PSYCHOSOCIAL BARRIERS TO HEALTH PROMOTION IN AN AMERICAN INDIAN POPULATION

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Abstract: Northern Plains Indians (N = 200) completed the Indian Specific Health Risk Appraisal and measures assessing beliefs about risk factors and personal risk. Participants rated personal risk optimistically, judged their risk factor standing as superior to that of their peers, and neglected to consider risk factor standing when appraising personal risk. Moreover, participants were often not improving their standing on risk factors they considered relevant to their health. Such biases in health beliefs may prevent health interventions from being successful.

American Indians and Alaska Natives experience a disproportionate burden of morbidity preventable by lifestyle change for such health problems as atherosclerotic heart disease, chronic liver disease and vehicular trauma. The life expectancy at birth of American Indians is three years less than that of U.S. Whites. This burden is particularly alarming among Northern Plains Indians for whom the overall mortality rate is greater than that of other American Indians and is approximately twice that of all U.S. races ("Trends," 1991; Welty, in press).

Conventional public health strategies among American Indians have concentrated on disseminating information about causal relationships between health risk factors and disease, yet targeted risk behaviors often persist in spite of "successful" health education (Rhoades, Hammond, Welty, Handler, & Amler, 1987; Sullivan, 1990). Clearly, individuals must not only learn the facts, but also believe that they are personally at risk, before they will take steps towards changing their behaviors. Indeed, most health models such as the Health Belief Model and Protection Motivation Theory link perceptions of risk and health risk behavior (see Weinstein, 1993, for review). Eliminating preventable disease necessitates not only educating a population, but also breaking down psychosocial barriers that may impede individual improvement.

The Health Risk Appraisal (HRA), an instrument promoted by the Centers for Disease Control (CDC), has been administered in an Indian-specific version to thousands of American Indians (Welty, in press). The feedback of the HRA provides respondents with an estimate of personal health risk, along with suggestions for how to decrease this risk. However, numerous studies have shown the HRA to be an ineffective means of motivating lifestyle change (Nice & Woodruff, 1990; Schoenbach, 1987; Wagner, Beery, Schoenbach, & Graham, 1982). This investigation elaborates upon several elements that may contribute to the psychological appraisal of personal health risk among American Indians and may consequently undermine the effectiveness of the HRA and other educational strategies.

Our first hypothesis is that American Indians tend to underestimate their chances of experiencing health problems. In particular, we expected that American Indians would believe their risk to be objectively lower than that of their peers. Second, we also predicted that individuals perceive their own behavior as less risky than that of their peers. Third, we hypothesized that American Indians do not take their standing on risk factors into account when judging their risk. These three predictions were based in part upon previous research demonstrating that individuals in non-Indian populations tend to believe that their own health risk is objectively lower, and their standing on risk factors objectively better, than that of their peers (Klein & Kunda, 1993; Weinstein, 1984, 1987; Weinstein & Klein, 1995). Additionally, individuals often ignore their risk factor standing when judging risk (Weinstein, 1984, 1987). Determining how these biases may influence American Indian health perceptions and behaviors could help to identify reasons for the high prevalence of risk behaviors in this population.

Our final hypothesis is that even when American Indians do appreciate the significance of a particular risk factor, their behavior may not reflect this understanding. No studies to our knowledge have addressed this question directly. The notion that such individuals *do* know the risk factors associated with health problems is a novel one, and suggests that the HRA is ineffective because it is providing already known information without the tools to take action.

In sum, we conducted this study in order to develop a more theoretical understanding of why interventions such as the HRA are ineffective among American Indian and Alaska Native populations, by demonstrating the presence of psychological barriers impinging on the processing of risk information. This research is of particular importance because it concerns a group (Northern Plains American Indians) possessing an alarming risk of many health problems. It was predicted that participants would (a) appraise their health risks in an optimistically biased manner, believing their own risk to be lower than that of their same-age, same-sex peers, (b) consider their risk factor standing to be superior to that of their peers, (c) not take risk factor standing into account when judging their personal

health risk, and (d) not seem to be attempting to improve their standing on risk factors that they considered to be important and relevant to health risk.

