Mortality Analysis Among Mental Illness
Adult Clients in Nevada from 1998 to 2000:

---Matching the Mental Health Databases in Nevada
to Nevada's Death Certificate Registry Database

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SPECIAL REPORT ON MENTAL HEALTH AND MORTALITY IN NEVADA, 1998-2000

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INTRODUCTION

This report represents the second large-scale data sharing effort between the Division of Mental Health and Developmental Services (MHDS) and the State Health Division's Bureau of Health Planning and Statistics (BHP&S). The first data sharing effort occurred in April of 2001 with MHDS exporting data from the Southern Nevada Adult Mental Health Services (SNAMHS) database to the Center for Health Data & Research (CHDR) within the BHP&S.

Data provided was linked (see technical notes for a full discussion of methodology and terminology related to this procedure) to the State of Nevada's death certificate registry located within the BHP&S and used to make a report entitled, "Mortality Analysis Among Mental Illness Clients in Southern Nevada…" available for download at www.health2k.state.nv.us/matchiim/center.htm.

The second phase of this data sharing effort occurred in December of 2001 and has now expanded to include mental health data from the entire state. In identical fashion as what was done for the SNAMHS report, the State of Nevada's death certificate registry was matched against the State of Nevada's mental health databases (see technical notes for further discussion). The current report is an effort to analyze the data that came about because of this match. Three distinctive datasets pertaining to mental health clients will be analyzed and their respective "stories" told. They are as follows:

A.) Individuals in Nevada's mental health databases

B.) Individuals in Nevada's mental health databases and the death certificate registry database

C.) Individuals in B that committed suicide.

The Bureau of Health Planning and Statistics (BHP&S) is located within the State of Nevada's Health Division. The BHP&S works with other programs and bureaus within the Health Division and the Department of Human Resources regarding designing and conducting statistical/analytical studies and is in the process of creating a data warehouse for future public health studies. This data warehousing effort is in its early stages of development and will eventually hold more than 45 health and related databases for projects similar to this effort.

The Department of Mental Health Services (MHDS) is located within the Department of Human Resources. Administration and services are organized into three regions: southern, northern, and rural. Four agencies deliver adult mental health services in the state: three comprehensive mental health centers and one forensic agency. The division provides a full range of adult mental health services that include; inpatient, residential, case management, partial care, vocational, outpatient and emergency services.

Future reports may be made using the data from MHDS and the CHDR including but not limited to mental health and HIV/AIDS, mental health and prison data, and mental health mortality analysis for juveniles and children.

Statistical Abstract

Key Findings

- The age-adjusted mortality rate per 100,000 patients from 1998 to 2000 for mental health patients dying within one year of initial contact (1,643.4) was 81% higher than the general population age-adjusted mortality rate (907.8) over the same period.

- The crude suicide rate per 100,000 patients from 1998 to 2000 for mental health patients dying within one year of initial contact (243.8) was more than 12 times the general population rate (20.0) over the same time frame.

- The age-adjusted mortality rate per 100,000 patients from 1998 to 2000 for mental health patients dying within one year of initial contact to the mental health database was 1,643.4. This rate dropped to 1,506.1 within the second year of initial contact and 1,211.4 within the third year of initial contact. In comparison, the age-adjusted mortality rate for Nevada over this same period was 907.8 per 100,000.

- The five leading causes of death for mental health patients from 1998 to 2000 were suicide (19.0%), diseases of the heart (17.5%), accidents (17.5%), cancer (6.1%), and chronic obstructive pulmonary disease (COPD) (5.3%). There were also high rates for human immune-deficiency virus (HIV) (3.2%), homicide (2.6%), and chronic liver disease & cirrhosis (2.3%).

- Of those that died within one year of initial contact to a mental health agency (N=214), the five leading causes of death were suicide (22.8%), accidents (19.3%), diseases of the heart (15.3%), cancer (5.9%), and HIV (4.0%).

- Of those that died after one year of initial contact to a mental health agency (N=206), the five leading causes of death were diseases of heart (20.7%), accidents (15.0%), suicide (13.6%), COPD (7.9%), and cancer (6.4%).

- The crude death rate per 100,000 individuals for young adults 20 to 29 years old in the mental health database (577.9) was much higher compared to the general population (92.6). The difference was also large for 30 to 39 year olds from the database (705.2) compared to the general public (157.5). For all age groups in this study the crude death rate was higher for the mental health population compared to the general population.

- Of those that died, 175 (42.1%) had a primary diagnosis of depression and 35 of the victims (14.5%) had a primary diagnosis of suicide attempt/threat.

- Of those that had a primary/secondary diagnosis of suicide attempt/threat (N=1,631), less than 1% (N=13) actually committed suicide.

- Of the mental health patients that committed suicide, 24.6% were employed compared to 62.3% in the general population.

Mental Health databases

- There were 19,688 persons in the mental health databases from 1998 to 2000, of which 54.7% (10,770) were from SNAMHS, 19.6% (3,857) from NNAMHS, and 23.9% (4,715) from rural clinics.

- Of the 19,688 entries, 9,190 (46.7%) were male and 10,373 (52.7%) were female; 125 (.6%) had no gender specified.

- The majority (32.2%) were 30-39 years old. The second leading group was 20-29 year olds (26.2%). Only 15.9% of patients were 50 years of age or older.

- The largest racial/ethnic group was Whites (79.5%) with Blacks (8.7%), and Hispanics (7.2%) making up the second and third largest groups, respectively.

- Of the 8,962 (46.4%) patients had a presenting problem of depression, 2,847 (14.7%) were diagnosed with thought disorder, and 1,342 (7.0%) were diagnosed with a suicide attempt/threat.

- There were 6,830 (36.0%) patients classified as "separated/divorced" and 6,812 (35.9%) were listed as "never married".

Deceased Mental Health Patients

- Of the mental health patients that made initial contact with one of the mental health agencies from 1998 to 2000, 420 (2.1%) are dead as of November 2001.

- Of this group, 221 (52.6%) were male and 195 (46.4%) were female. Four individuals that died had no gender supplied in the mental health database (1.0%).

- The age group most represented was 40-49 year olds (25.2%), followed by 50-59 year olds (20.4%) and 30-39 year olds (17.6%).

- Whites were the largest racial/ethnic group represented among the deceased at 88.5%. Blacks were second largest at 6.0%, and Hispanics were third at 3.6%.

Mental Health Patients That Committed Suicide

- Of the mental health patients that made initial contact from 1998 to 2000 with one of the mental health agencies, 76 (0.4%) committed suicide as of November 2001.

- Of the suicide victims, 44 (57.9%) were male and 32 (42.1%) were female.

- The age group most represented for suicides was 30-39 year olds (31.6%), followed by 40-49 year olds (27.6%) and 20-29 year olds (22.4%). Only 9.2% of the suicides were committed by those between the ages of 50 and 59.

- The largest racial/ethnic group represented was Whites at 92.0%, followed by Hispanics at 4.8%, and Blacks at 3.2%.

- Of those that committed suicide, 36.0% were listed as "never married" and another 36.0% were classified as "separated/divorced". Additionally, 49.1% were labeled as "unemployed and not looking for a job".

TECHNICAL NOTES

<u>TERMS</u>

- **Presenting Disorder**: When a client first visits a mental health agency they are able to provide both a primary and secondary mental health disorder. The clients have a list of choices, for example alcohol use, depression, etc… This is a self-reported value and is not related to a diagnosis provided by a facility.

- **Admission Date / First Contact Date**: This is the first date that someone in the mental health database is entered into the system. For tracking purposes and in order to calculate mortality rates this value is used. This date does not signify admittance or extended service, but rather that someone made contact with one of the State's mental health facilities. Throughout the report, this date will be referred to as first contact date or initial contact date.

- **Primary Medical Diagnosis**: This is the primary "AXIS 1" diagnosis given to a patient from a health provider at one of Nevada's mental health agencies. This is a medical diagnosis and relies on ICD-9 diagnosis codes. This is quite different from the presenting disorder since this is reported by a provider and the presenting disorder is given by the patient.

- **SNAMHS**: Southern Nevada Adult Mental Health Services. This agency represents the bulk of the mental health programs in the state due to the disproportionably large population in southern Nevada. The bulk of clients from this database reside in Clark County, which has Las Vegas as its largest city.

- **NNAMHS**: Northern Nevada Adult Mental Health Services. This agency represents the second largest part of Nevada's mental health programs. The bulk of clients from this database reside in Washoe County, Reno is its largest city.

- **Rural Clinics**: The rural clinics represent the third major mental health service agency in the state. This agency is responsible for a large amount of territory in terms of square mileage.

- **Lakes Crossing**: The Lakes Crossing facility is a specialized facility that does not have many clients from a mortality analysis point of view (about 200 new contacts each year). Their clients are used for statewide analysis but not included in agency analysis in this report.

DATA

        In the pilot study using SNAMHS data back in October the data was transmitted as comma delimited ASCII files, totaling 39,009 valid records as of December 31, 2000 with 47 data fields per record. The data files contained all records in the SNAMHS database as of the end of the year 2000.

        For this project, the export process was the same as before, but in order to assure high data quality only three years (1998 to 2000) of MHDS data was used for the report that totaled 19,688 records. The 19,688 cases include both active and closed cases; the qualification was that first contact with a client be made between January 1, 1998 and December 31, 2000. The three years selected were to ensure that all the data providers from the state had reliable data with similar formats. Data before 1998 varied in format from region to region, and in some cases, electronic records did not exist for previous years. Only individuals 20 years old and over were considered for analysis in this report. Conclusions can be drawn with regard to cause of death for mental health patients, diagnosis accuracy for mental health suicides, and overall effectiveness of the mental health databases in recognizing potential suicide victims. The SNAMHS data was used again for this report along with files from the Northern Nevada Adult Mental Health Services (NNAMHS), rural clinics, and the Lakes Crossing agency.

METHODOLOGY

        Both mental health and death data sets were converted into a fixed file format with the use of SAS. The first and last names on both files were truncated to eight characters in order for the two files to have uniform length. The birth dates of individuals on both files were also converted for uniformity. The program used for matching the two databases was AutoMatch. To be considered a match the record needed to meet only one of the following criteria:

1. Match SSN exactly.
2. Match birth date, last name, and first name exactly.
3. Match last name and first name exactly. Match SSN within one character.
4. Match birth date exactly. Match SSN within one character.

The program performs the first matching scheme and all matched pairs are placed in a particular file for later use. The non-matching remainders (residuals) are then filtered through the second scheme. Again matched pairs are moved and the residuals go through pass three. This continues until all passes are performed.

Pass #	Matches
1	367
2	54
3	2
4	7
SUBTOTAL	430
Manually Removed	- 10
TOTAL	420

Table 1 – Matches by pass number

Of the matched pairs 85.3% (N=367) are picked up in the first pass. Pass two is also effective at picking up matches, 12.6% (N=54) of the matches are found there. The reason pass two is effective is that accurate SSN's are often not provided by one of the two data sets. The overall effect of this scheme is good at locating most individuals that are both in the mental health databases and the death database. For quality control purposes a hand review of all matches was performed. Ten individuals were removed from the list once it was determined they weren't a match. Seven of those individuals had a matching SSN but were clearly not the same person. The other three individuals that were removed from the database appeared to be the same person, but they were discovered because the death date was prior to the mental health admission date. A reason this may have occurred is that these individuals making contact to a mental health agency could be using fraudulent information.

Once the matching process in AutoMatch is complete an output file is produced. That file is read into SAS for data analysis. All 115 variables from both files are retained in this file so that no information is lost.

THE MENTAL HEALTH DATABASES

<u>Trend Analysis</u>

In order to get a sense of those in the mental health population that are deceased it can be helpful to look at the profile of mental health patients in Nevada. The main aspects that will be looked at for this report are enrollment, demographic profile, and mental health conditions. The individuals that are considered for this report are those making initial contact with one of the mental health agencies from January 1, 1998 to December 31, 2000, and who were 20 years of age or older.

The first aspect that will be examined is the enrollment of individuals in the programs over this period (Figure 1). The enrollment numbers by year of initial contact were calculated once individuals that appeared more than once were reduced to a single occurrence in the database.

Mental Health Patients in Nevada by Year of Admittance and Region of Admittance

Legend: □ SNAMHS ■ NNAMHS □ Rural Clinics □ Lakes Crossing

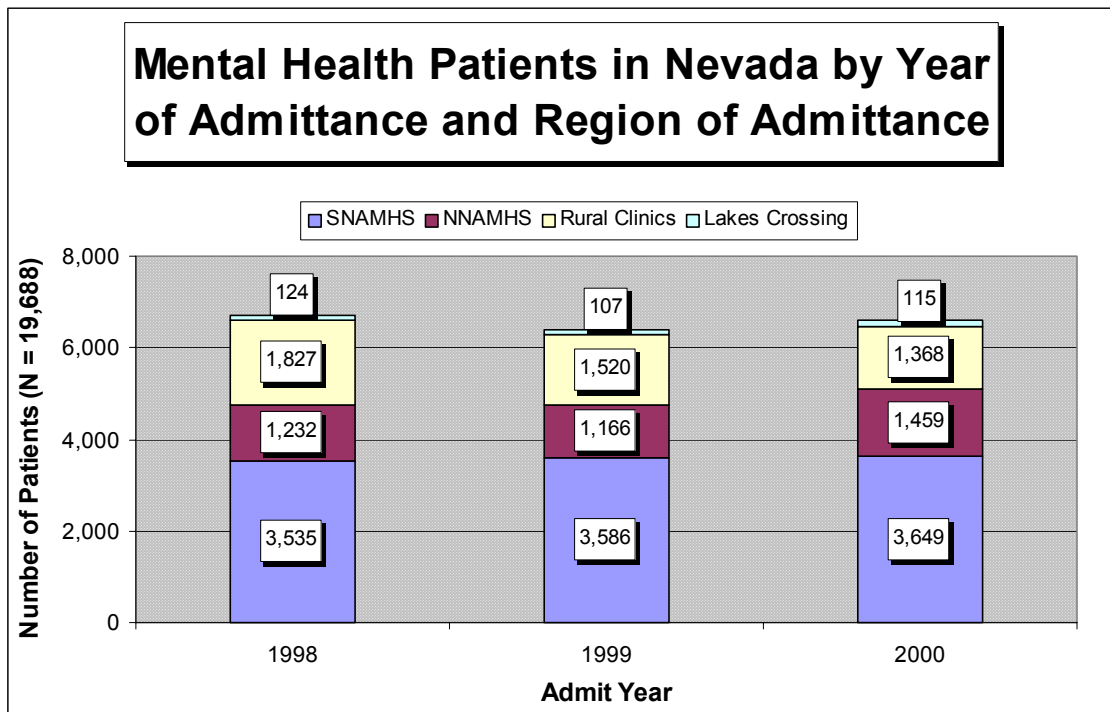| Admit Year	SNAMHS	NNAMHS	Rural Clinics	Lakes Crossing
1998	3,535	1,232	1,827	124
1999	3,586	1,166	1,520	107
2000	3,649	1,459	1,368	115

Number of Patients (N = 19,688)

Figure 1 – Mental health patients by year of initial contact

The mental health databases for the State of Nevada, which includes SNAMHS, NNAMHS, the rural clinics, and Lakes Crossing, contained 19,688 individuals that made initial contact from 1998-2000. Enrollment showed a decrease of 1.9% in Nevada from 1998 (N=6,718) to 2000 (N=6,591) (Figure 1). Much of the decline can be attributed to a

25.2% decrease in new enrollments in the rural clinics over the same period (N=1,827 in 1998, and N=1,368 in 2000).

In terms of the individual programs within the state mental health system, SNAMHS and NNAMHS showed overall increases in enrollment from 1998 to 2000, whereas the rural clinics and Lakes Crossing showed decreases (Figure 2). The NNAMHS clinics new contacts decreased 5.4% from 1998 to 1999 (N=1,232 and N=1,166 respectively), but increased 25.1% (N=1,166 and N=1,459 respectively) in 2000. The SNAMHS clinics showed a slight increase in initial contact over all three years (3.2%).

