

# Within the Hidden Epidemic: Sexually Transmitted Diseases and HIV/AIDS Among American Indians and Alaska Natives

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**Objectives:** To review the epidemiology, research, and prevention programs for sexually transmitted diseases in American Indians and Alaska Natives (AI/ANs).

**Study Design:** We reviewed the current national and regional trends in sexually transmitted diseases (STDs) for AI/ANs from 1998–2004, peer-reviewed studies from January 1996, through May 2006, and reports, unpublished documents, and electronic resources addressing AI/AN STD prevention and control.

**Results:** STD prevalence among AI/ANs remains high. For example, the case rate of *C. trachomatis* in the North Central Plains AI/AN populations is 6 times the overall US rate. Trends for *C. trachomatis* also show sustained increases. Little research exists on STDs for this population, and most is focused on HIV/AIDS. Fear of compromised confidentiality, cultural taboos, and complex financial and service relationships inhibit effective surveillance, prevention, and management.

**Conclusions:** Recommendations for STD control in this population include improved local surveillance and incorporation of existing frameworks of health and healing into prevention and intervention efforts. Research defining the parameters of cultural context and social epidemiology of STDs is necessary.

SEXUALLY TRANSMITTED DISEASES (STD) in American Indians and Alaska Natives (AI/ANs) are an important public health concern, with reported case rates for chlamydia, gonorrhea, and syphilis that are 2 to 6 times higher than rates in non-Hispanic whites (in keeping with the 1977 National Congress of American Indians and the National Tribal Chairmen's Association resolution, we use the term American Indians and Alaska Natives, abbreviated to AI/AN. We also use the term Native to refer to both American Indians and Alaska Native peoples).<sup>1</sup> Recent data suggest that the gap in prevalence of most reportable STDs between AI/AN and other racial/ethnic groups may be widening.<sup>1,2</sup> Women infected with chlamydia and gonorrhea often experience significant sequelae including pelvic inflammatory disease, ectopic pregnancy,

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and tubal infertility.<sup>3</sup> Untreated syphilis may cause congenital syphilis in newborns, blindness, stroke, heart disease, and death.<sup>3,4</sup> In addition, these STDs have been shown to facilitate the acquisition and transmission of HIV.<sup>3,5,6</sup> The annual direct cost of STDs, including HIV, is estimated to be between \$9.3 and \$15.5 billion dollars.<sup>3,7</sup> For facilities that care for AI/ANs, the costs associated with a higher STD burden may strain already scarce resources.

Despite the high morbidity and economic costs of STDs for this population, current practices of screening, treatment, and follow-up in AI/AN communities appear to be suboptimal.<sup>8,9</sup> Improvements in STD control and prevention are clearly needed, yet little is known about which components of STD programs or prevention activities may be most effective for controlling the spread of STDs in this population.

The challenges of addressing STDs in the AI/AN community reach beyond resource allocation or clinical models of treatment. The epidemiologic profile of STDs among AI/ANs manifests from myriad factors, including complex social and sexual networks, varying cultural proscriptions regarding sexual activity, health, and help-seeking, availability of appropriate treatment and partner management strategies, and coordination of tribal, state, and federal programs. In this article, we will review the current epidemiologic evidence, research, and programmatic activities related to STDs, including HIV/AIDS, among AI/ANs. Thus, this effort

Support for this project came from the National Institute of Mental Health grants R01 MH59017 and R01 MH69086, and the Centers for Disease Control and Prevention.

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Received for publication December 8, 2005, and accepted February 3, 2007.

represents the first comprehensive synthesis of an often obscure and elusive literature on STDs in AI/AN communities.

### *Demographic and Health Context of AI/ANs*

Health disparities are often highly correlated with economic and social disparities. A review of the conditions in which many AI/ANs live may provide important context to the rates and trends of STDs in this population. According to the 2000 US Census, AI/ANs comprise less than 2% of the total US population.<sup>10</sup> They may belong to one or more of 560 federally recognized tribes or Alaska Native Villages,<sup>11</sup> all immensely diverse in cultural traditions, ways of living, and epidemiologic profiles. About 60% do not live on a reservation or tribal area, yet frequently travel between urban areas and tribal lands for ceremonies, education, or employment opportunities. About 28% of all AI/ANs live in poverty, compared with 12% of the total population.<sup>10</sup> Unemployment rates are above 10% for most tribes (likely underestimated since they exclude persons no longer looking for work); households are crowded; and educational achievement lags behind other Americans, with only 10% of all AI/ANs living on tribal lands holding a bachelor's degree or higher, compared with 24% in the US general population.<sup>10</sup> AI/ANs also endure elevated levels of mortality and morbidity. For example, age-adjusted mortality rates show that AI/ANs are over 7 times more likely to die from alcoholism when compared with the US general population, one and a half times as likely to die from firearm wounds, and over 3 times as likely to die in a motor vehicle-related injury.<sup>12</sup> Although we know little about how this environment may shape AI/AN sexual risk-taking and the subsequent patterns of STDs, evidence suggests that trauma and ongoing stress may be deleterious to sexual health.<sup>13–15</sup>

## **Materials and Methods**

### *National Surveillance*

For the purposes of this article, "STDs" refer to chlamydia, gonorrhea, syphilis, and HIV/AIDS. HIV/AIDS can be nonsexually transmitted, but we include the disease in this review because of its close association with sexual activity. We used published reports from Centers for Disease Control and Prevention (CDC) surveillance systems of nationally notifiable diseases to calculate rates of chlamydia, gonorrhea, and syphilis and HIV/AIDS among AI/ANs.<sup>16–19</sup> Cases are defined according to CDC's *Sexually Transmitted Diseases Treatment Guidelines*.<sup>20</sup> Laboratories or physicians are required to send reports of positive cases of chlamydia, gonorrhea, syphilis, and AIDS to local or state health departments, which are subsequently forwarded to CDC for compilation.<sup>20</sup> The case rate is then calculated using the relevant estimated census population base (county, state, etc.), corrected for projected increases (or declines).

Compulsory reporting of AIDS is required in all 50 states and the District of Columbia. However, not all states have implemented CDC standards for name-based HIV reporting, and some have large AI/AN populations such as California, Illinois, and Washington. Oregon and Connecticut have name-based HIV reporting only for children under the age of 13.<sup>18</sup> For this reason, surveillance-based estimates of HIV prevalence are likely to characterize the HIV-related profile inaccurately for the AI/AN population. Here, we present only national AIDS rates.

### *IHS Surveillance*

For local AI/AN rates, we used data provided by the CDC and Indian Health Service (IHS) for IHS service areas to demonstrate

the increased differentials in areas of relative AI/AN concentration.<sup>21</sup> The IHS divides its responsibilities into 12 regions, comprising 621 service counties (usually on or near tribal lands), with an estimated service population of some 1.7 million AI/ANs, (about 61% of all AI/ANs in the United States). Case rates were compiled using AI/AN population data from these counties, in combination with AI/AN case-reporting geographically linked to these counties (summarized to the regional level). No IHS regional estimates of AIDS cases are available.

