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A Message from the Director of the Indian Health Service

To All *IHS Provider* Readers:

I would like to take this opportunity to recognize the importance of injury prevention and control in American Indian and Alaskan Native (AI/AN) communities. Unintentional injuries are the leading cause of death for AI/ANs ages 1 - 44 years, and Indians experience injuries at a rate 1.5 to 5 times greater than other Americans. Annually, injuries account for 41% of the years of productive life lost for AI/ANs.

Over the past decade, the Indian Health Service (IHS) Injury Prevention Program has contributed to overall decreases in injuries in AI/AN communities. Effective intervention strategies such as efforts to increase the use of safety belts, child safety seats, smoke alarms, and personal floatation devices have helped reduce the high rates of injuries in AI/AN communities. The IHS Injury Prevention Program also sponsors the Tribal Injury Prevention Cooperative Agreement Program, which funds 22 tribal Injury Prevention Coordinators and ten tribal injury prevention intervention projects in 30 different tribal communities across the country. In addition, the IHS Injury Prevention Program sponsors the Injury Prevention Practitioner Training and Injury Prevention Residency Fellowship programs, which have graduated more than 200 individuals since 1988. Many of these graduates have gone on to become some of our leading experts and dedicated proponents of injury prevention and control in AI/AN communities.

The history of the IHS Injury Prevention Program includes a shift in focus from an education-only strategy to the institutionalizing of proven public health practices. This special issue on injury prevention showcases the IHS and tribal partnership efforts to combat the injury disparity rates in AI/AN communities. For more information about the IHS Injury Prevention Program, please visit *http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm*.

I want to acknowledge the dedication of all those who have made outstanding contributions in injury prevention and control. This is a lifetime initiative to keep ourselves, our families, our communities, and our nation safe.

Charles W. Grim, DDS, MHSA
Director, Indian Health Service
Assistant Surgeon General

Injury Prevention in Indian Country

Lawrence Berger, MD, MPH, Clinical Assistant Professor of Pediatrics at the University of New Mexico School of Medicine, volunteered to coordinate two special issues of *The IHS Provider* dedicated to Injury Prevention in Indian Country. This is the first; the second will be published later this fall. We wish to recognize Dr. Berger's initiative and hard work that made this project possible.

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The Prevention of Suicide in Alaska's Tribal Health Care Setting

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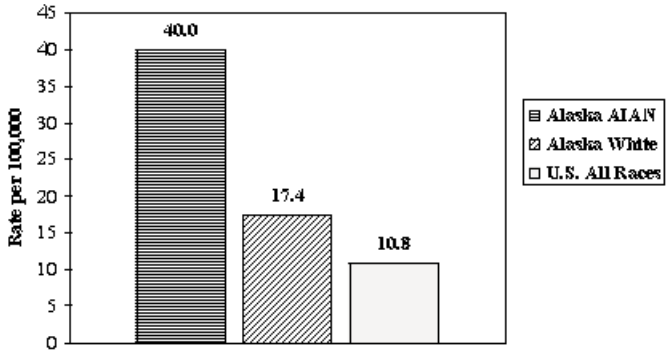
Epidemiology of Suicide in Alaska

The Alaska Area has the highest suicide rate of all twelve IHS service Areas.[1] During the period 2000 to 2004, the age-adjusted suicide rate for American Indians and Alaska Natives (AI/ANs) in Alaska was 40.0 per 100,000**.** This rate is 2.3 times greater than the rate for White Alaskans (17.4 per 100,000) and 3.7 times greater than the US All Races population (10.8 per 100,000) (see Figure 1).[2]

Figure 1: Suicide rates, 2000-2004, age-adjusted



Suicide is the fourth leading cause of death among Alaska Native people, resulting in 229 deaths from 2000 to 2004 (see Table 1).[2] If the suicide rate among Alaska Natives (40.0 per 100,000) had been the same as the US All Races suicide rate (10.8 per 100,000), 167 fewer Alaska Native people would have died from suicide during this 5-year time period. Although the US White suicide rate decreased by 12% during 1979 to 2003, there was no significant change in the suicide rate among Alaska Native people during these years.[3]

While suicide rates in non-Native populations nationwide tend to be higher in older people, the opposite is true among Alaska Native people. Alaska Native people over the age of 55 are 57% *less* likely to commit suicide than the US White population 55 and older. Conversely, suicide is the leading cause of death for young Alaska Native people ages 15 - 24 and is the second leading cause of death for 25 to 44 year olds. Alaska Native males suffer a suicide rate three times that of Alaska Native females (Table 1). Alaska Native males ages 15 - 24 years suffer the greatest burden. They are almost nine times as likely to die of suicide than US White males in this age group (150.8 per 100,000 vs. 17.6 per 100,000 for 2000-2004).[2] Alaska Native youth have the highest suicide rate of any IHS Area.[4]

Table 1. Alaska Suicide Mortality Rates, 2000-2004, WISQARS

	Both Sexes		Males		Females	
Race	Deaths	Age-Adjusted Rate	Deaths	Age-Adjusted Rate	Deaths	Age-Adjusted Rate
Am Indian/ AK Native	229	40.0	171	59.9	58	19.8
White	403	17.4	326	28.2	77	6.3
All Races	650	20.4	508	31.8	142	8.8

The major risk factors for suicide in the general US population include mental and addictive disorders (including alcohol); easy access to lethal means; a history of previous suicide attempts; a history of physical or sexual abuse; a family history of suicidality; and recent and severe stressful life events.[5] Studies specific to AI/AN youth have found that previous suicide attempts, family disruption, loss of ethnic identity, and a lack of a religious or a spiritual connection put these youth at an even higher risk of suicide than youth in the general population.[5] The results of a 3-year suicide 'follow back' study of Alaskan suicides showed that risk factors salient to medical personnel include a disability or illness, a family history of mental illness, previous suicide attempts, aggressive behaviors, and substance abuse.[6] Access to firearms is also seen as a risk factor in a state where two-thirds of all suicide deaths involve firearms.[7]

A recent, systematic review of suicide prevention strategies found that two approaches were effective in preventing suicide: educating physicians on the recognition and treatment of depression; and restricting access to lethal

means. Other interventions, such as public awareness and education campaigns, screening programs to identify at-risk individuals, and media efforts (e.g., establishing media guidelines and educating journalists) "need more evidence of efficacy."[8]

Contact with Alaska Health Care System before Suicide

The 3-year Alaska 'follow back' suicide study reviewed suicide decedents' prior access to health care. It showed that 64% of all suicide decedents had seen a primary care physician within six months of their death.[6] Another recent study of Alaska Native males who died from suicide in northern Alaska found that contact with a primary care provider during the year before their death was common in this population. The retrospective case-control study compared 30 suicide cases to 30 controls matched for race, age, gender, and community of residence. Nearly three-fourths of suicide cases received some type of care in the region's medical facilities (regional hospital and village clinics) during the 12 months preceding their death. Compared to the control group, Alaska Native males who died from suicide were 2.8 times more likely to have been treated at the hospital, 3.3 times more likely to have received care for an injury, and 22.2 times more likely to have been treated for an alcohol-related injury during the 12 months preceding their death.[9] These studies suggest that there may be opportunities in the primary care setting to identify those most at risk of suicide and refer these patients to appropriate care before they choose to end their life.

Innovative strategies in Alaska

Within the Alaska Tribal Health System, tribally-operated health care organizations are working to reduce suicide in the health care setting in innovative ways. In addition to traditional pharmacotherapy, outpatient and inpatient behavioral health services and referrals to substance abuse treatment programs, several new programs are being implemented to reduce suicide rates. Initiatives include depression screening; safe firearm storage programs; gatekeeper training for community health aides on the recognition of warning signs of suicide; and case management services for Alaska Native people at risk of self-harm. A few of these programs are highlighted below.

Depression Screening in a Primary Care Setting and Case Management Services. The Southcentral Foundation, a tribal health organization in Anchorage, Alaska, has implemented a depression screening and intervention program in a primary care setting at the Alaska Native Medical Center. The screening and treatment protocol is modeled after the Institute for Healthcare Improvement's Breakthrough Series. The protocol consists of two main components: a patient questionnaire and a provider interview, and was derived from the Primary Care Evaluation of Mental Disorders (PRIME-MD). PRIME-MD is a screening tool designed to assist general practitioners in the diagnosis of minor psychiatric disorders.

Screening for depression begins during intake with the Certified Medical Assistant or Licensed Practical Nurse. Based on responses to an initial set of questions, a second set of questions may be asked to gain more information regarding the severity of depression. After this initial screening and an interview with the provider, a determination is made if antidepressants and/or a referral to behavioral health services are needed. Education about self-care for depression is provided. Follow-up phone contact and in-person visits are made if anti-depressants are prescribed. Between 2001 and 2005, 58% of the patients screened positive for depression had not had a behavioral health visit or been diagnosed with a mood disorder within one year prior to screening.[10] Thus, prior to the implementation of the screening program, these patients may not have been identified as depressed. This suggests that more patients in need of mental health and other services are being recognized and helped.

In May 2006, the Southcentral Foundation launched the Denaa Yeets' (Athabascan for "Our Breath of Life") Program, which provides support and case management services to adult Alaska Native men and women who are at risk of self-harm. Participants can self-refer or be referred to the program by a health care provider. Participants complete a self-harm survey that is used by program staff to develop a care plan. The care plan includes but is not limited to referrals to substance abuse treatment programs, housing services, food assistance programs, and counseling services. The program is designed to facilitate a sense of individual self-worth, cultural identity, and a desire for life by engaging clients and their children in cultural activities including talking circles, drum-making, fishing, and potlucks (Bergeron D. Personal communication, March 28, 2007).

Referral to Gun Locker and Locking Medicine Cabinets for At Risk Youth. A fellow of the Indian Health Service's Injury Prevention Program Development Fellowship implemented an intervention in a village in southwest Alaska for parents or guardians of youth who have suicide risk factors. The program offered parents locking medicine or gun cabinets to store lethal means. Suicidal risk factors considered were trouble with the law; history of suicide attempts; diagnosed mood disorder/behavioral health involvement; recent traumatic event; and alcohol/drug abuse. Local EMS volunteers installed medicine and gun cabinets in the homes of participants. Twenty-four referrals for medicine cabinets were made by local village health aides and 19 medicine cabinets were successfully installed in homes. Seven program participants were referred to the program because of the potentially lethal effects of an overdose of a medication that was prescribed to a member in the home even though none of the youth had risk factors for suicide. Five referrals were not home during the installation phase of the medicine cabinets. Only two referrals were made for gun lockers, so recipients of gun lockers were drawn by lottery. Although installation of the medicine and gun cabinets was well received, no follow-up on the long term use of the

cabinets or the program's impact on suicide attempts was conducted (Hagan KD. Unpublished).

Hospital-based Interventions in Rural Alaska. The Maniilaq Association, a tribal health and social service organization in Northwest Alaska is in the process of implementing two hospital-based approaches to suicide prevention in collaboration with Project Life (a new program within Maniilaq Behavioral Health). The first is a long-term postal contact program modeled after a randomized controlled trial conducted by Motto and Bostrom.[11] This program will send letters to people who come into the ED for a suicide attempt. The letters are intended to provide unconditional support for people as well as decrease help-seeking barriers in times of crisis. The letters will be sent by Project Life staff on holidays, birthdays, anniversary dates, and periodically throughout a three-year period. Motto and Bostrom found that their program significantly reduced the suicide rate among clients receiving the letters and for years afterward.

The regional hospital, in collaboration with Project Life, is also implementing a suicide/depression screening process in the acute care and emergency department. In the pilot phase, acute care nurses will do the screening. The screening instrument consists of two primary questions, one focused on depressive symptoms and the other on behavioral risks associated with suicide in the region. If the patient answers "yes" to either question, the nurse will then ask seven additional questions which are focused on depression and suicide risk. If the patient responds affirmatively to any of these questions, they will be referred to Maniilaq Counseling Services. The procedures for doing screening and referral in a culturally appropriate way are currently in development.