Mental Health Patients in Nevada by Year of Admittance and Region of Admittance

Legend: ■ SNAMHS ■ NNAMHS □ Rural Clinics □ Lakes Crossing

Y-axis: Number of Patients (N = 19,688)
X-axis: Admit Year

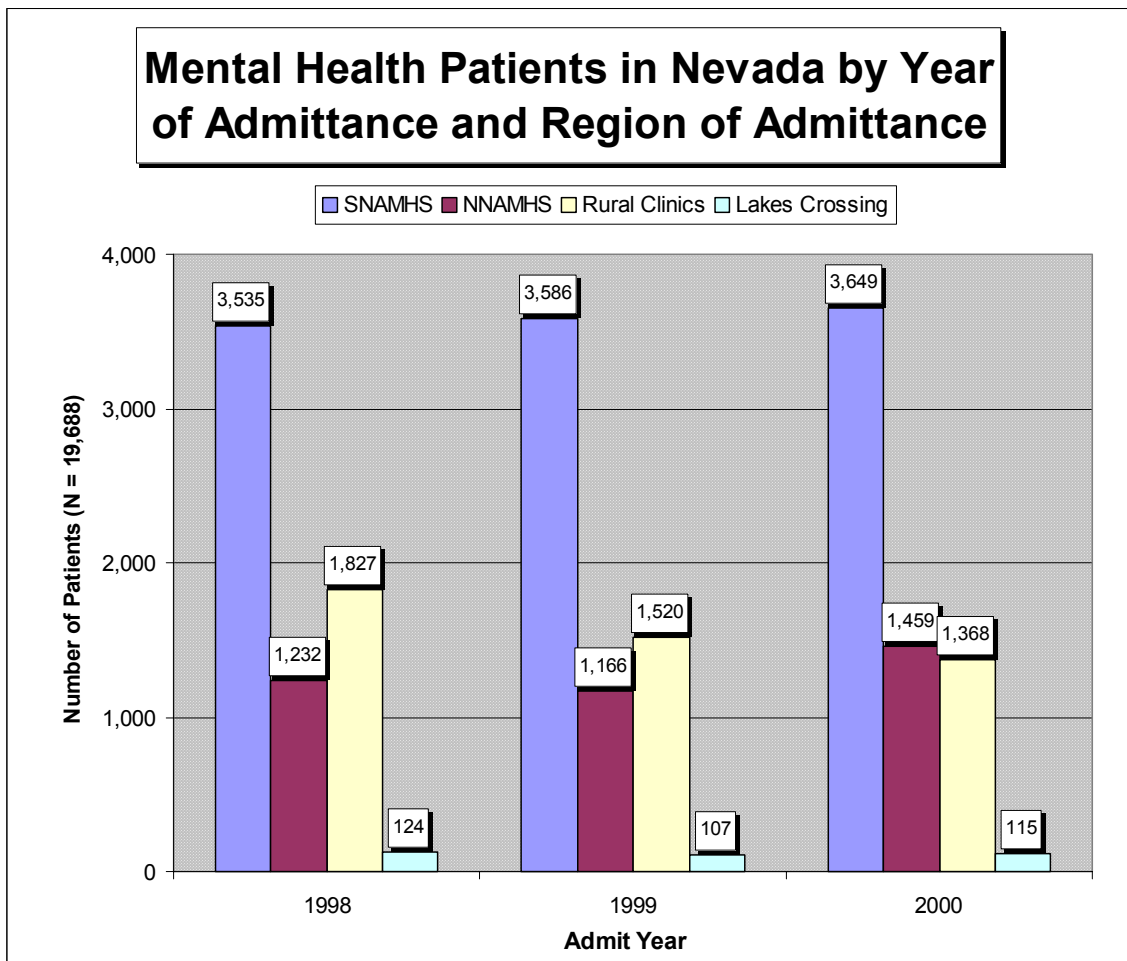| Admit Year	SNAMHS	NNAMHS	Rural Clinics	Lakes Crossing
1998	3,535	1,232	1,827	124
1999	3,586	1,166	1,520	107
2000	3,649	1,459	1,368	115

Figure 2 - Mental health patients by year of initial contact

Demographic Profile

        With regard to the demographic makeup of the mental health population in Nevada, females outnumbered the males in the population. A total of 9,190 (46.7%) were male, 10,373 (52.7%) were female, and 125 (.6%) had no gender provided in the database (Figure 3). The majority of individuals in the mental health databases (84.1%) were between the ages of 20 and 49.
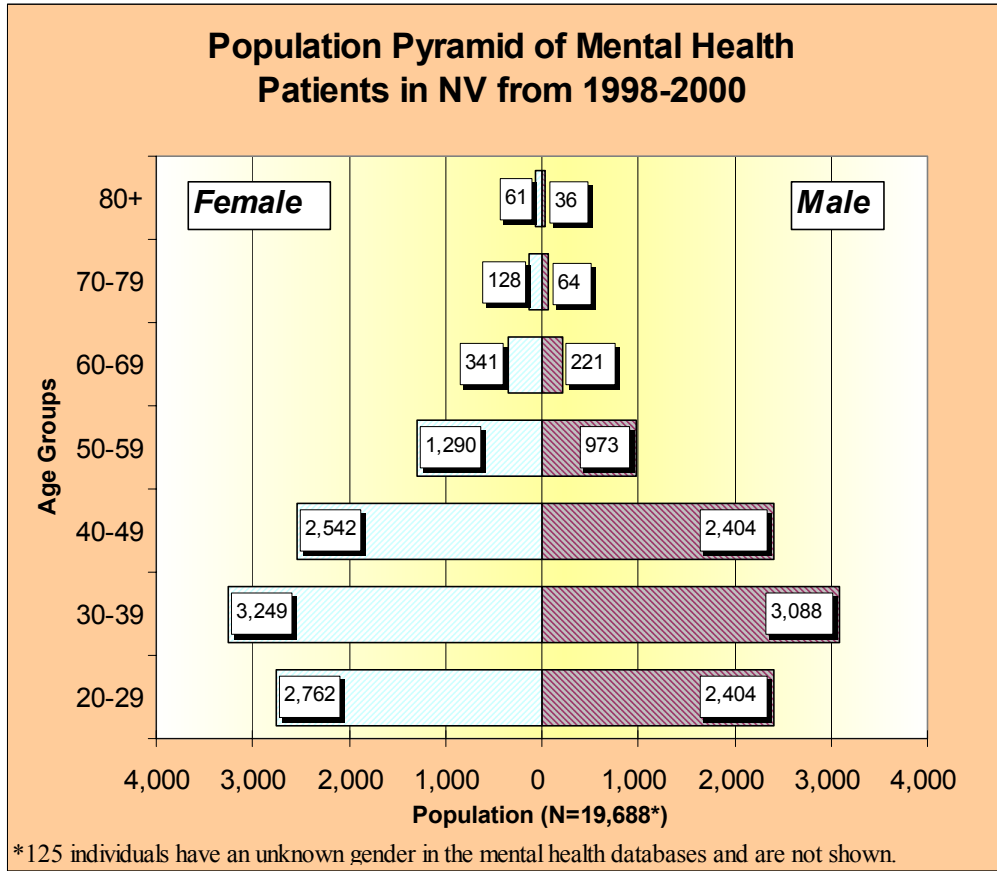

Figure 3 - Population pyramid of mental health patients

Note: Data source is Center for Health Data and Research (CHDR) based on figures provided by the State of Nevada Demographer's Office.

        The age group most represented in the mental health databases was 30 to 39 year olds (N=6,337), followed by 20 to 29 year olds (N=5,166). The third largest group was 40 to 49 year olds (N=4,946). The average age of those in the database was 38.1 years old, and the median age was 37 years. In the Nevada population, the age group most represented was 30 to 39 year olds if individuals under 20 were not considered.

Population Pyramid of Nevadans, 1998-2000

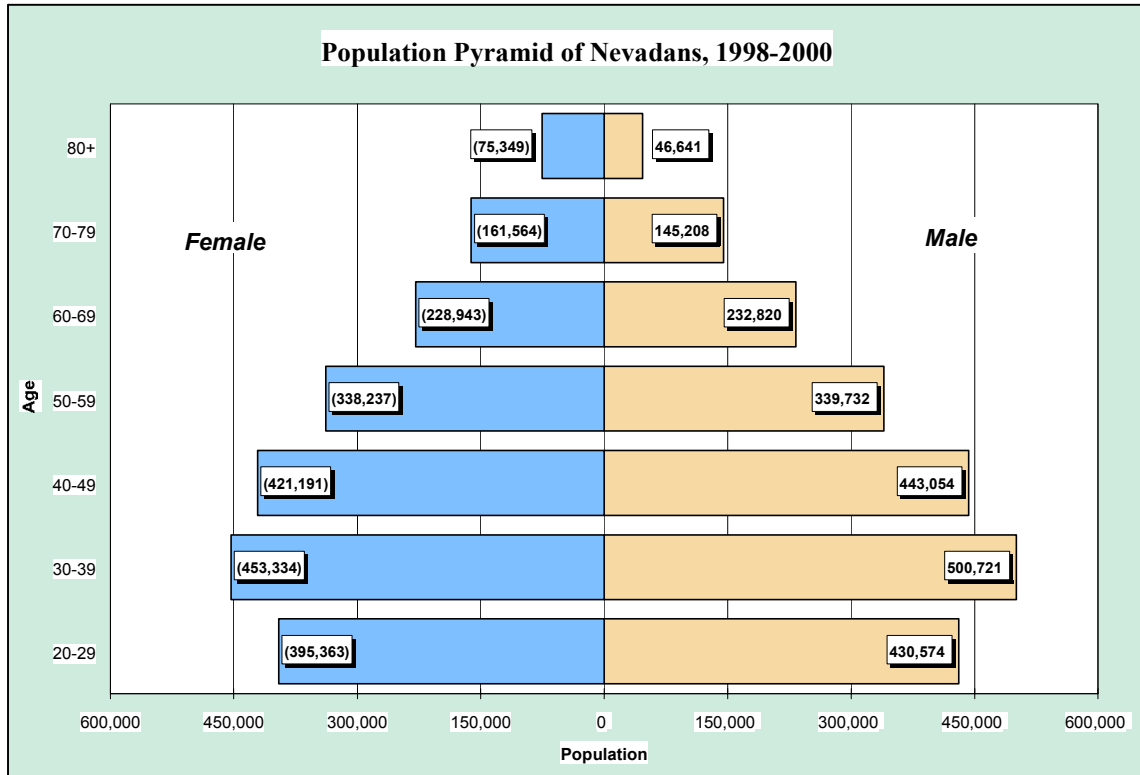| Age	Female		Male
80+	(75,349)		46,641
70-79	(161,564)		145,208
60-69	(228,943)		232,820
50-59	(338,237)		339,732
40-49	(421,191)		443,054
30-39	(453,334)		500,721
20-29	(395,363)		430,574

Figure 4 - Population pyramid of Nevadans over 20 years old from 1998 to 2000

The age group most represented was 30 to 39 year olds (N=954,056) in the state population, with that group representing 22.6% of persons. Compared to the mental health population, this group was over represented at 32.4%. Other age groups over represented in comparison to Nevada's population were the 20 to 29 year olds (26.4% compared to 19.6%) and 40 to 49 year olds (25.3% compared to 20.5%). In addition, there was a disproportionate representation of mental illness among females. It should be noted that in the Nevada population over the same period there were slightly more males than females; 2,138,750 males (50.8%), compared to 2,073,981 females (49.2%). In the mental health databases, 84.1% of the population was between the age of 20 and 49, but for the general population of Nevada this rate was much lower at 62.8%.

The largest minority of male patients was Blacks at 9.4% of the population (Figure 5). The largest minority of the female population were also Blacks at 8.0% (Figure 6). The second leading minority for both subsets within the mental health population was Hispanics. In the male subset, Hispanics represented 7.2% of the total number of male mental health patients, while Hispanic females represented 7.3% of the total number of female mental health patients.
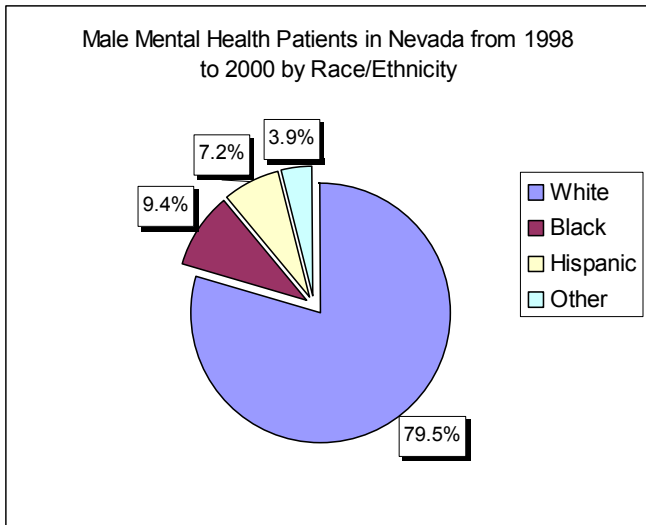
Looking at the racial/ethnic breakdowns for the state as a whole, the mental health population had a larger percentage of Whites (67.6% to 79.5%, respectively). The mental health Hispanic population was underrepresented at 7.2% compared to the state at 19.7%. Blacks were slightly overrepresented in the mental health population at 8.7% of total mental health patients making contact compared to the State of Nevada's rate of 6.7%.

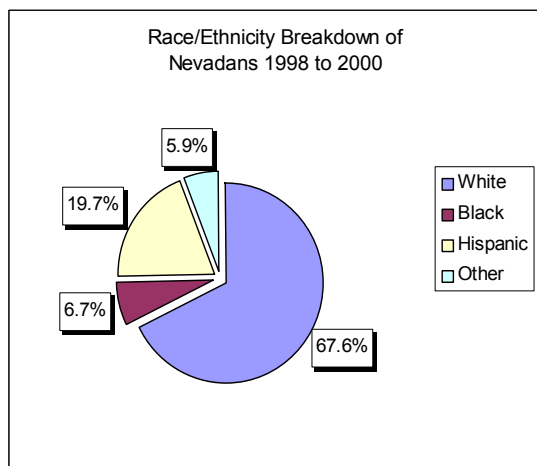Figure 5 - Race/ethnicity of male mental health patients

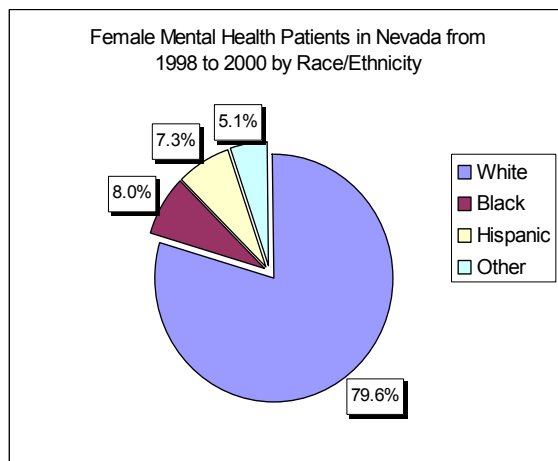Figure 7 - Race/ethnicity of Nevadans 1998 to 2000