The IHS estimates used here were calculated in a similar manner as national CDC STD rates, using AI/AN cases and AI/AN-specific county populations. However, local variability in adherence to those specifications is possible,<sup>21</sup> and may be a particular problem at tribally-operated facilities (distinct from IHS-, privately-, or publicly-operated facilities). Because of tribal sovereignty, these facilities are not tied to the same reporting requirements that are mandated by states; tribally-operated facilities may choose not to report STD cases to the state or county surveillance system.<sup>22</sup> The extent of this problem and its affect on overall or regional rates is not possible to determine. One study indicated that of those responding to a survey, 85% of tribally-operated and urban Indian health care facilities report HIV/AIDS cases to state or county authorities, and only 71% report chlamydia and gonorrhea (however, only 55% of facilities participated in the survey).<sup>23</sup>

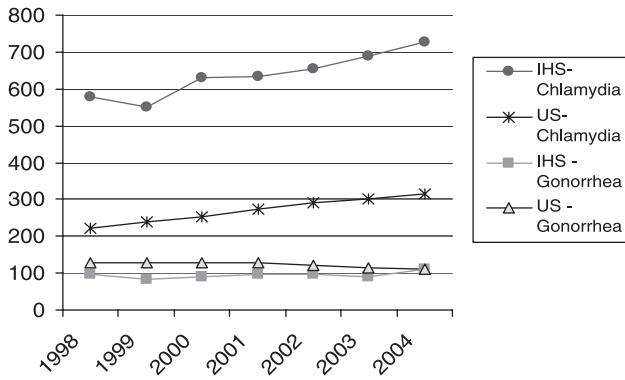
### *Literature Search Strategy*

We performed a Medline and PsycInfo search of articles appearing in peer-reviewed journals on STDs among AI/ANs from January 1996 through May 2006. We constructed two lists of terms for our search strategy: one for STDs, which included "sexually transmitted diseases," "STDs," and each of 4 STDs (chlamydia, gonorrhea, syphilis, and HIV/AIDS). The second list was comprised of population terms, including "American Indian," "Alaska Native," "Native American," and "Aboriginal." We selected those articles that focused on AI/AN populations and STDs, including studies based on Canadian populations. We included studies on human papillomavirus (HPV) that appeared as a result of these search terms. HPV is not a reportable STD, but is a significant area of morbidity for AI/AN populations and thus merits mention. We excluded quantitative studies that mentioned AI/AN groups with small sample sizes. Finally, because research challenges, programs, and services in these communities often do not appear in peer-reviewed journals or program proceedings, we conducted internet and manual searches to identify available reports delineating sexual risk factors and STD prevention and control efforts occurring in AI/AN communities. Additionally, each member of the Taskforce (coauthors) has worked with diverse AI/AN communities in different capacities; each contributed relevant unpublished literature to this review.

## **Results**

### *Epidemiology of STDs Among AI/ANs*

*Chlamydia.* Trends in AI/AN chlamydia case rates from 1998–2004 show a slightly lower rate of annual average increase (4%) when compared with the overall US case rate (6%); however, the AI/AN rates are over twice as high as the overall US rates (Fig. 1). Figure 2 shows specific IHS regional patterns of chlamydia case rates for 2004. All IHS regions except the California region have higher case rates when compared with the overall US rate; the Aberdeen area (North-Central Plains) chlamydia rate was 6 times higher than the overall US rate.



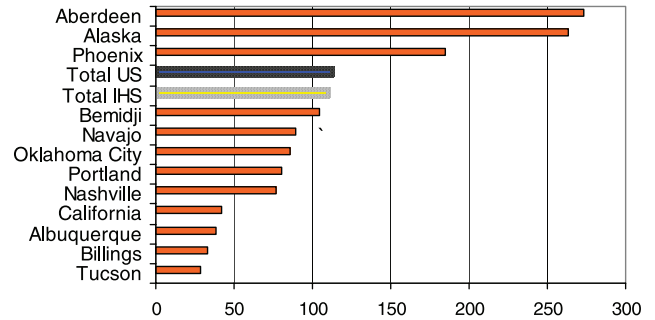
Source: Wong, 2006

Fig. 1. IHS and US chlamydia and gonorrhea, rates per 100,000, 1998–2004.

**Gonorrhea.** In contrast to the pattern for chlamydia, the AI/AN gonorrhea case rate was similar to the US rate. However, the AI/AN trend over this time period reflects a 3% average annual increase, whereas that for the United States overall reveals a 2% average annual decrease for the same period (Fig. 1). Figure 3 shows IHS regional trends for gonorrhea. All but 3 regions (Aberdeen, AK, and Phoenix) show lower rates than the US rate; however, both Aberdeen and Alaska regions are twice the level of the overall US rate, and all but 3 regions (Billings, Nashville, and Oklahoma City) have shown increases over the prior 6 years, counter to the overall United States trend (data not shown).

**Syphilis.** The national case rates for primary and secondary syphilis among AI/ANs have increased from 2.2 to 3.2 per 100,000 from 2000 through 2004, paralleling the overall US case rate increase (2.1–2.7 per 100,000).<sup>17</sup> For the IHS service population, the estimated increase is from 1.3 to 3.5 per 100,000.<sup>21</sup> Syphilis often occurs in association with discrete outbreaks, and thus national statistics may mask such events occurring in specific AI/AN communities.<sup>9</sup> In one Southwest US American Indian community, for example, over 93 cases of syphilis were reported between 2000 and 2003, with 3 associated cases of congenital syphilis.<sup>9,24</sup> In a 2004 outbreak in Maricopa County, AZ, the AI/AN rate was 18.6 per 100,000.<sup>25</sup> In the Southeast United States, the AI/AN rate for one community reached levels of 112.4 cases per 100,000 persons in 2001, a 78% increase over a 5-year period.<sup>9</sup>

**AIDS.** The number of AIDS cases among AI/ANs has increased during the years from 1990 (223 cases) to 2003 (3,026



Source: Wong, 2006

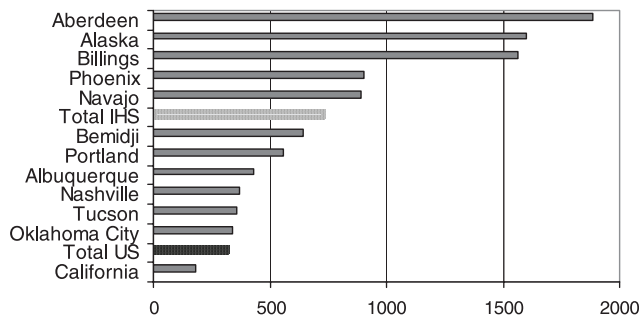
Fig. 3. Gonorrhea rates per 100,000, by IHS service areas, 2004.

cases).<sup>18</sup> The CDC-estimated rate of AIDS for this population is slightly less than would be expected given the AI/AN representation in the population. However, several dimensions of the AIDS epidemic for this group are especially concerning. AI/ANs experience a faster time course from initial diagnosis of HIV infection to AIDS-defining illness than any other racial group in the United States. In 2001, 48% of AI/ANs diagnosed with HIV were subsequently diagnosed with AIDS within 12 months, compared with 40% for the general population.<sup>19</sup> They also experience one of the lowest survival rates after an AIDS diagnosis is made.<sup>19</sup> Available data do not provide information on whether the rapid progression (and low survival) is due to a late diagnosis of HIV, or an accelerated viral pathogenesis. Among those diagnosed with AIDS, AI/AN youth ages 13 to 24 make up 6% of all AI/AN cases, cumulatively, compared with 4% of those same ages in the general population.<sup>18</sup> Finally, in 2004, 33% of AI/ANs diagnosed with AIDS were women or girls, a level second only to blacks (35%).<sup>26</sup>

*Research, Reports, and Programs on STDs and HIV/AIDS Among AI/ANs*

**Peer-Reviewed Articles.** A total of 71 peer-reviewed journal articles were published from January, 1996, through May, 2006, on STDs among AI/ANs. Fifty-eight articles had an exclusive or primary HIV/AIDS focus and 14 had a primary focus on STDs other than (or in addition to) HIV/AIDS. (Table 1). Three articles focused on trends and patterns. McNaghten and colleagues looked specifically at national AI/AN patterns of STDs,<sup>27</sup> although Miller et al.,<sup>8</sup> Patrick et al.,<sup>31</sup> and Shields et al.,<sup>29</sup> examined patterns of specific STDs in community samples among which AI/ANs comprised a substantial proportion. Thoroughman and colleagues,<sup>30</sup> provided an important footnote to these efforts by showing substantial racial misclassification of AI/AN women in Oklahoma in STD case reporting.

Three articles assessed sexual partner networks.<sup>33,35,37</sup> Each of these suggested that the circulation of infected AI/AN persons, coupled with partnering patterns, are likely to provide disease transmission bridges to even remote rural areas. The findings from 2 related articles<sup>34,38</sup> indicated that condom use among drug users varies by race of partner, and that male drug users were less likely to use condoms with AI/AN women when compared with partners of other races. Schiff and colleagues presented results of a clinic-based control trial on cervical neoplasia among Southwest AI women.<sup>36</sup> They showed the importance of HPV and other STDs to this condition for this population. A multiethnic study on HPV for AI women included young age at sex, multiple sexual partners, and women whose partners who reported very high numbers of other



Source: Wong, 2006

Fig. 2. Chlamydia rates per 100,000, by IHS service areas, 2004.

