

PSYCHIATRIC INPATIENT NEEDS FOR HIGH-RISK RESIDENTS  
IN HARRIS COUNTY, TEXAS

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## CHAPTER I

### INTRODUCTION

A psychiatric, inpatient needs assessment of an area is an attempt to quantify community life, but this quantification remains elusive because need perceptions differ among patients, providers, and cultures. It can be defined as a limited amount of services when compared with established averages or national standards, a gap between demand and services to meet that demand, or a need may be related to gradual or sudden changes in incidence or prevalence rates. Needs are usually considered as a combination of all these definitions of needs assessments (Hagedorn, 1978, p. 64; Hargreaves, Attkisson, Siegel, McIntyre, & Sorenson, 1974, pp. 7-10).

Social factors have been found to be significantly related to mental illness rates. Although social conditions are not necessarily causal for mental illness, studies have indicated higher prevalence rates of mental illness in the inner city areas. Adverse social conditions in these areas include low income, high unemployment, and crowded housing conditions. Illness can be defined as the relationship between health and factors influencing health (Rosengren,

1980). Mental illness, then, results from an individual's inadequacy to interact effectively with his environment and within accepted social norms of that environment. Poor living conditions can aggravate an ineffective interaction. These social factors may be more pronounced if populations are experiencing rapid growth. Thus, a population is created with a risk of developing a mental disorder that is higher than various national population risk estimates or risk estimates of stable localities. Social factors are viewed as an aggregate and not at the individual level, because social changes benefit some people whereas others are not benefited.

Concurrent with societal factors that are significantly related to mental illness are social and cultural factors, such as the patient's social values, that determine an individual's management of his problem. Does the individual perceive himself in the sick role? Do those closely associated with the individual perceive him in a sick role, or is deviant behavior tolerated by the family? Why would an individual refuse to recognize himself in the sick role? Is the individual afraid other people will learn about his problem? Is the individual skeptical of psychiatric treatment? Does the individual perceive the need for help as a sign of weakness (Cockerham, 1978, p. 87; Glasser, Duggan, & Hoffman, 1975)?



Unmet needs of mental disorders can be reflected in increased social problems exhibited by the indicators of more illegitimate births, higher divorce rates, higher suicide rates, greater stress, and higher crime rates. These indicators can be viewed as a measure of societal degradation, which in turn accrue more emotional difficulties, resulting in greater social problems and greater cost to society. The resultant poorer quality of life affects everyone, either directly or indirectly.

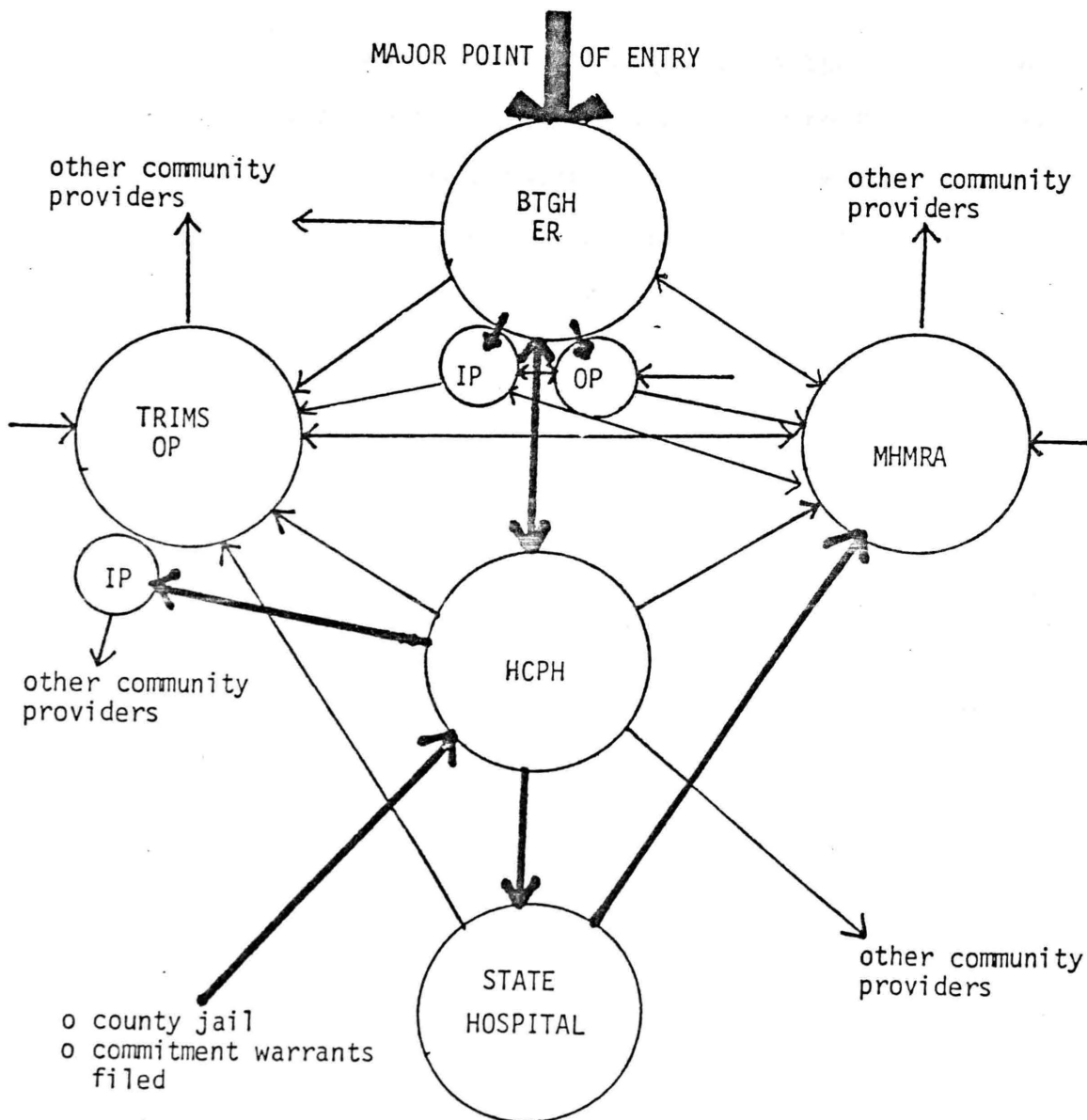
The economic viability derived from community support for a public psychiatric facility is enhanced when mental illness is viewed from the perspective of affecting everyones lives. It is difficult to expect a community to support a specialized hospital for its indigent population. Communities have certain attitudes that preclude such support. Therefore, for a community to support a psychiatric institution for the indigent population, community members must feel they, too, will benefit.

#### Statement of the Problem

A major premise of this thesis is that there is an inadequate supply of acute inpatient psychiatric services for the medically indigent population of Harris County, Texas. The indigent community in this county lacks appropriate access to psychiatric care due to insufficient

psychiatric inpatient treatment services in the public sector. High costs of care provided by the private sector and the rapid growth of the county that includes Houston, Texas does not ease the burden placed upon the public sector. Further, public inpatient psychiatric providers are segmented into four, major providers, and no coordinating body exists to insure an integrated system of care. Figure 1 provides an orientation of the complex referral patterns of public mental health providers in Harris County.

The indigent population has access to a psychiatric emergency service at the Ben Taub General Hospital, which is equipped with 10, short-term-care beds for psychiatric observation. This psychiatric emergency service is a major entry point into public psychiatric treatment services. Moving from this point, which operated at a 75% occupancy rate in 1981, through the system proves to be a major obstacle. There are insufficient psychiatric beds to meet the processing demand placed on the psychiatric emergency service. One route is to a 40-bed, psychiatric commitment unit that is also a major entry point into the system. This unit receives about 4.1% of all psychiatric emergency service admissions. This commitment unit transferred 5.3% of its admissions to inpatient facilities at a local state psychiatric research institution (Texas Research Institute for Mental Sciences) in 1980, 29.2% were discharged with the



BTGH--Ben Taub General Hospital

HCPH--Harris County Psychiatric Hospital

MHMRA--Harris County Mental Health Mental Retardation Authority

TRIMS--Texas Research Institute for Mental Sciences

Figure 1. Referral patterns of public mental health providers in Harris County.

understanding they would seek psychiatric outpatient care, and 62.8% were transferred to the Austin State Hospital at a distance of 180 miles from Houston. This commitment unit consistently operates at a 100% occupancy level. The psychiatric emergency service transfers nearly 60% of its admissions to a 25-bed, psychiatric inpatient treatment unit located in its same hospital, the Ben Taub three south unit. Once at this treatment facility, about 40% were referred for commitment procedures to the Austin State Hospital via facilities at the Harris County Psychiatric Hospital. The remainder of admissions to the 25-bed, psychiatric inpatient treatment unit were discharged to the community following treatment. The occupancy rate of this unit was 98% in 1981. Patients presenting at the psychiatric emergency service with a diagnosis of alcohol abuse can be referred to two beds funded by the Harris County Mental Health and Mental Retardation Authority and located in The Methodist Hospital. The psychiatric emergency service refers patients, to a lesser extent, to the Texas Research Institute for Mental Sciences. This agency currently has 49, psychiatric inpatient treatment beds for research purposes. Prospective patients with mental disorders relevant to research studies conducted at this agency have priority for admission. These research protocols involve studies of alcohol abuse, drug abuse, geriatrics, and general adult. Therefore, these

psychiatric beds are not as easily accessible to the indigent population as the other public psychiatric facilities. Although most patients seen at this agency were discharged to the community, a small percentage was sent to Austin State Hospital. A 77% occupancy rate was recorded for this facility in 1981. The psychiatric emergency service's final alternative is to discharge patients for psychiatric outpatient care. Discharges for psychiatric outpatient care account for 30% of all discharge destinations. Finally, representatives of the Harris County jail psychiatric service estimated that 50-75% of these admissions would not have occurred if psychiatric services were available in the community. Since the availability of public psychiatric inpatient services in Harris County is low, the overall quality of care is poor because of the unfulfilled demand.

Harris County census tracts can be measured on an ordinal scale to detect the resident population with a high degree of risk for developing a mental disorder. General population data on this high-risk group of residents coupled with this population's current inpatient psychiatric utilization data, indicate current admission rates for mental disorders. The number of beds required by this high-risk group of residents can be determined by estimating a level of unmet need.

The unit of analysis for projecting inpatient psychiatric beds was those census tracts which were the indication for inpatient psychiatric admissions to public-care facilities in Harris County, Texas. The dependent variable of analysis was those psychiatric beds needed by Harris County's high-risk population. Factors influencing the dependent variable included the total population residing in the high-risk census tracts and measurement in terms of the frequencies of age and sex. These high risk census tracts were determined by measuring nine socioeconomic variables against standards presented in A Typological Approach for Social Area Analysis (Goldsmith, Unger, Rosen, Shambaugh, & Windle, 1975). Utilization factors also influenced the dependent variable. These utilization factors reflected inpatient admissions data to Harris County hospitals available for indigent care as assessed by diagnostic categories.

Social epidemiology was the discipline for classification of this research project, because the field of epidemiology is concerned with disease as it relates to groups of people, rather than individuals.

The temporal classification of this research was concurrent, because current trends were assessed. The study was classified as action research, because the results of this study would only be directly applicable to Harris

County and only for a certain time period. The research method was descriptive, because the study was concerned with the current state of affairs surrounding mental health in Harris County.

The question addressed by this study was philosophically classified as metaphysical. This classification was defined as ontology. Ontology is concerned with probable forms and principals which underlie the structure of need. The thesis asked the general question, What are the fundamental forms and principals that underlie the structure of need for psychiatric inpatient services? The research answered the following specific questions:

1. Which census tracts are high risk census tracts and how are they generally characterized by the population descriptors of age, sex, and race?
2. What are the utilization patterns of acute inpatient psychiatric admissions?
3. What are the acute inpatient psychiatric rates of admissions?
4. What is the average length of stay by diagnosis and age?
5. What is the acute psychiatric inpatient need for the high-risk census tracts of Harris County, Texas?

### Goals

Assessment of acute inpatient psychiatric need for that group of Harris County, Texas residents who have a measured high-risk for developing a mental disorder was the broad goal of this thesis. Although past research indicated socioeconomic and demographic variables can measure an area's degree of risk for prevalence of mental disorders, assumptions were inferred concerning the level of inpatient need required by this high-risk group. These assumptions were strengthened by quantifying the inpatient psychiatric needs that were met for this high-risk group.

### Objectives

An estimate of unmet need can be discerned by comparing local acute inpatient admissions rates to the actual national inpatient utilization rate of 1%. Admission rates are composed of two factors: a population targeted for admissions coupled with utilization data.

A high-risk population for developing a mental disorder was determined by examining 1980 census data for Harris County, Texas census tracts. The census data provided information on socioeconomic variables for each census tract in the county. These census tracts were analyzed by nine variables appropriate for measurement of an area's degree of risk. These variables represented social space dimensions



of income, ethnicity, household composition variables, familism, residential lifestyle, and housing conditions. These tracts were assigned an aggregate variable definition of risk to determine a high-risk population. Once these high-risk census tracts were defined and considered as an aggregate, the geographic location was determined, and the following descriptive information were computed on the total high risk population: total population, males, females, ethnicity, and age.

Utilization data historically and descriptively quantified the inpatient psychiatric demand for the high-risk population. Utilization data provided information to draw inferences of inpatient psychiatric needs that were not met. These inferences were strengthened by examining the following facility characteristics: availability, accessibility, appropriateness of patient demand, alternative forms of care, and admissions characteristics.

### Definitions

Need is defined as those psychiatric inpatient beds needed if a system were to meet all legitimate demands placed upon it.

Acute care is considered as treatment for an acute break of a chronic diagnosis or treatment of an acute

diagnosis. Length of stay for acute care is generally considered as less than 30 days.

First count census data are those items that are asked of every individual on the census questionnaire. Second count census data are those items that are sampled questions or asked of 25% of all residents in the United States.

All diagnoses were classified in one of the following nine categories: alcoholism, drug abuse, organic brain syndrome, schizophrenia, affective disorders, psychosis, personality disorders, neurosis, and the category, unknown.

#### Assumptions

The typology for designating high risk areas assumed analysis of relatively homogeneous areas. Since census tracts are the smallest groupings of large heterogeneous areas and can be used to identify small pockets of risk, this thesis assumed individual census tracts were relatively homogeneous.

Only first count 100% sampled data were available from the 1980 census within a reasonable period of time. Excluded from analysis were economic and social status data. Economic data were derived based on projections of a 1979 transportation study. Although these data were not presented in the most desirable form (three broad categories) and the income was projected from the 1970

census, this thesis assumed income was too important to delete from the study. Thus, it was determined that projected data were better than no data.

It is assumed that citizens responded appropriately to the census questions and that everyone returned their census forms.

It is assumed that acute inpatient psychiatric services are to be adequately provided within the community the patient resides. This thesis assumed beds would be available within the community to meet the community's demand.

An average length of stay occasionally exceeded 30 days, for certain psychiatric diagnoses and age groups. It was assumed these patients would be better served in the community in which they reside. The low frequency of excessive lengths of stay indicated provision for these instances would be worthwhile.

It was assumed that psychiatric diagnoses were made on universal judgment and that no change will occur in the future that would deviate from this judgment. Further, it was assumed that current acute psychiatric admission rates and trends will remain constant for the future projected, though these rates could be affected by any change in service delivery.

This thesis assumed that all patients who were treated at the psychiatric inpatient treatment services were patients with a legitimate demand. This was assumed because the system operates at peak occupancy rates, thereby services are eliminated to all but those with a legitimate and critical need.

An ideal occupancy rate was assumed to be 80% so that a 20% reserve may be held to accomodate emergency admissions and seasonal fluctuations.

It was assumed that the sampled log books of psychiatric inpatient treatment services were accurately transcribed and entered into a computer accurately .

## CHAPTER II

### REVIEW OF THE LITERATURE

Assessing inpatient needs for psychiatric services is a research activity that combines the management tool, planning, with appropriate research techniques. Measurement of accessibility, availability, adequacy, and quality of resources enables the planning discipline to document the current state of affairs, identify gaps in the system, and establish long-range goals for change. The research involved in the planning process for mental health services provides a detailed understanding of a target population's mental health needs and services to be developed to respond to those needs (Hargreaves et al., 1974, pp. 7-10; Hagedorn, p. 56, 1978).

Ideally, a needs assessment would be conducted regularly at the local level to identify the current state of mental health. The local experience can be compared with national standards or experiences of other similar locales to determine a community's most urgent problems, to determine potential problem areas before they arise, to enable prioritizing goals for successful planning, or to provide historical data for future studies. This idealistic

assessment is usually not performed. More often, an organization conducts a needs assessment as crisis intervention requires, i.e.: when organizing a new service delivery, when anticipating major changes in service delivery, or when its catchment areas are undergoing marked demographic and socioeconomic changes (Bayer, 1980, pp. 1-7; Hagedorn, 1978, p. 55; Hargreaves et al., 1974, pp. 7-10; Kramer, 1976).

Frimier sums that a needs assessment "might be likened to navigation; it enables those who are concerned to find out where they are and how far and in what direction they need to go" (Longest et al., 1979).

### Theoretical Development

The ideal level of resources per unit of need is determined by quantifying indexes of need and resources. The following indexes effect utilization of psychiatric inpatient facilities (Bachrach, 1975, p. iii; Hargreaves et al., 1974, pp. 7-10; Horvath, 1970; Longest, Konan, & Tweed, 1979, pp. 9-15; Neill, Novack, Bromet, & Abromovitz, 1977; Stone, 1980):

1. Constituency--epidemiologic and demographic data,
2. Physicians, psychiatrists, and social agencies--referral patterns,

3. Cultural factors and social behavior indicators--social norms, beliefs, customs, cultural constraints concerning attitudes, public attitudes, lay opinions involved in policy-making, and social problem indicators.

4. Health services factors--resources' and organization's availability and accessibility, alternative care availability, occupancy rates, policies, and lengths of stay.

