

**Suicide and Nonfatal, Self-Inflicted Harm
Beltrami County, 1990-2005**

Preliminary Epidemiologic Investigation

Jon Roesler, MS
Epidemiologist Supervisor

Injury and Violence Prevention Unit
Minnesota Department of Health

651.201.5487
jon.roesler@health.state.mn.us

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Background

During 2004 there were several youth suicides in Beltrami County within a short period of time. Reports were coming from schools and other youth-serving organizations about individuals either talking about suicide, or knowing about others considering suicide. Healthy Communities Healthy Kids, a local nonprofit, primary prevention organization whose main goal has been to be a catalyst for systems change through community organizing and collaboration, did a community needs assessment. An outcome of the needs assessment was the formation of a program for suicide prevention coordination. Employing a part-time coordinator, Rebecca Snyder, the program convened a suicide prevention task force in 2005. Recently renamed the Headwaters Alliance for Suicide Prevention, the task force focuses on education, awareness, treatment access, and building resiliency and other protective factors.

In 2007 the task force made a request for technical assistance from the Minnesota Department of Health (MDH), Injury and Violence Prevention Unit. The request was to examine and describe suicide and self-inflicted harm in Beltrami County. The development and release of this report is part of the technical assistance provided.

Methods

Publicly available data were obtained from MDH websites: mortality data from death certificates were accessed using Interactive Queries (IQ¹) for 1990-2005; and nonfatal, morbidity data from hospital discharge data was accessed using the Minnesota Injury Data Access System (MIDAS²) for 1998-2005. For many suicide mortality analyses the number of cases was frequently 20 or less for a specific year, limiting the calculation of reliable rates; consequently, rates were frequently aggregated over the 1990-2005 time, or 5-year floating averages were calculated. Age-adjusted rates were calculated using the US 2000 standard population. While race is available in the mortality data obtained from death certificates, it is not available in the nonfatal hospital data.

Suicide Mortality

Figure 1 shows the number and crude rate per 100,000 population by year for suicide mortality from 1990-2005. While there is significant year-to-year variation, the numbers show an increasing trend from 1990 to 1997, a decline reaching a low in 2001, and then a renewed increasing trend reaching a high of 13 suicides in 2005.

However, the population of Beltrami County increased significantly during 1990-2005. The number of residents grew from 34,498 in 1990 to an estimated 42,883 in 2005, a 24% increase; one would expect a concomitant increase in the number of suicides. Therefore, it is important to look at the *rate of suicide*, to control for the increase in population. Also in Figure 1, the crude rates show an increasing trend from the early to mid 1990s, a decline until the beginning of the

¹ <https://pqc.health.state.mn.us/mhsq/frontPage.jsp>

² <http://www.health.state.mn.us/injury/midas/>

21st century, and then another increasing trend continuing through 2005. The highest rates of documented suicide occurred in the mid to late 1990s.

While some trends in suicide mortality over time have been identified, it is difficult to ascertain the extent and nature of the problem without a reference population; those comparisons are shown in Figures 2 through 5.

Figure 2 shows the comparison of age-adjusted suicide mortality rates for Beltrami County with those of Minnesota. Although similar at the beginning of the period, rates are consistently higher for residents of Beltrami County than the state as a whole.

Comparison of the gender distribution is shown in Figure 3, and the age distribution is shown in Figure 4. While there was little difference in the distribution in gender, there was a significant difference in the age distribution, with Beltrami County experiencing a significantly greater proportion of its suicides among youth and young adults.

Finally, a comparison of race is shown in Figure 5; Beltrami County shows a greater proportion of the suicide mortality occurring to those of Native American race; this is not surprising given the greater proportion of Beltrami residents that are Native American. However, the age adjusted suicide mortality rate of whites in Minnesota was 10.3/100,000, compared to 13.2 in Beltrami County; Native American suicide mortality rates for Minnesota and Beltrami residents were 18.7 and 33.5, respectively.