TABLE 1. Summary of STD Research in AI/AN Populations, 1996–2006

Authors	Year of Publication	Goal of Study	Year(s) of Study	Study Population	Data Source/Sampling Method
McNaghten et al. <sup>27</sup>	2005	HIV/AIDS and STD trends	Cumulative through 2000	US national AI/AN population	Surveillance data
Miller et al. <sup>8</sup>	2004	CT and GC prevalence rates among US youth	2001–2002	Nationally representative sample of youth, ages 18–26	AddHealth data
Steenbeek et al. <sup>28</sup>	2004	Provide guidance on holistic approaches to STI prevention	N/A; review, nursing strategies	First Nations and Inuit adolescents in Canada	N/A
Shields et al. <sup>29</sup>	2004	Prevalence and correlates of CT among street youth in Canada	1999	Street youth (15–24) from 7 large urban centers across Canada	Recruited in a snowball sampling approach through drop-in centers, outreach work, mobile van units.
Thoroughman et al. <sup>30</sup>	2002	Estimate extent of racial misclassification	1995	AI/ANs in Oklahoma	Oklahoma State Surveillance data and Oklahoma IHS Patient registry
Patrick et al. <sup>31</sup>	2002	Examine outbreak of syphilis in Vancouver	1996–1999	Syphilis outbreak pop in Vancouver	Population and health indicator data for Vancouver
Speier <sup>32</sup>	2001	Elicit perceptions of infectious diseases and community well-being	1999	Native people of the Chugot region, Alaska	12 Focus groups—teen, adult, and elder community members recruited through community networks
Jolly et al. <sup>33</sup>	2001	Compare structure and form of sexual networks in two cities	1996 (Colorado Springs, CO); 1998 (Winnipeg, Canada)	Partner notification data from El Paso County Department of Health and Environment; CT positives in Manitoba Canada, and their partners	Network data from jurisdictions of respective sites
Fisher et al. <sup>34</sup>	2000	Assess correlates of Alaskan drug use and STDs	1991–1995	Out-of-treatment drug users in Anchorage, Alaska	Recruitment within 6 census-tracts for 18+, positive for morphine or cocaine, and out-of-Tx
Wylie and Jolly <sup>35</sup>	2001	Examine structure and form of sexual networks and influence in STDs in Manitoba, Canada	1997–1998	CT positives in Manitoba Canada, and their partners	6-mo block of laboratory data, linked with Manitoba communicable disease control database
Schiff et al. <sup>36</sup>	2000	Examine correlates of cervical neoplasia, with specific attention on HPV/ other STDs	1994–1997	AI/ANs from New Mexico	Women recruited through 3 IHS clinics in New Mexico

(Continues)

TABLE 1. (Continued)

Total N (all races)	Analyses/Measures	Comments/Conclusions/Findings	Special AI/AN-Specific Recommendations/Notes
National surveillance	Secondary	Emphasis on HIV/AIDS trends and patterns, STDs as a risk factor	Coordination among providers, tribes, fed, state, and local health care necessary to prevent HIV/AIDS
N = 14,322; 136 AI/AN students; no reservation schools included in sample	First void specimens, LCR assays	AI/AN CT prevalence: 10.41%, second only to blacks (12.54%); GC N/A. Wide Cis for AI/AN	None
N/A	N/A	Emphasizes importance of structure and content of health services with respect to cultural appropriateness	Advocated participatory action research for collaboration, mutual education, and centrality of local knowledge. Kahnawake Schools Diabetes Prevention Project (Mohawk) as example. Also suggested peer-education and enhancing self-advocacy skills. Notes some Native languages do not have past or future tenses—challenge for prevention/thinking about consequences of risk
N = 1355 (Aboriginals = 379 or 28%)	Questionnaire and first-void urines, PCR testing	Aboriginals had higher prevalence of CT (13.7% vs. 6.6% for nonaboriginals)	Notes that aboriginal youth often travel between urban and rural areas, and high risk of STDs correlates with early age of onset of intercourse, and multiple partnerships
CT Okla Surv.(OS): N = 4,829; GC OS: N = 4,605; S OS: N = 603; IHS registry: N = 492,804	Secondary	After adjustment for racial misclassification, AI/AN GC rates increased by 32%; AI/AN GC rates increased by 57%; AI/ANs increased by 27%	Misclassification likely to occur throughout surveillance system
N = 277 (22% aboriginal)	Secondary, case-note review, partner notification case review	22% of syphilis cases were AI/AN; context draws on data from several sources (STD clinics, injection drug use programs)	None
N = 99	Summaries presented of a discussion guide on wellbeing and services surrounding infectious diseases	Knowledge of high prevalence diseases relatively good; less adequate for low prevalence/new diseases; community interest in more dialogue/holistic approaches	Based on findings, a new video on STD prevention was developed
Winnipeg: Cases = 571, Contacts = 663 (AI/ANs are 105 and 84, respectively); Colorado Springs: Cases = 468, Contact = 700 (AI/ANs n are 8 and 7, respectively)	Network analyses	Networks similar in size and structure in both locations; sparsely linked networks stretching to periphery may provide means for ongoing endemic; dense networks closer to core associated with steep rises in incidences	Raised questions of whether AI/AN networks similar to those of blacks, and thus illustrate way in which CT is maintained at a higher level in these groups, and may provide for a general hypothesis of networks of disadvantaged populations
N = 1,089; (ANs = 216)	Risk behavior assessment, self-reported STDs	AN women drug users 2.58 times more likely to report GC infections than nonNative women; white men who have sex with both white and AN women less likely to use condoms with AN women	HIV prevention efforts need to be aimed at AN women on a major scale
Total N identified = 4544; N of networks of interest = 429, of which aboriginal n was 117	Network analysis of partnerships, direct and indirect sexual contact	Components ranged from 2 to 82 partners; geographic analysis demonstrated potential for STD transmission from urban to rural communities; study also suggested frequent, successful transmission of pathogens	None
N w/dysplasia = 302; N with normal Pap = 326	Clinic-based case control study; included lab tests and interviews	Strongest risk factors for cervical neoplasia were HPV type-16, any HPV, any STDs, less than HS education, and low income (<\$10,000 pa)	Risk factors for cervical neoplasia similar to those found in other populations of the SW

(Continues)

TABLE 1. (Continued)

Authors	Year of Publication	Goal of Study	Year(s) of Study	Study Population	Data Source/Sampling Method
Calzavara et al. <sup>37</sup>	1999	Sexual partnering as a risk factor (HIV/STD) in Ontario, Canada	1994? (implied, not stated)	Aboriginals from Ontario, Canada	Representative sample of aboriginals from 11 reserve communities in Ontario (Ontario First Nations and Healthy Lifestyles Survey) includes Ojibway, Cree, and Iroquois
Fenaughty et al. <sup>38</sup>	1998	Explore characteristics of sex partners as risk factor for HIV/AIDS and STDs	1996	Native American out-of-Tx drug users in Flagstaff, Tuscon, Anchorage, Denver	Recruitment for 18+, positive for cocaine, meth/amphetamines, heroin, opiates, and out-of-Tx
Kenney <sup>39</sup>	1996	Ethnic differences in risk factors associated with HPV	1993–1994	Multiethnic women, recruited from 10 sites in Southwest United States	Multiethnic women, aged 18–35, who could read English or Spanish, and had a Pap since 1990

Source: Medline and PsychInfo databases January 1996–May, 2006. CT = Chlamydia; GC = Gonorrhea; HPV = Human papillomavirus.

partners (average of 29 partners).<sup>39</sup> One article offered a guide on holistic approaches to STD prevention among AI/AN youth.<sup>28</sup> Finally, Speier<sup>32</sup> provides the results of a qualitative study on AN community perceptions on infectious diseases, including STDs. Her results indicate that community members were reasonably knowledgeable about prevalent infectious diseases, but wanted holistic prevention and treatment approaches which incorporated community values and concerns.

