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## A NATIONAL STUDY OF SOCIAL NETWORKS AND PERCEPTIONS OF HEALTH AMONG URBAN AMERICAN INDIAN/ALASKA NATIVES AND NON-HISPANIC WHITES

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### Summary

Using data from The National Epidemiologic Survey on Alcohol and Related Conditions, the strength of social networks and the association of self-reported health among American Indians and Alaska Natives (AI/AN) and non-Hispanic Whites (NHW) were compared. Differences in social network–health relationships between AI/ANs and NHWs were also examined. For both groups, those with fewer network members were more likely to report fair or poor health than those with average or more network members, and persons with the fewest types of relationships had worse self-reported health than those with the average or very diverse types of relationships. Furthermore, small social networks were associated with much worse self-reported health in AI/ANs than in NHWs.

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Limited research on social networks among minority populations has found associations between social networks and preventive health service utilization among Hispanic and Black Americans (Kang & Bloom, 1993; Suarez *et al.*, 2000); however, studies examining associations between social networks and health in American Indian/Alaska Native (AI/AN) populations are rare. In this study, a US national sample is used to: (1) compare the strength of AI/ANs social networks with those of non-Hispanic Whites and (2) examine the association between the strength of AI/AN social networks and self-reported health. The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) is a population-based epidemiological survey of adults in the United States, conducted in two

waves between 2001 and 2005 (Grant *et al.*, 2009). Data on social networks as well as various health measures were collected in Wave 2 (2004–2005). Non-Hispanic White (NHW) and non-Hispanic AI/AN participants who provided data on social networks were selected for the sample. The sample was also restricted to those living in an urban or suburban location because rural areas were under-represented. After applying exclusion criteria, 16,447 NHW and 472 AI/AN participants were available for this analysis.

Cohen's Social Network Index (SNI), a 22-item instrument that measures the number of members and diversity of a social network and that has been used in a variety of studies since 1979 (Cohen & Sokolovsky), assesses the presence of twelve different types of relationships: spouse, grown children, parents, parents-in-law, close relatives, friends, neighbours, co-workers, fellow students or teachers, religious group members, volunteer group members and other group members (Cohen *et al.*, 1997). Respondents reporting a certain type of relationship were then asked to give the number of members with whom he or she communicated socially at least once every 2 weeks. The number of members from each type of relationship with whom contact was made at least once every 2 weeks was summed to give the first measure of Cohen's SNI: total number of network members. These were added across the twelve different relationships possible. The second measure of Cohen's SNI (the network diversity score) was the total number of different relationship types that composed the social network, with a maximum of twelve possible.

Self-reported health was measured by the NESARC using the following question: 'In general, would you say your health is excellent, very good, good, fair, or poor?' This single-item self-reported health measure has been shown to be consistent with objective health measures (DeSalvo *et al.*, 2006). For descriptive purposes, participant age was grouped into the following categories: 20–29, 30–39, 40–49, 50–54 and 55 years and older. Age was treated as a continuous variable in regression models. Education level was categorized as less than high school graduate, high school graduate and more than high school graduate. Marital status was dichotomized as married or cohabiting versus not. Approximate quartiles were used to divide household income into categories of US\$0–24,999, US\$25,000–49,999, US\$50,000–79,999 and US\$80,000 and over.

Survey weighted logistic regression was used to model the relationship between SNI and self-reported health (see Table 1). Moderation of these relationships by race was assessed using a test of interaction. Models were adjusted for sex, age, marital status, education and income. Social Network Index diversity and size measures were categorized by quartiles to allow consistent estimation of non-linear trends. Self-reported health was dichotomized as either good (good to excellent) or poor (fair to poor). Survey weights standardized the sample to that of the US adult population. Model coefficients were assessed for statistical significance using the Wald test at the 0.05 level. All statistical analyses were conducted using Stata version 11.2 (StataCorp, College Station, Texas).

First, the different relationship types available for AI/AN and NHW participants were summarized. The two groups were similar with respect to availability of the five different familial relationships examined. Both AI/AN and NHW participants had an average of 3.1 familial types of relationships (95% CI for difference: –0.0, 0.1). However, for non-familial

relationship contacts, the two groups differed. Only 15% of AI/ANs had at least one volunteer contact whereas NHWs had 21% (Fisher's Exact  $p < 0.01$ ). Thirty-three per cent of AI/ANs had at least one religious contact whereas 40% of NHWs had at least one religious contact ( $p < 0.01$ ). The mean number of non-familial types of relationships for AI/AN (2.5) was significantly lower than that of NHW (2.7, 95% CI for difference:  $-0.4, -0.1$ ).

Next, the extent to which participants not only had available relationships, but also reported frequent contact with persons in those existing relationships, was examined. Again, AI/AN and NHW participants were similar with respect to the different types of familial relationships with which they had frequent contact. For most relationship types, the two racial groups were similar with respect to number of network members. These variables were then summed to calculate the two measures of Cohen's SNI and compare them across the two racial groups. Overall, the total number of social network members was similar among AI/AN (mean = 24.3, SE = 1.5) and NHW (mean = 24.8, SE = 0.3,  $p = 0.72$ ). In a regression model adjusting for demographic characteristics, network diversity scores did not differ between the two groups (mean difference comparing AI/AN to NHW: 0.0; 95% CI:  $-0.2, 0.2$ ).

