Mortality Analysis Among Mental Illness Clients in SNAMHS from 1990 to 2000:

---Matching the SNAMHS database to Nevada's death database

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SPECIAL REPORT ON SNAMHS AND MORTALITY IN NEVADA, 1990-2000

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Statistical Abstract

Key Findings

- The crude mortality rate per 100,000 patients from 1990 to 1999 for SNAMHS patients within one year of admittance (1,348.6) was almost double the general rate (771.1) over the same time frame.

- The crude suicide rate per 100,000 patients from 1990 to 1999 for SNAMHS patients within one year of admittance (355.8) was more than 15 times the general rate (22.8) over the same time frame.

- The mortality rate per 100,000 SNAMHS patients within one year of admittance to the SNAMHS database was 1,348.6. This rate dropped to 839.4 within the second year of admittance and 646.1 within the third year of admittance.

- The five leading causes of death for SNAMHS patients were Diseases of the Heart (20%), Suicide (16.4%), Accidents (10.7%), Cancer (9.5%), and Chronic Obstructive Pulmonary Disease (COPD) (5.4%). There were also high rates for Human Immune-Deficiency Virus (HIV) (3.9%), Chronic Liver Disease & Cirrhosis (3.1%), and Homicide (2.4%).

- Of those that died within one year of being admitted to the SNAMHS database (N=417) the five leading causes of death were Suicide (29.5%), Diseases of the Heart (16.7%), Accidents (12.8%), Cancer (6.5%), and COPD (5.3%).

- Of those that died after three years of being admitted to the SNAMHS database (N=665), the five leading causes of death were Disease of Heart (22.9%), Cancer (13.0%), Accidents (9.3%), Suicide (7.6%), and COPD (6.6%). This is much closer to the general populations' causes of death, so the SNAMHS issues were less of a factor in these mortalities.

- The crude death rate per 100,000 individuals for young adults under 20 in the SNAMHS database (529.1) was much higher compared to the general population (64.4). The gap was also large for 20-39 year olds from the SNAMHS database (920.5) compared to the general public (180.5). The difference still existed but is smaller for 40-59 year olds in SNAMHS (1,210.2) with the general population (549.1). For individuals over 60, the death rate was actually lower for those in the SNAMHS database (2,283.1) than in the general population (2,974.5).

- 93 of the suicide victims (39.9%) had a primary diagnosis of depression and 53 of the victims (22.8%) had a primary diagnosis of suicide attempt/threat.

- Of those that had a primary/secondary diagnosis of suicide attempt/threat (5,157), 1.45% (N=75) actually committed suicide.

- 27.6% of the suicide victims from SNAMHS were employed compared to 62.3% in the general population.

SNAMHS database
- There were 39,009 entries in the SNAMHS database, of which 67.1% (26,192) have been entered since 1995.

- Of the 39,009 entries 18,993 (48.7%) were male and 20,016 (51.3%) were female.

- The majority (30.8%) were 30-39 years old. The second leading group was 40-49 year olds (28.5%). While 50-59 year olds represented 16%.

- The largest race and ethnicity was Whites (76.2%). The next largest group was Blacks (12.5%), while Hispanics made up the third largest group (7.8%).

- 17,313 (46.2%) of the patients had a primary diagnosis of depression, 5,939 (15.9%) were diagnosed with thought disorder and 3,839 (10.3%) were diagnosed with suicide attempt/threat.

- 15,565 (39.9%) were never married and 13,107 (33.6%) were separated/divorced. Also 14,430 (43.9%) were unemployed and not looking for a job.

Deceased SNAMHS Patients
- 1,436 (3.74%) of SNAMHS patients are deceased as of December 31, 2000.

- Of this group, 806 (56.1%) were male and 630 (45.9%) were female.

- The leading age group for mortality was 40-49 year olds (24.9%); the second leading group was 50-59 year olds (21.4%) followed by 30-39 year olds (20.2%).

- Whites were by far the largest race and ethnicities among the deceased (83%), Blacks were second largest (10.3%), and Hispanics were third (5.2%).

SNAMHS Patients That Committed Suicide
- 236 SNAMHS patients committed suicide: This number represents 6% of total suicides committed in Nevada between 1990 and 2000.

- Of the suicide victims, 151 (64%) were male and 85 (36%) were female.

- The leading age group was 30-39 year olds (34.3%), the next largest group was 40-49 year olds (24.2%) followed by 20-29 year olds (20.8%). Only 12.3% of the suicides were committed by those ages 50-59.

- The leading race and ethnicity was Whites (86.4%) followed by Hispanics (6.4%) and then Blacks (5.9%).

- 93 (39.5%) of the suicide victims were never married and 100 (42.2%) were unemployed and not looking for a job.

INTRODUCTION

This report represents the first large-scale data sharing effort between the Division of Mental Health and Developmental Services (MHDS) and the Bureau of Health Planning and Statistics (BHP&S). To pilot this type of data sharing in April of 2001 MHDS exported the data from the Southern Nevada Adult Mental Health Services (SNAMHS) database. This data was provided 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. This report looks only at the SNAMHS data set, not MHDS data for the whole state.

BHP&S is located in the State of Nevada Health Division. The BHP&S works with other programs and bureaus within the State Health Division and the Department of Human Resources regarding designing and conducting statistical/analytical efforts along with the creation of a data warehouse for future public health studies. This data warehousing effort is in the early stages of development and will eventually hold more than 35 health and related databases for projects similar to this effort.

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 facility. The division provides a full range of adult mental health services that include; inpatient, residential, case management, partial care, vocational, outpatient and emergency services.

This report will look at three distinct data sets pertaining to mental health; A.) Individuals in the SNAMHS database, B.) Individuals located in both the SNAMHS database and the Nevada death database, and C.) Individuals in B that committed suicide. By comparing and contrasting these three sets, with the state of Nevada's death statistics, some powerful conclusions can be drawn with regards to cause of death for SNAMHS patients, diagnosis accuracy for SNAMHS suicides, and overall effectiveness of the SNAMHS database in recognizing potential suicide victims.

METHODOLOGY

Both 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. The Matching scheme implemented was as follows:

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

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	1,110
2	12
3	23
4	178
5	113
TOTAL	1436

Table 1 – Matches by Pass #

Of the matched pairs 77.3% (N=1,110) are picked up in the first pass. The reason pass four is effective is that names are often misspelled beyond the point of only being off by one character. The final matching scheme is also effective; this is caused by the fact that not every patient had the correct (or any) social security number provided in both data sets. The overall effect of this scheme is quite effective at locating most individuals that are both in the SNAMHS database and the death database. This matching scheme can be categorized as conservative because these matching schemes would not produce matches unless they truly are the same individual.

Once the matching process in AutoMatch is complete an output file is produced. That file is read into SAS for data analysis. All 101 variables from both files are retained in this file so that no information is lost.

THE SNAMHS DATABASE

Trend Analysis

      The SNAMHS database had 39,009 individuals. The program has shown a steady increase in the number of entries added per year since 1993 (Figure 1). Of the total number of SNAMHS patients, 747 (1.9%) had an unknown admit year.
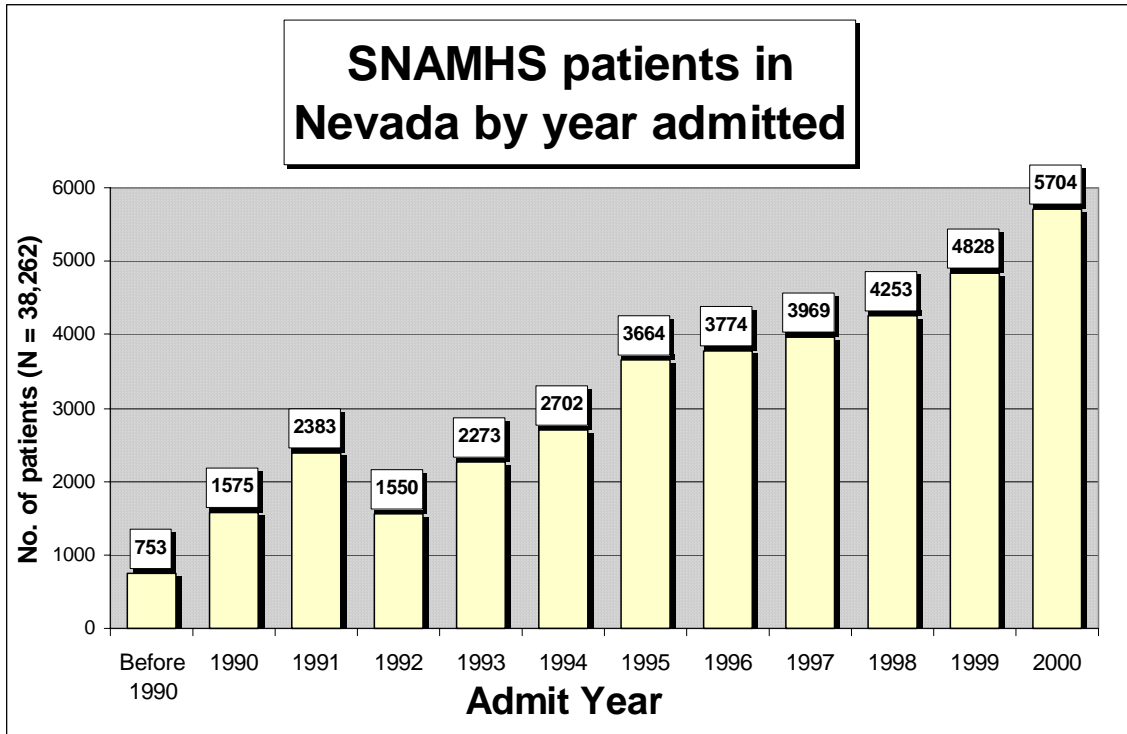