Method

Sample

Questionnaires were collected from a sample of 200 urban dwelling Northern Plains Indians (120 women and 80 men) between the ages of 18 and 75. Ten additional participants were excluded because they were not American Indians. In addition to recruiting a sample that varied across all conventional demographic dimensions including age, sex, educational level, income, and occupational status, we took several additional steps to increase the representativeness of our sample. First, among those approached, approximately 75% consented to participate (and those who consented possessed a similar age and sex profile to those who refused). Second, based on past research showing Indian Health Service clinic users to be representative of their local American Indian populations (Goldberg et al., 1991), 160 of our participants were recruited in the outpatient clinic of an IHS hospital in the Northern Plains. Most of these were patients waiting for walk-in, appointment, or pharmacy visits. Everyone appearing at the clinic over a two-month period was approached for possible participation. Third, we buttressed the clinic sample by including relatives or friends accompanying patients as well as maintenance, medical records and security workers, and nurses. The findings reported were *not* affected by the inclusion of these additional clinic participants. Finally, we recruited 50 additional participants outside the clinic, a sample that included employees and visitors of several tribal offices throughout the city serving the American Indian community. Again, the findings were virtually identical whether or not this portion of the sample was included. Consequently, we report analyses conducted on the whole sample.

Procedure and Materials

Each participant was asked to complete a series of questionnaires. Informed consent was obtained, and participants were given the option of having their completed Health Risk Appraisal (HRA) placed in their medical records. Respondent anonymity and confidentiality were maintained in all other ways. Participants were compensated with a health promotion t-shirt.

Data were collected in a four-part instrument. The Indian-specific HRA, a form of the Carter Center instrument modified by the IHS in 1987, comprised Part I. The HRA surveyed respondents on forty health risk-related factors, such as exercise, smoking, alcohol consumption, and

family history of diabetes and breast cancer. Additionally, the HRA's protocol included measurement of blood pressure, height, weight, and random blood glucose and cholesterol levels. Blood was collected by the experimenter using a finger-stick technique, and analyzed for glucose and cholesterol levels by Accu-Chek II and ProAct machines, respectively. Participants were given the results immediately.

The remainder of the instrument consisted of questionnaires used to elaborate upon factors contributing to perceptions of health risk. Prior to the study, these questionnaires were pilot-tested for length and comprehensibility and were revised accordingly. Because these measures have been developed and used in other investigations, we do not rehearse their psychometric properties here.

In Part II, participants appraised their perceived risk of developing specific health problems (relative to the risk of same-age, same-sex American Indian peers in the same town) on a series of seven-point scales ranging from "much below average" (–3) to "much above average" (+3). This scale assesses bias in risk perceptions at the group level: empirically, if a predominant number of participants rate themselves as having a below-average risk, the sample as a whole can be said to be optimistically biased (e.g., Weinstein, 1984, 1987).

Participants estimated the prevalence of HRA-measured risk factors among peers of their own age and sex in Part III. For example, respondents were asked to estimate what percentage of Northern Plains Indians of their age and sex are smokers, and how many miles over the speed limit their peers usually drive. The scales on each question followed those used on the HRA (for those items on the HRA that had required participants to circle yes or no, participants were asked to estimate the percentage of Northern Plains Indians that would circle yes).

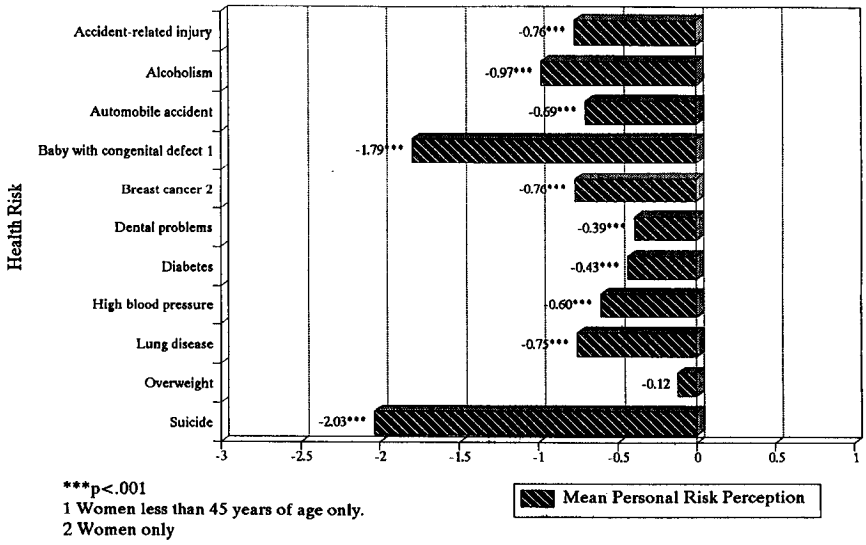
In Part IV, respondents indicated the extent to which some of the HRA health risk behaviors were related to health on five-point scales ranging from "not at all related" to "extremely related." Respondents also reported, on similar scales, how important it was to them to decrease or increase the frequency of these behaviors in their everyday life (depending upon whether the behavior was negative or positive, respectively).

