forces in this rural environment contributed to the medical and mental health problems of the people, we believe that the dynamics of this rural system also contributed to the successful implementation of the linkage. The strong value accorded cooperation in this rural area affected systems collaboration positively. Additionally, the basic competence of professional and lay persons, a competence laced with a healthy pragmatism, promoted the interpersonal relationships that strengthened the cooperative effort.

The Mental Health Initiative concept was designed in the mid-1970s, but it has great relevance to the political and service realities of the 1980s. National emphasis is now being placed on the local delivery of services. The appropriate expectation is that community-based services shall be provided with a minimum of duplication and with maximum efficiency, achieved partly by interdisciplinary and interorganizational cooperation. Local health workers attuned to such a philosophy can comprehensively intervene with the family and the community systems where the patient lives and works.

The linkage project we describe is relevant to the 1980s. It was formally ended with a commendable record after 14 months. Reduced Federal support for community programming has prematurely terminated this linking of primary health care and mental health services.

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Self-Inflicted Gunshot Wounds Among Alaska Natives

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SYNOPSIS

Deaths by violence (accidents, homicide, suicide) have increased significantly among Alaska Natives who have a suicide rate three times that of the general U.S. population. Self-inflicted gunshot wounds comprised 75 percent of the suicides among Alaska Natives from 1976 through 1980. A review of psychiatric consultations concerning 34 Alaska Natives who had survived a self-inflicted gunshot wound indicated some common characteristics.

Of the group, 28 were male, and 20 had been using alcohol at the time of the shooting. Interpersonal conflicts were cited by most persons as partial motivation for the shooting, and most shootings were impulsive rather than premeditated. Few patients had a psychiatric history or appeared impaired at the time of the consultation.

Cultural and intrapsychic factors that might contribute to this high rate of self-destructive behavior were examined. These include a proscription against verbal expression of negative affect and an increase of non-Native influences with subsequent social disorganization and cultural conflict.

FOR SEVERAL DECADES, DEATH BY VIOLENCE has increased significantly among Alaska Natives. In the period from 1950 to 1974, mortality by violence (accidents, homicide, suicide, alcohol) in this population grew from less than 20 percent to greater than 40 percent of all deaths. During the same pe-

riod, the death rate per 100,000 for suicides among Alaska Natives grew from less than 15 per 100,000 population to greater than 30. The rate for the non-Native United States population remained constant at slightly more than 10 per 100,000 (*1*).

A large number of deaths by suicide of Alaska Natives have been committed by self-inflicted gunshot wounds. It is probable that survivors of self-inflicted gunshot wounds are similar psychodynamically to those who died by this method, since most survivors sustained serious wounds to the trunk or head which would have been fatal if they had not been treated. Further, these persons are likely to differ qualitatively from people whose suicide attempts, such as a drug overdose, were less likely to result in mortality or significant morbidity. Drug overdose attempts are often accompanied by ambivalence and the knowledge that one will likely survive. This study attempts to explore and begin to understand factors contributing to the alarming rate of suicide by firearms of Alaska Natives.

Methodology

The Alaska Native Medical Center in Anchorage serves as a source of primary care for Alaska Natives in the Cook Inlet region as well as the referral center for regional hospitals in rural and Bush Alaska (areas accessible only by plane). The center has an active psychiatry department staffed by psychiatrists and psychiatric nurse practitioners. This department provides consultation upon request for medical and surgical patients.

For the 6 years from July 1975 through June 1981, 34 consultations were completed concerning patients who were admitted for the treatment of a self-inflicted gunshot wound. Their charts were reviewed for information that might suggest factors contributing to these self-inflicted injuries. The nonsystematic nature of the consultations in this retrospective study suggests an underreporting of potentially significant issues contributing to the shootings.

Results

Table 1 is a summary of the cases. The 34 charts were reviewed for age, sex, Native group, alcohol intake at the time of the event, location of the wound, and alleged motive. Chi square analysis was employed to determine significance.

Of the 34 consultations completed, 5 self-inflicted wounds were felt to be accidental by the patient or consultant. In one of these events the patient was playing Russian roulette, while another patient reported that he had been cleaning his weapon when it discharged. Six patients were female, and the remaining 28 were male. The ages ranged from 13 to 47 with a mean of 21.4 years. Fifty-nine percent had been using alcohol at the time of the shooting.

