

## Forecasting the Flu with Social Network Analysis



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A study in the online journal *Scientific Reports* claims that scientists can accurately predict how the flu will spread a week into the future. Using social network analysis, researchers at the University of California (UC) in San Diego combined traditional data with big data to boost the network's predictive power.

Corresponding author Michael Davidson, a PhD student in political science at UC San Diego, explained that the social network analysis blends the big data from Google Flu Trends (GFT) with more conventional data of flu monitoring from the US Centers for Disease Control and Prevention (CDC). GFT is good at displaying current infection levels, but the new method looks to where the flu is likely to spread.

"Our innovation is to construct a network of ties between different US health regions based on information from the CDC. We asked: Which places in years past got the flu at about the same time? That told us which regions of the country have the strongest ties, or connections, and gave us the analytic power to improve Google's predictions," said Davidson.

GFT works by accumulating real-time data of internet searches for information about the flu and its symptoms. The Google data are approximately two weeks ahead of the CDC reports of flu activity, and are valuable as such. However, if there is a spike in public health concerns about the flu which do not correspond to confirmed cases, the data are not helpful.

The UC San Diego researchers' social network weighs GFT predictions against CDC reports of laboratory-tested flu cases. This allows the researchers to improve upon the GFT model with more refined data. They hope the new method will be employed soon to benefit the health of the public.

"We hope our method will be implemented by epidemiologists and data scientists to better target prevention and treatment efforts, especially during epidemics," Davidson said.

Partial funding for the research came from the Robert Wood Johnson Foundation and the James S. McDonnell Foundation. Dotan A. Haim, another political science graduate student, and Jennifer M. Radin of the UC San Diego/San Diego State University Joint Doctoral Program in Public Health co-authored the study with Davidson.

Source: University of California, San Diego

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