The rank order of age-adjusted suicide mortality rates by county for the period 1990-2005 are shown in Table 1; Beltrami County is ranked second. When counties are ranked for the period 1996-2005, Beltrami County is ranked first. The rank order for only ages 5-34 for 1990-2005 is shown in Table 2; Beltrami County is ranked first. During the period of 1996-2005, Beltrami County also had the highest rate of suicide for ages 5-34. Rates were not calculated when the number of deaths was 20 or less for a specific county.

Nonfatal, Hospital-treated, Self-inflicted Harm

Figure 6 shows the number and age adjusted rates of nonfatal, hospital-treated, self-inflicted harm for Beltrami County. While there is some year-to-year variability, both the numbers and rates show increasing trends from 1998 to 2005, the period for which data are available.

As with mortality, in Figures 7 through 10, Beltrami County is compared to Minnesota as a whole, to better understand where the excess burden may be occurring. Figure 7 compares the age-adjusted rates for Beltrami County with those of Minnesota for the same period of time. As with the mortality data, the rates are comparable during the early part of the observed period, but later during the time frame the rates for Beltrami County become significantly higher.

The distribution of gender among nonfatal, hospital-treated, self-inflicted harm (shown in Figure 8) is similar between Minnesota and Beltrami County. However, significant differences are revealed in the comparison of age groups, and in the distribution of hospitalized and the emergency department (ER/ED) only cases, shown in Figures 9 and 10.

Discussion

Methodologically, the difficulty in describing the problem of suicide in Beltrami County is that, even with high rates, the absolute number of suicides remains relatively small for a county like Beltrami. Conforming to common statistical practice, rates are not calculated when the number of events is 20 or less, to avoid analysis of unstable data. To calculate stable rates, we examined a long period (1990-2005), and calculated floating 5-year averages. With morbidity data, the number of events is great enough that most desired rates for any given year are stable enough to be calculated.

The findings show that residents of Beltrami County sustain a significantly greater burden of suicide and self-inflicted harm than do residents of Minnesota as a whole. Much of the excess burden appears to be borne by the youth and young adults. While the suicide mortality rates are extremely high in Native Americans (rates in excess of three times that of the state), the rates are also higher among whites.

There needs to be more discussion about the type of treatment available for cases of self-inflicted harm being treated at hospitals. The greater proportion of Beltrami residents receiving only ER/ED treatment may reflect the rural nature of the county and lack of inpatient psychiatric facilities. It may also be that many of the hospital psychiatric admissions of self-inflicted harm are to hospitals in Fargo. As most out-of-state hospital data are not reported to the MDH, this would result in an undercount in the number, rate, and proportion of hospitalized cases of nonfatal, self-inflicted harm.

Further investigation needs to be made of the means of self-harm, including the role of firearms, alcohol, prescription and over-the-counter (OTC) medications, and illicit drugs. Data describing interactions with the criminal justice system may suggest opportune times to intervene. A continued epidemiologic investigation using methodologies from the CDC's National Violent Death Reporting System to collect additional non-public data (including medical examiner and police data) may be useful in further describing the problem in ways that suggest proximal interventions.

The role of economic factors such as income, unemployment, housing, economic assistance, and socio-economic status should be further explored. These data could be obtained from other public data sets and linked with the existing data. Analyses might suggest more distal interventions. Analysis of the Minnesota Student Survey, a questionnaire administered statewide every three years to students in the 6th, 9th, and 12th grades and containing self-report data on suicide attempts and suicide ideation, might provide further insights into possible interventions.

The challenge of reducing suicide and self-inflicted harm should not be underestimated. There are relatively few proven or promising strategies to prevent suicide. Nonetheless, because this report documents the epidemic nature of the problem and because there is knowledge about effective interventions, it is important to identify and obtain the resources needed to implement those strategies.