In addition to supportive letters and acute care screenings done in the hospital and clinic, Project Life has a wide variety of activities including organizing digital storytelling projects focused on cultural and community strengths; raising suicide awareness and resilience skills in the classroom; promoting a media campaign focused on changing social acceptance of suicidal behavior; aiding institutions in the creation and implementation of suicide prevention protocols; and providing suicide awareness and intervention trainings for clergy, health aides, and other community gatekeepers. The project, which builds on findings from several community-based research projects,[12-13] began in 2006 and is funded by the Substance Abuse and Mental Health Services Administration.

Conclusion

Suicide prevention initiatives, such as depression screening and education about restriction of lethal means, are becoming more common in the health care setting. Interventions developed within the general population should be thoroughly evaluated for cultural appropriateness, applicability, and effectiveness before implementation within a tribal health care setting. Tribal primary and acute care clinics show promise of being an effective place for identifying those at-risk and providing education, referral, and support. Sustainability of such initiatives is one of the biggest challenges that tribal health care organizations will face, as most facilities struggle daily with limited financial resources. To ensure optimal allocation of limited resources, programs need to be evaluated using both primary outcomes (completed and attempted suicides, suicidal ideation) and intermediate impacts (such as help-seeking behavior, identification of at-risk individuals, entry into treatment, and antidepressant prescription rates).[9] Finding effective mechanisms for identifying risk factors and intervening in a clinical setting are the primary tasks of tribal health care organizations as they develop suicide prevention initiatives for their primary care settings.

References

1. Indian Health Service. *Regional Differences in Indian Health: 1998 and 1999*. Washington, DC: US Department of Health and Human Services; 1999.
2. Centers for Disease Control and Prevention: Web-Based Injury Statistics Query and Reporting System (WISQARS). Accessed May 23, 2007 at *www.cdc.gov/ncipc/wisqars*.
3. Day G, Provost EM, Lanier AP. *Alaska Native Mortality Update: 1999-2003*. Anchorage, AK: Alaska Native Tribal Health Consortium; December 2006.
4. Centers for Disease Control and Prevention. Injury mortality among American Indian and Alaska Native children and youth — United States, 1989-1998. *MMWR*. 2003;52:697-701.
5. Olson LM, Wahab S. American Indians and suicide: a neglected area of research. *Trauma, Violence, Abuse*. 2006;7:9-33.
6. Alaska Injury Prevention Center. *Alaska Suicide Follow-Back Study Final Report*. Anchorage, AK: Alaska Department of Health and Social Services; 2007.
7. Statewide Suicide Prevention Council. Annual Report to the Legislature: 2007. Juneau, AK: Alaska Department of Health and Social Services; 2007.
8. Mann JJ, Apter A, Bertolote J, *et al*. Suicide prevention strategies: a systematic review. *JAMA*. 2005;294:2064-2074.
9. Hill R, Perkins R, Wexler L. An analysis of hospital visits during the 12 months preceding suicide death in northern Alaska. *Alaska Medicine.* 2007;49:16-21.
10. Dillard DA, Christopher D. The Southcentral Foundation Depression Collaborative. *Int J Circumpolar Health*. In Progress.
11. Motto JA, Bostrom AG. A randomized controlled trial of post-crisis suicide prevention. *Psychiatr Serv*. 2001;158:36-42.
12. Wexler L, Goodwin B. Youth and adult community member beliefs about Inupiat youth suicide and its

prevention. *Int J Circumpolar Health*. 2006;65:448-458.
13. Wexler LM. Inupiat youth suicide and culture loss: Changing community conversations for prevention. *Soc Sci Med*. 2006;11:2938-48.

Helpful Sites

Indian Health Service Community Suicide Prevention Website: *http://www.ihs.gov/NonMedicalPrograms/nspn/index.cfm?page=NSPN_A39_S124.cfm*

Suicide Prevention Resource Center: *www.sprc.org*

Denaa Yeets Program: *http://www.southcentralfoundation.com/denaa.cfm*

Alaska Statewide Suicide Prevention Council: *http://www.hss.state.ak.us/suicideprevention/*

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Introduction to *The IHS Provider* Special Issues on Injury Prevention

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There has been impressive progress toward reducing the burden of injuries among American Indians and Alaska Natives (AI/AN). Over a period of twenty years (1982 - 1984 vs. 2002 - 2004), the age-adjusted mortality rate for unintentional injuries fell 28%, compared to a 5% decline for the US as a whole.[1] Many challenges remain, however, in the realm of both unintentional injuries (e.g., motor vehicle crashes, falls, and poisonings) and intentional injuries (e.g., intimate partner violence, other assaults, and suicides). As noted in the following articles, for example, the suicide rate for AI/ANs in Alaska is almost four times greater than for the overall US population; the motor vehicle mortality rate for one American Indian community is nearly eight times the national average.

Our goal for these special issues of *The IHS Provider* is to raise the visibility of injuries as a leading cause of preventable mortality and morbidity in American Indian and Alaska Native communities. In addition to sharing data for advocacy at the local and national levels, we highlight a number of successful interventions implemented by tribes, tribal organizations, and the IHS. An outstanding characteristic of these programs is that they employ strategies shown to be effective by rigorous evaluations. These are the public health equivalents of the "evidence-based" approaches recommended for clinical medicine.

Injuries can be devastating for individuals, families, and entire communities. We hope that these articles will stimulate new energy, and generate additional resources, for the prevention of both unintentional and intentional injuries.

Reference

CDC. National Centers for Injury Prevention and Control. Web-based Injury Statistics Query and Reporting System (WISQARS). Accessed on May 30, 2007 at *www.cdc.gov/ncipc/wisqars*.

Reduce Injuries: Eliminate Disparities in Child Mortality Rates among American Indian and Alaska Native Children and Youth

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Introduction

Disparities in health outcomes among populations have many possible causes. They include socio-economic factors, differences in the availability and accessibility of medical services, variations in the quality of medical care, lifestyle differences, and even genetic influences.[1-5] One example of a major health disparity is the difference in child mortality rates among American Indian/Alaska Native (AI/AN) children and White children.[6] The overall child mortality rate for AI/AN children, ages 1 through 19 years, is 44.28 per 100,000 for the years 2000 - 2002. This rate is nearly 40% higher than that of White children in the US (31.94 per 100,000).[7] Because injuries are the leading cause of death for US children ages 1 - 19, and account for 75% of all deaths among AI/AN children in that age group,[8] we investigated the impact of mortality from injuries on the overall child mortality rate in these two populations.

Methods

We determined cause of injury, and calculated all-cause mortality and age-specific mortality rates, for all AI/AN and White children and youth 0 - 19 years of age in the US using CDC's Web-Based Injury Statistics Query and Reporting System (WISQARS).[7] WISQARS contains mortality data compiled by the National Center for Health Statistics (NCHS). For the years 2000 - 2002, WISQARS categorizes external cause of injury death, and all-cause mortality, from the International Classification of Diseases, 10th Revision.[9] Mortality rates per 100,000 population by race, age, and cause are automatically calculated in WISQARS using population statistics from the US Census Bureau.[7] Injury causes described here are grouped into several categories including all injuries, all unintentional causes, unintentional motor vehicle traffic crashes, unintentional pedestrian events, unintentional drowning, unintentional fire/burn, unintentional suffocation, unintentional poisoning, unintentional falls, homicide, and suicide. Because the vast majority of infants die from non-injury causes, we analyze infants separately in Tables 1, 3, and 4.

To determine the contribution of injuries to all-cause mortality, we calculated an "adjusted" all-cause mortality rate for AI/AN. The adjusted rate assumes that the AI/AN injury mortality rate is equal to the White injury mortality rate. The adjusted rate was obtained by 1) calculating the number of excess AI/AN injury deaths by subtracting the White all-injury mortality rate from the AI/AN all-injury mortality rate and then

Table 1. 10 Leading causes of death, American Indians/Alaska Natives and Whites Ages 0-19 years, both sexes, 2000-2002, United States

Rank	AI/AN*	White*	AI/AN*	White*
	Infants	Infants	Ages 1-19	Ages 1-19
	Number (rate)	Number (rate)	Number (rate)	Number (rate)
1	Congenital Anomalies 169 (137.1)	Congenital Anomalies 12,948 (140.4)	Unintentional Injury 746 (22.9)	Unintentional Injury 27,453 (15.3)
2	SIDS 152 (110.2)	Short Gestation 7,404 (80.3)	Suicide 163 (5.0)	Malignant Neoplasms 5,170 (2.9)
3	Short Gestation 113 (82.0)	SIDS 4,508 (48.9)	Homicide 132 (4.0)	Suicide 4,727 (2.6)

Table 1. (continued)

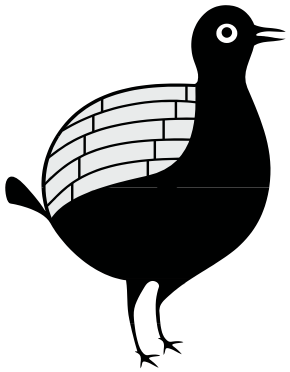
4	**Unintentional Injury** 67 (45.6)	**Maternal** Complications 2,809 (30.5)	**Malignant Neoplasms** 60 (1.8)	**Homicide** 3,781 (2.1)
5	**Maternal** Complications 50 (36.3)	**Placenta, Cord** 2,085 (22.6)	**Congenital anomalies** 38 (1.2)	**Congenital** anomalies 2,561 (1.4)
6	**Placenta, Cord** 33 (23.9)	**Respiratory** Distress 1,839 (19.9)	**Heart Disease** 35 (1.1)	**Heart Disease** 1,692 (0.94)
7	**Influenza and** pneumonia 29 (21.0)	**Unintentional** Injury 1,799 (19.5)	**Influenza and pneumonia** 15	**Influenza and** pneumonia 562 (0.31)
8	Circulatory System 24 (17.4)	**Bacterial Sepsis** 1,408 (15.2)	**Septicemia** 15	Septicemia 475 (0.26)
9	**Homicide** 21 (15.2)	Circulatory System 1,295 (14.0)	**Benign Neoplasms** 9	**Benign** Neoplasms 451 (0.25)
10	**Bacterial Sepsis** 20 (14.5)	**Intrauterine Hypoxia** 1,233 (13.4)	**Chronic lower respiratory** disease 9	Cerebrovascular 428 (0.24)

* Number of deaths (rate per 100,000). Rates are not calculated for those causes with fewer than 20 deaths because of potential instability.

** Injury-related causes are represented in bold.

Table 2. Leading causes of injury death, American Indians/Alaska Natives, and Whites, Ages 0-19, 2000-2002, United States

	AI/AN			White		AI/AN:White
Cause of Death	Number	Rate*		Rate*		Rate Ratio
Motor Vehicle Traffic	517	15.2		9.8		1.5
Pedestrian**	66	1.9		1.1		1.7
Suicide	163	4.8		2.5		1.9
Homicide	153	4.5		2.3		1.9
Drowning	74	2.2		1.4		1.6
Unintentional Suffocation	46	1.4		1.0		1.4
Fire/Burn	36	1.1		0.6		1.8
Unintentional Poisoning	31	0.9		0.7		1.3
Falls	9			0.3		



* Rate per 100,000 population. Rates are not calculated for those causes with fewer than 20 deaths because of potential instability.