Forty per cent of AI/ANs in the lowest quartile of social network size reported poor health versus 18% in other quartiles. Only 20% of NHWs in similar social network size reported poor health versus 12.8% in other quartiles. AI/ANs had an associated 3.7 factor difference in odds ratios for poor health comparing small social networks with large ones (95% CI: 2.3–5.8). Similarly, AI/ANs with the least diverse networks had a 34% poor self-reported health versus 18% in other network diversities. Comparatively, NHWs had 23% poor health in lowest diversity networks versus 11% in others. AI/ANs relative to NHWs had an associated 2.6-fold difference in the odds ratio for poor health comparing least network diversity with others (95% CI: 1.7–3.9). The AI/ANs did not show further trends in poor health comparing other network quartiles (comparing 3rd and 2nd quartiles, OR 1.3, 95% CI: 0.5, 3.3) whereas NHWs in the 2nd quartile of social networks continued to show less favourable health conditions relative to those with larger networks (OR = 1.5, 95% CI: 1.3–1.7). Similar results were found in comparing network diversity.

The above results indicate two primary findings: SNI measures of total network members and network diversity were strongly associated with self-reported health among AI/ANs. Those in the quartiles with the fewest members/types of relationships had worse self-reported health than those with other network sizes and diversities. Furthermore, this relationship was strongly moderated by race with AI/ANs showing a much greater difference in health outcomes than NHWs. Because this sample is restricted to urban and suburban participants, these results cannot be generalized to rural populations. Additionally, the cross-sectional nature of this study precludes causal conclusions regarding the association between SNI characteristics and self-reported health. Future research might address these areas.

## References

- Cohen CI, Sokolovsky J. Health-seeking behavior and social networks of the aged living in single-room occupancy hotels. *Journal of the American Geriatrics Society*. 1979; 27(6):270–278. [PubMed: 447989]
- Cohen S, Doyle WJ, Skoner DP, Rabin BS, Gwaltney JM Jr. Social ties and susceptibility to the common cold. *Journal of the American Medical Association*. 1997; 277:1940–1944. [PubMed: 9200634]
- DeSalvo KB, Bloser N, Reynolds K, He J, Muntner P. Mortality prediction with a single general self-rated health question: a meta-analysis. *Journal of General Internal Medicine*. 2006; 21(3):267–275. [PubMed: 16336622]
- Grant BF, Goldstein RB, Chou SP, Huang B, Stinson FS, Dawson DA, Compton WM. Sociodemographic and psychopathologic predictors of first incidence of DSMIV substance use, mood and anxiety disorders: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *Molecular Psychiatry*. 2009; 14:1051–1066. [PubMed: 18427559]
- Kang SH, Bloom JR. Social support and cancer screening among older black Americans. *Journal of the National Cancer Institute*. 1993; 85(9):737–742. [PubMed: 8478960]
- Suarez L, Ramirez AG, Villarreal R, Marti J, McAlister A, Talavera GA, et al. Social networks and cancer screening in four U.S. Hispanic groups. *American Journal of Preventive Medicine*. 2000; 19(1):47–52. [PubMed: 10865163]

**Table 1**

Survey weighted logistic regression model estimates for odds of health outcomes by social network index (SNI) quartiles, NESARC 2001–2005<sup>a</sup>

SNI measure	AI/ANs ( <i>n</i> = 578)	NHWs ( <i>n</i> = 20,161)
Total number of network members		
Quartile 1: 0–9	2.9 (1.4–6.2)	2.1 (1.8–2.4)
Quartile 2: 10–15	0.9 (0.4–1.8)	1.7 (1.5–2.1)
Quartile 3: 16–27	0.7 (0.3–1.7)	1.2 (1.0–1.4)
Quartile 4: 28 or more	Referent	Referent
Global test <sup>b</sup>	0.004	<0.001
<i>p</i> interaction <sup>c</sup>	<0.001	
Diversity score		
Quartile 1: 0–4	5.2 (1.6–17.5)	1.5 (1.2–2.0)
Quartile 2: 5	2.6 (0.7–9.0)	2.0 (1.6–2.6)
Quartile 3: 6–7	3.3 (1.0–10.9)	2.8 (2.2–3.5)
Quartile 4: 8–12	Referent	Referent
Global test <sup>b</sup>	0.045	<0.001
<i>p</i> interaction <sup>c</sup>	<0.001	

<sup>a</sup> Adjusted for age, sex, marital status, education and income.

<sup>b</sup> Multivariate Wald test for whether the three ORs of poor health between quartiles are simultaneously 1, or equivalently consistent with no relationship.

<sup>c</sup> Obtained from logistic regression estimation of the interaction parameter in the joint model.