Figure 6 - Race/ethnicity of female mental health patients

The living arrangements of these mental health clients are represented graphically in Figure 8. The age group most likely to live on the street was the 40 to 49 year olds at 5.1%, followed by 50 to 59 year olds at 4.9%. Those most likely to live in homeless shelters were 50 to 59 year olds at 4.7%, followed by 40 to 49 year olds at 3.9%. All groups were most likely to live in a private residence ranging from 83.0% of 20 to 29 year olds to 76.6% of the 40 to 49 year olds (Figure 8).
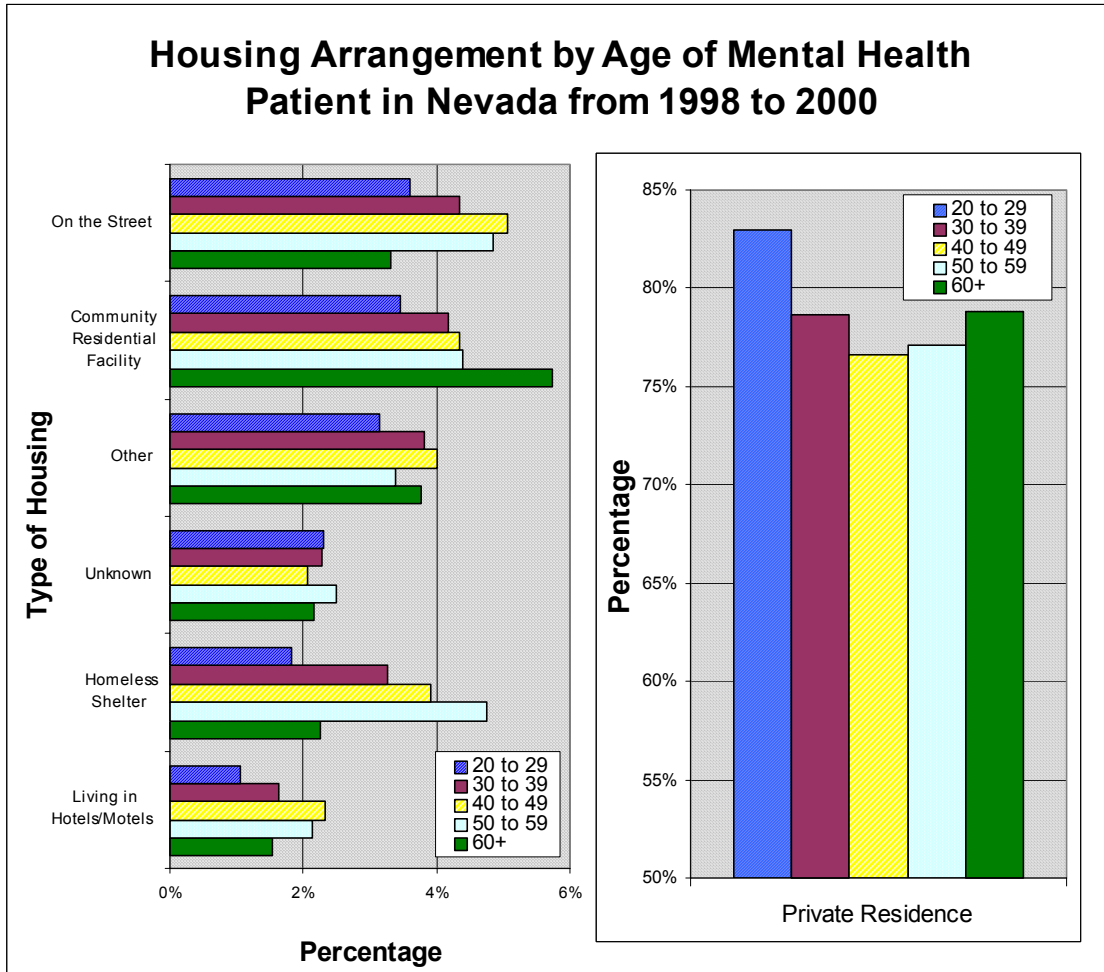
Figure 8 - Living arrangements of mentally ill in Nevada from 1998 to 2000

Payment of services rendered by type of coverage by the population served is graphically displayed in Figure 9. Most of the individuals that received care (63.3%) had no insurance and received services paid for by the state. The largest provider for the population was Medicaid at 19.2%. However, rural clinics only received 12.2% of their patients from Medicaid, compared to 20.2% from the other clinics (NNAMHS and SNAMHS). To compensate for this discrepancy, individuals from the rural clinics are

more likely to have private insurance (30.6% compared to 4.9%) than those from the other databases.

Type of Medical Coverage for Mental Health Patients in Nevada, 1998 to 2000

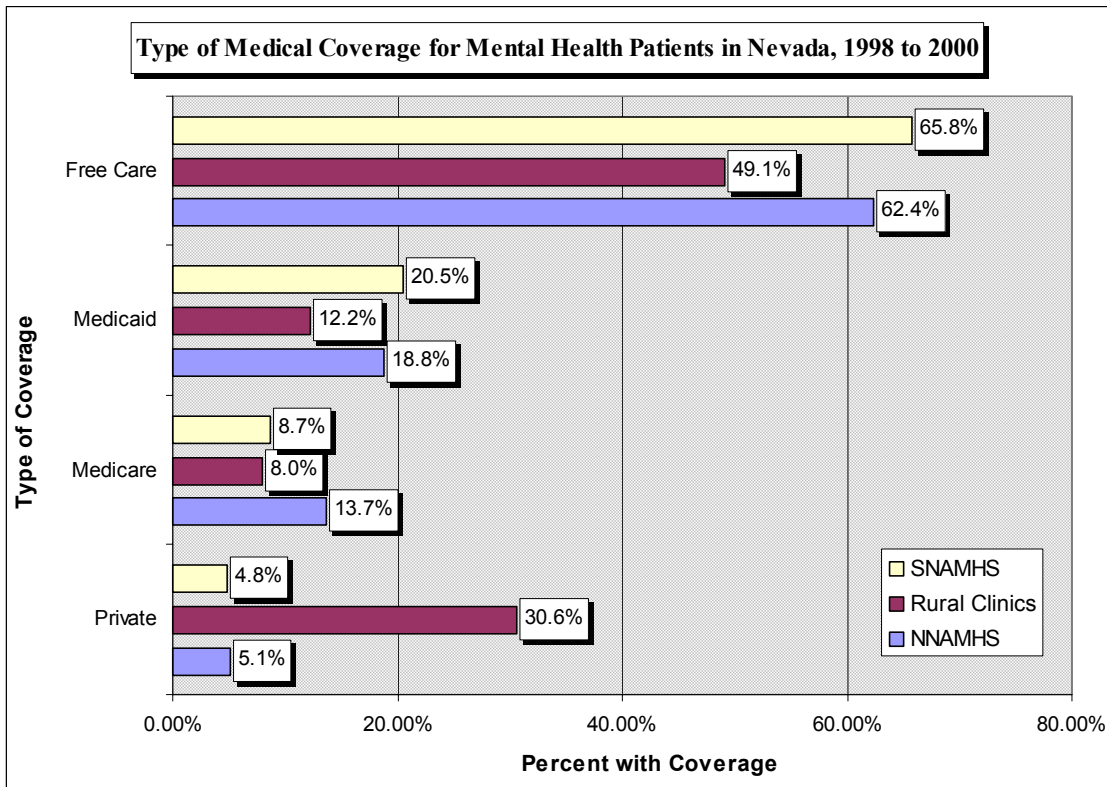| Type of Coverage	SNAMHS	Rural Clinics	NNAMHS
Free Care	65.8%	49.1%	62.4%
Medicaid	20.5%	12.2%	18.8%
Medicare	8.7%	8.0%	13.7%
Private	4.8%	30.6%	5.1%

Figure 9 - Type of medical coverage for Nevada's mentally ill 1998 to 2000

Those in the rural database (38.3%) are also much more likely to be married than those in the SNAMHS or NNAMHS databases (18.6% and 16.7%, respectively). Individuals in NNAMHS are the most likely to be divorced (42.4%), while the least likely were those patients from SNAMHS (33.2%).

Marital Status of Mental Health Patients in Nevada from 1998 to 2000 by Place of Admittance				
Marital / Dbase	NNAMHS	Rural	SNAMHS	All
Divorced	42.4%	37.2%	33.2%	36.0%
Married	16.7%	38.3%	18.6%	22.8%
Never Married	34.2%	19.3%	43.2%	35.9%
Unknown	2.7%	1.7%	2.0%	2.1%
Widowed	4.0%	3.4%	3.0%	3.3%

Table 2 - Marital status of mentally ill patients from 1998 to 2000

Presenting Mental Health Problem for Nevada's Mental Health Patients from 1998 to 2000
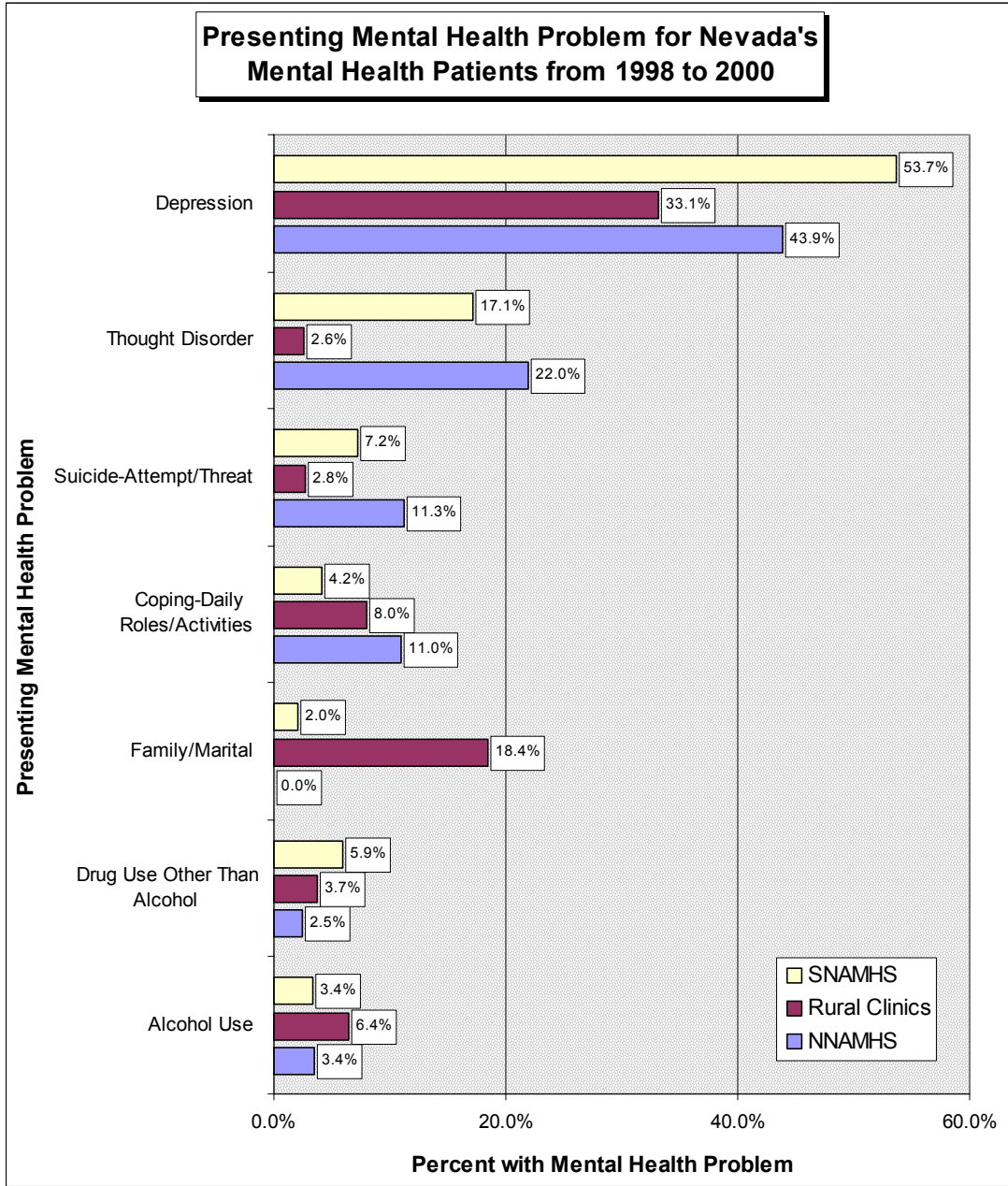
Figure 10 - Presenting mental illness by place of initial contact

The most common presenting mental health problem was depression. By clinic, SNAMHS had the most prevalent rate at 53.7%, followed by the NNAMHS clinic at 43.9% (Figure 10). Thought disorder was the second most common problem for mental health patients in SNAMHS (17.1%) and NNAMHS (22.0%). However, family and marital issues (18.4%) was the second most commonly reported mental health problem for the rural clinics. In terms of suicide attempts and or threats by a patient, NNAMHS

patients were the most likely to attempt and or threaten suicide (11.3%). SNAMHS patients were second most likely at 7.2%, while rural patients were least likely to attempt/threaten suicide (2.8%).

Depression as it affected the different racial/ethnic groups in the mental health population is displayed graphically in Figure 11. The group most affected by this type of illness was Hispanics (47.4%), followed by Whites (46.7%). Blacks were the most likely to have a thought disorder at 24.5%, an attempted or threatened suicide at 7.6%, and to have used drugs other than alcohol at 7.6%.
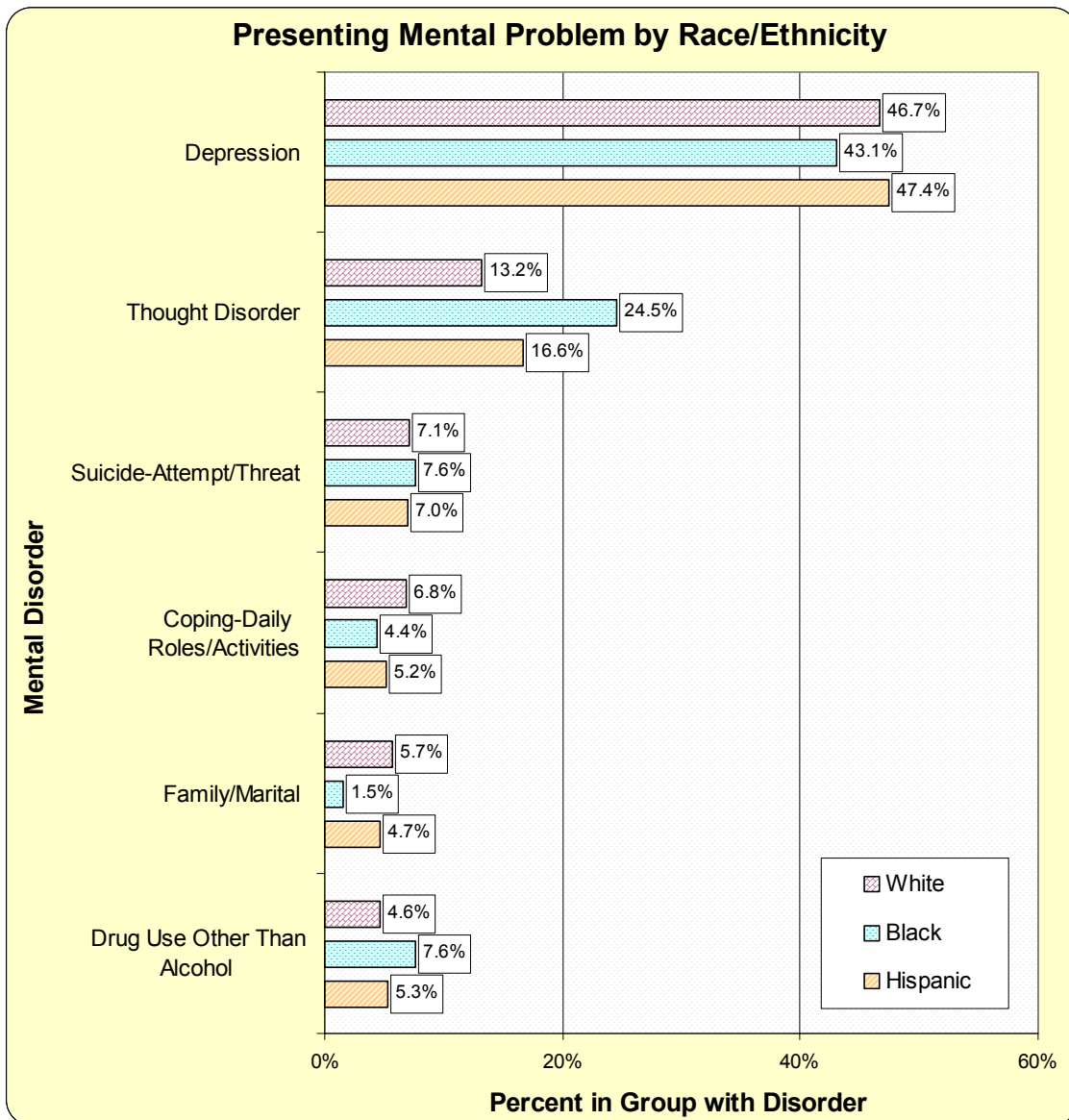

Presenting Mental Problem by Race/Ethnicity

Figure 11 - Presenting mental health problem by race/ethnicity

MENTAL HEALTH PATIENT MORTALITY

Trend Analysis

Of the 19,688 patients making initial contact from 1998 to 2000, 420 had died (2.1%). The death records that were considered for matching included all of 1998 to 2000 deaths and most of 2001's deaths (approximately 86.7%). In order to assess the relative death rates of the mentally ill compared to the general population it was necessary to consider the number of years one lives after initial contact with a mental health agency. This is consistent with how death rates for the state are calculated. One year's death rate considers those that die over a one-year period, from January 1st to December 31st, divided by the known population of the state in that given year.

Below is a table showing the year a patient made initial contact by the number of years that person lived after initial contact (Table 3). The most common year for a mentally ill individual to die was within the first year of initial contact (N=214). In the first year of initial contact to the mental health database, on average about 71 individuals died. After the first year, roughly 47 individuals died per year for each complete year thereafter. In essence, mental health patients were more than one and a half times more likely to die in the first year than any other subsequent one-year period.

Initial Contact	Years Lived After First Contact Date				ALL
	< 1	*1 - 2*	*2 - 3*	*3 - 4*	
1998	70	47	46*	20**	183
1999	71	47*	19**		137
2000	73*	27**			100
ALL	**214**	**121**	**65**	**20**	**420**

* Data may not be complete due to 86.7% completeness of 2001 death file.