As a service to the participants, all answers to the HRA were recorded on a scanner-ready form which was immediately entered into a portable computer and scored by the HRA Finding the Way program. A printout providing a personalized mortality risk, along with recommendations for reducing that risk, was returned and interpreted to the participant by an investigator after all four parts of the questionnaire were completed. Patients with serious health problems identified through the HRA were referred to their usual health care provider for follow-up.

Results

Perceptions of Future Personal Risk as Compared to That of Others

We first address the participants' responses on each of the comparative health risk scales (Part II). Recall that these scales ranged from "below average" to "above average," with a zero midpoint. As seen in Figure 1, the mean responses on each of these scales was significantly below zero (as assessed by one-sample *t*-tests at $p < .001$) for all but one health risk (overweight), demonstrating that participants as a group tended to see their risk as below average. This reflects an optimistic risk bias at the group level because such a disproportionate number of participants cannot be below average.



Note: More negative means reflect greater optimistic bias.

Figure 1
Mean ratings of personal health risks compared with estimates of peers' health risks.

Perceptions of Personal Standing on Risk Factors as Compared to That of Others

We next compared participants' responses on the HRA risk factors with their estimates of their peers' standing on these same risk factors (Part III). If there is no bias in participants' beliefs, the mean standing on each of the risk factors should equal participants' estimates of these means. However, as seen in Table 1, there was a tendency for

Table 1
Actual responses on HRA risk factors compared with respondents' estimates of average responses on these factors

HRA Risk Factor	Actual percentage or mean	Estimated percentage or mean	t[1]
Yes/No items			
Ever diagnosed with diabetes	15%	33%	6.50***
Have relatives with diabetes	50%	39%	2.82**[2]
Smoke cigarettes	55%	67%	2.90**
Smoke cigars or pipes	8%	24%	5.75****
Use smokeless tobacco	6%	31%	10.23****
Ride motorcycle	20%	13%	1.93
Ever seriously considered suicide	19%	19%	0.06
Items on Scales			
Thousands of miles traveled per year	16.04	14.77	0.34
Number of cigarettes smoked per day	12.82	14.38	1.64
Wear seat belt	2.36	1.55	6.94****
Drive over speed limit	1.40	1.84	7.13****
Times drive drunk or ride with drunk driver per month	1.19	12.42	9.51****
Times per month one drink or more	3.43	16.69	8.33****
Drinks per week	3.95	19.73	2.81**
Drinks at one time	3.56	10.55	7.98****
Times per month 5 drinks or more	1.68	3.16	17.21****
Physical exercise	2.20	2.02	2.89**
Brush/floss teeth	2.06	1.70	6.13****
Caffeine	2.26	2.60	4.93****
Women Only:			
Time since last mammogram	3.60	3.20	2.26*[2]
Relatives with breast cancer	1.24	1.77	5.88****
Time since last pap smear	1.86	2.43	4.35****
Examine breasts for lumps	2.17	1.62	6.34****
Time since breasts examined by doctor/nurse	1.82	2.82	7.03****
Number of preganancies	3.68	4.21	2.45*

*p<.05. **p<.01. ***p<.001. ****p<.0001.

[1] Degrees of freedom vary between 104 and 195 depending on applicability of risk factor and number of respondents

[2] Difference is significant in direction opposite to prediction. All others are in self-serving direction, regardless of the type of scale used.

respondents to exaggerate the difference between themselves and their peers in a self-serving manner. For example, based on self-reports, respondents consumed 3.95 drinks per week but estimated that their peers consumed 19.73 drinks per week. Such self-serving biases were found to be significant (by a series of paired *t*-tests) for 19 of 25 risk factors, most at $p < .01$ or better.