### Epidemiology

The research methods and techniques employed in the field of epidemiology can be used to provide the documentation required to facilitate the planning process. Although Hagedorn (1978, p. 64) stated that a needs assessment is not strictly an epidemiological study, he asserted that a needs assessment study is based on individual perceptions of an ultimate definition of "need". These perceptions are interlaced with epidemiology and politics.

Epidemiology extends beyond the traditional concept of the study of epidemic diseases to include all diseases, such as mental disorders. Paul (1966, p. 9) stated that epidemiology is a "measurement of circumstances where diseases occur, where diseases tend to flourish and where

they do not". Epidemiology focuses on groups of individuals, not individual occurrences (Cockerham, 1978, p. 18). Lilienfeld and Lilienfeld (1980, p. 4) stated that one purpose of an epidemiological study is to clarify the etiology of a specific disease by combining epidemiological data with data from other sources. Social epidemiology studies, among others, patients with mental disorders. These findings are related to the situation in which the patient became ill and is at risk of a reoccurrence. Social epidemiology quantifies and qualifies the number of people at risk for developing a disease and determines a prevalence or incidence rate for disease for that high risk group at a given point in time (Wing, 1980, p. 24).

The field of epidemiology is an appropriate research tool to quantify inpatient needs of an area by measuring indexes of need and resources. Factors to be addressed in this study would be the constituency population, utilization factors of that population, and factors affecting utilization patterns.

Population at risk. The populations at risk of developing a mental disorder have been assessed on a limited basis in this country. Studies have been conducted that have determined prevalence rates in specific geographic populations. Early studies included the Stirling County



Study in Nova Scotia conducted in the 1950's, the Pasaminic Study conducted in 1957, and the Midtown Manhattan Study conducted in the 1960's. Reported prevalence rates for these studies were 31%, 10%, and 23%, respectively (Kramer, 1976; Pasaminic, Roberts, Lemkau, & Krueger, 1977). The President's Commission Report on Mental Health (1978, p. 8) reported that 25% of the American people suffer from a mental health problem. More recently John Schwabb, Bell, Warheit, and Ruby Schwabb (1979, p. 199) found the prevalence risk for mental disorders in Alachua County, Florida was about 28% as measured by two instruments. The National Institute of Mental Health estimates 15% of the American population develop a mental disorder during any given year. However, only 3% of the population receive any type of treatment (Regier, Goldberg, & Taub, 1978).

It is evidenced that there is no determined risk prevalence for mental disorders. However, given the rate of utilization, there is a large gap between those who receive services and those who need services.

#### Demographic, socioeconomic, and social indicators.

Socioeconomic and demographic factors enable identification of a population targeted to receive services. A detailed picture of need results when demographic data are considered in coordination with utilization data and the assessed rates

of mental illness in a population. A variety of studies have shown that demographic and socioeconomic factors are associated positively with rates of mental disorders. Demographic and socioeconomic indicators aid in identifying the areas of high-risk populations. These indicators also aid in determining the seriousness of mental problems by providing unbiased information concerning the targeted population. A social area analysis will enable mental health planners to make inferences about the psychological behavior of the studied population to determine if a population has a high risk of developing mental disorders. Social ecologists encouraged 100% sampling of citizens to document social areas. As a result of the social biologists encouragement, census data include indicators of social rank, ethnicity, marital status, age, sex, family lifestyle, and residential life styles (Rosen, Goldsmith, & Redick, 1979).

Social rank can be measured by occupation, income, and educational levels. Low social rankings have been shown repeatedly to be associated with mental disorders. The apparant reasons for these associations are that individuals with low social status may be lacking in "social, psychological, or genetic endowments". Those that are incapacitated by a mental disorder will not participate in the work force, creating a lowered social status. Families

in the lower social strata may not have the concerns to hide mental disorders; and, finally, private services, that serve a more well-to-do population, are less likely to report information (Rosen et al., 1979).

Ethnicity is described as a group of individuals with a common cultural heritage. Blackness, brownness, or otherness does not create mental illness; the associations of ethnicity with mental disorders occur when the ethnic composition of the studied population differs from the host population. A problem may develop if the minority has difficulty interacting with the host population, thus a high degree of stress or social isolation is created (Rosen et al., 1979).

Marital status, family status, and related dimensions are also census indicators shown to be associated positively with mental illness. Census data provide information on marital status, living arrangements, characteristics of a family (including size and composition), and the presence or absence of a spouse or parent (Rosen et al., 1979).

High rates of mental disorders are exhibited by those aged fourteen years and older who have been involved in a marital disruption. Higher rates of mental illness have also been exhibited by persons living alone or with unrelated persons. Positive associations exist between these persons and severe mental disorders and neurosis.

Social isolation figures heavily in this observance. Single males appear to have higher rates of mental illness than females. Marriage could reduce the risk of mental disorders. One-parent families headed by a female also have higher incidences of mental illness for both parent and child. The reasoning associated with this observance is that this type of situation results in lowered social, psychological, and financial resources that affect coping ability (Rosen et al., 1979).

Census data on families are centered around the aforementioned one-parent families, family units, and the family life cycle. It is unknown if individuals and household characteristics are more important than area characteristics as they relate to mental illness (Rosen et al., 1979).

A family life cycle can be considered in one of seven cycles: adulthood, marriage, child-bearing, child-rearing, children leaving home, one spouse dies, and then the other spouse dies. The role and implications of that role aids in identifying role behavior of an individual. Identifying the family stage enables a better understanding of the problems a person faces as the family ages (Rosen et al., 1979).

Biological and social developments are associated with age and sex. There are no significant differences between the sexes for functional psychosis and schizophrenia. Manic

depressive illnesses, however, are two times higher in females; and women have higher rates of neurosis. Men have greater rates of personality disorders and are alcoholics at a rate four times higher than that of women. Age is a significant factor for some mental disorders. Schizophrenia is higher in males aged 18-24 years and women aged 25-44 years. Depressive disorders are greater in women aged 25-44 years and men aged 45-64 years (Rosen et al., 1979).

Residential mobility can be associated with community instability and is signified by relationship of household and individual mobility. The relationship is unclear, but the rationale is that mobility is likely to be stressful due to disrupted social network, stress involved with re-establishment of a social network, and lack of social support (Rosen et al., 1979).

Residential life style also has bearing on mental illness. Type, condition, and ownership of housing are representative factors of residential lifestyle. Higher rates of mental illness are associated with poor and overcrowded housing conditions. This association is due to lack of privacy, stress of relationships in close proximity, competition, and the greater risk of psychological withdrawal. Lifestyles for those who rent in multiple-family dwellings differ from those who own homes. The highest rates of mental illness are associated with

those individuals of low social status mixed with a mobile, heterogeneous population living in multiple-family housing units (Rosen et al., 1979).

Cultural factors can aid in determining why people who need services do not utilize services . Planning for mental health services has avoided any concentration on this issue. However, personality and life style factors play an important role in utilization of services; these factors can be used to supplement sociodemographic factors, which reflect group factors, not individual factors. Cultural and social factors can be considered at an aggregate level, such as social norms, or at the individual level, such as beliefs about illness, identification of the individual in the illness role, and the level of illness at which the individual seeks care. Cultural effects that play a role are viewed from both the aggregate and individual level. These are measured in terms of ethnicity, age, family role, stigma of mental illness, doubts about treatment effectiveness, and the stage of illness which the group and individual consider as ill (Marvin Dawkins, Terry, & Marva Dawkins, 1980; Glasser et al., 1975; Neill et al., 1977).

Social indicators provide information on psychological behavior that results from unmet needs. Key indicators are illegitimate births, divorce rates, suicide rates, stress rates, and crime rates. An increase of these factors over a

period of time could indicate that unmet needs exist for a community.

Utilization factors. Utilization factors document demand placed upon the system. These data yield information regarding mental illness in a population and changing utilization patterns. Utilization data collected for this documentation are the clinical diagnosis of mental illness, average lengths of stay, age, sex, and referral source network. Missing in utilization data are those individuals who are not using services but require services. Thus, needs are not realized and turned into demand. Utilization data, then, are "two steps removed from demand" (Hagedorn, 1978, p. 65). Utilization data are considered as a compromise between those who require services and do not receive services and those who utilize services (Horvath, 1970; Kramer, 1976; MacStravic, 1977; Warheit, 1980). The model depicted in Figure 2 is illustrative of the compromise between need and demand for services.

Health services factors. Health services factors for inpatient services include the perceptions of providers, facilities available (as measured by occupancy rates, average lengths of stay, patient days, patient mix), adequacy of facilities, accessibility of services, policies of the facility, and the availability of alternative care.

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Need		No Need	
Demand	No Demand	Demand	No Demand
(Good)	(Undesirable)	(Undesirable)	(Good)
Use of	No Use of	Use of	No Use of
Services	Services	Services	Services
(Good)	(Undesirable)	(Undesirable)	(Good)

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SOURCE: Homer Hagedorn. A Manual on State Mental Health Planning. (Washington D..C., U.S. Government Printing Office, 1975):66.

Figure 2. Needs versus utilization.



Availability of services is measured by the presence or absence of a service. Adequacy is assessed at the individual level and at the service level: i.e., inpatient services per 1,000 target population in comparison with national standards. Accessibility of a service refers to restrictions placed upon services by the institution offering services.

Donabedian (Longest et al., 1979, p. 7) identified three assessment modes for the health care system. These are structural, process, and outcome assessment. Process assessment concentrates on the management of patients via care measurements. Outcome evaluates the success of treatment based on patient outcome, and structural assessment studies the facilities, services, and manpower utilized in provision of care.

### Bed Determination

There are four methods involved in determining the number of beds required by a specific population. These are information gathered from community surveys, utilization information, socioeconomic-demographic approach, and the fixed bed ratios approach.

There are two techniques for community surveys which are derived from two differing viewpoints. One approach involves weighting public participation versus professional

input. The second approach involves acquisition of relevant statistical data and combining these data with personal impressions of a community's needs. Both of these techniques require judgement in weighting the population at risk of developing a mental disorder against factors that influence utilization rates of mental illness in that population. Advantages of community surveys are that the investigator is able to obtain some indication of a community's unmet needs, but the expense and design complexity is great (Bayer, 1980, p. 20; Hagedorn, 1978, pp. 62-68).

Utilization information is the second approach to assessing mental health needs. These data can include utilization-need equivalency techniques, an assumed need level, and techniques based on utilization data. Projections are based on the current level of use, and therein lies the disadvantage of this method. Variables to be considered in utilization information include availability, accessibility, appropriateness of services, and available alternatives (Bayer, 1980, pp. 21-22; Hagedorn, 1978, pp. 77-79).

A social area analysis is informative to delineate the population in need. This method is involved with projecting a population at risk of developing a mental disorder. The Mental Health Demographic Profile System, developed by the

National Institute of Mental Health, is useful for this analysis. The National Institute of Mental Health has compiled social and economic data on census tracts and catchment areas. The data source rates a population as having a low- to high-risk for developing a mental disorder based on factors that are significantly related to mental disorders. Advantages of the Mental Health Demographic Profile System include the availability of census data. Disadvantages include the lack of information to determine the demand the assessed high-risk population will exhibit and the problem of dated data available between census counts (Bayer, 1980, p. 23; Hagedorn, 1978, pp. 80-86).

Fixed bed ratios are usually based on a combination of all the above methods. Based on these approaches The National Institute of Mental Health (1981) recommends a ratio of .15 to .4 beds per 1,000 population in the specified service area. The advantage of this method is that it is simple. Its' disadvantage is that it does not take local conditions into consideration (Bayer, 1980, p. 24).

Although inpatient needs can be assessed by any one method, a combination of methods will optimize conclusions. Social area analysis geographically locate and delineate the target population. Community surveys indicate a level of need for that population. Utilization data indicate trends and current patterns of use; these data identify gaps in

the system. Bed ratios enable comparison between the local area and other locales.

### Empirical Research Methods

#### Socioeconomic, Demographic, and Social Behavior Indicator Approach

The employment of this method presupposes that certain sociodemographic indicators are associated with the need for mental health services, which research has associated with higher prevalence rates for mental disorders. Designation of a high-risk area utilizing demographic data aids in determination of service location, identifies priority groups, aids in service delivery, determines staff needed, and identifies similar areas of need. High need areas would be expected to demand resources and services at a greater rate than lower risk areas. The major indexes of this approach are income, employment, housing conditions, sociodemographic characteristics, social behavior, and quantification of social problems. These types of data quantify community life and are necessary for planning to determine patient placement, appropriate discharge procedures, and identification of a high-risk population. It may be possible to ascertain certain associations with mental disorders and the age at which a disorder is first recognized if sociodemographic data can be gathered from

inpatients. Thereby, some idea of disease etiology is provided (Hagedorn, 1978, p. 80; Kramer, 1976).

The identified indicators can be considered alone or as a unit when conducting a needs analysis of an area. Mustian and See (1973) performed a causal experiment that exhibited income was as sufficient a predictor of mental health needs as the previous state plans requiring weighted indicators of population characteristics: density and dependent population, family income, educational level, mental health resources, admission rates, and a person's mental health and social problems. The state plan then ranked areas from lowest in need to greatest in need. Mustian and See (1973) utilized simpler indicators that were not weighted for dependent ratios of population characteristics: median family income for socioeconomic indices, admissions to state mental institution per 100,000 population, and the percentage of nonwhites. Spearman coefficients were performed to insure the two prioritizing systems were from the same universe. These were then converted to Z scores and probabilities were determined. The authors found income to be highly correlated with the state priority plan, whether exhibited alone or in combination with one or all simplified indicators.

Income may readily enable prioritizing areas of need; however, this indicator does not provide detailed

information concerning the high-risk population. Thorough research is required to quantify the high-risk population. Specific indexes are relevant for assessing specific programmatic needs. This system might pinpoint areas of need, but it does not indicate the extent to which needs are not being met. Also, the system does not give an age or sex breakdown of the low income group. However, analyzation by one variable is useful as a simple, economic method of pinpointing areas of need.

Social area analysis identifies significant areas by social indicators. The National Institute of Mental Health has developed the Mental Health Demographic Profile System--a system containing 130 variables from the 1970 census to analyze a social area. These indicators include 48 socioeconomic status factors, five ethnic composition factors, 36 household and family structure variables, and 35 housing condition factors. The Mental Health Demographic Profile System data base provides the statistics by county, catchment area, and census tract, as well as comparison data of a catchment area with the county, state, and nation (Goldsmith, Unger, Rosen, Shambaugh, & Windle, 1975, p. 2; Hagedorn, 1978, p. 80-86; Rosen, Lawrence, Goldsmith, Shambaugh, & Windle, 1975 p. 39).

The Mental Health Demographic Profile System has performed correlational analysis and factor analysis on all

catchment areas for all variables to reduce the difficulty involved by analysis of 130 variables. This has effectively reduced the number of variables to analyze by eliminating redundant variables or variables that could accurately reflect conditions represented by other variables. This experience has provided a manageable number of variables to economically analyze an area (Goldsmith et al., 1975 p. 2; Hagedorn, 1978, pp. 80-86; Rosen et al., 1975, p. 39). The Mental Health Demographic Profile System recognizes 23 variables that will determine a population's risk and generally describe this population (see Appendix A). These variables are universal indicators that will ordinarily measure a social area for degree of risk for developing a mental disorder. Each area, though, is unique from all other areas, and a needs assessment is benefited by considering other variables available from the system, focusing on the area's uniqueness.

Comparative information by catchment areas is presented in the system by ordinal ranking of variables for each area as a comparative norm in six categories. This percentile ranking of variables for areas is designated as:

Extremely High	90-100th percentile
High	70- 89th percentile
Moderate High	50- 69th percentile
Low Moderate	30- 49th percentile

Low                      20- 29th percentile

Extremely Low        0- 9th percentile

The Mental Demographic Profile System can assist in identification of populations with a high-risk for developing a mental disorder and determining target populations for services. Considering these variables as comparative with other catchment areas, a nationwide ranking of catchment areas can be determined for each selected variable. Percentile rankings can be performed on any selected group of indicators with this identification. A catchment area is designated as a high risk area if it falls within the 90th percentile distribution for that indicator. This distribution is translated that 90% of the catchment areas would have a lesser degree of incidence (Rosen et al., 1975, pp. 16-18).

Goldsmith et al. (1975, p. 2) have prepared a self-teaching manual on use of the Mental Health Demographic Profile System to analyze local areas. The goal of their system was to analyze social space by as few variables as possible. These variables were selected based on literature evaluation, face and construct validity. The social indicators utilized represent social rank, life style, ethnicity, residential lifestyle, and community stability. Goldsmith et al. (1975, pp. 27-43) provided standards to determine appropriate ranking of need. These standards were



developed based on a selected percentile value of ranked distributions of the white population (because it is the largest and population statistics are not broken down by race) in metropolitan counties. The study recommended modification of codes to reflect the uniqueness of a particular area.

Rosen (1975, p. 2) has suggested a method of applying this demographic data with utilization data. Population data are the denominators for determining utilization rates. These local utilization rates are compared to actual U.S. admissions rates of inpatient utilization at 1%. This level of inpatient utilization is considered as the minimum care needed. Higher need estimates are not applied to higher risk groups. Differences can imply inequities exist in service delivery. The National Institute of Mental Health suggested a comparison of risk estimates with actual utilization rates to determine needs.

This system has been well-researched and documented. It provides excellent documentation for the mental health planner involved in planning service delivery and prioritizing areas of need and services. However, there are problems inherent with the system:

1. Availability of census data and all the considerations involved with the use of census data, i.e.: the census is only prepared every 10 years, and as of March,

1982 only ethnicity and two housing variables were known for Harris County. The National Institute of Mental Health forecasts 1984 as the target date for the 1980 Mental Health Demographic Profile System. Inherent with the census data are sampling problems; some indicators are given for the county alone and can not be broken into census tracts.

2. No prevalence or incidence data can be inferred from the percentile ranking other than a nationwide inpatient utilization rate of 1%; falling short of quantification.