Interpersonal conflicts were cited in the majority of cases as partial motivation for the self-inflicted shooting. The conflict was usually within the family of origin or within a romantic relationship. Although an intrapsychic conflict might have been experienced and, indeed, could have been a major factor in the shooting, many patients attributed the act to the coexisting interpersonal conflict or to the fact that they had been drinking. Several patients reported the recent suicide of a close family member, often as a result of a gunshot wound.

Case Reports

Case A. A 31-year-old single Eskimo male shot himself in the chest while intoxicated. The patient was not certain why he shot himself; "The gun was on the wall, not loaded, and I took it down and loaded it and just pulled the trigger . . . Can you figure out why I did that? Loneliness is all I can figure." At the time of the consultation it was noted that he was not depressed in affect and was reluctant to discuss what had occurred; "I can't think about killing or shooting myself anymore. Just forget it. It happened. It's over."

Case B. A 20-year-old single Eskimo male was admitted twice in 2 months, having shot himself in the abdomen with a 22-caliber rifle both times. The first incident occurred at a boarding school away from his home village, and the second at his parent's home, where he had returned to convalesce. Both episodes were alcohol related.

Two months before the initial admission, a brother of the patient had died after shooting himself. The patient mentioned dreams about his brother which increased while in the hospital. Each time he expressed remorse over his act and denied ongoing suicidal ideation. During the second admission another brother was killed in a snowmobile accident, resulting in this patient's early discharge to his village.

Case C. A 21-year-old Eskimo female separated from her husband shot herself in the abdomen with a 30.06 rifle. She was not drinking at the time. She had separated from her husband 3 months earlier and stated, as a motive for the shooting, an inability to choose between her boyfriend or her hus-

Table 1. Survey of consultations concerning 34 Alaska Natives with self-inflicted gunshot wounds

Native group and sex	Alcohol related	Wound location	Motive or comment
Eskimo, M	No	Abdomen	Brother beats him.
Eskimo, F	No	Chest	Marital problems.
Eskimo, M	Yes	Abdomen	Marital problems.
Eskimo, M	No	Abdomen	Ejected from home by father.
Aleut, M	Yes	Face and chest	2 separate shootings 8 months apart.
Eskimo, M	No	Hand	Mentally retarded. Considered accidental.
Eskimo, M	Yes	Abdomen	Brother committed suicide by firearm several months earlier.
Eskimo, M	Yes	Axilla	Despondent over girlfriend's marriage to another man.
Eskimo, M	Yes	Abdomen	Ejected from home by brother.
Eskimo, M	Yes	Abdomen	No motive given. Remembered nothing.
Eskimo, M	No	Abdomen	Not getting along with older brother.
Indian, M	Yes	Jaw	Brother beats him.
Eskimo, M	Yes	Thigh	Argument with brother.
Eskimo, M	Yes	Abdomen	Conflict with a woman.
Eskimo, M	Yes	Thigh	Conflict with sister and brother-in-law.
Eskimo, M	Yes	Leg	Father died 11 months earlier. Girlfriend marrying another man.
Eskimo, M	Yes	Head	Playing Russian roulette. Claimed shooting was accidental.
Eskimo, M	No	Abdomen	Felt to be accidental.
Eskimo, M	No	Abdomen	Stated he was cleaning gun and it discharged.
Eskimo, F	No	Abdomen	Could not choose between husband and boyfriend.
Indian, F	Yes	Abdomen	Multiple domestic problems.
Eskimo, M	No	Abdomen	Argument with girlfriend.
Eskimo, F	Yes	Abdomen	Boyfriend in jail.
Eskimo, M	No	Neck	Older brother committed suicide by firearm 6 months earlier.
Eskimo, M	No	Abdomen	Angry at others interfering in his life.
Eskimo, M	No	Forearm	Marital discord.
Eskimo, M	Yes	Face	Brother committed suicide 5 years earlier. Patient stabbed self in heart 4 years earlier.
Eskimo, M	No	Leg	Felt to be accidental.
Indian, F	No	Leg	Prior drug overdose.
Eskimo, F	Yes	Arm	Despondent over relationship with boyfriend.
Eskimo, M	Yes	Abdomen	Ex-girlfriend would not talk to him.
Indian, M	Yes	Face	Problem with girlfriend. 3 suicides in family.
Aleut, M	Yes	Chest	Loneliness.
Eskimo, M	Yes	Abdomen	Fight with a girl. Brother committed suicide by gunshot 1 year earlier.

NOTE: M male, F female.

band. She stated, "I was overwhelmed with personal problems and did not feel I could talk with anybody about them . . . I was only thinking about shooting myself and was touching the gun when it went off." She expressed a difficulty in being able to verbalize her problems.