Figure 1 - SNAMHS patients by year admitted

      In 1990, there were less than 1,000 cases in the SNAMHS database. As of the end of the year 2000, a total of 39,009 individuals had been entered into the SNAMHS database. With increasing coverage, perhaps this program will reach more troubled individuals.

      As will be shown later in this report, only 6% of suicide victims are ever entered into the SNAMHS database. This percentage has improved somewhat since 1991 when only 3.2% of suicide victims were in the SNAMHS database (as of December 31, 1991). The increased coverage of suicide victims in the SNAMHS database from 1992 to 2000 is in direct correlation to the increase in the number of patients added to the SNAMHS database.

Demographic Profile

      With regard to the demographic makeup of the SNAMHS database, males and females were equally distributed. A total of 18,993 (48.7%) were males and 20,016 (51.3%) were females (Figure 2).
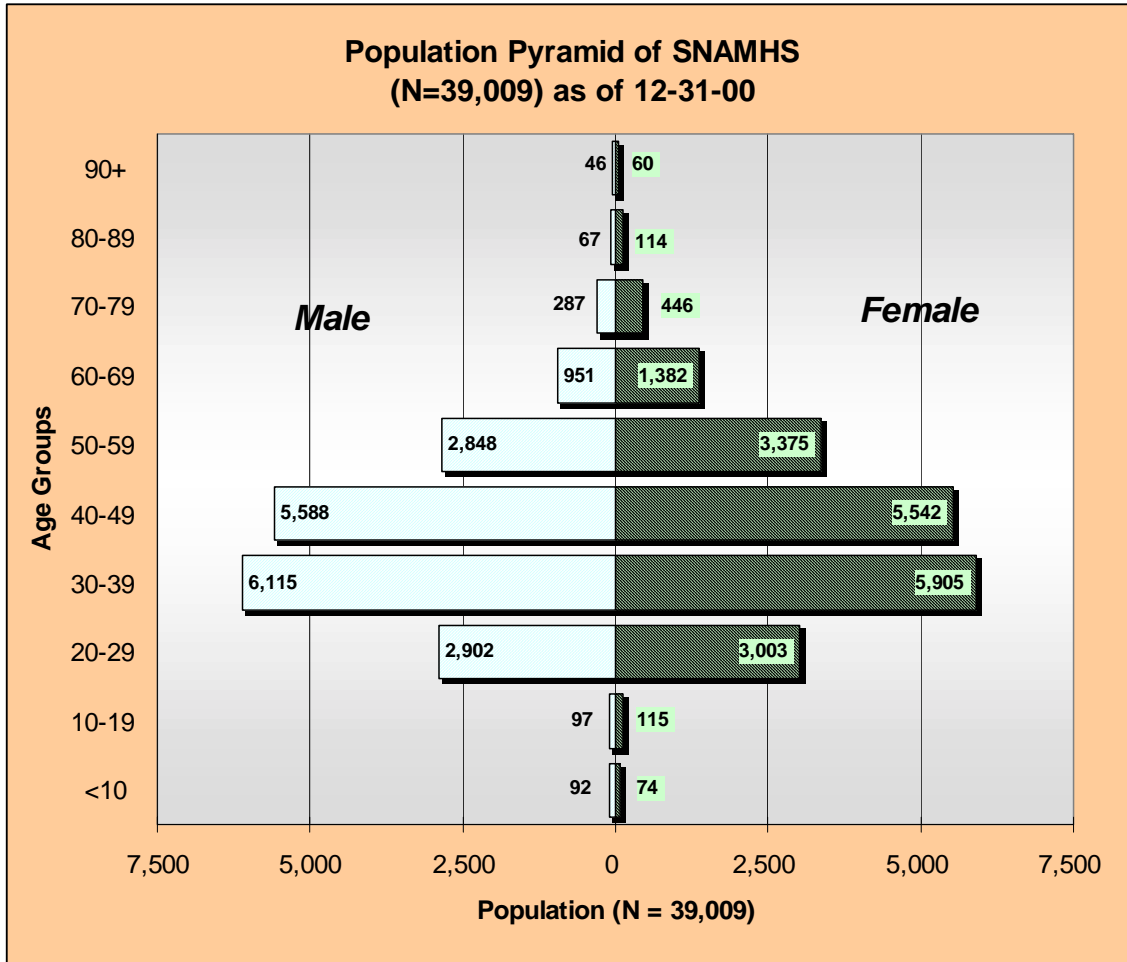
Figure 2 - Population Pyramid of SNAMHS Patients

      Only 1% (N=378) of the SNAMHS patients were under 20 years old. The leading age group was 30-39 year olds at 30.8% (N=12,020). The second largest group was 40-49 year olds (28.5%) followed by 50-59 year olds (16%). 20-29 year olds only represented 15.1% (N=5,905) of the SNAMHS population.

In terms of race/ethnicity, the population of SNAMHS patients was predominately white. Of the 39,009 patients, 76.2% (N=29,742) were White (Figure 3). This population of patients could be referred to as closely representative of the overall population. Whites represent 70% of the population (based on 1999 population estimates provided by the state demographer's office). In contrast, Blacks in the SNAMHS database were over-represented. Of the 39,009 patients, 12.5% (N=4,886) were black yet they make up only 7% of the general population (based on 1999 population estimates provided by the state demographer's office). Hispanics were under-represented in the SNAMHS database as they only represent 7.8% (N=3,032) of the patients, yet they make up 17% of the general population (based on 1999 population estimates provided by the state demographer's office).
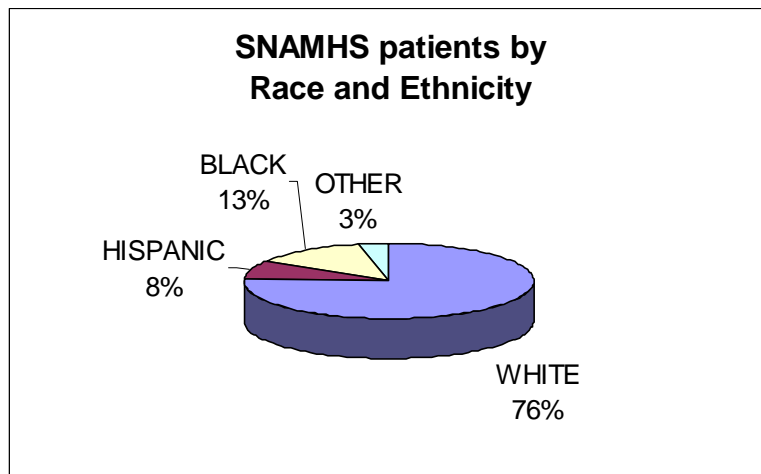

Figure 3 - Race and Ethnicity of SNAMHS patients

An additional demographic factor that can be observed in this population is the marital status (Table 2). For marital status a side-by-side comparison of general marriage rates (based on 1990 Census data) and those in the SNAMHS database are compared.