Table 2 provides a summation of 64 articles with an HIV/AIDS focus (5 of which also appear in Table 1). We classified each of the

64 articles by its main topic and subtopic (when appropriate). Overall, for studies with AI/AN populations or subgroups, prevention or intervention was the HIV/AIDS topic with the most articles (15), followed by reviews, overviews, or trends (14), and substance use and care or treatment for HIV-positives (13 each).

The categorization of articles in the table demonstrates a growing research effort on many dimensions of HIV/AIDS about AI/AN populations; even so, the number of articles is small, and randomized control studies are all but absent. Nonetheless, many of these articles provide information that may be applicable to the prevention and control of other STDs in this population, for example, sexual risk factors among AI/ANs, or community approaches to intervention.

TABLE 2. Summary of AI/AN HIV/AIDS Peer-Reviewed Publications, 1996–2006

Topic	Pubs (#)	Citations
Prevention/intervention	15	32, 40–53
Overview, trends, reviews	14	27, 43, 47, 54–64
Substance use	13	38, 49, 53, 65–74
HIV+ or AIDS care/treatment	13	54, 56, 61, 62, 66, 75–82
Women	9	42, 50, 63, 67, 83–87
Partnering/condom use/risk factors	9	37, 38, 70, 72, 73, 86, 88–90
Youth	8	40, 44, 46, 51, 91–94
Violence	3	84, 85, 88
Institutional context/service use	3	55, 77, 82
Physiobiology/medical/laboratory	3	75, 95, 96
Media	2	97, 98
Testing	2	65, 99
Gay, lesbian, bi-sexual, transgender	1	41

Medline and PsychInfo searches for peer-reviewed journal articles (n = 64), January, 1996–May, 2006; articles coded for main topic and sub-topic when appropriate. Some may contain more than 2 subtopics not reflected here.

#### *Epidemiology of Sexual Risk-Taking Behaviors Among AI/ANs*

As in the national population, the majority of STDs among AI/ANs occur among young people. Among AI/ANs, 68% of all chlamydia cases, and 60% of all gonorrhea cases occur among those aged 15 to 24.<sup>17</sup> In our review, we found one large study on sexual risk-taking among AI/AN youth. In 2000–2001, the Bureau of Indian Affairs (BIA) conducted a survey on risk-taking behavior with over 5600 high school students enrolled in BIA schools.<sup>100</sup> This study, using comparable questions to the national Youth Risk Behavior Study (YRBS),<sup>101</sup> found that 59% of high-school students reported having had sex, compared with 46% of the national sample, that 24% reported having 4 or more partners during their lifetime versus 14% of the national sample, and that 56% of those sexually active used a condom at last intercourse versus 58% nationally. (Note that important methodological differences between the two studies precluded significance testing of differences.) Of those who had already had sex, 11% of AI/AN youth reported initiating sex before the age of 13, compared with 7% nationally.<sup>100,101</sup> The results indicate that sexual risk-taking is comparatively high among AI/AN youth, even though condom use appears to be roughly equivalent. An earlier study (1992), also based on a survey with BIA high school students, found similar patterns.<sup>102</sup> Unfortunately, very little ethnographic data exists on

TABLE 1. (Continued)

Total N (all races)	Analyses/Measures	Comments/Conclusions/Findings	Special AI/AN-Specific Recommendations/Notes
N = 651, analytic sample N = 369—had sex in past 12 mo and completed all questions for variable appearing in analysis	Descriptives on partnering patterns; logistic regressions on whether respondent had no partners, at least one partner within the community, outside of the community, or both	Patterns of sexual activity likely to increase vulnerability to sexually transmitted diseases. Persons who have partners both within and outside of their communities (potential bridge populations) are more likely to be from remote areas	Notes prevention opportunity with aboriginal-developed and –designed prevention curricula to reduce sexual risk
N = 153	Self-reported STDs; risk behavior assessment (RBA); sex partner matrix (SPM)	Partners in which male is white and female is AI/AN less likely to use condoms, more likely to inject drugs compared to other partners	White male IDUs may be HIV/STD vector for infection among AI/AN females. Noted circulation of AI/AN between urban and rural reservation/village communities, thus providing a bridge for disease transmission
N = 302 (AI/ANs = 87)	Patient survey (demographic and risk factors); chart review	Four major risk factors for AI women were young age of sexual intercourse, multiple sexual partners, and sex with males who had many partners	None. Author noted that genetic factors may influence susceptibility, and prevalence of various forms of HPV

the context of decision-making that produces such numbers. One report found that youth indicate that an environment of risk, including level of exposure to substance use, perceived sexual activity of peers, and role models in families or communities, were key to their sexual decision-making context.<sup>103</sup>

#### *STD Prevention and Control Efforts in AI/AN Communities*

STD prevention and control activities are sparse in AI/AN communities, and, as in peer-reviewed articles, HIV/AIDS appears to have received greater attention than other STDs. We have summarized the results of our search for reports and guides, descriptions of model programs or activities, and electronic resources in Table 3.

Several potentially effective models do exist, but systematic evaluations of the effectiveness are rare. Screening for STDs at clinics and hospitals appears to occur more regularly for women than for men, but may also inappropriately target older age groups.<sup>9</sup> Although a number of clinic-based HIV training programs specifically designed for AI/AN communities exist,<sup>121–124</sup> clinical HIV services may not always be offered because of the expense or lack of expertise.<sup>125</sup> Comprehensive program assessments, grounded in the particular context of each AI/AN community, are urgently needed.<sup>105,126</sup>

A number of programs and data-collection initiatives exist that are not documented in peer-reviewed publications, but contribute to the base of our knowledge of STD prevention and control among AI/ANs.<sup>104</sup> Tribal epidemiology centers represent multi-institutional cooperative efforts to coordinate monitoring and prevention activities at local levels.<sup>127</sup> Several of these centers have identified STDs as a major focus of program and surveillance activities. The Northwest Tribal Epidemiology Center initiative entitled Project Red Talon is designed to provide member tribes with education, training, and technical assistance for the prevention and treatment of STDs.<sup>107</sup> The project includes a regional STD profile and needs assessment; technical assistance to tribal health care advocates; and a rolling implementation of new screening and treatment strategies.<sup>126</sup> The Inter-Tribal Council of Ari-

zona has developed an HIV/AIDS-focused strategy that is now in the process of national scale-up.<sup>109</sup> Tribal and pan-Native urban programs are also increasingly active, both in targeted programmatic activities<sup>117</sup> and in efforts to increase coordination and cooperation with state and federal agencies.<sup>111,116</sup> In recognition of the potential synergy of such collaborative efforts, the CDC has undertaken initiatives which provide funding directly to tribes, instead of to states in which tribes are located.<sup>127</sup> Such steps are vitally important in channeling resources so that they may be most efficiently used in areas with the greatest need. Unfortunately, the continuation of this type of funding is not assured.<sup>128</sup>

#### *Discussion and Recommendations*

The epidemiologic evidence suggests that AI/ANs have elevated case rates of chlamydia, gonorrhea, and syphilis when compared with the national population, and that in areas of relative AI/AN concentrations, the burden is even greater.<sup>21</sup> The prevalence of AIDS was not found to be elevated among AI/ANs. However, the association of chlamydia, gonorrhea, and syphilis with HIV transmission places them at risk for progression to this condition. Indeed, extant literature on STDs among AI/ANs is dominated by a focus on HIV/AIDS. Reports, guides, and resources show a similar orientation. The distribution of articles (and resources) is perhaps not surprising given the consequences and visibility of HIV/AIDS relative to other STDs, and the availability of funding to support research in this area.

Clearly, substantial overlap exists for risk factors related to HIV/AIDS and other STDs. However, research on non-HIV/AIDS STDs continues to be particularly valuable for at least 3 reasons: (1) it provides specific information on parameters of these diseases (e.g., community perception of STD risk and consequences) not revealed in HIV/AIDS-focused work; (2) it addresses a major risk factor for HIV/AIDS in a vulnerable population; and (3) chlamydia, gonorrhea, and syphilis require clinical and epidemiologic management distinct from that for HIV/AIDS, and the successful implementation of these protocols for this population is paramount.