At the time of the interview, she felt more able to handle her concerns and an increased openness and ability to communicate with her parents. She said that she felt like living again.

Case D. A 16-year-old Eskimo male shot himself in the abdomen with a low-caliber pistol. He had been drinking at the time and used this fact to explain the shooting; "It was an accident . . . I was drinking." The motive given was remorse following a fight with a girl he described as disliked by the majority of villagers; "I just couldn't get the bad feeling inside of me away . . . I wanted to get that feeling out."

Twelve months earlier a brother of the patient shot himself in the abdomen and died. The patient was close to this brother. The patient had recently expressed to friends that he felt alone and lonely. He had told someone at school that he had a pocketful of bullets and would be dead by the next day.

Comparison with Total Alaska Population

Mortality data from death certificates were examined to identify deaths attributed to self-inflicted gunshot wounds among all Alaskans for the years 1976–80 to gather an impression on the magnitude of the problem. Computer printouts were obtained from the Office of Information Systems, Department of Health and Social Services, State of Alaska, Juneau. Deaths judged to represent suicide by firearm and accidental death by firearm were tabulated separately. Accidental deaths included those in

which someone other than the deceased discharged the weapon accidentally.

The Alaska State demographer supplied the following estimates for the State's population, based on the 1980 census, which were used to derive death rates per 100,000 population:

Year	*Total population*
1976	410,700
1977	413,100
1978	403,100
1979	400,600
1980	400,481

There were minor variations in the population from year to year, primarily among the non-Native population, but the variation was less than 10 percent from the highest to the lowest year. Death rates in all years were based on the 1980 census data (table 2). Components of the Alaska population in 1980 by race and group were as follows:

Race or group	*Population*	*Percent of total*
Indian	21,849	34.1
Eskimo	34,135	53.3
Aleut	8,063	12.6
Total Alaska Native	64,047	100.0
White	308,455	91.7
Black	13,619	4.0
Asian and Pacific Islander	8,035	2.4
Other	6,325	1.9
Total non-Native	336,434	100.0

Statistics on suicide and accidental deaths by firearm for the Native and non-Native populations are presented in table 2. The mean rate for Natives was 24.0 and for non-Natives, 13.3. When deaths by firearm which were ruled accidental are compared, the 14.1 rate among Natives is remarkably greater than the 3.6 per 100,000 for non-Natives.

Total suicide deaths by all means were also observed (table 2). The higher rate of suicide among Natives as compared with non-Natives is maintained. Four of five deaths ruled to be suicide in Alaska resulted from firearms in these years.

Since 1978, deaths among Alaskan Natives were recorded by the decedent's group. The rate of suicide by gunshot wound in relation to total suicide deaths of Eskimos, Indians, and Aleuts are compared in table 3. No significant difference was observed ($P > 0.3$).

Discussion

Suicide attempts by firearm have a high potential for lethality. Many persons whose case records were reviewed required air evacuation to the Alaska Native Medical Center in Anchorage, and they arrived in a severely compromised physiological state. Without skilled surgical and medical intervention both before their journey and on arrival, they might not have survived. That they survived might have been due to the fortuitous course of the bullet; many do not survive such wounds long enough to receive medical care.

Table 2. Firearm deaths (suicides and accidents) and total suicides among Alaskans, by sex, 1976–80

	Native				*Non-Native*			
Year	*Male*	*Female*	*Total*	*Rate per 100,000*	*Male*	*Female*	*Total*	*Rate per 100,000*
Total suicides by firearm	60	17	77	[1]24.0	181	43	224	[1]13.3
1976	12	3	15	23.4	32	9	41	12.2
1977	17	1	18	28.1	43	10	53	15.8
1978	12	3	15	23.4	46	8	54	16.1
1979	8	4	12	18.7	25	7	32	9.5
1980	11	6	17	26.5	35	9	44	13.1
Accidental deaths by firearm	37	8	45	[1]14.1	59	2	61	[1]3.6
1976	5	2	7	10.9	17	2	19	5.6
1977	3	1	4	6.2	7	0	7	2.1
1978	3	1	4	6.2	14	0	14	4.2
1979	12	1	13	20.3	6	0	6	1.8
1980	14	3	17	26.5	15	0	15	4.5
All suicides	74	24	98	[1]30.6	220	55	275	[1]16.3
1976	16	5	21	32.8	37	11	48	14.3
1977	21	4	25	39.0	52	12	64	19.0
1978	15	4	19	29.7	54	12	66	19.6
1979	10	4	14	21.9	35	9	44	13.1
1980	12	7	19	29.7	42	11	53	15.8

[1] Mean rate.

