Despite the finding that HIV-tested adolescents were at higher risk, more than half of those reporting an HIV-antibody test actually had no self-reported risks for HIV infection. This finding, coupled with the finding that tested students knew less about HIV and AIDS, points to the critical role of HIV education. Educating adolescents about methods of HIV transmission and protection and engaging them in personal HIV risk assessment activities can help to correct some of the myths and worries of adolescents while dispelling the notion that adolescents are immune to the risk of HIV infection. A thorough discussion of the HIV testing and counseling process and a review of reasons to seek HIV testing must be included within any HIV education program.

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Prevalence of Risk Factors for Residential Fire and Burn Injuries in an American Indian Community

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Synopsis

Fatality rates from residential fires are high among American Indians. Contact burns and scalds are also among the leading types of thermal injuries. Information about the prevalence of risk factors for burn injuries is required to design interventions aimed at reducing residential fire and burn injuries. The authors conducted a survey in July and August 1992 of 68 households located in a small American Indian community in Washington State to ascertain the prevalence of selected risk factors for residential fire and burn injuries.

Nearly all households (96 percent) in the study had a smoke detector, and 95 percent of those tested were functioning. However, a high prevalence of other household characteristics associated with excess risk of residential fire and burn injuries was identified: 59 percent of households had at least one member who smoked, 25 percent had a member who smoked in

bed, 38 percent had a member who drank alcohol and smoked at the same time, 46 percent used wood stoves as a heat source, and 15 percent of households were mobile homes.

Thirteen percent of households had at least one fire during the previous 3 years, and the incidence of burns due to all causes and requiring medical treatment was 1.5 per 100 persons per year. Hot water temperature was measured to determine the potential risk for scald burns, and 48 percent of households had a maximum hot water temperature of 130° or more Fahrenheit. Such surveys can guide intervention strategies to reduce residential fire and burn injuries in American Indian communities.

Residential fires rank fourth among causes of unintentional injury deaths (*1*) and account for three-quarters of all fire deaths in the United States. Unintentional injury mortality rates, including those associated with residential fires, are higher among American Indians (AI) than among the general U.S. population (*2*). A study in King County, WA, found the crude incidence rate of residential fire injuries among American Indians to be 4.4 times greater than among whites (*3*). Scald and contact burns are also leading causes of burn injuries among American Indians. In an American Indian community in Arizona, contact burns accounted for 43 percent and scald burns for 33 percent of emergency room burn visits (*4*).

Several specific residential and personal characteristics are associated with an excess risk of residential fire and burn injuries (*5,6*). Households who have cigarette smokers and alcohol consumers among their members are at increased risk for fire injury (*7,8*). Heating equipment is a leading cause of house fire deaths (*9,10*). Similarly, risk of fire fatality is greater for people in mobile homes and in homes without a smoke detector (*9*).

Efforts to reduce the incidence of fire and burn injuries among AI must be based on an adequate understanding of the prevalence of risk factors in affected communities. We conducted a household survey during July and August 1992 in an AI community in Washington State to identify the prevalence of selected characteristics associated with an excess risk of residential fire and burn injuries.

Methods

A list was prepared of all households in Kitsap County, WA, which, according to tribal records from July 1992, included at least one enrolled member of the Suquamish Tribe. From the 211 households, a systematic sample of 106 households was created by selecting the first household as the starting point and selecting every other household thereafter. Of these, 92 were identified as having tribal members living in Kitsap County during the interview period (others had moved or were deceased). The Suquamish Tribe, a small northwest coastal Salish tribe, has approximately 750 enrolled members.

Face-to-face household interviews were conducted at 68 (74 percent) of the 92 households during the period July 10 to August 28, 1992. Of the 24 nonrespondents, 8 declined to be interviewed and 16 could not be contacted. Contact was made by an unannounced home visit or telephone. The desired respondent was defined as a household member 18 years or older who was identified, by the initial person contacted, as being the most knowledgeable about the survey topic. If unavailable, another adult household member was interviewed. The survey questionnaire included 88 open-ended and closed-ended questions about knowledge and practices related to residential fire and burn injuries, their prevention and incidence.

After the interview, the surveyor tested the function of the smoke detector closest to the sleeping area, using a commercially available smoke detector testing spray (*A*). Two measurements of the maximum hot tap water temperature were obtained at a faucet in either the kitchen or bathroom, using a digital thermometer (*B*). The survey and testing took approximately 30 minutes to complete.

Results

Selected characteristics of the survey respondents and households are shown in the table. Eighty-one percent were AI, and three-quarters were female. Of study households, more than half were located on a reservation. Most households were single- or two-family homes; 15 percent were mobile homes.

Electricity was the leading type of heat source (79 percent), and nearly half of households used wood stoves. Other sources were fireplaces, gas, and portable space heaters.