3. Absolute causal relationships between social indicators and mental illness are not known.

4. Decision on indicators to use must depend on a "feel" for a community and one can not necessarily measure one's own community against national standards.

Longest et al. (1979, p. 27) performed a cluster analysis on all 1,499 catchment areas in the United States to group similar catchment areas. These catchment areas were measured by a group of variables that had universal applicability over all catchment areas. The variables were chosen based on basic research associating sociodemographic variables with mental illness. Thus, representation of a catchment area within a group of catchment areas reflects multiple social space dimensions. The variables insured

that all catchment areas within a group had similar sociodemographic profiles, and each group was identifiable from another group based on these social dimensions. Longest et al. assumed that homogenous clusters of catchment areas would lead to an expected prevalence of mental illness. Obversly, heterogeneous clusters would indicate a difference between prevalence and need. This expected prevalence would indicate a need for services and resources. This assumption was based on the Law of Continuity which states that similar circumstances lead to similar events.

Needs of a catchment area were determined in this study based upon theoretical relationships between social space variables and prevalence of mental illness. Selection of these social space variables was considered highly important, and the Mental Health Demographic Profile System was utilized for selection. The selection of these variables was dependent on theoretical and empiricle research, parsimony, and universal applicability. Theoretical criteria assumed a social variable must have an established correlation with prevalence for mental illness. It was decided that social space variables must exhibit three conceptual areas: areal socioeconomic status, areal lifestyle characteristics, and areal population movement. The two empirical criteria employed indicated that variables

had to exhibit a broad range of variation in order to develop meaningful clusters, and variables had to indicate "predictive utility" when correlated with high-risk variables. Indicators which describe these high-risk variables, indicative of subpopulations, were extracted from the Mental Health Demographic Profile System. The social space variables were identified after considerations and consultations with the National Institute of Mental Health personnel. These variables were identified as: income, unemployment, underemployment, median school years completed, low occupational status for males, median age, non-family households, families with children, single dwellings, renter occupancy, recent movers, and migrants (Longest et al., 1979).

Measures of central tendency and univariate statistics were performed for all catchment areas in the U.S. for each of these 12 social space variables. Zero correlations among these variables were also performed for all the catchment areas. These measures were useful to determine if the variables represented distributional features. These variables were then tested for their predictive qualities by zero order correlational analysis. The results indicated that each high-risk variable was associated with one or more social space variables, indicating variance. The results of the regression analysis indicated that the social space

variables accounted for the high-risk variance. This information suggested the selected variables displayed a broad range for variation, and the variables represented high-risk factors associated with subpopulation groups (Longest, 1979).

Variables associated with need were determined. A cluster analysis was devised to place catchment areas into similar areas of need that were distinguishable from other clusters or catchment areas. This concept of similarity was based in the clustering method. First, each catchment area occupied one point in relation to the aggregated 12 variables of social space. The point a catchment area occupied was considered as its sociodemographic profile. Similarity of catchment areas was measured by euclidean distance. A measure of zero indicated all catchment areas were exactly alike and positive numbers indicated a difference. The 12 social space variables contributed to the dissimilarity between two catchment areas. Longest et al. determined acceptable distances within the similarity measurements, and the design for clustering was chosen as a stratified heirarchial clustering.

Ten clusters were obtained for all 1,499 catchment areas, and a matrix of complete linkage distance between the clusters were obtained. The matrix illustrated intercluster distances and cluster diameters. Multiple analysis of

variance were conducted to locate measures of dispersion (heterogeneity) on each social space variable, and discriminant function analysis was performed on each social space variable (Longest et al., 1979).

Relative needs can be inferred from the cluster analysis, although the procedure for assigning prevalence of mental illness based on the cluster's analysis of variables and subsequent ranking has not been developed. The authors developed a risk profile that ranked the clusters based on an evaluation of the social space variables for each cluster. Particular attention was focused on the socioeconomic factors which have been shown to be highly correlated with prevalence for mental illness. The risk profiles compared each social space variable with the national mean and standard deviation for that variable. The cluster was considered to have a higher prevalence for mental illness if a cluster had one variable which fell below the national average for any conceptual area. Clusters were ranked into three categories: high-need, moderate-need and low-need. A high-need was exhibited if a cluster had one atypical variable on the conceptual area of socioeconomic factors. Although atypical factors could be found in the conceptual category of lifestyle, these were considered stress factors. Atypical lifestyle factors indicated a high-need only if this factor was accompanied by an atypical

socioeconomic factor. A low need was determined if the atypical variables were above the national means, and a moderate need was assigned if the variables for each conceptual area were neither high or low (Longest et al., 1979).

The authors found all the high need areas in metropolitan areas. Later they assessed the catchment areas by the Federal Government's Need Index--high needs are present if 25% of the population is in poverty. As opposed to cluster analysis, this index indicated more rural areas in need. The authors decided that the factor of difference involved residential lifestyle variables. They suggested future clustering methods should utilize more rural versus urban indicators (Longest et al., 1979).

This literature is directly tied with theoretical research, given the delimitations of the Mental Health Demographic Profile System data. The authors determined appropriate universal variables by employing an elimination procedure and then insured these social space variables were representative of high-risk variables for developing a mental disorder. The authors could have characterized further their clusters by providing statistics on these high risk variables for each cluster, even though the need is represented by other factors. This characterization would

be helpful in program planning for these clustered catchment areas.

Assessing mental health needs in California was essential to determine priority areas for Short-Doyle funding. Sorkin, Weeks, and Freitag (1973) devised a need index which involved a weighting procedure of 21 social variables. These variables were frequently mentioned in the literature as indicators of mental health need. These indicators consisted of social conditions, utilization rates, socioeconomic, and demographic factors. The weighting procedure was devised to assign weights reflective of mental illness need and to determine the demand for resources based on that need. The need index was computed by multiplying each indicator with its weight and adding all indicators for a final needs index.

The weights based on the author's inferences appear to be relatively simplistic, and some indicators (such as ethnicity) appear to be spurious. No rational basis or reference was given for the variables selected or the weighting procedure. This entire index would be impossible to compute for Harris County, Texas, because many indicators are not readily available by census tract.

Optenberg (1980) ranked Harris County census tracts by the indicators of family socioeconomic status (income), density (persons/household), and mobility (turnover). He



ranked all Harris County census tracts compared with each other. These indicators were converted to standard deviation units, and the indicator was weighted. Each census tract was assigned a score and ranked on a percentile basis. The highest risk for mental illness was located in the inner city areas. Ethnicity was correlated with the high-risk census tracts to determine strength and direction. A significant correlation was exhibited between census tract risk and ethnicity.

Optenberg (1980) provided inadequate discussion of his results, and no mention was made on determination of the percentile risk profile ranking. The study does incorporate ethnicity in a back-up fashion which is important and avoids using ethnicity as a prerequisite of mental illness. The variables utilized were based on 1970 census information, rendering the study obsolete for 1980.

#### Utilization Methods and Bed Determinations

Inventorying existing resources can provide a starting point for need estimation by providing pertinent documentation. This background will aid in developing an educated guess for determining the number of acute inpatient psychiatric beds needed.

Traditionally, the key concepts of utilization were historical data of admissions, patient days, occupancy

rates, average daily census, and average lengths of stay. These data can be determined in a comparative manner concerning what constitutes an appropriate psychiatric admission, length of stay, and occupancy rate. Four factors underlying utilization rates are key indexes associated with health resources (Hagedorn, 1978, pp. 95-96; Kramer, 1976; Sherman, Burnwell, & Olsen, 1981):

1. Accessibility--consideration of factors that restrain service utilization, i.e.: cultural attitudes, geographic location, financial factors, patterns of utilization, restrictions placed on beds, policies, and characteristics of care.

2. Availability--services are available or not available.

3. Alternative care--available types of alternative care: half-way houses, day hospitals.

4. Effectiveness of service--gaps existing in the continuum of services: appropriate staffing, operating beds.

Horvath (1971) proposed a nation-wide simulation model for determining bed needs. He suggested identifying patients by diagnosis rather than admission. Each diagnostic category could be cross tabulated with treatment needed and stated in a common unit: i.e., average length of stay. Several regions could be surveyed for differences.

This model was primarily concerned with assessing differences of health care within a specified region. The model studied a region's socioeconomic factors, known to be associated with risk for mental illness, and assessed resource availability in the specified region. These findings were stratified into subclasses of populations by age, sex, race, diagnosis, and length of stay. This stratification enables appropriate planning and delivery of mental health services. This model promotes comparison of regional services with overall national services, determination of inequities, and simulation to assess viability of alternative services.

### Bed Ratios

All ratio methods presuppose that national percentile averages are applicable to any area. These ratio standards are not presented with any information on the community in which such ratio exists. Also, the ratio standards do not indicate if that ratio is satisfying needs for that particular community. Ratios could be easily considered if the user was provided with population characteristics and relative unmet need of the community the ratio served.

Bachrach (1972) identified three types of data to assess mental health needs which is based on utilization data. These include some pre-established standard of need

presented as a bed ratio per 1000 population, current patterns of utilization and their trends, or comparing utilization patterns and trends to similar areas. The difficulty with the first and third technique lie in the fact that community uniqueness is not considered. Bachrach does compare her county, though, with its state.

Data were acquired for public and private hospital admissions by number and percentage distribution for two years. The admissions data determined 50% of the county's residents utilized a public state facility, 6% utilized private facilities, and 42% utilized a general hospital. Two years is not a significant time period to indicate trends. It was noted, though, that all admissions to inpatient facilities increased by 4%; although, the rate of admission per 100,000 population exhibited a change. Admissions to the public and private sector increased 37% and 18%, respectively, and psychiatric admissions to general hospitals decreased 21%. This decrease was attributed to admissions decrease at a distant general hospital used by county residents. The reasons for the admissions drop were unexplainable, but admissions at other county and general hospitals increased.

Admissions of Maryland residents to state hospitals increased over a six year period. The year of greatest increased state admissions was less than one-half the

increase in admissions exhibited by county residents. A change from chronic to acute care seems attributable to this increased usage. When schizophrenia and alcoholism were considered as depicting the two types of usage, it was found schizophrenia admissions were decreasing while alcoholism admissions were increasing. Two-thirds of alcoholics were discharged within one month, and 74% of non-alcoholic patients were released after one month. Thus, lengths of stay were reduced, and admissions were increased.

While admissions to local inpatient facilities were increasing, admissions to state hospitals were decreasing. This was explained by the fact that a rapid turnover was responsible for increased admissions in local hospitals, while the chronic patients at state hospitals were being reduced by discharge and death.

The historical data indicated admissions rates would rise 10% per year. Increased admissions do not indicate actual bed needs. One method to forecast needs is to develop a general ratio and apply this ratio to population projections. One plan recommended 3.75 beds per 1,000 and recommendations for acute care beds have been recommended from one per 1,000 to 1.5 per 1,000. Bachrach presented a table illustrating these numbers for a projected population level of the county.

Bachrach realized that the actual need is unknown and that accurate measures are unavailable. This created a difficulty in predicting future needs. It was stated that too much attention may be devoted to bed projections when evaluations of trends, such as diagnoses and length of stay information, are more useful to determine why admissions are increasing. Also, it was recommended that facility location be considered, because patients will utilize facilities closer to home.

This technique can be described as active research that is tied to the theoretical literature. Bachrach could have combined more of the trend data she collected into the bed ratio projections. This data could have substantiated her choice of bed ratios. Additional background information on the bed ratios would have been helpful in determining the appropriate bed ratios for her area.

The Lankenau Proposal (1977) based its bed projections on an ideal standard ratio of 40 beds per 100,000 population and an 80% occupancy rate. This proposal developed a fact sheet concerning psychiatric inpatient services for a specified area. This fact sheet presented information on beds in the region, beds available to the populace in the region, occupancy rates, and needed beds based on 40 beds per 100,000 population for a projected population. This figure was then adjusted for an 80% occupancy rate.

This technique is too simplistic based entirely on existing demand, and no adjustment made for current unmet demand. The ratio supplied may be an entirely appropriate bed ratio, but no reasoning is given to substantiate this claim.

#### Formulas to Derive Total Beds Needed

The basic disadvantage with all bed formulas is related to the fact that past utilization trends do not document need. Historical data may not have future relevance if the future is predicted on past demand, and past demand is not reflective of unmet need. These formulas will not be of assistance unless this fact is taken into consideration. However, bed needs formulas can be adjusted for length of stay, age, diagnosis, and future expected patterns of service delivery.

The Hill-Burton formula is the basis for most bed need formulas and consists of the following steps (Bayer, 1980, p. 21):

1. Patient days divided by population per 1,000 equals the current use rate.
2. Use rate times the projected population divided by the number of days in the year equals the future average daily census.

3. Average daily census divided by the assessed occupancy rate equals the estimated number of beds.

Bayer (1981, p. 21) proposed an alternative utilizing the Hill-Burton approach to assess acute inpatient needs. This alternative considered existing resources and whether these resources complemented community mental health systems. This approach assessed the following considerations:

1. Short-term demand analysis using utilization information as a starting point: determine patients now treated for less than 30 days for all psychiatric diagnosis and associate with projected length of stay and occupancy rate.

2. Determine an optimal bed distribution: total psychiatric admissions per catchment area, length of stay--based on regional or ideal averages, occupancy rate--based on regional average with consideration given to unit size, patient accessibility, and scheduling.

3. Overlay numbers one and two with standards and criteria applied by external forces.

Coordinating these steps with the following formula: beds equal inpatient days of acute care divided by (number of days in the year times percent occupancy), total beds needed can be determined. This universal formula can be applied to chronic-, intermediate- and, acute-care beds.



The method takes into account trend data and diagnostic data. The projection could be applied to any area with the consideration that unmet needs may not be reflected.

Solberg (1980) maintained services, not beds, require planning. He further asserted diagnoses, not admissions numbers, are to be utilized for bed forecasts. The steps in his method included:

1. Number of admissions for a psychiatric diagnosis.
2. Admissions per population equals admission rate.
3. Number of future admissions equals future admission rate times future population.
4. Future admissions times average length of stay equals patient days.
5. Number of beds equal patient days divided by (the number of days in a year times .9), assuming a 90% occupancy rate.
6. Adjust number three for county net migration seeking care: total psychiatric admissions in county divided by total psychiatric resident admissions in county.
7. Determine projected patient days: patient days equals admissions in number six times average length of stay.
8. Project beds at a 90% occupancy rate.
9. Adjust numbers five through eight to include state hospital admissions.

The author assumed no change in admission rates or length of stay. However, the formula is devised to reflect variances in length of stay for differing diagnostic admissions. Also, by utilizing trend admission data, this formula can account for adjusted admission rates. Treating diagnoses, rather than number of admissions, the author has provided information more relevant than admission rates. Diagnostic rates can assist in determining disease etiology and lengths of stay.

A Connecticut Health Systems Agency (1981) conducted an adult acute (less than 30 days length of stay) bed needs study by the bed ratio and utilization demand based studies. Their intent was to project beds needed for 1985. The first step in their project was to analyze area adult inpatient services for each catchment area, retrospectively, for three years. They documented each psychiatric unit and psychiatric hospital for number of staffed beds, bed designations, location, area admissions, average length of stay, and occupancy rate. They also documented restrictions or barriers that would affect patient accessibility. Beds needed were projected by the ratio method based upon this information. This method applied a ratio of .2 to 1.0 beds per 1,000 population in the catchment area. They concluded the bed range was too broad to use effectively and did not include any utilization information.

The next step involved an in-depth measurement of the utilization-demand data of the sampled hospitals. The same units of analyses as stated above provided information for a specified six month period. Data obtained were admissions by age, length of stay, patient origin, and the facility's average length of stay. The study realized the time frame was too short to analyze trends and that current utilization rates do not necessarily reflect demand.

Delimitations of the study included the fact that some hospitals were unable to provide the requested information. Therefore, the analysis incorporated only aggregated, or specified given data, or data that could be "reasonably estimated". Veterans Administration hospitals were excluded, because patients at these hospitals were there by preference and not because of service insufficiencies. The private facilities were also considered a matter of personal preference, but the admissions to these units were not expected to become greater. Therefore, these admissions were included in the projected admissions, but only the excess admissions were utilized for bed projections. The study did not include psychiatric admissions on a medical unit. These admissions were either too short to consider or were transferred to a psychiatric unit once discharged from the medical unit. State facility admissions were considered of intermediate and chronic levels; therefore,

lengths of stay greater than 45 days were excluded from this study. However, admissions to all other adult inpatient units greater than 30 days were included. These lengths of stay accounted for 25% of all admissions. It was assumed that these admissions required an extended stay but not long enough to warrant transfer to a state facility. Excessive lengths of stay were adjusted rather than ignoring the admission. Substance abuse admissions were excluded from this study with the consideration that these admissions deserved a separate study. Services by age could not be projected, because information was not available. Since admissions below age eighteen years accounted for 5-6% of the total, they were considered negligible for the study.

The steps in bed calculations were as follows:

1. Calculate beds needed from utilization rates:  
admissions for six months divided by population equals  
admissions per 10,000.
2. Projected admissions times estimated average length  
of stay ( 20 days, based on utilization information) equals  
total six months patient days.
3. Projected average daily census equals patient days  
divided by 183 days (six months).
4. Total beds equal average daily census divided by  
projected occupancy rate (80%). An 80% occupancy rate was  
designated to provide for seasonal fluctuations.

The results of this utilization study elicited concerns when compared with the ratio study. The utilization determination of beds needed is significantly lower. The author states one is "grossly overrepresented" or one is grossly underrepresented. The overrepresentation could occur because differences in a population's sociodemographic characteristics were not determined, whereas underrepresentation could be indicative of unmet need. Projected beds could have been quantitated by measuring the availability and accessibility of beds.

Availability of beds was measured by determining the number of liscensed beds in each catchment area and determining the population of that catchment area which uses the beds. The number of beds restricted for any reason was documented. Comparing projected 1985 admissions and utilization rates with available existing beds, total beds needed were derived utilizing an 80% occupancy rate and a 20 day average length of stay. Inherent in this projection was the value judgement that acute beds are provided within the community and not at state hospitals.