** Pedestrian deaths are included in the motor vehicle traffic category.

multiplying the excess death rate by the AI/AN population; 2) subtracting the AI/AN excess injury deaths from the total number of AI/AN deaths from all causes; and 3) re-calculating the AI/AN all-cause mortality rate using the adjusted numerator. Using data from Tables 3 and 4, the calculation for adjusted AI/AN all-cause mortality rate, age 0 - 19 years would be:

1. Excess Deaths = 33.9/100,000 – 20.6/100,000 X 3,396,861 = **452**
2. Adjusted Deaths = 2,482 – 452 = **2,030**
3. Adjusted AI/AN all-cause mortality rate = 2,030 X 100,000 ÷ 3,396,861 = **59.8 per 100,000.**

Results

In the 1 - 19 year age group, the number of *injury deaths* (unintentional injury, homicide, and suicide) is far greater than the number of deaths from the next *seven* leading causes combined: for AI/AN children, 1,040 injury deaths vs. 182

Table 3. Child mortality by age group and leading cause American Indians/Alaska Natives and Whites, 2000-2002, United States

Age	<1	1-4	5-9	10-14	15-19	0-19 total
	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)	Number (%)
AI/AN:						
All deaths, all causes	1,039 (100)	284 (100)	142 (100)	226 (100)	791(100)	2,482 (100)
All injury deaths*	96 (9.2)	137 (48.2)	91(64.1)	156 (69.0)	672 (85.0)	1,152 (46.4)
Unintentional injury	67 (6.4)	102 (35.9)	83 (58.5)	120 (53.1)	440 (55.6)	812 (32.7)
Homicide	21 (2.0)	32 (11.3)	6 (4.2)	10 (4.4)	84 (10.6)	153 (6.2)
Suicide			1 (0.7)	24 (10.6)	138 (17.4)	163 (6.6)
White:						
All deaths, all causes	54468 (100)	10,570 (100)	6 ,777 (100)	8,981 (100)	31,121 (100)	111917 (100)
All injury deaths*	2,504 (4.6)	4,612 (43.6)	3,043 (44.9)	4,668 (52.0)	24,248 (77.9)	39,075 (34.9)
Unintentional injury	1,799 (3.3)	3,843 (36.4)	2,712 (40.0)	3,532 (39.3)	17,366 (55.8)	27,453 (24.5)
Homicide	563 (1.0)	666 (6.3)	283 (4.2)	370 (4.1)	2,462 (7.9)	3,781 (3.4)
Suicide			14 (0.2)	672 (7.5)	4,041 (13.0)	4,727 (4.2)

* Includes "intent unknown"

deaths from the next seven other causes (ratio of 5.7:1); for White children, 35,961 injury deaths vs. 11,339 deaths from the next seven other causes (ratio of 3.2:1) (Table 1). Among AI/AN ages 1 - 19 years, the four leading causes of death in rank order are unintentional injuries, suicide, homicide, and cancer. Among Whites ages 1 - 19, the four leading causes are (in order) unintentional injuries, cancer, suicide, and homicide.

The situation is different for infants under one year of age, where congenital anomalies, SIDS, and the consequences of short gestation are the leading causes of death in both populations. Among AI/AN infants, unintentional injury ranks fourth as a leading cause of death, and homicide ninth. Among White infants, unintentional injury ranks seventh as a leading cause of death (Table 1) while homicide ranks fourteenth.

Mortality Rates by Cause and Age Group

Motor vehicle traffic crashes were the leading cause of injury death among AI/AN and White children and youth ages 0 - 19 years, with the AI/AN rate 1.5 times greater than the White rate (Table 2). Suicide and homicide were the second and third leading causes of injury death among AI/AN children and youth, with rates 1.9 times greater than rates for White children and youth. The causes of injury with the least disparity for AI/AN children and youth were unintentional poisoning and unintentional falls. Injury death rates from these causes for AI/AN children and youth were only slightly higher or the same as rates for Whites (rate ratio of 1.3 and 1.0, respectively) (Table 2).

As a percentage of all AI/AN deaths to children and youth, injuries ranged from 9% of deaths among infants to 85% of the deaths to teens aged 15 - 19 years (Table 3). The importance of injuries as a leading cause of death among AI/AN children and youth increases dramatically after infancy, and goes up with each age group. For ages 0 - 19 years combined, almost half of all AI/AN deaths were due to injuries, compared to just over a third of the deaths among Whites (Table 3). For the age groups 1 - 4 and 15 - 19 years, the percentage of deaths due to unintentional injuries was similar for both AI/AN and Whites (36% and 56% respectively). Homicide was responsible for a relatively large proportion of the deaths to young AI/AN children (2% of infants, 11.3% of ages 1 - 4) and older teens (10.6% of ages 15 - 19).

Table 4. Child Mortality Rates* by Age Group American Indians/Alaska Natives and Whites 2000-2002, United States

Age	<1	1-4	5-9	10-14	15-19	0-19 total
Injury mortality rates						
AI/AN unadjusted	69.6	21.4	10. 4	16.9	76.5	33.9
AI/AN adjusted	27.1	12.5	6.4	9.4	49.8	20.6
White	27.1	12.5	6.4	9.4	49.8	20.6
All-cause mortality rate						
AI/AN unadjusted	753.6	45.3	16.6	24.8	91.4	**73.1**
AI/AN adjusted	710.8	36.4	12.5	17.3	64.7	**59.8**
White	590.6	29.3	14.4	18.4	65.0	**59.2**
3-year population						
AI/AN	137,878	626,519	857,174	909,675	865,615	3,396,861
White	9,221,896	36,091,523	47,155,295	48,734,576	47,893,599	189,096,889

* Per 100,000 population.

† All-cause mortality rates have been re-calculated based on injury mortality rates equal to US White rates. AI/AN adjusted all-cause mortality rate = (total deaths – excess injury deaths) X 100,000 ÷ AI/AN 3-year population

Injury mortality rates were highest among AI/AN infants (69.6 per 100,000) and older teens 15 - 19 years (76.5 per 100,000) (Table 4). When the AI/AN all-cause mortality rate was adjusted for the excess injury rate, the new adjusted all-cause mortality rate for AI/AN ages 0 - 19 years was essentially the same as the White rate (59.8 per 100,000 vs. 59.2 per 100,000) (Table 4 and Figure 1). Adjusted all-cause mortality rates for AI/AN were *lower* than for White rates in age groups 5 - 9, 10 - 14, and 15 - 19 years, but AI/AN adjusted rates remained higher among infants and 1 - 4 year olds (Table 4).

Discussion

A striking finding is that *the overall child mortality rates for AI/AN and US White populations, ages 0 - 19 years would be essentially equal (59.8 vs. 59.2 per 100,000, respectively) if AI/AN child injury rates were reduced to those of the US White population*. In some age groups (5 - 9, 10 - 14, and 15 - 19 years) the overall child mortality rates would be *lower* among AI/AN children. Only among infants and 1 - 4 year olds would the overall child mortality rate remain higher among AI/AN children (Table 4 and Figure 1).

Targeting injury prevention to AI/AN children and youth is especially warranted in light of the age distribution of the AI/AN population. According to the 2000 Census, 33.3% of individuals who are American Indians or Alaska Natives are under the age of 18. Almost 40% of persons who are Navajo, Sioux, or Alaska Natives are under 18 years of age. This compares to 25.6% of the total US population.[10]

If the injury death rate among AI/AN children and youth (birth to 19 years) had been reduced to the rate of White children and youth the same age, an estimated 452 AI/AN injury-related deaths from 2000 - 2002 would have been prevented. Reducing child injury rates among AI/AN children and youth (birth to 19 years) from 34 to 21 per 100,000 (the current rate for Whites and a 38% reduction) is an ambitious goal, but feasible. From 1982 to 2002, unintentional injury mortality rates among AI/AN children aged 0 - 9 years decreased 39%. During this same time period, rates for White children decreased 51%. Among AI/AN youth aged 10 - 19 years, unintentional injury death rates decreased 28%; the decrease among White youth was 30% (CDC, NCIPC, unpublished study). Although AI/AN unintentional injury death rates have decreased over time, the overall injury disparity compared with rates for Whites persists.[6]

Our findings are subject to at least two limitations. First, AI/AN mortality rates probably underestimate the true rates because of misclassification of race on state death certificates. The extent of racial miscoding in AI/AN children and youth is not well-defined, but our reported AI/AN mortality rates should be considered conservative (under-estimates, rather than over-estimates).[11,12] Second, cause-specific rates of infant deaths are complicated by diagnostic ambiguities.[13] Differentiating among unintentional suffocation, SIDS, and child abuse, for example, often requires a postmortem examination, death scene investigation, and detailed review of case records.[14] Particularly in AI/AN communities, geographic isolation, lack of resources, an absence of tribe-specific child mortality review teams, and cultural practices can be barriers to fulfilling these requirements.

Conclusion

Few health disparities have such potential for elimination as the discrepancy in child mortality rates among American Indian and Alaska Native children. In 2000, The IHS Injury

Prevention Program and the American Academy of Pediatrics hosted a Senate briefing in Washington, DC, including the testimony of AI/AN people about the burden of childhood injuries and the need for additional resources. More recently, the national Tribal Injury Prevention Steering Committee (TSC) has requested of Congress $10 million over five years to expand the capacity-building injury prevention program for tribes. While great strides have been made in establishing child passenger safety programs in AI/AN communities, injury prevention programs that target adolescents,[15,16] and interventions to prevent all forms of child maltreatment,[17-21] deserve more emphasis among native populations. Many injury prevention strategies are effective,[22-34] but too few are fully implemented in AI/AN communities.[35-37]

Reducing childhood injuries requires on-going efforts. For example, every newborn requires a car safety seat before leaving the hospital, and programs to enforce traffic safety laws must be repeated often or they lose their effectiveness. There is a need for expanded collaborations among tribal nations, the IHS, and other national agencies and organizations, such as the Bureau of Indian Affairs Highway Safety Program, Department of Justice, and law enforcement groups.

The Committee on Native American Child Health and the Committee on Injury and Poison Prevention of The American Academy of Pediatrics published a joint statement noting that "strong advocacy is needed to promote childhood injury prevention as an important priority for federal agencies and tribes."[37] By highlighting the dramatic impact of child injury rates on overall child mortality, we hope injury prevention programs will be continued and expanded at the local, state, and national levels.

References

1. Grossman DC, Baldwin L, Casey S, et al. Disparities in infant health among American Indians and Alaska Natives in US Metropolitan Area. *Pediatrics.* 2002;109:627-633.
2. Bullock A and Bell RA. Stress, trauma, and coronary heart disease among Native Americans. *Am J Public Health*. 2005;95:2122-2123.
3. Fine MJ, Ibrahim SA, Thomas SB. The role of race and genetics in health disparities research. *Am J Public Health*. 2005; 95:2125-2128.
4. Roger D and Petereit DG. Cancer disparities research partnership in Lakota Country: Clinical trials, patient services, and community education for the Oglala, Rosebud and Cheyenne River Sioux Tribes. *Am J PublicHhealth.* 2005; 95: 2129-2132.
5. Centers for Disease Control and Prevention. Surveillance for health behaviors of American Indians and Alaska Natives: Findings from the Behavioral Risk Factor Surveillance System, 1997-2000. *MMWR*. 2003;52, No. SS-7.
6. Bernard SJ, Paulozzi LJ, Wallace LJD. Fatal Injuries among Children by Race and Ethnicity: United States, 1999–2002. *MMWR Surveillance Summaries.* 2007; 56 (SS-5).
7. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control: Web-based Injury Statistics Query and Reporting System (WISQARS). Accessed on February 22, 2006 at *http://www.cdc.gov/ncipc/wisqars/default.htm*.
8. Wallace LJD, Patel R, Dellinger A. Centers for Disease Control and Prevention. Injury mortality among American Indian and Alaska Native Children and Youth – United States, 1989-1998. *MMWR*. 2003;52:697-701.
9. World Health Organization: *International Statistical Classification of Diseases and Related Health Problems, 10th Revision, Version for 2003*. Geneva. Accessed February 23, 2006 at *http://www3.who.int/icd/vol1htm2003/fr-icd.htm*.
10. Ogunwole SU: We the People: American Indians and Alaska Natives in the United States. *Census 2000 Special Reports*. 2006. U.S. Census Bureau.
11. Epstein M, Moreno R, Bacchetti P. The underreporting of deaths of American Indian children in California, 1979 through 1993. *Am J Public Health.* 1997;87:1363-1366.
12. Indian Health Service. *Adjusting for miscoding of Indian race on state death certificates*. Rockville, MD: US Public Health Service, 1996.
13. Hill R. Fatal injuries among American Indian and Alaska Native infants, 1992-1994. *IHS Primary Care Provider*. 1999; 24(7):109-114.
14. American Academy of Pediatrics, Committee on Child Abuse and Neglect: Distinguishing Sudden Infant Death Syndrome From Child Abuse Fatalities. *Pediatrics*. 2001;107: 437-441.
15. Department of Health and Human Services (DHHS). *Youth violence: a report of the Surgeon General* [online]. 2001. Available from URL: *www.surgeongeneral.gov/library/youthviolence/toc.html*.
16. National Highway Traffic Safety Administration (NHTSA), Dept. of Transportation (US). *Traffic safety facts 2003: Young drivers*. Washington (DC): NHTSA; 2004b [cited 2005 June 19]. Available from *www-nrd.nhtsa.dot.gov/pdf/nrd-30/NCSA/TSF2003/809774.pdf*.
17. Thomas D, Leicht C, Hughes C, et al. *Emerging Practices in the Prevention of Child Abuse and Neglect*. Caliber Associates and the Childrens Bureau, Office on Child Abuse and Neglect, Washington, DC, 2003.
18. Olds DL, Henderson CR Jr, Chamberlin R, et al. Preventing child abuse and neglect: a randomized trial of nurse home visitation. *Pediatrics.* 1986;78(1): 65-78.
19. Olds DL, Robinson J, Pettitt L, et al. Effects of home visits by paraprofessionals and by nurses: Age 4 follow-up results of a randomized trial. *Pediatrics*. 2004;114:1560 - 1568.
20. Rimsza ME, Schackner RA, et al. Can Child Deaths Be Prevented? The Arizona Child Fatality Review