** Incomplete data because all patients couldn't have lived for entire period since initial contact not always January 1st.

Table 3 – Year lived after initial contact by deceased mental health patients in NV '98 to '00

A more detailed analysis of death rates for this special population along with comparisons to state totals will be provided later in this section. Also included in that section will be age-adjusted death rates. This is because the mental health population is younger than the general population on average. The next part of this report will focus on the cause of death of those that made initial contact with a mental health agency and died.

Top Causes of Death for NV Mental Health Patients From 1998 to 2000 by Years Lived After Admission Date

Cause of Death*

Cause	Died Within One Year of Admittance	Died After One Year of Admittance
Intentional self-harm (Suicide)	22.8%	13.6%
Accidents	19.3%	15.0%
Diseases of heart	15.3%	20.7%
Malignant neoplasms (Cancer)	5.9%	6.4%
HIV disease	4.0%	2.1%
Chronic lower respiratory diseases	3.5%	7.9%
Assault (homicide) & legal intervention	3.0%	2.1%
Cerebrovascular diseases (Stroke)	2.5%	6.4%
Chronic liver disease and cirrhosis	2.0%	2.9%

Percent That Died From Cause

■ Died Within One Year of Admittance
■ Died After One Year of Admittance

* Only leading disease groups are shown, for purposes of this chart all other diseases are not considered a grouping.
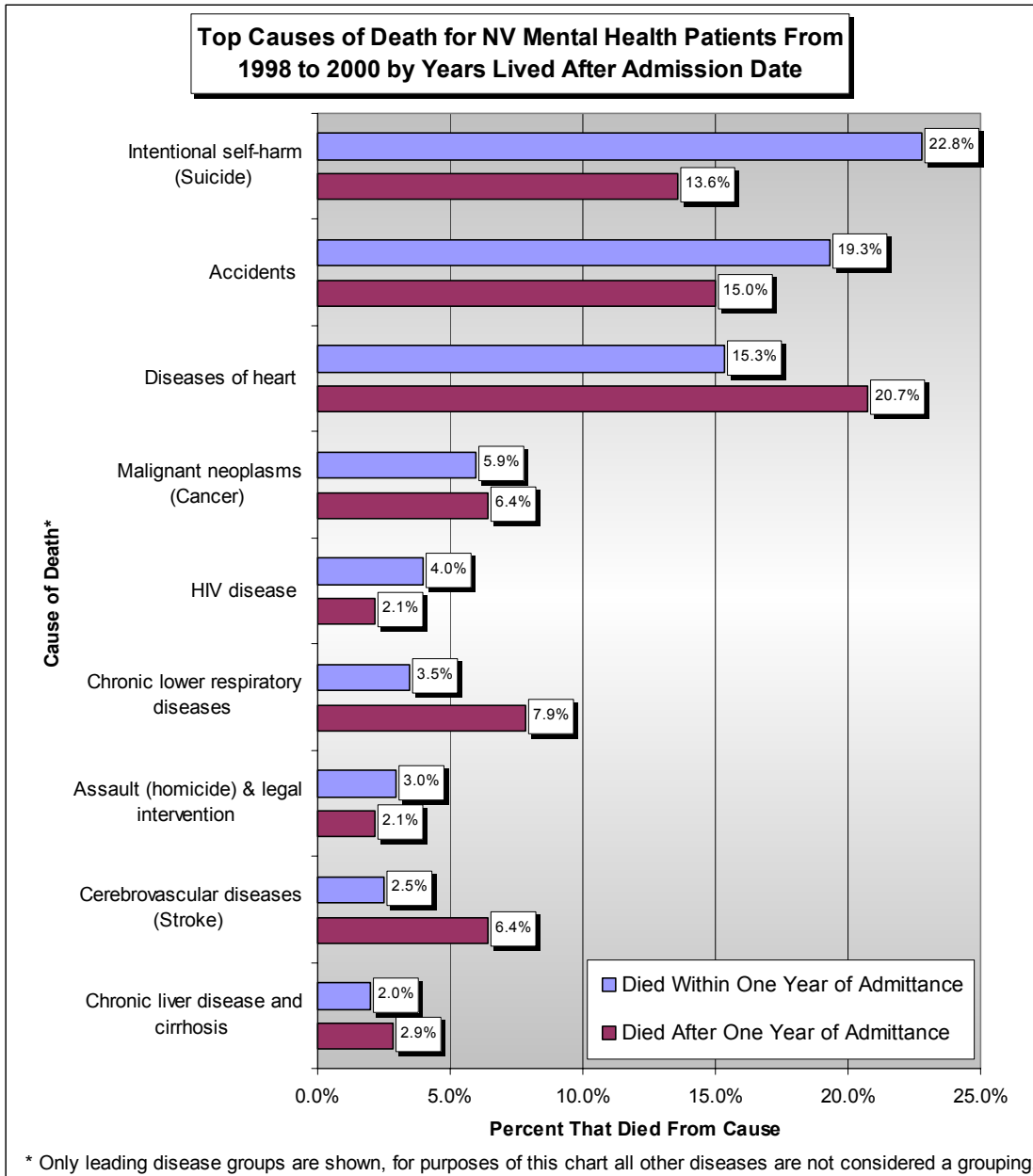
Figure 12 - Top causes of death for mental health patients

The leading cause of death for the mental health population was suicide. Two cohorts were used to further analyze suicide amongst this population (Figure 12). The first cohort was those that died within one year of making initial contact with a mental health professional, while the second cohort were those that lived more than one year after making initial contact, but then died thereafter. Within the first year of initial contact, more than one out of every five deaths (22.8%) was caused by suicide. For those that died one year or more after making initial contact, diseases of the heart (20.7%) were

the leading cause of death. Accidents were the second leading cause of death for both cohorts. Those persons dying within one year of initial contact had the higher prevalence at 19.3%. The third leading cause of death for those that died within a year of making initial contact was diseases of the heart at 15.3%. Those persons that lived for a year or more after initial contact had the higher prevalence of suicide at 13.6%.

Over time, the second cohort approached cause of death tendencies more similar to the general population. This was apparent by the increased occurrences of strokes and cancer, along with the aforementioned diseases of the heart. If sufficient data exists, examination of those that died five years after making contact with a mental health agency could reveal that the causes of death would be more similar to Nevada in general than those that died within one year of making contact with a mental health agency.

Causes of death for both the Nevada population and the mental health population are graphically displayed in Figure 13. Diseases of the heart were the leading cause of death for Nevadans over the 3-year period studied at 27.8% of total deaths. In comparison, diseases of the heart in the mental health population represented only 17.5% of total deaths. There is an even larger discrepancy for the second leading cause of death for Nevadans compared to the mental health population. Cancer accounted for almost one in four (24.1%) of Nevada deaths between 1998 and 2000, but accounted for less than one in sixteen of mental health deaths over the same time frame (6.1%).

Where the State of Nevada's population death rates due to diseases of the heart and cancer were in large measure out of proportion to the mental health population, four other causes of death were much more representative in the mental health population than the general population over the three year period studied. Suicides in the mental health population represented 19% of all deaths, whereas suicides in the general population only represented 2.7% of all deaths. Death by suicide was more than seven times likely to occur a mental health patient than a member of the general population. Deaths due to accidents were almost four times more likely to occur to persons in the mental health population (17.5% and 4.5%, respectively). Homicidal deaths were more than twice as likely to occur in the mental health population (2.6% and 1.1%, respectively). Deaths due to the human immunodeficiency virus (HIV) were more than five times more likely to occur in the mental health population (3.2% and 0.6%, respectively).

Leading Causes of Death in Nevada from 1998 to 2000: General Population vs. Mental Health Population

Cause of Death	Nevadans	Mental Health Patients
Diseases of heart	27.8%	17.5%
Malignant neoplasms (Cancer)	24.1%	6.1%
Chronic lower respiratory diseases	6.7%	5.3%
Cerebrovascular diseases (Stroke)	5.7%	4.1%
Accidents	4.5%	17.5%
Intentional self-harm (Suicide)	2.7%	19.0%
Influenza and pneumonia	2.4%	1.2%
Septicemia	2.0%	1.2%
Nephritis, nephrotic syndrome and nephrosis	1.9%	1.8%
Chronic liver disease and cirrhosis	1.8%	2.3%
Diabetes mellitus	1.8%	0.3%
Alzheimer's disease	1.1%	0.3%
Assault (homicide) & legal intervention	1.1%	2.6%
HIV disease	0.6%	3.2%

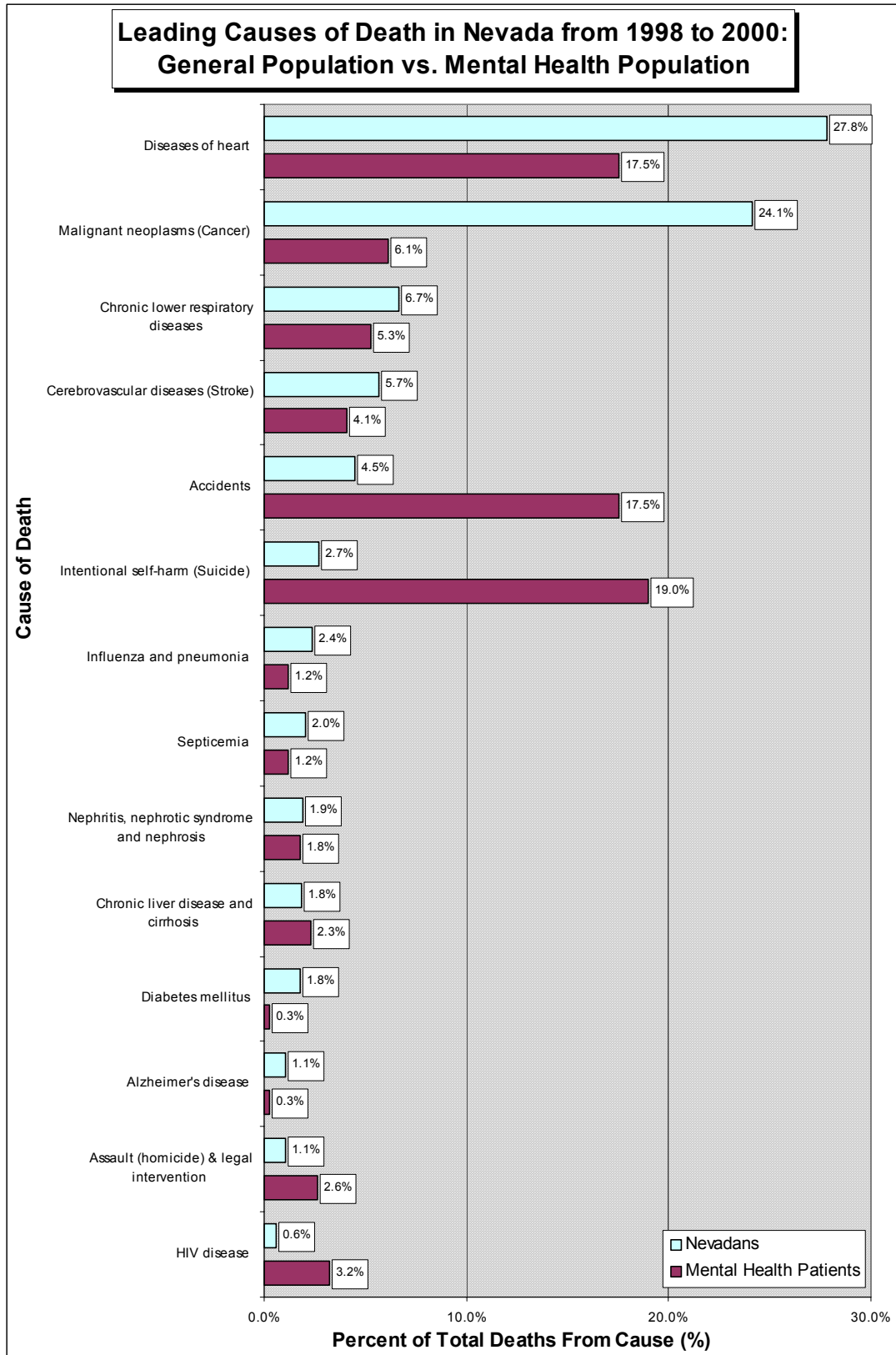**Percent of Total Deaths From Cause (%)**

Figure 13 - Top causes of death in NV 1998 to 2000: general population vs. mental health

Crude death rates for the mental health population compared to the general population revealed four places with significantly higher rates (Table 4). The crude death rate for suicide was more than 12 times greater for the mentally ill compared to Nevada's population (243.8 and 20.0, respectively). The largest discrepancy in crude death rates for the mentally ill compared to Nevada's general population was for cancer. Mental health patients are younger than the general population and this may explain this difference.

Cause of Death	Crude Death Rate - Nevadans	Crude Death Rate - Mental Health Patients
Diseases of the Heart	208.6	193.4
Malignant Neoplasms (Cancer)	180.6	74.9
Chronic Lower Respiratory Diseases	49.9	43.7
Cerebrovascular Diseases (Stroke)	42.6	31.2
Accidents	33.5	243.3
Intentional Self-Harm (Suicide)*	20.0	243.8*
Nephritis, Nephrotic Syndrome And Nephrosis	14.4	18.7
Influenza And Pneumonia	17.8	18.7
Septicemia	15.2	18.7
Chronic Liver Disease And Cirrhosis	13.8	25.0
Diabetes Mellitus	13.3	0.0
Alzheimer's Disease	8.0	6.2
Assault (Homicide) & Legal Intervention	8.0	37.4
Atherosclerosis	4.1	0.0
HIV Disease	4.5	49.9
Total	749.3	1,087.0

*Revised after hand review of yet to be classified 2001 deaths

Table 4 - Crude death rates in Nevada by cause, 1998 to 2000: general population and mental health

With regard to the crude death rates for all causes, the mental health population had a higher rate for all three years in this study (Table 5). The largest one-year difference in the crude death rate was in 2000 when the mental health patients' rate was 51.6% higher than the general population's rate (1,107.6 and 730.8, respectively).

Year	Source	Pop	Deaths*	Rate Per 100,000	Diff. (%)
1998	NV	1,855,790	14,180	764.1	36.4%
	Mental Health Patients	6,718	70	1042.0	
1999	NV	1,967,650	14,843	754.4	47.5%
	Mental Health Patients	6,379	71	1113.0	
2000	NV	2,034,050	14,865	730.8	51.6%
	Mental Health Patients	6,591	73	1107.6	
1998 to 2000	NV	5,857,490	43,888	749.3	45.1%
	Mental Health Patients	19,688	214	1087.0	

* Deaths considered for mentally ill population only those that died within one year of admittance

Table 5 - Crude death rates in Nevada from 1998 to 2000: general population and mental health

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The age group most represented in the deceased mental health population was the 20 to 29 year age group (Table 6). Within that group, an individual was more than six times more likely to die than an individual in the same age range in the general population (577.9 and 92.6, respectively). For all of the age groups, those that were mentally ill were more likely to die than their respective age group cohorts were in the general population.

Age Group	Source	Pop	Deaths*	Rate Per 100,000	Ratio
20 to 29 Years	NV	825,937	765	92.6	6.24
	Mental Health Patients	5,191	30	577.9	
30 to 39 Years	NV	954,056	1,503	157.5	4.48
	Mental Health Patients	6,381	45	705.2	
40 to 49 Years	NV	864,244	2,797	323.6	3.84
	Mental Health Patients	4,983	62	1244.2	
50 to 59 Years	NV	677,969	4,516	666.1	1.91
	Mental Health Patients	2,274	29	1275.3	
60 to 69 Years	NV	461,763	7,780	1684.8	2.42
	Mental Health Patients	565	23	4070.8	
70 to 79 Years	NV	306,772	12,250	3993.2	1.81
	Mental Health Patients	194	14	7216.5	
TOTAL	NV**	4,090,741	29,611	723.9	1.43
	Mental Health Patients	19,588	203	1036.3	

* Deaths considered for mentally ill population only those that died within one year of admittance
** Those under 20 years of age and 80+ not considered for TOTAL

Table 6 - Crude death rate by age group in Nevada from 1998 to 2000: general population and mental health

Age-adjusted death rates (2000 standard population) revealed an even larger discrepancy when comparing the mental health and general population's death rates (Table 7). An individual from the mental health population was 81% more likely to die than an individual from the general population (1,643.4 per 100,000 population and 907.8 per 100,000 population, respectively).