Marital Status	Never Married	Married	Separated/Divorced	Widowed
NV 1990 (Census)	23.7%	53.8%	16.8%	5.6%
SNAMHS	39.9%	19.5%	33.6%	2.8%

Table 2 - Marital Status of SNAMHS patients vs. general population

SNAMHS AND MORTALITY

Trend Analysis
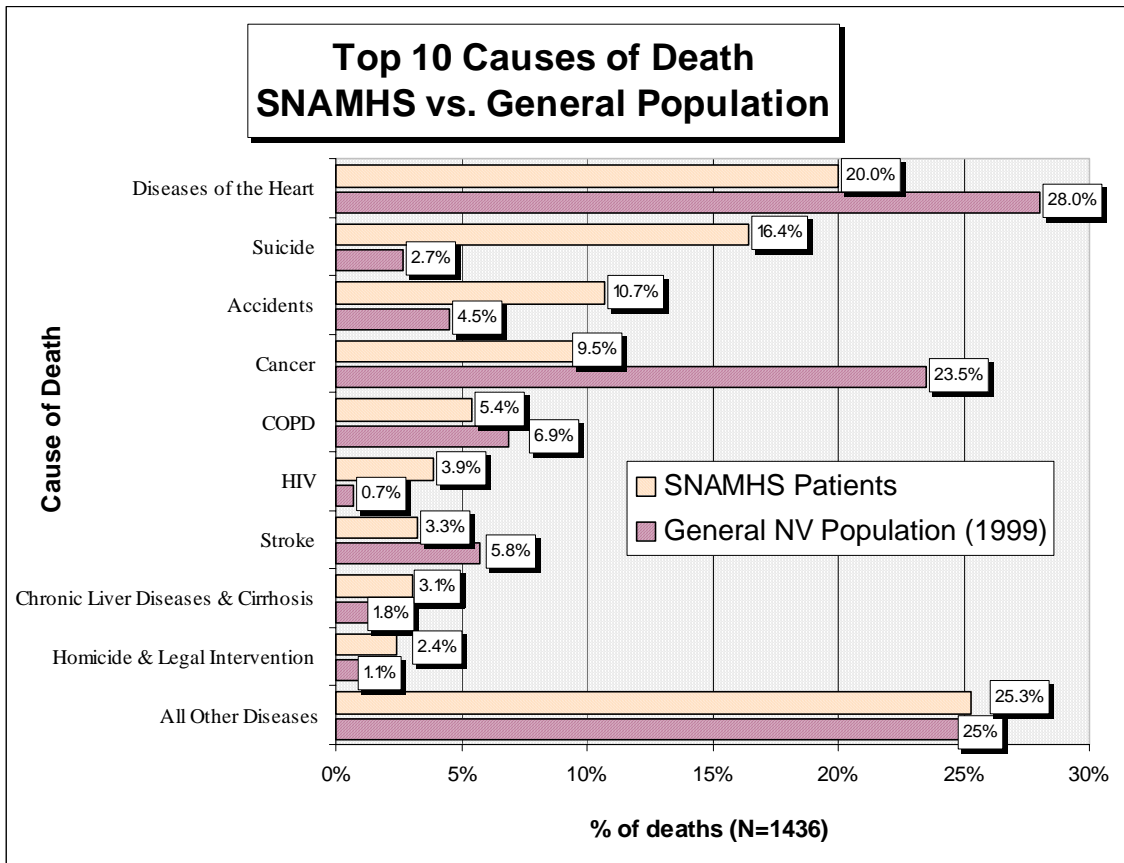
Figure 4 - Top 10 Causes of Death for SNAMHS Patients vs. General Population

Of the 39,009 SNAMHS patients, 1,436 (3.68%) have died. One helpful chart to examine is the top ten causes of death for this population (Figure 4) compared to the general population (based on 1999 population estimates provided by the state demographer's office).

Diseases of the heart was the primary cause of death of SNAMHS patients at 20% (N=287) of all cases reported (N=1,436). Suicide was the second leading cause of death at 16.4% (N=236). In 1999, the general leading causes of death were diseases of the heart at 28% (N=4,641) and suicide at only 2.67% (N=429). There was a large discrepancy between SNAMHS and the general population for deaths caused by HIV/AIDS. In general, the cause of death being HIV/AIDS was only .7% (N=113). In SNAMHS, this rate was 3.9% (N=56).

The mortality rates looked at so far are for the SNAMHS population as a whole. Comparing those that died within one year of being admitted to the SNAMHS database to those that died more than three years after admittance can be useful as well (Table 3).

Cause of Death	1st Year SNAMHS	Rate	SNAMHS >3 Years	Rate	NV 1999
Suicide	127	29.5%	39	7.6%	2.7%
Disease of Heart	72	16.7%	118	22.9%	28.0%
Accidents	55	12.8%	48	9.3%	4.5%
Cancer	28	6.5%	67	13.0%	23.5%
COPD	23	5.3%	34	6.6%	6.9%
HIV	17	3.9%	21	4.1%	0.7%
Homicide & Legal Intervention	11	2.6%	7	1.4%	1.1%
Stroke	11	2.6%	24	4.7%	5.8%
Chronic Liver Diseases & Cirrhosis	10	2.3%	20	3.9%	1.8%
All Other Diseases	77	17.9%	87	16.9%	25%

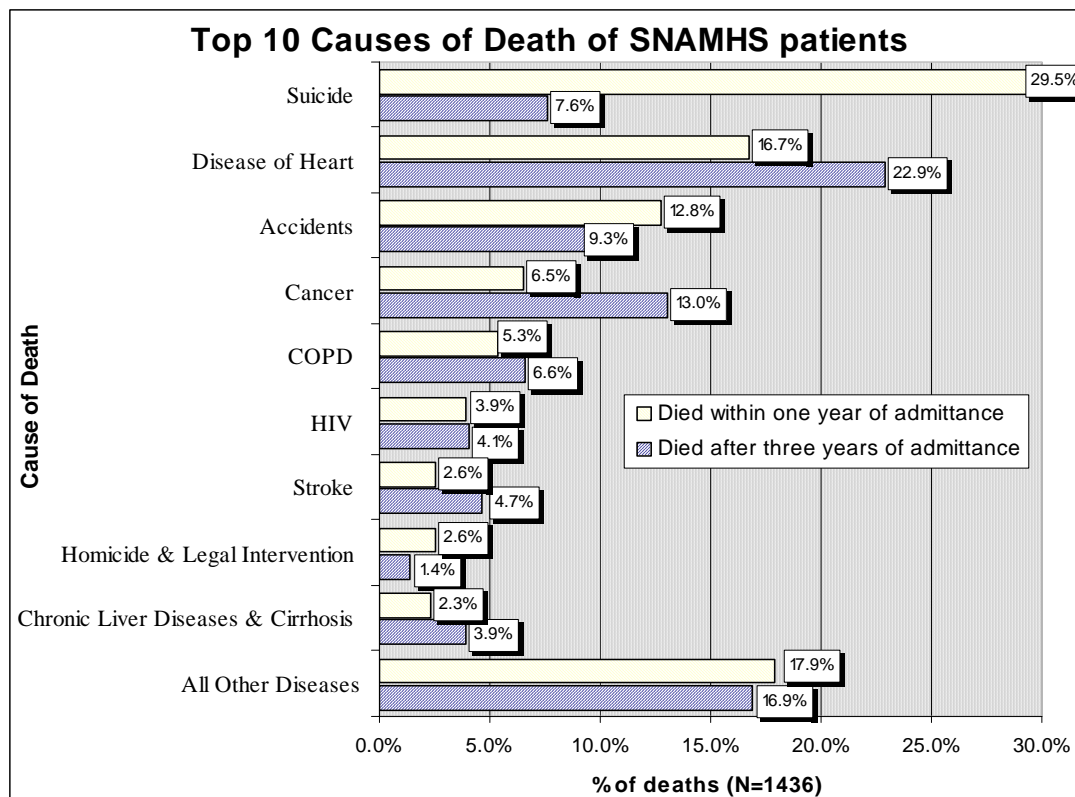**Table 3 - Top 10 Causes of Death for SNAMHS patients and general population**

Figure 5 – Top 10 Causes of Death for SNAMHS patients

As can be seen by the table and chart above (Table 3 and Figure 5), the leading cause of death in the subset of those that die within one year of being admitted to the

SNAMHS database was suicide at 29.5% (N=127). This rate was over three time as high as the SNAMHS patients who died after three years of being admitted (7.6%), and over ten times higher than the general rate (2.7%). The individuals that died after three years of admittance had a closer distribution to the general population. Based on those contrasts, mental health issues appeared to have less of an impact on these particular deaths.

