16 relate the educational level by sex of the study group and the province. In examining these tables, it is notable that for males, in 1971 and in 1976, the greater the education the greater the representation of the provincial population group in the study group. This would seem to indicate that there is indeed a greater concentration of better educated males in the larger centers of the province.

Table 16

Educational Level by Sex - Alberta and Study Data  
1976 Census

Grade	Males			Females		
	Alberta	Study	Stdy/Alta	Alberta	Study	Stdy/Alta
< Gr 5	23215	15470	0.6664	23200	17895	0.7713
Gr 5 - 8	108265	68355	0.6314	88760	63625	0.7168
Gr 9 -10	129410	90395	0.6985	127590	94130	0.7378
Gr 11-13	167780	129350	0.7710	199095	157135	0.7892
Post Sec	116225	92735	0.7979	121185	100195	0.8268
Some Uni	67090	55750	0.8310	64270	52720	0.8203
Grad Uni	62945	55490	0.8816	35885	31315	0.8726

**Source:** Statistics Canada, Census of Canada, General Population, Housing, Household, Family and Labour Force Data, 1976 Census of Canada, Service and Supply, Ottawa Canada, 1977.

The situation for females is not directly comparable. It appears that, to some extent, the same type of relationship between representation in the study group and the amount of education exists. However, there are exceptions to this statement. Most notable are those females with less than a grade 5 education (functionally illiterate). This group seems to be represented in the larger centers to an extent that approaches the representation of the group of females with grade 9 - 10 education. Additionally, the distribution of educational attainment for males and females is not the same.

### The Representativeness of the Sample :

It can be seen that, given the size of the sample in relation to the overall population from which it was drawn, these data more than represent the total population of Alberta. However, severe biases do exist in the data. The sample is over-representative of areas with population bases greater than 200 in 1981 as this was the criterion for inclusion in the study. By definition then, the study does not represent the rural areas of the province.

After including these factors, the conclusion reached is that for the analysis of data relating to the regulated and organized portion of the province of Alberta, (those areas of greater than 200 population) these data are more than adequate.

### **Summary of Sample Findings**

This sample is representative of the organized communities of Alberta. A major feature of the sample, in relation to the total population of Alberta and of Canada is that of change. Over the past ten years, changes have occurred in the sex ratios, dependency ratios, age structure, educational composition and marital status distributions of the population of this province.

## Community Level Data

The following section of this chapter deals with community specific data and relates to the model of community outlined previously. It will be noted that there are overlaps in the data presented. These overlaps are necessitated by the interrelationships among the various components of this concept of community.

Data are presented that relate to the concepts of community-environment, community-resources, community-structural complexity, and social change and the community. The final descriptive section is concerned with the major dependent variable group - human attrition.

### Community - Environment Data :

#### Physical Environment :

An examination of the data pertaining to the environmental conditions within the province, confirms the initial conclusions regarding the province. The communities, by and large, are located in the foothills of the Rocky Mountains. The average height above sea level for these communities is 768.38 meters. Since the latitude of the province is from 49.00 degrees to 60.00 degrees north latitude, the average temperature of 0.244 degrees celsius is not surprising. The fact that the area has an average

rainfall of 29.67 centimeters (11.68 inches) and an average snowfall of 132.66 centimeters (52.23 inches) indicates the temperate nature of the area. The annual averages of 2144 hours of sunshine and 118 frost free days make much of the area an ideal summer farming environment.

**Table 17**

The Physical Environment of Alberta Communities

Characteristics	Mean	Std Dev	C.of Var.
Elevation	768.385	210.653	0.274
Average Temp.	0.244	0.156	0.639
Annual Rainfall	11.681	1.547	0.132
Annual Snowfall	52.228	15.251	0.292
Annual Hours Sun	2144.371	109.755	0.051
Number Frost free Days	118.131	33.480	0.283
Distance to Major Center	196.694	158.099	0.804

Finally, the average distance from a community to a major center (Edmonton or Calgary) is quite great (196.694 km), indicating that the population of the province not residing in either Edmonton or Calgary is indeed spread throughout its area and not concentrated about the major centers. This, coupled with the fact that the average density of population in the province is 3.5 persons per square kilometer, indicates a sparsely populated area as the setting of the study.

Variability across these indicators of the physical environment is shown in Table 17. By computing the coefficient of variation (Blalock 1979 : 84), the relative dispersion of these community characteristics may be compared. This coefficient is calculated using the following formula :

$$\text{C. of Var.} = \text{Standard Deviation} / \text{Mean}$$

In column 3 of Table 17 it can be seen that only the Distance to Major Centers, and the Average Temperature have great variability. The rest of the measures have relatively little dispersion.

Transportation Environment :

This dispersed population is linked through a transportation network within the province. As has been seen elsewhere (Weiss and Greenlick, 1970; Mechanic and Tessler, 1976), the distance to services not present in the community may have an effect on the utilization of those services. Although the focus of this study is not directly that of service utilization, the availability of services to the population is seen as an important factor in the assessment of the extent to which human attrition is evident in communities. For instance, with an average distance of 28.5 kilometers (Table 18) between communities and their nearest hospital, it can be seen that a time lag of at least 15 to 20 minutes exists between the time service is desired and the

time service is proximate. Similarly, with the distance to the nearest police detachment of 19.5 kilometers, a time lag of 10 to 15 minutes exists between the desire for, and the proximity of service. The effects that these time lags have on human attrition is unknown.

The fact that some 92% of Alberta communities have intercity bus service to their town, that railroads serve approximately the same percentage of communities, and that air service is available to one-quarter of the communities of the province is an indication of the availability of transportation linkages throughout the area.

Table 18

The Transportation Environment of Alberta Communities

Characteristics	Mean	Std Dev	C. of Var.
Distance to Major Center	196.694	158.099	0.804
Distance to Hospital	28.425	19.978	0.703
Distance to Police	19.452	10.083	0.518
Number of Railroads	1.857	1.435	0.773
Air Service	0.294	0.457	1.551
Bus Service	0.905	0.295	0.326

The map in Appendix C shows the grid system of highways and railroads that interconnect the area. Clearly, ground transportation is the most accessible means of transportation in Alberta.

The coefficient of variation again reveals the extent of dispersion across communities. For these items variability is very great on all items except the presence of bus service. It appears that some of these communities are remote, in terms of access to resources, and that unevenness exists in the services available within the province.

#### **Community Resources Data :**

The primary interest of this indicator of community is to assess the extent to which differences in resource bases exist among communities. As a result, an additional factor in the discussion of community must be introduced at this time. The size of the community in terms of its population is obviously closely related to the amount or number of resources available in a community. Where differences in population are not too great, univariate statistics such as a mean and standard deviation are reasonable and acceptable ways to describe data. Where however, there are vast differences in the population bases, as is the case for 9 of the 175 cases in this sample, those differences seriously bias the univariate statistics regarding communities.

Two different strategies exist for the handling of this problem. One method is simply not to use statistics based within the moment frame of reference. That is, instead of using the mean, the median or mode would be used, and instead

of using the standard deviation, the interquartile range would be used. Unfortunately, large quantities of information are lost with this method. The alternative method is far more appealing in that the familiar univariate statistics of the mean, standard deviation, and coefficient of variation remain, and the extremes are removed from the primary analysis for subsequent separate analysis. In the case of this study the 9 communities with a 1981 population of more than 10000 persons have been removed, and the analysis presented in the following table. The additional column of data represents the statistics that would have existed had these outliers not been removed.

The results of these manipulations of the data set are seen in Table 19. As can be seen, the differences between using the entire data set and using only part of the set are notable though not always important. Where there seems to be a rather important difference is in the data related to physically constructed items (hotel rooms, hospital beds, or shopping centres). It can be seen that the removal of the largest nine centers from the data set has clearly altered the mean and variance of the items. In most other cases the major difference between the two values appears to be in the variance, which given the effect that the inclusion of these extra cases has on the overall range of the variables is not surprising.

Table 19

## The Physical Resources of Alberta Communities

Community Characteristics	Part Sample *			Total Sample		
	Mean	Std Dev	C.ofVar	Mean	Std Dev	C.ofVar
Number Railroads	1.74	1.294	0.745	1.85	1.435	0.776
Number Shopping Centers	1.72	1.379	0.802	2.34	2.962	1.264
Number Financial Institutions	3.33	2.422	0.727	5.50	17.864	3.219
Number Apartments	113.90	169.372	1.487	212.67	556.316	2.616
Number Daycares	2.76	11.960	4.333	4.08	15.567	3.815
Number Elementary Schools	19.92	37.902	1.903	22.65	44.521	1.966
Number Junior Hi	29.77	44.137	1.483	30.65	47.404	1.547
Number High Sch	30.52	44.641	1.463	30.83	48.104	1.560
Number Hotel Rms	101.48	106.132	1.046	136.04	199.288	1.465
Number Nursing Homes	1.02	0.156	0.153	1.84	3.006	1.634
Number Seniors Homes	1.11	0.902	0.813	1.20	1.109	0.924
Number Hospital Beds	46.81	31.049	0.663	64.10	364.702	5.690

\* Communities with &lt; 10,000 persons, N = 166

## Physical Resources :

As can be seen from Table 19, the items in the listing of the physical resources available to the community are wide and varied. At the same time, the variation across the communities is also quite great. The removal of the nine largest communities from the data set has made considerable difference to the appearance of the data. Obviously, given the alteration of the standard deviations, and thus implicitly the variance, these communities were skewing the data. What remains after their removal is a far more homogeneous data set of resources. Still, the examination of the coefficients of variation show considerable variability even within this partial sample. In examining these resources several features are of interest. Items related to shelter (the number of apartments, the number of occupied dwellings), and to human welfare (schools, hospital beds, etc.) tend to be in greater abundance than more specialized items such as nursing homes, financial institutions, etc. Given the nature of most communities this is to be expected. What is somewhat surprising is the extent of the variation among these items. For instance, the variation across the communities for the number of elementary, junior high, and high schools is relatively unchanged by segregating the nine largest communities. When these communities are removed from the data set, the resulting variation is still much the same as it was for the entire sample. However, the removal

of the outliers has a very different effect on such items as the number of financial institutions, the number of hospital beds, the number of nursing homes, the number of senior citizen's homes, the number of shopping centers, or the number of apartments. This is as it should be if there is indeed a concentration of specialized resources in the larger centers. In the case of educational facilities, they are not, in comparison to those just mentioned, specialized, and therefore are a general part of the makeup of every community. Daycare centers are the only community characteristic which shows an increase in variability when the effects of the nine larger communities are removed. This would seem to indicate that the distribution of daycare centers throughout the province is not dependent upon community size. However, for the other indicators of physical resources within the community, the community size is positively related to the number of physical resources in the community.

#### Social or Human Resources :

For this study, social and human resources are defined as the extent to which there is available to the community a pool of intellectual and educated persons that can be used as a community resource.

Thus the extent to which the highest educated (those with greater than high school matriculation) reside in the community, and the extent to which the professionally trained reside in the community, are seen as the basis for determining this resource.

In Table 20 it is apparent that, as with the more specialized physical resources, the more specialized social or human resources tend to reside in the larger centers. The variation in means and standard deviations, when the nine largest communities of the province are removed from the data set, indicates that the contribution to the overall mean was such that the new mean is lower than the old. The exception here is for the item entitled Illiteracy Rate which in both 1971 and 1976 shows a wider variation (indicating more high and low scores) for the full data set than for the partial data set. Additionally, at least in 1976, the census data show that when the large centers are removed, the illiteracy rate of the communities increases.

Finally, this table shows that the professionally trained tend to locate in the larger centers. Although the full array of professional services is not represented here, it is felt that the other professions will also follow a similar pattern.

Table 20

The Human Resources of Alberta

Community Characteristics	Part Sample			Total Sample		
	Mean	Std Dev	C.of V	Mean	Std Dev	C.of V
1976 Top Educated / All educated	0.129	0.048	0.372	0.134	0.057	0.425
1971 Illit. Rate	0.075	0.065	0.867	0.077	0.070	0.909
1976 Illit. Rate	0.066	0.058	0.879	0.064	0.061	0.953
Number of Doctors	5.856	4.514	0.771	9.828	47.709	4.854
Number of Dentist	2.208	1.288	0.583	5.531	38.404	6.943

## Wealth and Poverty :

The concepts of wealth and poverty are, as mentioned previously, closely linked. The meaning of the indicators of poverty however, are not simply the inverse of the indicators of wealth. The manifestation of poverty is more than just the absence of wealth. It is a social condition and as with most social conditions, poverty is a difficult concept to operationalize. In the case of this study, the rate of public assistance services that are provided (in terms of number of case contacts per 1000 population) is the only available measure.

By way of comparison, the only measure of wealth available for the study is that of the number of financial institutions in the community. As previously discussed, the tendency of specialized services to be concentrated in large population centers affords a distorted view of the extent to which there is wealth in a community. As a result, several ancilliary indicators of wealth are being used. Among these are the extent to which accomodation in the community is owned as opposed to rented, and the average value of an average house (three bedroom bungalow).

The distribution of these indicators is shown in Table 21. The rates per 1000 population of public assistance service contacts is 389.00 for the less populated communities, and the standard deviation of 373.00 presents a

Table 21

## Wealth and Poverty in the Community

Community Characteristics	Part Sample			Total Sample		
	Mean	Std Dev	C.of V	Mean	Std Dev	C.of V
Public Assistance Cases/1000 pop	389.00	373.0	0.959	390.00	407.00	1.044
Number Financial Institutions	3.33	2.422	0.727	5.50	17.864	3.248
Ownership/ Occupancy 1981	0.73	0.117	0.160	0.73	0.147	0.201
Average 3 Bdrm Home 1980	71414	12635	0.177	72363	13095	0.181

situation wherein there is a great deal of variation in public assistance rates across the various communities. The inclusion of the larger centers in the data set does nothing to improve the situation and, in fact, increases the variation across communities.

It must be pointed out again that the rate of public assistance service contacts is **not** the same as the number of public assistance cases. As was previously mentioned, these data are derived from Community Health and Social Service data which have in turn been manipulated to reflect case worker activity rather than case counts.

#### **Community Structural Complexity Data :**

As has been described in the methods section, the measures of the concept of community structure are two-fold. The first is represented on Table 22 and indicates the institutional completeness of the communities. Here the operational question is, given the array of possible institutions in the communities, which are present and which are absent in each community?

Over all communities, a presence to absence ratio of 2.332 exists. This figure is comparable across each of the individual items and shows the extent to which a given item or set of items is over or under-represented in Alberta communities. That is to say for example, that given the

overall likelihood of any particular item to be present in a community (2.332 : 1 :: presence:absence), Alberta Liquor Control Board stores are over-represented across communities, as are Post Offices, schools, and paper deliveries. On the other hand, hospitals are under-represented as are dentists and nursing homes.

Since it is presumed that the larger centers will have all the community characteristics displayed on this listing, no total : partial sample analyses were completed for institutional completeness data. Additionally, because of missing data across many of these community indicators, calculations of the proportion of items present in each community could not be made.

Clearly, these items are intimately related to the other measure of community structure, namely institutional complexity. Table 23 displays the same array of items as Table 22, however, at this point, the question of interest is not which of the items are present or absent in a community but rather, the numbers that exist within the community. Here in particular, the exclusion of the nine largest centers has a direct impact on the summary statistics of the items. The association between the size of the community and the complexity of social roles is clear - as community size increases, more social roles become available.

Table 22

Community Institutional Completeness Data

Characteristics	Present	Absent	Ratio of P/A
Police	83	34	2.441
Fire Department	114	34	3.352
Railroad	107	8	13.375
Shopping Centers	67	108	0.620
Bus Service	106	10	10.600
Air Service	32	84	0.381
Welfare Office	24	124	0.194
Paper Delivery	113	3	37.666
TV Service	115	33	3.489
A.L.C.B.	103	41	2.512
Post Office	146	2	73.000
Fin Institutions	118	30	3.933
Apartments	108	67	1.612
Daycare	66	50	1.320
Elem. Schools	116	1	116.000
Junior High Sch	115	2	57.500
High School	105	12	8.750
Hotel	121	54	2.241
Organizations	109	66	1.652
Nursing Homes	41	75	0.546
Seniors Homes	96	20	4.800
Hospital	75	41	1.829
Doctor	97	20	4.850
Dentist	72	45	1.600

Within the items of institutional complexity are a subset of interest (highlighted). These are the social roles associated with the major dependent variable of the study, human attrition. Again it can be seen that the larger the community the greater the number of these specialized human services.