The authors pointed out that these bed allocations were subject to change as appropriate alternatives were developed. These alternatives would include insurance practices, more services to provide for involuntary

patients, and expansion of alternative services such as half-way houses and partial hospitalization.

This research is action-oriented, but the study was too short to assess any utilization trends. The researchers project the future on the present state of affairs without determining if the present demand is reasonable or unreasonable. The reasons given for the decisions not to include the Veteran's Administration Hospital, but to include private hospital's excess, remained unclear. The delimitations were well documented. However, the dismissal of children's needs, because they only constituted 5-6% of admissions, indicate that children are a population to be dismissed. Children could have been deferred to another study, as were drug abusers, instead of being dismissed. The study could also have benefited by comparing diagnostic categories with age, length of stay, and number of admissions. This cross tabulation would have generated important information with regard to length of stay and admission trends and could begin to shed light on disease etiology.

Warheit (1980) projects number of beds needed based on an unelaborated mental health survey consisting of clinical judgements of psychiatric symptoms and statistical analysis. It was determined 2.4% of the population over the age of 18

required psychiatric care. Of this group 75% (or 1.8% of the population) required acute inpatient treatment.

Steps in his study consisted of:

1. Total number of persons over eighteen. Calculate 2.4% of that population. Calculate 1.8% of that population.

2. Total of number one times average length of stay per episode. Average length of stay considered by diagnostic category, acute or chronic care, location of care, age, sex, and socioeconomic status.

3. Bed estimate: High risk inpatient population times average length of stay equal number of beds at 100% occupancy rate. Project beds per population at current rate and determine beds needed.

The statement that 2.5% of the population will demand care may be true and may have been conducted by an excellent study, but sufficient information is not provided to warrant this faith. However, this estimate is in agreement with the percentage set forth by the Mental Health Demographic Profile System, with the observance of the Connecticut Health System Agency, and with the study of Regier et al. (1978). The steps in determining a bed number are well documented and consider a variety of factors that warrant consideration.

The Mental Health Needs Council of Harris County (1980:21-26) utilized prevalence rates as a basis for need

determination. They cited a Blue Cross/ Blue Shield Study because of experience with a wide range of socioeconomic groups. This insurance study indicated 5.6 persons per 1000 low income population received inpatient care. Utilizing this prevalence rate the Council projected beds based on an average length of stay of 16.3 days as indicated by actual utilization rates of local, indigent-care facilities, and an average length of stay of 21 days as indicated by the private local psychiatric hospitals. The Mental Health Needs Council asserted that 46% of Harris County residents would be unable to pay for psychiatric services due to high costs and low insurance coverage.

The Council does not provide information on quality of care rendered between public and private institutions to be able to accurately determine an appropriate length of stay. Although 46% of Harris County residents may be unable to pay for psychiatric care, needs determined based on this population seem overly optimistic. Also, as of 1980, 40.8% of Harris County residents made up to \$25,000. Obviously, low income groups are reflected in this percentage but so are well-to-do groups. Traveling up the income scale, degree of risk for mental illness reduces. What did the Blue Cross study determine was a low income level? Finally, the report provided excellent broad utilization data.



Hornstra and Udell (1973) conducted a study on public and private psychiatric facilities in seven counties in an effort to provide established utilization data for consideration by insurance companies. Two populations were utilized for the study: all persons applying for all psychiatric services in one year and all treated patients for psychiatric services on a given day, referred to as the prevalence population.

The one year population had a prevalence rate of 11.6 per 1,000 persons for the entire seven county area. Individual county rates ranged from 6.2 to 13.8 per 1,000. The major city of the seven counties was assessed for the first 99 census tracts which is a mixture of very poor and well-to-do. The one year population had a prevalence rate of 18.8 per 1,000 and the one day prevalence study had 8.1 per 1,000. Removing the well-to-do census tracts, the following rates were obtained: 18.1 per 1,000 was determined as the prevalence rate for the one year population and a 7.4 per 1,000 prevalence rate for those measured on a given day.

The authors studied the ratio of one-year applicants to one-day prevalence rates by diagnosis to provide chronicity information. A high ratio indicated a high turnover rate, indicating acute-care patients. These ratios could enable determination of service delivery effectiveness as well as

utilization. Alcoholics had a ratio of 5.9, indicating short-term utilizers; schizophrenics had a ratio of .9, indicating chronicity of diagnosis.

The applicant per prevalence ratios also yielded information on types of patients treated at various facilities and turnover rates. The turnover rate was highest for upper level status admissions yet lower for the private sector in public-supported hospitals and vice versa.

The authors do not provide reasoning or hypothesis for this finding. This would be ideal to assess facility quality. Why do high income patients have higher lengths of stay in public facilities than private facilities. Do private facilities hold patients longer for monetary purposes? The fact that low-income patients have higher turnover rates in these institutions gives rise to this hypothesis. This is active research based on simple calculations, but length of stay specific for diagnosis and hospital could have given the same information.

### Conclusions

Utilization data can determine needs of a population or a specified subpopulation. These data can quantify a population's changing utilization patterns in terms of facility use, age, sex, and diagnostic rates. Associating socioeconomic and demographic characteristics with

utilization characteristics, future needs can be projected by the following formula:

$$\text{Need} = R_j n_j$$

$R_j$  = utilization rate

$n_j$  = number of individuals in population

Since components of  $R_j$  are vast and can not always be assumed to be significantly associated with disease, need levels such as the theoretical 2%, 10%, and 20% levels can be assumed. Ideal utilization rates can be recommended, to the extent there is unmet need (Hagedorn, 1978, p. 78; Kramer, 1976). This approach would enable the reader to make a determination of unmet need levels based upon his own interpretation of an area's needs.

Littlestone (Bachrach, 1975, p. 5) stated that it "is no longer possible to divine a psychiatric bed number by extending a curve". It is very risky to project a final bed number because of the numerous factors involved in a bed projection. It might be advisable to heed the warning of Baldwin (Bachrach, 1975, p. 5) when he urged to consider the consequences of adopting a bed ratio, not determining it. The data development that are included in a bed needs projection will have made the estimate appropriately quantifiable and it will provide appropriate information for others, with differing viewpoints, to interpret a different bed number. Finally, the data are useful for other purposes

of planning, i.e. programmatic design (Bachrach, 1975, pp. 5-6; MacStravic, 1977). It can be concluded that the final bed number derived is not as important as the data development and interpretation leading to an estimated bed number.

## CHAPTER III

### METHODS AND STUDY DESIGN

#### Determination of Harris County's High-Risk Population

A high-risk population for developing a mental disorder was determined by examining 1980 census data for Harris County, Texas census tracts. The census data provided information on socioeconomic and demographic variables for each census tract in the county. These census tracts were analyzed by nine variables appropriate for measurement of an area's degree of risk. These tracts were assigned an aggregate variable definition of risk to determine a high-risk population.

#### Instrument, Sample and Measurement Scales

Variables chosen to measure an area's degree of risk were selected based upon two criteria. First, the variables were chosen from the 23 universal variables presented by the Mental Health Demographic Profile System (Rosen, 1977, pp. 11-12; Goldsmith et al., 1975, pp. 23-25) that will qualify and quantify an area for a degree of risk. Six of these 23 variables are general population descriptors and do not measure risk. These indicators are useful to describe

the high-risk census tracts, once they are determined. Eight of the 17 remaining variables were eliminated based upon unavailability from the 1980 census. Variables omitted were socioeconomic data; these were not 100% sampled questions and were due for publication at an unknown date. Income was not available from the 1980 census; however, it was available for inclusion due to a locally conducted transportation study (Rice Center, 1979) which projected 1970 income census data for 1980 into three categories (less than \$7,000, \$7,001-\$24,999 and greater than \$25,000), based upon current census tract designations and rates of inflation.

Each census tract was measured by the following nine variables listed with the six conceptual social space dimensions they represent:

- A. Economic status: percent population with income below \$7,000. For purposes of this research, the population with income less than \$7,000 was considered as the percent poverty population, although it is recognized that poverty income is higher than \$7,000 for a family of four.
- B. Ethnic composition: percent minority households
- C. Household composition and family structure

1. Households headed by a primary individual:  
percent family households consisting of one  
person
  2. Households headed by a primary individual--  
female: percent single family households  
consisting of a female
  3. Husband-wife households: percent multiple-  
membered family households with both husband  
and wife present
  4. Female-headed households: percent of  
multiple-membered family households headed  
by a female.
- D. Familism: percent of all households with six  
plus persons
- E. Residential Lifestyle: percent free-standing  
dwellings
- F. Condition of Housing
1. Overcrowding: percent persons 1.01 plus  
per room

Each variable for each Harris County census tract was converted to a percentage and then assigned an ordinal ranking. This ranking ranged from a low to a high value when assessed by national standards presented in A Typological Approach for Social Area Analysis (Goldsmith et al., 1975, pp. 3-47). This procedure was developed based

on the Mental Health Demographic Profile System. Utilizing this ordinal ranking each variable for each census tract was assigned an ordinal level of risk from one (indicating an extremely high level of risk) to six (indicating an extremely low level of risk) based on literature evaluation. Appendix B presents typology ranking standards for selected variables coupled with the ordinal risk rankings for each variable.

Income data were not available in the format presented by the typology, therefore ordinal risk categorizations employed income standards presented in the Typology coupled with the Federal Government Need Index (Longest et al. 1979, p. 67). The Federal Government Need Index states that 25% or more of a population in poverty have an extremely high level of need for mental health care.

### Statistics

The cluster analysis subprogram of the Biomedical Computer Programs (1979:633) was utilized to cluster all Harris County census tracts into similar areas of social space. Cluster analysis groups census tracts based upon an aggregate variable definition of social space for each census tract. Once clusters were formed, the Statistical Package for Social Sciences (1975:187) was utilized to determine ordinal risk frequencies for all nine variables



per cluster. These frequencies were employed to aid in designation of an appropriate level of risk for each cluster. These high-risk census tracts were, then, defined and considered as an aggregate. Appropriate descriptive information were computed on the total high-risk population: total population, males, females, ethnicity, and age groupings.

Determination of Acute, Psychiatric Beds Needed  
by the High-Risk Population

Strengthen Assumption that the High-Risk  
Population Utilizes Indigent Care Facilities

See and Mustian (1973, p. 27) determined a high correlation existed between income and level of risk for mental disorders. The Federal Government Needs Index assumed a catchment area is at an extremely high-risk if 25% or more of its population is in poverty. Longest et al. (1979, p. 45) designated catchment areas as a high-risk if the area had a high poverty percentage coupled with a high percentage on one other conceptual dimension.

This thesis assumed the high-risk population for developing a mental disorder utilized indigent patient care services, because of the income criteria employed to determine the high-risk population. Confidentiality laws preclude observance of medical records to cross-reference patient addresses with this assumption. Patient origin

studies by zipcodes were obtained from the Harris County Health System Agency for psychiatric indigent-care facilities to support this assumption. These origin studies sampled admissions by zipcodes to the indigent-care facilities for a non-consecutive four-week period in 1979 and 1980. The Agency also provided a breakdown of zipcodes by census tracts. The census tracts present in the Agency's sample were compared with the determined high-risk census tracts. This comparison insured that the population residing in the defined high-risk census tracts were actually treated for psychiatric inpatient-care at public facilities.

### Instrument

An estimate of the number of acute psychiatric beds needed by the high-risk population was determined by comparing local prevalence rates to the national inpatient utilization rate of 1%. Using the following formula, a bed number was deduced:

1. Number of acute inpatient psychiatric admissions, specific for diagnosis and age group, to all public-care facilities available to Harris County residents.
2. Determine the current rate of acute inpatient psychiatric admissions, diagnosis and age specific, based

upon admissions in number one and the 1980 high-risk population.

3. Assuming a level of unmet needs exist, project an optimal admissions rate, diagnosis and age specific. Utilize the national standard psychiatric inpatient utilization rate of 1% as the assumed level of inpatient psychiatric need.

4. Determine patient days for this optimal admission rate utilizing the assumed level of need developed in number three and multiplied by the 1980 population. These results are then multiplied by an average length of stay determined by current utilization rates for each psychiatric diagnosis, age specific.

5. Determine psychiatric beds needed for the high-risk population, assuming an 80% occupancy rate. Patient days divided by (number of days in the year times .8).

#### Data Sources and Sample

The availability of public inpatient psychiatric services is small, and it was manageable, to some extent, to analyze all of the facilities. Log books were totally sampled and examined to all local facilities for the years 1979-1981. Generally, variables recorded were: length of stay, diagnosis, age, sex, race, and discharge destination.

Following are the sampled institutions presented with variable exceptions:

1. Ben Taub General Hospital Psychiatric Emergency Service. Length of stay information was not included for the 1979 and 1980 data set because this information can be found in the Mental Health Needs Council Report (1980, p. 44). Data for 1981 included length of stay information. Ben Taub psychiatric emergency service admissions were included to provide optimal utilization information for descriptive admissions data. Although these patients stay for a short period of time, it was assumed they would benefit from a longer length of stay if beds were available to meet that demand.

2. Ben Taub General Hospital. All variables were represented.

3. Texas Research Institute for Mental Sciences. Race was not recorded by this facility. Records for 1979 were incomplete.

4. Alcohol Detoxification beds funded by the Harris County Mental Health Mental Retardation Authority and located at The Methodist Hospital. This unit was inoperative in 1979. Optimal length of stay for alcohol detoxification is considered as 14 days, and the unit currently operates at that level. Since a 14 day length of

stay is considered ideal, this length of stay was utilized in all computations.

5. Austin State Hospital--A computer printout was obtained from the Texas Department of Mental Health and Mental Retardation regarding admissions with lengths of stay less than thirty days for 1979, 1980 and 1981. Aggregated information was obtained on psychiatric diagnoses, age, race, and sex frequencies. Therefore, these data could not be broken down variable by variable as they could for the other studied institutions. These acute psychiatric admissions are not served within the community, however this thesis assumed acute psychiatric admissions are to be treated in the community the patient resides.

#### Statistics and Measurement Scales

Descriptive information relating to the public, psychiatric facilities was managed by the condcriptive, frequency, and breakdown sub-programs of the Statistical Package for Social Sciences (1975:187). Descriptive information included the mean age and length of stay for each studied year by all institutions, except the Austin State Hospital due to data presentation.

Frequencies of psychiatric diagnoses, age groups, sex, race, and discharge patterns were determined for each studied year for all five, public-supported, psychiatric

facilities. This information indicated trends and provided numerators for rates of acute psychiatric admissions.

Data was managed by the frequency and breakdown sub-programs of the Statistical Package for Social Sciences (1975:249) to determine specific, acute psychiatric inpatient admission rates. Frequencies of age specific diagnoses were determined utilizing data from all local facilities. These frequencies were based upon 1980-1981 combined data. Since the data from the Austin State Hospital were presented as aggregated data, it was assumed that psychiatric diagnostic frequencies by age would remain constant. Total admissions specific for age groups reflected Austin State Hospital data when determining rates. Length of stay, specific for diagnosis and age, was determined by examining acute psychiatric admissions data for 1979, 1980, and 1981 from the Ben Taub psychiatric inpatient service and the Texas Research Institute for Mental Sciences. This total sample was required to obtain a meaningful data base for those diagnoses with low incidence rates and for the number of unknown variables. The Ben Taub psychiatric emergency service was excluded from the length of stay determinations as it would underinflate the appropriate length of stay. Lengths of stay for alcoholism were considered to be 14 days based upon an ideal length of stay.

### Population

A needs study is undertaken because each individual area is unique for contributing to mental disorders. However, this study on Harris County could be generalized to other areas which experience similar social area definitions and have similar poor qualities of service for their public sector.

### Subject Anonymity

Patient names have no relevance to this study. At no time will a patient's name, number, or any other identifying factor enter documentation.

### Limitations and Delimitations

Some areas of analysis were absent or not presented in the best form possible for analysis. This was due to the unavailability of second count census data (sampled items). This limitation led to the selected variables chosen. It is recognized that some social areas will be heavily represented and others not. This heavier representation does not change an area's degree of risk (as in double counting) but emphasizes that areal space. Other census problems, excluding timeliness, are also limitations i.e., response to census items may be inaccurate, both over- and under-exaggerated.

The study is limited by the fact that it measures met need, and it is not capable of assigning a value to unmet need. Only an implication of unmet need can be deduced from information gathered. It is further limited in that it assumed the "met" demand is a good sample of all demand which is unknown.

Determinations of hospital occupancy rates are dependent on the incidence of mental illness which is dependent on available beds, alternative sources of care, and public attitudes--non-quantifiable sources.

#### Justification

The "State of the Art" for socio-demographic analysis has been set forth by Goldsmith et al. (1975, pp. 3-44). An intensive method for characterization of homogeneous areas is specified in this typology. The characterization is based upon universal, applicable, high-risk variables applied to local areas. Authenticity is related to the Mental Health Demographic Profile System. Credibility is extended because universal variables and time consistent standards, with suggestions to update obvious changes, are provided as a target population and denominator data. Therefore, a high-risk population must be determined before assigning a bed number.



One method of assigning beds is to apply bed ratios extended by The National Institute of Mental Health. These ratios are authenticated in that they represent actual beds per population across the United States. Credibility exists in that this is logical; however, it leaves a planner with a wide range of beds and no real way to quantify why a particular number of beds should be chosen. Thorough background information about target populations, their needs and the extent to which those needs are met are required. This enables planners to make informed, comparative decisions when adopting similar ratio ranges. However, it has great credibility if many people with varying opinions must be satisfied.

Variations on the Hill-Burton formula, developed in the 1940's, enable planners to utilize overall or specific utilization data to quantify need for beds (Bayer 1980, pp. 1-7). The authenticity of utilization data to quantify beds is based on the early Hill-Burton and Certificate of Need requirements. Credibility is lacking because of the unknown variable of unmet need.

Unmet levels of need are determined based on identification of a target population, the 1950's surveys estimating risk, and comparisons with actual utilization data.