Table 3. Suicide by firearms and total suicides, by Alaska Native group, 1978–80

Year	Eskimo		Indian		Aleut	
	Number	Rate per 100,000	Number	Rate per 100,000	Number	Rate per 100,000
Suicides by firearm	23	22.4	12	18.3	6	24.8
1978	9	26.4	5	22.9	1	12.4
1979	6	17.6	3	13.7	2	24.8
1980	8	23.4	4	18.3	3	37.2
All suicides	29	28.3	14	21.4	7	28.9
1978	12	35.2	6	27.5	1	12.4
1979	8	23.4	3	13.7	2	24.8
1980	9	26.4	5	22.9	4	49.6

Only 8 of the 34 patients were wounded in an extremity. The other 26 shot themselves in the trunk or the head. It could reasonably be assumed that they resemble, psychodynamically, persons who completed suicide, and they are dissimilar from those who made less serious suicide attempts, or used less certain means, in which survival is the norm.

The profile resulting from the review of 34 cases was of a male Native in his second or third decade who shot himself in the abdomen with a low-caliber rifle, often under the influence of alcohol. He is unlikely to have a formal psychiatric history or be experiencing a major depression. The incident often followed a conflict with a family member or girlfriend. It is likely that a family member or friend had died by violence, often self-inflicted.

Suicide is a major cause of death among Alaska Natives. Recently, it has been second only to motor vehicle accidents as a cause of death. It has not always ranked so high. In the 1950s, suicide deaths in this group averaged fewer than five per year. An upward trend began to be noted in the 1960s (*2*). This trend is deplored by the Alaska Natives I have encountered. The high rate of suicide does not imply a positive social sanction. Many of the patients expressed a feeling of shame and feared nonacceptance in their village following their shooting. One patient stated, "The people in the village are angry at me. I don't know if I can face them now."

Historically among some Alaska Native cultures, specifically the Inupiat Eskimo, a traditional pattern of suicide has been recognized (*3*). Typically the person was a middle-aged or older man who was often ill or infirm and could not perform his usual roles in society. The suicide was undertaken after reflection and sometimes consultation with family members, who might assist in the final act. This form of suicide was positively sanctioned and had a cohesive effect upon the community.

That firearms are an important instrument of death in Alaska should come as no surprise. The concept of gun control in Alaska is relatively unpopular. Firearms are ubiquitous among Natives and non-Natives alike, especially in rural and Bush areas. Guns are essential to those who hunt for part of their food, as do many Alaskans. Among American adolescents as a whole, the use of firearms as the instrument of suicide has been increasing (*4*). In addition to the acceptability and availability of guns in Alaska, the victims' frequent acquaintance with others who have used this weapon to kill or attempt to kill themselves is likely a major factor in its use. An association between victims of self-inflicted gunshot wounds to the face was noted among 18 such events reviewed at the University of New Mexico; 6 persons in this series were from the same pueblo (*5*).

Alcohol is a well-known adjunct to suicidal behavior. A significant correlation between recent interpersonal loss, and subsequent suicide had been observed in a series of alcoholics (*6*). The use of alcohol associated with suicidal behavior among Alaska Natives has been previously observed (*1–3*). Among the patients included in my study, some regarded the use of alcohol as an explanation for their act; "It was an accident. I was drinking."

It was more common for alcohol to function in a dissociative role. The patient became detached from the self-destructive act, as if it had occurred in another time and place and bore little relationship to the current reality: "My head was out there . . . nobody could have stopped me. It was like my mind wasn't a part of me."

Some are amnesic about the events and denied any recollection of suicidal feelings One young man simply stated his only recollection as "I was pretty drunk," adding, "I feel stupid." However, upon further questioning of the patient a possible precipitant such as recent loss could often be found.

Another man said, "I can't remember why it happened . . . I was drunk." He later acknowledged, "I think about my brother who hung himself last year. It really bothers me . . . I guess maybe that was on my mind. I can't seem to forget it."

In the aggregate, the retrospective motives given for the shootings, while important to the patient, would not appear to warrant such a dramatic response. The clinician must wonder why one would raise a gun to oneself after a minor family fight. Most of the attempts described previously could be classified as impulsive; such impulsive attempts are believed to be motivated by the desire to reduce tension (*7*). The Alaska Native is uniquely beset by a combination of forces both intraphysic and cultural that contribute to an alarming level of suicide.