The number of deaths that occurred to individuals that are in the SNAMHS database totaled 1,436 between 1990 and 2000 (Figure 6). The increase in the number of deaths each year can be explained by the increase to the SNAMHS population each of these years.
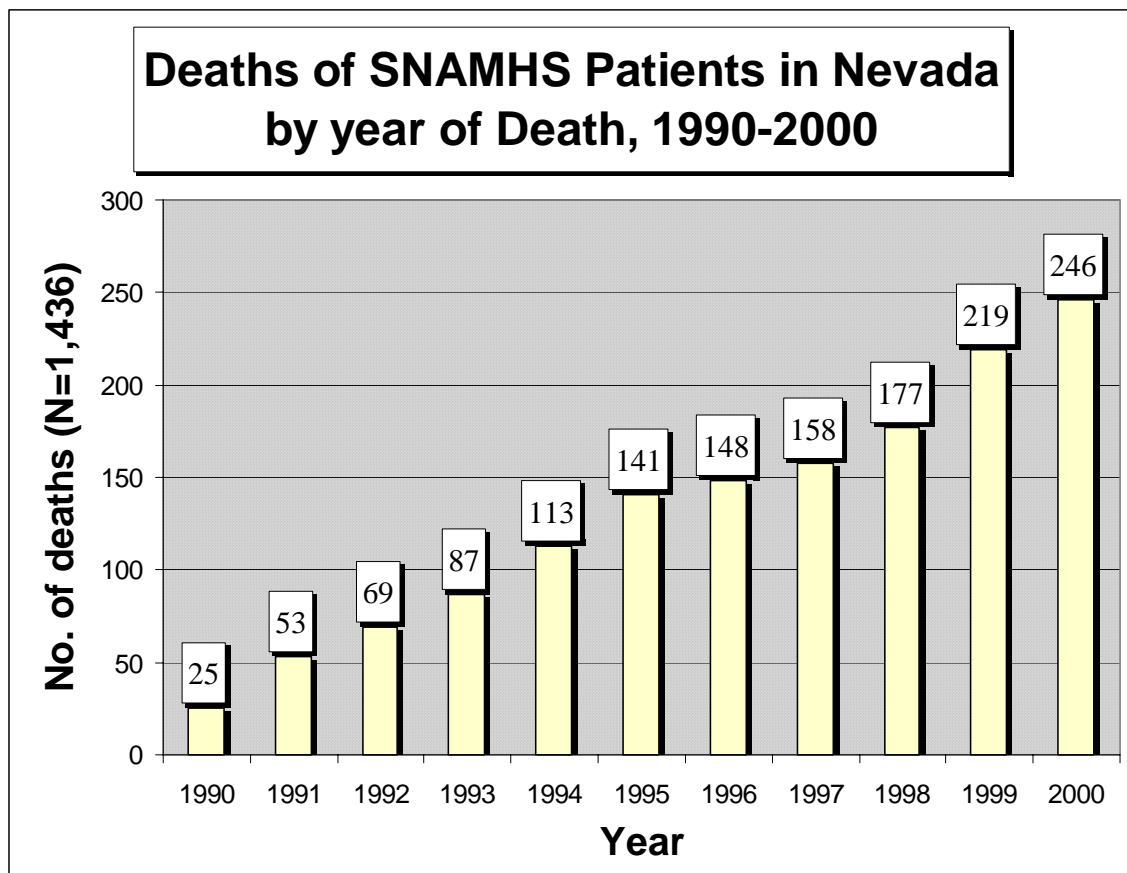

Figure 6 - SNAMHS patients by year of death

In order to look at changes in death rates from year to year it is important to compare the death rates from SNAMHS to that of the general population (Table 4).

Year		Pop	Deaths	Rate Per 100,000
1990	NV	1,201,833	9,133	759.9
	SNAMHS	1,565	24	1533.5
1991	NV	1,297,910	9,687	746.4
	SNAMHS	2,373	37	1559.2
1992	NV	1,343,940	10,141	754.6
	SNAMHS	1,549	22	1420.3
1993	NV	1,398,760	10,918	780.5
	SNAMHS	2,265	46	2030.9
1994	NV	1,494,230	11,680	781.7
	SNAMHS	2,695	39	1447.1
1995	NV	1,582,389	12,340	779.8
	SNAMHS	3,662	49	1338.1
1996	NV	1,688,140	12,916	765.1
	SNAMHS	3,773	45	1192.7
1997	NV	1,740,897	13,092	752.0
	SNAMHS	3,966	44	1109.4
1998	NV	1,874,760	14,180	756.4
	SNAMHS	4,248	58	1365.3
1999	NV	1,967,650	16,132	819.9
	SNAMHS	4,825	53	1098.4
1990 to 1999	NV	15,590,509	120,219	771.1
	SNAMHS	30,921	417	1348.6

Table 4 - Death Rates for Nevada and SNAMHS (1990 to 2000)

The death rate for the SNAMHS database was calculated by treating groups of individuals from each admittance year as a cohort. In 1990 the population considered was made up of only those individuals added to the SNAMHS database in 1990. Those individuals that died in that subpopulation, within one year of being admitted, were considered in the calculation of the crude mortality rate.

The overall crude death rate from the SNAMHS population (1,348.6) is nearly double the general populations' rate (771.1) over this time period. The largest single year difference can be seen in 1993 where the death rate for SNAMHS patients was 2,030.9 compared to the general rate of 780.5 for that same year. The reason 2000 could not be considered for this comparison is that SNAMHS patients admitted in 2000 would not have a full year from their admittance date to the last date entered in the death database.

Age groups represent another cohort to consider in data analysis. A useful way to look at this data is to compare the crude death rates of the SNAMHS population to the state as a whole by age groups (Table 5). The death rates are significantly higher for most age groups compared to the general population (based on 1990 to 1999 population estimates provided by the state demographer's office). The second largest difference between SNAMHS patients and the general rate is noticed in the 20-29 years age group. The crude death rate for SNAMHS patients aged 20-29 (914.5) is more than six times higher than the general rate for this same group (147.9).

Crude Death Rate Table		Population	Deaths	Deaths Per 100,000
10-19 Years	NV Deaths	2,006,407	1,296	64.6
	SNAMHS Deaths	212	2	943.4
20-29 Years	NV Deaths	2,144,163	3,171	147.9
	SNAMHS Deaths	5,905	54	914.5
30-39 Years	NV Deaths	2,718,815	5,605	206.2
	SNAMHS Deaths	12,020	111	923.5
40-49 Years	NV Deaths	2,334,025	8,403	360.0
	SNAMHS Deaths	11,130	122	1,096.1
50-59 Years	NV Deaths	1,643,811	13,439	817.6
	SNAMHS Deaths	6,223	88	1,414.1
60-69 Years	NV Deaths	1,261,590	26,052	2,065.0
	SNAMHS Deaths	2,333	45	1,928.8
70-79 Years	NV Deaths	859,946	37,054	4,308.9
	SNAMHS Deaths	733	25	3,410.6

Table 5 – Crude Death Rates by Age (general population and SNAMHS)

These death rates were based on an individual from the age group cohort dying within one year of admittance to the SNAMHS population. These crude rates are calculated in a similar fashion by the state each year.

It is possible to also look at the death rate for these cohorts for years other than the first year after patients were admitted. On the next page is a year-by-year comparison with the crude death rates for these patients that died in the first, second, and third year of being admitted to the SNAMHS database (Table 6). A person that died was only considered to be in one death group. For example an individual that is counted in the "Second Year" group would not be considered as a "Second Year" and "Third Year" death, because the death occurred in the second year.