Table 23

Community Institutional Complexity Data

Community Characteristics	Part Sample			Total Sample		
	Mean	Std Dev	C.of V	Mean	Std Dev	C.of V
Number Police	13.57	98.317	7.25	20.67	124.578	6.03
Fire Dept. Size	32.08	99.984	3.12	31.01	135.709	4.38
Number Doctors	5.86	4.514	0.77	9.82	47.709	4.86
Number Dentists	2.21	1.288	0.58	5.53	38.404	6.94
Number Organiz'ns	11.14	9.404	0.84	20.50	90.172	4.40
Number Railroads	1.74	1.294	0.74	1.85	1.435	0.77
Number Shopping Centers	1.72	1.379	0.80	2.34	2.962	1.27
Number Financial Institutions	3.33	2.422	0.73	5.50	17.864	3.25
Number Apartments	113.90	169.372	1.49	12.67	556.316	2.62
Number Daycares	2.76	11.960	4.33	4.08	15.567	3.82
Number Elementary Schools	19.92	37.902	1.90	22.65	44.521	1.97
Number Junior Hi	29.77	44.137	1.43	30.65	47.404	1.55
Number High Sch	30.52	44.641	1.46	30.83	48.104	1.56
Number Hotel Rms	101.48	106.132	1.05	136.04	199.288	1.46
Number Nursing Homes	1.02	0.156	0.15	1.84	3.006	1.63
Number Seniors Homes	1.11	0.902	0.81	1.20	1.109	0.92
Number Hospital Beds	46.81	31.049	0.66	64.10	364.702	5.69

It should be noted that the listing of the items presented here as community institutional complexity items is almost identical to that of the physical resources in the community. In future analyses of these data, such confounding will have to be dealt with; however, in this description of the communities of Alberta such an overlap in data is not serious.

### **Social Change and the Community :**

For the purposes of this study the concept of social change has been seen as synonymous with demographic change, in particular, population growth or decline.

During the ten years that data have been collected on this province, growth has been one of the key descriptors of the province. The rapid development of the resource industries in Alberta, coupled with the increased importance of resource exploration from a national and international economic standpoint, has meant that the province has quickly become a land of opportunity. It was seen in the population data that the demographic structure of the province has shifted towards a younger, more technically educated population. The data related to the shifts in demographic structure within the sample are shown in Table 24.

In this table the lower growth rates of the larger communities are shown by the fact that the inclusion of the

Table 24

Community Social Change Data

Community Characteristics	Part Sample			Total Sample		
	Mean	Std Dev	C.of V	Mean	Std Dev	C.of V
5 year growth rate	287.67	477.130	1.65	163.05	776.589	4.76
10 year growth rate	527.44	775.365	1.47	179.54	887.525	4.94
15 year growth rate	826.07	1754.483	2.12	181.99	886.667	4.87
Sex ratio 1971	97.30	29.233	0.30	91.66	42.325	0.46
Sex ratio 1976	101.67	41.917	0.41	96.45	50.633	0.52
Sex ratio 1981	105.32	38.654	0.37	99.85	41.701	0.42
Dependency ratio 71	53.17	139.013	2.61	51.57	130.908	2.54
Dependency ratio 76	39.03	5.429	0.13	39.42	5.214	0.13
Dependency ratio 81	43.94	14.672	0.33	44.65	14.525	0.33
Gen. Fertility 1971	26.48	30.766	1.16	26.22	29.065	1.11
Gen. Fertility 1976	21.96	62.008	2.82	21.87	63.190	2.89
Gen. Fertility 1981	20.65	50.702	2.46	20.72	52.910	2.55

larger centers in the data set results in a decrease in the average growth rate of the province. This situation is true for the five year growth rate, is more so for the ten year growth rate and, in the case of the fifteen year growth rate, (1966 to 1981) is the most noticeable.

This same table shows that the smaller (< 10000 population) centers of Alberta are changing in terms of sex composition. The sex ratio for these communities shows that in 1971 there were more females than males. By 1981, the opposite was true. A similar trend is seen in examining the total sample data but it is not as obvious as in the partial sample.

#### HUMAN ATTRITION DATA

The major dependent variable of this study is to be measured in terms of several variables. For the most part, each variable is again measured by several other indicators. The complexity of this measurement scheme is necessitated by the fact that each of the sub-indicators, under certain circumstances, has merit as a dependent variable. Each indicator, while inter-related to all the respective sub-indicators, is for the most part related to the other indicators of human attrition.

### **Mental Health System Data :**

The first of the indicators to be dealt with is the one most directly related to the topic of this thesis. Mental illness in Alberta is measured by several items. The category of diagnosis at admission to the mental health program of the province is recorded on the M.H.I.S. data file and has been aggregated and included in Table 25. The variety of diagnoses, as well as the fact that case distributions across the 175 communities of this study result in unstable rates, has meant that only the provincial totals are presented for examination in this study.

Some questions exist regarding the reliability of the 1975 data for mental health. This was the year that the Community Health and Social Services Department commenced the Mental Health Information System (M.H.I.S.) for recording data and some "start up" problems may have existed. However, these 1975 cases have been included in calculations used in this study.

An examination of Table 25 shows that over the course of the seven years of the data collection, admissions to the system have nearly equalled discharges from it. However the ratio of inpatient admissions (those hospitalized) to total admissions to the system has steadily declined over the seven year period; the implication is that the system itself is undergoing some sort of a shift from inpatient to outpatient service provision.

Table 25

Mental Health Data 1975 to 1981  
Total and Partial Sample \*

Characteristics		1975	1976	1977	1978	1979	1980	1981	7 YEAR
Admissions	T	4557	8854	8979	9362	8580	9238	10352	59922
	P	1500	2718	5058	3617	3536	3678	4070	24177
Discharges	T	4910	7836	9318	9041	8377	9223	14365	58570
	P	3047	2563	3114	3338	3404	3845	5417	20228
Psychoses Admits	T	318	840	1427	1078	1090	1189	994	6656
	P	103	245	314	327	353	401	309	1772
Neurotic Admits	T	306	1358	1752	1906	1936	1896	1811	10965
	P	71	398	558	701	717	681	673	3799
Schizoid Admits	T	332	910	819	793	680	697	703	4934
	P	95	201	187	181	182	185	176	1202
Alcohol Admits	T	151	370	382	405	377	382	381	2448
	P	43	141	139	162	150	151	172	958
Tr Sit Dis Admit	T	368	666	1028	1537	1608	2379	2435	10021
	P	115	227	323	625	754	1083	1083	4210
No Diag Admit	T	3056	4697	3999	3631	2872	2683	4025	24963
	P	1047	1706	1542	1609	1363	1169	1654	10090
In Patient Admits	T	750	1935	1862	1714	1601	1555	1339	10756
	P	216	562	536	527	485	478	414	3218
Rate of Admission / 1000 pop. **	T	--	--	--	--	--	--	--	35.445
	P	--	--	--	--	--	--	--	81.271

T = Data on full sample of 175 communities

P = Data on partial sample which excludes > 10000 population cities

\* Source : Community Health and Social Service Mental Health  
Information System Data Base

\*\* Figure does not equal the calculation in chapter 3 due to  
inclusion of a full provincial population in the denominator.

The most common diagnosis upon admission to the system is the category of "no diagnosis," indicating that assessment or at least a 'non labelling' perspective, may very well be in operation in the system. Less encouraging in terms of the types of admissions to the system is the rapid increase (> 500%) in the admission category of Transient Situational Disorder. If the label were to be taken literally, it could be said that of the Albertans admitted to the mental health system between 1975 and 1981, an increasing proportion are being admitted because they are not able to adapt to the changes in circumstances in which they find themselves. Even if the first data entry (1975) were to be discounted as "noise" in the data caused by an unstable data collection system, the increase over the six year period for this diagnostic category is by far the greatest of all categories presented (> 265%).

The seven year, total sample rate of admission per 1000 population is comparable to other community studies (Cassel, 1970). However, the partial sample rates are somewhat alarming. A rate of 81.271 per 1000 population as a rate of admission to the mental health system is over double the rate that would be expected. Unlike other human attrition measures, the rate of admission to the mental health system is not attributed to communities. The assignment of cases to the communities is based upon the place of residence stated upon admission to the system.

Two distinct possibilities exist as an explanation for this finding. The first is that an error in terms of the classification of the place of residence has occurred in the data. That is, it is possible that the nine communities excluded from the partial sample have more cases than are apparent from the data. It is possible that upon admission, the place of residence may be interpreted by the admissions personnel as being the permanent or longest-term place of residence and not the most recent residence. Given the rural to urban shift of population that was noted elsewhere, this situation would seriously over-count mental health admissions in the smaller centers.

The second and more plausible explanation of this extreme rate of admission to the system is that it is real. It is perhaps best understood by comparing partial and total sample values of different diagnostic categories in Table 25.

The ratio of partial to total samples (an indication of the extent of contribution the smaller centers make to the total sample score) shows that the partial sample communities, although accounting for only 17.7% of the population of the total sample, contribute 40.3% of all admissions to the system over the seven year data collection period. At the same time, and over the same period, 34.5% of all discharges come from the partial sample communities. This clearly indicates that more cases are being admitted

than discharged for the partial sample communities. An examination of inpatient admissions, an indicator of severity of condition, shows only 29.9% of inpatients coming from the partial sample communities. This is still an over-representation of the partial sample communities but is not so great as for the admission data. This would suggest that the partial sample communities are contributing less severe types of cases than other communities. An examination of the types of cases admitted to the M.H.I.S. confirms this finding. The percentage of schizoid admissions from the partial sample communities (24.4%) as part of total admissions, is only slightly above the percentage of total population represented by these communities (17.7%). Psychotic admissions coming from the partial sample communities are slightly higher again at 26.6%. The more transient disorders, and those more directly associated with stress - alcoholism, transient situational disorders, and neuroses, show that the partial sample communities contribute 39.1%, 42.0%, and 34.6% respectively to the three diagnostic categories mentioned. This profile of the partial sample community case contribution is not surprising, given the previous finding of a lower severity of condition.

Finally, the partial sample communities contribute 40.4% of the "no diagnosis" cases to the total sample. This suggests that not only are the partial sample communities

contributing less severe cases to the total sample, but that many of the cases are not being diagnosed upon admission, a situation often reserved for cases awaiting or undergoing assessment.

To understand the above, it must be remembered that most partial sample communities do not have mental health services within their boundaries. These sorts of services are specialized and they tend to follow the pattern of spatial concentration of other specialized services in the larger centers. Thus, it is suggested that since partial sample community cases do not appear as severe cases, and since services are not readily available, referrals without diagnosis are made to the system. Then, when services of diagnosis are made available (a visiting mental health clinic), a diagnosis is made of a condition that may have subsided (transient situational disorder), or of an ongoing problem (alcoholism), or condition (neurosis). These data do not allow for the testing of this proposition. However it, together with the alternate suggestion of measurement error, is intuitively attractive as an explanation of the finding that the partial sample community rate of admission to mental health services is twice the total sample rate.

#### **Criminal Justice System Data :**

Data pertaining to criminal acts in the province of Alberta are collected by officers of the Royal Canadian

Table 26

Total Criminal Arrests by R.C.M.P. for Categorized Crimes  
1978 to 1981

Characteristics	Total Sample					Partial
	1978	1979	1980	1981	4 YEAR	4 YEAR
TOTALS						
Violent Crimes	14692	15202	16607	17719	64220	20493
Property Crimes	145354	129791	112616	104372	492133	107641
Other Crimes	41430	45579	52159	54457	193625	81374
RATES	TOTAL SAMPLE			PARTIAL SAMPLE		
	Mean	Std Dev	C of V	Mean	Std Dev	C of V
Violent crime/1000	58.00	187.30	3.257	65.00	203.00	3.120
Property Crime/1000	266.00	351.80	1.323	291.00	371.00	1.270
Other Crime /1000	170.00	271.70	1.598	190.00	289.00	1.520

Mounted Police and are shown in Table 26. These data show that for violent crimes (defined as crimes against the person in the Criminal Code of Canada), and other crimes (most often crimes of a summary nature or drug and other restricted article related offences), a trend of steady increases exists across the four year data collection period.

Property crime, defined as crimes not against the person but involving primarily theft and destruction of property, shows an opposite trend over the same time period. As with the data from the mental health system, stable annual community specific rates cannot be computed. However, four year average rates can be computed and show that for communities with populations of less than 10,000, per capita violent crime is more likely to occur than in the larger communities. Similarly, for property crimes and other crimes, living in the smaller communities of the province means more contact with crime.

The coefficient of variation calculated for these data shows slightly greater homogeneity among the partial sample communities than the total sample.

Table 27

Rates of Social Service Provision - Partial and Total Sample  
1978-1982

Service Types	Partial Sample			Total Sample		
	Mean	Std Dev	C. of V	Mean	Std Dev	C OF V
Public Assistance	0.389	0.373	0.959	0.390	0.407	0.958
Child Welfare	0.112	0.079	0.705	0.109	0.081	0.743
Family Protection	0.025	0.027	1.080	0.024	0.027	1.125

Table 27-A

Social Welfare Data  
1978:1982

Characteristics	1978	1979	1980	1981	1982	5 YEAR
Public Assistance	85046	79931	65425	60859	78254	369515*
Single Parent P.A.	55719	50640	39129	43121	45397	234006*
Total Child Welfare	19345	19515	19347	17234	21947	97388*
Family Service Prot	2488	2778	2854	5867	4585	18572*

\* 5 Year Data for Communities < 10,000 population  
 Public Assistance = 86625  
 Total Child Welfare=26279  
 Family Service Protection = 6042

## **Social Welfare System Data :**

Table 27 presents the provincial level data regarding the provision of services by the Community Social Services Branch from 1978 through 1982. These data do not directly count the number of cases provided with service but rather indicate the amount of services provided by the Branch. This figure is arrived at by a complex case data manipulation formula that, unfortunately, is not available to the study. Nevertheless, an indication of the extent to which the communities are receiving services related to Public Assistance in general, as well as Public Assistance for Single Parents, Total Child Welfare Services, and Family Support and Protection Services is provided by these data.

### **Summary**

From the previous summary in this chapter, it will be recalled that Alberta was described as a province of change. Changes were noted in the demographic structure of the population that were long term and indicated, to some extent, that change was a part of living in this province.

In the latter part of the chapter, data pertaining to the structure and diversity of communities in Alberta were presented. Here too, great variations existed. The analyses completed on the basis of total versus partial samples

demonstrated that the larger communities of Alberta are essentially different from the smaller communities. This finding was replicated in the data related to human attrition.

Slight differences exist between the larger and smaller communities in terms of social service provision. However, the crime rates showed that the larger communities had slightly less crimes per capita than the smaller communities. The mental health system admission data presented the most extreme example of the differences between the larger and the smaller communities. Rates of admission for the smaller communities were three times as high as the rates for the larger centers. This was explained, in part, as a result of the lack of services in the smaller areas and the methods of service delivery of the data recording agency.

## Chapter 5

### Results of Bivariate and Multivariate Analyses

This chapter will provide the results of the bivariate and multivariate analyses of the study data. Initially, the dependent variables will be examined in terms of how they may be conceived of as a conceptual and operational entity. Then these variables will be inter-correlated to see how they relate to one another. Finally, the dependent variables will be entered into a Smallest Space Analysis (Lingoes, 1966) and the results will be discussed.

The construction of the various independent variables will then be examined and the results of the construction analyzed. The bivariate relationships among these variables will be analyzed and they too will be entered into a Smallest Space Analysis to ascertain the underlying structure of the data.

As a final analytic stage of this chapter, the results will be assessed in the light of the hypotheses of the study and the results of such evaluation will be reported.

## Dependent Variable Analysis

The dependent variables of this study are all derived from the overall concept of human attrition. These data are presented in the form of rates per 1000 population drawn from the raw data in order to standardize the data for the size of the community. With the community as the unit of analysis, the individual data points comprising a given dependent variable are not relevant. The aggregation of those data points across communities is the only rational manner in which to relate the data point to the communities.

With this strategy in mind, certain problems immediately arise. The mental health data were collected with the place of residence of the incoming patient as the key case identifier. Unfortunately, this was not true for either the crime data or the social welfare data. In the case of the former, the data were aggregated according to the location of the police force attending the arrest. For Alberta and the communities in this data set, this means a total of 148 of the 175 communities have actual data regarding the crimes that have occurred within the communities.

For the social welfare data, the situation is potentially more serious. Community Health and Social Services delivers, (and also records data on delivery), services from only 34 community offices throughout the province. These offices serve the surrounding districts and

aggregate this service information as their community office records. Since it was possible to ascertain which communities were served by the community offices (see Appendix B), and also to determine the population of the community office service areas, the rates of service provision were attributed to the communities that did not have community social service offices. That is to say, if a community social service office was located in Peace River and no such office was located in Grimshaw, Fairview, Nampa, Manning or Berwyn but these communities received services from the Peace River office, their populations were added to the Peace River population. The Peace River / Group population rate of welfare service provision was attributed to all of these communities including Peace River. This conservative approach to the calculation of these rates blends the higher rates of the larger communities with the total population. The results are that the larger (and fewer) communities tend to be under-estimated and the smaller (and more plentiful) communities tend to be slightly over-estimated. Because of this attribution of these rates to all of the communities, the variance of the rates will be reduced. The slopes of the correlations with other variables will not be affected but the actual correlation will be somewhat inflated.