Figure 1
Suicide
 Beltrami County

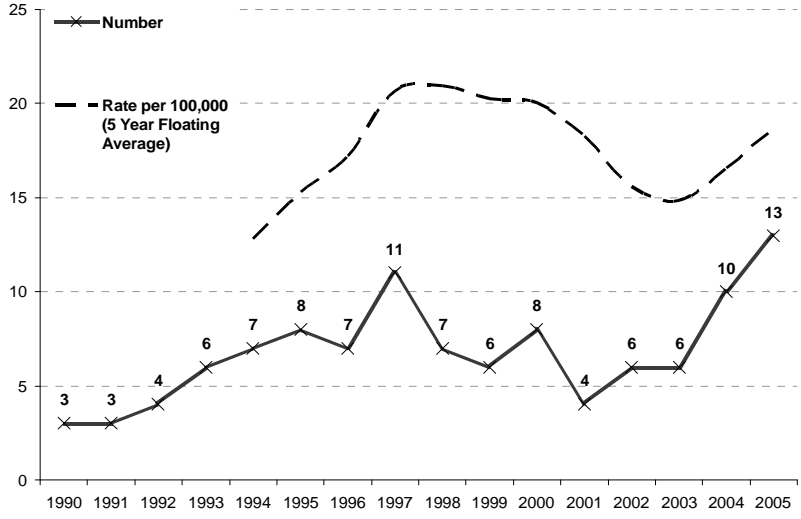


Figure 2
Suicide
 Age Adjusted Rates

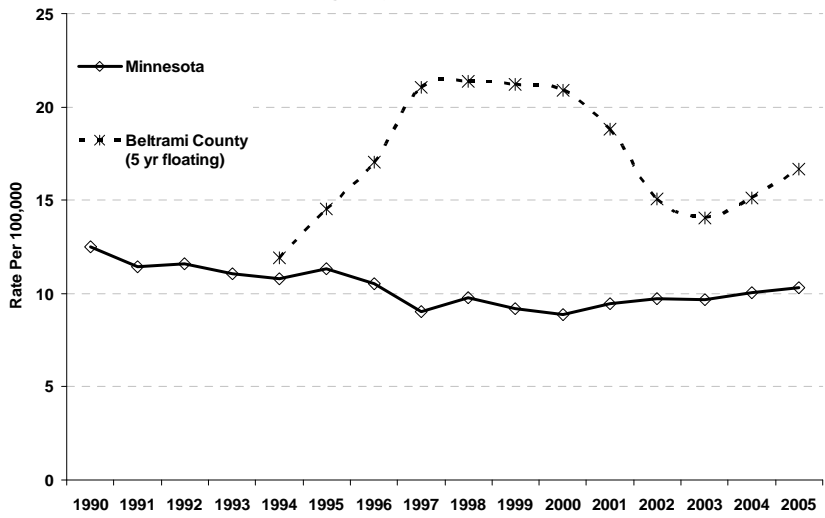


Figure 3
Suicide by Gender
 1990-2005

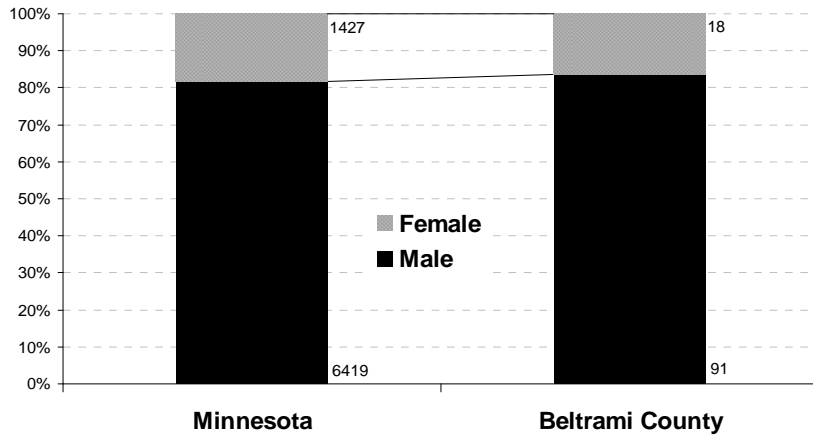


Figure 4
Suicide by Age Group
 1990-2005

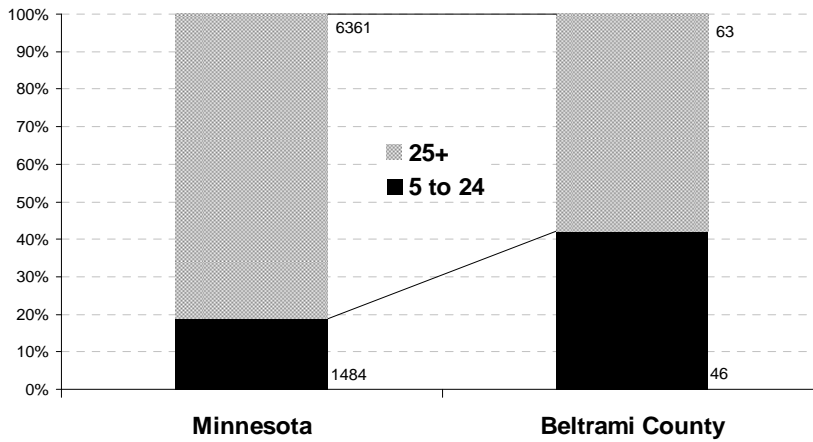


Figure 5

Suicide by Race

1990-2005

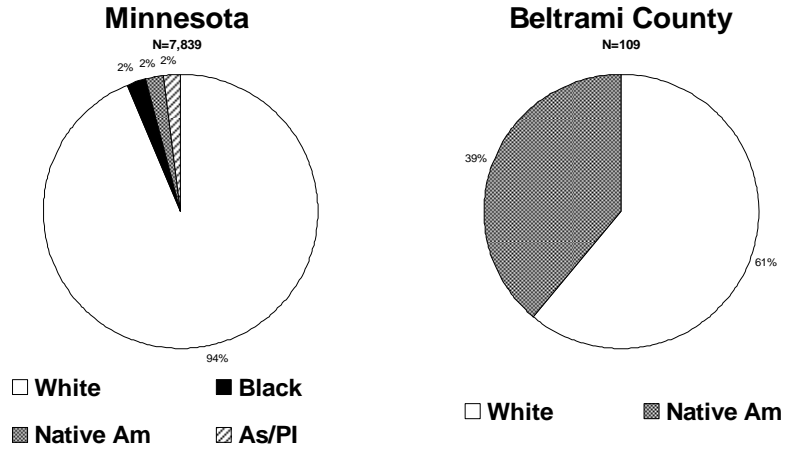


Figure 6

Nonfatal Self-inflicted Harm

Beltrami County

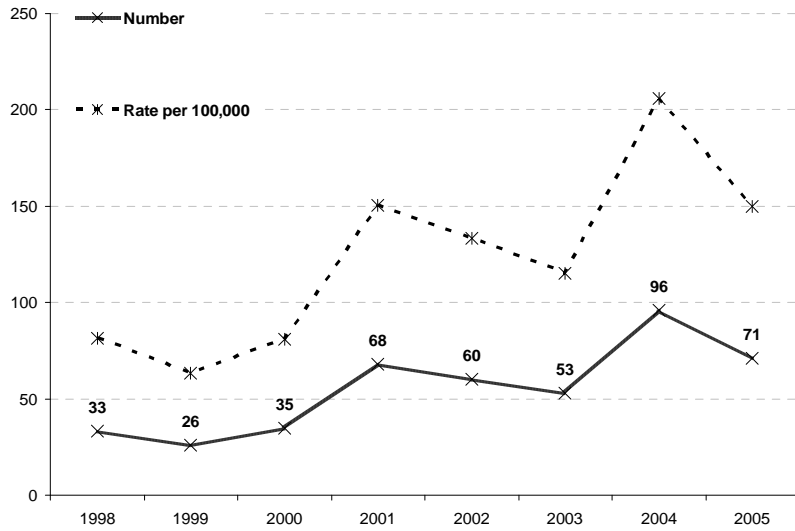


Figure 7
Nonfatal Self-inflicted Harm

Hospital-treated, Age Adjusted Rate

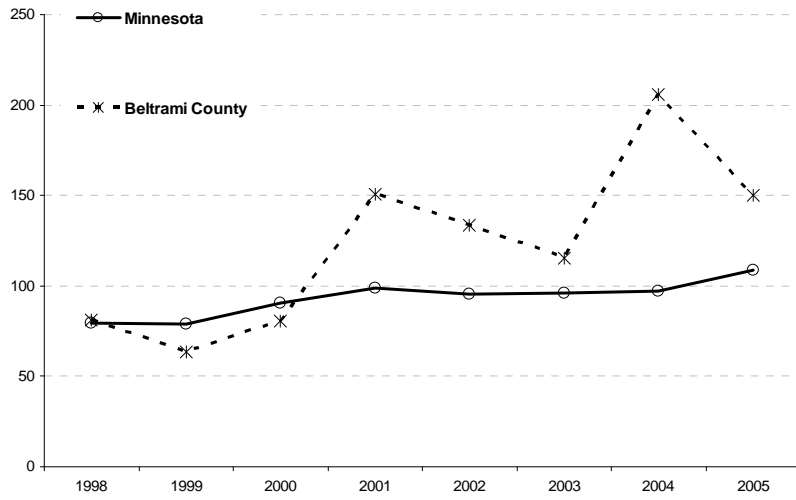


Figure 8
Nonfatal Self-inflicted Harm
 by Gender, 2005

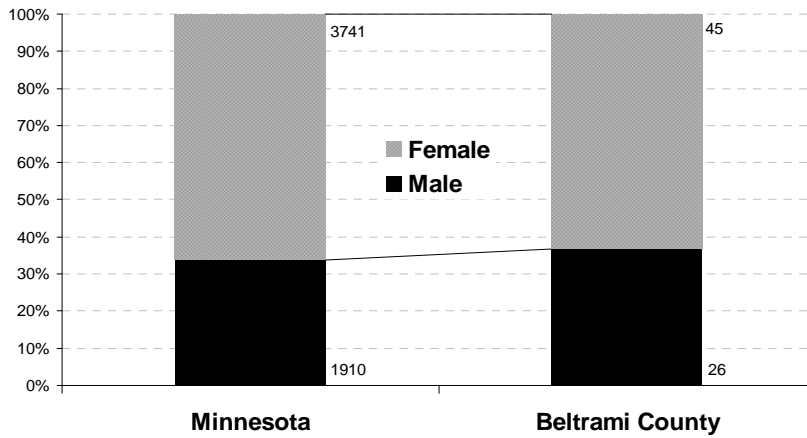