## CHAPTER IV

### RESULTS AND DISCUSSION

#### Identification of Harris County, Texas' High-Risk Census Tracts

Cluster analysis of Harris County census tracts revealed 17 clusters containing 410 of the 511 census tracts. All clusters had an amalgamation point (inner-cluster distance) of 1.881 or above. An amalgamation point is the diameter of a cluster as measured by euclidean distance. A small amalgamation point indicates homogeneity of a cluster. The low amalgamation distance within a cluster insures homogenous census tracts comprise the cluster. The diagonal figures in Table 1 represent inner-cluster distances, while the horizontal and vertical figures represent inter-cluster distances.

A cluster of census tracts was classified as a high-risk cluster based upon criteria presented by Longest et al. (1979, p. 45). These criteria included that the majority of census tracts within a cluster had a 25% or greater poverty population coupled with a high-risk on another conceptual social area. Six clusters representing 117 census tracts were determined to exhibit a high-risk for development of a mental disorder (see Table 2). Closer

TABLE 1  
AMMAGAMATED DISTANCES BETWEEN AND WITHIN 17 CLUSTERS OF SIMILAR CENSUS TRACTS,  
HARRIS COUNTY, 1980

Cluster Number	Cluster Number																	Number of Tracts
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	1.500																	17
2	1.968	1.582																38
3	3.178	3.178	1.836															20
4	3.178	3.178	1.913	1.502														10
5	3.178	3.178	2.318	2.318	1.512													40
6	3.178	3.178	2.318	2.318	1.753	1.581												76
7	3.178	3.178	2.318	2.318	1.970	1.970	1.784											8
8	3.178	3.178	2.318	2.318	1.970	1.970	1.919	1.684										23
9	3.178	3.178	2.318	2.318	1.970	1.970	1.919	1.739	1.569									21
10	3.178	3.178	2.318	2.318	1.970	1.970	1.919	1.739	1.762	1.713								32
11	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	1.617							47
12	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	1.982	1.700						8
13	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	1.982	1.982	1.440					10
14	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	2.107	2.107	2.107	1.839				25
15	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	2.233	2.233	2.233	2.233	1.881			8
16	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	2.497	2.497	2.497	2.497	2.497	1.699		14
17	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	3.383	2.1497	2.497	2.497	2.497	2.497	2.093	1.794	13

TABLE 2

DESCRIPTION OF 17 CENSUS TRACT CLUSTERS BY CONCEPTUAL AREA OF RISK,  
HARRIS COUNTY, 1980

Conceptual Social Area of Risk	Cluster Number																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Economic status	x			x	x		x			x	x	x	x	x		x	x
Household composition		x															
Familism											x	x					
Residential lifestyle																	
Housing condition											x	x	x	x	x	x	x

analysis revealed many of the high-risk census tracts had a 10% or less poverty population, while examination of the 101 census tracts that were considered as isolates (absence of clustering until all census tracts were clustered into one cluster) revealed extremely-high ordinal risk levels. Thus, the high-risk census tracts in Harris County are not as similar as the low-risk census tracts. Clustering may be more valuable when analyzing a greater number of variables.

Individual census tracts were examined by each variable to determine the critical high-risk census tracts whose population would be served by the public-supported facilities. For a census tract to be included in the high-risk category, the following criteria were employed:

1. A poverty population of 25% or more coupled with a high-moderate to extremely-high designation on one of the following or a low-moderate designation on two of the following: % single-membered families, multiple-membered families, families with six plus persons, free-standing dwellings or 1.01 persons plus per room. Ethnicity did not enter analysis as one's color does not create a mental disorder. Female, single-membered households and female-headed, multiple-membered families could not be considered as a high-risk unless these two variables were accompanied by a high-moderate to extremely-high designation

for their companion variables, single-membered families and multiple-membered families.

or,

2. A poverty population of 20-24.9% coupled with a high-moderate to extremely-high designation for two or more of the above stipulated variables.

One-hundred and forty-three census tracts were found to exhibit a high-risk for development of mental disorders. These high-risk census tracts comprised a total population of 425,377. Tables 3 and 4 provide general population descriptors. It is realized that the addition of males and females does not equal the total population, and the addition of races does not equal the total population. This is due to data suppression when tabulating the census and the method used and suggested by the data providers to determine the hispanic population.

#### Characterization of High Risk Census Tracts

A poverty population of 25% or greater was found in 83% of the high-risk census tracts. Households with six plus persons ranked as moderately-high to extremely-high in 63.6% of the high-risk census tracts, and 1.01 plus persons per room ranked as moderately-high to extremely-high in 81% of the high-risk census tracts. Single-membered families and multiple-membered families registered a low-risk ranking in

TABLE 3  
CHARACTERIZATION OF THE ADULT POPULATION RESIDING IN HIGH-RISK  
CENSUS TRACTS FOR DEVELOPING A MENTAL DISORDER,  
HARRIS COUNTY, 1980

Variable	Number
Total Population .....	425,377
Total Number of Males .....	210,562
Total Number of Females .....	213,114
Total Population White .....	96,986
Total Population Black .....	206,733
Total Population Hispanic .....	124,210

TABLE 4

AGE BY SEX CHARACTERIZATION OF THE ADULT POPULATION  
RESIDING IN HIGH-RISK CENSUS TRACTS FOR DEVELOPING  
A MENTAL DISORDER, HARRIS COUNTY, 1980

Age	Total	Male	Female
15 - 24	119,956	62,955.8	57,000.5
25 - 34	99,964	52,746.7	47,216.8
35 - 44	58,277	29,351.0	28,925.6
45 - 54	52,321	25,097.2	27,244.1
55 - 64	43,814	20,418.1	23,395.7
65+	49,344	19,992.7	29,351.0



71.3% and 80.4%, respectively. Finally, the percent free-standing dwellings ranked from a low-moderate to high-risk in 60% of the high-risk census tracts.

Census tract maps 1 through 5 geographically depict the psychiatric patient origin of public-supported psychiatric facilities (cross-hatched) highlighted with the high-risk census tracts. The psychiatric inpatient origin study overestimated the number of census tracts, because sampling of patient origin was obtained by zipcodes. Zipcodes were converted to census tracts. There were several census tracts within each zipcode. It can be concluded that the population residing in the high-risk census tracts are treated at the local public supported facilities.

#### Utilization Characteristics to Public-Supported Psychiatric Facilities

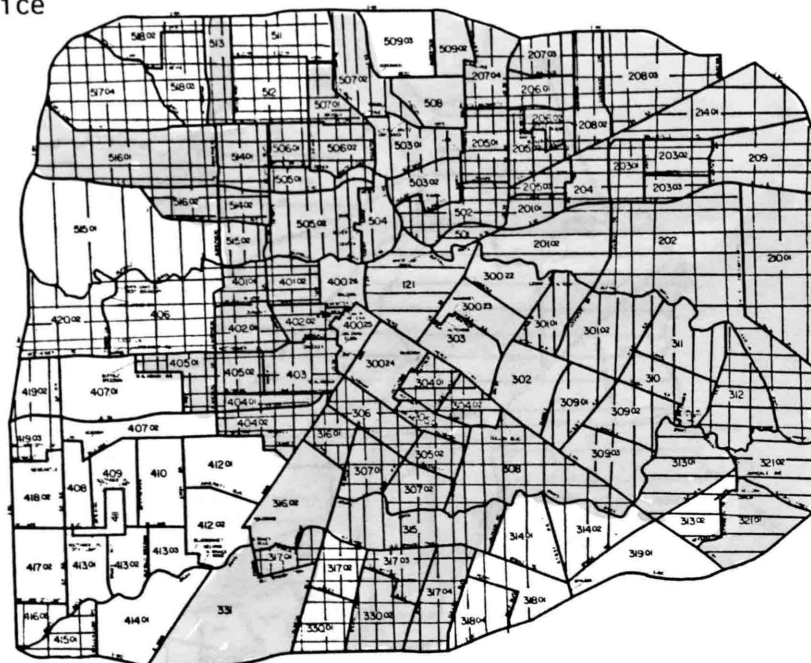
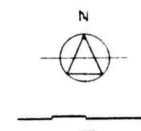
##### Psychiatric Admissions Characteristics

Total acute admissions accounted for 60.5% of all psychiatric admissions to the four, local psychiatric treatment facilities over the three year period 1979-1981. Total acute admissions at the four, local psychiatric facilities have remained relatively stable with 1979 acute admissions comprising 32.9% of the three year total, 1980 comprising 34.4%, and 1981 representing 32.7%. Combined lengths of stay at the Ben Taub inpatient psychiatric unit

Patient Origin by Zipcode:

—— Texas Research Institute for Mental Sciences

| Ben Taub inpatient service



# 1980 CENSUS TRACTS Harris County Texas

Census tract boundary descriptions prepared by  
Houston Region Census Statistical Areas Committee  
Houston Chamber of Commerce

In cooperation with  
City of Houston Planning Department

Map prepared by  
Houston-Galveston Area Council



SHEET 1 OF 5

Map 1. High-risk census tracts for developing a mental disorder in Harris County, Texas (inside Loop 610), 1980.

Patient Origin by Zipcode:

— Texas Research Institute for Mental Sciences

| Ben Taub inpatient service

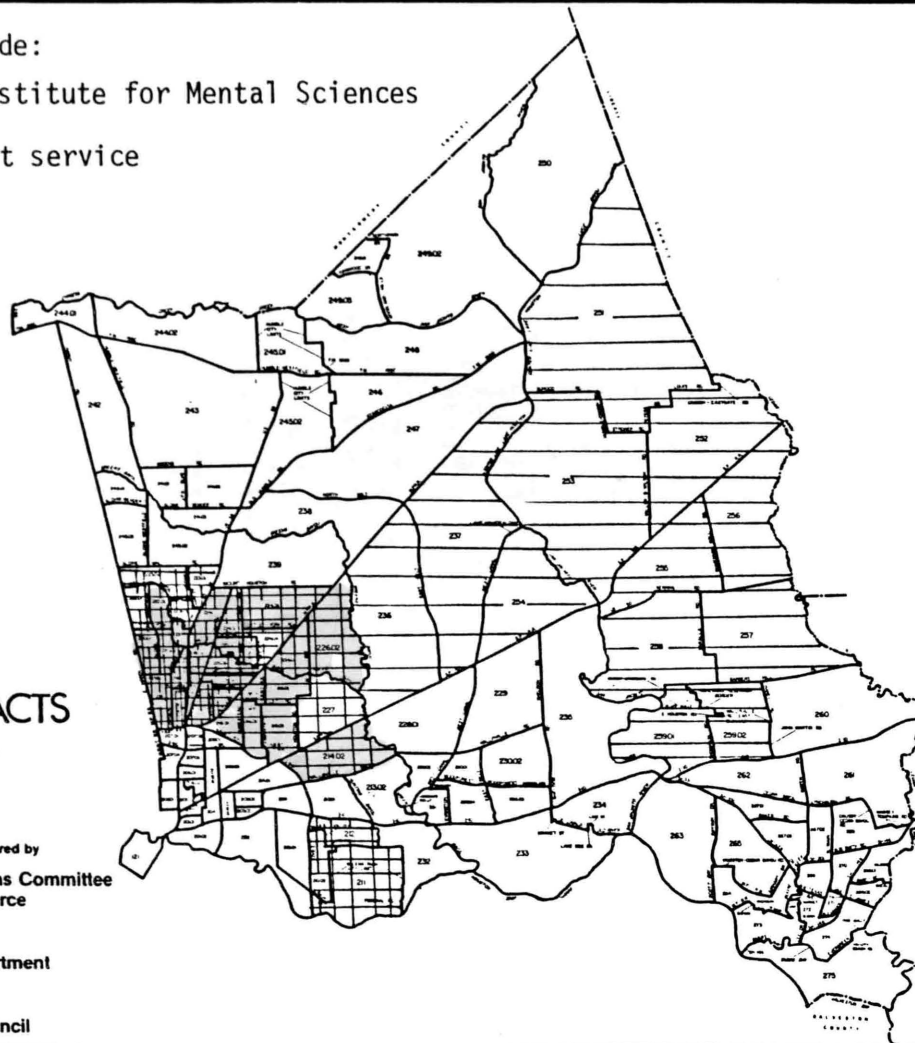


# 1980 CENSUS TRACTS Harris County Texas

Census tract boundary descriptions prepared by  
Houston Region Census Statistical Areas Committee  
Houston Chamber of Commerce

In cooperation with  
City of Houston Planning Department

Map prepared by  
Houston-Galveston Area Council



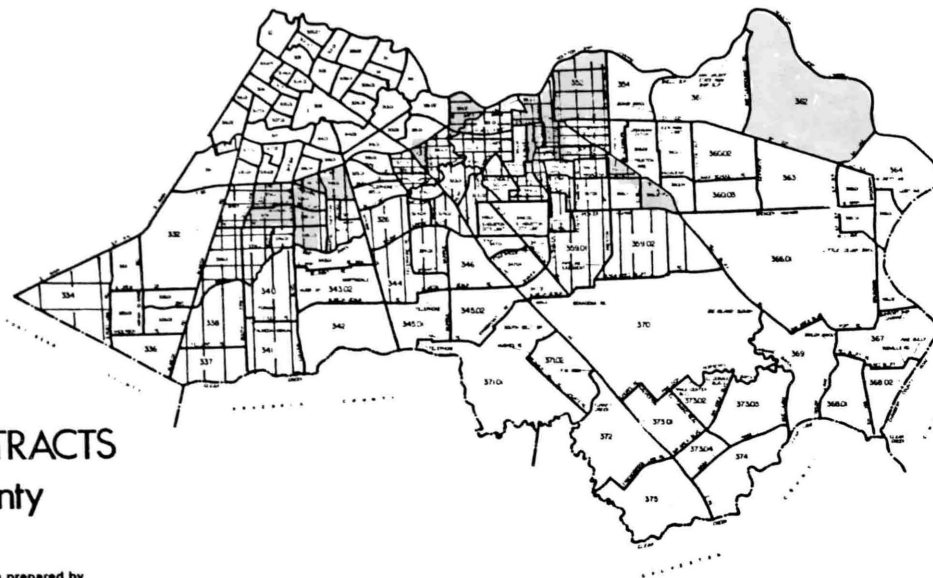
SHEET 2 OF 5

Map 2. High-risk census tracts for developing a mental disorder in Harris County, Texas (northeast Harris County), 1980

Patient Origin by Zipcode:

—— Texas Research Institute for Mental Sciences

| Ben Taub inpatient service



# 1980 CENSUS TRACTS Harris County Texas

Census tract boundary descriptions prepared by  
Houston Region Census Statistical Areas Committee  
Houston Chamber of Commerce

In cooperation with  
City of Houston Planning Department

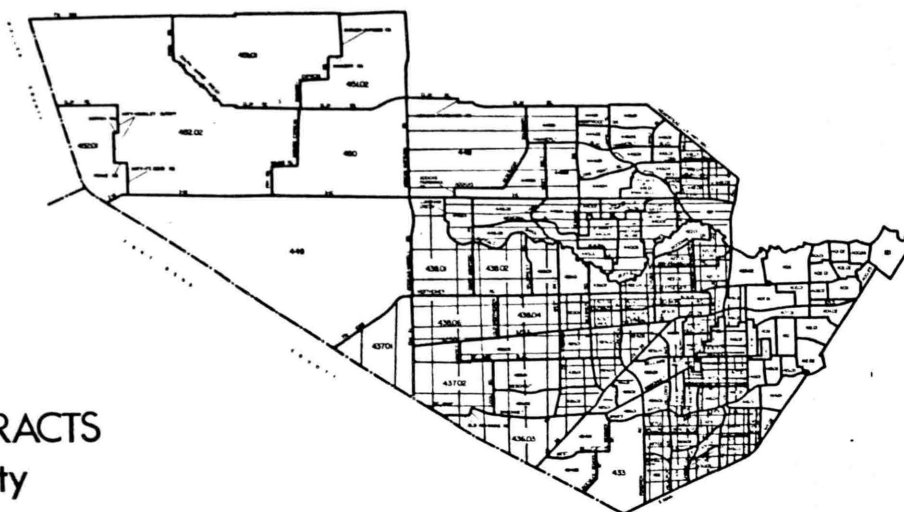
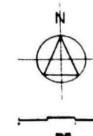
Map prepared by  
Houston-Galveston Area Council



SHEET 3 OF 5

Map 3. High-risk census for developing a mental disorder in Harris County, Texas  
(southeast Harris County), 1980.

| Ben Taub inpatient service



## Houston-Galveston Area Council



SHEET 4 OF 5

87

Patient Origin by Zipcode:

— Texas Research Institute for Mental Sciences

| Ben Taub inpatient service



## 1980 CENSUS TRACTS

Harris County

Texas

Census tract boundary descriptions prepared by

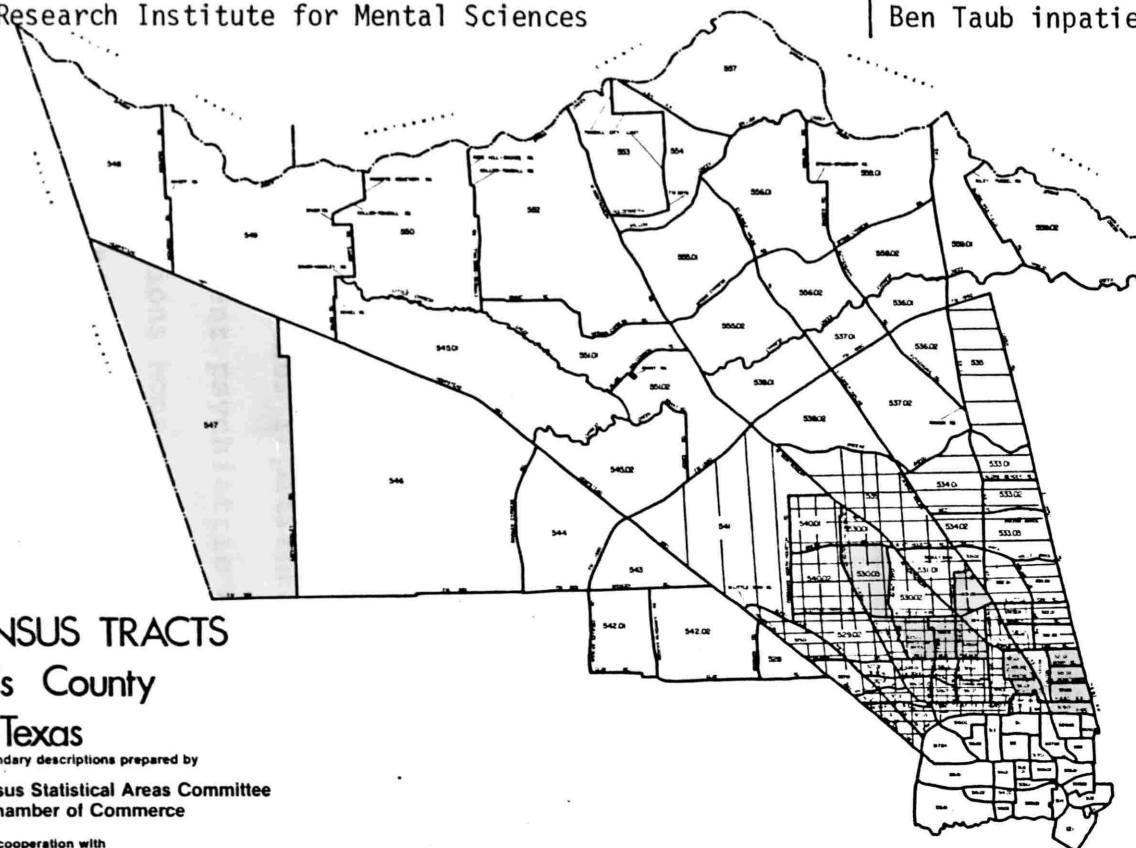
Houston Region Census Statistical Areas Committee  
Houston Chamber of Commerce

In cooperation with

City of Houston Planning Department

Map prepared by

Houston-Galveston Area Council



SHEET 5 OF 5

Map 5. High-risk census tracts for developing a mental disorder in Harris County, Texas (northwest Harris County), 1980.

and the Texas Research Institute for Mental Sciences have increased from 18.7 to 21.1 days. Of all Harris County admissions transferred to the Austin State Hospital, via the Harris County Psychiatric Hospital, 34.2% were discharged within 30 days. Over the three year period the Texas Research Institute for Mental Sciences provided for 35.6% of all acute admissions with 60, liscensed beds, the Austin State Hospital--25.2% with 310 beds available to Harris County residents, the Ben Taub psychiatric inpatient unit--18.1% with 27, liscensed beds, the Ben Taub emergency service--18.6% with 10, liscensed observation beds, and the alcohol detoxification unit--2.7% with two, liscensed beds. Table 5 details this inpatient acute admissions distribution.

Ben Taub psychiatric emergency service (1979-1981).

The Ben Taub psychiatric emergency service referred 57.6% of all admissions for further inpatient care, most frequently to Ben Taub's inpatient psychiatric service, and discharged 36.8% of all admissions home or to outpatient psychiatric care. The Ben Taub psychiatric emergency service had a 4.6% decrease in admissions over the three year period with an increase in occupancy rates from 44 to 74.8%. Lengths of stay increased corespondingly with the increased occupancy rate. Admissions discharged for further inpatient care

TABLE 5

ACUTE PSYCHIATRIC ADMISSIONS TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES  
AVAILABLE FOR RESIDENTS, HARRIS COUNTY, 1979-1981

Facility	Number of Admissions			Percent of Admissions			
	1979	1980	1981	1979	1980	1981	1979-1981
Ben Taub emergency service	330	324	405	18.0%	16.8%	20.9%	18.6%
Ben Taub inpatient service	382	338	314	20.9	17.2	16.3	18.1
Alcohol Detox	---	66	92	---	3.4	4.8	2.7
TRIMS*	698	744	592	38.2	37.9	30.6	35.6
Austin State Hospital	419	489	529	22.9	24.9	27.4	25.2
Total	1,829	1,961	1,932	100.0%	100.0%	100.0%	100.0%

\* Texas Research Institute for Mental Sciences



decreased 8.1%, while admissions discharged home increased 9.5%. This phenomenon probably reflects the increased occupancy rates and lengths of stay at Ben Taub three south, thereby, reducing the number of referrals that unit can accept from the emergency service. The mean length of stay for admissions discharged home or for psychiatric outpatient care was 2.7 days in 1981, an increase over the previous two years. The mean length of stay for admissions with a discharge destination to Ben Taub's psychiatric inpatient service or other psychiatric inpatient care increased to 3.1 days, thus reinforcing the problems created by increased occupancy rates exhibited by the psychiatric inpatient unit. Table 6 present data observed relating to this discussion.

Ben Taub psychiatric inpatient unit. Acute-care episodes constituted 52.9% of total admissions to Ben Taub's psychiatric inpatient unit for the three year period. Forty percent of all admissions were referred for further psychiatric inpatient care, frequently to the Austin State Hospital. Patients awaiting commitment procedures had a mean length of stay of 11.9 days. The length of stay for these patients remained relatively stable over the three year period. The mean length of stay for acute-care patients has risen steadily from 13.7 days in 1979 to 16.9 days in 1981. This increase in mean length of stay

corresponds with a 13.1% decrease in admissions for 1979-1981 and an increased occupancy rate from 95.9% in 1979 to 98.1% in 1981 (see Table 6).

Mental Health Mental Retardation Authority's alcohol detoxification unit. Admissions at the alcohol detoxification unit consist entirely of acute-care admissions with an average length of stay of 7.9 days for the two years in operation (1980-1981). More recently patients are remaining 14 days and this is considered an optimal length of stay for detoxification. Adjusted frequencies of admissions have increased 39.4% over the two year period, and occupancy rates have risen from 74.1% to 98.0% (see Table 6).

Texas Research Institute for Mental Sciences. The Texas Research Institute for Mental Sciences discharged 97.6% of all inpatient psychiatric admissions to home or to psychiatric outpatient clinics over the three year period. The mean length of stay has steadily increased 7.8% from 21.6 to 23.3 days. Admissions have correspondingly decreased, but occupancy rates have been sporadic from a low of 73.5% in 1979, to 88.9% in 1980, and 77.1% in 1981. Meanwhile beds in operation have steadily decreased from 59 in 1979 to 49 in 1981 (see Table 6).

TABLE 6

DESCRIPTIVE STATISTICS FOR PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES  
AVAILABLE TO RESIDENTS OF HARRIS COUNTY, 1979-1981

Facility	Liscensed Beds	Operative Beds	Number of Admissions	Patient Days	Occupancy Rate	Average Length of Stay, Days
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1979

BTER	10	10	986	1,608.0	44.0%	1.7
BT3S	27	25	684	8,755.2	95.9%	12.8
Alc Detox	--	--	---	-----	-----	----
TRIMS	60	59	733	15,832.8	73.5%	21.6
HCPH	40	40	1,620	17,820.0	122.0%	11.0
ASH	310	310	1,363	103,002.0	91.0%	75.5

1980

BTER	10	10	959	1,944.0	53.2%	2.0
BT3S	27	25	661	8,989.6	98.5%	13.6
Alc Detox	2	2	66	541.2	74.1%	8.2
TRIMS	60	53	761	17,198.6	88.9%	22.6
HCPH	40	40	1,477	13,293.0	91.0%	9.0
ASH	310	310	1,259	86,638.0	76.6%	68.8

1981

BTER	10	10	941	2,728.9	74.8%	2.9
BT3S	27	25	605	8,945.0	98.1%	14.8
Alc Detox	2	2	92	717.6	98.0%	7.8
TRIMS	60	49	592	13,793.6	77.1%	23.3
HCPH	40	40				
ASH *	310	310	1,331	79,540.0	93.9%	59.7

\* Reflects data for the first nine months of 1981

The Austin State Hospital. Acute admissions at the Austin State Hospital have increased from 32.8% of all admissions in 1979 to 45% of all admissions in 1981. The mean length of stay for acute admissions could not be determined due to data presentation from the State Hospital System. Occupancy rates for all admissions have been sporadic from 91.0% in 1979, to 76.6% in 1980, and 93.9% for the first nine months of 1981 (see Table 6).

Age, Sex and Race of  
Psychiatric Admissions

Age. Age of acute psychiatric inpatients was determined from 1980 and 1981 data, because of the inavailability of age data from the Texas Research Institute for Mental Sciences for 1979. Admissions to the four, local public psychiatric facilities and to the Austin State Hospital indicated 34.8% were in the 25-34 year age group followed by 25.9% in the 15-24 year age group. Of the 15-24 year olds treated at the local public psychiatric facilities, 77.4% were 20 years old or older. Therefore, 20-34 year olds comprised 54.7% of all acute admissions. However, for the two year period, 15-19 year olds exhibited the greatest increase in admissions for the 15-24 year age group. Tables 7 and 8 detail these frequencies. The balance of acute admissions for all public psychiatric facilities decreased correspondingly with each successive

TABLE 7

AGE GROUP OF ACUTE PSYCHIATRIC ADMISSIONS FOR HARRIS COUNTY RESIDENTS  
TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES IN HARRIS COUNTY  
AND THE AUSTIN STATE HOSPITAL, 1980-1981

Age Group (Year)	Number of Admissions		Percent of Admissions		
	1980	1981	1980	1981	1980-1981 Combined
15-24	500	509	25.5%	26.3%	25.9%
25-34	692	665	35.2	34.4	34.8
35-44	302	341	15.4	17.7	16.6
45-54	204	203	10.4	10.4	10.5
55-64	86	102	4.4	5.3	4.9
65+	75	58	3.8	3.0	3.4
Unknown	102	54	6.5	3.8	5.2

TABLE 8

AGE DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS WITHIN  
THE 15-24 AGE GROUP TO PUBLIC-SUPPORTED PSYCHIATRIC  
FACILITIES IN HARRIS COUNTY, 1980-1981

Age, Years	Percent of Admissions			Percent Rate of Change 1980-1981
	1980	1981	1980-1981 Combined	
15-19	19.8%	25.8%	22.7%	+6.0%
20	15.1	11.8	13.5	-3.3
21	12.4	13.6	13.0	+1.2
22	18.5	15.3	17.0	-3.2
23	15.6	18.2	16.9	+2.6
24	18.5	15.3	17.0	-3.2

age group. The 35-44 year age group comprised 16.6% of acute admissions, 45-54 year age group with 10.5%, 55-64 year age group with 4.9%, and the 65 year plus age group comprised 3.4%. The 35-44 year age group had the greatest rate of increase over the two year period, increasing 2.3% followed by the 15-24 year and 55-64 year age groups increasing nearly 1%. The 25-34 year and 65 year plus age groups had the greatest rate of decrease at nearly 1%.

Age groups differed between the Austin State Hospital and the local facilities. This difference can be attributed to differing diagnostic categories treated at the Austin State Hospital.

The mean age for all patients seen at all four, local public psychiatric facilities over the two year period was 33.6 years. Acute admissions to Ben Taub's psychiatric inpatient service had a mean age of 31.9 years, and the Ben Taub psychiatric emergency service acute admissions had a mean age of 31.8 years for the 1979-1981 period. The mean age of alcohol detoxification admissions was 38 years for the two year operative period (1980-1981), while the Texas Research Institute for Mental Sciences recorded a mean age of 35.3 years for the same two year period. The mean age for acute admissions to the Austin State Hospital was not available for determination due to data presentation (see Table 9).

TABLE 9

MEAN AGE OF ACUTE PSYCHIATRIC ADMISSIONS TO PUBLIC-SUPPORTED  
PSYCHIATRIC FACILITIES, HARRIS COUNTY, 1979-1981

Facility	Mean Age, Years			
	1979	1980	1981	1980-1981 Combined
Ben Taub emergency service	31.6	31.6	30.8	31.2
Ben Taub inpatient treatment service	31.8	32.3	31.6	31.95
Alcohol Detox	----	36.7	39.1	38.0
Texas Research Institute for Mental Sciences	----	34.9	35.7	35.3
All Four Combined	31.5	33.5	33.6	33.6



Sex. Females accounted for 50.8% of acute psychiatric inpatient admissions over the three year period and males comprised 47.4% of acute admissions to the four, local public psychiatric institutions. The trend over the three year period indicated inpatient acute psychiatric admissions for females have steadily declined 6.5% over the three year period, while acute admissions for males have increased 10.6% (see Table 10). Acute admissions to the Austin State Hospital revealed an entirely different sex breakdown. When these figures were combined with the local data, 53.6% of inpatient acute psychiatric admissions were males while 46.6% were females (see Table 11).

Females had a median age of 35.7 years for inpatient acute psychiatric admissions, significantly higher than the median age of males acute admissions at 30.3 years, at the four, local public psychiatric facilities.

Race. Race was not recorded by the Texas Research Institute for Mental Sciences. The combined data for the remaining three, local public psychiatric facilities and the Austin State Hospital for inpatient acute psychiatric admissions indicated whites and blacks predominate these admissions. Whites comprised 49.5% of acute admissions, and blacks comprised 35.9% of all acute admissions. Hispanics comprised 10.2% of acute admissions (see Table 12). Table

TABLE 10

SEX DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS TO  
PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES,  
HARRIS COUNTY, 1979-1981

Sex	Percent of Admissions			
	1979	1980	1981	1979-1981 Combined
Male	41.8%	48.0%	52.4%	47.4%
Female	53.6	51.7	47.1	50.8
Unknown	4.6	0.3	0.1	1.06

TABLE 11

SEX DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS FOR HARRIS COUNTY RESIDENTS TO  
PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES IN HARRIS COUNTY AND THE  
AUSTIN STATE HOSPITAL, 1979-1981

Sex	Number of Admissions			Percent of Admissions			
	1979	1980	1981	1979	1980	1981	1979-1981 Combined
Male	894	1056	1074	48.8%	53.8%	58.4%	53.6%
Female	879	901	851	47.5	45.9	46.3	46.6
Unknown	65	4	7	3.6	0.2	0.4	1.4

TABLE 12

RACE DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS FOR HARRIS COUNTY RESIDENTS  
TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES IN HARRIS COUNTY AND  
THE AUSTIN STATE HOSPITAL, 1979-1981

Race	Number of Admissions			Percent of Admissions			
	1979	1980	1981	1979	1980	1981	1979-1981 Combined
White	554	596	676	48.9%	48.9%	50.4%	49.5%
Black	430	407	488	38.0	33.4	36.4	35.9
Hispanic	99	139	138	8.8	11.4	10.3	10.2
Other	10	18	8	0.8	1.5	0.5	0.9
Unknown	38	55	29	3.3	4.5	2.1	3.3

13 indicates a slightly different racial breakdown for the local acute admissions with whites comprising 43.8% and blacks with 38.4%, while other groups remained stable. One explanation for this could be the differences in diagnostic frequencies for the studied psychiatric facilities accompanied by differing diagnostic rates for each ethnic group.

The mean age for whites was slightly higher at 33.2 years than for blacks and hispanics at 30.8 years and 30.4 years, respectively, at the three, local public psychiatric facilities recording race.

Percentages of males and females were consistent with the overall sex percentages for blacks; whites revealed a slightly higher percentage of males and a lower percentage of females than the average. Sex percentages differed significantly from the overall percentages for hispanics. Hispanic males comprised 57.3% of their admissions and females comprised 43.4% of hispanic acute admissions.

#### Psychiatric Diagnostic Characteristics

Diagnosis was infrequently recorded in the Texas Research Institute for Mental Sciences data in 1979. Therefore, overall frequencies for acute-care diagnosis to the four, local public psychiatric facilities and the Austin State Hospital were determined for the 1980-1981 period.

TABLE 13

RACE DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS  
TO PUBLIC-SUPPORTED HARRIS COUNTY FACILITIES,  
1979-1981

Race	Percent of Admissions			
	1979	1980	1981	1979-1981 Combined
White	41.9%	41.2%	48.0%	43.8%
Black	42.8	36.0	36.7	38.4
Hispanic	8.6	12.8	10.7	10.7
Other	1.4	2.5	1.0	1.6
Unknown	5.3	7.6	3.6	5.4

NOTE: Texas Research Institute for Mental Sciences is excluded from this table. This facility did not record data on race.

Schizophrenia and psychosis accounted for 49.8% of all inpatient acute psychiatric admissions, comprising 35.0% and 14.8%, respectively. These major diagnoses were followed by affective disorders with 10.6%, personality disorders with 10.4%, alcohol abuse with 10.2%, and drug abuse with 8.3%. These four diagnoses comprised 39.5% of acute admissions. The diagnoses of other (usually deferred or unrecorded diagnosis) at 6.5%, organic brain syndrome with 3.0%, and neurosis with .9% completed the diagnostic distribution (see Table 14).

The only significant diagnostic changes in the two year period were a 3.0% increase in diagnosis of affective disorders and a 2.6% decrease in diagnosis of personality disorders. Two years is too short a time period to make a statement concerning diagnostic trends (see Table 14). This could be explained by the fact that the new Diagnostic Statistical Manual, distributed for use in 1980, changed nomenclature of certain diagnostic groupings.