Year		Pop	Deaths	Rate Per 100,000
1990	First Year	1,565	24	**1533.5**
	Second Year	1,541	14	**908.5**
	Third Year	1,527	11	**720.4**
1991	First Year	2,373	37	**1559.2**
	Second Year	2,336	20	**856.2**
	Third Year	2,316	22	**949.9**
1992	First Year	1,549	22	**1420.3**
	Second Year	1,527	7	**458.4**
	Third Year	1,520	8	**526.3**
1993	First Year	2,265	46	**2030.9**
	Second Year	2,219	27	**1216.8**
	Third Year	2,192	14	**638.7**
1994	First Year	2,695	39	**1447.1**
	Second Year	2,656	23	**866.0**
	Third Year	2,633	14	**531.7**
1995	First Year	3,662	49	**1338.1**
	Second Year	3,613	31	**858.0**
	Third Year	3,582	13	**362.9**
1996	First Year	3,773	45	**1192.7**
	Second Year	3,728	33	**885.2**
	Third Year	3,695	31	**839.0**
1997	First Year	3,966	44	**1109.4**
	Second Year	3,922	27	**688.4**
	Third Year	3,895	25	**641.8**
1998	First Year	4,248	58	**1365.3**
	Second Year	4,190	34	**811.5**
	Third Year	4,156	N/A	**N/A**
1999	First Year	4,825	53	**1098.4**
	Second Year	4,772	N/A	**N/A**
	Third Year	N/A	N/A	**N/A**
Overall	First Year	30,921	417	**1348.6**
	Second Year	25,732	216	**839.4**
	Third Year	21,360	138	**646.1**

Table 6 - Crude death rate of SNAMHS population by admit year and year died after admission

The populations are adjusted by subtracting those that died the prior year because they are essentially removed from the population being considered. For every year the crude death rate is the highest within one year of admittance. The overall crude death rate in the first year (1348.6) is more than double the crude death rate for a patient dying in the third year (646.1). For the general population over these years the death rate is 771.1.

<u>Demographic Profile</u>

The race and ethnicity breakdown for deceased SNAMHS patients (Figure 7) is similar to that of the SNAMHS population (Figure 3). There is a slight decrease in the percentage of Hispanics and Blacks that died from the SNAMHS population compared to SNAMHS in general.

Only 5.2% (N=74) of those that died from the SNAMHS database were Hispanic, compared to the 7.8% Hispanics represented in the SNAMHS database.
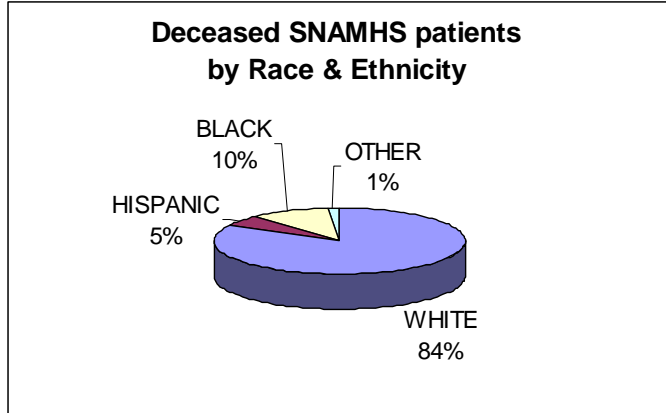
Deceased SNAMHS patients by Race & Ethnicity

BLACK 10%
OTHER 1%
HISPANIC 5%
WHITE 84%

Figure 7 - Race & Ethnicity of deceased SNAMHS patients

SNAMHS patients by Race and Ethnicity

BLACK 13%
OTHER 3%
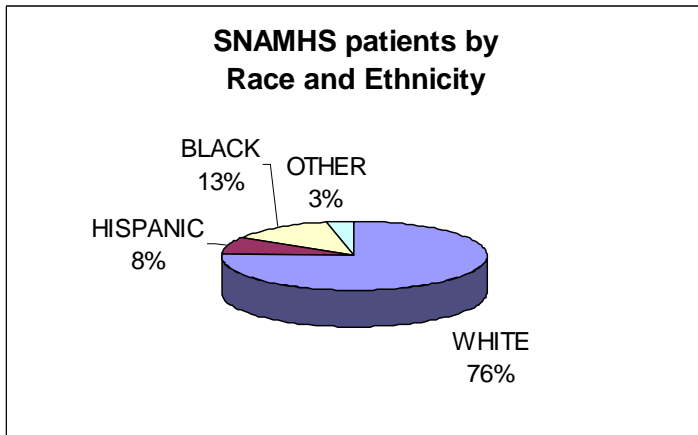HISPANIC 8%
WHITE 76%

Figure 3 - Race & Ethnicity of SNAMHS Patients

Similar results were found within the Black population. Of those that died, 10.3% (N=148) were Black compared to 12.5% in the SNAMHS population. The group that increased in representation in the deceased subpopulation was Whites. Whites represented 83.1% (N=1,188) of those that were deceased, compared to the 76.2% representation in the SNAMHS population.

The age and sex subpopulations are below for the SNAMHS population in general (Figure 2) and those in SNAMHS population that died (Figure 8). Of the patients that died, 56.1% (N=806) were male. In the SNAMHS database 48% were male.
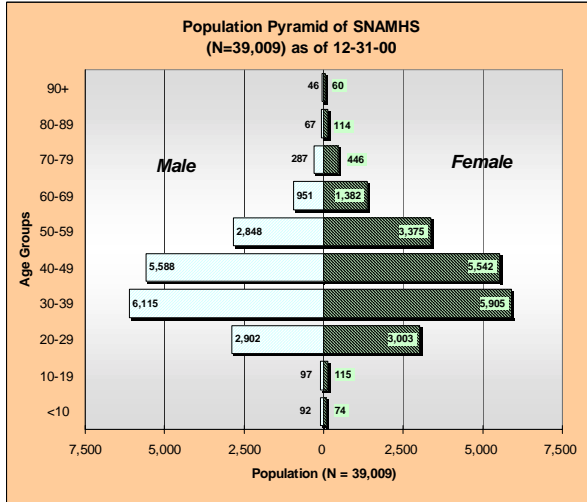