TABLE 3. Selected Treatment/Screening/Prevention Resources and Programs on STDs and HIV/AIDS Among AI/ANs

Resources/Models	Description
CDC/IHS initiatives	
Stop chlamydia! Use Azithromycin! <sup>104</sup>	Provides free azithromycin to tribal clinics in exchange for case report data
Volunteer firefighters program <sup>104</sup>	Program with some tribal and IHS service units which include STD screening of applicant firefighters as part of annual physical
Infertility prevention project (IPP) <sup>104</sup>	National and regional program intended to reduce chlamydia and gonorrhea; some IPP collaborations with tribes, IHS, and states specifically on AI/AN services and data
Site visits/needs assessments <sup>105</sup>	As needed/requested—evaluation of strengths and weaknesses of a tribal program
Alaska Native Tribal Health Consortium <sup>104</sup>	Collaboration with IHS/CDC on assessing gonorrhea and chlamydia screening, treatment, and prevention
Tribal jail STD screening pilot <sup>104</sup>	Guidelines to help tribes and IHS conduct STD screening in tribal jails
Health resources and services administration (HRSA)	
Special Projects of National Significance <sup>106</sup>	Funds innovative models of HIV/AIDS care for AI/ANs
Tribal EpiCenters/Health Boards/Councils	
Northwest Portland Area Indian Health Board <sup>107</sup>	Project Red Talon. Comprehensive project providing culturally relevant prevention materials, training, and technical support
Northern Plains EpiCenter (Drobnik A. HIV/STD activities at Northern Plains Tribal EpiCenter, Personal communication with CE Kaufman; July 10, 2006)	STD/HIV/AIDS assessment project. Emphasizes training, education, and prevention
Great Lakes Inter-Tribal Council <sup>108</sup>	HIV/AIDS prevention and awareness programs, including mentoring and elder education
Inter-Tribal Council of Arizona <sup>109</sup>	Emphasis on HIV prevention and coordination of key tribal stakeholders, recently scaled to national level
Other	
Cheyenne River <sup>110</sup>	STD outreach and prevention program coordinated with Volunteers of America
Healing Lodge <sup>111</sup>	Faith-based organization serving AI/ANs of Robeson County, NC. Provides STD outreach, HIV/AIDS prevention, condom distribution, coordinates with county health department, integrates varied interests of community, including elders and traditional healers
National Native American AIDS Prevention Center <sup>112</sup>	Mission is to provide HIV/AIDS education, prevention, and technical support for care for AI/AN persons
HIV/AIDS Prevention Project: Advancing HIV/AIDS Prevention in Native Communities <sup>113</sup>	Project of Colorado State University, funded by CDC to strengthen prevention capacity among Native peoples, and provided training and technical assistance to community-based organizations
Holistic Native Network <sup>114</sup>	Integrated HIV/AIDS, substance abuse, and mental health services for Native Americans in San Francisco
American Indian Community House <sup>115</sup>	HIV/AIDS project that provides information, education and case management services to Native Americans and their families infected with and affected by HIV (based in NY, NY)
Indigenous Peoples Task Force <sup>116</sup>	Provides culturally relevant education and services to the Native community (based in Minneapolis, MN)
Oglala Lakota Nation Wellness Team <sup>117</sup>	Concerned health providers, educators, and community members that organize specific events, including HIV-testing basketball tournaments, PSAs, health fairs, and school outreach
Circle of Life HIV-Prevention Curriculum (K-6; middle school) <sup>118</sup>	HIV- and STD- prevention and wellness curriculum designed specifically for American Indian elementary and middle school students
Native American Prevention Project Against AIDS and Substance Abuse <sup>51</sup>	AIDS- and substance use-prevention curriculum designed for 8 <sup>th</sup> and 9 <sup>th</sup> grade American Indians
Selected guides	
National Native American AIDS Prevention Center (NNAAPC) <sup>119</sup>	HIV Prevention with Native American Youth, a planning guide
Rural Center for AIDS/STD Prevention (Indiana University), and NNAAPC <sup>120</sup>	HIV/STD Prevention Guidelines for Native American Communities
School-based screening guidelines <sup>104</sup>	In development by CDC/IHS and ETR, Associates, guidelines for STD screening and treatment specific to AI/AN schools
Mountain Plains AIDS Education and Training Center <sup>121,122</sup>	Native American HIV Care: A Training Platform; and HIV/AIDS Prevention, Early Intervention, and Health Promotion for providers caring for Native Americans
Red Cross HIV/AIDS training <sup>123</sup>	HIV/AIDS training manual for AI/AN communities and medical providers
South Puget Intertribal Planning Agency-Building Effective AIDS Response Project and Northwest AIDS Education and Training Center <sup>124</sup>	Assessing HIV and other STI risk in American Indian/Alaska Native Communities



Our review indicates that little is known about the application and efficacy of STD screening, treatment, and partner management programs specific to AI/AN communities. Factors that contribute to disparities that affect these communities and need to be considered in assessing these parameters include geographic isolation, poor access to health services, insufficient screening and partner management services, and unique social norms, stigma, and gender dynamics. Youth comprise a substantial proportion of AI/ANs contracting STDs, which poses specific challenges to local prevention activities. Tribal and state laws vary widely (and are frequently contradictory) regarding STD screening or treatment services for minors; definitions for, and enforcement of, mandatory statutory rape reporting; and, increasingly, STD educational activities.

Improvements in STD systems of care for AI/AN populations will occur only if they reflect the local cultural framework of health, healing, and understanding of sexual relationships. Toward this end, we identify 6 areas of future research and programmatic focus: (1) behavioral and disease surveillance systems appropriate for effective localized monitoring and response; (2) AI/AN youth access and treatment policies and procedures; (3) culture- and context-specific partner management systems; (4) existing traditions of sexual health; (5) scientifically rigorous investigation of culturally appropriate prevention and control strategies; and (6) adaptation and evaluation of proven interventions.

The daunting epidemiologic profile of STDs among AI/ANs and the high cost associated with these conditions and their sequelae emphasize the profound need for successful models of intervention. STDs are preventable and many are curable; effective programs could eliminate or narrow extant disparities and substantially reduce health care costs. The cultural context of the STD epidemiology of the AI/AN population poses the challenge to the health community—public and private—for urgent, meaningful, and systematic attention.