1998-2000	Nevada	Mental Health Patients	Ratio
Crude Rate	749.3	1087.0	1.45
Age Adjusted*	907.8	1643.4	1.81

*Based on 2000 standard population

Table 7 - Age-adjusted death rates: mental health and general population

An interesting statistic is the declining crude and age-adjusted death rates for mentally ill patients who lived past their first year of initial contact with a mental health professional (Table 8). The crude death rate for those who survived until their third year from initial contact with a mental health professional was actually lower than the crude rate for the general population (697.1 and 749.3 per 100,000 population, respectively). However, age-adjusted death rates for the mentally ill were much higher than age-adjusted death rates for the general population of Nevada in all three groups.

For those that died after one year of first contact but before two years, the age-adjusted death rate was 65.9% higher than the general population (1506.1 and 907.8 per 100,000 population, respectively). For those that died after two years of initial contact but before three years from initial contact, the rate was still 33.4% higher than the general population (1211.4 and 907.8 per 100,000 population, respectively).

Crude and Age-Adjusted Death Rates of Mental Health Patients by Years Lived From First Contact				
Year	Pop	Deaths	Rate Per 100,000	Age-Adjusted
Within 1st Year of Initial Contact	19,688	214	1087.0	1643.4
In 2nd Year after Initial Contact	12,956	94	725.5	1506.1
In 3rd Year after Initial Contact	6,599	46	697.1	1211.4

Table 8 - Death rates of mental health patients by when death occurred

Demographic Profile

The racial/ethnic breakdown for deceased male mental health patients (Figure 14) was different from the male mental health population in general (Figure 5). Hispanic and Black males were underrepresented in the deceased population compared to the male mental health population at large (4.1% and 7.2% for Hispanics, respectively, and 4.1% and 9.4% for Blacks, respectively).
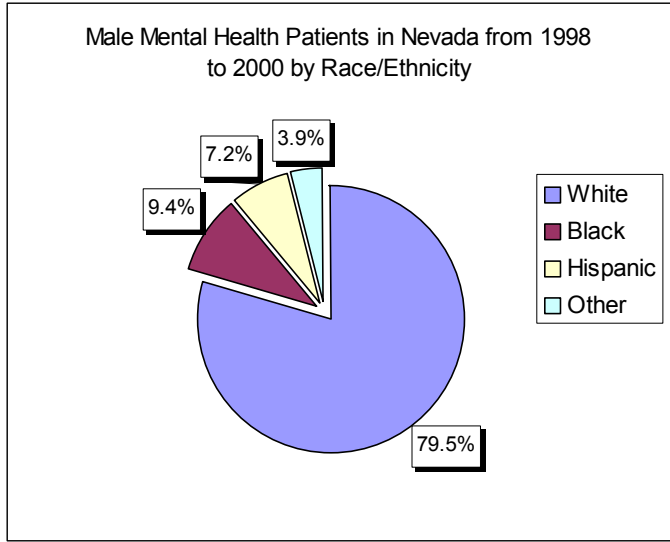
The group with the largest increase in representation in the deceased subset compared to the mental health male patients at large was Whites. Whites represented 90.5% (N=199) of those that were deceased, compared to the 79.5% (N=7,251) representation in the male population.

Male Mental Health Patients in Nevada from 1998 to 2000 by Race/Ethnicity

- White
- Black
- Hispanic
- Other

3.9%
7.2%
9.4%
79.5%

Figure 5 - Race/ethnicity of male mental health patients

Deceased Male Mental Health Patients in Nevada from 1998 to 2000 by Race/Ethnicity

- White
- Black
- Hispanic
- Other

4.1%
4.1%
1.4%
90.5%
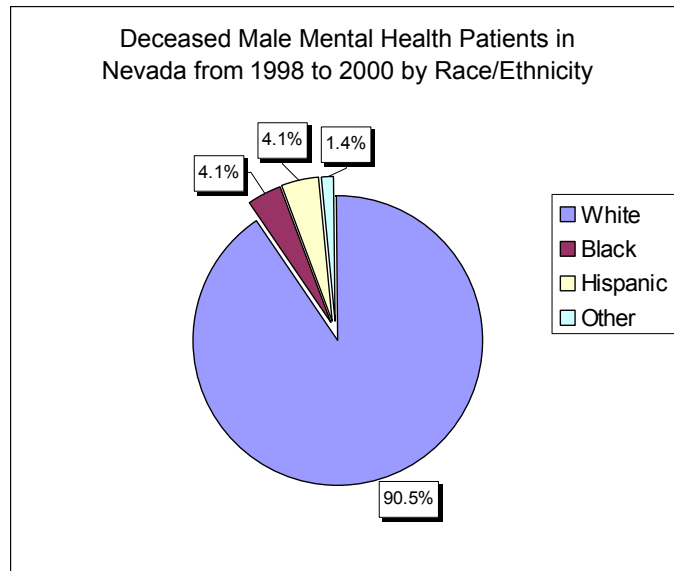
Figure 14 - Race/ethnicity of deceased male mental health patients

The racial/ethnic breakdown for deceased female mental health patients presented in Figure 15 is similar to deceased males; Hispanic females were underrepresented compared to their female mental health population counterparts at large. Deceased Hispanic females represented only 3.1% (N=6) of the total number of deceased mentally ill females. Overall, Hispanic females represented 7.3% (N=751) of the female mental health population. Deceased Black females were slightly over represented compared to the general sub-population of females. Of the mentally ill females that died, 8.2% (N=16) were Black, compared to 8.0% (N=826) in the overall mental health female sub-population.
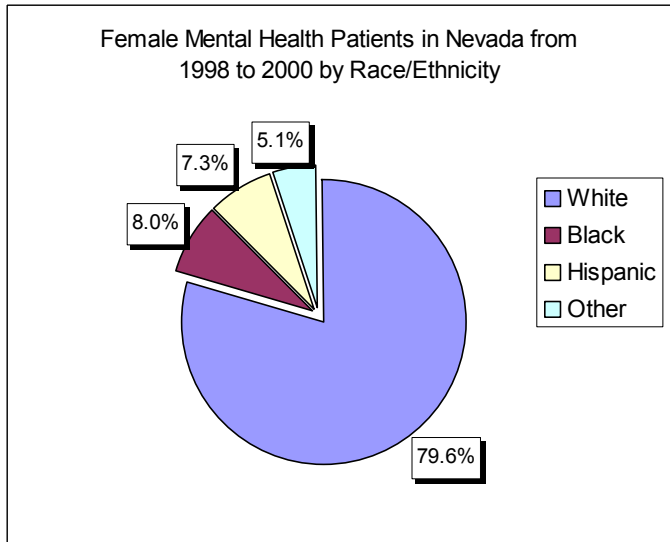
Figure 6 - Race/ethnicity of female mental health patients

The group with the largest increase in representation from the deceased female subpopulation to the mental health female subpopulation at large was Whites. Whites represented 87.1% (N=169) of those females that were deceased, compared to 79.6% (N=8,196) in the female mental health population.
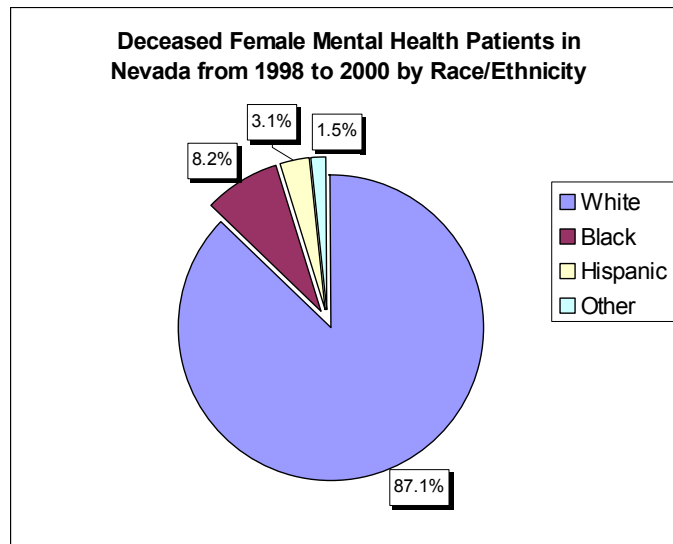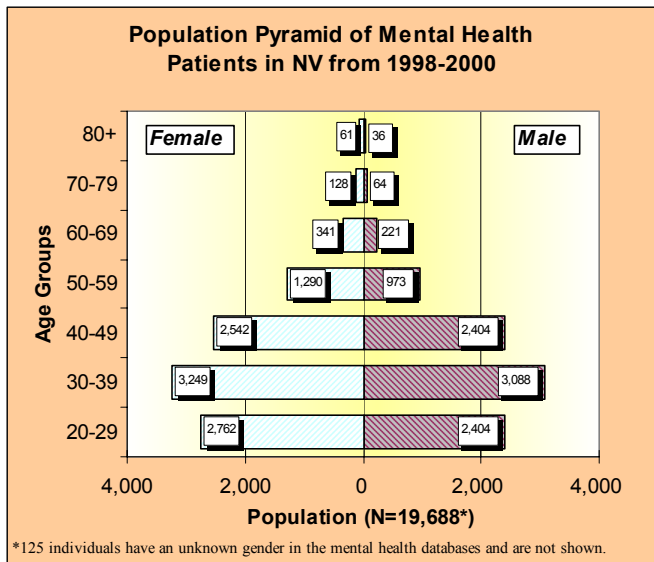

Figure 15 - Race/ethnicity of deceased female mental health patients

Age and gender distributions for the mental health population at large and the deceased mental health population are presented in Figure 3 and Figure 16. Of the patients that died, 52.6% (N=221) were male compared to 46.7% in the general mental health population

Figure 3 - Population pyramid of mental health patients

Mental health patients that died were older than their cohorts were in the mental health general population. The age groups most represented in the population of those that died were the 40 to 49 (25.2%) and 50 to 59 (20.4%) year age groups, respectively. For the mental health patient population at large, the group most represented was the 30 to 39 year age group (32.2%), followed by the 40 to 49 year (25.1%) group.
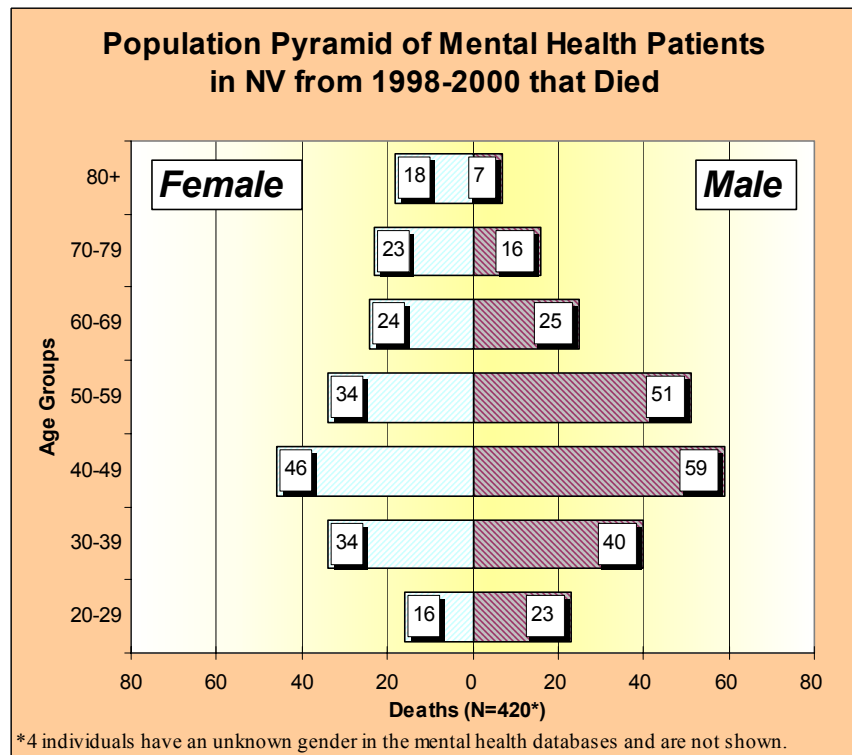

Figure 16 - Population pyramid of deceased mental health patients

Within those in the mental health population that died, the most common presenting mental illness was depression. Depression was also the most common presenting disorder in the general mental health population (Figure 17), with the general population having a slightly higher rate (46.4% and 42.1%, respectively). Thought disorder was the second leading presenting disorder for both cohorts, with those that died having slightly higher values (16.4% and 14.7%, respectively). Encountering diagnoses such as suicide attempt, coping with daily roles and activities, and alcohol use were slightly higher for the deceased cohort compared to the general population. The disorders that were more prevalent in the general population were family and marital problems, drug use other than alcohol, and the aforementioned depression.
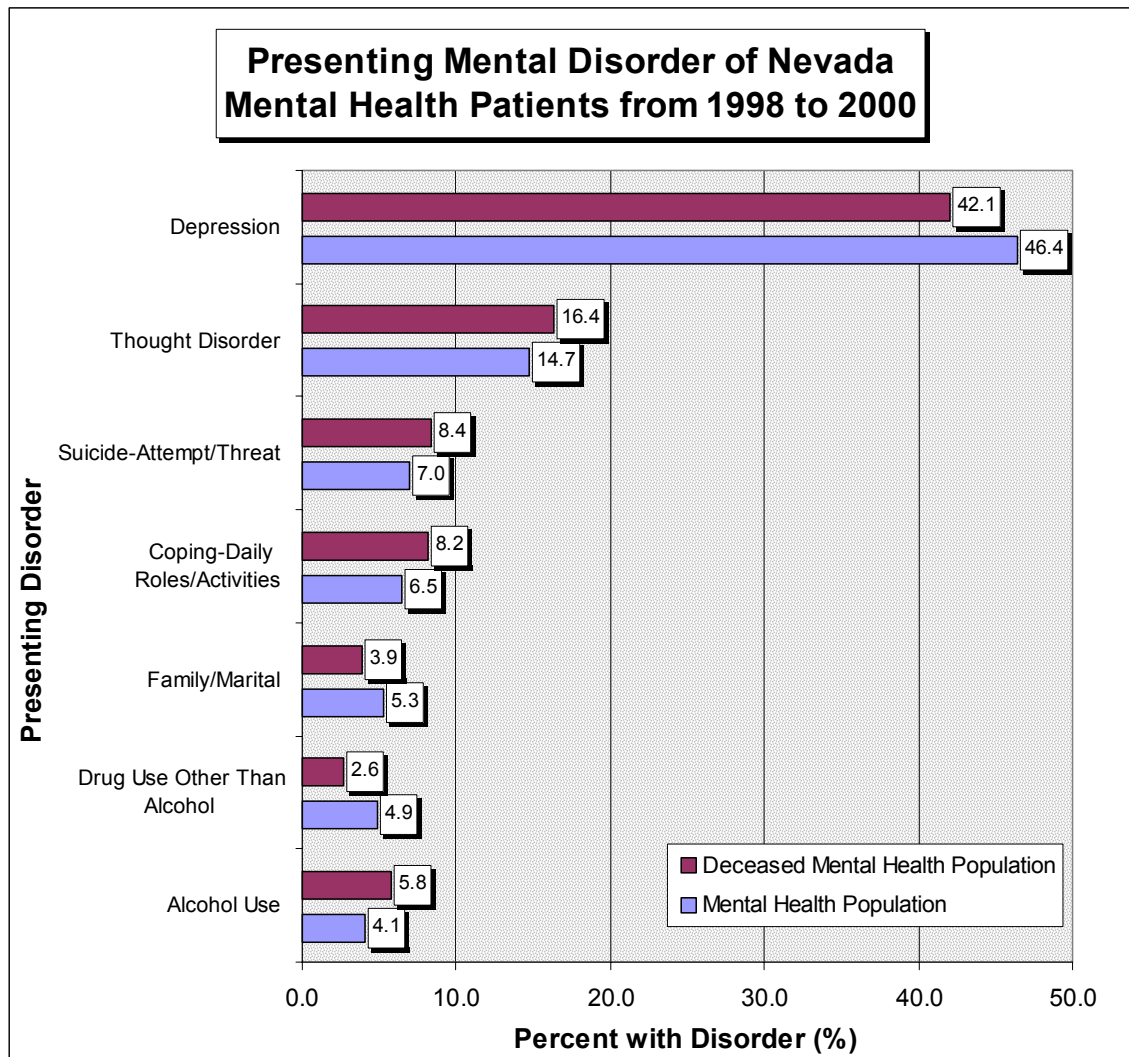

Figure 17 - Presenting mental disorder of NV mental health patients, 1998 to 2000

