

## Social Network Sways Vaccine Compliance

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Published: April 15, 2013

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Parents who didn't have their children fully vaccinated relied strongly on the advice of members of their close social networks in making decisions about immunizations, a study showed.

The odds for nonvaccination was 36 (95% CI 6 to 162) among parents who said that one-quarter to one-half of members of their close contacts recommended avoiding vaccinations, according to Emily Brunson, PhD, of Texas State University in San Marcos.

The odds rose further, to 273 (95% CI 37 to 2,028) when half to three-quarters of social network members advised avoidance and to 1,642 (95% CI 131 to 20,663) when 75%-100% of members advised against vaccination, Brunson reported online in *Pediatrics*.

Because most vaccines are administered when children are small, the important decisions are made by parents.

However, "parents rarely reach conclusions completely on their own. Rather, they rely on others, such as healthcare providers, family members, and friends, for information, direction, and advice," Brunson wrote.

To explore the influence of parents' social networks, defined as "the people they interact with as well as the sources of information they consult," she conducted an online survey in King County in Washington state, an area with high rates of nonvaccination.

Participation was limited to first-time parents born in the U.S. with children who were 18 months or younger.

The survey questioned parents about their perceptions about vaccines and infectious diseases; the people they most closely rely on for advice; and what other sources they use for health information.

The researcher then analyzed the data in three models: the parents' characteristics, their "people networks," and their "source networks," comparing the models with Akaike Information Criterion (AIC) calculations to establish statistical validity, with lower scores reflecting the accuracy of the model.

A total of 196 first-time parents participated, with 126 being considered "conformers," in that they followed and completed the vaccination schedule for the child, and 70 "nonconformers," who delayed or avoided immunizations.

Nonconformers had a significantly less positive view of immunization as rated on a five-point scale (2.8 versus 2.1,  $P < 0.001$ ), and only half intended to have all vaccinations done before the child enrolled in school.

In the people networks, nonconformers reported more social network connections (mean 6.7 versus 4.8,  $P = 0.05$ ) and included more women (71% versus 65%,  $P = 0.05$ ).

The most striking difference between the conformers' and nonconformers' people networks was that 72% of the nonconformers' network members also were in favor of nonconformity, while only 13% of conformers' network members held that view.

Both conformers and nonconformers considered a spouse or partner and healthcare provider as being among the most important network members, followed by family and friends.



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### Action Points

Parents who didn't have their children fully vaccinated, or nonconformers, relied strongly on the advice of members of their close social networks in making decisions about immunizations.

Note that the most striking difference between the conformers' and nonconformers' people networks was that 72% of the nonconformers' network members also were in favor of nonconformity, while only 13% of conformers' network members held that view.

More nonconformers stated that they had a source network (100% versus 80%,  $P<0.001$ ), and they included more sources (4.4 versus 3.4,  $P=0.01$ ).

As with the people networks, more of the nonconformers' sources recommended against vaccination (59% versus 20%,  $P<0.001$ ).

In the AIC analysis of the model that included parental characteristics, the score was 163.1 and conformity was associated with high household income (odds ratio 0.17, 95% CI 0.03 to 0.81), while having a post-university education was more likely among nonconformers (OR 5.34, 95% CI 1.05 to 27.08).

For the source network model, the AIC was 168.3, and once again, the only significant factor was the number of sources favoring nonconformity, with the OR of 35.75 (95% CI 9.96 to 128.27) when three-quarters or more of sources advised against vaccination.

In the people network model, the AIC was 99.9, with substantially higher percentages of nonconformers' network members expressing unfavorable views of vaccination. This AIC value, lower than for the parent or source models, suggested that this was the strongest influence on parents' immunization decisions, according to Brunson.

The findings also point to a less important role for source networks, such as media, compared with personal contacts, and to a lesser influence for parental demographic factors.

The observation in this study of the importance of social networks "strongly implies that for interventions aimed at promoting vaccine acceptance to be successful, they must take a broad approach, one that is capable of influencing not only parents but the people parents might discuss their vaccination decisions with," Brunson wrote.

A limitation of the study was the possibility of recall bias.

In an accompanying commentary, Douglas Opel, MD, and Edgar Marcuse, MD, of the University of Washington in Seattle, observed that efforts to increase vaccination rates will need to recognize the social forces involved.

"As a society, we respect the privacy of healthcare decisions; however, if we are to sustain adherence to the recommended immunization schedule as a social norm, we need to learn how to empower immunizing parents to become vocal and talk with other parents, including prospective parents, about why they chose to immunize their children," they wrote.

"We must develop and test public health interventions that are based on the cognitive processes actually used by parents in their immunization decision-making while working to increase the role of