Facebook interests could help predict, track and map obesity

April 24 2013

The higher the percentage of people in a city, town or neighborhood with Facebook interests suggesting a healthy, active lifestyle, the lower that area's obesity rate. At the same time, areas with a large percentage of Facebook users with television-related interests tend to have higher rates of obesity. Such are the conclusions of a study by Boston Children's Hospital researchers comparing geotagged Facebook user data with data from national and New York City-focused health surveys.

Together, the conclusions suggest that knowledge of people's online interests within geographic areas may help public health researchers predict, track and map obesity rates down to the neighborhood level, while offering an opportunity to design geotargeted online interventions aimed at reducing obesity rates.

The study team, led by Rumi Chunara, PhD, and John Brownstein, PhD, of Boston Children's Hospital's Informatics Program (CHIP), published their findings on April 24 in *PLOS ONE*.

The amount of data available from social networks like Facebook makes it possible to efficiently carry out research in cohorts of a size that has until now been impractical. It also allows for deeper research into the impact of the societal environment on conditions like obesity, research that can be challenging because of cost, difficulties in gathering sufficient sample sizes and the slow pace of data analysis and reporting using traditional reporting and surveillance systems.

"Online social networks like Facebook represent a new high-value, low-cost data stream for looking at health at a population level," according to Brownstein, who runs the Computational Epidemiology Group within CHIP. "The tight correlation between Facebook users' interests and obesity data suggest that this kind of social network analysis could help generate real-time estimates of obesity levels in an area, help target public health campaigns that would promote healthy behavior change, and assess the success of those campaigns."

To connect the dots between Facebook interests and obesity, Chunara, Brownstein and their colleagues obtained aggregated Facebook user interest data—what users post to their timeline, "like" and share with others on Facebook—from users nationally and just within New York City. They then compared the percentages of users interested in healthy activities or television with data from two telephone-based health surveys: the US Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System-Selected Metropolitan/Micropolitan Area Risk Trends (BRFSS-SMART), and New York City's EpiQuery Community Health Survey (CHS). Both surveys record geotagged data on body mass index, a reliable measure of obesity.

The comparison revealed close geographic relationships between Facebook interests and obesity rates. For instance, the BRFSS-SMART obesity rates were 12 percent lower in the location in the United States where the highest percentage of Facebook users expressing activity-related interests (Coeur d'Alene, Idaho) compared that in the location with the lowest percentage (Kansas City, Mo.-Kan.). Similarly, the obesity rate in the location with the highest percentage of users with television-related interests nationally (Myrtle Beach-Conway-North Myrtle Beach, S.C.) was 3.9 percent higher than the location with the lowest percentage (Eugene-Springfield, Ore.).

The same correlation was reflected in the New York City neighborhood

data as well, showing that the approach can scale from national- to local-level data. The CHS-reported obesity rate on Coney Island, which had the highest percentage of activity-related interests in the city, was 7.2 percent lower than Southwest Queens, the neighborhood with the lowest percentage. At the same time, the obesity rate in Northeast Bronx, the neighborhood with the highest percentage of television-related interests, was 27.5 percent higher than that in the neighborhood with the lowest percentage (Greenpoint).

"The data show that in places where Facebook users have more activity-related interests, there is a lower prevalence of obesity and overweight," said Chunara, an instructor in Brownstein's group. "They reveal how social media data can augment public health surveillance by giving public health researchers access to population-level information that they can't otherwise get."

The study also bolsters the case for using social media as a means of delivering targeted interventions aimed at reducing rates of obesity and other chronic diseases, as applicable.

Provided by Children's Hospital Boston