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Primary Medical Diagnosis of Mental Health Patients in General and those that Died, NV 1998 - 2000
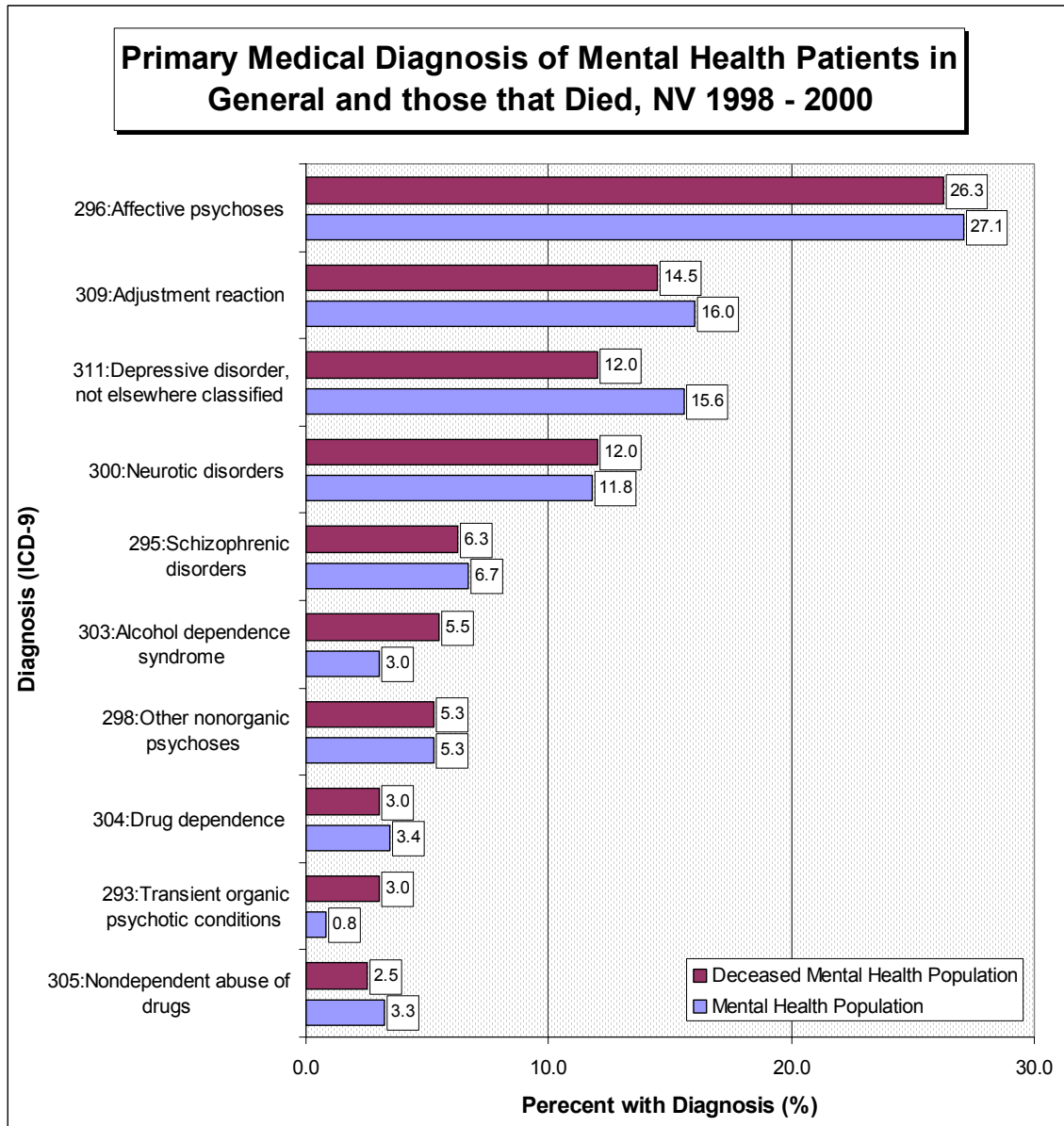
Figure 18 - Primary medical diagnosis of mental health patients (general and deceased) in NV, 1998 to 2000

Once the patients made contact with a mental health agency, they were evaluated further and in that review a primary medical diagnosis was established (Figure 18). The most common diagnosis for patients in general and deceased patients was affective psychoses, with the general population having a slightly higher rate (27.1% and 26.3% respectively). The diagnoses with the largest increases for the deceased subpopulation were alcohol dependence syndrome (5.5% and 3.0% respectively) and transient organic psychotic conditions (3.0% and 0.8% respectively). The largest decrease for this subset was depressive disorder not elsewhere classified (12.0% and 15.6% respectively).

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The most common type of medical coverage for both the mental health population in general and those that were deceased was no insurance or free care (Figure 19). The deceased population had higher levels of Medicaid coverage (27.1% and 19.2%, respectively) and Medicare coverage (20.8% and 9.3%, respectively) compared to the general mental health population.

Type of Medical Coverage for General and Deceased Mental Health Population in Nevada from 1998 to 2000

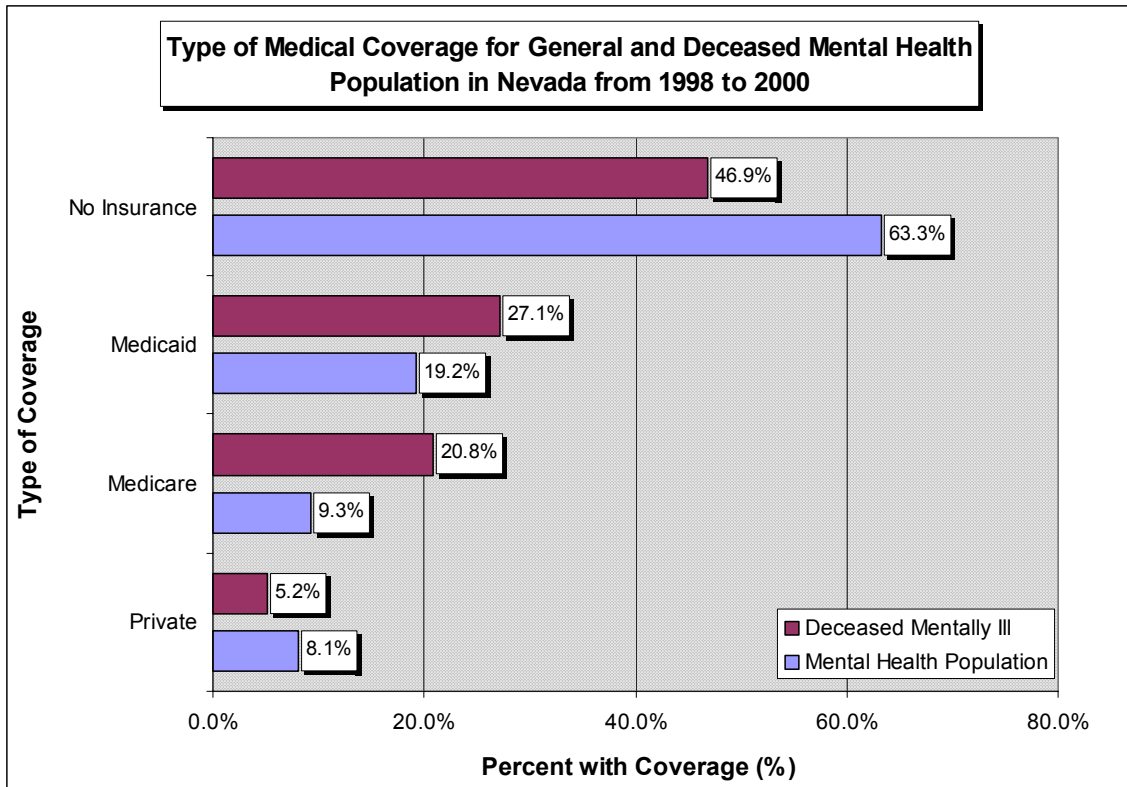| Type of Coverage	Deceased Mentally Ill	Mental Health Population
No Insurance	46.9%	63.3%
Medicaid	27.1%	19.2%
Medicare	20.8%	9.3%
Private	5.2%	8.1%

Figure 19 - Type of medical coverage for mental health population in NV, 1998 to 2000

The deceased patients from the mental health databases were less likely to be married or single compared to mental health patients in general (Table 9). Those that died were almost three times as likely to be widowed compared to patients in general (9.4% and 3.3% respectively), which might be explained by the fact that widowed persons are older on average. Those that died were also divorced more than patients in general (40.7% and 36.0% respectively).

Marital Status of Mental Health Patients

Marital / Status	General Pop.	Deceased
Divorced	36.0%	40.7%
Married	22.8%	20.5%
Never Married	35.9%	27.0%
Unknown	2.1%	2.4%
Widowed	3.3%	9.4%
All	100.0%	100.0%

Table 9 - Marital status of mentally ill in NV

Almost half (49.5%) of those in the mental health population that died were unemployed and not looking for a job (Figure 20). Persons in the general mental health population were most likely to be unemployed and not looking for a job (41.1%). Individuals in the mental health population in general were almost twice as likely to have a full time job in comparison to those that died (19.3% and 10.7%, respectively). Persons in the population that died were much more likely to be retired compared to the normal population. However, this statistic would be expected considering the increased death rates for older populations.
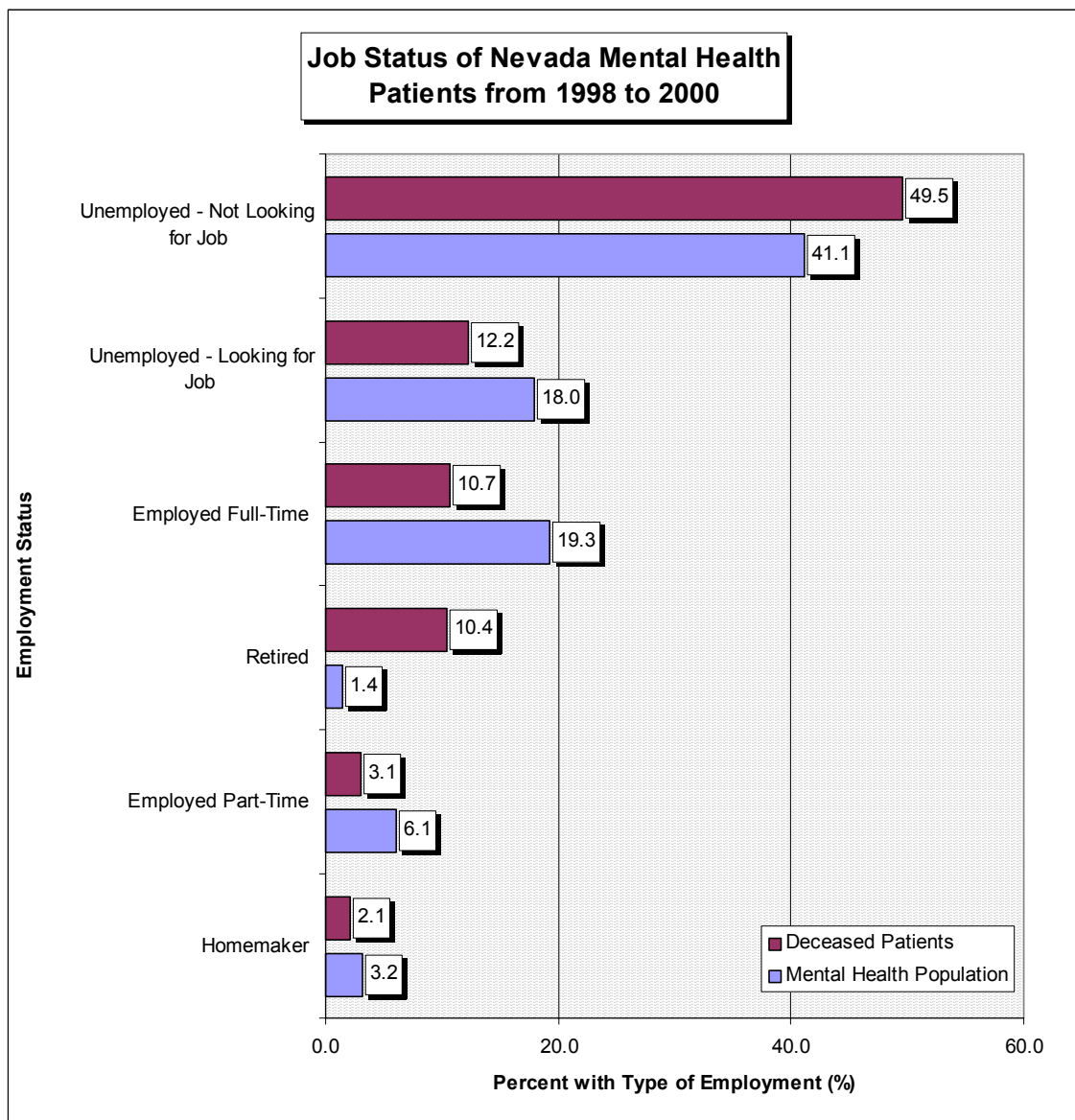

Figure 20 - Job status of NV mental health patients, 1998 to 2000

MENTAL HEALTH PATIENT SUICIDES

Trend Analysis

Suicide Rates in Nevada from 1998 to 2000				
Year	Source	Pop	Suicides	Rate Per 100,000
1998	NV	1,855,790	389	21.0
	Mental Health Patients	6,718	17	253.1
1999	NV	1,967,650	397	20.2
	Mental Health Patients	6,379	16	250.8
2000	NV	2,034,050	388	19.1
	Mental Health Patients	6,591	15*	227.6
1998 to 2000	NV	5,857,490	1174	20.0
	Mental Health Patients	19,688	48*	243.8
* Data may not be comple due to 86.7% completeness of death file				

Table 10 - Crude suicide rate comparison for NV and mental health patients

Suicide rates for the mental health population compared to the general population are presented in Table 10 and Figure 21. The suicide rates were calculated in a similar fashion to the death rates. Individuals that were entered into the mental health database in a given year were treated as a cohort. The suicides tracked were suicides committed within one year of initial contact. Summing all suicides for both databases and dividing by the sum of the populations over these years is the 1998 to 2001 total suicide rate.
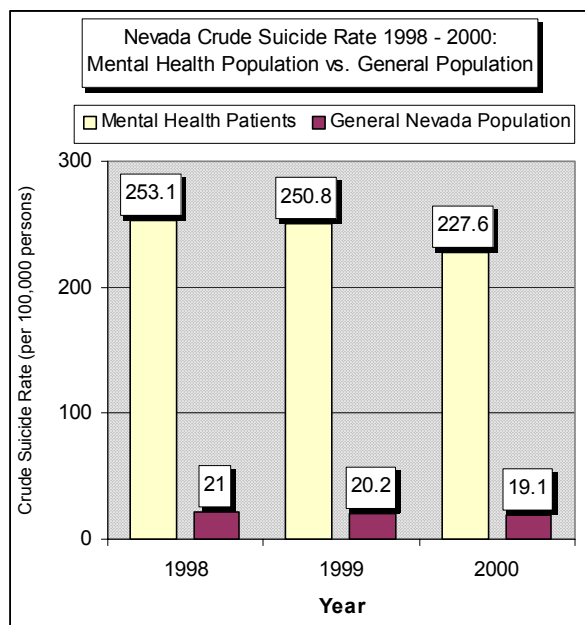

Figure 21 - Crude suicide rates in NV 1998 - 2000

The overall suicide rate between 1998 and 2000 for mental health patients was 243.8 per 100,000. The rate for the general population of Nevada over this same period was 20.0 per 100,000. In essence, an individual in the mental health population was 12 times more likely to commit suicide than individuals from the general population. The highest suicide rate for the mental health population in the three-year period came in 1999, at 250.8. This rate was nearly 15 times the general suicide rate for the same year (20.2 per 100,000 population).

Of the 1,139 estimated deaths by suicide from 1999 to 2001, 65 (5.7%) were individuals that had made their first contact with a mental health agency in Nevada from 1998 to 2000 (Table 11). In 2001, 23 (6.5%) of the 354 suicide victims in Nevada were also in the mental health database. Incidentally, this statistic was the highest rate for the three years studied. The lowest rate was in 2000 where 4.9% of the suicides were also in the mental health database.

Suicides in Nevada 1998 to 2000			
	NV	Mental Health Patients	Percent (%)
1999	397	23	5.8%
2000	388	19	4.9%
2001	354**	23*	6.5%

* Data may not be complete due to 86.7% completeness of 2001 death file
** Estimated value since all deaths in 2001 not coded yet

Table 11 – Percent of suicides in Nevada from mental health patients, 1998 - 2000

Table 11 has a unique perspective on the number of suicides in Nevada that occurred between 1999 and 2001 that were from people who never saw mental health professional in the state. Over 90% of suicide victims in Nevada were never reported to have seen a mental health professional. One might conclude either most people that committed suicide did not have a mental illness or that many people in the state that had mental illnesses and committed suicide never received mental health care in the state.