While the explanation offered was often a conflict between the patient and others, this event contributes only in a small way to the suicide attempt. Far more important is the internal world that allows such conflicts to weigh so heavily. Tabachnik described two groups of suicide attempters, the interpersonal and intrapersonal among American Indians (*8*). The patients in my series appear to have features of both. Overt expression of anger is relatively proscribed in Alaska Natives. In her study of the Utku of the Canadian Arctic, an Eskimo group, Briggs addressed this subject, "As a warm, protective, nurturent, even-tempered person represents the essence of goodness, so an unkind, bad-tempered person represents the opposite. Expressions of ill temper toward human beings are never justified in anyone over the age of three or four" (*9*).

Such an attitude toward negative affect appears prevalent in Alaska Natives as well. A tendency to internalize anger, pain, and worry has been observed among other Native Americans (*10*). Suicidal activity appears to be related to a lack of culturally sanctioned techniques for acting out hostile affect (*11*).

A difference in the internal world of the Alaska Native can not explain the precipitous increase in suicide in recent decades. The external world, the society in which Alaska Natives find themselves, has changed dramatically. Kraus and Buffler noted; ". . . a process of acculturation which has been excruciating in its speed and intensity. For many Native Alaskans, especially the young, the breakdown of the organized, consistent, traditional relationships due to pressures from without has resulted in a reduced ability to find and hold a position of psychological integrity and centrality. Loneliness, anxiety, frustration, continuing stress and at times despair characterize the lives of many Native Alaskans today" (*1*). The traditional village life and economy in Alaska has been forced to undergo major changes by external influences. The presence of non-Native influence and subsequent partial loss of control over their lives has been an ongoing feature in Native life since the 1800s, with the coming of missionaries, fur traders, and gold seekers. This trend intensified with Alaska's attainment of statehood in 1959 and more recently with the trans-Alaska oil pipeline of the 1970s and the Native Claims Settlement Act of 1971. A visitor to a Native village today will find many symbols of this change, perhaps exemplified by the satellite earth station providing convenient telephone communication and live network television. While many changes, such as improved communications, transportation, and health care have been welcome, none are without major social impact. Rapid, externally generated change has at times contributed to social disorganization, cultural conflict, and family disorder. These consequences in turn can precipitate low self-esteem, depression, and hopelessness which might trigger self-destruction.

Unfortunately, the problems I have described are not limited to Alaska Natives. Suicide and violent death trouble many other Native American groups (*12*). Others have described the relationship of suicide among Native Americans to cultural conflict (*13–20*). To various degrees and at various times, Native Americans and Alaska Natives have shared a common heritage of cultural disruption.

In order to prevent suicide, one needs either to identify those at risk and intervene individually or identify and effectively alleviate the social roots of this behavior. This series of cases of self-inflicted gunshot wounds is remarkable in a lack of ability to distinguish the victim from his or her peers. Most were not clinically depressed and made no statements of intent. Many suffered the recent loss of a loved one by violence, but such a loss unfortunately is not uncommon for the group, and it is in no way unique to those with suicidal behavior. Gun control in an environment where guns are common, necessary, and accepted would not be realistic.

Limiting the easy availability of alcohol would reduce the overall level of traumatic death. Currently some Native villages are considering measures to restrict the sale or importation of liquor. Of course if a person has demonstrated suicidal intent, individual treatment and prevention should be used. However, ultimately to reverse the tragic and dis-

proportionate hazard of suicide among Native Americans and Native Alaskans, the cultural causes will need to be addressed by Natives who have regained hope and control of their own lives.

Suicidal behavior, exemplified by the self-inflicted gunshot wound, continues to be a threat to young Alaska Natives. Its prevalence appears to be a function of increasing disruption and alienation, imposed upon a set of behavioral norms that limit one's ability to convey anger and pain.

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A Study of Underreporting of Down's Syndrome on Birth Certificates in an Ohio County, 1970–78

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SYNOPSIS

In a previous statewide assessment in Ohio of the percentage reporting of Down's syndrome (DS) on birth certificates, it was found that 33.9 percent of the cases chromosomally analyzed were so recorded. The objectives of this study were to gain a greater understanding of the basis of this low reporting percentage by concentrating on Hamilton County births only, to compare these percentages among hospitals in the county, and to determine the commonality of