Figure 9
Nonfatal Self-inflicted Harm
 by Age Group, 2005

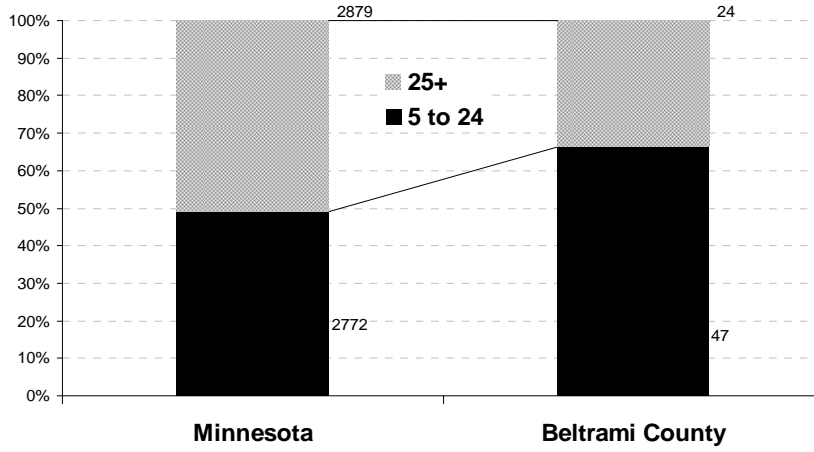


Figure 10
Nonfatal Self-inflicted Harm
 by Treatment, 2005

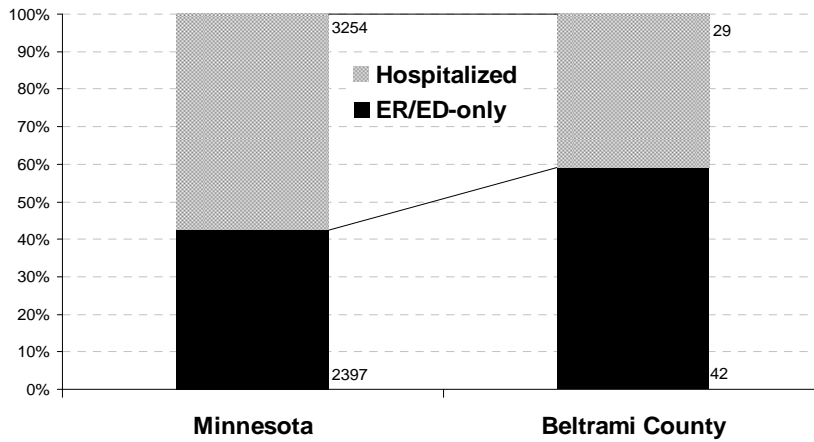


Table 1
Suicide Rate by Rank Order
Minnesota, 1990-2005

COUNTY	ADJUSTED RATE	NUMBER			
			MINNESOTA	10.3	7846
CLEARWATER	17.9	23	KANABEC	10.8	24
BELTRAMI	17.1	109	CHISAGO	10.8	67
CASS	15.3	60	RAMSEY	10.6	834
AITKIN	15.0	37	DODGE	10.6	28
CARLTON	14.8	74	WADENA	10.4	22
BECKER	14.2	65	FARIBAULT	10.3	25
ST. LOUIS	14.2	459	HENNEPIN	10.1	1775
MOWER	13.9	80	WABASHA	10.1	34
CROW WING	13.8	113	SCOTT	10.1	125
ITASCA	13.5	92	ISANTI	10.1	49
HUBBARD	13.5	35	DOUGLAS	10.1	49
PENNINGTON	13.5	28	TODD	9.9	37