Figure 5 - Population Pyramid of SNAMHS patients

The individuals that died were older compared to the SNAMHS patients in general. The largest age groups of those that died were 40-49 (24.9%) and 50-59 (21.4%). For SNAMHS patients in general, the largest age group was 30-39 (30.8%) and the next largest group was 40-49 (28.5%). In the SNAMHS population, individuals 50-59 (16%) represent a smaller portion compared to those that died from this group (21.4%).
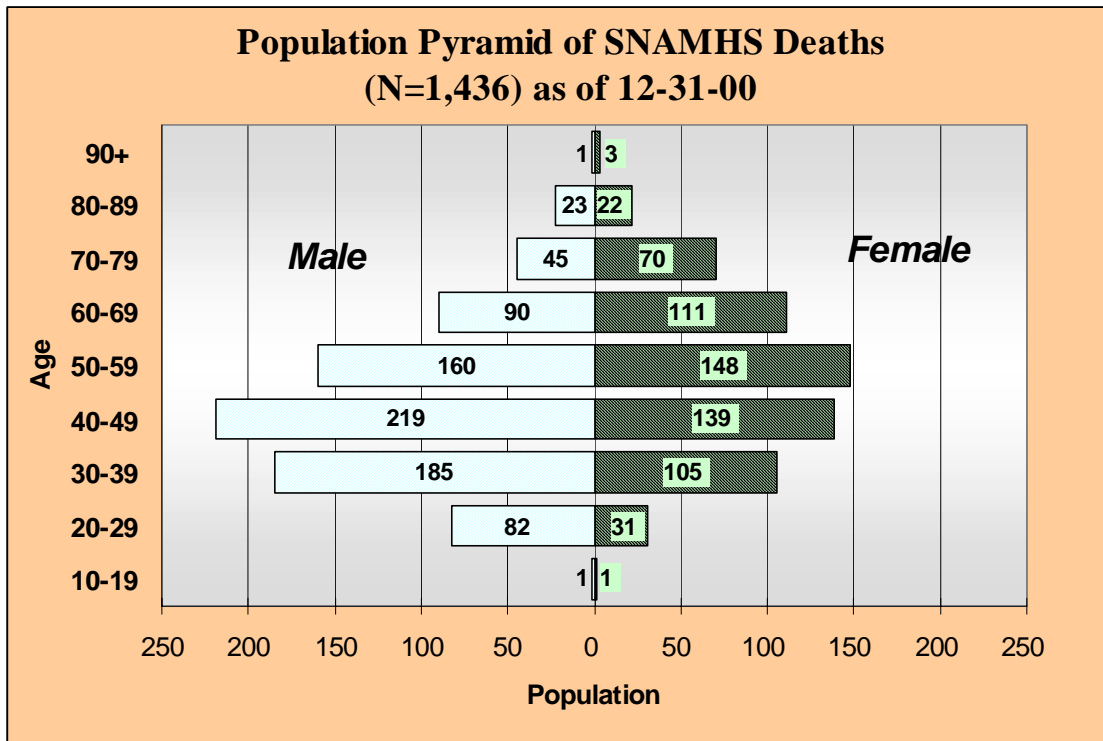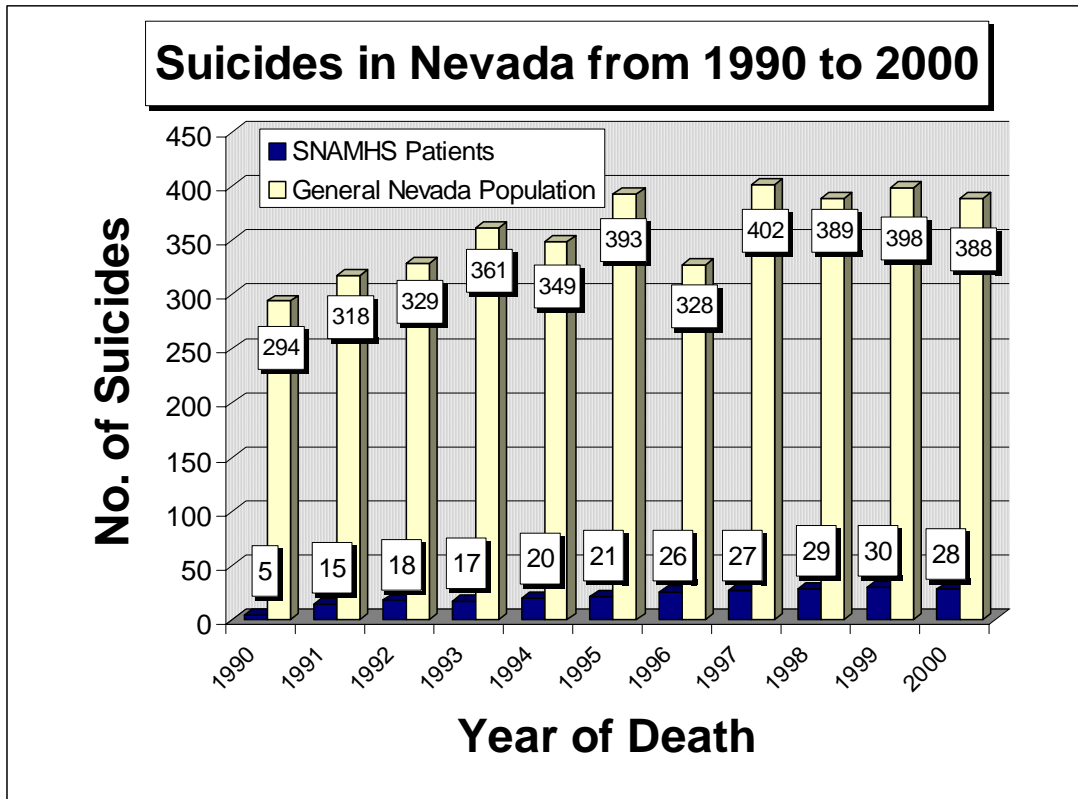

**Figure 8- Population Pyramid of deceased SNAMHS patients**

Trend Analysis

Figure 9 - Suicides in NV from 1990 to 2000 (SNAMHS patients and general population)

Of the 3,949 deaths by suicide from 1990 to 1998, 236 (6%) were individuals that were in the SNAMHS database (Figure 9 and Table 7). In 1996, 26 (7.93%) of the 328 suicide victims were also in the SNAMHS database. This was the highest percentage of suicide victims in the SNAMHS database between 1990 and 2000. The lowest year percentage wise was 1.7 % in 1990. Since 1992 the percentage of those that committed suicide and were also in the SNAMHS database has dipped below 5% only once. In 2000, 28 (7.22%) of the 388 suicide victims were in the SNAMHS database.

Year	% in SNAMHS
1990	1.7%
1991	4.7%
1992	5.5%
1993	4.7%
1994	5.7%
1995	5.3%
1996	7.9%
1997	6.7%
1998	7.5%
1999	7.5%
2000	7.2%
ALL	6.0%

Table 7 - Rate of SNAMHS Suicides from general population by year.

Another important factor is the diagnosis of those that committed suicide compared to the general SNAMHS population (Figure 10). This can help validate diagnoses that were administered to SNAMHS patients who have committed suicide.
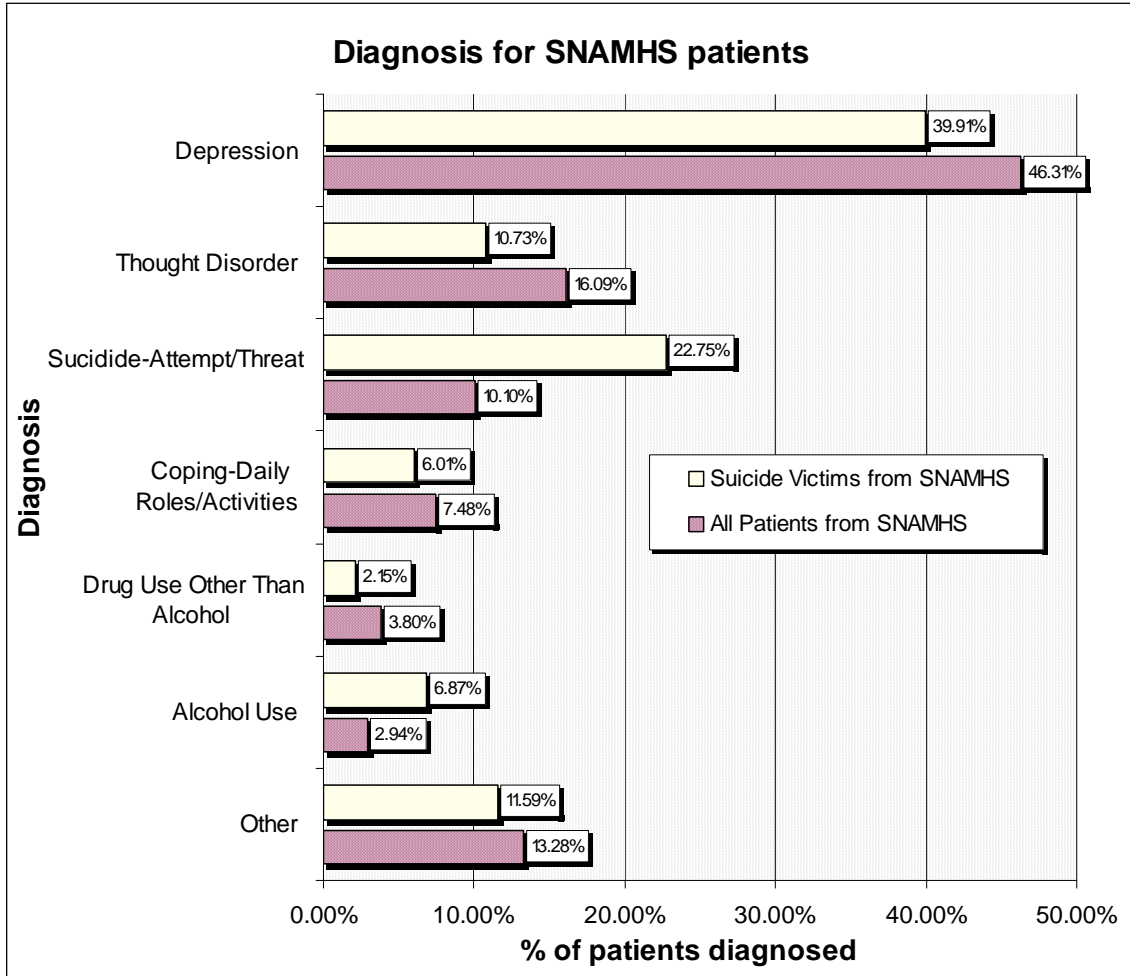
Figure 10 - Diagnosis for SNAMHS patients and suicide victims in the SNAMHS database

Each patient in the SNAMHS database was given a primary and secondary diagnosis for his or her most prominent mental health issues. The most common primary diagnosis for SNAMHS patients that committed suicide was depression (39.9%) followed by suicide attempt/threat (22.8%). Compared to SNAMHS patients in general who were diagnosed with depression as their primary diagnosis at 46.3% and suicide attempt/threat at only 10.1%. The primary diagnosis of alcohol use was also much higher in suicide victims (6.9%) compared to the general SNAMHS population (2.9%). In looking particularly at those that had a primary or secondary diagnosis of suicide attempt/threat 1.45% actually commit suicide (Table 8).

