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SLIPSTREAM

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Better Health, With a Little Help From Our Friends

IS your social network making you fat? Are your friends and family influencing you to smoke and drink more, or to sleep less?

And if our relationships contribute to behaviors that erode our health, can social networks be harnessed to improve it?

These are seminal questions in "network science" — an emerging field that examines how behavioral changes spread through social networks. By social networks, I don't mean virtual, will-you-"friend"-me? simulations, but old-fashioned, flesh-and-blood relationships. You know, people you actually see in person regularly — friends, relatives, co-workers, neighbors.

"It's a very old thing that we do, like ants, arranging ourselves to live in social structures," says Dr. Nicholas A. Christakis, a Harvard professor who studies health and social networks. "Really, humans have arranged themselves into networks for hundreds and thousands of years."

Dr. Christakis and his research partner, James H. Fowler, an associate professor at the School of Medicine at the University of California, San Diego, created an international uproar in 2007 when they published a study on obesity. In it, they reported that fat could be catching — spreading through social ties. One of the study's findings was that a person's chance of becoming obese increased 57 percent if the person had a friend who became obese. Another surprising finding of the study, published in The New England Journal of Medicine, was that one's chance of becoming obese was influenced not only by the weight gain of friends but also by friends of friends who gained weight.

Since then, the researchers have examined how other health-related behaviors and conditions — drug use and sleeplessness among teenagers, smoking and happiness — spread through social networks. And they have published a book explaining their work, titled "Connected: The Surprising Power of Our Social Networks and How They Shape Our Lives."

If social reinforcement can make us fat, can it also make us trim?

Now Dr. Christakis and Professor Fowler, as well as other scientists, are turning their attention to a new research area: how to harness social networks to promote public health.

Of course, we already know that people can and do change their health habits when they seek out and participate in new social groupings. Weight Watchers, anyone?

But how do we extract information from existing social networks to improve public health?

One method is to identify social connectors, people who spend time with more friends than average — and are thus exposed to more germs and are more likely to be among the first to contract contagious diseases like the flu. If health officials could find and track those social butterflies, they could tap into an early-detection system for epidemics and figure out whom to vaccinate first in order to slow the spread of disease.

Last winter, Dr. Christakis and Professor Fowler tried just such a strategy — monitoring people's friends — to track the spread of H1N1 flu at Harvard. They monitored 744 undergraduates who were either selected at random or were named as friends by the randomly selected students. Then they followed the undergrads, using their electronic medical records, to identify which students went to the university health service complaining of flu symptoms.

The method is based on "the friendship paradox" — the counterintuitive idea that your friends have more friends than you do. In other words, you're more likely to be friends with popular people than with loners. And those popular people tend to be closer to the core of a social network.

In the Harvard study, published Wednesday in the scientific journal PLoS One, the flu developed about two weeks earlier in the friend group than in the randomly selected group. The results, the study leaders say, indicate that public health officials could use friend monitoring like sentinel nodes in the human body, as an early-detection system for disease.

Friend monitoring systems could also be used to identify flu trends faster than methods now used by the Centers for Disease Control and Prevention — or on Google, for that matter — because the friend system pinpoints signs of an epidemic before it peaks in the general population, Professor Fowler says.

"This method, although we have studied H1N1, could be applied to anything that spreads — smoking, weight gain," he says.

Some researchers are also studying how a social network's structure affects the speed at which people adopt and stick to health habits.

To that end, Damon Centola, an assistant professor of economic sociology at the Sloan School of Management at M.I.T., conducted an experiment with more than 1,500 people. He created a Web-based health forum where they had access to and could rate health information sites.

Professor Centola then randomly assigned participants to one of two social network designs: one was set up like a residential neighborhood, with clusters of overlapping ties among neighbors; the other was a casual network where people did not share social ties.

Each participant was matched with other members, called "health buddies." Although people could not contact their buddies directly, they received e-mail from the system about their buddies' activities on the site.

The neighborhood structure turned out to be much better than the random social network at prompting people in the study to join and participate in the health forum, according to Professor Centola's report, published this month in the journal Science. More important, Professor Centola says, the more e-mails that people received about the activities of their health buddies, the more often they returned to the forum.

IN the real world, he says, this means the amount of social reinforcement you give to people to improve their health habits may be more important than who is encouraging them to do so. In other words, a local community network of friends and neighbors may be more important than a remote celebrity spokesman in stopping the spread of, say, sexually transmitted diseases among teenagers.

"It makes a bigger difference how you connect people than who is there in influencing desirable behaviors," Professor Centola says.

It also tells us that while weight gain among our friends and friends' friends can make us fatter, our close connections may also lead us to better health choices, like going to the gym more often or stir-frying more vegetables.

But if we are to make lasting changes in our health habits, Dr. Fowler says, we may need social reinforcement in which our friends, not to mention our friends' friends, change their habits with us.

And that's no small order for a social network. □