Program. *Pediatrics*. 2002;110. The online version of this article is located at *http://www.pediatrics.org/cgi/content/full/110/1/e11*.
21. Hahn RA, Bilukha O, Crosby A, et.al. First reports evaluating the effectiveness of strategies for preventing violence: early childhood home visitation: findings from the Task Force on Community Preventive Services. CDC. *MMWR Recommendations and Reports.* 2003;52/RR-14.
22. Doll L, Bonzo S, Mercy JA, Sleet DA, eds. *Handbook of Injury and Violence Prevention.* New York: Springer; 2007.
23. Dinn-Zarr TB, Sleet DA, Shults RA, et al. Task Force on Community Preventive Services. Reviews of evidence regarding interventions to increase use of safety belts. *Am J Prev Med*. 2001;21(4S):48-65.
24. Zaza S, Sleet DA, Thompson RS, et al. Task Force on Community Preventive Services. Reviews of evidence regarding interventions to increase use of child safety seats. *Am J Preventive Med.* 2001;21(4S):31-47.
25. Shults RA, Elder RW, Sleet DA, et al. Task Force on Community Preventive Services. Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *Am J Preventive Med*. 2001;21(4S):66-88.
26. Liller, K (ed). *Injury Prevention for Children and Adolescents: Research, Practice and Advocacy.* Washington, DC: American Public Health Association; 2006.
27. CDC. Motor-Vehicle Occupant Injury: Strategies for Increasing Use of Child Safety Seats, Increasing Use of Safety Belts, and Reducing Alcohol-Impaired Driving. A Report on Recommendations of the Task Force on Community Preventive Services. *MMWR*. 2001;50(No.RR-7) (2). Accessed on April 16, 2007 at *http://www.cdc.gov/mmwr/PDF/rr/rr5007.pdf.*
28. Horn A, Grossman D, Jones W, et al. Community-based program to improve firearm storage in rural Alaska. *Injury Prevention.* 2003;9:231-234.
29. Systematic Reviews of Childhood Injury, Harborview Injury Prevention Research Center. Access April 16, 2007, at *http://depts.washington.edu/hiprc*.
30. Simons-Morton B, Hartos J, editors. Reducing young driver crash risk: proceedings of an expert conference on young drivers. *Injury Prevention*. 2002;8(supplement II).
31. Task Force on Community Preventive Services, Guide to Community Preventive Services, Motor Vehicle Occupant Injury. Accessed April 16, 2007 at *http://www.thecommunityguide.org/mvoi/default.htm*.
32. Mallonee S, Istre GR, Rosenberg M, et al. Surveillance and prevention of residential-fire injuries. *New England J of Medicine*. 1996; 335(1): 27-31.
33. Kuklinski DM, Berger LR, Weaver JR. Smoke detector nuisance alarms: a field study in a Native American community. *IHS Primary Care Provider*. 1996;21:148-153.
34. Alaska Department of Health and Social Services, Injury Prevention and Emergency Medical Services, Kids Don't Float Program: Accessed on April 16, 2007 at *http://www.hss.state.ak.us/dph/ipems/injury_prevention/kids_dont_float.htm*.
35. Safety belt use estimate for Native American tribal reservations subject to tribal law and tribal traffic enforcement. NHTSA, Traffic Safety Facts, Traffic Tech 304, September, 2005.
36. Smith M and Berger LR. Assessing community-based child occupant protection programs in three Northwest Tribes. *Injury Prevention.* 2002; 8:289-292.
37. American Academy of Pediatrics, Committee on Native American Child Health and Committee on Injury and Poison Prevention: The Prevention of Unintentional Injury Among American Indian and Alaska Native Children: A Subject Review. *Pediatrics*. 1999;104:1397-99.

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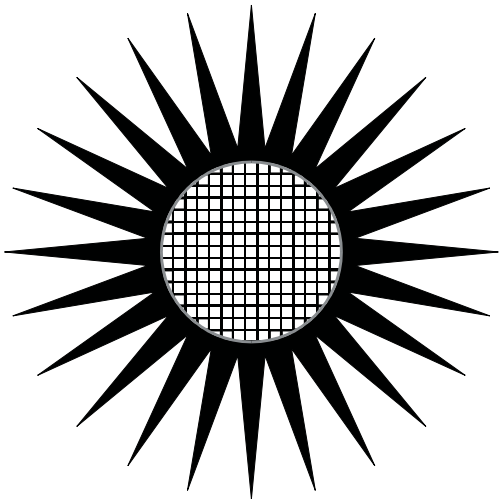
Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention or the Indian Health Service.



Using Evidence-Based Strategies to Reduce Motor Vehicle Injuries on the San Carlos Apache Reservation

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Introduction and Background

Motor vehicle injuries are a large public health burden for Americans Indians and Alaska Natives (AI/AN). In 2000, the overall motor vehicle injury death rate (age-adjusted) was 27.5 per 100,000 for American Indians/Alaska Natives versus 15.5 for US All Races. In Arizona, the rate was 76.8 for American Indians and 19.9 for All Races.[1] Motor vehicle injuries are an even more severe problem among members of the San Carlos Apache Tribe in eastern Arizona. In 2000, the motor vehicle injury death rate was 117 per 100,000 for American Indians who resided on the San Carlos Apache Reservation.[2]

The San Carlos (SC) Apache Indian Reservation is located in east central Arizona, 110 miles east of Phoenix. There are 10-12,000 tribal members residing on the reservation's 2,812 square miles. Tribal enterprises include a hotel and casino resort, convenience stores and gas stations, a telecommunications company, a construction aggregate supply company, and a saw mill. The unemployment rate in 2003 was 24.8%. There is an IHS hospital at San Carlos which serves primarily as an out-patient facility, and a satellite clinic about 30 miles east in Bylas, where there is also a police department sub-station. The SC tribal police department has 23 full-time officers. There are three full-time tribal judges.

The motor vehicle injury problem on the reservation is exacerbated by two factors: minimal occupant restraint use and alcohol consumption by drivers. In 2002, occupant restraint use on the reservation was 21% for drivers, 10% for adult passengers, and 0% for child car seats.[3] In comparison, the overall safety belt use rate for Indian country (excluding Navajo), was 55% and 81% for the United States overall.[4,5] A 1999 study of motor vehicle crashes (MVCs) on the reservation's four major roadways found that 24% of all crashes involved alcohol. Alcohol was involved in 50% of crashes with a fatality and 38% of all injury crashes.[7]

Evidence-based strategies refer to injury prevention interventions that research has proven to reduce injuries.[8-11] Table 1 summarizes the population-based interventions to reduce motor vehicle occupant injuries recommended by the US Task Force on Community Preventive Services.[12]

Table 1. Population-based interventions to reduce motor vehicle occupant injuries: Recommendations of the Task Force on Community Preventive Services[8]

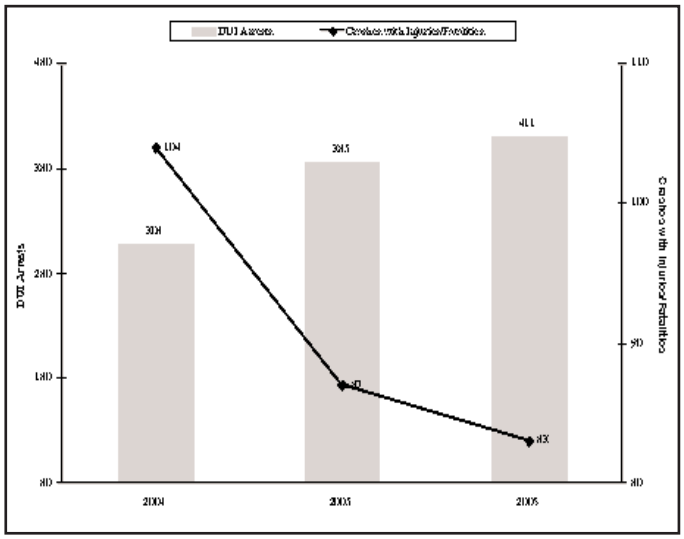
Use of Child Safety Seats
Child safety seat laws
Community-wide information and enhanced enforcement
Distribution and education campaigns
Incentive and education Programs
Use of Safety Belts
Safety belt laws
Primary enforcement laws
Enhanced enforcement
Reducing Alcohol- Impaired Driving
.08 blood alcohol concentration (BAC) laws
Lower BAC laws for young or inexperienced drivers
Minimum legal drinking age laws
Sobriety checkpoints
Intervention training programs for servers of alcoholic beverages
Mass media campaigns
School-based instructional programs

Methods

In December 2004, the San Carlos Police Department established a motor vehicle injury prevention program with funds from the Centers for Disease Control and Prevention (CDC). The Motor Vehicle Injury Prevention (MVIP) Program was funded for four years to implement evidence-based strategies to reduce motor vehicle-related injuries and deaths. It currently employes one full-time coordinator. The MVIP Program's interventions and programs were selected from *The Guide to Community Preventive Services*, a systematic review of community-based interventions.[12] Planned program activities included increased sobriety checkpoints, efforts to lower the legal limit to 0.08% blood alcohol concentration (BAC) for drivers on the reservation, and a public information media campaign.

In its first years of operation, the SC MVIP Program

Figure 1. Driving Under the Influence (DUI) arrests and crashes with injuries and/or fatalities on the San Carlos Apache Reservation, 2004-2006



focused on reducing alcohol-associated crashes. The program conducted sobriety checkpoints and implemented a comprehensive media campaign from 2005 through 2006. At a sobriety checkpoint, law enforcement officers systematically stop vehicles to assess drivers' level of alcohol or other drug impairment. Field sobriety and breathalyzer tests were utilized to assess alcohol impairment. The program reviewed sobriety checkpoint resources (manuals, policies, procedures, educational materials, media resources) from the Bureau of Indian Affairs Indian Highway Safety Program; Internet sites (e.g., the National Highway Traffic Administration website, *www.nhtsa.gov*); and by personal visits to other tribal and non-tribal police departments. Standard operating procedures were developed and approved for use by the SC Tribal Law and Order Committee. The locations, times of day, and days of the week for checkpoints were determined with anecdotal evidence and police crash reports. Sobriety checkpoints were conducted by the Police Department's DUI Task Force, which was instituted by the MVIP Program.

The comprehensive media campaign used both fee and non-fee based media. The media included the tribal newspaper and radio station, the local casino marquee, and public bulletin boards. Focus groups were held to develop specific and culturally appropriate messages. Messages were advertised more frequently during tribal and national holidays.

Approval for publication of this report was obtained from the San Carlos Apache Police Department.

Results

Between 2004 through 2006, there were 1,104 DUI arrests and 21 sobriety checkpoints involving 7,536 vehicles. An aggressive education and marketing campaign included 38 public service announcements and 21 community media events. These efforts were associated with a 33% increase in Driving Under the Influence (DUI) arrests, a 20% reduction in crashes involving injuries and/or fatalities (Figure 1), a 33% reduction in nighttime crashes, and 27% reduction in overall police-reported crashes. By contrast, driver, adult passenger, and child restraints – which were not specifically targeted for intervention in 2004 through 2006 — increased a very modest 8%, 6%, and 5%, respectively (Table 2).