Crime :

Included in the data set are three variables related to the rates of crimes in the communities. These are the rates of violent crimes per 1000 population, the rates of property crimes per 1000 population and the rates of other crimes per 1000 population. The univariate description of these data was presented earlier (Table 26). The correlations among these items are shown in Table 28.

Table 28

Zero Order Correlations of Crime Data for Alberta  
1978 to 1981

	Violent Crime /1000	Property Crime /1000	Other Crime /1000
Violent Crime /1000	---		
Property Crime /1000	0.813	---	
Other Crime / 1000	0.894	0.941	---

Clearly, these data are interrelated, so much so that the relationship of any single one of these variables to any other variable would serve to represent the entire set of items.

What is interesting to note about these high correlations is that three relatively distant measures of crime should be associated with one another to this extent. That is, crimes against the person, crimes against property,

and other crimes (including drug and alcohol related offences and other criminal code offences) are often seen as distinct measures. Here, they appear to all be measuring the same thing - crime.

The correlations are so great that the simultaneous inclusion of them in any multiple regression equation would result in serious multicollinearity (Lewis-Beck, 1980). The items are so extremely correlated that they could be added together as a scale and would exhibit a very high internal reliability. To do so would, however, preclude the possibility of using individual items in relationship with other measures of human attrition. Thus, crime will be considered as a series of dependent variables for further analyses.

#### Social Services :

The univariate distributions of data pertaining to the provision of social services in the province of Alberta are shown in Tables 27 and 27-A. In Table 29 the correlations among these items are shown. The Pearson r's are not as high as might have been expected. This is surprising considering that a single service provider administers these programs through needs and means testing criteria.

In Table 29, a marked difference exists in the magnitude of correlations between the social assistance service provision and the family protection service provision ( $r = 0.68$ ), and between the social assistance service provision and the child welfare provision ( $r = 0.86$ ). This may reflect some degree of specificity of services within Community Health and Social Services. Since these data all reflect the degree of services provided, they may be interpreted as relationships across the types of services provided. Thus, the greater the Social Assistance services provided, the greater the Child Welfare services provided to a community. The greater the Family Protection services provided, the greater the Child Welfare services provided.

Table 29

Zero Order Correlations - Welfare Data 1978 - 1982

	Social Assistance Service Provision Rate	Family Protection Service Provision Rate	Child Welfare Service Provision Rate
Social Assistance	---		
Family Service	0.675	---	
Child Welfare	0.855	0.721	---

In terms of a statement of inequalities of correlations, these relationships may be described as :

Social Assistance < Family Protection < Child Welfare

This suggests that the provision of Social Assistance services is more associated with the Child Welfare service provision than with the Family Protection service provision, and that the Family Protection service provision is more closely associated with the Child Welfare service provision than with the Social Assistance service provision.

Zero order correlations of all the measures of human attrition are shown in Table 30. Of greatest interest in this table is the relative absence of significant correlations across operationally related variable groupings. The three measures of crime, previously mentioned, are both significantly and strongly associated with one another, as are the three measures of social service provision. With the exception of the significant, though weak, association between the rates of mental health admissions and the rates of social assistance service provision ( $r = 0.21$ ), and between the rates of mental health admissions and rates of child welfare service provisions ( $r = 0.20$ ), all other correlations are non-significant and extremely low. Unemployment rates are not associated with any of the other measures of human attrition. These findings are directly

Table 30

Zero Order Correlations - Human Attrition Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Rate Public Assistance	---							
(2) Rate of Family Protection	0.6749 ***	---						
(3) Rate of Child Welfare Service	0.8549 ***	0.7202 ***	---					
(4) Rate of Violent Crimes	0.0072	0.0235	-0.0071	---				
(5) Rate of Other Crimes	-0.0058	0.0445	0.0112	0.9053 ***	---			
(6) Rate of Property Crime	0.0254	0.0849	0.0411	0.8262 ***	0.9636 ***	---		
(7) Unemployment Rate	0.0593	0.0379	0.0389	-0.0587	-0.0519	-0.0578	---	
(8) Rate of Mental Health System Admissions	0.2089 **	0.0954	0.2027 **	-0.0587	0.0176	0.0664	0.0424	---

(Significance Levels \*\*\* p<.001 \*\* p<.01 \* p<.05 )

related to hypothesis 2.0 and will be discussed further in that context. At this point however, some additional comments on Table 30 will be discussed.

The indicators of social service provision do not correlate with the indicators of crime in any significant manner. The magnitude of these associations is negligible and it is reasonable to state, given these Pearson r's, that the measures are not correlated with one another.

From these findings it appears that operationally related measures of human attrition are associated only with one another. Social service provision data, as measured by social assistance, family protection, and child welfare service provisions are related to each other but not to most other measures of human attrition.

Table 31 presents the results of a Smallest Space Analysis (Lingoes, 1966). The underlying structure of the data is a one-dimensional solution with violent crime and unemployment as the two polar concepts. Equally clear is the ranking of the variables along this continuum. The crime variables are basically a single point at the one extreme of the scale. The social service variables and the mental disorders measure are in the middle of the scale and the unemployment variable is at the other pole of the scale. Figure 1 presents a two dimensional solution of the same data

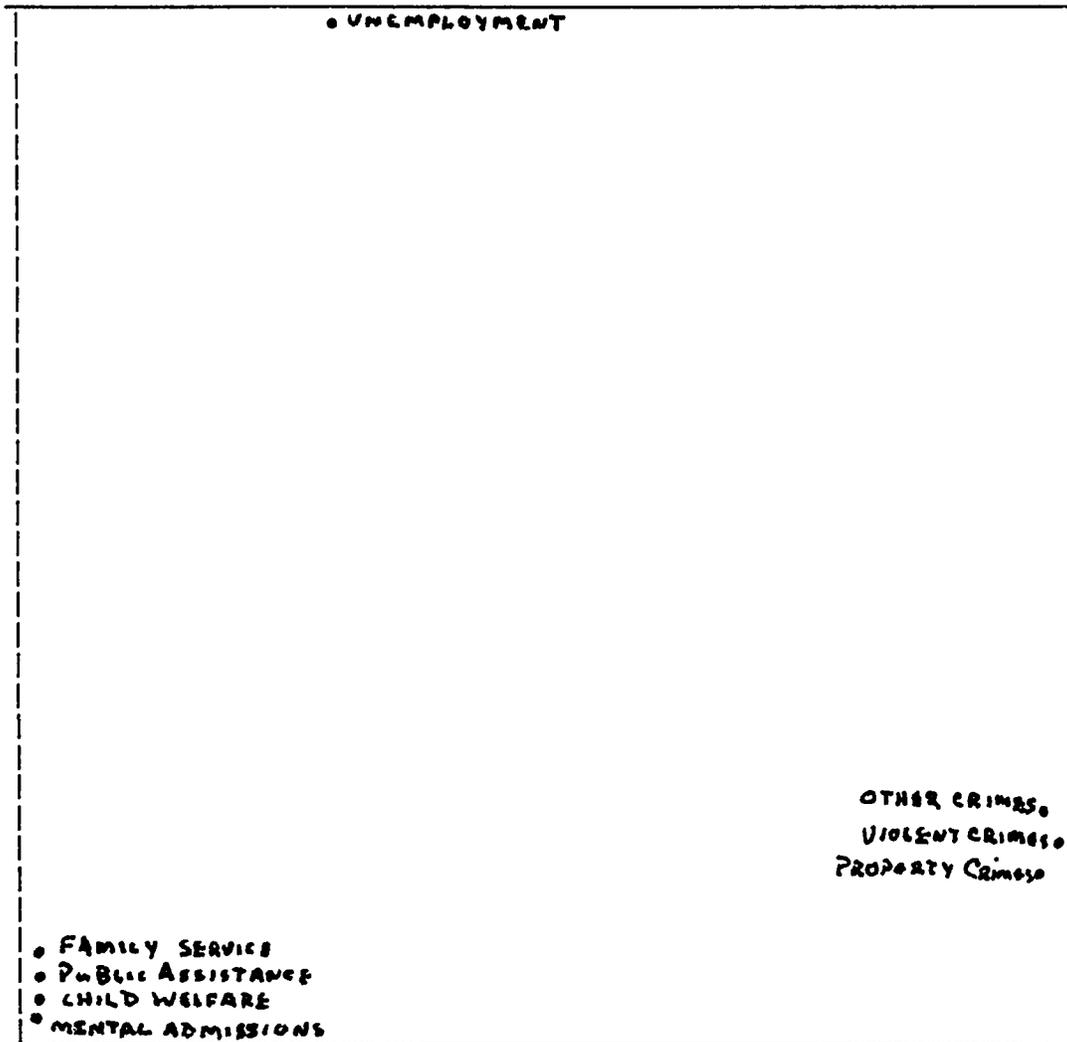
Table 31

Smallest Space Analysis Coordinates and Coefficients  
Human Attrition Measures

Item	One Dimensional Solution	Two Dimensional Solution	Three Dimensional Solution
(1) Mental Admissions	- 0.152	- 99.700 - 96.074	- 62.958 54.784 42.660
(2) Violent Crimes	100.000	100.000 - 81.162	100.000 27.547 - 29.788
(3) Property Crimes	99.653	99.110 - 81.412	81.208 34.560 - 14.692
(4) Other Crimes	99.803	99.611 - 81.105	91.089 20.861 - 16.036
(5) Social Assistance	- 0.327	- 99.999 - 95.073	- 78.274 68.576 - 36.482
(6) Family Service	0.051	- 99.200 - 95.544	- 55.929 75.717 - 42.660
(7) Child Welfare	- 0.252	-100.000 - 95.485	- 74.971 82.720 - 31.445
(8) Unemployment	-100.000	- 44.451 96.074	-100.000 - 82.720 - 26.535
Coefficient of Alienation	0.00104	0.00104	0.01391
Number of Iterations	28	73	100

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**Figure 1**  
Smallest Space Analysis  
Human Attrition  
Two Dimensional Solution



Coefficient of Alienation = 0.001

Number of Iterations = 73

and shows a similar pattern except that in two dimensions the three (or four, if mental disorders is considered a separate item from the social service items) constructs are presented as far away from one another as possible. Since the monotonic transformation in Smallest Space Analysis (S.S.A.) preserves the relationship among the correlations, it appears that the concepts of crime (social disruption), unemployment (economic potential loss), social service (social potential loss) and mental health (normative deviation) are not closely associated.

A further measure of the association among the measures of human attrition was made by use of the computer procedure Reliability, found in SPSS (Hull and Nie, 1979). Here, the intercorrelation of the items are assessed in two separate but related manners. The two statistics produced from this analysis are the Kuder - Richardson (Kuder and Richardson, 1937) measure of reliability for dichotomous item scales, and Cronbach's (Cronbach, 1951) alpha which is based on the average item to total correlation.

The results of this analysis reveal that a marginally acceptable scale ( $\alpha = 0.67$ ) could be obtained by an additive combination of the items in the set of human attrition measures. The exclusion of the social assistance item would present a stronger scale in terms of internal

reliability, although not necessarily in terms of construct validity. Thus, the eight items may be rationally considered as a scale that is internally reliable and has face validity.

**Table 32**

**Reliability Analysis of Construct  
Human Attrition**

Variable Name	Component Mean	Scale Mean If deleted	Scale Alpha if deleted
Social Welfare	0.3906	0.7281	0.7169
Child Welfare	0.1094	1.0093	0.5916
Family Protect	0.0237	1.0950	0.6159
Violent Crime	0.0575	1.0612	0.4977
Property Crime	0.2659	0.8528	0.4436
Other Crime	0.1701	0.9486	0.4407
Mental Admits	0.0580	1.0607	0.6233
Unemployment	0.0434	1.0753	0.6324

Kuder-Richardson (KR)=0.61551 Cronbach's Alpha = 0.67287

**Independent Variable Analysis**

The zero order correlations among most of the variables are presented in Table 33. In an effort to present these data in a more concise, reduced format, an attempt was made to create indexes of several of these variables. These scales were assessed for internal reliability in the manner described for the human attrition measures and only the acceptable scale was used in the analysis.

The scales established were Human Services (made up of a count of community resources related to the provision of services to the community), Social Positions (made up of a

Table 33

Zero Order Correlations of Independent Variables

VARIABLE	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
1. Police	---																
2. FireDep	.825 ***	---															
3. Doctors	.598 ***	.818 ***	---														
4. Dentist	.484 ***	.817 ***	.968 ***	---													
5. Railrds	.179 *	.248 **	.297 ***	.289 ***	---												
6. ShopGen	-.031	.519 ***	.817 ***	.803 ***	.308 **	---											
7. FinancI	.785 ***	.743 ***	.969 ***	.986 ***	.236 **	.474 ***	---										
8. Aptment	.060	.021	.910 ***	.931 ***	.196 *	.624 ***	.700 ***	---									
9. HotelRm	.408 ***	.381 ***	.599 ***	.519 ***	.310 ***	.543 ***	.544 ***	.811 ***	---								
10. Hi Schl	-.070	.168 *	.202 *	.303 **	.107	.493 ***	-.069	-.177 *	-.232 *	---							
11. Jr High	-.001	.221 **	.267 **	.350 ***	.152 *	.493 ***	.027	-.132	-.171 *	.961 ***	---						
12. ElemSch	.221 ***	.426 ***	.504 ***	.551 ***	.206 *	.536 ***	.328 ***	-.047	.035	.696 ***	.776 ***	---					
13. DayCare	.528 ***	.498 ***	.660 ***	.673 ***	.115	.305 *	.661 ***	.642 ***	.550 ***	.166 *	.268 *	.675 ***	---				
14. Nur. Hms	.556 ***	.741 ***	.917 ***	.887 ***	.421 ***	.928 ***	.982 ***	.860 ***	.569 ***	.509 ***	.591 ***	.905 ***	.989 ***	---			
15. SnCitHm	.258 **	.241 **	.478 ***	.393 ***	.044	.445 ***	.392 ***	.553 ***	.486 ***	-.233 **	-.174 *	-.108	.254 *	.474 ***	---		
16. HospBds	.472 ***	.815 ***	.955 ***	.993 ***	.320 ***	.801 ***	.969 ***	.664 ***	.533 ***	.300 **	.349 ***	.542 ***	.659 ***	.867 ***	.372 ***	---	
17. #HumSer	.897 ***	.977 ***	.855 ***	.809 ***	.257 **	.510 ***	.843 ***	.127	.450 ***	.112 *	.179 *	.413 ***	.568 ***	.786 ***	.302 ***	.860 ***	---
Mean	20.67	31.01	9.83	5.53	1.86	2.34	5.50	212.7	136.1	30.83	30.66	22.65	4.08	1.84	1.21	64.10	67.05
Std. Dev	124.6	135.7	47.71	38.40	1.44	2.96	17.86	556.3	199.3	48.10	47.40	44.52	15.57	3.01	1.11	364.7	316.2

Significance Levels \* P < .05 \*\* P < .01 \*\*\* P < .001

count of the total number of social position indicators in the community), and Communications Network (made up of a count of the number of communications related services in the community). Alphas for these scales were Human Services = 0.74, Social Positions = 0.47, and Communications Network = 0.31. In all instances, a marginal improvement of the scale alpha occurred with the deletion of certain items. Even with this procedure, only the Human Services index obtained an alpha score high enough to be rated as an internally reliable scale. Table 34 presents a reliability analysis of these items. The interpretation of the results is similar to the reliability analysis of the human attrition variables.

Table 34

Reliability Analysis of Construct  
Human Service Providers

Variable Name	Item Mean	Scale Mean if deleted	Scale Alpha if deleted
Police	20.67	110.47	0.6858
Fire Dept.	31.01	100.14	0.5854
Number Doctors	9.83	121.32	0.7109
Number Dentist	5.53	125.62	0.7261
No. Hosp Beds	64.10	67.04	0.8307
=====			
5 item scale : Kuder - Richardson coefficient = 0.9449			
Cronbach's Alpha = 0.7389			

This scale has been entered into the correlation matrix presented in Table 22. It clearly relates to its component items (r values between 0.81 and 0.98) and only moderately relates to other items.

Table 33 shows a few other interesting correlations. The educational items (the number of High Schools, Junior High Schools, and Elementary Schools) are inter-related with  $r$ 's of 0.96 for the number of High Schools to Junior High Schools, 0.78 for the number of Junior High Schools to Elementary Schools, and 0.69 for the number of Elementary Schools to High Schools. Since the reliability analysis displayed in Table 34 is based on the correlation matrix, it is not surprising to note that these human service items are highly inter-correlated (mostly with  $r > 0.8$ ). Medically oriented items (the number of doctors, dentists, hospital beds, and nursing homes) are also highly inter-correlated with most  $r$  values greater than 0.6.