In looking at those that had a primary or secondary presenting disorder of suicide attempt or threat, less than one percent actually committed suicide (Table 12). Those in SNAMHS that had attempted or threatened suicide as a primary/secondary presenting disorder were most likely to commit suicide (1.04%), while those in NNAMHS were the least likely to die from suicide (.02%).

Presenting Disorder of Suicide Attempt or Threat				
Region	Type of Disorder	Number with Disorder	Committed Suicide	Percent
SNAMHS	Primary Presenting Disorder	775	8	1.03%
	Secondary Presenting Disorder	186	2	1.08%
NNAMHS	Primary Presenting Disorder	435	1	0.23%
	Secondary Presenting Disorder	120	0	0.00%
Rural Clinics	Primary Presenting Disorder	110	2	1.82%
	Secondary Presenting Disorder	48	0	0.00%
All	Primary Presenting Disorder	1342	11	0.82%
	Secondary Presenting Disorder	289	2	0.69%

Table 12 - Rates of suicide for diagnosis of suicide attempt/threat by region

Figure 22 depicts suicides by year of death and region. In both 1999 and 2001 there were 22 suicides committed by mental health patients, while in 2000, there were only 19. These figures help provide a different perspective of the suicides but the year-by-year crude suicide rates mentioned earlier give a more accurate reflection of the seriousness of suicide in a given year.
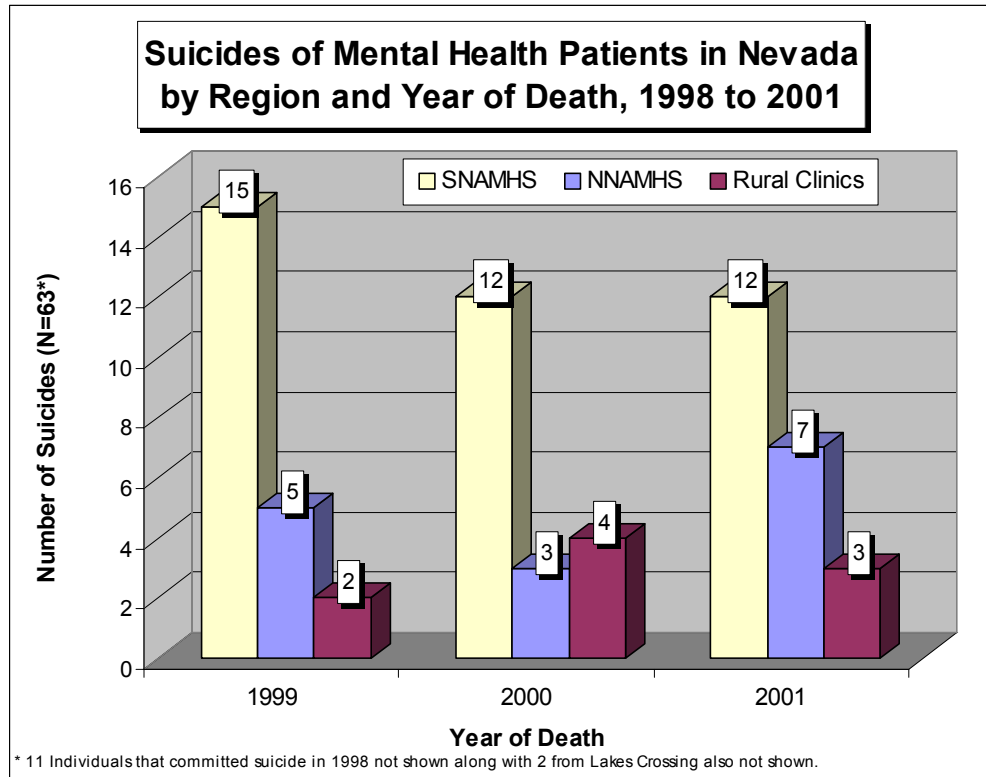

Figure 22 – Mental health patient suicides by year of death

The average number of days from initial contact with a mental health professional to the date of death by suicide was 345 (Table 13). The median number of days was 233, meaning that half of suicides occurred within 233 days of first contact.

Analysis Variable: Days of Life		
Number	Mean	Median
76	345.3	233

Table 13 – Analysis of number of days until a person committed suicide from first contact date

Of the 76 suicides committed by mental health patients in Nevada over the three-year period of this study, 48 (63.2%) were committed within one year of initial contact with a mental health professional (Figure 23).

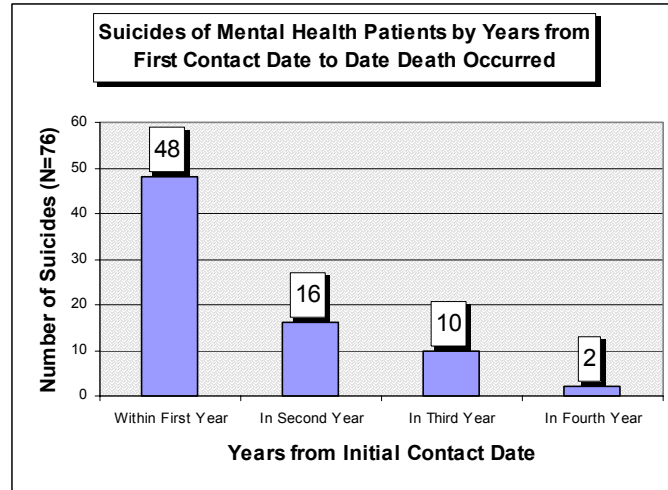**Suicides of Mental Health Patients by Years from First Contact Date to Date Death Occurred**

Figure 23 - Suicide of mental health patients by year occurred after first contact

Of the 48 patients that committed suicide within one year of contact, eight committed suicide (16.7%) within one month (Figure 24). The trend shows a decrease in suicides by month until the fourth month. Ten people committed suicide four months after contact (20.8%), the highest of any one-month period.
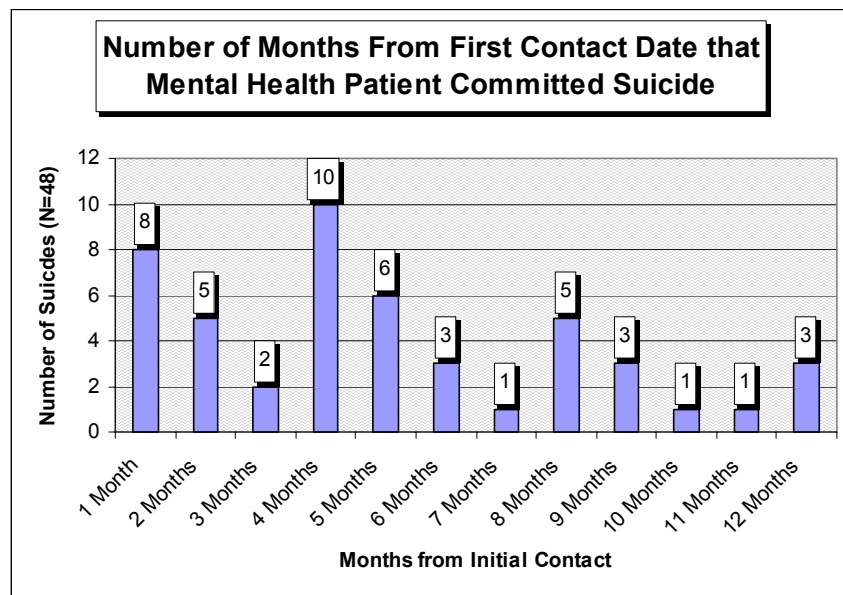
Number of Months From First Contact Date that Mental Health Patient Committed Suicide

Figure 24 - Suicide of mental health patients by month occurred after contact, first year only

Demographic Profile

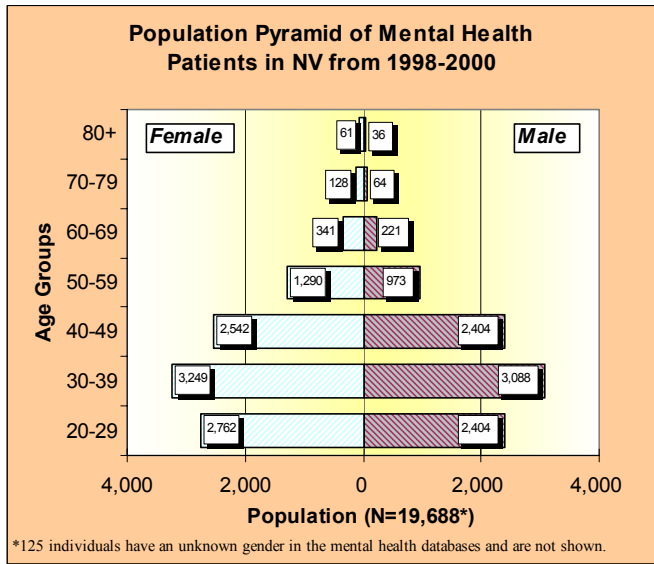**Population Pyramid of Mental Health Patients in NV from 1998-2000**

	Female		Male	
80+	61	36		
70-79	128	64		
60-69	341	221		
50-59	1,290	973		
40-49	2,542	2,404		
30-39	3,249	3,088		
20-29	2,762	2,404		

Population (N=19,688*)

*125 individuals have an unknown gender in the mental health databases and are not shown.

Figure 3 - Population pyramid of mental health patients

A population pyramid of those that committed suicide from the mental health database is presented below (Figure 25). To the left is the population pyramid of the general mental health population (Figure 3). Of patients who committed suicide, 57.9% (N=44) were male. The age group most represented in this subpopulation was 30-39 year olds (31.6%). A group that was over-represented in the suicide subpopulation was 60-69 year olds. They represented 6.6% (N=5) of the suicide population compared to 2.8% of the overall mental health population.

Population Pyramid of Mental Health Patients in NV from 1998-2000 that Committed Suicide

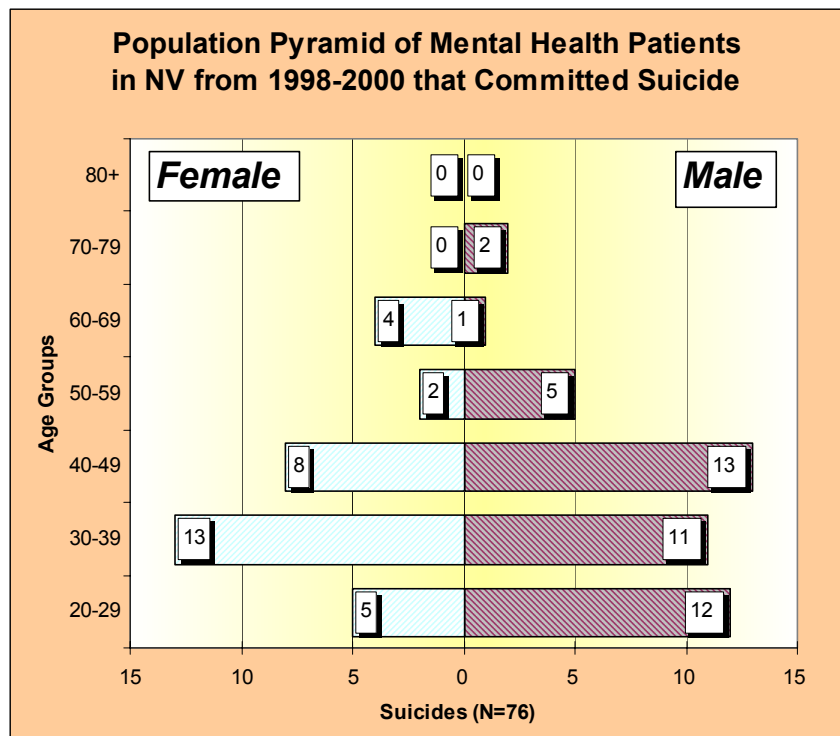|	Female		Male	
80+	0	0		
70-79	0	2		
60-69	4	1		
50-59	2	5		
40-49	8	13		
30-39	13	11		
20-29	5	12		

Suicides (N=76)

Figure 25 - Population pyramid of mental health patients that committed suicide

The racial/ethnic breakdowns for the mental health population as a whole and the suicide subpopulation are presented in Figures 3 and 26 below.
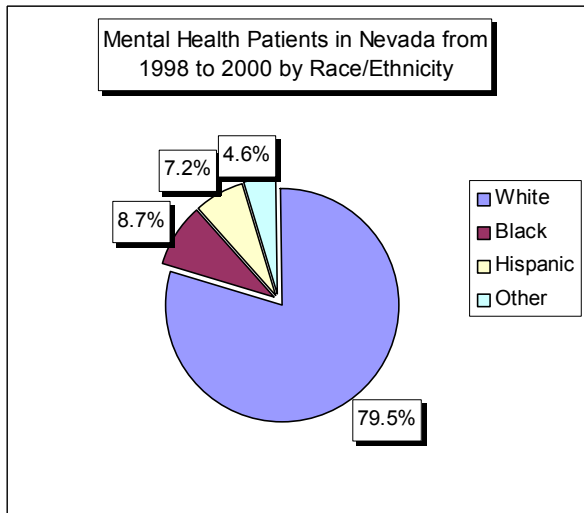

Figure 26 – Race/ethnicity of mental health patients

The majority of those that committed suicide were White. White mental health patients represented 92.1% of all those that committed suicide from the mental health database. In the mental health population, only 79.5% were White, while this same racial group made up 67.3% of the general population. (based on 1998 to 2000 population estimates provided by the State Demographer's Office). In contrast both Blacks and Hispanics were under-represented in the suicide subpopulation compared to the mental health population. Blacks represented 3.2% of the suicide population compared to 8.7% in the mental health population as a whole. Similarly, Hispanics made up 4.8% of all suicide victims in the mental health population, whereas this same ethnic group made up 7.2% of the general mental health population.
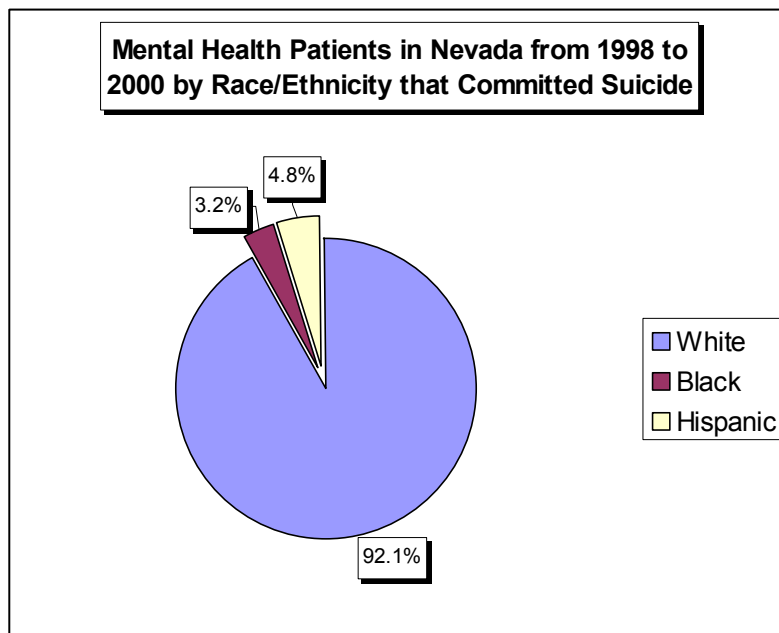

Figure 27 - Race/ethnicity of mental health suicides, 1998 to 2000

The presenting disorder of those that committed suicide within the mental health population is presented in Figure 28.