Diagnosis of Suicide (Attempt/Threat)	SNAMHS	Suicide Victims	% Commit Suicide
Primary	3867	53	1.37%
Secondary	1290	22	1.71%

Table 8 - Rates of suicide for diagnosis of suicide attempt/threat in SNAMHS

An important aspect to look at when drawing conclusions about these suicides is the suicide rate for the SNAMHS population compared to the general public (Table 9). The suicide rates were calculated in a similar fashion to the death rates. Individuals that were entered into the SNAMHS database in a given year were treated as a cohort. The suicides tracked are suicides committed within one year of admittance to the SNAMHS database. Summing all the suicides for both databases and dividing by the sum of the populations over these years is the 1990 to 1999 total suicide mortality rate (based on population estimates provided by the state demographer's office and death database).

Year		Pop	Suicides	Rate Per 100,000
1990	NV	1,201,833	294	24.5
	SNAMHS	1,565	6	383.4
1991	NV	1,297,910	318	24.5
	SNAMHS	2,373	17	716.4
1992	NV	1,343,940	329	24.5
	SNAMHS	1,549	8	516.5
1993	NV	1,398,760	361	25.8
	SNAMHS	2,265	10	441.5
1994	NV	1,494,230	349	23.4
	SNAMHS	2,695	11	408.2
1995	NV	1,582,389	393	24.8
	SNAMHS	3,662	10	273.1
1996	NV	1,688,140	328	19.4
	SNAMHS	3,773	17	450.6
1997	NV	1,740,897	402	23.1
	SNAMHS	3,966	11	277.4
1998	NV	1,874,760	389	20.7
	SNAMHS	4,248	11	258.9
1999	NV	1,967,650	397	20.2
	SNAMHS	4,825	9	186.5
1990 to 1999	NV	15,590,509	3,560	22.8
	SNAMHS	30,921	110	355.7

Table 9 - Crude suicide rate comparison for NV and SNAMHS

The overall suicide rate for this time period (1990 to 1999) for SNAMHS patients was 355.7 per 100,000 people. The rate for the general population over this same time

period was 22.8. This means that someone in the SNAMHS database is 15 times more likely to commit suicide than someone from the general population.

The highest suicide rate for the SNAMHS population can be seen in 1991 at 716.4. This rate was almost 30 times the general suicide rate for the same year (24.5). It is also interesting to note that the suicide rate from 1990 to 1994 was 497.8 compared to the suicide rate of 283.3 from 1995 to 1999 for the SNAMHS population. This means the suicide rate dropped 43% in 1995 to 1999 compared to 1990 to 1994 for SNAMHS patients.

It can also be helpful to look at the year the suicides were committed (Figure 11). Again, the reason the numbers are higher for later years is due to increased coverage in the SNAMHS database. The year-by-year rates mentioned earlier may give a more accurate reflection of the seriousness of suicide in a given year.
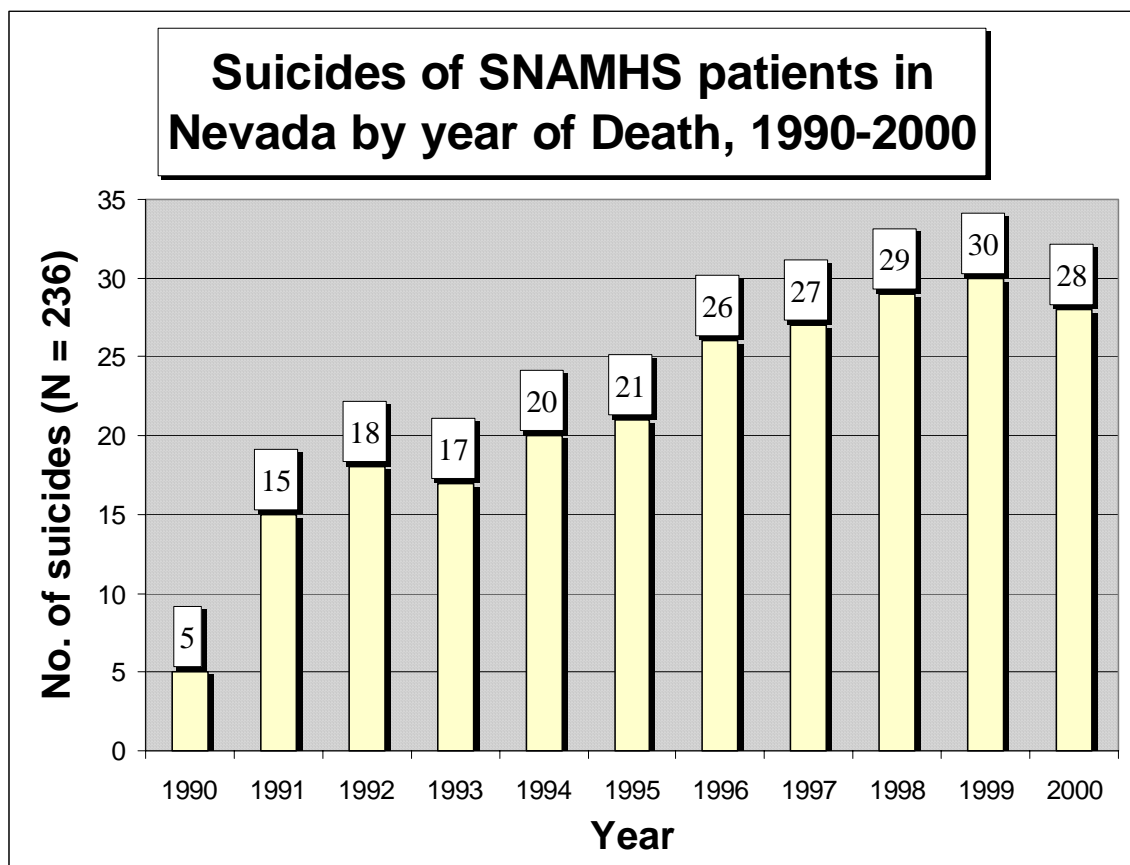

Figure 11 - SNAMHS suicides by year of death

Demographic Profile

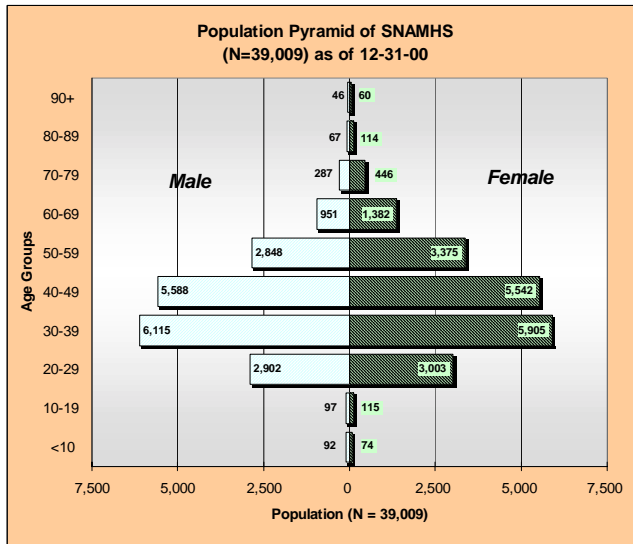**Population Pyramid of SNAMHS**
(N=39,009) as of 12-31-00

Figure 2 - Population Pyramid of SNAMHS patients

A population pyramid of those that committed suicide from the SNAMHS database is below (Figure 12). To the left is the population pyramid of the SNAMHS population (Figure 2). Of those from SNAMHS that took their lives, 64% (N=151) were male. The leading age group that took their lives was 30-39 year olds (34.3%). This was large compared to their representation in the SNAMHS population (30.8%). Another group that was over-represented in the suicide subpopulation was 20-29 year olds. They represented 20.8% (N=49) of the suicide population compared to 15.1% this group represented in the SNAMHS database.