Among the correlations that are not as easy to interpret in Table 33 are those between the number of financial institutions and the number of police, fire department members, doctors, dentists, and daycare centers. Why these items should be significantly correlated at  $r$ 's in excess of 0.66 is unclear. The only plausible explanation appears to be that it is an artifact of the size of the community. That is, the larger communities have more of these items and smaller communities have fewer.

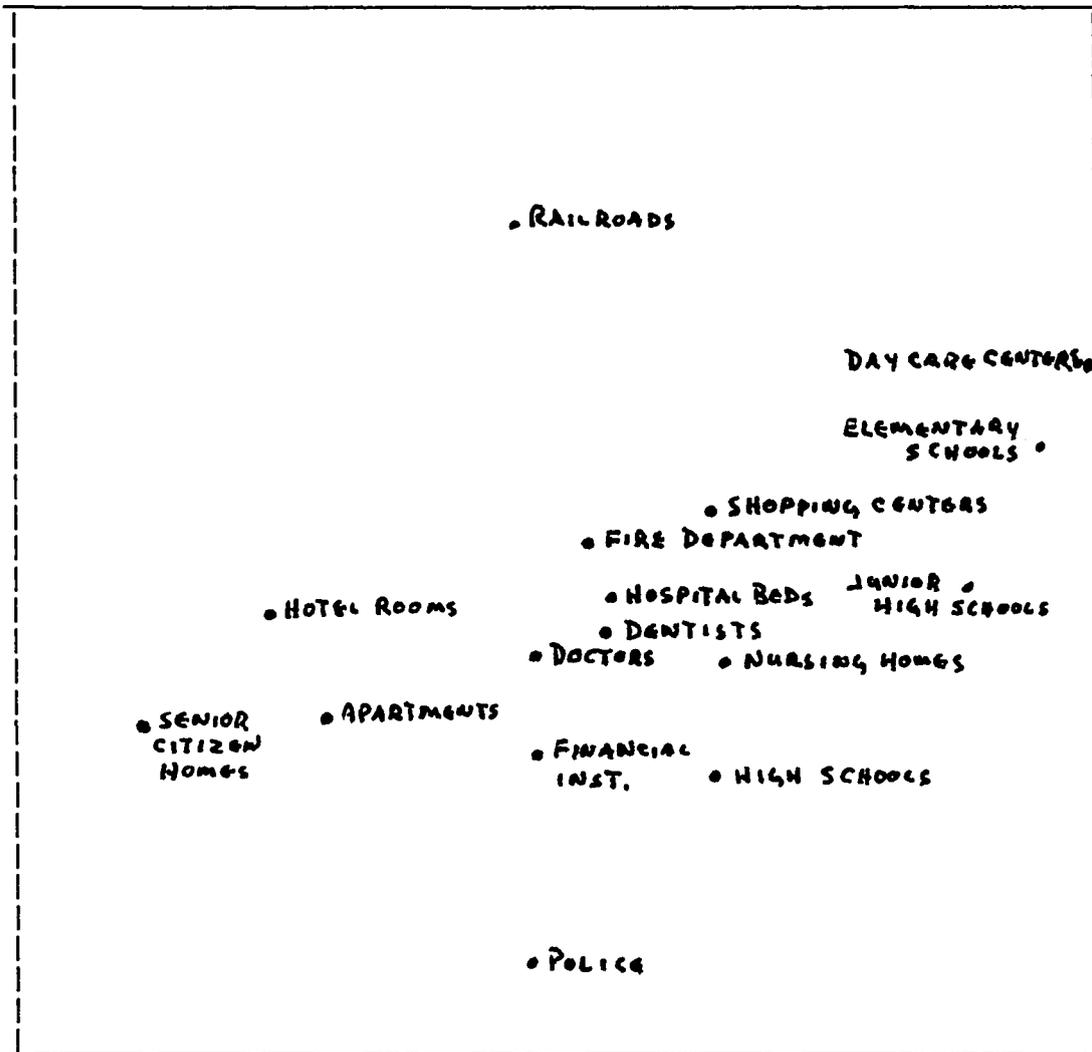
The result of the S.S.A. on the correlation matrix of these variables is presented in Table 35. It appears from this table that a minimally acceptable three dimensional

Table 35

Smallest Space Analysis Coordinates and Coefficients  
Independent Variables

Item	One Dimensional Solution	Two Dimensional Solution	Three Dimensional Solution
Police	- 6.202	- 7.714 - 82.064	- 27.184 25.679 62.724
Fire Dept Size	22.975	7.200 - 1.925	0.023 8.713 35.198
Number of Doctors	19.008	- 2.957 - 27.571	- 8.993 44.214 - 8.840
Number of Dentists	25.080	6.534 - 23.332	0.044 41.046 - 21.917
Number of Railroads	- 4.340	- 10.610 62.141	- 3.124 - 61.335 - 5.398
Number Shopping Centres	48.822	31.972 5.933	27.822 40.306 - 58.056
Number Financial Inst.	13.174	- 6.648 - 42.827	- 15.051 51.719 7.012
Number Apartments	- 20.930	- 41.962 - 36.919	- 33.535 74.537 - 40.927
Number Hotel Rooms	- 20.392	- 52.058 - 15.758	- 66.533 52.311 - 1.487
Number of Day cares	100.000	100.000 32.090	100.000 - 18.235 - 35.210
Elementary Schools	87.808	89.725 19.458	94.410 - 3.995 - 20.506
Junior High Schools	67.623	72.654 - 12.269	72.284 22.617 9.372
High Schools	33.461	25.984 - 52.657	19.834 70.203 18.896
Nursing Homes	37.350	25.464 - 29.219	23.855 48.319 - 3.727
Senior Citizen Homes	- 42.568	- 79.322 - 37.414	- 73.711 36.282 - 62.724
Number of Hospital Beds	25.557	7.367 - 18.306	1.921 28.425 - 21.102
Coefficient of Alienation	0.338	0.199	0.129
Number of Iterations	13	26	69

**Figure 2**  
 Smallest Space Analysis  
 Community Indicators  
 Two Dimensional Solution



Coefficient of Alienation = 0.199

Number of Iterations = 26

solution exists for these data. The groupings of the items resulting from this solution is presented in two dimensions on Figure 2. The human service providers are seen to group together, and the educational resource items tend to group together. However, the other items considered as independent variables in this study do not appear to group into clear rational clusters. The error factor in the monotonic transformation (the fact that a "good fit" exists in more than the three dimensions) may account for some of this but an examination of Table 33 shows that primarily the items just are not that closely associated.

The foregoing discussion of the correlation matrix is applicable to the analysis of results displayed in Figure 2. As mentioned above, the transformation of that matrix into a 2 dimensional space does not produce a "good fit" for the data and some of these relationships will not be apparent.

### **The Combination of Dependent and Independent Variables**

One of the objectives of a study of this nature is to ascertain the extent to which the dependent variables are related to the independent variables. The following Smallest Space Analysis is presented as an attempt to explain this relationship. Table 36 presents the one, two, three, and four dimensional solution to these data. It is noted that the "best fit," or solution with the least error in

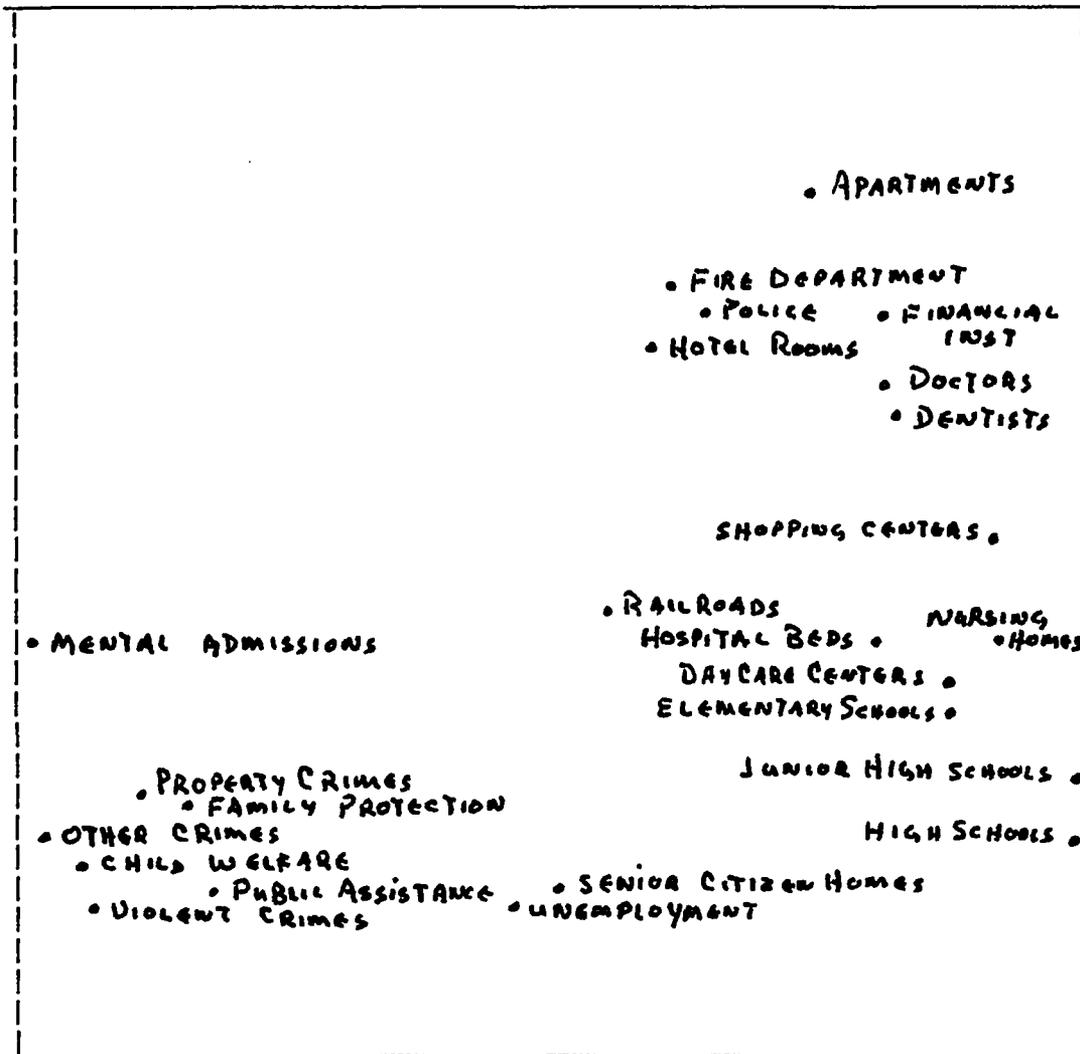
Table 36

Smallest Space Analysis Coordinates and Coefficients  
Independent and Dependent Variables

Item	One		Two		Three		Four	
	Dimensional Solution	Dimensional Solution	Dimensional Solution	Dimensional Solution	Dimensional Solution	Dimensional Solution	Dimensional Solution	Dimensional Solution
Police	14.201	24.508	46.348	27.631	44.690 - 73.696	30.325 - 44.454	76.153	16.779
Fire Department	34.332	48.180	11.010	48.312	20.728 - 56.104	51.338 - 22.658	60.267 - 33.051	
Doctors	39.990	58.622	33.345	63.787	41.729 - 12.003	67.557 - 45.794	9.911 - 14.960	
Dentists	42.654	64.222	26.678	69.250	33.696 - 9.638	73.128 - 37.637	12.105 - 28.440	
Railroads	6.600	10.900 - 17.347		11.875 - 27.961	4.502	13.315 10.993	9.976	59.341
Shopping Centers	61.441	83.558 - 0.213		85.718 7.086	30.394	90.369 - 8.551 - 38.649 - 27.694		
Financial Inst.	35.217	57.917	44.512	62.955	53.281 - 21.544	66.945 - 58.671	25.911 - 10.987	
Apartments	18.463	43.838	71.877	46.409	69.186 26.621	48.026 - 75.999 - 33.610 - 8.902		
Hotel Rooms	0.171	8.304	40.284	11.791	45.832 30.239	11.511 - 52.612 - 35.406 - 32.192		
High Schools	100.000	100.000 - 67.605		98.227 - 82.104 - 30.467		98.640 82.116	22.739 - 41.801	
Jnr High Schools	90.161	99.716 - 54.821		100.000 - 69.415 - 23.668		100.000 74.546	28.317 - 18.041	
Elementary School	69.483	80.994 - 36.672		85.090 - 43.029 - 42.185		90.490 48.029	4.385 7.398	
Day Care Centers	55.620	84.600 32.947		95.152 22.972 - 36.222		95.537 - 24.899	17.888 31.098	
Nursing Homes	60.816	83.154 21.126		92.971 23.531 - 14.818		99.152 - 26.542	10.729 2.591	
Senior Cit Hms	- 8.155	0.474 74.234 - 4.228		84.368 11.694 - 4.929 - 82.116 - 26.305 24.758				
Hospital Beds	41.024	61.442 23.217		66.049 27.554 - 11.084		69.955 - 31.951	13.604 - 36.628	
Public Assistance	- 68.958 - 61.440 - 75.418 - 58.406 - 84.368 - 22.115 - 57.572 81.309 14.076 - 27.510							
Family Protection	- 72.697 - 72.319 - 54.085 - 74.491 - 57.503 - 35.477 - 65.294 64.386 49.307 - 1.458							
Child Welfare	-100.000 - 79.206 - 71.243 - 75.384 - 76.373 - 45.883 - 79.309 73.766 9.875 19.406							
Violent Crime	- 80.339 - 83.770 76.165 - 85.868 61.804 - 62.111 - 85.352 - 60.317 62.718 - 34.705							
Other Crimes	- 94.306 - 95.418 65.450 -100.000 62.233 - 31.169 -100.000 - 64.930 32.261 3.601							
Property Crimes	- 60.718 - 75.186 54.483 - 81.326 54.463 - 26.998 - 82.800 - 59.844 26.248 - 18.073							
Mental Admissions	- 89.487 -100.000 - 20.537 - 85.859 - 16.905 59.686 - 75.153 19.914 - 60.896 - 59.341							
Unemployment Rate	- 24.727 - 7.169 - 76.165 - 4.318 - 47.063 73.696 - 3.472 36.608 - 76.153 34.601							
Coef. of Alienation	0.335	0.172		0.120		0.098		
Number of Iterations	11	34		41		100		

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**Figure 3**  
 Smallest Space Analysis  
 Community and Human Attrition Indicators  
 Two Dimensional Solution



Coefficient of Alienation = 0.172

Number of Iterations = 34

transformation is the four dimensional solution. In the interests of clarity and parsimony however, the two dimensional solution is presented in Figure 3.

The first and most obvious feature of this presentation is that the human attrition items are polarized away from the community indicators. The second point to be made is that the previously described grouping among those measures of human attrition is preserved even in the light of their association with a wide range of other variables.

The independent variables in this study, the community indicators, remain as entities separate from the dependent variables and, with the exception of those previously mentioned items, separate from one another. The clustering appears to be random with respect to any underlying schema (eg. facilities versus services, etc.).

### **Hypotheses**

It will be recalled that three hypotheses were posed for testing. The results of that analysis are set out by hypothesis in the following pages.

#### **Hypothesis 1.0**

A positive relationship exists between the rate of social change and the rate of human attrition. Attrition will be higher for rapid social change communities than for slow social change communities.

Tables 37, 38, and 39 show the zero order correlations of the indicators of human attrition and the rate of growth for rapid growth communities and for slow growth communities across a five year, ten year, and fifteen year period.

If the hypothesis is to be supported, evidence of positive correlations between the measure of human attrition and the growth rate should appear and the associations should be stronger in rapid growth communities than in slow growth communities.

For the majority of correlations in Tables 37, 38, and 39 with 5, 10 and 15 year growth rates, non significant, low magnitude Pearson r's result. Where significant values occur (various crime measures and growth rates, and mental health system admissions and growth rates), the magnitude of the correlations is moderate to low and the sign of the correlation is negative. These relationships are inverse and show that the greater the rate of growth the lower the rates of attrition.

Clearly Tables 37, 38, and 39 do **not** support this hypothesis. Quite the contrary appears to be the case. Almost consistently, the Pearson r's are negative in association with the growth measures, and by and large, they are of greater magnitude for low growth communities. The implication here is two fold : first, the hypothesis is not supported, and second, the opposite to the proposed relationship seems, in fact, to be the case.