Discussion/Conclusions

Sobriety checkpoints and a comprehensive anti-DUI media campaign are effective tools for use in American Indian communities. That the largest (33%) decline in motor-vehicle crashes occurred during night-time hours supports the conclusion that the DUI campaign contributed to decreased drinking and driving.

Our results are consistent with *The Guide to Community Preventive Services* findings that sobriety checkpoints can reduce injuries, deaths, and overall crashes. Several factors contributed to our program's success:

- Basing the MVIP Program in the Tribal Police Department
- Forming extensive partnerships
- Establishing a DUI Task Force
- Hiring a uniquely-qualified program coordinator
- Obtaining consistent funding
- Demonstrating community support
- Providing incentives to participating police officers

The establishment of the MVIP Program was a direct result of the foresight and commitment of the Tribal Police Department. The department's leaders recognized the need for a comprehensive prevention effort; the importance of reliable data collection for planning and evaluation; and the value of extensive partnerships. Having the MVIP Program housed in, and managed by, the police department led to tribal ownership of the program from its very inception.

Program partners included federal agencies (e.g., Indian Health Service, Centers for Disease Control and Prevention, Bureau of Indian Affairs), multiple law enforcement agencies (tribal, state, county, and city municipalities), a private-sector marketing firm, the non-profit Intertribal Council of Arizona (ITCA), and several tribal programs.

The DUI Task Force consisted of police officers, police department administrators (the chief of police and police captain), and the MVIP Program Coordinator. Having a designated Task Force allowed the department to focus enforcement resources on drinking and driving, improve communication with other police jurisdictions, create a strategic plan, and sustain the initiative over time .Long-term (four-years) financial support has enabled the program to carefully plan, implement, and evaluate the interventions. Major expenses included police officer overtime pay and equipment for the sobriety checkpoints.

The Program Coordinator is a San Carlos Apache tribal member with training in injury prevention and accounting, skill in using computers for desktop publishing and database searches, and experience as a tribal employee with SC law

Table 2. Summary of data related to the San Carlos Motor Vehicle Injury Prevention Program, 2004-2006.

Item	2004	2005	2006	*Change from 2004-2006*
Driving Under the Influence				
# of DUI* arrests	308	385	411	33.4 %
# of sobriety checkpoints	0	9	12	12
# vehicles stopped at DUI checkpoints	0	3,644	3,892	3,892
Media				
# of unpaid PSAs**, newspaper articles, local access channel	0	3	4	4
# of paid PSAs, newspaper articles, local access channel	0	11	20	20
# of community media events	0	9	12	12
Total crashes				
# of police-reported crashes	338	276	247	- 26.9%
# of crashes occurring in "daytime" (6 AM – 5:59 PM)	191	159	142	- 25.7 %
# of crashes occurring at "nighttime" (6 PM – 5:59 AM)	146	102	98	- 32.9 %
Crashes with injuries and/or fatalities				
# of crashes with injuries and/or fatalities	104	87	83	-20.2 %
# of fatal crashes	6	6	5	-16.6 %
Observed occupant restraint use (%)				
Drivers	13.2	20.9	20.8	7.6 %
Adult passengers	4.7	15.7	10.3	5.6 %
Children under 9 years	0	8.5	5.1	5.1 %

*Driving Under the Influence
**Public service announcements

enforcement and the Tribal Housing Authority. She has been able to bridge the disciplines of public health and law enforcement, and to work closely with community members, tribal agencies, and policy makers.

A survey in 2005 revealed extensive community support. Ninety-four percent of the respondents indicated it was "very important" to do something to reduce drinking and driving on the SC Apache Reservation, and 81% favored conducting sobriety checkpoints.

Our experience is consistent with factors associated with successful sobriety checkpoint programs nationally: an active local task force to manage checkpoints, available financial and human resources, an effective communication strategy, and support from the general public and officials to deter alcohol impaired driving.[13-16] Also of great value was the use of incentives to encourage participation by police officers in the DUI effort. Incentives included "home-cooked" meals before the checkpoints; awards (food, windbreakers, jackets) for exceptional performance; and an expense-paid trip to a national traffic safety conference for the officer with the most DUI arrests in a calendar year. The incentives were especially important in the face of a chronic shortage of police officers.

Conclusion

In May, 2007, the San Carlos Apache Tribal Council passed two important motor vehicle-related resolutions. The first lowers the presumption of alcohol impairment from a BAC of 0.10% to 0.08%. The second establishes a primary occupant restraint law for the SC Apache Reservation. Both these resolutions are expressions of a commitment to save lives and reduce injuries. They are also an expression of tribal sovereignty, in that the SC code will be a primary law while Arizona's adult occupant restraint law provides for only "secondary" enforcement (that is, seat belt citations can only be issued if a vehicle is stopped for some other violation).

The SC MVIP Program plans to increase its efforts to reduce alcohol-impaired driving by conducting sobriety checkpoints, increasing the frequency of BAC testing, and adopting uniform standards for coding on police reports. It will also seek to vigorously publicize and enforce the primary occupant restraint law.

The combination of police enforcement efforts, educating the public and stakeholders about the seriousness of motor vehicle crashes and methods of prevention, and advocating for needed policy change all greatly enhance the ability of tribe to

save lives and reduce suffering. We recommend these evidence-based strategies to other tribal communities seeking to reduce motor vehicle-related injuries and fatalities.

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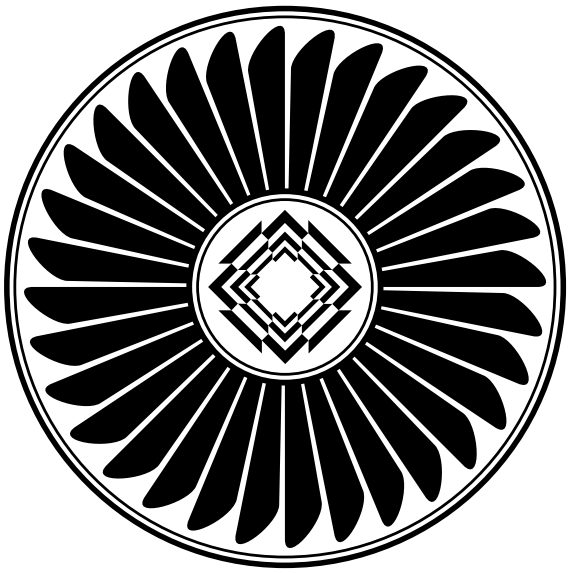
References

1. Web-based Injury Statistics Query and Reporting System (WISQARS): Fatal death reports. Accessed on May 4, 2007 at *www.cdc.gov/ncipc/wisqars*.
2. Mrela CK. *Health Status Profile of American Indians in Arizona, 2000 Data Book*. Phoenix, Arizona. Arizona Department of Health Services. April 2002. *http://www.azdhs.gov/plan/report/hspam/indian00.pdf.*
3. Piontkowski S. Seat belt observation data, IHS San Carlos Service Unit, 2007. Unpublished.
4. Leaf WA, Solomon MG. *Seat Belt Use Estimate for Native American Tribal Reservations* (October 2005). Washington, DC: National Highway Traffic Safety Administration; Report No. DOT HS 809 921.
5. Glassbrenner D, Ye J. *Seat Belt Use in 2006 – Overall Results (November 2006).* Washington, DC: National Highway Traffic Safety Administration; Report No. DOT HS 810 677.
6. Deleted during revision.
7. Crump W. A descriptive study of motor vehicle crashes on four major roads located on the San Carlos Apache Reservation (1999). San Carlos, Arizona: Indian Health Service. Unpublished.
8. Centers for Disease Control and Prevention. Motor-vehicle occupant injury: strategies for increasing use of child safety seats, increasing use of safety belts, and reducing alcohol-impaired driving. A report on recommendations of the Task Force on Community Preventive Services. *MMWR*. 2001;50(RR07):1-13.
9. Alcohol impaired driving. *Insurance Institute for Highway Safety Status Report.* 2005;40(4):1-8.
10. Centers for Disease Control and Prevention. National Drunk and Drugged Driving Prevention Month – December 2004. *MMWR*. 2004;53:1103.
11. National Highway Traffic Safety Administration. *The nation's new strategy to stop impaired driving*. Washington DC: Department of Transportation (DOT HS 809 746); 2004.
12. Motor Vehicle Occupant Injury. Guide to Community Preventive Services Website. Centers for Disease Control and Prevention. Accessed on May 7, 2007 at *www.thecommunityguide.org/mvoi/*.
13. Fell JC, Ferguson SA, Williams AF, Fields M. Why are sobriety checkpoints not widely adopted as an enforcement strategy in the United States? *Accident Analysis and Prevention*. 2003;35:897-902.
14. Bureau of Indian Affairs, Indian Highway Safety Program. *Impaired Driving Assessment.* Albuquerque, NM; March 6-10, 2006.
15. National Highway Traffic Safety Administration. *Grassroots support for impaired-driving law enforcement crackdown efforts*. Washington DC: Department of Transportation (DOT HS 810 364); 2006.
16. International Association of Chiefs of Police. *Impaired Driving Guidebook: Three keys to renewed focus and success*. June 2006. Access April 16, 2007 at: *http://www.nhtsa.dot.gov/people/injury/enforce/ImpDrGuidebook/images/ImpDrvGuide.pdf.*



The Bemidji Area IHS Sleep Safe Program: Increasing Smoke Alarm Usage in American Indian Head Start Homes

CAPT Diana M. Kuklinski, MS, RS, Director, Environmental Health Services Section, Bemidji Area Indian Health Service, Bemidji, Minnesota; and Harold Cully, BS, RS, Area Injury Prevention Specialist, Oklahoma Area Indian Health Service, Oklahoma City, Oklahoma

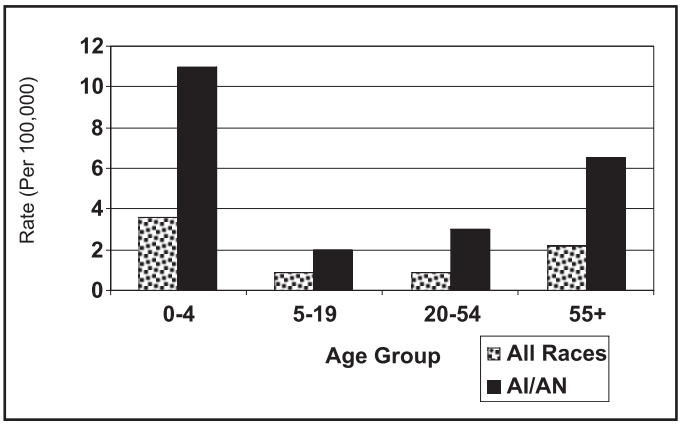
Introduction

The Bemidji Area Indian Health Service (BAIHS) Injury Prevention (IP) Program, part of the Environmental Health Service Section, provides services to 34 reservations in Minnesota, Wisconsin, and Michigan. Our program strives to reduce injury rates of American Indians (AI) by increasing tribal capacity in developing and implementing comprehensive local programs. This is achieved by IHS and tribal environmental health and injury prevention staff working in partnership with local communities in implementation of IP programs.

Although fire-related deaths and disparities have been declining gradually over the past two decades, the residential fire mortality rate for American Indians and Alaska Natives (AI/AN) is 1.5 times the national All Races rate.[1] In AI/AN populations, fire mortality rates vary geographically; they are highest in the north-central and middle western US and Alaska, where rates are 10 times the national All-Races rates.[2] The majority of fatal residential fires for all races combined occur in homes with absent or inoperable smoke alarm(s).[3] Other major risk factors include smoking, alcohol impairment, and physical disability.

Young AI/AN children (preschoolers) and elders are at highest risk of residential fire-related mortality[1]. The high rate of fire-related mortality in children has been attributed to their 1) limited ability to independently and/or quickly escape from a house fire; 2) lack of understanding of the need to escape from fire; and 3) difficulty in awakening from a deep sleep when a smoke alarm sounds.[4] In the Bemidji Area, young AI children aged 0 - 4 years old are at the highest risk of fire-related death (10.9 per 100,000)(Figure 1).[1] This is over three times higher than the All-Races rate for this age group (3.6 per 100,000) in Bemidji Area. Thus, Bemidji Area IHS has prioritized implementing fire safety programs aimed at reducing the exceedingly high rate of fire injury in young AI children.