## References

1. CDC. Sexually Transmitted Disease Surveillance 2004. Atlanta, GA: Department of Health and Human Services, CDC, Division of STD Prevention; 2005.
2. Division of STD Prevention. Tracking the Hidden Epidemics: Trends in STDs in the United States 2000. Atlanta, GA: Department of Health and Human Services; 2000:8.
3. Eng TR, Butler WT. The Hidden Epidemic: Confronting Sexually Transmitted Diseases. Washington, DC: National Academy Press; 1997.
4. Johnson RE, Newhall WJ, Papp JR, et al. Screening test to detect *Chlamydia trachomatis* and *Neisseria gonorrhoeae* infections—2002. MMWR Recomm Rep 2002; 51(RR15):1–27.
5. Cohen MS, Hoffman IF, Royce RA, et al. Reduction of concentration of HIV-1 in semen after treatment of urethritis: Implications for prevention of sexual transmission of HIV-1. Lancet 1997; 349:1868–1873.
6. McClelland RS, Wang CC, Mandaliya K, et al. Treatment of cervicitis is associated with decreased cervical shedding of HIV-1. AIDS 2001; 15:105–110.
7. Chesson HW, Blandford JM, Gift TL, Guoyu T, Irwin KL. The estimated direct medical cost of sexually transmitted diseases among American youth, 2000. Perspect Sex Reprod Health 2004; 36:11–19.
8. Miller WC, Ford CA, Morris M, et al. Prevalence of chlamydial and gonococcal infections among young adults in the United States. JAMA 2004; 291:2229–2235.
9. Cheek JE, Shelby LK, de Ravello L, Blasini-Alcivar L. Sexually Transmitted Disease 2002 Annual Report. Indian Health Service and Centers for Disease Control and Prevention; 2003.
10. U.S. Census Bureau. Census 2000 Summary Files 1, 2, 3 (SF1, SF2, SF3). 2002.
11. Bureau of Indian Affairs. The Bureau of Indian Affairs Mission Statement. Available at: <http://www.doiu.nbc.gov/orientation/bia2.cfm>.
12. U.S. Department of Health and Human Services. Trends in Indian Health 1998–1999. Rockville, MD: Department of Health and Human Services; 2001.
13. Duncan GJ, Raudenbush SW. Neighborhoods and adolescent development: How can we assess the links? Paper presented at: Does it take a village? Community Effects on children, adolescents, and families, Pennsylvania State University, 1998.
14. Bailey SL, Pollock NK, Martin CS, Lynch KG. Risky sexual behaviors among adolescents with alcohol use disorders. J Adolesc Health 1999; 25:179–181.
15. Kaufman CE, Beals J, Mitchell CM, LeMaster PL, Fickenscher A. Stress, trauma, and risky sexual behavior among American Indians in young adulthood. Cult Health Sex 2004; 6:301–318.
16. Centers for Disease Control and Prevention. Trends in Reportable Sexually Transmitted Disease in the United States, 2004. Atlanta, GA: Department of Human Health and Services; 2005.
17. Centers for Disease Control and Prevention. Rates per 100,000 population by race/ethnicity, age group, and sex, United States, 2000–2004: Chlamydia, gonorrhea, and primary and secondary syphilis (Tables 11B, 21B, and 34B). Available at <http://www.cdc.gov/std/stats/tables/>. Accessed May 12, 2006.
18. Centers for Disease Control and Prevention. Cases of HIV Infection and AIDS in the United States, 2003, 2004. Vol 15.
19. Centers for Disease Control and Prevention. Cases of HIV Infection and AIDS in the United States, by race/ethnicity, 1998–2002, 2003. Vol 10 (No. 1).
20. MMWR. Sexually transmitted diseases treatment guidelines, 2006. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5511a1.htm>. Accessed September 28, 2006.
21. Wong D, Swint E, Paisano EL, Cheek JE. Indian Health Surveillance Report—Sexually Transmitted Diseases, 2004. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, and Indian Health Service; 2006.
22. Harris JL, Roussel AE, Fichtner RR. HIV/AIDS, STD, TB, and Hepatitis B and C case reporting practices of tribally operated health facilities. Available at: <http://www.cste.org/pdffiles/2005/finalReportQualitativeSurveillanceAssessment2.pdf>. Accessed September 25, 2006.
23. Kauffman JA, Reichard S, Walline A. Survey of HIV, sexually transmitted disease, tuberculosis, and viral hepatitis case reporting practices in tribally-operated and urban Indian health facilities: Final report on survey findings, 2004. [http://www.cste.org/pdffiles/2005/CSTE%20Survey%20Tribal\\_Urban%20Indian%20Facilities%20Final%205.6.05.pdf](http://www.cste.org/pdffiles/2005/CSTE%20Survey%20Tribal_Urban%20Indian%20Facilities%20Final%205.6.05.pdf). Accessed September 25, 2006.
24. Wong D. Syphilis outbreak on (tribal name), 2000–2004. Report of the Epidemic Intelligence Service of the Division of STD Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia. Unpublished memo, 2004.
25. Centers for Disease Control and Prevention. Eliminating Syphilis—Maricopa County, AZ. Available at: <http://www.cdc.gov/stopsyphilis/LocalProfiles/2004/MaricopaAZ2004.pdf>. Accessed May 6, 2006.
26. Centers for Disease Control and Prevention. Cases of HIV infection and AIDS in the United States, by race/ethnicity, 2000–2004. HIV/AIDS Surveill Rep 2006; 12:1–24.
27. McNaghten AD, Neal JJ, Li J, Fleming PL. Epidemiologic profile of HIV and AIDS among American Indians/Alaska Native in the USA through 2000. Ethn Health 2005; 10:57–71.
28. Steenbeek A. A holistic approach in preventing sexually transmitted infections among First Nations and Inuit adolescents in Canada. J Holist Nurs 2004; 22:254–266.
29. Shields SA, Wong T, Mann J, et al. Prevalence and correlates of chlamydia infection in Canadian street youth. J Adolesc Health 2004; 34:384–390.
30. Thoroughman DA, Frederickson D, Cameron D, Shelby LK, Cheek JE. Racial misclassification of American Indians in Oklahoma state surveillance data for sexually transmitted diseases. Am J Epidemiol 2002; 155:1137–1141.
31. Patrick DM, Rekart ML, Jolly A, et al. Heterosexual outbreak of infectious syphilis: Epidemiological and ethnographic analysis and implications for control. Sex Transm Infect 2002; 78(Suppl 1): i164–i169.
32. Speier TL. Community well being and infectious diseases among Alaska Native communities in the Chugach region. Int J Circumpolar Health 2001; 60:659–675.