**Table 37**  
Zero Order Correlations of Human Attrition Variables and Growth Rates  
for High and Low Growth Communities  
Five Year Growth Rate\*

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MEAN SCORES	71.43	169.67	236.57	0.419	0.024	0.117	0.072	0.195	0.284	0.048	0.060
Std Deviations	133.15	217.54	498.79	0.508	0.026	0.093	0.257	0.338	0.413	0.088	0.042
(1) Grow 5 yr	---	0.711 ***	0.299 **	-0.132	-0.087	-0.074	-0.043	0.011	0.040	-0.587 ***	0.157
(2) Grow 10 yr	<b>0.963</b> ***	---	0.402 ***	-0.093	-0.045	-0.057	-0.083	-0.002	0.046	-0.406 ***	-0.007
(3) Grow 15 yr	<b>0.944</b> ***	<b>0.993</b> ***	---	-0.048	-0.080	-0.057	-0.065	-0.016	0.027	-0.136	-0.012
(4) Pub Assist	-0.114	-0.099	-0.103	---	0.612 ***	0.888 ***	-0.018	-0.033	-0.003	0.062	0.248 *
(5) Fam Prot	-0.106	-0.098	-0.101	<b>0.912</b> ***	---	0.711 ***	-0.014	0.026	0.063	0.067	0.149
(6) Child Wel	-0.066	-0.050	-0.056	<b>0.792</b> ***	<b>0.773</b> ***	---	-0.048	-0.044	-0.011	0.031	0.233 *
(7) Viol Crime	-0.231 *	-0.222 *	-0.225 *	<b>0.181</b> *	<b>0.209</b> *	<b>0.190</b> *	---	0.934 ***	0.877 ***	-0.073	-0.118
(8) Oth Crime	-0.252 *	-0.242 *	-0.246 *	<b>0.066</b>	<b>0.085</b>	<b>0.127</b>	<b>0.955</b> ***	---	0.969 ***	-0.079	-0.098
(9) Prop Crime	-0.276 **	-0.265 **	-0.269 **	0.095	0.122	0.136	<b>0.936</b> ***	<b>0.970</b> ***	---	-0.093	-0.058
(10) Unemplmnt	-0.013	0.005	0.006	-0.001	-0.043	0.040	<b>0.067</b>	<b>0.073</b>	<b>0.095</b>	---	0.047
(11) Ment Adm	-0.439 ***	-0.422 ***	-0.428 ***	0.140	0.040	0.148	<b>0.231</b> *	<b>0.247</b> *	<b>0.269</b> **	<b>0.029</b>	---
MEAN SCORES	331725	365179	370091	0.360	0.023	0.101	0.043	0.145	0.246	0.038	0.056
Std Deviations	1085341	1242544	1240552	0.264	0.028	0.066	0.057	0.177	0.275	0.023	0.039

Significance Levels \*\*\* P < .001 \*\* P < .01 \* P < .05

\* High Growth Comm. (N=86) in Bold Low Growth Comm. (N=89) are not

**Table 38**  
Zero Order Correlations of Human Attrition Variables and Growth Rates  
for High and Low Growth Communities

Variable	Ten Year Growth Rate*										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MEAN SCORES	20775.1	133.62	229.19	0.434	0.024	0.117	0.066	0.167	0.234	0.049	0.065
Std Deviations	195095	183.47	506.83	0.520	0.027	0.088	0.257	0.338	0.408	0.088	0.042
(1) Grow 5 yr	---	-0.077	-0.048	-0.056	-0.070	-0.089	-0.028	-0.053	-0.063	0.027	-0.166
(2) Grow 10 yr	<b>0.980</b> ***	---	0.413 ***	-0.045	-0.058	-0.058	-0.106	-0.062	-0.065	-0.462 ***	0.162
(3) Grow 15 yr	<b>0.961</b> ***	<b>0.993</b> ***	---	0.060	0.127	0.033	-0.054	-0.033	0.006	-0.122	-0.000
(4) Pub Assist	-0.094	-0.092	-0.096	---	0.657 ***	0.924 ***	-0.014	-0.029	0.011	0.053	0.218 ***
(5) Fam Prot	-0.092	-0.094	-0.098	<b>0.886</b> ***	---	0.671 ***	-0.019	-0.010	0.041	0.054	0.134
(6) Child Wel	-0.049	-0.049	-0.055	<b>0.777</b> ***	<b>0.791</b> ***	---	-0.059	-0.064	-0.021	0.028	0.201 *
(7) Viol Crime	-0.255 **	-0.259 **	-0.263 **	<b>0.175</b>	<b>0.239</b> *	<b>0.251</b> *	---	0.941 ***	0.894 ***	-0.069	-0.124
(8) Oth Crime	-0.282 **	-0.286 **	-0.290 **	<b>0.103</b>	<b>0.155</b>	<b>0.192</b> *	<b>0.953</b> ***	---	0.975 ***	-0.066	-0.086
(9) Prop Crime	-0.305 **	-0.310 **	-0.314 **	<b>0.116</b>	<b>0.159</b>	<b>0.176</b>	<b>0.941</b> ***	<b>0.963</b> ***	---	-0.077	-0.041
10) Unemplmnt	-0.044	0.007	0.009	<b>0.036</b>	-0.008	<b>0.069</b>	<b>0.062</b>	<b>0.057</b>	<b>0.082</b>	---	0.006
11) Ment Adm	-0.391 ***	-0.397 ***	-0.402 ***	<b>0.162</b>	<b>0.046</b>	<b>0.174</b>	<b>0.250</b> *	<b>0.252</b> *	<b>0.290</b> **	<b>0.158</b>	---
MEAN SCORES	<b>310299</b>	<b>365216</b>	<b>370099</b>	<b>0.344</b>	<b>0.023</b>	<b>0.101</b>	<b>0.049</b>	<b>0.174</b>	<b>0.294</b>	<b>0.038</b>	<b>0.051</b>
Std Deviations	<b>1073324</b>	<b>1242533</b>	<b>1240550</b>	<b>0.233</b>	<b>0.028</b>	<b>0.073</b>	<b>0.056</b>	<b>0.181</b>	<b>0.291</b>	<b>0.021</b>	<b>0.038</b>

Significance Levels    \*\*\* P < .001    \*\* P < .01    \* P < .05  
\* High Growth Comm. (N=86) in **Bold** and Low Growth Comm. are not

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**Table 39**  
**Zero Order Correlations of Human Attrition Variables and Growth Rates**  
**for High and Low Growth Communities**  
**Fifteen Year Growth Rate\***

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MEAN SCORES	20788	163.47	100.99	0.435	0.025	0.119	0.064	0.164	0.235	0.046	0.063
Std Deviations	195093	228.31	293.22	0.520	0.028	0.092	0.257	0.339	0.410	0.088	0.041
(1) Grow 5 yr	---	-0.076	-0.037	-0.057	-0.069	-0.088	-0.027	-0.052	-0.062	0.030	-0.162
(2) Grow 10 yr	<b>0.980</b> ***	---	0.255 **	0.032	0.123	0.032	-0.115	-0.107	-0.097	-0.403 ***	0.026
(3) Grow 15 yr	<b>0.961</b> ***	<b>0.993</b> ***	---	-0.066	-0.195 *	-0.007	-0.076	-0.018	0.028	-0.314 **	0.187 *
(4) Pub Assist	-0.093	-0.091	-0.094	---	0.639 ***	0.891 ***	-0.031	-0.054	-0.022	0.049	0.213 *
(5) Fam Prot	-0.090	-0.092	-0.096	<b>0.901</b> ***	---	0.702 ***	-0.043	-0.038	0.004	0.035	0.098
(6) Child Wel	-0.041	-0.041	-0.048	<b>0.802</b> ***	<b>0.768</b> ***	---	-0.064	-0.062	-0.017	0.020	0.202 *
(7) Viol Crime	-0.262 **	-0.266 **	-0.269 **	<b>0.362</b> ***	<b>0.362</b> ***	<b>0.320</b> **	---	0.940 ***	0.891 ***	-0.064	-0.119
(8) Oth Crime	-0.287 **	-0.292 **	-0.296 **	<b>0.217</b> *	<b>0.221</b> *	<b>0.223</b> **	<b>0.943</b> ***	---	0.976 ***	-0.061	-0.088
(9) Prop Crime	-0.312 **	-0.317 **	-0.321 **	<b>0.236</b> *	<b>0.229</b> *	<b>0.203</b> *	<b>0.932</b> ***	<b>0.959</b> ***	---	-0.071	-0.038
(10) Unemplmnt	-0.076	-0.026	-0.024	0.115	0.068	0.130	0.017	0.019	0.028	---	0.033
(11) Ment Adm	-0.395 ***	-0.401 ***	-0.406 ***	0.202 *	0.082	0.177	0.231 *	0.245 *	0.267 **	0.089	---
MEAN SCORES	<b>310285</b>	<b>365185</b>	<b>370232</b>	<b>0.343</b>	<b>0.022</b>	<b>0.099</b>	<b>0.051</b>	<b>0.177</b>	<b>0.297</b>	<b>0.040</b>	<b>0.053</b>
Std Deviations	<b>1073329</b>	<b>1242542</b>	<b>1240510</b>	<b>0.233</b>	<b>0.026</b>	<b>0.066</b>	<b>0.057</b>	<b>0.180</b>	<b>0.279</b>	<b>0.021</b>	<b>0.039</b>

Significance Levels \*\*\* P < .001 \*\* P < .01 \* P < .05  
\* High Growth Comm. (N=86) in Bold and Low Growth Comm. are not

However, even though the hypothesis is not supported, these tables contain other interesting findings.

Across all these tables a significant, though weak and negative association exists between rates of growth and the rates of violent, other, and property crimes for high growth communities. The relationship is not present for low growth communities. For high growth communities, these correlations appear as an array with the violent crime/5 year growth rate correlation as the low end of the continuum and property crime/15 year growth rate as the upper end. This suggests that sustained, high growth has a negative impact on crime rates in the community.

A stronger relationship occurs across these three tables for growth rates (5, 10, and 15 year) and mental health system admissions. Again, the relationship is negative and again, it is present for the high growth communities and not the low growth communities. Growth appears to have a negative influence on this measure of human attrition as well.

Finally, a comment on the associations not involving growth (other than as a selection parameter) is warranted. It will be noted from Tables 37, 38, and 39 that the correlations among the operationally related variables (violent crime, other crime, and property crime, and social assistance, child

welfare, and family protection service provision) are still the strongest of all Pearson r's. Generally these correlations are also strongest for high growth communities as compared to low growth communities.

Table 39 shows an interesting association among the crime measures and the social service measures. For high growth communities, this table (which selects communities into high versus low growth groups based upon 15 year growth rates) presents significant, positive correlations across the two groups of data. That is, the greater the social assistance service provision the greater the violent crime rate ( $r = 0.362$ ), the greater the child welfare service provision the greater the violent crime rate ( $r = 0.320$ ), and the greater the family protection service provision the greater the violent crime rate ( $r = 0.362$ ).

This relationship does not emerge for the low growth communities, nor is it as strong for the other two tables in this set.

Human attrition, as measured by the rates of crime, social service provision, mental health system admissions, and unemployment appears to be negatively associated with rates of community growth.

### **Hypothesis 1.1**

Across all contexts an inverse relationship exists between the indicators of human attrition and the indicators of the community's ability to absorb the shock of social change.

Table 40

Zero Order Correlations - Human Attrition Variables and Selected Communities

Variable Name	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Police	---														
(2) Fire	<b>.83</b>	---													
(3) Doctors	<b>.60</b>	<b>.82</b>	---												
(4) Dentists	<b>.48</b>	<b>.82</b>	<b>.97</b>	---											
(5) Railroads	<b>.18</b>	<b>.25</b>	<b>.30</b>	<b>.29</b>	---										
(6) Shop Cent	<b>.03</b>	<b>.52</b>	<b>.82</b>	<b>.80</b>	<b>.31</b>	---									
(7) Financial	<b>.79</b>	<b>.74</b>	<b>.97</b>	<b>.99</b>	<b>.24</b>	<b>.47</b>	---								
(8) Apartment	<b>.06</b>	<b>.02</b>	<b>.91</b>	<b>.93</b>	<b>.20</b>	<b>.62</b>	<b>.70</b>	---							
(9) HotelRoom	<b>.41</b>	<b>.38</b>	<b>.56</b>	<b>.52</b>	<b>.32</b>	<b>.54</b>	<b>.54</b>	<b>.81</b>	---						
(10) High Sch	<b>-.07</b>	<b>.17</b>	<b>.20</b>	<b>.30</b>	<b>.11</b>	<b>.49</b>	<b>-.07</b>	<b>-.18</b>	<b>-.23</b>	---					
(11) JuniorHigh	<b>.00</b>	<b>.22</b>	<b>.27</b>	<b>.35</b>	<b>.15</b>	<b>.49</b>	<b>.03</b>	<b>-.13</b>	<b>.17</b>	<b>.96</b>	---				
(12) ElemSchool	<b>.22</b>	<b>.43</b>	<b>.50</b>	<b>.55</b>	<b>.21</b>	<b>.54</b>	<b>.33</b>	<b>-.05</b>	<b>.04</b>	<b>.70</b>	<b>.78</b>	---			
(13) Day Care	<b>.53</b>	<b>.50</b>	<b>.66</b>	<b>.67</b>	<b>.12</b>	<b>.31</b>	<b>.66</b>	<b>.64</b>	<b>.55</b>	<b>.17</b>	<b>.27</b>	<b>.68</b>	---		
(14) Nurs home	<b>.57</b>	<b>.74</b>	<b>.92</b>	<b>.89</b>	<b>.42</b>	<b>.93</b>	<b>.98</b>	<b>.86</b>	<b>.57</b>	<b>.51</b>	<b>.59</b>	<b>.91</b>	<b>.99</b>	---	
(15) SrCitzHome	<b>.26</b>	<b>.24</b>	<b>.48</b>	<b>.39</b>	<b>.04</b>	<b>.45</b>	<b>.39</b>	<b>.55</b>	<b>.49</b>	<b>-.23</b>	<b>-.17</b>	<b>-.11</b>	<b>.25</b>	<b>.47</b>	---
(16) HospBeds	<b>.47</b>	<b>.82</b>	<b>.96</b>	<b>.99</b>	<b>.32</b>	<b>.80</b>	<b>.97</b>	<b>.66</b>	<b>.53</b>	<b>.30</b>	<b>.35</b>	<b>.54</b>	<b>.66</b>	<b>.87</b>	<b>.37</b>
(17) Pub Assist	<b>.00</b>	<b>-.02</b>	<b>-.07</b>	<b>-.06</b>	<b>.03</b>	<b>-.16</b>	<b>-.06</b>	<b>-.06</b>	<b>.03</b>	<b>-.03</b>	<b>-.02</b>	<b>.05</b>	<b>-.07</b>	<b>-.24</b>	<b>-.07</b>
(18) Fam Prot	<b>-.01</b>	<b>-.02</b>	<b>-.08</b>	<b>-.07</b>	<b>.04</b>	<b>-.18</b>	<b>-.06</b>	<b>-.07</b>	<b>.05</b>	<b>-.05</b>	<b>-.04</b>	<b>.06</b>	<b>-.08</b>	<b>-.18</b>	<b>-.06</b>
(19) Child Wel	<b>-.03</b>	<b>-.04</b>	<b>-.10</b>	<b>-.09</b>	<b>.04</b>	<b>-.16</b>	<b>-.09</b>	<b>-.09</b>	<b>-.05</b>	<b>-.09</b>	<b>-.08</b>	<b>.00</b>	<b>-.08</b>	<b>-.25</b>	<b>-.02</b>
(20) Viol Crime	<b>.00</b>	<b>-.00</b>	<b>-.01</b>	<b>-.02</b>	<b>.02</b>	<b>-.18</b>	<b>-.04</b>	<b>-.03</b>	<b>.03</b>	<b>-.24</b>	<b>-.24</b>	<b>-.23</b>	<b>-.15</b>	<b>-.16</b>	<b>.17</b>
(21) Oth Crime	<b>-.01</b>	<b>-.01</b>	<b>-.02</b>	<b>-.03</b>	<b>.05</b>	<b>-.20</b>	<b>-.05</b>	<b>-.01</b>	<b>.02</b>	<b>-.28</b>	<b>-.28</b>	<b>-.30</b>	<b>-.17</b>	<b>-.23</b>	<b>.17</b>
(22) Prop Crime	<b>.05</b>	<b>.05</b>	<b>.03</b>	<b>.01</b>	<b>.09</b>	<b>-.14</b>	<b>.01</b>	<b>.05</b>	<b>.13</b>	<b>-.25</b>	<b>-.25</b>	<b>-.28</b>	<b>-.14</b>	<b>-.15</b>	<b>.18</b>
(23) Ment Adm	<b>-.01</b>	<b>-.04</b>	<b>-.08</b>	<b>-.09</b>	<b>.00</b>	<b>-.04</b>	<b>-.08</b>	<b>.02</b>	<b>.06</b>	<b>-.17</b>	<b>-.11</b>	<b>-.14</b>	<b>-.21</b>	<b>-.34</b>	<b>.04</b>
(24) Unemplmt	<b>.01</b>	<b>.02</b>	<b>.01</b>	<b>.01</b>	<b>.18</b>	<b>.05</b>	<b>.01</b>	<b>.01</b>	<b>.05</b>	<b>-.02</b>	<b>-.01</b>	<b>.01</b>	<b>-.02</b>	<b>.04</b>	<b>.05</b>

\* BOLD FACE NUMBERS INDICATE SIGNIFICANCE OF P < .05

Table 40

Attrition Variables and Selected Community Indicators

	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
70	---																
54	.81	---															
07	-.18	-.23	---														
03	-.13	.17	.96	---													
33	-.05	.04	.70	.78	---												
66	.64	.55	.17	.27	.68	---											
98	.86	.57	.51	.59	.91	.99	---										
39	.55	.49	-.23	-.17	-.11	.25	.47	---									
97	.66	.53	.30	.35	.54	.66	.87	.37	---								
06	-.06	.03	-.03	-.02	.05	-.07	-.24	-.07	-.06	---							
06	-.07	.05	-.05	-.04	.06	-.08	-.18	-.06	-.06	.68	---						
09	-.09	-.05	-.09	-.08	.00	-.08	-.25	-.02	-.09	.86	.72	---					
04	-.03	.03	-.24	-.24	-.23	-.15	-.16	.17	-.01	.01	.02	-.01	---				
05	-.01	.02	-.28	-.28	-.30	-.17	-.23	.17	-.02	-.01	.05	.01	.91	---			
01	.05	.13	-.25	-.25	-.28	-.14	-.15	.18	.03	.03	.09	.04	.83	.96	---		
08	.02	.06	-.17	-.11	-.14	-.21	-.34	.04	-.08	.21	.10	.20	-.05	.02	.07	---	
01	.01	.05	-.02	-.01	.01	-.02	.04	.05	.01	.06	.04	.04	-.06	-.05	-.06	.04	---

NUMBERS INDICATE SIGNIFICANCE OF P < .05

Table 40 relates to this hypothesis and shows the correlations among measures of human attrition and measures of community.