Correspondence Between Actual Standing on Risk Factors and Perceptions of Risk

The next question was whether participants rating themselves as low in risk would be those with the best standing on risk factors, while those rating themselves as high in risk would be those with the worst standing. We predicted that this would not hold true; in statistical terms, we predicted low correlations between participants' risk perceptions (Part II) and their actual standing on related risk factors measured on the HRA (Part I). As seen in Table 2, this prediction was confirmed. We found that

Table 2
Correlations of HRA risk factors with perceived health risks

Risks and HRA risk factors	Correlation with comparative risk judgment
Alcoholism	
Times per month one drink or more	+.11
Drinks per week	+.14*
Drinks at one time	+.19**
Times per month 5 drinks or more	+.18**
Baby with congenital defect (women only)	
Smoke cigarettes	−.09
Number of cigarettes smoked per day	−.05
Number of cigars smoked	−.03
Number of pipes smoked	—
Amount of smokeless tobacco	−.07
Number of pregnancies	+.01
Age at first pregnancy	+.12
Times per month one drink or more	+.06
Drinks per week	+.04
Drinks at one time	+.04
Times per month 5 drinks or more	+.03

Table 2 (Continued)
Correlations of HRA risk factors with perceived health risks

Risks and HRA risk factors	Correlation with comparative risk judgment
Being in traffic accident	
Thousands of miles traveled per year	+.08
Drive over speed limit	+.05
Times drive drunk or ride with drunk driver per month	+.06
Ride Motorcycle	+.01
Thousands of miles of motorcycle use	+.07
Being injured in traffic accident	
Wear seat belt	−.05
Breast cancer (women only)	
Relatives with breast cancer	+.04
Weight	+.04
Caffeine	+.04
Age at first pregnancy	−.06
Dental problems	
Brush/floss teeth	−.21**
Amount of smokeless tobacco	+.01
Diabetes	
Blood glucose	+.25***
Weight	+.21**
Relatives with diabetes	+.31***
Ever diagnosed with diabetes	+.36***
Physical exercise	−.12*
High blood pressure	
Blood pressure (diastolic)	+.23***
Blood pressure (systolic)	+.26***
Cholesterol	+.18**
Take medication for hypertension	−.31***
Smoke cigarettes	−.05
Number of cigarettes smoked	−.03
Number of cigars smoked	+.003
Number of pipes smoked	+.01
Amount of smokeless tobacco	−.14*
Times per month 1 drink or more	+.01

Table 2 (Continued)
Correlations of HRA risk factors with perceived health risks

Risks and HRA risk factors	Correlation with comparative risk judgment
High blood pressure (Continued)	
Drinks per week	+.05
Drinks at one time	+.04
Times per month 5 drinks or more	−.01
Caffeine	+.09
Weight	+.16*
Physical exercise	−.18**
Lung Cancer	
Smoke cigarettes	+.25***
Number of cigarettes smoked	+.20**
Number of cigars smoked	+.05
Number of pipes smoked	+.02
Amount of smokeless tobacco	−.14*
Obesity	
Weight	+.38***
Physical exercise	−.04
Suicide	
Ever seriously considered suicide	+.10

*$p<.05$. **$p<.01$. ***$p<.001$.

Note: A significant correlation indicates that respondents' risk factor standing on the HRA (e.g., smoking) was correlated with their perceived risk of having an associated health problem (e.g., lung cancer). Non-significant correlations indicate no perceived relationship between the risk factor and the health problem under which it is listed.

36 of 55 medically established and popularly known correlations between risk factors and health hazards were not significant in this sample. Thus, for example, respondents rating themselves low in risk for being in a traffic accident were no less likely to speed, drive drunk, or drive long distances than those rating themselves higher in risk. These findings suggest that respondents either do not appreciate the relationship between their risk factor standing and their personal health risk or are not applying this understanding to themselves.

An unexpected finding was that risk perceptions were more likely to be correlated with the physiological measures (weight, blood pressure, serum cholesterol and blood glucose), than with self-reported family history and behavioral measures.

Correspondence of Perceived Relevance and Importance of Risk Factors With Actual Standing

The final prediction was that those participants who acknowledged that a risk factor might be related to their health would be no more likely to report healthy behaviors than those who did not acknowledge the link. To test this prediction, we correlated participants' responses on HRA risk factors (Part I) with their ratings of how related these risk factors were to their health (Part IV). As seen in column 1 of Table 3, fewer than half of these correlations are significant, supporting our hypothesis.