Figure 1. Age specific fire- and burn-related deaths per 100,000 population, American Indians vs. All Races, by selected age groups, Minnesota, Wisconsin, Michigan combined (Bemidji Area IHS States), 1989-1998*



*Data presented are for years prior to implementation of the Sleep Safe Program

Since the first residential smoke alarm was patented in 1969,[5] they have proven to reduce residential fire-related death by 40 - 60 percent.[6] Although over 90 percent of homes in the US are reported to have at least one smoke alarm,[7] this is often not the case for AI/AN populations. In some AI/AN communities, fewer than half of the homes surveyed had even one operable smoke alarm, and smoke alarms were often disconnected due to frequent "nuisance" alarms from cooking or moisture from bathrooms.[8-10] Factors contributing to nuisance alarms in AI/AN homes include small home size (<1,000 square feet), prevailing use of frying as a cooking method, and location and type of smoke alarm installed.[8,9,11]

Many AI/AN children are enrolled in Head Start. Tribal Head Start grantees are funded through the Administration for Children and Families, Head Start Bureau, United States Department of Health and Human Services. The IHS Head Start Program, through an interagency agreement with the Head Start Bureau, provides preventive health support services for AI/AN grantees. Nationally, 197 tribal Head Start and Early Head Start programs provide comprehensive health, education, nutritional, and other developmental services to

25,911 AI/AN children ages 0 - 5 years in the US.[12] The local Head Start provides a central meeting place where children and parents congregate, classroom instruction and parent meetings, and education and interaction on a variety of topics, including health and safety. These messages are further reinforced by required home visits conducted by Head Start staff.

Several studies have shown that residential fire injury rates declined after targeting high-risk neighborhoods with smoke alarm installation combined with an education and media campaign.[13] Further, one study showed that Head Start home visitors were successful in increasing education and usage of smoke alarms in homes of Head Start children.[14] Consistent with these strategies, we created the Sleep Safe Program in 1998. The goal of this program is to reduce residential fire-related mortality in AI/AN children ages 0 - 5 years through provision of education and installation of smoke alarms. This program is a collaborative partnership between the IHS Division of Environmental Health Services, the US Fire Administration, and the IHS Head Start Program. It emphasizes community partnering via tribal Head Start programs, proper selection and location smoke alarms, education and reinforcement of fire safety educational messages, initial and follow-up home visits to assess smoke alarm operability, and proper installation of smoke alarms.

Methods: Sleep Safe Program Development

Indian Health Service Environmental Health Program staff coordinate the Sleep Safe Program's activities, with the lead Coordinator from the Oklahoma Area IHS and two co-coordinators from Bemidji Area IHS. The initial planning for this program involved a meeting in 1998 between IHS Environmental Health and IHS Head Start representatives to develop an outline for the curriculum.[15] The curriculum was intended to be flexible, based on the recognition that each community has a different set of needs, challenges, partners, and potential risk factors for fire-related injury. We also wanted to ensure flexibility for each site in designating their Sleep Safe Coordinator. The curriculum was drafted using a format consistent with that used in other Head Start educational materials. Additionally, activities were developed to meet Head Start performance standards in community partnering and safety.

Tribal Head Start programs are solicited annually to apply for the Sleep Safe Program. The University of North Carolina School of Public Health (UNC) provided assistance with development of a one-day annual Coordinator's workshop and on-going evaluation and monitoring for Sleep Safe sites participating between 1999 - 2001. They also evaluated the Sleep Safe curriculum annually and assisted in revising the program materials.

The initial curriculum consisted of four "guides" from which feedback was obtained by conducting three focus groups (3 - 6 participants each) of Arizona tribal Head Start teachers and community members who had reviewed and applied the materials at their respective sites. Input from the focus groups was used to improve clarity, readability, ease of application, content, and activities of the curriculum. A facilitator's guide from a resource manual previously developed through a collaborative project with the US Fire Administration to assist AI/AN communities in developing effective fire safety programs[16] was used to guide the focus group sessions.

Evaluation and revision of materials are key to ensuring the effectiveness of the Sleep Safe Program. On-going review of program implementation is accomplished through interviews with coordinators, evaluation of the curriculum and annual coordinator's workshops, retrospective data review, and quality assurance (QA) visits to homes by environmental health staff. The following are core components of the Sleep Safe Program:

Community partnering. Head Start's emphasis on community partnering allows each site to take advantage of local partners that can assist in implementation of their program. Such partners include environmental health, injury prevention, public health nursing, community health representatives, housing and fire departments, Honoring our Children (a Wisconsin program), and others. These partners assist with program implementation including training, data collection and analysis, and installation of smoke alarms.

Curriculum. The original curriculum was expanded from four to eight guides (Figure 2) and is used by project coordinators and their partners in developing and implementing their local comprehensive fire safety programs.

Training. An annual two-day workshop brings coordinators and their environmental health partners together to learn program goals and objectives, and administrative and technical requirements for project implementation. After the workshop, coordinators provide training to local Head Start staff, home visitors, parents, and Head Start students.

Home visits are provided by trained visitors initially and during follow-ups 2 - 8 months later.

Installation of photoelectric smoke alarms equipped with ten-year lithium batteries. Photoelectric smoke alarms were selected due to their lower rate of nuisance alarming.[8,9] We did not provide ionization models with hush buttons because 1) they are prone to nuisance alarming; and 2) many people tend to disable the smoke alarm rather than repeatedly activating the hush button.[17] Sites prioritize installation of smoke alarms to ensure that each home has at least one working smoke alarm. Additional smoke alarms, as available, are installed on each level of the home and in sleeping rooms.

Data tracking during home visits. The one page form collects smoke alarm presence and operability data during initial and follow up visits.

Each Sleep Safe site's progress is monitored via quarterly progress reports submitted to the IHS Sleep Safe Program Coordinator. These reports provide process data such as the number of initial and follow-up home visits conducted, smoke alarm operability, number of smoke alarms installed, training provided, and descriptions of other activities conducted.

Figure 2. Core components and purpose of the Sleep Safe Program Curriculum Guides*

Curriculum Guides	
Component	**Purpose**
1. Coordinator's Guide	Describes the roles and responsibilities of coordinators and EHO's in implementing program activities
2. Environmental Health Officer (EHO) Guide	Describes how to plan an effective smoke alarm distribution program, including installation, data collection, and follow-up activities
3. Smoke Alarm Distribution Guide	
4. Teacher's Guide	Describes fire safety educational activities that can be provided to parents and children by Head Start teachers
5. Staff and Childcare Provider's Guide	
6. Children's Guide	
7. Tribal Partnerships Guide	Describes how to expand fire safety partnerships and activities to the larger community
8. Resource Guide	Provides additional resources and Internet sites for fire safety information and activities

*Developed by IHS, USFA, and UNC to support the Sleep Safe Program

Because the goal of the Sleep Safe Program is to ensure at least one operable smoke alarm per Head Start student, impact data tracked are the percent increase in homes with at least one working smoke alarm as determined during initial and follow-up home visits. Anecdotal stories of Sleep Safe Program-installed smoke alarms alerting residents to fire are also collected and documented.

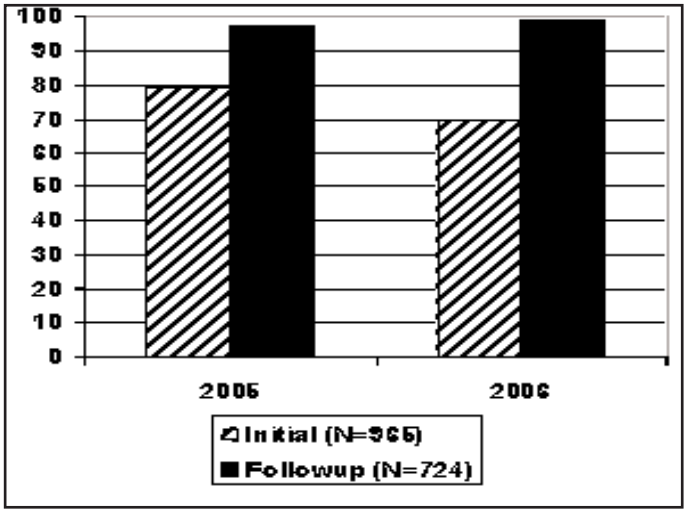
Results

Since fall 1999, 76 tribal Head Start grantees across the country have participated in the Sleep Safe Program as new or continuing sites. These programs have distributed over 20,000 smoke alarms. The results presented below focus on the efforts of the Bemidji Area IHS in implementing this program.

From 1999 to May 2006, the Sleep Safe Program has been implemented by 20 of the 27 Bemidji Area tribes with Head Start programs. Seven of the sites participated for four or more years, two participated for six years, and four participated for only one year. Bemidji Area IHS Sleep Safe sites installed 7,125 smoke alarms. The Minnesota Department of Health provided 984 of these smoke alarms. The cost of the smoke alarms installed by BAIHS Sleep Safe sites totals an estimated $106,876.

Prior to implementing the Sleep Safe Program in the BAIHS, we observed on several reservations that less than 50 percent of homes had at least one working smoke alarm. This is typical of sites in their first year of participation. Continuing Sleep Safe sites see many families re-enrolling their students for several years of Head Start, and their baseline smoke alarm operability tends to increase each year. During FY2005 and FY2006, among all sites in the Bemidji Area, smoke alarm operability increased 40 percent, from a baseline of 70 percent (N=965) to 99 percent (N=724) on follow-up visits (Figure 3). Because of the documented effectiveness of smoke alarms in reducing deaths in residential fires, the observed increase in smoke alarm operability would predict a decrease in residential

Figure 3. Percentage of homes with at least one working smoke alarm, initial and follow-up home visits, Sleep Safe Program Sites



fire mortality. Among American Indian/Alaska Native children ages 0 - 4 years living in the three states of the Bemidji Area (Michigan, Minnesota, and Wisconsin), there have been only two residential fire deaths in the five-year period 2000 - 2004. This compares to ten such deaths in the five-year period (1994 - 1998) preceding the implementation of Sleep Safe in 1999.[1] In addition, we have documented five anecdotal stories of lives saved by smoke alarms installed by local Sleep Safe programs.

Success in the Sleep Safe Program spurred some sites to expand activities within their communities to other aspects of childhood injury prevention. Six Bemidji Area Tribal Head Starts were funded by BAIHS for carbon monoxide (CO) detector installation projects that they did in conjunction with Sleep Safe activities. These sites distributed 906 CO detectors, usually as incentives to ease entry into homes during follow up smoke alarm visits. One site assisted a neighboring non-Tribal Head Start in implementing the program. Interest in child passenger safety led eleven Area Tribal Head Start grantees to apply for the Ride Safe Child Passenger Safety program. This program, implemented in FY 2003, was modeled after Sleep Safe in providing curriculum, educational outreach, and in this case, child safety seat installation. In Bemidji Area, implementation of the Ride Safe Program led to increased expertise of tribes in child passenger safety by training 41 certified CPS techs who distributed over 1,000 child safety seats.

During the initial years of the Sleep Safe program, problems were encountered in the quality of data obtained from many sites, especially those that discontinued participation in the program after one or two years. These problems included 1) forms submitted with inconsistent or missing data; 2) inclusion of self-reported data; 3) failure of some home visitors to fill out some or all of their forms; and 4) forms that were lost.

Discussion

Previous smoke alarm distribution programs often saw a lack of long-term operability of the devices. Residents frequently disconnected the smoke alarm if there were false ("nuisance") alarms, or they failed to replace a used battery. Sleep Safe addresses these problems by providing ten-year batteries and photoelectric alarms (which are less likely to nuisance alarm); educating parents about the importance of smoke alarms; and promoting parental involvement in the community fire safety effort.

Participation in Sleep Safe by tribal Head Start sites is voluntary. Successful implementation of the Sleep Safe Program varied among project sites. We sought to understand factors that contributed to sites that were able to implement the program and achieve increased smoke alarm usage. Characteristics of successful sites include a motivated coordinator; administrative support for the staff time commitment required of this program; and effective community partnering, especially with IHS or tribal environmental health and/or injury prevention staff. Although 20 sites in Bemidji Area have participated in this program, only seven continued for at least four years. This is due in part to high rates of staff turnover; variable support from Head Start administration; competing priorities and mandates; lack of support from local Environmental Health or Injury Prevention partners; and under-estimation of the time commitment. Some sites discontinued the program after a few years because they had saturated their communities with smoke alarms.