If the correlations between measures of community (discussed previously as independent variables) and measures of human attrition (discussed previously as dependent variables) are negative, significant and moderately strong, this hypothesis will be seen as supported by the data.

In examining Table 40, the upper triangle (items 1 through 16) are the same as those presented in Table 33. The extreme lower right triangle (items 17 through 24) are the dependent variables discussed in Table 30, as well as Tables 37 to 39. Of interest to this analysis is the rectangle of the inter-correlations among these two groups of variables.

Most notable about this section of the table is the absence of significant correlations. Of the 128 cells in this portion of the matrix, only 18 are significant at  $p < .05$ . The greatest magnitude of any correlation in this section of the table is that between the rate of mental health system admissions and the number of nursing homes in the community ( $r = -.034$ ). This, as well as the other 13 lesser magnitude correlations is the only support generated in these data for the hypothesis.

No particular pattern exists to most of these associations. For example, no significant or important correlation occurs between the number of police and various rates of crimes. Were this the case, conclusions could have ranged from "the presence of police reduces the rates of crimes" for negative correlations, to "the presence of police, because of the rates of reporting crimes, appears greater" for positive associations. No such findings occur and thus, no conclusions can be made regarding the effects of resources on human attrition.

What does occur are weak, negative associations between the number of elementary, junior high and high schools, and the various rates of crimes. These occur at magnitudes ranging from  $r = -0.23$  to  $-0.30$ . Why higher crime rates should exist when fewer educational facilities are available cannot be directly interpreted. Similarly, why more senior citizen homes and greater rates of crimes should correlate ( $r = 0.17$ ) cannot be interpreted. Fortunately, given these somewhat bizarre findings, the correlations are low and thus not overly important.

The extent to which hypothesis 1.1 is supported is questionable. The correlations among the human attrition items and the items measuring community are negative and quite weak ( $r$  approaches  $-0.30$ ). Equally clear, from Figure

3, are the clusters of dependent variables, referred to previously, which appear in stable groupings and are unrelated to one another and to the measures of community.

It is suggested that this hypothesis is weakly supported, in that the human attrition items and those items measuring the community are negatively correlated. It must be understood, however, that the measures of human attrition are not highly related to one another, and that the support for the hypothesis is tentative at best.

#### **Hypothesis 2.0**

A positive association exists between the indicators of human attrition.

Data relating to this hypothesis have been discussed previously under the heading of Dependent Variable Analysis. Tables 28, 29, and 30, as well as Figure 1 are all related to these discussions.

If this hypothesis were to be supported by the data, the inter-correlations of the various measures of human attrition would be consistently strong and positive.

The findings of the dependent variable analysis were that some of the measures of human attrition were highly, positively associated and others appeared not to be related at all.

Variables described as operationally related, such as the three measures of social service provisions, or the three measures of rates of crimes, were found to be the most correlated. As will be noted from all the tables that include these items (including Tables 37 to 39 which include the High versus Low growth rate communities), these patterns of association are consistent. Thus, it appears that, in these data, consistent and strong correlations occur in data collected by single agencies.

These strong associations are not found in the correlations between the majority of other human attrition variables. This point is made most vividly by examining Figure 1 which clearly shows the extent to which these various measures of human attrition are associated.

The conclusion then, is that the hypothesis which states that, there is a positive association among the different measures of attrition, is not borne out in this analysis.

Items associated by virtue of their service providers are correlated in this table. These groups of variables are not associated to each other in the manner that would have been expected were the hypothesis to be supported.

## Summary

The bivariate correlations among the various measures of community and of human attrition revealed several interesting results.

Items associated operationally, such as when they are collected by the same agency, are highly correlated with one another. They are, however, not correlated with non-operationally related items to any extent.

The independent variables of this study (measures of community) were not associated with one another to any significant degree. Associations were observed among the human service indicators, the health indicators, and the educational indicators.

Negative but weak associations exist among measures of human attrition and measures of the community. These associations are, for the most part, non significant and could be the result of artifactual error.

Hypotheses 1.0 and 2.0 were not supported by the data from this study. In the case of hypothesis 1.0, the opposite relationship to the one predicted was found. Hypothesis 1.1 was very, very weakly supported by the non-significant, weak correlations mentioned above.

The multivariate analysis of these data, using Smallest Space Analysis, revealed that the measures of human attrition were not related to one another, and that when examined together with the measures of community, retained their inter-relationships. Thus, the measures of human attrition, though not closely associated with one another are more associated with each other than with the measures of community.

## Chapter 6

### Discussion and Conclusions

The context in which social phenomena occur is seen as an important factor in the nature, magnitude and existence of social relationships. This study has taken that thought and examined it in light of relationships between such descriptors as community (seen as social complexities) and indicators of human attrition (seen as a loss of human potential). Research questions have focused upon such concerns as the extent and stability of relationships involving human attrition and community indicators under various contextual arrangements; the stability, nature, magnitude and association of indicators of human attrition; the relationships of indicators of community; and as a passing point of interest, the ability of a social complexity model to differentiate across a broad range of communities.

Throughout these analyses the unit of analysis has been the community. The utility and the advantages of the ecological approach used in this dissertation will be discussed in the light of the findings of this study.

In the course of this examination, three separate hypotheses were examined and evaluated in terms of the degree of support mustered from data gathered on the Province of Alberta. Finally, some fairly specific conclusions emerge from this study regarding the effects of change on human attrition, the effects of community on human attrition, and the stability and association of various measures of human attrition.

### **Summary of the General Findings Regarding Alberta**

The use of the community as a unit of analysis in this dissertation has allowed for the examination of change in the population structures and in the rates of human attrition over time. Using the community as the focus for the analyses allowed for the use of a structural model of the community for purposes of comparison. Such comparisons between the population of the Province of Alberta and Canada, and between the communities in this study and the population of Alberta as a whole, have led to several interesting general conclusions about Alberta.

#### **Growth :**

The province has and continues to grow as an important area of the nation of Canada. The population of the province now accounts for some 9 percent of the total population of Canada. This is a net increase of 2 percent of the country's total population over the span of ten years. In comparison,

Ontario, the most populated province of Canada, has marginally declined in population by 0.5 percent. British Columbia, Alberta's western neighbor, has increased its share of the total Canadian population by approximately 1 percent during the same time period.

The increase in provincial population has not been an even one. That is, the population of the province does not structurally resemble the population of the country, nor does it structurally resemble the population of the province as it was ten years previously.

Alberta in 1971 was a predominantly male populated area and was over-represented in the 0 - 14 year old age categories of both sexes. Older females (ages 45 +), were under-represented in terms of the proportion of the Canadian population resident in the province. Fewer than expected widowed and almost twice the expected divorced resided in Alberta. The proportion of those over 15 years of age who had never married was also under-represented in Alberta.

By 1981, the population of Canada had shifted from being predominantly male to being predominantly female. Alberta remained predominantly male. The Canadian population matured by the expected ten years in the interim between decennial censuses, however, Alberta's population matured at a faster than expected rate with the 1981 modal age categories being the

20 - 34 year olds. This is typical of areas with age-specific immigration. Though still under-represented, the population in the older age groups had also grown in the intercensal period. The proportion of those over 15 years of age who had never married increased from 1971 to 1981. Although still under-represented, the proportion of widowed had also increased during this ten year period. Only the proportion of the population in the divorced group declined during this period.

Within the province, the shifts are even more pronounced, with greater proportions of better educated people residing in the non-rural ( > 200 population in 1981 ) study communities by 1976. The 20 - 34 year old male age groups and female age groups are the predominant ones in these centers, as are the elderly ( > 65 years ).

The changes that took place are easily explained because of the types of resource development occurring within the province. Educated young males and their families are moving to the province. In other circumstances, the types of people expected to move to a resource development area would be described as the single, young, "roughneck" types, with few strings and even fewer social responsibilities. This has not been the case in Alberta. The kinds of developments that have occurred within Alberta have been megadevelopments. Massive investments in plants and equipment, and recruitment of highly trained personnel to operate these facilities has

precluded the migration of the under-educated youth looking for "fast bucks and a good time." Instead, concerted efforts on the part of development companies have taken place to attract personnel who will stay, at least for a while.

These factors are represented in the data pertaining to the age-sex structure and the educational distribution of the population of the province. As was seen from the population comparisons with Canada, the province is now over-represented in terms of those with post-secondary education and partial university education. These people fall into the 20-34 year old age categories and as such, are seen as more stable in their lifestyles than the less educated, younger frontiersmen that explored for gold in the Klondike in the 1890's, or explored for the original oil wells during the mid-1950's and early 1960's.

The differences that appeared across the communities in the data set being analyzed were quite great, both in terms of the structural differentiation present within the province, and in terms of the concentrations of resources in certain areas of the province. Contrary to our expectations, the communities that are growing the most rapidly in Alberta are not necessarily the two largest centers. Rather, many of the smaller resource towns have shown remarkable rates of growth over the fifteen years represented by the population data.

In light of conventional wisdom regarding the shifts from rural to urban population centers, these findings are not particularly supportive. That is, were the "folklore" true, the big cities should be growing the fastest. In Alberta, the inclusion of the single resource based community as a major growth center (a sort of planned community), has upset this paradigm.

The province of Alberta is made up of a varied population whose major descriptor demonstrates that this population is constantly changing. As was seen in the analysis regarding the shifts in population between the overall population of Canada and Alberta, this is a province of growth. The normative thought that is seen in these data is that positive growth rates are the accepted rule and declines are an exception. In fact, the analyses of the data have shown that of the 175 communities examined over the data base of 15 years, only 15 have shown a negative growth rate. Over the ten year period, the number of declining communities is 10, and over the five year period, only 3 communities have declined in population. Growth, however, is not the only indicator of the occurrence of change as a major facet of life in Alberta. The population is also undergoing quite remarkable changes in demographic structure. Most notable are the changes in sex ratios towards a more predominantly male population as well as the shift towards a young, adult population. Although the latter is a trend

noticeable across Canada, the former is contrary to national trends. Finally, two major social characteristics are changing. The educational distribution of the province is shifting towards a highly educated and more technically trained population, and the marital status distribution of the province is shifting towards a greater proportion of married persons. In other words, Alberta is growing and as time goes on the trend is becoming more pronounced.

Community :

Communities in Alberta have been described and compared using a modification of the "structural complexity model" of Hage (1972). This model directed attention to several specific aspects of the community. In particular, the environments surrounding the community, the physical and social resources of the community, the extent to which wealth and poverty exist in the community, the degree of institutional completeness and institutional complexity in the community, and the demographic characteristics of the community were all examined.

The results of these analyses are detailed in previous chapters. At this time however, a brief summary of findings regarding the community in Alberta is appropriate. This summary will reveal the efficacy of the model of community utilized in this study. The utility of this model will be discussed at a later point.

Communities in Alberta are spread throughout the 638,233 square kilometer area of the province. Unlike many settled areas, the population of this province has not tended to aggregate about the major centers, but rather have populated the major transportation routes.

A result of this pattern of settlement has been the lack of availability of services in many of the more remote and/or less populated communities. The smaller communities are often without such services as police protection or hospitals. This pattern, together with the apparent concentration of specialized resources (such as financial institutions) and specially trained personnel (such as university graduates), have been seen by others as contributing to the decline of community in the prairie provinces of Canada (Abramson, 1968). In the case of Alberta, not only have the smaller communities not declined in population, they have grown.

As was seen in the discussions regarding the institutional completeness of the sample communities, some social institutions do not follow the pattern outlined above. The institutions that do not follow these patterns have tended to be the more "essential" services of the community such as schools, fire departments, etc., and not the specialized resources such as nursing homes, hospitals, or day care centers.

Change across the communities of Alberta was seen as not being differentiated by the size of the communities. This is perceived as accurate in terms of the sex ratios, dependency ratios, and general fertility rates of the population. However, the larger communities have tended to grow at a slower rate than the smaller communities.

Given the nature of development within the province, the shift in sex ratios among smaller communities, from predominantly female to predominantly male, is an expected outcome. The corollary shift in the dependency ratio is also in keeping with the development of resource based, labor intensive communities. The slower growth rate of the larger centers demonstrates that the smaller and more remote communities are the locus of activity for these developments.

Resources still tend to concentrate in the larger centers and these cities still act as hubs for development in the province. However, the forced growth of the resource towns appears, over the fifteen year period, to be eroding this concentration of resources.

## The Hypotheses

The three major hypotheses and the evidence related to their support or refutation are included in the preceding results chapters. However, by way of summarizing and generalizing the importance of these results, each hypothesis will again be reviewed.

Hypothesis 1.0 :

A positive relationship exists between the rate of social change and the rate of human attrition. Attrition will be higher for the rapid social change communities than for the slow social change communities.

This hypothesis was not supported by these data. In fact, the results of these analyses actually support the opposite conclusions regarding the effects of social change on human attrition.

Growth, and especially population growth, implies that change is occurring or has occurred. Social change implies the passing of life events and therefore stress. Stress is seen as an integral part of the distress (or attrition) process. Therefore a finding that community growth, and particularly rapid community growth, is not only unrelated to the increases in attrition but actually is negatively related to attrition is of great importance. Other studies (Bacigalupi and Freudenburg, forthcoming; Thompson et al, 1983; Wilkinson, forthcoming) have shown that certain aspects

of human attrition (divorce rates and violent crime rates) are not associated with rapid population growth. However, such a broad range of indicators of human attrition all being negatively associated with population growth is without precedent in the literature.

The negative correlations across various growth rates for the communities experiencing high growth rates (from 200 percent to 400 percent over the five, ten and fifteen year periods) and for the communities experiencing low growth rates, are consistent. This fact, coupled with the fact that the magnitude of these correlations is greater for the high growth centers suggests an explanation that is not based in the stress literature but rather in the literature of deliberate social change. The social impact assessments, previously described, performed on these types of communities are of little assistance here. They tell of various atrocities committed in the name of positive community growth and reflected in exorbitant rates of human attrition. They appear to direct our thoughts towards models in which growth is seen as inherently bad - something not to be encouraged.

This analysis contradicts these thoughts. The idea that the province of Alberta has been able to plan for its growth and thus avoid the socially deleterious effects of change, is doubtlessly appealing to the politicians, however, this is clearly not the case. Population growth has been an

idiosyncratic occurrence in the province with the province continually "scrambling" to keep up with pressures for greater services. Thus, a plausible explanation of these findings is the thought that, by and large, population growth and community expansion is a normative expectation that buffers the effects of the stresses of such change. The community infrastructure does not change in anticipation of social change. Changes in infrastructure follow the social change - they are reactive. However, what is apparent is that those most able to adapt - the better educated, the younger, and the employed populate these rapid growth communities. They emerge as the survivors.

Hypothesis 1.1 :

Across all contexts an inverse relationship exists between the indicators of human attrition and the indicators of the community's ability to absorb the shock of social change.

This hypothesis tends to be supported although very weakly. The weakness of the associations among indicators of community and indicators of human attrition is somewhat surprising, although it is encouraging to note that the direction of these relationships is as was predicted. However, such low correlations are less than encouraging.

It is possible that the data employed in this study are not clean. Errors in recording may have occurred, or not all of the appropriate measures of the community are included

(e.g., no s.e.s. measure). The fact that the smallest space analysis does not show the relationship of any of these community indicators in association with the human attrition indicators is indeed disappointing.