Table 3
Correlations of HRA behaviors with perceived relevance of these behaviors to health and rated importance to self

HRA risk factor	Correlation with perceived relevance to health	Correlation with rated importance to self
Thousands of miles traveled per year	+.10	+.04
Wear seat belt	+.38***	+.44***
Drive over speed limit	−.07	−.20**
Physical exercise	+.21***	+.29***
Brush/floss teeth	+.37***	+.33***
Caffeine	−.04	−.16*
Weight	−.02	−.07
Smokers Only:		
Number of cigarettes smoked per day	+.04	−.05
Number of cigars smoked per day	+.16	+.20*[1]
Number of pipes smoked per day	−.08	−.13
Times used smokeless tobacco per day	−.18*	−.07
Alcohol Users Only:		
Drinks per week	−.11	−.28***
Times per month one drink or more	−.06	−.10
Times drive drunk or ride with drunk driver per month	−.13*	−.17**
Women Only:		
Time since last mammogram	−.22**	−.35***
Time since last pap smear	−.07	−.12
Examine breasts for lumps	+.38***	+.53***
Time since breasts examined by doctor/nurse	−.22**	−.23**

*$p<.05$. **$p<.01$. ***$p<.001$.

[1]This correlation implies that the more important it was to respondents NOT to smoke, the more cigars they smoked.

Similar analyses were conducted to determine whether respondents reported healthier behaviors on HRA items that were important to them. Correlations between HRA risk factors and importance ratings may be found in column 2 of Table 3. In this case, 10 of 18 correlations are significant, and tend to be stronger than the correlations in column 1. This implies that perceived relatedness and importance are not redundant constructs. Once again, however, there are several factors for which the correlation between rated importance and actual behavior was surprisingly low, suggesting that even when participants understood the relevance and importance of a risk factor, they were not necessarily more likely to be taking measures to improve their standing on that factor. For example, participants who felt it was important to smoke less, watch their weight, and get annual pap smears were no more likely to be taking these precautions than those who did not feel such precautions to be important.

Discussion

This study assessed some of the psychosocial factors underlying American Indian perceptions of their own health risks. Our findings show that our American Indian participants optimistically appraised their chances of evading preventable disease, magnified differences between their own standing on risk factors and the standing of their peers (thereby making themselves appear relatively lower in risk), often neglected to take their own standing on risk factors into account when appraising their overall risk of experiencing preventable illness, and still were no more likely to be taking steps to improve their standing on risk factors they considered important and relevant to their health. These biases may hinder the effectiveness of health interventions such as the HRA, and generally may act as barriers to behavioral change.

Our first two findings are consistent with research on non-Indians showing that people justify their lifestyles by perceiving their own behaviors to be more healthful than those of their peers. For example, people practicing AIDS-risk behaviors underestimate their risk of contracting HIV because they deem their own habits to be safer than those of their high-risk peers (Bauman & Siegel, 1987). Recent evidence suggests that social comparison plays an important role in judgments of risk (for review, see Klein & Weinstein, in press). In one study, for example, participants who imagined that their risk of experiencing a health problem was 60%, yet below the average risk of their peers, anticipated being less worried about this risk level than did participants asked to imagine that their risk was 30% but above average (Klein, in press).

Furthermore, when individuals are given social comparison information, it is often processed in a self-enhancing manner. Upon hearing that a similar other is HIV-positive, people may reduce perceptions of similarity to that individual (Gump & Kulik, 1995). Moreover, upon learning

that their own behavioral profiles compare unfavorably with those of others, they may discount the relevance of these behaviors to health problems (Klein, 1996). In some cases, social comparisons with others may even exacerbate risk biases (Weinstein & Klein, 1995). Consequently, it is essential to employ social comparison information very carefully when designing interventions. Currently, HRA feedback provides participants not only with a calculation of their own chances of developing a number of health problems, but also with the average risk of their peers. If respondents are engaging in self-enhancing strategies when receiving this information, the ineffectiveness of HRA as a behavior change tool may be more understandable. Recent research suggests that optimism biases are less likely to result when making comparisons with live, physically present individuals who are similar on several demographic attributes (e.g., Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995), suggesting that using such targets would be more effective than providing statistical social comparison information.