#### Diagnoses by Institution

Ben Taub psychiatric emergency service. Adjusted frequencies of inpatient acute psychiatric diagnoses to the Ben Taub emergency service differed from the overall, acute diagnostic pattern for the two year period 1980-1981. Although psychosis and schizophrenia accounted for 56.8% of

TABLE 14

DIAGNOSTIC DISTRIBUTION OF ACUTE PSYCHIATRIC ADMISSIONS FOR HARRIS COUNTY RESIDENTS  
TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES IN HARRIS COUNTY AND  
THE AUSTIN STATE HOSPITAL, 1980-1981

Diagnosis	Number of Admissions		Percent of Admissions			Percent Change 1980-1981
	1980	1981	1980	1981	1980-1981	
Alcohol Abuse	195	205	9.9%	10.6%	10.2%	+0.7%
Drug Abuse	155	166	7.9	8.6	8.3	+0.7
O.B.S.*	62	55	3.2	2.8	3.0	-0.4
Schizo- phrenia	684	679	34.9	35.1	35.0	+0.2
Affective Disorder	179	233	9.1	12.1	10.6	+3.0
Psychosis	306	271	15.6	14.0	14.8	-1.6
Personality Disorder	229	176	11.7	9.1	10.4	-2.6
Neurosis	25	13	1.3	.7	.9	-0.6
Other	126	128	6.4	6.6	6.5	-0.2

\* Organic Brain Syndrome



acute admissions, schizophrenia comprised 34.7% of these admissions and psychosis comprised 22.1%, significantly different from the overall pattern. Personality disorders ranked third with 12.7% and affective disorders were fourth at 11.5%. These two diagnoses are juxtaposed from the overall ranking but are similar to the overall frequencies. Drug abuse followed with 7.4%, other with 6.8%, organic brain syndrome with 2.8%, and neurosis with 0.4% of all diagnoses. Alcohol abuse comprised 1.6% of all admissions, and this differs significantly from the overall frequencies. The low incidence of alcohol abuse is probably explained by the fact that patients presenting with this diagnosis are not admitted but referred to the alcohol detoxification unit located in The Methodist Hospital. Also, a discharge diagnosis will frequently classify alcohol abuse as a personality disorder.

A comparison of diagnostic patterns for the Ben Taub psychiatric emergency service between those discharged to home (or acute admissions) and those discharged for further hospitalization (acute- or longer-term admissions, dependent upon the referral hospital's discharge patterns) revealed that diagnoses of schizophrenia or psychosis are more often referred for further psychiatric hospitalization. All other diagnoses are more often stabilized and sent to home or to outpatient psychiatric clinics (see Table 15).

TABLE 15

FREQUENCY OF PSYCHIATRIC DIAGNOSIS TO THE BEN TAUB  
FACILITY BY DISCHARGE REFERRAL, 1979-1981

Diagnosis	Emergency Service		Inpatient Treatment	
	Home (percent)	Inpatient (percent)	Home (percent)	Inpatient (percent)
Alcohol Abuse	1.6%	0.7%	1.5%	0.7%
Drug Abuse	7.4	0.9	7.1	0.4
O.B.S.*	2.8	1.9	2.8	1.4
Schizo- phrenia	34.7	40.9	34.4	52.8
Affective Disorder	11.5	7.2	11.6	6.6
Psychosis	22.1	37.3	22.9	30.0
Personality Disorder	12.7	6.4	12.4	4.5
Neurosis	0.4	0.2	0.4	---
Other	6.8	4.5	6.8	4.0

\* Organic Brain Syndrome

Ben Taub psychiatric inpatient service. Frequency of diagnoses for acute admissions to the Ben Taub psychiatric inpatient unit was nearly identical to the diagnostic breakdown of the Ben Taub psychiatric emergency service, in terms of ranking and frequencies. These same rankings of diagnoses held true for further inpatient psychiatric care for both the emergency service and inpatient unit. However absolute frequencies between the two units differ (see Table 15).

Alcohol Detoxification unit. All patients presenting at the alcohol detoxification unit, located at The Methodist Hospital, present with a problem of alcohol abuse. However, the discharge psychiatric diagnosis is usually a personality disorder.

Texas Research Institute for Mental Sciences. The diagnostic pattern of acute psychiatric admissions to the Texas Research Institute for Mental Sciences differed from the overall diagnostic pattern and those of the Ben Taub units. The diagnoses, rankings, and frequencies are:

1. Schizophrenia-- 35.2%
2. Affective Disorders-- 17.3%
3. Drug Abuse-- 13.8%
4. Personality Disorders-- 12.3%
5. Organic Brain Syndrome-- 9.2%

6. Psychosis--	7.8%
7. Other--	6.5%
8. Alcoholism--	2.0%
9. Neurosis--	0.0%

The frequencies and percentages of affective disorders, drug abuse, and organic brain syndrome diagnoses are significantly different from the other, local facilities. The higher percentage of organic brain syndrome could account for the higher mean age exhibited by this facility, as this disorder is more prevalent in the aged. Psychosis is markedly lower in this group--7.5% as compared to 22% and above in the other groups.

Austin State Hospital. Seventy percent of all acute admissions to the Austin State Hospital consisted of a diagnosis of schizophrenia, alcohol abuse, or drug abuse, comprising 39.2%, 20.1%, and 10.8%, respectively.

#### Psychiatric Diagnoses by Age, Sex, and Race

Age. Schizophrenia ranked as the most predominant diagnosis for all age groups except the 55 year plus groups, in which it ranked second for the two year period 1980-1981 at the four, local public psychiatric facilities. Psychosis ranked as the second most frequent diagnosis from the ages 15 through 44 years. Psychosis ranked third in the 45

through 64 year age groups and dropped to fourth for those aged 65 years and over. Schizophrenia and psychosis accounted for 55% or more of all inpatient acute psychiatric admissions for the 15 to 34 year olds at the local public psychiatric institutions. Overall affective disorders ranked third, but this ranking existed only for the 35-44 year age group and those 65 years and over. Affective disorders ranked fifth for the 15-24 year and 25-34 year age groups and second for the 45-54 year olds. Fourth ranked personality disorders ranked fifth for those aged 15-34 years, and steadily increased to first over the successive age groups, falling back to fourth in the 65 year and over age group. Alcohol abuse is the fourth most frequent diagnosis for those aged 35-64. The ranking drops to sixth or seventh for all other age groups. Drug abuse ranks as the fourth most frequent diagnosis among the two youngest age groups, sixth for the middle aged groups, and eighth for the two oldest age groups. A diagnosis of other ranks as seventh for all age groups except the youngest and oldest age groups. Organic brain syndrome is the most frequent diagnosis for those 65 years and over, dropping to fifth for the 55-64 year olds, and ranking last or next to the last for all other age groups. Neurosis consistently ranks last. Tables 16 summarizes this discussion.

TABLE 16

DIAGNOSTIC BREAKDOWN BY AGE FOR ACUTE PSYCHIATRIC ADMISSIONS TO HARRIS COUNTY  
PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES, 1980-1981

Diagnosis	Percentage of Admissions					
	15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65+ Years
Alcohol Abuse	14.0%	7.8%	13.2%	10.9%	9.9%	0.8%
Drug Abuse	8.9	9.8	6.8	4.5	1.5	0.8
O.B.S. *	1.2	---	1.4	1.5	9.2	31.0
Schizophrenia	36.0	36.4	30.0	30.2	23.7	23.8
Affective Disorder	8.2	9.0	16.3	22.4	25.2	16.7
Psychosis	23.3	19.3	17.0	20.1	16.0	9.5
Personality Disorder	14.2	12.5	9.0	6.7	8.4	15.9
Neurosis	0.6	0.3	0.5	0.4	---	---
Other	6.1	4.5	5.9	3.4	6.1	1.6

\* Organic Brain Syndrome

Sex. Acute male admissions were diagnosed for alcohol abuse four times more often than females and 1.5 times more often for drug abuse during the three year period to local public psychiatric institutions. Female acute admissions were diagnosed 2.4 times more often for affective disorders and 1.5 times more often for personality disorders. Other diagnostic categories were relatively evenly distributed between the two sexes (see Table 17).

Race. Data on race and diagnostic breakdowns were only available for the Ben Taub psychiatric services and the alcohol detoxification unit, located at The Methodist Hospital. Whites have a rate of alcohol abuse approximately three times higher than blacks and hispanics. Whites have slightly higher rates of personality and affective disorders. Blacks and hispanics have higher rates of schizophrenia and psychosis than whites. Hispanics appear to have a lower rate of drug abuse than the other two groups. Organic brain syndrome, neurosis and other are evenly distributed. Table 18 details this discussion.

#### Length of Stay for Acute Psychiatric Admissions

Average lengths of stay for acute inpatient psychiatric admissions, specific for diagnosis, age group, and sex, were determined by examining all acute admissions during the three year period (1979-1981) to the Ben Taub psychiatric

TABLE 17

ACUTE PSYCHIATRIC ADMISSIONS BY DIAGNOSIS AND SEX  
TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES  
IN HARRIS COUNTY, 1980-1981

Diagnosis	Percent of Admissions		
	Males	Females	Unknown
Alcohol Abuse	10.7%	2.7%	----
Drug Abuse	8.9	6.0	----
O.B.S. *	2.3	3.3	----
Schizophrenia	35.6	30.1	10.0
Affective Disorder	7.1	16.7	10.0
Psychosis	19.8	20.4	10.0
Personality Disorder	9.4	13.9	----
Neurosis	0.4	0.4	----
Other	5.7	6.6	10.0

\*Organic Brain Syndrome



TABLE 18

DIAGNOSTIC BREAKDOWN BY RACE OF ACUTE PSYCHIATRIC  
ADMISSIONS TO PUBLIC-SUPPORTED PSYCHIATRIC  
FACILITIES IN HARRIS COUNTY, 1980-1981

Diagnosis	Percent of Admissions		
	White	Black	Hispanic
Alcohol Abuse	12.2%	4.3%	3.3%
Drug Abuse	2.7	2.4	0.8
O.B.S.*	1.2	1.5	1.7
Schizophrenia	26.5	37.1	38.2
Affective Disorder	8.9	3.9	5.4
Psychosis	26.0	35.7	31.5
Personality Disorder	15.0	8.0	11.2
Neurosis	0.5	0.3	----
Other	6.9	5.9	7.9

\* Organic Brain Syndrome

inpatient unit and the Texas Research Institute for Mental Sciences. It was necessary to combine the three years of acute inpatient psychiatric admissions due to the extent of unknown variables in the four variable data set. Combining data for the three year period provides optimal information for determining length of stay. Table 19 represents absolute frequencies for admissions with a complete data set. The information presented in this table is considered as representative of those admissions with incomplete data sets. Table 20 presents absolute frequencies for length of stay specific for diagnosis and age group and is also considered as a representative sample of all admissions. Table 21 presents discharge diagnosis with the average length of stay for all inpatient acute psychiatric diagnoses, non-specific for age. The table also provides average lengths of stay, specific for diagnosis and age group, and diagnostic frequencies for each age group. This table represents a larger sample of admissions than the previous two tables for diagnostic length of stay, because only two known variables were required for analysis. Comparing these average lengths of stay with those in the previous two tables, it is seen that the other two tables do reflect an adequate sampling for length of stay by diagnosis with the exception of neurosis. Since this diagnostic frequency is so low, no adjustment will be made to

TABLE 19

MEAN LENGTH OF STAY FOR ACUTE PSYCHIATRIC ADMISSIONS BY DIAGNOSIS, AGE, AND SEX TO BEN TAUB  
INPATIENT SERVICE AND TRIMS, 1979-1981

Diagnosis	Total LOS, Days	15-24 Years		25-34 Years		35-44 Years		45-54 Years		55-64 Years		65+ Years	
		M	F	M	F	M	F	M	F	M	F	M	F
Alcohol Abuse	37 13.5		3 16.3	13 8.9	3 8.0	6 11.8	3 13.0	2 14.0	1 47.0	2 17.5			
Drug Abuse	197 17.6	42 14.4	22 15.4	57 20.1	30 15.9	14 22.9	13 20.4	6 10.7	7 18.0	2 26.5		1 16.0	
O.B.S. *	126 35.2	5 44.4	3 18.3	2 7.5	1 10.2	4 29.3	3 17.0		4 55.8	5 28.4	7 18.6	15 27.4	23 45.9
Schizo- phrenia	985 23.7	148 21.6	98 23.2	156 19.4	136 19.1	47 19.3	65 21.1	14 27.8	68 24.3	5 25.0	23 24.8	2 30.0	27 35.4
Affective Disorder	367 20.2	25 16.4	46 19.2	19 17.5	71 17.6	18 16.4	14 15.9	16 15.6	41 19.7	8 21.4	22 27.9	9 49.1	11 31.6
Psychosis	497 18.3	72 20.1	65 17.6	50 12.7	90 12.4	9 16.0	38 16.8	8 23.9	40 14.2	3 23.3	19 17.7	4 34.3	7 26.4
Personality Disorder	339 16.7	35 13.3	53 16.9	36 14.1	70 10.8	8 11.8	26 11.3	3 29.0	25 13.8	5 14.6	8 21.8	4 44.2	15 47.1
Neurosis	17 16.3	3 5.0	1 25.0	1 0.0	1 2.0	1 0.0							
Other	470 13.2	21 13.0	27 13.3	23 15.5	24 17.6	9 13.1	11 16.3	6 13.3	5 12.4		8 23.4	2 18.5	1 29.0

\* Organic Brain Syndrome

TABLE 20

MEAN LENGTH OF STAY FOR ACUTE PSYCHIATRIC ADMISSIONS BY DIAGNOSIS AND AGE TO BEN TAUB  
INPATIENT SERVICE AND TRIMS, 1979-1981

Diagnosis	Total LOS, Days	Number of Known Admissions by Length of Stay (Days)					
		15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65+ Years
Alcohol Abuse	37 13.5	4 16.3	16 8.8	9 12.2	3 25.0	2 17.5	
Drug Abuse	197 17.6	64 14.8	87 18.6	27 21.7	13 14.6	2 26.5	1 16.0
O.B.S.*	126 35.2	8 34.6	3 39.0	7 24.0	4 55.8	12 22.7	38 38.6
Schizo- phrenia	985 23.7	246 22.2	293 19.3	112 20.3	82 23.1	28 24.9	29 35.0
Affective Disorder	367 20.2	71 18.2	90 17.6	62 16.1	57 18.6	30 26.1	20 39.5
Psychosis	497 18.3	137 18.9	140 12.5	47 16.6	48 15.8	22 18.5	11 29.2
Personality Disorder	339 16.7	88 15.5	106 11.9	34 11.3	18 16.3	13 19.0	19 46.5
Neurosis	17 16.4	4 10.0	2 1.0	1 0.0			
Other	470 13.2	48 13.2	37 16.8	20 14.6	11 12.9	8 23.4	3 22.0

\* Organic Brain Syndrome

TABLE 21

ACUTE PSYCHIATRIC DIAGNOSES BY AGE, SPECIFIC FOR FREQUENCY AND LENGTH OF STAY, FREQUENCIES ADJUSTED TO REFLECT ALL PUBLIC-SUPPORTED FACILITIES AVAILABLE TO HARRIS COUNTY RESIDENTS

Diagnosis	ALOS, Days	15-24 Years		25-34 Years		35-44 Years		45-54 Years		55-64 Years		65+ Years	
		%	LOS	%	LOS	%	LOS	%	LOS	%	LOS	%	LOS
Alcohol Abuse	14.0	1.4	16.3	7.8	8.8	13.2	12.2	10.9	25.0	9.9	17.5	.8	13.5
Drug Abuse	18.0	8.9	14.8	9.8	18.6	6.8	21.7	4.5	14.6	1.5	26.5	.8	16.0
O.B.S. *	36.3	1.2	34.6	0.2	39.0	1.4	24.0	1.5	55.8	9.2	22.7	31.0	38.6
Schizophrenia	23.1	36.0	22.2	36.5	19.3	30.0	20.3	30.2	23.1	23.7	24.9	23.8	35.0
Affective Disorder	19.8	8.2	18.2	9.0	17.6	16.3	16.1	22.4	18.6	25.2	26.1	16.7	39.5
Psychosis	18.2	23.3	18.9	19.3	12.5	17.0	16.6	20.1	15.8	16.0	18.5	9.5	29.2
Personality Disorder	17.4	14.2	15.5	12.5	11.9	9.0	11.3	6.7	16.3	8.4	19.0	15.9	46.5
Neurosis	6.0	0.6	10.0	0.3	16.9	0.5	16.4	0.4	16.4	---	---	---	---
Other	16.6	6.1	13.2	4.5	16.8	5.9	14.6	3.4	12.9	6.1	23.4	1.6	22.0

\* Organic Brain Syndrome

compensate for this factor. Length of stay for alcohol abuse was adjusted to reflect a 14 day length of stay.

Sex. Acute admissions to the Ben Taub inpatient psychiatric unit and to the Texas Research Institute for Mental Sciences indicated males and females had a relatively evenly distributed length of stay, 20.1 and 20.8 days, respectively. Overall, females appeared to stay one-half day longer than males.

Age group. Length of stay for the 15-24 year age group is 20.1 days, dropping to 17.3 days (the shortest length of stay for any age group) for the 25-34 year age group. The length of stay gradually rises with each successive age group and jumps dramatically between the 55-64 year age group (24.1 days) and the 65 year plus age group (38.8 days).

Psychiatric diagnosis. The shortest length of stay is for neurosis--the least frequent diagnosis--at 6.0 days. Other, personality disorders, psychosis, and affective disorders, accounting for 42.3% of all admissions, had an average length of stay clustering between 16.6 and 19.8 days. Schizophrenia, the most frequent diagnosis, had an average length of stay of 23.1 days. Organic brain syndrome, the most frequent diagnosis for the 65 years and

over age group, was 36.3 days. The relationship between this diagnosis and age group probably reflects the dramatic increased length of stay for the 65 year plus age group.

Psychiatric Admission Rates for  
the High-Risk Population

The overall rate of acute inpatient psychiatric admissions for the high-risk population for developing a mental disorder in Harris County was .0047 in 1981. The average national utilization rate is .01. Thus, Harris County is probably not meeting an actual demand for services by 50%.

Rates of Admissions Specific for  
Sex, Race and Age

Sex. Based on all acute inpatient psychiatric episodes for 1980, high-risk males are over-represented in admissions while females are under-represented. However, both are underserved, assuming a 1% level of utilization. Males have an admission rate of 5.02 per 1,000 and females have a 4.1 per 1,000 rate (see Table 22).

Race. All races are underserved; whites are overrepresented for all admissions, based on their proportion in the high-risk population, with a rate of 6.02 per 1,000. Blacks have a rate of 2.1 per 1,000 followed by hispanics with a 1.2 per 1,000 rate (see Table 23).