33. Jolly AM, Muth SQ, Wylie JL, Potterat JJ. Sexual networks and sexually transmitted infections: A tale of two cities. *J Urban Health* 2001; 78:433–445.
34. Fisher DG, Fenaughty AM, Paschane DM, Cagle HH. Alaska Native drug users and sexually transmitted disease: Results of a five-year study. *Am Indian Alsk Native Ment Health Res* 2000; 9:47–57.
35. Wylie JL, Jolly A. Patterns of chlamydia and gonorrhea infection in sexual networks in Manitoba, Canada. *Sex Transm Dis* 2001; 28:14–24.
36. Schiff M, Becker TM, Masuk M, et al. Risk factors for cervical intraepithelial neoplasia in Southwest American Indian women. *Am J Epidemiol* 2000; 152:716–726.
37. Calzavara LM, Bullock SL, Myers T, Marshall VW, Cockerill R. Sexual partnering and risk of HIV/STD among Aboriginals. *Can J Public Health* 1999; 90:186–191.
38. Fenaughty AM, Fisher DG, Cagle HH, Stevens S, Baldwin JA, Booth R. Sex partners of Native American drug users. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998; 17:275–282.
39. Kenney JW. Ethnic differences in risk factors associated with genital human papillomavirus infections. *J Adv Nurs* 1996; 23:1221–1227.
40. Aguilera S, Plasencia AV. Culturally appropriate HIV/AIDS and substance abuse prevention programs for urban Native youth. *J Psychoactive Drugs* 2005; 37:299–304.
41. Gilley BJ, Co-Cke JH. Cultural investment: Providing opportunities to reduce risky behavior among gay American Indian males. *J Psychoactive Drugs* 2005; 37:293–298.
42. Scott KD, Gilliam A, Braxton K. Culturally competent HIV prevention strategies for women of color in the United States. *Health Care Women Int* 2005; 26:17–45.
43. Duran B, Walters KL. HIV/AIDS prevention in “Indian Country”: Current practice, indigenist etiology models, and postcolonial approaches to change. *AIDS Educ Prev* 2004; 16:187–201.
44. Majumdar BB, Chambers TL, Roberts J. Community-based, culturally sensitive HIV/AIDS education for Aboriginal adolescents: Implications for nursing practice. *J Transcult Nurs* 2004; 15:69–73.
45. Mitchell CM, Kaufman CE, Beals J. The pathways of choice and healthy ways project teams. Equifinality and multifinality as guides for preventive interventions: HIV risk/protection among American Indian young adults. *J Prim Prev* 2004; 25:491–510.
46. Sileo TW, Gooden MA. HIV/AIDS prevention education: Considerations for American Indian/Alaska Native youth. *J HIV/AIDS Prev Child Youth* 2004; 6:47–64.
47. Vernon I, Jumper-Thurman P. Prevention of HIV/AIDS in native American communities: Promising interventions. *Public Health Rep* 2002; 117(Suppl 1):S96–S103.
48. Tafoya T. Unmasking Dashkayah: Storytelling and HIV prevention. *Am Indian Alsk Native Ment Health Res* 2000; 9:53.
49. Baldwin JA, Maxwell CJ, Fenaughty AM, Trotter RT, Stevens SJ. Alcohol as a risk factor for HIV transmission among American Indian and Alaska Native drug users. *Am Indian Alsk Native Ment Health Res* 2000; 9:1–17.
50. Klein D, Williams D, Wibrodt J. The collaboration process in HIV prevention and evaluation in an urban American Indian clinic for women. *Health Educ Behav* 1999; 26:239–249.
51. Baldwin JA, Rolf JE, Johnson J, Bosers J, Benally C, Trotter RT. Developing culturally sensitive HIV/AIDS and substance abuse prevention curricula for Native American youth. *J Sch Health* 1996; 66:322–327.
52. Brassard P, Smeja C, Valverde C. Needs assessment for an urban Native HIV and AIDS prevention program. *AIDS Educ Prev* 1996; 8:343–351.
53. Stevens S, Estrada AL, Glider PJ, McGrath RA. Ethnic and cultural difference in drug-using women who are in and out of treatment. *Drugs Soc* 1998; 13:81–95.
54. Hamill S, Dickey M. Cultural competence; what is needed in working with Native Americans with HIV/AIDS? *J Assoc Nurses AIDS Care* 2005; 16:64–69.
55. Greabell L, Cordes P, Klein SJ. HIV/AIDS and Native Americans: The health departments’ response. *J Psychoactive Drugs* 2005; 37:267–272.
56. Speier TL. Special projects of national significance and the Alaska Tribal health system: An overview of the development of a best practice model for HIV/AIDS care and treatment in Alaska. *J Psychoactive Drugs* 2005; 37:305–311.
57. Vernon I, Jumper-Thurman P. The changing face of HIV/AIDS among Native populations. *J Psychoactive Drugs* 2005; 37:247–255.
58. Hall HI, Li J, McKenna MT. HIV in predominantly rural areas of the United States. *J Rural Health* 2005; 21:245–253.
59. Dean HD, Steele CB, Satcher AJ, Nakashima AK. HIV/AIDS among minority races and ethnicities in the United States, 1999–2003. *J Natl Med Assoc* 2005; 97(7 Suppl):5S–12S.
60. Bertolli J, McNaghten AD, Campsmith M, et al. Surveillance systems monitoring HIV/AIDS and HIV risk behaviors among American Indians and Alaska Natives. *AIDS Educ Prev* 2004; 16:218–237.
61. Dallas C. How scholarly nursing literature addresses health disparities for racial/ethnic minority men. *ABNF J* 2004; 15:10–14.
62. Diamond C, Davidson A, Sorvillo F, Buskin S. HIV-infected American Indians/Alaska Natives in the Western United States. *Ethn Dis* 2001; 11:633–644.
63. Lynch M, Pugh K. Uneven ground: HIV in women of color. *Adv Nurse Pract* 2000; 9:44–48.
64. Weaver HN. Through indigenous eyes: Native Americans and the HIV epidemic. *Health Soc Work* 1999; 24:27–34.
65. Foley K, Duran B, Morris P, et al. Using motivational interviewing to promote HIV testing at an American Indian substance abuse treatment facility. *J Psychoactive Drugs* 2005; 37:321–329.
66. Nebelkopf E, Penagos M. Holistic native network: Integrates HIV/AIDS, substance abuse, and mental health services for Native Americans in San Francisco. *J Psychoactive Drugs* 2005; 37:257–264.
67. Simoni JM, Sengal S, Walters KL. Triangle of risk: Urban American Indian women’s sexual trauma, injection drug use, and HIV sexual risk behaviors. *AIDS Behav* 2004; 16:33–45.
68. Miller C, Wood E, Spittal PM, et al. The future face of coinfection: Prevalence and incidence of HIV and hepatitis C virus coinfection among young injection drug users. *J Acquir Immune Defic Syndr* 2004; 36:743–749.
69. Kerr T, Wood E, Small D, Palepu A, Tyndall MW. Potential use of safer injecting facilities among injection drug users in Vancouver’s downtown Eastside. *Can Med Assoc J* 2003; 169:759–763.
70. Craib KJP, Spittal PM, Wood E, et al. Risk factors for elevated HIV incidence among aboriginal injection drug users in Vancouver. *Can J Public Health* 2003; 168:19–24.
71. Martin JD, Mathias RG, Sarin C, Byrne SE. HIV and hepatitis B surveillance in First Nations alcohol and drug treatment centres in British Columbia, Canada. *Int J Circumpolar Health* 2002; 61:104–109.
72. Stevens SJ, Estrada AL, Estrada BD. HIV drug and sex risk behaviors among American Indian and Alaska Native drug users: Gender and site differences. *Am Indian Alsk Native Ment Health Res* 2000; 9:33–47.
73. Reynolds GL, Fisher DG, Estrada AL, Trotter R. Unemployment, drug use, and HIV risk among American Indian and Alaska Native drug users. *Am Indian Alsk Native Ment Health Res* 2000; 9:17–33.
74. Martin JD, Mathias RG. HIV and hepatitis B surveillance in First Nations alcohol and drug treatment centers in Br Columbia, Canada. *Int J Circumpolar Health* 1998; 57(Suppl 1):280–284.
75. Goddard G, Brown C, Ahmad A-SG. Oral disease prevalence among HIV-positive American Indians in an urban clinic. *J Psychoactive Drugs* 2005; 37:313–319.
76. Bien MB. Art therapy as emotional and spiritual medicine for Native Americans living with HIV/AIDS. *J Psychoactive Drugs* 2005; 37:261–292.
77. Ashman JJ, Perez-Jimenez D, Marconi K. Health and support service utilization patterns of American Indians and Alaska Natives diagnosed with HIV/AIDS. *AIDS Educ Prev* 2004; 16:238–249.
78. Barney DD, Rosenthal CC, Speier TL. Components of successful HIV/AIDS case management in Alaska Native Villages. *AIDS Educ Prev* 2004; 16:202–217.
79. Nebelkopf E, King J. A holistic system of care for Native Americans in an urban environment. *J Psychoactive Drugs* 2003; 35:43–52.
80. Oggins J. Notions of HIV and medication among multiethnic people living with HIV. *Health Soc Work* 2003; 28:53–62.
81. Bouey PD, Duran BE. The Ahalaya case-management program for HIV-infected American Indians, Alaska Natives, and Native Hawaiians: Quantitative and qualitative evaluation of impacts. *Am Indian Alsk Native Ment Health Res* 2000; 9:36–52.