During the early years of the program, many sites were inconsistent in the collection and submission of good quality data. The first home visit data collection form collected volumes of data, some of which were unrelated to fire safety. One copy of this form was filled out during the initial home visit, and one during the follow up visit. Forms that were received often were incomplete, with inconsistent data, and often either the initial or follow up form for any given home was missing. Because of this, the home visit data collection form was radically simplified, with coordinator's feedback, to collect only smoke alarm installation and operability data. The two pages were combined into one page to keep initial and follow-up data together. A guide was also developed to facilitate and standardize staff training in data collection during field visits. In 2005 we implemented an on-line data collection and analysis program through *Surveymonkey.com*. This tool has greatly improved reporting and data analysis. The data training session was expanded at the annual coordinator's workshop, and we added a computer laboratory to teach participants data entry and analysis skills.

Random home visits for quality assurance made by a team of environmental health staff on one reservation revealed problems in home visitor standardization. Some of the home visitors had not physically tested the smoke alarms, instead they had telephoned residents or had the residents fill out their own data forms. Some home visitors installed smoke alarms incorrectly, suggesting a need for more effective training of home visitors. At one site, smoke alarms were simply handed out and not installed. We felt that these problems were due in part to lack of partnering by the site's local environmental health or injury prevention partner and lack of adequate training of Head Start home visitors.

Local environmental health and injury prevention staff can assist their sites by providing staff and community training, assisting with data collection and analysis, and in smoke alarm installations. Because environmental health and injury prevention staff, especially early on, were not often engaged in providing assistance to their sites, we cemented the relationship between them and their site in several ways, as follows: 1) we developed an Environmental Health Officer's (EHO) Guide to define the roles and responsibilities of EHOs to their sites; and 2) we required attendance by the EHO at the annual coordinator's workshop. After we made the above changes to data collection and EHO partnering, we obtained our first complete data sets for BAIHS sites during FY 2005 and FY 2006.

Conclusion

The BAIHS Injury Prevention Program recognizes that reducing injuries depends on the active involvement of communities. It aims to partner with communities to address local injury problems through locally developed solutions. We have demonstrated that the Sleep Safe Program is a promising strategy for increasing the number and operability of smoke alarms in homes of high-risk AI/AN Head Start children. It has also stimulated the development of community partnerships and expansion into other aspects of childhood injury. The Sleep Safe program can serve as a model and tool for local groups to use as a starting point for addressing fire and other injury problems in their communities.

References

1. CDC, National Centers for Injury Prevention and Control. (2007). Web-based Injury Statistics Query and Reporting System (WISQARS) [online]. Available from *www.cdc.gov/ncipc/wisqars*.
2. Patel RN, Wallace LJD, Paulozzi L. *Atlas of injury mortality among American Indian and Alaska Native children and youth, 1989-1998*. Atlanta, GA. Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. 2005.
3. United States Fire Administration. *Fatal Fires*. Topical Fire Research Series, Volume 5, Issue 1. 2005.
4. United States Fire Administration. *Fire Risk*. Topical Fire Research Series, Volume 4, Issue 7. 2004.
5. Hutchinson, Alex. *The Top 50 Inventions of the Past 50 Years.* Popular Mechanics, December 2005. Accessed on line on April 6, 2007 at *http://www.popularmechanics.com/technology/upgrade/2078467.html?page=3*.
6. Hall, JR. *US experience with smoke detectors: who has them? How well do they work? When don't they work?* Quincy, MA: National Fire Protection Association. 1989.
7. U.S. Consumer Product Safety Commission. *The Smoke Detector Operability Survey Report on Findings*. 1999.
8. Kuklinski DM, Berger LR, Weaver JR. Smoke detector nuisance alarms: a field study in a Native American community. *NFPA Journal*. 1996;90:65-72.
9. Fazzini TM, Perkins R, Grossman D. Ionization and photoelectric smoke alarms in rural Alaskan homes. *West Journal of Medicine*. 2000;173: 89-92.
10. Kuklinski D, Allen C. *White Earth Collaborative Elder Home Fire* Safety Project. *IHS Primary Care Provider*. 2001;26 (5):69-70.
11. Berger LR, Kuklinski DM. When Smoke Alarms are a Nuisance: A Call to Action. *Arch Pediatr Adolesc Med.* 2001;155:875-876.
12. Personal Communication (2007), CAPT Ralph Fulgham, Lead Environmental Health Specialist, IHS Head Start.
13. Douglas M, Mallonee S, Istre G. Comparison of community based smoke detector distribution methods in an urban community. *Injury Prevention.* 1998;4:428-432.
14. Johnston BD, Britt J, D'Ambrosio L, et al. A preschool program for safety and injury prevention delivered by home visitors. *Inj Prev.* 2000;6:305-309.
15. Kuklinski D. Mobilizing communities in fire safety: the Sleep Safe fire safety program. *The IHS Primary Care Provider*. 1999;24(9):132-135.
16. Kuklinski D. *Fire Safety Resource Manual for American Indian & Alaska Native Communities.* Supported by the Indian Health Service and the US Fire Administration. 1998.
17. *Smoke Detector Testing in Rural Alaska*. Juneau: Alaska Council on Science and Technology, Fire Safety Task Force; May 1982.

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The Role of Technical Assistance in the IHS Tribal Injury Prevention Cooperative Agreements Program (TIPCAP): Enhancing Injury Prevention Capacity Among Tribes and Tribal Organizations.

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The Indian Health Service (IHS) Injury Prevention Program (IPP) provides a multifaceted approach to developing the capacity of American Indian/Alaska Native tribes and tribal organizations to address their injury problems (Table 1). In 1997, the IHS IPP established the Tribal Injury Prevention Cooperative Agreements Program (TIPCAP) to enhance tribal capacity to address high rates of injury morbidity and mortality. TIPCAP provides varying levels of funding to tribes and tribal organizations for three purposes: to facilitate injury prevention program development (Part I); implement program interventions (Part II); and conduct injury prevention conference activities (Part III). During the three funding cycles from 1997 through the present, Part I TIPCAP funding has been provided to a total of 51 tribes/tribal organizations for a total of approximately $13.4 million (Table 2). This article describes the context and components of technical assistance provided to Part I TIPCAP sites, the lessons learned from our work, and the implications for other IHS and federal programs.

What Is the Context in Which Technical Assistance Was Provided?

To be eligible for Part I TIPCAP funding, tribes/tribal organizations must have a service population of at least 2,500 people and hire a full-time coordinator to manage the tribe's injury prevention program. Each site is assigned a local IHS staff member who serves as the site's project officer and immediate source of support and assistance. Through initial funding and annual continuation application processes, TIPCAP sites identify and prioritize local injury concerns and outline goals, objectives, activities, and program budgets to address them. Sites are encouraged to employ evidence-based injury prevention strategies.[1]

Beginning in 1997, the IHS contracted with the University of North Carolina School of Public Health to provide a variety of evaluation, monitoring, and technical assistance services to support the IHS IPP. The ten-year partnership with UNC has included 1) an evaluation of the 12 IHS Area injury prevention programs; 2) an evaluation and revision of the IHS injury prevention training program; and 3) support to four national injury prevention programs including the National Indian Safe Home Coalition, Sleep Safe (fire safety), Ride Safe (child passenger safety), and the TIPCAP. During the three TIPCAP funding cycles from 1997 to the present, UNC has provided monitoring, training, and technical assistance services to tribal and IHS staff participating in the program through six activities: 1) annual site visits; 2) conference calls (2 - 3 per year); 3) project newsletters (3 - 4 per year); 4) annual training workshops; 5) on-going technical assistance and training; and 6) consultation with IHS Headquarters staff.

The IHS IPP secured UNC's support to assist TIPCAP

Table 1. IHS Injury Prevention Program approach to building AI/AN injury prevention capacity

- Direct injury prevention funding to tribes and tribal organizations
- Injury prevention training program
  - Introduction to, Intermediate, and Advanced Injury Prevention Short Courses
  - Program Development and Epidemiology year-long fellowships
- IHS injury prevention staff at the Area, district, and service unit levels to assist tribes in designing, implementing, and evaluating injury prevention programs
- Technical assistance from external academic staff

Table 2. IHS Tribal Injury Prevention Cooperative Agreements Program Part I funding summary, 1997 - present

Funding Cycle	Funding Amount	Tribes/Tribal Organizations Funded by TIPCAP	
1997-1999	$25,000 per year for three years	1. Bristol Bay Area Health Corp., AK 2. Fort Peck Assiniboine & Sioux, MT[a] 3. Fallon Paiute-Shoshone Tribe, NV 4. Pueblo of Jemez, NM 5. Jamestown S'Klallam Tribe, WA 6. United Tribes Technical College, ND	7. Hoopa Valley Tribe, CA 8. Sac and Fox Nation, OK[a] 9. Miccosukee Corporation, FL 10. Osage Nation, OK 11. Pokagon Band of Potawatomi, MI 12. Ysleta del sur Pueblo, TX
2000-2005	$50,000 per year for two/five years	1. Caddo Nation, OK 2. CA Rural Indian Health Board, CA 3. Chickasaw Nation, OK 4. Colorado River Indian Tribes, AZ 5. Comanche Nation, OK 6. Eastern Band of Cherokee, NC 7. First Mesa Consolidated Villages, AZ 8. Fond du Lac Band of Ojibwe, NM 9. Hardrock Chapter, Navajo Nation, AZ 10. Hoopa Valley Tribe, CA 11. Pueblo of Jemez, NM 12. Kaw Nation, OK 13. Kodiak Area Native Association, AK 14. Navajo Nation Highway Safety, AZ 15. Northern Native American Health Alliance, WI 16. Norton Sound Health Corp., AK[b]	17. Oneida Tribe of Wisconsin, WI[b] 18. Pascua Yaqui Tribe, AZ 19. Pawnee Nation, OK[b] 20. Ponca Nation, OK[c] 21. Reno Sparks Indian Colony, NV 22. Rocky Boy/Chippewa Cree, MT 23. Sisseton Wahpeton Oyate, SD[b] 24. SouthEast Alaska Regional Health Consortium, AK 25. Spirit Lake Nation, ND 26. St. Regis Mohawk, NY 27. Taking Back Our Communities, AZ[b] 28. Three Affiliated Tribes, ND 29. Trenton Indian Service Area, ND 30. United Tribes Tech. College, ND 31. Ute Tribe, UT[b]
2005-2010	$50,000 per year for up to five years	1. Bristol Bay Area Health Corp., AK 2. Choctaw, OK 3. Indian Health Council, CA 4. Kiowa, OK 5. Norton Sound Health Corp., AK 6. Oneida Tribe of Wisconsin, WI	7. Osage Nation, OK 8. Quechan Indian Tribe, AZ 9. San Felipe Pueblo, NM 10. Sisseton Wahpeton Oyate, SD 11. Standing Rock Sioux, ND 12. Toiyabe Indian Health Project, CA 13. White Mountain Apache, AZ
	$75,000 per year for up to five years	14. Caddo Nation, OK 15. Northern Native American Health Alliance, WI 16. CA Rural Indian Health Board, CA 17. Fond du Lac Band of Chippewa, MN	18. Hardrock Chapter, AZ 19. Pueblo of Jemez, NM 20. Kaw, OK 21. Navajo Highway Safety Program, AZ 22. SouthEast Alaska Rural Health Consortium, AK

[a] Initial project funding began in July 1998.
[b] Six sites received funding for only two years (2003-2005)
[c] Funded only from 2000-2002

sites in designing and implementing effective injury prevention activities. Ten years of continuous work with various facets of the IHS IPP, particularly TIPCAP, has allowed UNC to understand program goals and proactively provide relevant guidance for improvements. UNC project team members have sought to establish effective relationships with those working in AI/AN communities by emphasizing rapport-building activities, active listening, acknowledging local expertise, and awareness of cultural appropriateness in communications.