Population Pyramid of SNAMHS Suicides
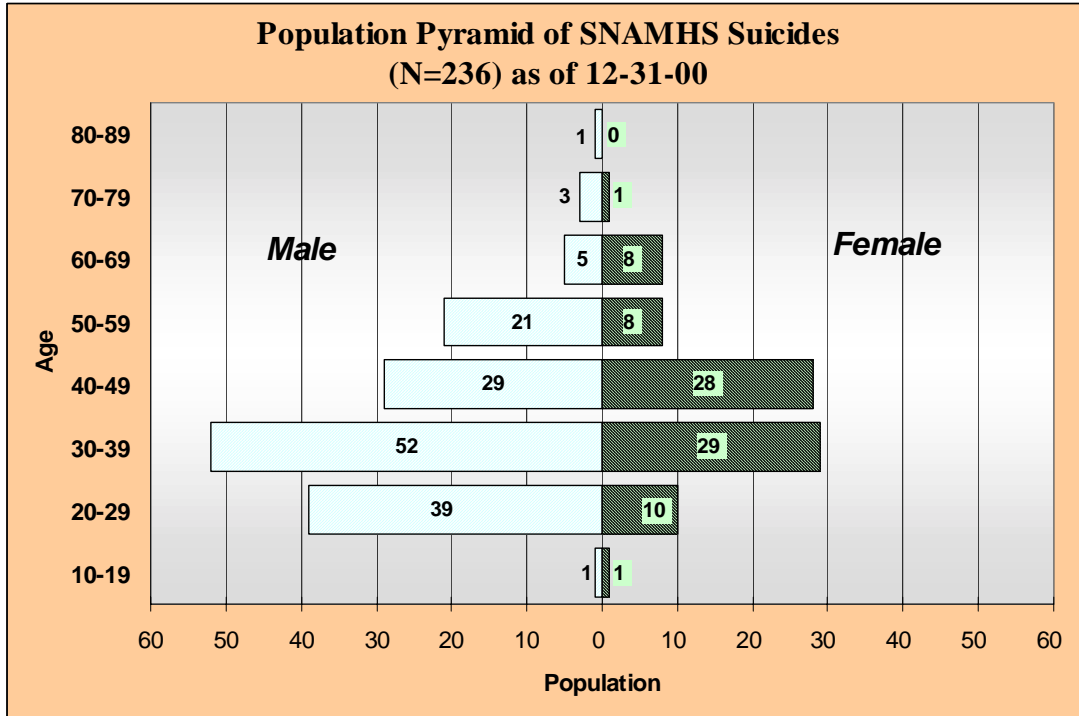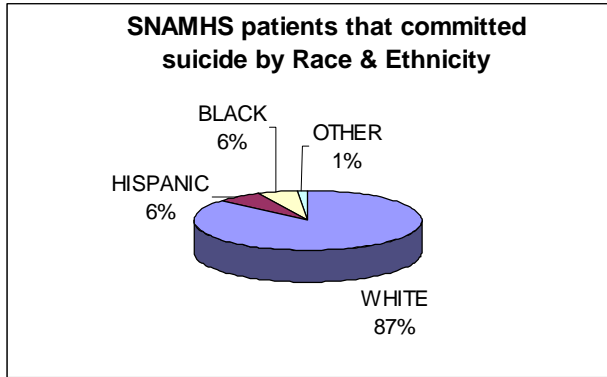**(N=236) as of 12-31-00**

Figure 12 - Population Pyramid of SNAMHS patients that committed suicide

Another demographic to look for in this subpopulation is race and ethnicity. Below is the race and ethnicity distribution of those who committed suicide in the SNAMHS population (Figure 13), and the SNAMHS population on the whole (Figure 3).

Figure 13 - Race & Ethnicity of SNAMHS suicide victims

The overwhelming majority of those that committed suicide were White (N=204). Whites represented 86.5% of those that committed suicide from the SNAMHS database. In the SNAMHS population only 76.2% were Whites and in the general population only 70% were Whites (based on 1999 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 SNAMHS population. Blacks represented 5.9% (N=14) of the suicide population compared to 12.5% in SNAMHS. Similarly 6.4% (N=15) of the suicide victims were Hispanic compared to 7.8% in the SNAMHS population.
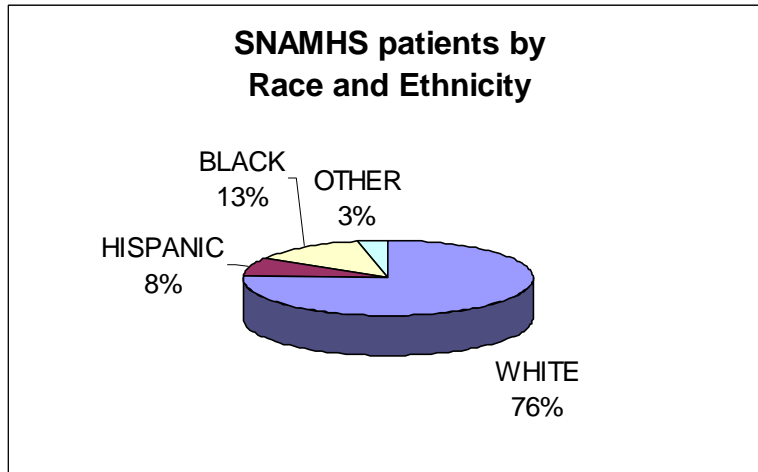
Figure 3 - Race & Ethnicity of SNAMHS Patients

A few additional demographic factors that can be observed in this population are marital and job status (Tables 10 and 11 respectively). For marital status, a side-by-side comparison of the general population (based on 1990 Census data), SNAMHS patients in general, and those that committed suicide from the SNAMHS database are compared in Table 9. The largest group of those that committed suicide was those that were never married at 39.5% (N=93). This rate is much higher than the general never married rate of 23.7%. Widowed individuals accounted for 5.2% (N=12) of the suicides. This is almost double the representation in comparison to the SNAMHS population (2.8%). Individuals that committed suicide in the SNAMHS population and were separated/divorced (30.9%) represented a large portion in comparison to those in the general population that were separated/divorced (16.8%).

Marital Status	Never Married	Married	Separated/Divorced	Widowed
NV 1990 (Census)	23.7%	53.8%	16.8%	5.6%
SNAMHS	39.9%	19.5%	33.6%	2.8%
SNAMHS Suicides	39.5%	19.7%	30.9%	5.2%

Table 10 - Marital Status of suicide victims from SNAMHS, SNAMHS patients, and Nevada

Most suicide victims were unemployed and not looking for a job (42.2%). The employment rate for this group is 27.6%, which is much lower than the general employment rate in 1999 of 62.3% (based on 1999 labor force summary from DETR and 1999 population estimates provided by the state demographer's office).

SNAMHS Suicide Victims - Job Status	Percent
Employed Full-Time	20.8%
Employed Part-Time	6.8%
Homemaker	1.0%
Other	10.4%
Retired	2.6%
Student	1.0%
Unemployed - Looking for Job	15.1%
Unemployed - Not Looking for Job	42.2%

Table 11 - employment status of suicide victim from SNAMHS

<u>Conclusion</u>

With SNAMHS data analyzed, the obvious issue of Mental Health data analysis on a statewide basis has arisen. The MHDS and BHP&S plan to put in place the transfer of all mental health data for the State of Nevada, including the Northern Nevada Mental Health Services (NNAMHS) database and the rural counties of Nevada database using the same export format.

With these datasets from the MHDS, the BHP&S and MHDS will be able to create a comprehensive report that looks at mental health statewide.

A number of other projects could also come to fruition with additional funding. Cross matching the mental health database with the HIV/AIDS database for the State of Nevada, as well as Medicaid and Hospital Discharge databases maintained by the State, can also yield important health and fiscal information never before seen in regard to mental health issues. Record linkage provides valuable information that a single database cannot provide. Thus allowing one to look at the entire picture of health related issues for particular clients instead of one subset of health data at a time.

Diagnoses of HIV and AIDS bring a great deal of emotional and physical stress on a person with the disease. Data gleaned from mental health patients who also suffer from HIV and AIDS can broaden the scope of understanding on the burden HIV and AIDS have on the State of Nevada. An understanding of where people are emotionally and mentally with the disease can help in stopping the spread of HIV and AIDS.

Important lessons learned in this data sharing effort between MHDS and BHP&S, which may be a benefit to other division and bureaus considering similar projects, were the following:

1. Signed data sharing agreements detailing the purpose(s) of the entities involved should be setup prior to transmission of the data;

2. All data transmitted must be encrypted using at least 128-bit encryption technology by both agencies. This technology is available for free via the website for PGP (Pretty Good Privacy) at www.pgp.com