82. Duran BE, Bulterys M, Iralu J, Graham Ahmed Edwards CM, Edwards A, Harrison M. American Indians with HIV/AIDS: Health and social service needs, barriers to care, and satisfaction with services among a Western tribe. *Am Indian Alsk Native Ment Health Res* 2000; 9:22–35.
83. Wyatt GE, Moe A, Guthrie D. The gynecological, reproductive, and sexual health of HIV-positive women. *Cultur Divers Ethnic Minor Psychol* 1999; 5:183–196.
84. Saylor K, Daliparthi N. Native women, violence, substance abuse and HIV risk. *J Psychoactive Drugs* 2005; 37:273–280.
85. McKeown I, Reid S, Orr P. Experiences of sexual violence and relocation in the lives of HIV infected Canadian women. *Int J Circumpolar Health* 2004; 63(Suppl 2):399–404.
86. Morrison-Beedy D, Carey MP, Lewis BP, Aronowitz T. HIV risk behavior and psychological correlates among Native American women: An exploratory investigation. *J Womens Health Gend Based Med* 2001; 10:487–494.
87. Mill JE. Describing an explanatory model of HIV illness among aboriginal women. *Holist Nurs Pract* 2000; 15:42–56.
88. Walters KL, Simoni JM, Harris C. Patterns and predictors of HIV risk among urban American Indians. *Am Indian Alsk Native Ment Health Res* 2000; 9:1–21.
89. Harlow LL, Prochaska JO, Redding CA, et al. Stages of condom use in a high HIV-risk sample. *Psychol Health* 1999; 14.
90. Calzavara LM, Burchell AN, Myers T, Bullock SL, Escobar M, Cockerill R. Condom use among aboriginal people in Ontario, Canada. *Int J STD AIDS* 1998; 9:272–279.
91. Mitchell CM, Beals J, Kaufman CE, and the Pathways of Choice and Healthy Ways Project Teams. Alcohol use, outcome expectancies, and HIV risk status among American Indian young adults: A latent growth curve model with parallel processes. *Journal of Youth and Adolescence* (In press).
92. Mitchell CM, Kaufman CE, Beals J, Pathways of Choice and Healthy Ways Project Team. Identifying diverse HIV risk groups among American Indian young adults: The utility of cluster analysis. *AIDS Behav* 2004; 8:263–275.
93. Mitchell CM, Kaufman CE, The Pathways of Choice and Healthy Ways Project Teams. Structure of HIV knowledge, attitudes, and behaviors among American Indian young adults. *AIDS Educ Prev* 2002; 14:381–398.
94. Ramirez JR, Crano WD, Quist R, Burgoon M, Alvaro EM, Grandpre J. Effects of fatalism and family communication on HIV/AIDS awareness variations in Native American and Anglo parents and children. *AIDS Educ Prev* 2002; 14:29–40.
95. Poesz BJ, Papsidero LD, Ehrlich G, et al. Prevalence of HTLV-I-associated T-cell lymphoma. *Am J Hematol* 2001; 66:32–38.
96. Iyer RK, Kim PS, Bando JM, Lu KV, Gregg JP, Grody WW. A multiethnic study of Delta32ccr5 and ccc2b-V64I allele distribution in four Los Angeles populations. *Diagn Mol Pathol* 2001; 10:105–110.
97. Clarke JN, Fridman DB, Hoffman-Goetz L. Canadian aboriginal people's experiences with HIV/AIDS as portrayed in selected English language aboriginal media. *Soc Sci Med* 2005; 60:2169–2180.
98. Hoffman-Goetz L, Shannon C, Clarke JN. Chronic disease coverage in Canadian aboriginal newspapers. *J Health Commun* 2003; 8:475–488.
99. Tseng AL. Anonymous HIV testing in the Canadian aboriginal population. *Can Fam Physician* 1996; 42:2341–2344.
100. Everett-Jones S, Shaughnessy L, Branum C. Youth Risk Behavior Survey of High School Students Attending Bureau Funded Schools. Bureau of Indian Affairs Office of Indian Education Programs in conjunction with the Centers for Disease Control; 2001.
101. Grunbaum J, Kann L, Kinchen S, et al. Youth risk behavior surveillance—United States, 2001. *MMWR* 2002; 51:SS–4. Atlanta, GA: Center for Disease Control and Prevention; 2002:64.
102. Blum RW, Harmon B, Harris L, Bergeisen L, Resnick MD. American Indian–Alaska Native youth health. *JAMA* 1992; 267:1637–1644.
103. Satter DE, Zubiate A, Gatchell M. National Native American AIDS prevention center needs assessment: Focus groups series on young native adults and sexual health. Los Angeles, CA: UCLA Center for Health Policy Research; 2004.
104. IHS Division of Epidemiology and Disease Prevention. Sexually Transmitted Diseases, Current Projects. Available at: [http://www.ihs.gov/medicalprograms/epi/index.cfm?module=health\\_issues&option=std&cat=sub\\_5](http://www.ihs.gov/medicalprograms/epi/index.cfm?module=health_issues&option=std&cat=sub_5). Accessed June 21, 2006.
105. Blasini-Alcivar L, Barrow R, Byrum D, Frick D, Mosure D. Chlamydia Program Assessment Report for Rosebud Comprehensive Health Care Facility, Rosebud, South Dakota. Atlanta: Division of STD Prevention, Program Development and Support Branch; 2004.
106. University of Oklahoma Research and Evaluation Center Staff. HRSA SPNS AI/AN Grantee Projects Case Study Protocol (Draft) 2004.
107. Red Talon STD/HIV Coalition. STD/HIV Tribal Action Plan: A Three-Year Strategic Plan for the Tribes of Idaho, Oregon, and Washington. Portland, OR: Northwest Portland Area Indian Health Board; 2006.
108. Great Lakes Inter-Tribal Council. HIV/AIDS Prevention Program. Available at: <http://www.glitc.org/HIVweb/>. Accessed July 15, 2006.
109. Inter-tribal Council of Arizona. National STD/HIV/AIDS Prevention Program. Available at: <http://www.itcaonline.com/nshapp/>. Accessed May 15, 2006.
110. Volunteers of America. Cheyenne River Outreach & STD Prevention Services. Available at: [http://www.voa-dakotas.org/subpage.cfm?content\\_item\\_id=2633&folder\\_id=899](http://www.voa-dakotas.org/subpage.cfm?content_item_id=2633&folder_id=899). Accessed July 19, 2006.
111. Native American Interfaith Ministries. Healing Lodge, STD Outreach Program. Available at: <http://www.thehealinglodge.org/programs/services.htm>. Accessed June 15, 2006.
112. National Native American AIDS Prevention Center (NNAAPC). Oakland, CA. Available at: <http://www.nnaapc.org>. Accessed June 21, 2006.
113. HIV/AIDS Prevention Project. HIV/AIDS Prevention Project: Advancing HIV/AIDS Prevention in Native Communities. Available at: <http://www.colostate.edu/Depts/CASAE/happ>. Accessed September 25, 2006.
114. Native American Health Center—Family Child and Guidance Center. Holistic Native Network. San Francisco, CA. Available at: <http://www.nativehealth.org/>. Accessed June 21, 2006.
115. American Indian Community House. New York, NY. Available at: <http://www.aich.org>. Accessed June 21, 2006.
116. Indigenous Peoples Task Force. Minneapolis, MN. Available at: <http://www.indigenouseoplestf.org/about.cfm>. Accessed June 21, 2006.
117. Oglala Lakota Nation Wellness Team. Pine Ridge, SD; 2006.
118. Orbis Associates. Circle of Life HIV/AIDS and STD Prevention Curriculum. Washington, D.C.: Orbis Associates; 2002.
119. Mangum A, Green Rush A, Sanabria V. HIV Prevention with Native American Youth: A Program Planning Manual. NNAAPC; 1994.
120. Native Communities HIV/STD Prevention Guidelines Task Force. HIV/STD Prevention Guidelines for Native American Communities: American Indians, Alaska Natives, and Native Hawaiians. Bloomington, IN: Rural Center for HIV/STD Prevention; 2004.
121. Bradley-Springer L, Oropeza L, Corwin MA, Rotach E, Kual'i'i C. Native American HIV Care: A Training Platform. Denver, CO: Mountain Plains AIDS Education and Training Center, National Native Am AIDS Prevention Center, and the Florida/Caribbean AIDS Education and Training Center; 2004.
122. Oropeza L, Bradley-Springer L, Johnson S. HIV/AIDS Prevention Early Intervention and Health Promotion: A Self-Study Module for Health Care Providers Serving Native Americans. Denver, CO: Mountain Plains AIDS Education and Training Center and Native American AIDS Prevention Center; 2005.
123. The American Red Cross TAC. American Indians Decision to Survive. Tulsa: American Red Cross National Headquarters; 1996.
124. South Puget Sound Intertribal Agency and Northwest AIDS Education and Training Center. Assessing HIV and other STI risk in Am Indian/Alaska Native communities. Available at <http://www.spipa.org/expanding.shtml>. Accessed September 26, 2006.
125. National Alliance of State and Territorial AIDS Directors. Native Americans and HIV/AIDS: Key Issues and Recommendations for Health Departments; November, 2004.
126. Craig Rushing S, Mondeaux F, Lane L. Red Talon STD Profile: STD Treatment and Prevention Capacity within Idaho, Oregon, and Washington Tribes. Portland, OR: Northwest Portland Area Indian Health Board, Project Red Talon; 2005.
127. Department of Health and Human Services. Epidemiology Grant Program for American Indians/Alaska Natives. Notice of Competitive Cooperative Agreement Applications. Vol 69. Department of Health and Human Services: Federal Register. Doc 04-14647; 2004:38907–38911.
128. National Coalition of STD Directors. Preventing STDs in Indian country: A call for collaboration, unpublished data.