The results that do emerge suggest that facilities in the community are not acting to reduce (or for that matter to increase) the amount of human attrition present in the community. They have no effect on the rate of human attrition. This finding, as with the findings related to hypothesis 1.0, is contrary to conventional wisdom that suggests that attrition can best be controlled and thus reduced, in communities with greater magnitudes of resources and facilities. The idea underlying this wisdom is that resources must be available to be used. If these resources are to be used to hold back the effects of human attrition they will likely be of a type that are related to forms of attrition (For example, police and crime, number of social positions and unemployment, educational, financial, and generally supportive resources, and social service need, and mental disorders). In Alberta, this is not so.

Hypothesis 2.0 :

A positive association exists between the indicators of human attrition.

The hypothesis is not supported in the data. Of the three hypotheses examined during the course of this study, it was noted that the hypothesis regarding the association of indicators of human attrition to one another was clearly not supported. This finding has several implications for the analyses of attrition at the community level.

As has been seen in the literature (Phillips, 1968), often, any indicator of human attrition and/or any combination of measures, are taken to represent the overall phenomenon. This obviously is not a satisfactory approach to the study of attrition. It appears from the data analyzed across all communities in Alberta that indicators of attrition are associated to one another only insofar as they are representative of the activities of the collection agencies.

The results of this study suggest that many of the indicators of attrition are much more associated with population change in the community than with each other. The highest correlation among those variables not operationally related is  $r = 0.21$ . The rate of population growth, however, is correlated with the mental health system admissions with  $r$  values between  $-0.44$  and  $-0.39$ . Unemployment and population growth correlate between  $-0.59$  and  $-0.12$ , and various rates of crimes correlate with growth between  $-0.36$  and  $-0.22$  (see Tables 37 to 39 for these data). The consequences of the

negative correlations have been discussed previously. What is important here is the fact that the measures of attrition, with the exception of the operationally related items, are more closely associated with growth than with each other.

There was some indication that the items of human attrition should be considered as a type of additive scale. This scale was seen to be internally reliable, however, the concept of such a multifaceted scale is somewhat problematic. As was seen from the smallest space analysis, some of the items in the collection of human attrition indicators are not related to one another. Thus, the inclusion of these items, while appealing in terms of increasing the breadth of the concept covered by the scale, has negative consequences for its overall validity.

In this sense, the idea of human attrition is seen as a series of interpretively linked concepts that are somewhat orthogonally related in an empirical sense. That is, they are measuring different aspects of the same concept but that idea is so broad that it demands the use of multiple indicators in order to adequately assess its existence. The facets of such a concept would appear to include such things as social disorganization, social productivity loss, economic productivity loss, and social deviance.

### **Limitations of the Study**

This study of human attrition and the community has analyzed a broad and diverse range of data at the community level. These data are by no means complete and the resulting analyses suffer as a result of these omissions. In particular, the lack of a clear indicator of socio-economic status is viewed as most problematic. However, as was previously mentioned, the data set assembled for this study is flexible and this information can be readily added when available. These socio-economic indicators along with the current educational status of the communities will become available with the release of the 1981 census results.

Similarly, the omission of some of the interesting data regarding the market environments of the communities, the occupational structure of the communities, and the migratory status of these communities has weakened the analyses that could be performed. These data may become available from recent labor force surveys in Alberta and will be added later.

The omission of some of the communities in the province is also seen as a shortcoming of the study. It is definitely more powerful to examine human attrition across a total population, than to examine it only across selected communities. Again, the information on these missing communities, as well as the missing data outlined above can be readily added to the data set used in this study when they are available.

The archival data used to assess human attrition are adequate for the task at hand. However, if these data more completely and accurately identified the community of residence of all subjects, the strength and accuracy of predictions regarding human attrition would be enhanced.

The limiting of the study to an area experiencing rapid and continued growth over the past number of years has prevented any direct conclusions regarding the effect that the population decline has had on human attrition. This is not a serious limitation for this particular study, where the focus was on growth as a stressor; however, were an area that was experiencing a population decline added to the study, the effects of population change on human attrition rates could have been examined.

Finally, the analytic techniques utilized were varied and appropriate to the levels of data included in the study. However, other techniques may have allowed for differential interpretation of results. For instance, the use of multiple regression across these data points would have allowed for the building of predictive models regarding human attrition. Similarly, the use of canonical correlation would have allowed for the simultaneous analyses of the multiple dependent and independent variables to determine predictive efficiency. This would indeed have been useful were the intent of the study to determine those factors in the

ecological complexity of community that best predict human attrition. This was not the intent of this study though such results would indeed be useful to planners of interventions.

#### **Future Directions for Research**

Clearly, this latter point is one worthy of future examination. The practical application of such knowledge is immense and the scientific gains attributable to such results are also of import. Were it possible to establish those features in the structure of community that related directly and indirectly to the presence of human attrition, those factors that mediate such features might also be determined.

Sociologists studying the community should be interested in the pursuit of additional research on data such as these. The efficacy of models such as Hage's structural complexity model and the utility of the use of the community as a unit of analysis should lead researchers towards a number of sociologically interesting questions.

In particular, assessors of the impacts of deliberate social change should find many pathways for future research. The assumption that the negative effects of growth are inherent within the fact of growth itself has been shown to be wrong. This should lead to research questions that examine the contexts in which there are negative social consequences to planned social change and the correlates of those negative effects.

Researchers in the fields of mental health should find the ecological approach to the analysis of social phenomena such as human attrition, of use in their studies. In particular, research questions should emerge regarding the spatial distribution of mental illness, the correlates of mental illness at the community level, the other social disorganization measures in relationship to mental illness, and the evaluation of community mental health centers across social areas.

An aside to the major findings of this study appears warranted at this point. In examining the rates of admission to the mental health system extreme differences were noted between the smaller communities and their larger counterparts. While differences in diagnoses across the two sizes of communities was not the focus of interest for this study, the finding that seemingly less acute mental disorders were more often the diagnoses from the smaller communities than were the more acute disorders is interesting. This is an area that is worthy of additional investigations.

Finally, theorists in general, should find this study interesting in terms of the lack of empirical relationships found among indicators of similarly conceived constructs. The fact that indicators of human attrition are not so strongly related to each other as would be presumed, given the similarity of the underlying concept, is of interest. Further

research into the operationalizing of such multiple constructs as human attrition should be most useful to the entire discipline.

### **Summary and Concluding Remarks**

This study had as an objective the examination of mental health at the community level under differing social contexts.

Mental health has always been an elusive concept to empirically assess. In this study, human attrition was apparent in indicators of social disorganization, lack of social productivity, lack of economic productivity, and social deviance. These factors were seen as negative indicators of mental health. An inverse association with growth, the context of interest to the study, was found among these indicators. By way of explanation of these findings, the continued and expected growth of the province as a whole was offered. This normative expectation together with the idea that in Alberta, the nature of development (high technology) is such that immigrants are selected on the basis of their competence for job performance. Concomitant with job competence comes a higher degree of social competence. Thus, for example, even though Alberta has the second highest total crime rate in the nation, the crime rates decrease where populations rapidly increase.

Community level indicators (such as community - environment, community - resource, and community - structural complexity measures) were weakly and negatively related to human attrition and in most instances, not related to one another. This suggests that either : the concept of community based on Hage's work is inadequate to assess such relationships; or, that the measurement of community under study is so poor as to suppress relationships that might actually exist; or, in actuality, the relationship existing between the indicators of community and the indicators of human attrition is weak and negative and that other factors will be more strongly associated with human attrition.

The latter is the explanation of choice for several reasons. As was seen in the literature review of the social correlates of mental disorders, most of the individual level associations found in the literature have been between social variables (gender, marital status, age, etc.) and mental illness. Structural variables have, at the individual level, been disappointing in terms of their association with this measure of human attrition. Thus there is little reason to expect that at the community level the situation should be much different. Relationships exist, adding some strength to arguments that social resources are necessary for mental health to occur, but the strength of such arguments must be tempered by the fact that these relationships are indeed weak.

Additionally, the model of the community as suggested by Hage has allowed for the examination of these community level relationships. The finding that indicators of community are not strongly related to one another, except for certain obvious clusters of items, expresses the immense complexity of community as a concept. Obviously, a community is more than just the structural components within the environment. The social demographics must also be considered.

The failure of the different indicators of human attrition to relate closely to one another is felt to be a major finding of this study. Suggestions that single indicators of human attrition, such as social welfare rates, crime rates, or rates of mental illness, are adequate to assess the social well-being of the communities must be rejected on the grounds that they are invalid. Human attrition is a complexity and, as such, must be measured through the use of multiple indicators.

Finally, the data set used for these analyses is an important contribution to sociology and social research. It is a flexible, comprehensive compilation of data from multiple sources that has very great potential for use in future research on community and social organization.

**APPENDIX A**

**Listing of Communities in Alberta by Census District \***

**Census Division 1**

**Bow Island**  
**Burdett**  
**Foremost**  
**Irvine**  
**Medicine Hat**  
**Redcliff**

**Census Division 3**

**Cardston**  
**Claresholm**  
**Cowley**  
**Fort Macleod**  
**Glenwood**  
**Granum**  
**Hillspring**  
**Magrath**  
**Nanton**  
**Pincher Creek**  
**Stavely**

**Census Division 4**

**Cereal**  
**Consort**  
**Empress**  
**Hanna**  
**Oyen**  
**Veteran**  
**Youngstown**

**Census Division 6**

**Airdrie**  
**Beiseker**  
**Black Diamond**  
**Blackie**  
**Calgary**  
**Carstairs**  
**Cayley**  
**Chestermere Lake**  
**Cochrane**  
**Cremona**  
**Crossfield**  
**Didsbury**  
**High River**  
**Irricana**  
**Longview**

**Census Division 2**

**Barnwell**  
**Barons**  
**Bassano**  
**Brooks**  
**Coaldale**  
**Coalhurst**  
**Coutts**  
**Duchess**  
**Grassy Lake**  
**Lethbridge**  
**Milk River**  
**Nobelford**  
**Picture Butte**  
**Raymond**  
**Rosemary**  
**Stirling**  
**Taber**  
**Tilley**  
**Vauxhall**  
**Warner**

**Census Division 5**

**Acme**  
**Arrowwood**  
**Carbon**  
**Carmangay**  
**Champion**  
**Cluny**  
**Delia**  
**Drumheller**  
**Gleichen**  
**Hussar**  
**Linden**  
**Lomond**  
**Milo**  
**Morrin**  
**Munson**  
**Rockyford**  
**Rumsey**  
**Standard**  
**Strathmore**  
**Three Hills**  
**Torrington**  
**Trochu**  
**Vulcan**

**Census Division 6(cont).**

**Okotoks**  
**Olds**  
**Sundre**  
**Turner Valley**

**Census Division 7**

**Alliance**  
**Amisk**  
**Big Valley**  
**Botha**  
**Castor**  
**Chauvin**  
**Coronation**  
**Czar**  
**Daysland**  
**Donalda**  
**Edgerton**  
**Forestburg**  
**Gadsby**  
**Galahad**  
**Halkirk**  
**Hardisty**  
**Heisler**  
**Hughendon**  
**Irma**  
**Killam**  
**Lougheed**  
**Provost**  
**Rochon Sands**  
**Sedgewick**  
**Stettler**  
**Strome**  
**Wainwright**  
**White Sands**

**Census Division 11**

**Argentia Beach**  
**Beaumont**  
**Betula Beach**  
**Bon Accord**  
**Breton**  
**Calmar**  
**Crystal Springs**  
**Devon**  
**Drayton Valley**  
**Edmonton**  
**Edmonton Beach**  
**Entwistle**  
**Fort Saskatchewan**  
**Gibbons**  
**Golden Days**

**Census Division 8**

**Alix**  
**Bentley**  
**Birchcliff**  
**Blackfalds**  
**Bowden**  
**Caroline**  
**Clive**  
**Delburne**  
**Eckville**  
**Elnora**  
**Gull Lake**  
**Half Moon Bay**  
**Innisfail**  
**Lacombe**  
**Mirror**  
**Norglewold**  
**Penhold**  
**Ponoka**  
**Red Deer**  
**Rimbey**  
**Rocky Mountain House**  
**Sylvan Lake**

**Census Division 9**

**Canmore**  
**Crowsnest Pass**  
**Ghost Lake**

**Census Division 10**

**Andrew**  
**Bashaw**  
**Bawlf**  
**Bittern Lake**  
**Bruderheim**  
**Camrose**  
**Chipman**  
**Derwent**  
**Dewberry**  
**Edberg**  
**Ferintosh**  
**Hairy Hill**  
**Hay Lakes**  
**Holden**  
**Innisfree**  
**Kitscoty**  
**Lamont**  
**Lavoy**  
**Lloydminster(part)**  
**Mannville**  
**Marwayne**  
**Minburn**

**CENSUS DIVISION 11(cont)**

Grandview  
Itaska Beach  
Kapasiwin  
Lakeview  
**Leduc**  
Legal  
Ma-Me-0 Beach  
Millet  
**Morinville**  
**New Sarepta**  
Point Allison  
Poplar Bay  
**Redwater**  
Seba Beach  
Silver Beach  
**Spruce Grove**  
**St. Albert**  
**Stony Plain**  
Sundance Beach  
Thorsby  
**Wabamun**  
Warburg  
**Wetaskiwin**

**Census Division 13**

Alberta Beach  
**Athabaska**  
**Barrhead**  
**Boyle**  
Castle Island  
Clyde  
Fort Assiniboine  
Island Lake  
**Mayerthorpe**  
Mewatha Beach  
Nakamun Park  
**Onoway**  
Radway  
Ross Haven  
Sandy Beach  
Sangudo  
Silver Sands  
South View  
Sunset Beach  
Sunset Point  
Thorwild  
Val Quentin  
West Cove  
**Westlock**  
**Whitecourt**  
Yellowstone

**CENSUS DIVISION 10(cont)**

**Mundare**  
Myrnam  
**New Norway**  
Paradise Valley  
Rosalind  
Ryley  
**Tofield**  
**Two Hills**  
**Vegreville**  
**Vermillion**  
**Viking**  
**Willingdon**

**Census Division 12**

**Bonnyville**  
Bonnyville Beach  
**Cold Lake**  
**Elk Point**  
**Fort McMurray**  
**Glendon**  
**Grand Centre**  
**Lac La Biche**  
Pelican Narrows  
**Plamondon**  
**Smoky Lake**  
**St. Paul**  
Vilna  
Warspite  
Waskatenau

**Census Division 14**

**Edson**  
Evansburg  
**Hinton**  
Wildwood

**Census Division 15**

**Beaverlodge**  
**Berwyn**  
**Donnelly**  
Eaglesham  
**Fairview**  
**Fahler**  
**Fox Creek**  
**Girouxville**  
**Grande Cache**  
**Grande Prairie**  
**Grimshaw**  
**High Level**  
**High Prairie**  
Hines Creek

**CENSUS DIVISION 15(cont)**

**Hythe**

**Kinuso**

**Manning**

**Mclennan**

**Nampa**

**Peace River**

**Rainbow Lake**

**Rycroft**

**Sexsmith**

**Slave Lake**

**Spirit River**

**Swan Hills**

**Valleyview**

**Wanham**

**Wembley**

\* Towns highlighted are those included in the study group

**Towns with Welfare Offices and Statistics**

HIGH LEVEL	LAC LA BICHE	WAINWRIGHT
PEACE RIVER	SMOKY LAKE	WETASKIWIN
GRANDE PRAIRIE	ST PAUL	CROWSNEST/ BLAIRMORE
GRAND CACHE	VEGREVILLE	BROOKS
WHITECOURT	VERMILLION	LETHBRIDGE
SLAVE LAKE	CAMROSE	MEDICINE HAT
BARRHEAD	DRUMHELLER	EDMONTON
ATHABASKA	HANNA	SHERWOOD PARK
EDSON	OLDS	ST ALBERT
HIGH PRAIRIE	RED DEER	CALGARY
BONNYVILLE	ROCKY MTN HOUSE	CANMORE
FORT MCMURRAY	STETTLER	