Presenting Mental Disorder for Nevada Mental Health Patients, 1998 to 2000: Suicide Deaths vs. All Patients
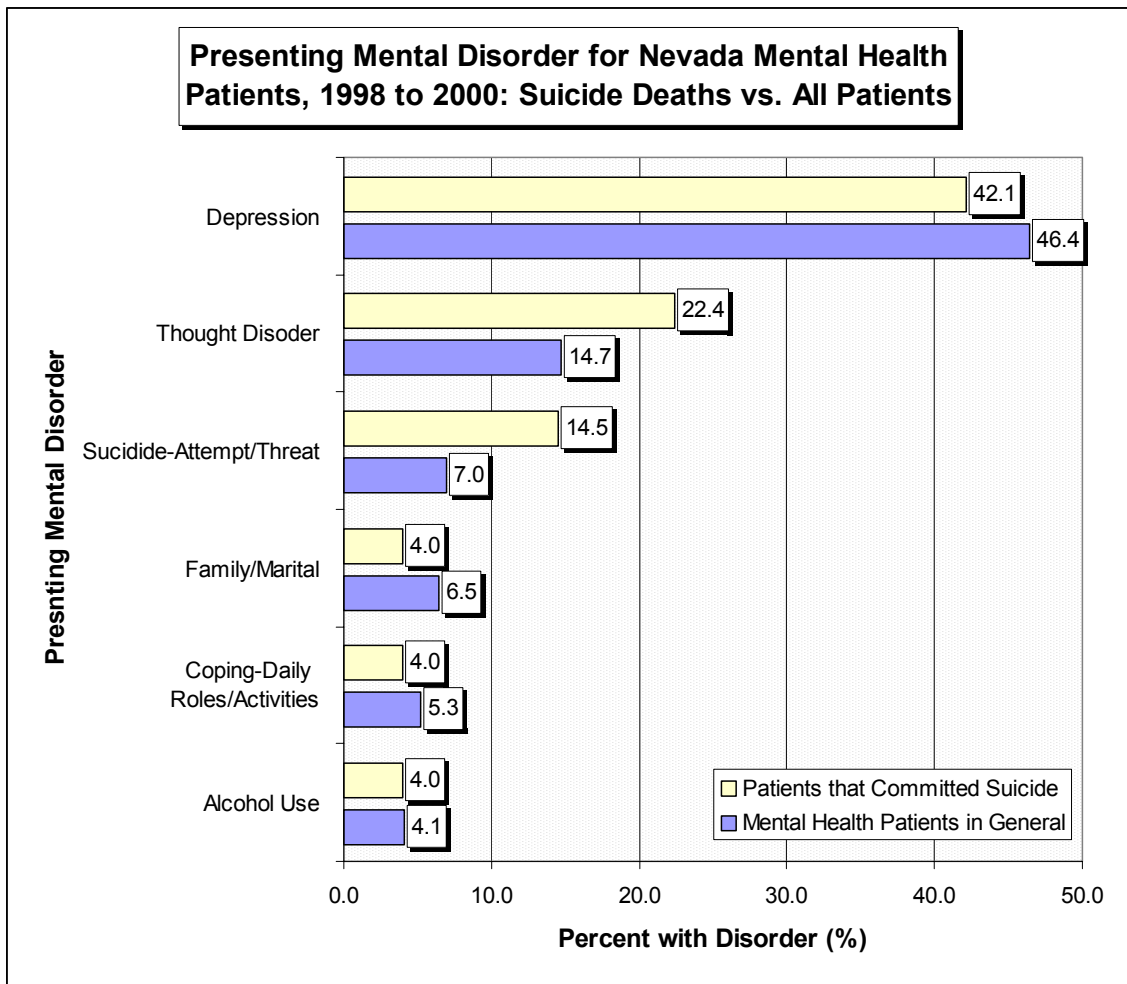
Figure 28 - Presenting mental disorder of mental health patients (general and suicides) in NV, 1998 to 2000

Each patient who is entered into the mental health databases of Nevada is asked to give a primary and secondary presenting disorder for his or her most prominent mental health problems. The most common disorder given by patients that committed suicide was depression (42.1%), followed by thought disorder (22.4%). For the general mental health patient population within the state, the leading primary disorder was depression at 46.4%, followed by thought disorder at 14.7%. Not surprisingly, the third highest primary presenting disorder for suicide victims was a "suicide attempt or threat" at 14.5%. This rate was much higher than the mental health population as a whole at 7.0%.

The leading primary medical diagnosis for the mental health population as a whole and those that committed suicide within the mental health population was "affective psychoses"(Figure 29). One of the larger discrepancies between these two cohorts was for schizophrenic disorders, with those that committed suicide being 64.2% more likely to have had this diagnosis than patients are in general (11.0% and 6.7%, respectively). Another large discrepancy in a diagnosis for the suicide cohort concerned neurotic disorders. Of the general mental health population, 11.8% suffered from these disorders compared to only 6.9% of those that had committed suicide.
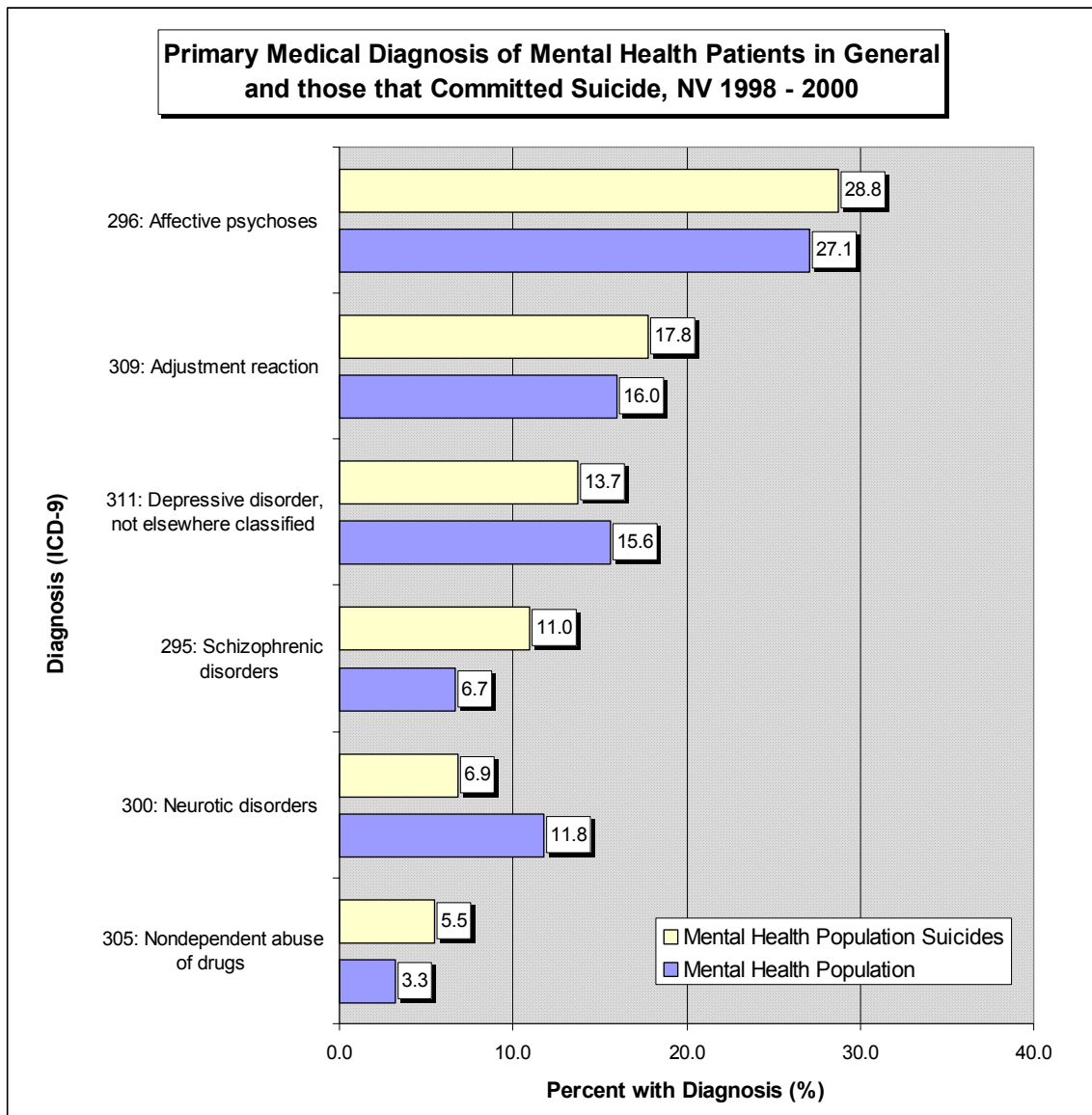

Figure 18 - Primary medical diagnosis of mental health patients (general and suicides) in NV, 1998 to 2000

Depression was the leading presenting disorder for patients that had committed suicide from NNAMHS (Figure 30). The rate of 58.8% having this illness was higher than the rate for the population in general (43.9%). Of those that committed suicide, presenting disorders of a suicide attempt or threat were higher in the SNAMHS and rural regions compared to the general mental health population. The largest discrepancy existed in rural Nevada where only 2.8% of the general mental health population had threatened suicide, but 14.3% actually committed suicide. Thought disorder was more likely to be the presenting problem for SNAMHS mental health patients that had committed suicide (35.3%) compared to their SNAMHS general mental health population counterparts (22.0%).
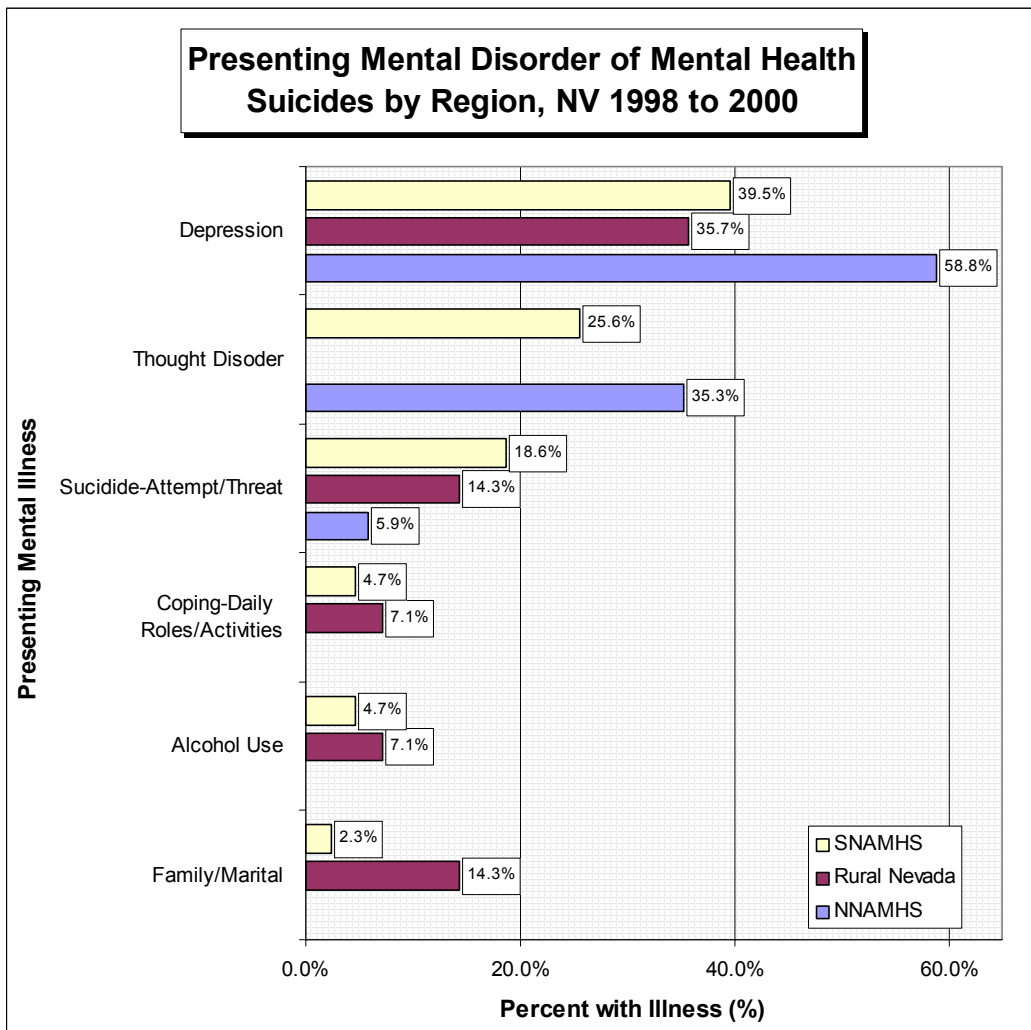

Figure 30 - Presenting diagnosis for mental health patients that committed suicide by region, 1998 to 2000

Marital and job status characteristics of the suicide subpopulation and general mental health population are presented in Tables 14 and 15. Of the patients that committed suicide in the mental health population, those never married and those separated or divorced represented 36.0% of the total. This statistic was much higher than the general population's (1990 Census) "Never Married" rate of 23.7% and the "Separated/Divorced" rate of 16.8%. Widowed individuals accounted for 5.3% (N=4) of the suicides in this subpopulation. This statistic was higher than those in the general mental health population that were widowed (3.3%).

Marital Status	Never Married	Married	Separated/Divorced	Widowed
NV 1990 (Census)	23.7%	53.8%	16.8%	5.6%
Mental Health Patients*	35.9%	22.8%	36.0%	3.3%
Mental Health Patient Suicides	36.0%	22.7%	36.0%	5.3%

*2.1% not shown with unknown marital status

Table 14 - Marital status of Nevadans, mental health patients, and patients that committed suicide

Nearly 70% of all suicides in the mental health databases were from patients who were unemployed. The employment rate for this group was 24.6%, much lower than the 1999 general employment rate of 62.3% (based on 1999 labor force summary from DETR and 1999 population estimates provided by the state demographer's office).

Mental Health Suicide Victims - Job Status	Percent
Unemployed – Not Looking for Job	49.1%
Unemployed – Looking for Job	19.3%
Employed Full-Time	19.3%
Employed Part-Time	5.3%
Homemaker	3.5%
Other	1.8%
Retired	1.8%

Table 15 - Employment status of suicide victims that were mental health patients

Conclusion

        This report has sought to tell different stories from subsets of mental health and death data that have been cross-matched, aggregated, parsed, and analyzed. These data can be presented various ways, and as such, require careful planning as to their presentation in a report. Much effort by the authors of this document was made to present meaningful information as it pertained to mental health and mortality. Some of the more salient points that should be summarized are as follows:

- The leading cause of death for those in the mental health population was suicide (19%).

- Less than 7% of all suicide victims in Nevada from 1999 to 2001 were patients in the mental health system of Nevada.

- The primary presenting disorder among the mentally ill in Nevada was depression.

- Of the suicides committed by mental health patients in Nevada over the three-year period of study, 63% were done so within the first year of being seen by a mental health professional.

- Death due to HIV/AIDS was 5 times more likely to occur in an individual in the mental health population compared to the general population (3.2% and 0.6%, respectively).

        A future project will be to address this last discrepancy regarding mental health and HIV status. Cross matching the mental health database with the HIV/AIDS Reporting System (HARS) for the State of Nevada, as well as Medicaid and hospital discharge databases maintained by the state will yield important health and fiscal information never before seen with regard to mental health problems. Record linkage provides valuable information that a single database cannot provide, such as looking at the entire picture of health related issues for particular clients instead of one subset of health data at a time.

        Diagnoses of AIDS and the virus that causes AIDS, HIV, can bring additional mental as well as physical stress to a person who has the disease or the virus, respectively. Data gleaned from mental health patients who also suffer from HIV and/or AIDS can broaden the scope of understanding on the burden of this disease to the State of

Nevada. Understanding where people are emotionally and mentally with the disease can help in stopping the spread of HIV and AIDS.

Additional projects currently under consideration by the Center for Health Data & Research (CHDR) that are a direct result of the analyses presented in this report are as follows:

1. More detail on what "admitted" means. Are these patients under residential care, how often are they getting treated, etc? This type of knowledge would probably be with program people and would require someone to visit agencies to find out more information.

2. Detailed review of the following mortality data:

    ❖ Deaths of those in inpatient care vs. outpatient care
    ❖ County of residence with particular attention on accident data
    ❖ The time of year the deaths/suicides occur
    ❖ The impact of new generation medicines on mortality
    ❖ The effect of co-existing disorders on mortality and suicide
    ❖ Adolescent mortality and suicide analysis with the help of DCFS data
    ❖ Analysis with particular attention on death date compared to last service date
    ❖ The impact of the MHDS waiting list clients in mortality
    ❖ Mortality analysis of those in the state in developmental services

3. A hand review of accidental deaths may provide more information on this elevated result. Possibly conduct an intent analysis (overdose, etc)?

4. A more in depth analysis is needed with regard to the high suicide rate at 4 months after initial contact (figure 26). It may be possible to examine SNAMHS data for the past 20 years (1980-present).

5. Examine the approximately 2,500 patients in SNAMHS that set up an appointment but were never seen (1990-present). No additional data on these subjects is available at this time, but through linkages, more could be learned.

One important lesson learned in this data sharing effort between MHDS and BHP&S, which may be a benefit to other divisions and bureaus considering similar projects, was the use of encryption technologies to transmit data. All data transmitted was encrypted using at least 128-bit encryption technology by both agencies via a software program called PGP (Pretty Good Privacy). This software is available for free download at the following address http://www.pgp.com.