TABLE 22

RATIOS, UTILIZATION RATES, AND PROJECTED RATES BY SEX OF ACUTE PSYCHIATRIC  
ADMISSIONS FOR HARRIS COUNTY RESIDENTS TO PUBLIC-SUPPORTED HARRIS COUNTY  
PSYCHIATRIC FACILITIES AND THE AUSTIN STATE HOSPITAL, 1980

Sex	Ratios (percent)		Utilization		Projections	
	High Risk Population	Admissions	Number of Episodes	Rates/1000	Number of Episodes	Rates/1000
Males	49.5%	53.8%	1056	5.02	2105.6	10
Females	50.1%	45.9%	901	4.23	2131.1	10



TABLE 23

RATIOS, UTILIZATION RATES AND PROJECTED RATES BY RACE OF ACUTE PSYCHIATRIC  
 . ADMISSIONS FOR HARRIS COUNTY RESIDENTS TO PUBLIC-SUPPORTED HARRIS COUNTY  
 PSYCHIATRIC FACILITIES AND THE AUSTIN STATE HOSPITAL, 1980

Race	Ratios (percent)		Utilization		Projections	
	High Risk Population	Admissions	Number of Episodes	Rates/1000	Number of Episodes	Rates/1000
White	22.8%	48.9%	623	6.4	969	10
Black	48.5%	33.4%	425	2.1	2067	10
Hispanic	29.2%	11.4%	145	1.2	1242	10

Age. The 25-34 year olds are over-represented with a rate of 7.2 per 1,000, while 35-44 year olds are slightly over-represented with a 5.3 per 1,000 rate. This does not mean that these admissions are not real needs; proportionately, other age groups are not receiving their share of limited resources. The 15-24 year olds and 45-54 year olds are slightly underrepresented with rates of 4.3 per 1,000 and 4.1 per 1,000, respectively. Those persons 55 years and older have extremely low proportions of admissions. These rates of admissions are 2.1 per 1,000 and below (see Table 24).

#### Beds Required

Rates of diagnostic frequencies were determined for acute inpatient psychiatric utilization patterns, specific for each age group. Initially a frequency distribution of diagnoses by age group was determined by examining all four, local facilities for the years 1980 and 1981. This diagnostic frequency was multiplied by the total number of 1980 admissions for each age group (including the Austin State Hospital admissions). The product was then divided by the 1980 high risk population, specific for each age group. This computation provided diagnostic rates specific for each age group. These individual diagnostic rates were then

TABLE 24

RATIOS, UTILIZATION RATES, AND PROJECTED RATES BY SEX OF ACUTE PSYCHIATRIC  
ADMISSIONS FOR HARRIS COUNTY RESIDENTS TO PUBLIC-SUPPORTED HARRIS COUNTY  
PSYCHIATRIC FACILITIES AND THE AUSTIN STATE HOSPITAL, 1980

Age Group	Ratios (percent)		Utilization		Projections	
	High Risk Population	Admissions	Number of Episodes	Rate/1000	Number of Episodes	Rate/1000
15-24	28.2%	25.5%	526	4.4	1119.5	10
25-34	23.5	35.2	728	7.2	999.6	10
35-44	13.7	15.4	318	5.3	582.7	10
45-54	12.3	10.4	215	4.1	523.0	10
55-64	10.3	4.4	90	2.1	438.0	10
65+	11.6	3.8	81	1.6	493.0	10

summed to provide admissions rates per age group. Table 25 presents this data.

Table 26 inflates the acute psychiatric inpatient admissions rates in Table 25 to an overall inpatient utilization level of 1%. This 1% rate of inpatient utilization reflects national demand. These rates were then multiplied by the local length of stay sample, specific for diagnosis and age group, to determine patient days (see Table 27).

Assuming an 80% occupancy rate, patient days were converted to beds needed. Table 28 indicates the distribution of these beds by age group and diagnosis. The youngest and oldest age groups require the most beds; and schizophrenia, psychosis, and affective disorders require more beds than other diagnoses. A total of 311 beds were required by Harris County's high-risk population. Harris County provided 75 beds.

#### Discussion and Recommendations

Although 311 beds are suggested for a population with an extremely high-risk for developing a mental disorder, at best this number is an educated guess based upon quantified utilization patterns. Following advise found in the literature, this bed number can only be considered after reviewing several factors.

TABLE 25

RATES OF ACUTE PSYCHIATRIC DIAGNOSTIC FREQUENCIES OF HARRIS COUNTY RESIDENTS  
TO PUBLIC-SUPPORTED PSYCHIATRIC FACILITIES IN HARRIS COUNTY AND  
THE AUSTIN STATE HOSPITAL, 1980-1981

Diagnosis	Rate/1,000					
	15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65+ Years
Alcohol Abuse	.06	.57	.72	.45	.2	.013
Drug Abuse	.39	.71	.37	.19	.09	.013
O.B.S.*	.053	.015	.08	.06	.19	.51
Schizo- phrenia	1.6	2.7	1.6	1.2	.49	.32
Affective Disorders	.36	.66	.89	.92	.52	.27
Psychosis	1.0	1.4	.92	.83	.33	.16
Personality Disorder	.62	.9	.491	.28	.17	.26
Neurosis	.026	.022	.027	.016		
Other	.27	.33	.321	.14	.13	.026
Total Rate	4.4	7.2	5.3	4.1	2.05	1.6

\* Organic Brain Syndrome

TABLE 26

PROJECTED RATE OF ACUTE PSYCHIATRIC ADMISSIONS BASED UPON A 1%  
LEVEL OF INPATIENT UTILIZATION BY AGE GROUP AND DIAGNOSIS

Diagnosis	Rate/1,000					
	15-24 Years	25-34 Years	35-44 Years	45-54 Years	54-64 Years	65+ Years
Alcohol Abuse	.14	.79	1.36	1.09	.98	.08
Drug Abuse	.89	.99	.69	.46	.15	.08
O.B.S. *	.12	.02	.15	.15	.93	3.2
Schizo- phrenia	3.6	3.8	3.0	2.9	2.39	2.0
Affective Disorder	.82	.92	1.7	2.24	2.5	1.7
Psychosis	2.3	1.9	1.7	2.02	1.6	1.0
Personality Disorder	1.4	1.3	.92	.68	.83	1.6
Neurosis	.06	.03	.051	.039		
Other	.61	.46	.61	.34	.63	1.6

\* Organic Brain Syndrome

TABLE 27

PATIENT DAYS NEEDED BASED ON A 1% ADMISSIONS RATE FOR SELECTED AGE AND PSYCHIATRIC DIAGNOSIS  
FOR HARRIS COUNTY, HIGH-RISK POPULATION, 1980

Diagnosis	Patient Days						Total Patient Days
	15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65+ Years	
Alcohol Abuse	235	1,104.6	1,110.2	1,391.6	600.6	54.6	4,496.6
Drug Abuse	1,580.6	969.2	872.3	350.4	174.9	62.4	4,009.8
O.B.S. *	494.8	74.1	208.8	435.2	923.9	6,094.9	8,231.7
Schizo- phrenia	9,585.9	7,332.1	3,548.4	3,504.3	2,607.0	3,454.6	30,032.3
Affective Disorder	1,790.8	1,618.7	1,595.5	2,336.2	2,857.9	3,314.0	13,513.1
Psychosis	5,214.5	2,373.8	1,645.1	1,652.7	1,296.9	1,439.6	13,622.6
Personality Disorder	2,602.5	1,545.8	605.7	580.3	691.6	3,668.8	9,694.7
Neurosis	72.0	49.0	47.6	32.8			
Other	966.2	771.1	518.3	228.3	645.8	1,735.8	4,865.5
Total	22,542.0	17,986.3	10,151.9	10,511.8	9,798.6	19,824.7	90,815.3

\* Organic Brain Syndrome

TABLE 28

TOTAL ACUTE-CARE BEDS REQUIRED BASED ON A 1% ADMISSION RATE AND AN 80% OCCUPANCY RATE.  
FOR THE HIGH-RISK POPULATION IN HARRIS COUNTY, 1980, SPECIFIC FOR AGE AND DIAGNOSIS

Diagnosis	Beds						Total Beds Required
	15-24 Years	25-34 Years	35-44 Years	45-54 Years	55-64 Years	65+ Years	
Alcohol Abuse	.8	3.8	3.8	4.7	2.1	.2	15.4
Drug Abuse	5.4	3.3	2.9	1.2	.6	.2	13.6
O.B.S. *	1.7	.3	.7	1.5	3.2	20.9	28.3
Schizophrenia	32.8	25.1	12.2	12.0	8.9	11.8	102.8
Affective Disorder	6.1	5.5	5.5	8.0	9.7	11.3	46.1
Psychosis	17.9	8.1	5.6	5.7	4.4	4.9	46.6
Personality Disorder	8.9	5.3	2.1	1.9	2.4	12.6	33.2
Neurosis	.3	.2	.2	.1			.7
Other	3.3	2.6	1.8	.8	2.2	5.9	16.6
Total	77.2	61.6	34.8	35.9	33.6	67.8	311

\* Organic Brain Syndrome



A major disadvantage of utilization studies is that demand is measured, not need. Admittedly, this research did not measure those individuals requiring psychiatric care who do not receive treatment. However, there have been no studies conducted in Harris County to quantify psychiatric need of the high-risk population. In view of this deficiency the "state of the art" has been to project future demand based on current utilization rates. This research attempted to quantify and historically document Harris County's unique demand. Beds were projected based upon these local characteristics and increased to the level of national inpatient demand of 1%.

The historical documentation and quantification of demand fulfills the goal of a needs assessment to document the current state of affairs. This documentation coupled with differing viewpoints and expertise will enable mental health providers to identify gaps in the system, set long-range goals, and provide the background for decision making. As an example, if all patients were seen who require treatment, a different diagnostic breakdown might be seen. Depressive and personality disorders might increase and schizophrenia might decrease. A mental health provider might experiment with the data to represent this change and plan accordingly. Other mental health providers might feel the length of stay would change if all persons were

adequately accomodated. Again, the existing data warrants experimentation.

In light of this discussion, a few recommendations are proposed. The first recommendation involves determination of a prevalence rate for Harris County's population. This can be accomplished by interviewing a large sample of the high-risk population to determine a level of unmet mental health needs. These prevalence rates might also be determined by conducting diagnostic interviews of patients presenting at certain psychiatric admission points who are turned away for care.

Results indicated 29 beds are to be provided for substance abuse. However, alcohol and drug abuse are unique mental disorders. This study attempted to document current utilization by the high-risk population and projected that utilization based on a minimum standard. A separate study of needs could be exclusively focused on these groups.

A thorough utilization study can be conducted in three or so years to provide navigation for mental health providers. This will indicate trends and identify new factors in the system which are relieving current problems or creating new problems.

Another factor to consider when viewing the bed number is that sufficient support services do not exist to coordinate with inpatient discharges. Many of the local

community outpatient centers have not been able to accept new patients for a year. Most of the centers are under-staffed and can not provide optimal care to their patients. An increase in numbers of beds, excluding an increase in support services, will not alleviate an already critical situation.

Finally, these acute psychiatric beds were projected for a population with an extremely high-risk for developing a mental disorder. This high-risk population may not be all inclusive of an eligible population for a public-supported hospital. These projected beds are to provide for those with the most critical need in Harris County. It is wise to consider 311 beds as a launching pad for complete, coordinated psychiatric services, not as a ceiling.

## APPENDIX A

### SELECTED VARIABLES FROM THE MENTAL HEALTH DEMOGRAPHIC PROFILE SYSTEM

#### General Population Data

1. Total population
2. Number of males (in households)
3. Number of females (in households)
4. Population in group quarters
5. Population white
6. Population negro

#### Socioeconomic Status

##### Economic Status

7. Income of families and unrelated individuals: median income of families and unrelated individuals
8. Families in poverty: percent of all families below poverty level

##### Social Status

9. Low occupational status, males: percent of unemployed males 16 and over who are operatives, service workers and laborers including farm laborers
10. High occupational status, males: percent of employed males 16 and over who are professionals, technical and kindred workers, and managers except farm

##### Educational Status

11. School years completed: median school years completed by persons 25 and over

### Ethnic Composition

- 12. Negro: percent of household population Negro
- 13. Other nonwhite: percent of household population non-white and non-Negro
- 14. Foreign stock: percent of population who are foreign born or native born of foreign or mixed parentage

### Composition and Family Structure

- 15. Husband-wife households: percent of all households with husband-wife families
- 16. Age of household heads: median age of household heads
- 17. Youth dependency ratio: persons under 18 per 100 persons 18-64 in household population
- 18. Aged dependency ratio: persons 65 and over per 100 persons 18-64 in household population

### Type of Housing (Urbanization)

- 19. Single dwelling units: percent of all year-round housing units that are single detached (excluding mobile homes and trailers)
- 20. High rise apartments: percent of all year-round housing units that are in structures of 7 or more stories

### Condition of Housing

- 21. Overcrowding: percent of persons in households in housing units with 1.01 or more persons per room
- 22. Standard housing: percent of occupied housing units with direct access and complete plumbing and kitchen facilities for exclusive use

### Community Instability

- 23. Recent movers: percent of population who moved into present residence 1969-1970

## APPENDIX B

### TYPOLOGY STANDARDS AND ORDINAL RANKINGS

#### TYPOLGY STANDARDS

#### ORDINAL RANKINGS OF RISK

##### INCOME

##### MEDIAN INCOME

##### PERCENT BELOW POVERTY

Less Than \$5879	--EXTREMELY LOW	25.0 plus percent	--1
\$5,879-\$7,024	--LOW	20.0-24.9 percent	--2
\$7,025-\$7,987	--LOW MODERATE	15.0-19.9 percent	--3
\$7,988-\$8,891	--HIGH MODERATE	10.0-14.9 percent	--4
\$8,892-10,298	--HIGH	5.0- 9.9 percent	--5
\$10,299 plus	--EXTREMELY HIGH	0.0- 4.9 percent	--6

##### ETHNIC COMPOSITION

##### PERCENT HOUSEHOLD POPULATION BLACK OR HISPANIC

0.0 percent	--EXTREMELY LOW	95.0 plus percent	--1
0.1- 4.9 percent	--LOW	75.0-94.9 percent	--2
5.0- 9.9 percent	--A FEW	50.0-74.9 percent	--3
10.0-29.9 percent	--SOME	30.0-49.9 percent	--4
30.0-49.9 percent	--SIZEABLE	5.0-29.9 percent	--5
50.0-74.9 percent	--PREDOMINANT	0.0- 4.9 percent	--6
75.0-94.9 percent	--HIGH		
95.0 plus percent	--EXTREMELY HIGH		

##### FAMILY STATUS

##### PERCENT FAMILY HOUSEHOLDS HEADED BY A PRIMARY INDIVIDUAL

##### PERCENT SINGLE FAMILY HOUSEHOLDS HEADED BY A FEMALE

##### PERCENT OF NON-SINGLE FAMILY HOUSEOLDS HEADED BY A FEMALE

Below 5.0 percent--EXTREMELY LOW	85.0 plus percent--1
5.0-14.9 percent--A FEW, LOW	70.0-84.9 percent--2
15.0-29.9 percent--SOME	50.0-69.9 percent--3
30.0-49.9 percent--MODERATE, MIXED	30.0-49.9 percent--4
50.0-69.9 percent--PREDOMINATE	5.0-29.9 percent--5
70.0-84.9 percent--HIGH	Below 5.0 percent--6
85.0 plus percent--EXTREMELY HIGH	

# PERCENT FAMILY HOUSEHOLDS WITH MORE THAN ONE PERSON THAT ARE HUSBAND-WIFE HOUSEHOLDS

Below 5.0 percent--EXTREMELY LOW	Below 5.0 percent--1
5.0-14.9 percent--A FEW, LOW	5.0-14.9 percent--2
15.0-29.9 percent--SOME	15.0-29.9 percent--3
30.0-49.9 percent--MODERATE, MIXED	30.0-49.9 percent--4
50.0-69.9 percent--PREDOMINATE	50.0-84.9 percent--5
70.0-84.9 percent--HIGH	85.0 plus percent--6
85.0 plus percent--EXTREMELY HIGH	

# FAMILISH

# PERCENT HOUSEHOLDS CONSISTING OF MORE THAN ONE PERSON WITH SIX PLUS PERSONS

Below 8.0 percent--EXTREMELY LOW	14.1 plus percent--1
8.0- 9.3 percent--LOW	11.8-14.0 percent--2
9.4-10.4 percent--LOW MODERATE	10.5-11.7 percent--3
10.5-11.7 percent--HIGH MODERATE	9.4-10.4 percent--4
11.8-14.0 percent--HIGH	8.0- 9.3 percent--5
14.1 plus percent--EXTREMELY HIGH	Below 8.0 percent--6

# TYPE OF HOUSING

# PERCENT SINGLE DETACHED HOUSING UNITS

Below 5.0 percent--EXTREMELY LOW	Below 5.0 percent--1
5.0-19.0 percent--LOW	5.0-19.0 percent--2
20.0-49.0 percent--LOW MODERATE	20.0-49.0 percent--3
50.0-79.9 percent--HIGH MODERATE	50.0-79.9 percent--4
80.0-94.0 percent--HIGH	80.0-94.0 percent--5
95.0 plus percent--EXTREMELY HIGH	95.0 plus percent--6

## CONDITION OF HOUSING

PERCENT HOUSEHOLD POPULATION IN HOUSING UNITS WITH  
1.01 PERSONS PER ROOM

Below 8.6 percent--EXTREMELY LOW	19.8 plus percent--1
8.6-11.1 percent--LOW	15.4-19.7 percent--2
11.2-13.0 percent--LOW MODERATE	13.1-15.3 percent--3
13.1-15.3 percent--HIGH MODERATE	11.2-13.0 percent--4
15.4-19.7 percent--HIGH	8.6-11.1 percent--5
19.8 plus percent--EXTREMELY HIGH	Below 8.6 percent--6



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