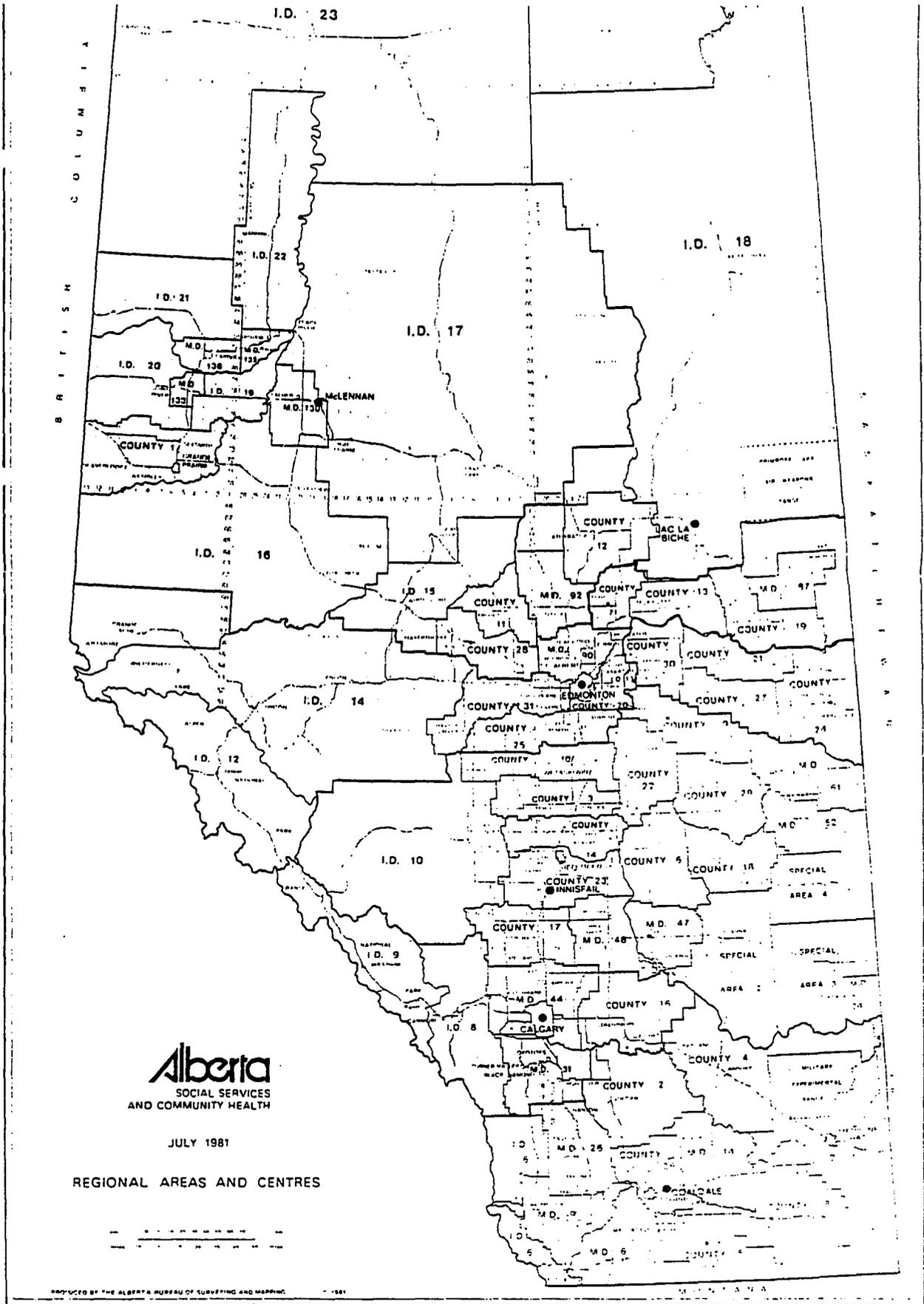
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**COMMUNITIES WITHOUT WELFARE OFFICES OR STATISTICS**

COMMUNITY NAME	SERVICED BY WELFARE OFFICE FROM
FORT VERMILLION	HIGH LEVEL
LA CRETE	PEACE RIVER
RAINBOW LAKE	HIGH LEVEL
BERWYN	PEACE RIVER
DONNELLY	HIGH PRAIRIE
FAIRVIEW	PEACE RIVER
GIROUXVILLE	HIGH PRAIRIE
GRIMSHAW	PEACE RIVER
MANNING	PEACE RIVER
NAMPA	PEACE RIVER
BEAVERLODGE	GRANDE PRAIRIE
HYTHE	GRANDE PRAIRIE
RYCROFT	GRANDE PRAIRIE
SEXSMITH	GRANDE PRAIRIE
SPIRIT RIVER	GRANDE PRAIRIE
WEMBLEY	GRANDE PRAIRIE
FOX CREEK	WHITECOURT
MAYERTHORPE	WHITECOURT
SWAN HILLS	BARRHEAD
WESTLOCK	BARRHEAD
BOYLE	ATHABASKA
EDSON	EDSON
HINTON	EDSON
JASPER	EDSON
FAHLER	HIGH PRAIRIE

COMMUNITY NAME	SERVICED FROM WELFARE OFFICE IN
MCLENNAN VALLEYVIEW COLD LAKE GLENDON GRAND CENTRE	HIGH PRAIRIE GRANDE PRAIRIE BONNYVILLE BONNYVILLE BONNYVILLE
PLAMONDON WANDERING RIVER ANDREW WILLINGDON ELK POINT	LAC LA BICHE LAC LA BICHE VEGREVILLE VEGREVILLE ST. PAUL
TWO HILLS CHIPMAN HOLDEN MUNDARE RILEY	VEGREVILLE VEGREVILLE VEGREVILLE VEGREVILLE VEGREVILLE
TOFIELD VIKING LLOYDMINSTER MANNVILLE BASHAW	VEGREVILLE WAINWRIGHT VERMILLION VERMILLION CAMROSE
BITTERN LAKE DAYSLAND EDBERG FERINTOSH FORESTBURG	CAMROSE CAMROSE CAMROSE CAMROSE STETTLER
NEW NORWAY NEW SAREPTA STROME ACME BEISEKER	CAMROSE WETASKIWIN CAMROSE DRUMHELLER DRUMHELLER
CARBON HUSSAR IRRICANA LINDEN STANDARD	DRUMHELLER DRUMHELLER DRUMHELLER DRUMHELLER DRUMHELLER
THREE HILLS TROCHU CONSORT OYEN AIRDRIE	DRUMHELLER DRUMHELLER HANNA HANNA CALGARY

COMMUNITY NAME	SERVICED FROM WELFARE OFFICE IN
BOWDEN	RED DEER
CARSTAIRS	OLDS
CROSSFIELD	CALGARY
DIDSBURY	OLDS
INNISFAIL	RED DEER
SUNDRE	OLDS
BENTLEY	RED DEER
BLACKFALDS	RED DEER
ECKVILLE	RED DEER
LACOMBE	RED DEER
PENHOLD	RED DEER
RIMBEY	WETASKIWIN
SYLVAN LAKE	RED DEER
ALIX	RED DEER
ALLIANCE	STETTLER
BIG VALLEY	STETTLER
CASTOR	STETTLER
CORONATION	STETTLER
DELBURNE	RED DEER
DONALDA	STETTLER
ELNORA	RED DEER
MIRROR	RED DEER
CHAUVIN	WAINWRIGHT
EDGERTON	WAINWRIGHT
HARDISTY	WAINWRIGHT
HUGHENDON	WAINWRIGHT
IRMA	WAINWRIGHT
KILLAM	CAMROSE
LOUGHEED	WAINWRIGHT
PROVOST	WAINWRIGHT
SEDGEWICK	WETASKIWIN
CALMAR	WETASKIWIN
DEVON	WETASKIWIN
LEDUC	WETASKIWIN
PONOKA	WETASKIWIN
PINCPER CREEK	BLAIRMORE
BASSANO	BROOKS
VAUXHALL	LETHBRIDGE
CARDSTON	LETHBRIDGE
CLARESHOLM	LETHBRIDGE

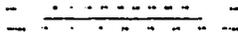
COMMUNITY NAME	SERVICED FROM WELFARE OFFICE IN
COALDALE	LETHBRIDGE
FORT MACLEOD	LETHBRIDGE
GRANUM	LETHBRIDGE
MAGRATH	LETHBRIDGE
MILK RIVER	LETHBRIDGE
NANTON	LETHBRIDGE
NOBLEFORD	LETHBRIDGE
PICTURE BUTTE	LETHBRIDGE
RAYMOND	LETHBRIDGE
STAVELY	LETHBRIDGE
TABER	LETHBRIDGE
VULCAN	CALGARY
BOW ISLAND	MEDICINE HAT
FOREMOST	MEDICINE HAT
REDCLIFF	MEDICINE HAT
BON ACCORD	EDMONTON
BRUDERHEIM	VEGREVILLE
DRAYTON VALLEY	EDMONTON
FORT SASKATCHEWAN	EDMONTON
GIBBONS	EDMONTON
LAMONT	VEGREVILLE
MORINVILLE	EDMONTON
REDWATER	SMOKY LAKE
ONOWAY	BARRHEAD
SPRUCE GROVE	EDMONTON
STONY PLAIN	EDMONTON
WABAMUN	EDMONTON
BLACK DIAMOND	CALGARY
BLACKIE	CALGARY
GLEICHEN	CALGARY
HIGH RIVER	HIGH PRAIRIE
OKOTOKS	CALGARY
STRATHMORE	CALGARY
TURNER VALLEY	CALGARY
BRAGG CREEK	CALGARY
COCHRANE	CALGARY
EXSHAW	CALGARY
BANFF	CALGARY
LAKE LOUISE	CALGARY



**Alberta**  
 SOCIAL SERVICES  
 AND COMMUNITY HEALTH

JULY 1981

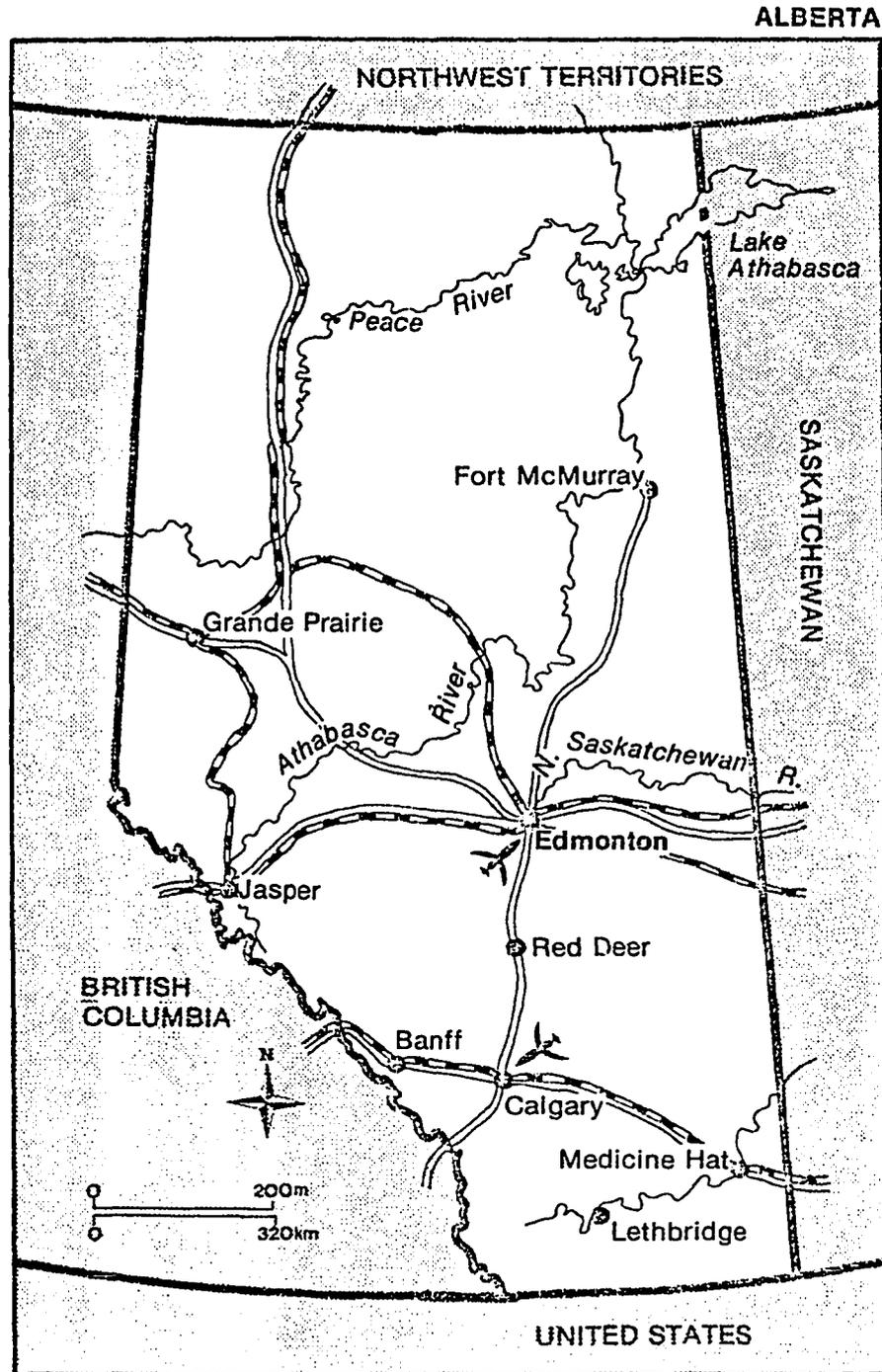
REGIONAL AREAS AND CENTRES

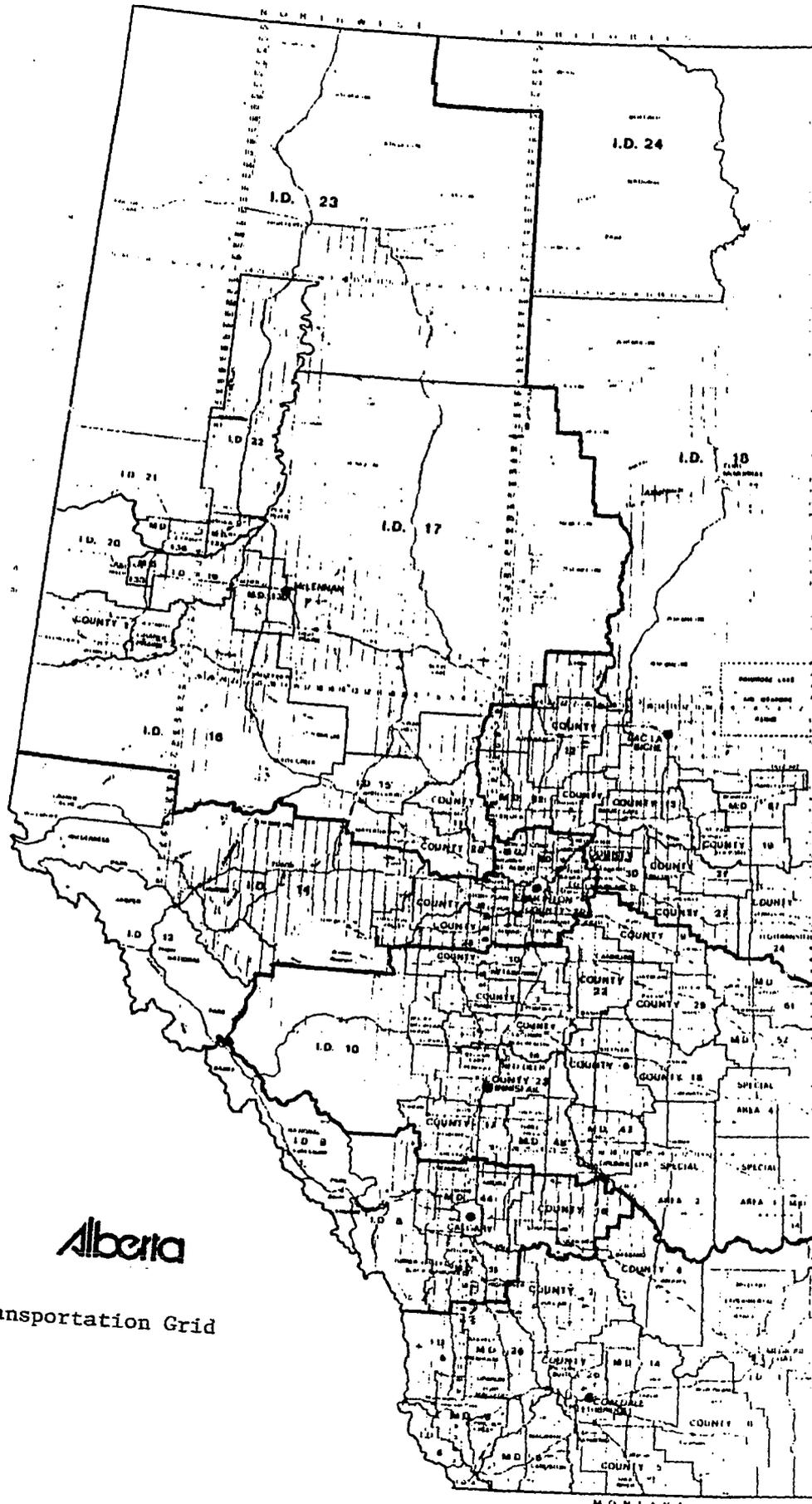


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APPENDIX C

MAJOR TRANSPORTATION ROUTES IN ALBERTA





Alberta  
 Transportation Grid



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