Table 3. General skills enhanced by technical assistance

1. Writing specific and measurable objectives
2. Employing evidence-based, effective strategies
3. Planning multi-level injury prevention approaches (e.g., education, environmental modification, enforcement)
4. Collecting data to address objectives
5. Writing effective progress reports

What Components Are Important to Providing Technical Assistance?

It is important to devote time to build relationships by listening and learning how the tribes' injury prevention and other programs are managed. This requires that we both understand and appreciate contextual factors (e.g., administrative, economic, political, or social) with which the injury prevention coordinator must work when conducting injury prevention program planning, implementation, and evaluation. The technical assistance we provide must also be responsive to the immediate needs and interests of the coordinator. Identifying and considering site-specific issues ensures that we avoid making incorrect assumptions about how the coordinator may be able to manage the injury prevention program.

Before providing technical assistance related to the tribe's injury prevention program, we must understand its approach to reducing injuries. Careful review of the sites' funding applications (initial/continuation) and progress reports, with clarification from coordinators, enables us to plan and conduct effective conference calls and on-site visits. Site visits afford the most significant opportunity to provide technical assistance to coordinators and project officers. To enhance on-site assistance, we also ask coordinators to complete a technical assistance site visit planning survey. In addition, prior to the annual TIPCAP workshop, attendees complete a needs assessment to inform the workshop agenda topics and to prioritize knowledge and skill-building activities. Consistent assessment and feedback through these mechanisms has helped us to identify and better meet program-wide and site-specific technical assistance needs.

We plan our technical assistance efforts to increase knowledge (e.g., effective injury prevention strategies), and more importantly, to enhance skills among coordinators and project officers. Skill-building assistance has focused on five general areas (Table 3). We have also supported coordinators' abilities to conduct local training activities through their involvement in planning committees for the annual workshop. Coordinators and project officers actively participate in the processes of planning, implementing, and evaluating the annual workshop, which also helps to build public speaking and presentation skills. In addition, coordinators reinforce writing, marketing, and advocacy skills with submissions to the TIPCAP newsletter, presentations at local or national conferences/meetings, and progress reporting. Based on our understanding of a common set of needs across multiple sites, we also developed specific tools to assist program coordinators and project officers (Table 4). In addition, we facilitated a two-year process, involving retrospective data analysis and prospective data collection, working with 17 tribes to develop and pilot-test a protocol for collecting valid observational seatbelt use survey data, which has since been adopted by tribal and IHS staff in several IHS service Areas.[2]

Table 4. Specific Tools Provided to Address Technical Assistance Needs

1. Project reporting templates
2. Program planning/evaluation worksheets
3. Site progress/monitoring templates (tables, graphs)
4. Budget monitoring spreadsheets
5. Protocol for IHS staff to use with sites experiencing challenges to program implementation

Throughout all of our work, we have found it valuable to provide clear, consistent, and constructive messages that are reinforced in multiple ways. We communicate messages verbally during conference calls, site visits, and workshops, as well as in written form in newsletters, detailed conference call/site visit summaries, and supplemental handouts. We ensure that various staff involved with a program, including coordinators, supervisors, project officers, and IHS Headquarters staff receive our written feedback.

During the 2000 - 2005 TIPCAP funding cycle, our efforts to provide consistent technical assistance benefited from the development and use of a conceptual model that guided data collection and analysis and allowed us to assess the degree to which TIPCAP was successful in increasing injury prevention capacity, the program's stated purpose. Outlined in detail in our final report, available on the IHS IPP website, *http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm*, we measured capacity building using data from document reviews, on-site visits, conference calls, and multiple surveys.[3] We summarized data across five components: 1) program support; 2) program staffing; 3) program management; 4) intervention activities; and 5) degree of progress. An overall site summary measure was developed (advanced, intermediate, basic) to allow comparison within and across sites. Our efforts led to the provision of 18 recommendations for the TIPCAP to consider during future funding cycles, some of which are referenced in the next section. IHS Headquarters staff can use results from our data collection/analysis to advocate for continued or enhanced support for TIPCAP.

What Have We Learned from Our Work?

Technical assistance is more likely to be effective if it is based on a long-standing relationship of trust, is flexible, and is tailored to program coordinators' needs.[4] This is particularly true among AI/AN communities that may have had negative experiences with outside experts entering a community, often bringing assumptions and expecting collaboration. We agree that it takes at least two years to develop positive working relationships with AI/AN tribal representatives.[5] Our ten years of work with and for tribal communities has afforded us the unique opportunity to work on-site with over 100 tribes/tribal organizations across the US. This longevity and on-site work has greatly informed the types of technical assistance we are able to provide, the ways in which we provide it, and how our assistance and advice may be received in tribal communities and among IHS staff.

TIPCAP sites are funded as cooperative agreements, which include reporting requirements and assistance provided by project officers, with additional oversight from the IHS Headquarters program and contracts and grants office staff during continuation application processes. Sites have been encouraged to develop their programs to best meet local needs. We have recommended that TIPCAP enhance the ability of the program, overall, to assess its impact by 1) providing greater support and oversight for the development of comprehensive (e.g., process and impact) and well-constructed objectives (e.g., specific, measurable, time-specific); 2) ensuring complete and timely submission of standardized project reporting to capture similar information across sites; and 3) assessing annually the extent to which coordinators and project officers believe progress in meeting objectives has occurred. For the 2005 - 2010 funding cycle we are also recommending that sites develop logic models to provide an overview of their programs.[6,7] We anticipate that by developing logic models, sites will specify enhanced program objectives, conduct more focused interventions, and better understand the need to collect data to measure short and medium term impacts (e.g., changes in knowledge, behaviors, policies).

Similar to challenges experienced by other programs or organizations, TIPCAP has endured discontinuity in program leadership and oversight from IHS Headquarters. Such organizational challenges have put additional responsibilities on project officers, some of whom have limited experience in providing technical assistance/oversight, are geographically isolated from a site, and/or face budget constraints limiting on-site visits. While it has been effective to have an external group such as UNC provide on-going monitoring and technical assistance services, project officers bear primarily responsibility for local assistance and oversight and may need additional support to do this more effectively. TIPCAP's annual continuation application process allows project officers to formally provide recommendations and/or request special conditions regarding site work plans, objectives, and/or activities. This process could be strengthened with improved communication and agreement across the administrative units at IHS (e.g., Headquarters contracts and grants, Headquarters IPP staff, and project officers). An improved process should ensure that sites are both identifying and meeting well-stated and measurable objectives, something to which the TIPCAP program aspires.

The skills required of a coordinator to develop a comprehensive injury prevention program are substantial. We have learned that technical assistance must be defined broadly, going beyond discussions of effective injury prevention strategies and skill development in program planning, implementation, and evaluation. Technical assistance for injury prevention also includes the skills and sensibilities necessary to establish and maintain program partnerships that can result in changes at the individual, environment, and policy-levels. In some tribal communities, a history of inter or cross-departmental tensions limits collaborative relationships needed for community-based injury prevention programs. Therefore, an injury prevention coordinator must possess both the knowledge to plan effective prevention strategies and skills in communication, coalition building, and marketing/advocacy. We have proactively provided a wide range of skill development activities to those involved with TIPCAP. To address unintentional injuries (e.g., due to motor vehicle crashes), coordinators must have the skills to accomplish multi-level community-based interventions, which are different from prevention strategies used in more traditional clinical or health education programs. These skills include 1) providing education directly to community members to increase knowledge/skills (e.g., using one-on-one or media channels); 2) working with highway/road departments to identify and make improvements to roadways; and 3) working with tribal and municipal/state law enforcement, tribal judicial staff (judges, prosecutors), and tribal decision-makers to enhance and/or enforce exiting traffic safety laws/policies. When addressing intentional injuries (e.g., homicide, suicide), coordinators must develop partnerships with medically-based treatment disciplines as well as criminal justice system partners to address complex human, behavioral, and social conditions in tribal communities.

The types of assistance we provide must be appropriate for the experience and skills of TIPCAP coordinators. In some cases, we have also been asked to provide skill-building activities for others working with the coordinator (e.g., coalition members, colleagues, supervisors). More importantly, as outsiders, we have also learned the importance of understanding when and how to offer suggestions, how to diffuse conflict, and when to admit mistakes and accept differences of opinion. When waiting for and addressing technical assistance requests, we must exercise patience, especially when we are initially establishing relationships with coordinators and project officers.

In addition to the annual workshop evaluation, we have found it important to regularly survey and summarize satisfaction with our technical assistance services to ensure they were meeting local-level needs. On-going and meaningful self-reflection is essential and has enabled us to make improvements to the services provided to TIPCAP. For example, as a result of both feedback and our experience, we now conduct full-day site visits (instead of half-day visits) to allow for more on-site time for discussion and skill-building, and in 2005, we initiated group-format site visits for sites within geographic proximity to each other. We also recommended periodically conducting group-format conference calls to better facilitate networking among sites, which added to other networking and skill-building opportunities coordinators were provided to publicly speak about their multi-year injury prevention program efforts (e.g., at group-format site visits, annual workshops, and for other conferences).

What Are the Implications for Other IHS and Federal Programs?

There are advantages to contracting external organizations for technical assistance. They often have more current technical knowledge, a broader array of skills and expertise on staff, and

the ability to respond quickly to address situations that require immediate attention.[4] External organizations do not supervise the program; therefore staff may be willing to reveal program weaknesses and explore solutions.[4] To provide tailored technical assistance, we recommend establishing long-term partnerships (if possible) with external organizations by emphasizing rapport-building; continuously reflecting on how services are provided; and communicating program progress, responsibilities, and recommendations in ways that are clear, consistent, and realistic. Technical assistance is also enhanced with staff continuity over time. For example, two UNC team members have been involved throughout the ten years of collaboration with tribes/IHS. This continuity of experience has allowed for long-term vision, a deep understanding of the program, and time to improve on services. During the 2000 - 2005 TIPCAP funding cycle, the program invested between 10 to 15 percent of its budget to external technical assistance. This important investment is appropriate, considering the TIPCAP budget and the burden that injuries have in Indian Country.

Federal or state programs that provide funding to multiple sites, particularly those that involve cooperative agreements, can benefit from the approach used by TIPCAP. In particular, programs that provide input, oversight, and technical assistance to funded sites will benefit from using a continuous improvement process. We encourage other programs to pay careful attention to 1) understanding local-level/contextual issues; 2) regularly assessing coordinator and project officer technical assistance needs; 3) meeting those needs by providing clear, consistent, and tailored technical assistance; and 4) finding ways to summarize program information by and across sites in order to communicate program impact to decision- and policy-makers.

References

1. Task Force on Community Preventive Services. Recommendations to reduce injuries to motor vehicle occupants: increasing child safety seat use, increasing safety belt use, and reducing alcohol-impaired driving. *Am J Prev Med*. 2001; 21(4S):16-22.
2. Bowling JM, Crump C, Cannon M, et al. Seat Belt Observational Survey Protocol Development Project Final Report. Chapel Hill, NC: The University of North Carolina School of Public Health, Department of Health Behavior & Health Education. Available at *http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm*. 2005.
3. Crump C, Cannon M, Letourneau RJ, et al. Indian Health Service Tribal Injury Prevention Cooperative Agreement Program 2000-2005 Final Report. Chapel Hill, NC: The University of North Carolina School of Public Health, Department of Health Behavior & Health Education. Available at *http://www.ihs.gov/MedicalPrograms/InjuryPrevention/index.cfm*. 2007.
4. Neufeld GR. Technical assistance in human services: an overview. In: Sturgion MLT, Ziegler A, Neufeld R, & Wiegerink R, eds. Technical Assistance: Facilitating Change. Bloomington: Development Training Center, Indiana University; 1978:19-38.
5. English K, Wallerstein N, Chino M, et al. Intermediate outcomes of a tribal community public health infrastructure assessment. *Ethn Dis*. 2004;14:S1-61-SI-69.
6. Goldman KD, Schmalz KJ. Logic models: the picture worth ten thousand words. *Health Promot Pract*. 2006; 7(1):8-12.
7. WK Kellogg Foundation. Using Logic Models to Bring Together Planning, Evaluation, and Action: Logic Model Development Guide. Battle Creek, Michigan: WK Kellogg Foundation. 2004.

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