Of course, these conclusions may hinge to a large degree on the population being studied. In cultures exhibiting an interdependent orientation, such as the Japanese, the tendency to see oneself as different (and better) than others is less prevalent (Heine & Lehman, 1995), suggesting that interventions inclusive of carefully selected social comparison targets may still be ineffective. The question of how much American Indians rely on social comparisons when judging their risk awaits further research.

Our third finding was that respondents rating themselves as low in risk to develop future health problems were no more or less likely than other respondents to exhibit healthy behavior. Interestingly, all physiological values, but very few self-reported behaviors, were highly correlated with associated health risks. For example, weight, current blood pressure, and cholesterol (all measured in the protocol) were significantly correlated with the perceived risk of having high blood pressure, but cigarette smoking, alcohol use, and caffeine consumption (all self-reported) were not. People's health risk perceptions may be more affected by their standing on their physiological as opposed to behavioral risk factors. Future research might consider explanations and implications of this finding.

Finally, even when participants acknowledged that a risk behavior was related to health, they still did not appear to be trying to improve their standing on that factor. For example, participants who indicated that cigarette smoking was related to health did not necessarily smoke less. Respondents' rated importance of avoiding health-threatening activities or engaging in health promotion behavior was also a poor predictor of actual health habits. These findings suggest that the provision of risk factor information such as that appearing on the HRA feedback form may not effect behavioral change because the information is already known, and knowledge alone does not necessarily lead to behavior change.

Indeed, two previous studies examining the psychological effects of health promotion through education have shown no impact on individuals' attitudes toward disease susceptibility, or their perceptions of the benefits of preventive action (Cioffi, 1979; Stiles, 1987). However, research has shown that people accurately retain information obtained from the HRA (Kellerman, Felts, & Chenier, 1992). The acquisition of health information during health promotion sessions may mask a failure to change: on follow-up surveys to the HRA, respondents have reported behavioral changes not substantiated by improvements in health status (Nice & Woodruff, 1990). Just because people remember the right answer does not mean that they adopt healthier lifestyles.

Because some of our results assume that our respondents were typical of the Northern Plains Indian community as a whole, we took several measures to increase our confidence in the representativeness of our sample. Our respondents were diverse in age, sex, educational background, employment status and in risk behaviors, yet characteristically similar to participants in other HRA screenings conducted during the same time period. Approximately 75% of those approached participated, and our analyses were not affected by the inclusion of non-patients and non-clinic users. Moreover, past research at other IHS sites has supported the generalizability of clinic samples such as ours (Goldberg et al., 1991).

The findings here illustrate the strategies that enable individuals to view their health positively—they can underestimate their future risk, perceive their risk factor standing as better than average, or ignore the relationship between their risk factor standing and their actual health risks. Furthermore, even when people do acknowledge the importance of a risk factor, they may not take steps to improve their standing on that factor. Effective interventions must take all of these factors into account if they are to be successful. If people are taught to appraise their objective risk more accurately, in a way that does not eliminate the psychological benefit of a positive outlook, they may engage in more healthful behaviors.

Of course, even if people do hold accurate health perceptions, it does not necessarily follow that their behavior will be consistent with these perceptions. In daily life, an individual must not only have the knowledge and the will (Carter, 1985), but also the *means* to achieve a healthy lifestyle. Greater than 60% of residents in one Northern Plains Indian reservation lived below the poverty level in 1989, creating the poorest county in the U.S. (Kilborn, 1992). American Indians overall have higher rates of unemployment, and receive less education and income, than all other Americans ("Trends," 1991). Consequently, such individuals may not have the necessary resources to effect behavioral changes. For example, if no other transportation is available or affordable, riding with intoxicated drivers may be inevitable (Oken, Lightdale, & Welty, 1995). More nutritious foods may also prove more expensive and unattainable. Providing a

sense of self-efficacy, as well as real power to effect personal change, is of utmost importance in any Indian health promotion program. Because of these realities, improving the HRA questionnaire and similar health education devices to minimize psychological barriers may not eliminate preventable illness, but does provide a workable first step.

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Author Note

This research was funded by the National Institute of Arthritis, Diabetes, Digestive and Kidney Diseases—NAID (#5T35DK07420); the Aberdeen Area Indian Health Service; and Colby College Social Science Grants 01-2289, 01-2207, and 01-2230. We are grateful to the Rapid City Indian Health Advisory Board and the Public Health Service Indian Hospital in Rapid City for their assistance in data collection, and to Linda Oken for her technical expertise.