ROSEAU	13.2	32	RICE	9.9	86
SHERBURNE	13.1	119	ANOKA	9.8	436
LE SUEUR	12.8	50	WINONA	9.5	70
PINE	12.7	49	STEELE	9.5	50
MEEKER	12.5	41	GOODHUE	9.5	65
JACKSON	12.4	23	KANDIYOHI	9.5	61
OTTER TAIL	12.3	106	BENTON	9.4	48
MORRISON	12.3	59	OLMSTED	9.3	174
REDWOOD	11.6	29	CLAY	9.3	74
POLK	11.3	56	WASHINGTON	9.1	266
BLUE EARTH	11.3	96	BROWN	8.9	38
KOOCHICHING	11.2	27	NICOLLET	8.9	42
FILLMORE	11.2	39	DAKOTA	8.9	464
WRIGHT	10.9	145	MILLE LACS	8.8	29
SWIFT	10.9	21	STEARNS	8.7	180
LYON	10.9	41	NOBLES	8.7	28
FREEBORN	10.8	60	RENVILLE	7.9	21
			MCLEOD	7.9	42
			MARTIN	7.3	26
			HOUSTON	7.2	21
			CARVER	6.1	63

*Counties are not included in the ranking if there were 20 or fewer deaths from suicide during the time period.

Table 2
Suicide Rate by Rank Order
Minnesota, Ages 5-34, 1990-2005

COUNTY	ADJUSTED RATE	NUMBER
BELTRAMI	21.2	63
BECKER	18.0	34
LE SUEUR	15.6	26
MOWER	15.2	35
CASS	13.9	21
OTTER TAIL	12.6	41
ITASCA	12.4	33
CARLTON	12.3	25
ST. LOUIS	11.4	145
MORRISON	11.4	24
CROW WING	11.1	36
GOODHUE	10.7	30
POLK	10.7	22
CHISAGO	10.7	30
SHERBURNE	10.6	50
KANDIYOHI	10.2	28
ISANTI	10.1	22
MINNESOTA	8.9	2959
WRIGHT	8.8	57
WASHINGTON	8.8	117
RAMSEY	8.7	306
HENNEPIN	8.4	629
RICE	8.4	35
SCOTT	8.3	52
BLUE EARTH	8.2	37
DAKOTA	8.2	203
STEARNS	8.2	84
ANOKA	8.1	174
OLMSTED	7.4	62
CARVER	6.5	31
CLAY	6.0	24

*Counties are not included in the ranking if there were 20 or fewer deaths from suicide during the time period.