Of the study households, 96 percent had at least one installed smoke detector. Of the smoke detectors tested in each of 62 households, 59 (95 percent)

Selected characteristics of respondents and households, fire injury study, Suquamish Tribe, 1992 (percentage)

Characteristic	Respondents (N=68)
Age, years (mean = 41.3 ± 18.1):	
18–34	46
35–54	29
55 or older	25
Sex:	
Female	76
Male	24
Race:	
American Indian	81
White [1]	19
Highest education completed [2]:	
Less than high school	12
High school graduate or beyond	87
Type of home:	
Single- or two-family house	82
Mobile home	15
Apartment, townhouse, condominium	3
Home ownership:	
Rent or renting to own	50
Own	49
Other	2
Home located on reservation	60
Working telephone	88
Annual household income [3]:	
Less than $15,000	49
$15,000–40,000	29
More than $40,000	15
Heat source type (primary or secondary):	
Electricity	79
Wood stove	46
Fireplace	15
Gas	9
Portable	3
Households with at least 1 installed smoke detector	96
Smoke detector types tested (N=62) [4]:	
Battery	55
Electrically wired	44
Unknown	2
Smoke detector alarm sounded with testing	95
Household with member who smokes cigarettes	59
Household with member who smokes in bed	25
Household with member who drank alcohol in past month	59
Among those who drank alcohol in past month, household with members having:	
Less than 5 drinks on any occasion	50
3–4 drinks on any occasion	73
Household with member who smokes cigarettes and drinks alcohol at same time	38

[1] Other household member was Suquamish Tribe member.
[2] 1 respondent refused.
[3] 5 respondents refused or did not know.
[4] Testing not performed in 3 households with installed smoke detectors.
NOTE: Totals may not add to 100 percent because of rounding.

functioned when tested. Of those tested, 55 percent were battery operated and 44 percent were electrically wired. A majority (59 percent) of households reported that a smoke detector sounded the alarm when no uncontrolled fire was present; cooking was the most common cause (84 percent). Two of the three households that had no smoke detector gave "false alarms" as a reason for not having a detector.

Fifty-nine percent of households had at least one member who smoked, and 25 percent had a member who smoked in bed. Thirty-eight percent had a member who consumed alcohol and smoked at the same time. Forty-eight percent of households had a maximum hot tap water temperature 130° or more Fahrenheit (F)—the temperature at which a scald burn can occur within 30 seconds—and 16 percent had a maximum hot water temperature 140° or more F—the temperature at which a scald burn can occur within 10 seconds.

Thirteen home or yard fires occurred in nine households (13 percent) over the 3-year period before the survey, resulting in an incidence rate of 6.4 fires per 100 households per year. Information reported about the most recent fire that occurred in each of the nine households showed that one was the result of outdoor burning and eight occurred indoors (five kitchen grease fires, one in a bedroom started by a cigarette lighter, two other). Of the indoor fires, a smoke detector was reported to have sounded an alarm in seven instances. Only one fire resulted in an injury.

In 20 households (29 percent), a member was burned at home due to any cause during the previous year; 4 of the 59 burns received medical treatment. Fireworks, sold widely on the reservations, caused a burn or injury to a household member in 9 percent of study households during the previous 3 years.

Discussion

A high prevalence of modifiable personal and environmental characteristics (such as cigarette and alcohol use, smoking in bed, and use of a wood stove) known to be associated with excess risk of residential fire injuries was identified in this study. Although a study of persons in four other AI communities in Washington showed similar rates of smoking and alcohol use (*11*), the high prevalence of functioning smoke detectors, known to be protective against fatal residential fire injuries, was unexpected. Among four AI communities in western Washington, 24 percent of adults reported that there were no smoke detectors in their homes (*11*).

The proportion of homes with smoke detectors in

this study compared favorably to both King County, WA, (*12*) and Fairfax County, VA, (*13*) where independent studies during 1985 showed 91 and 84 percent of households had smoke detectors, 83 and 84 percent of which were working, respectively. The variation of risk factor prevalence among these communities highlights the importance of obtaining community-specific data before initiating programs to reduce fire injury rates in American Indian communities. An intervention focused on ensuring the presence of smoke detectors in households would have been superfluous in the community studied.

The proportion of households in this study with a hot water temperature of 130° or more F (48 percent) was substantially greater than that found in Seattle in 1988 (*14*). The Seattle study, conducted 5 years after passage of Washington State legislation requiring that new hot water heaters be set at 120° F, found that 16 percent of households with heaters installed after the law and 30 percent of heaters installed before the law had temperatures 130° F.

Although this study was not designed primarily to determine the incidence of residential burn injury, the results are consistent with high reported risk of residential burn injury rates among AI in the region (*3*). The rate of burn injuries occurring at home that received medical attention (1.5 burns per 100 persons per year) is somewhat higher than the rate of approximately 0.4 burns per 100 persons per year estimated in the 1985–87 National Health Interview Survey (*15*). The high reported incidence of residential fires (13 percent of households with at least one fire during the 3 years before the study) also highlights the high risk of the community.

Effective efforts to reduce fire and burn injuries in AI communities may require environmental modifications such as installation of smoke detectors, automatic sprinkler systems, or water heaters pre-set at temperatures less than 120° F. Programs to reduce behavioral risk factors associated with fire and burn injury will be needed. However, because of the cultural, geographic, and socioeconomic diversity among AI communities, community-specific baseline data should be acquired before designing intervention strategies.

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Equipment

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B. Taylor digital pocket thermometer. Thermometer Corp. of America, 280 Cane Creek Road, Fletcher, NC, 28732.