

Researchers study prescription drug posts on social networks

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Do you want information on Viagra or ibuprofen? Check out general social networks such as Twitter and Pinterest. Interested in sleep disorders or depression? You're better off going to specialized health social networks such as WebMD or drugs.com.

That is one of the findings of a just published paper, "Pharmaceutical Drugs Chatter on Online Social Networks," based on an analysis of more than 1 million drug-related posts, by a team of researchers at the University of California, Riverside's Bourns College of Engineering and Zhejiang University in China.

The findings have implications for a wide range of stakeholders. Healthcare providers have more knowledge when recommending social network sites to their patients, or to create new forums for particular health conditions or drugs, which are important given the increasing engagement of patients in their health management.

Also, health care marketing professionals may better focus their resources given a drug. And, researchers of healthcare content in social networks can use the results when selecting data sources.

The findings include:

- Posts to health social networks, such as Web MD and drugs.com, were about twice as likely to have negative sentiment compared to those in general social networks, such as Twitter and Google+.

- The same group of drugs are popular across all analyzed general social networks, while different drugs are popular in health social networks.
- Posts about psychotherapeutic agents, such as Abilify and Cymbalta, are about five times more common on health social networks, while posts about genitourinary tract agents, such as Viagra and Cialis, are 16 times more common in general social networks.

The paper, soon to be published in the *Journal of Biomedical Informatics*, was written by Vagelis Hristidis, an associate professor in the computer science and engineering department at UC Riverside, Matthew T. Wiley, a graduate student working with Hristidis; Kevin M. Esterling, a professor of political science at UC Riverside; and Canghong Jin, a visiting graduate student from Zhejiang University in China.

The researchers identified 10 social networks to study and charted whether they: (1) were health focused or general; (2) moderated; (3) required registration; (4) in the form of question and answer.

The general social networks studied were Twitter, Google+ and Pinterest. (Facebook was not because its data is not public). The health social networks were DailyStrength, Drugs.com, DrugLib.com, EverydayHealth.com, MediGuard.org, WebMD and Medications.com.

The researchers obtained a list of the 200 most commonly prescribed drugs and narrowed it down to 122 by eliminating such things as variants of the same drug but with different strengths.

Meanwhile, they created tools that allowed them to collect references to the drugs from the social network sites. The tools included filters that eliminated such things as duplicate posts and non-English posts. All data was collected in accordance with the terms of use of each social

network. Messages that could be considered spam were not removed because the definition of spam is subjective.

The earliest collected data from the different sites was generated anywhere from 2001 to 2012, depending on when the site was created. The [data collection](#) process ended in early 2013.

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The posts were analyzed in three ways. One, whether they were positive, negative or objective. Two, by breaking them into six drug categories: coagulation modifiers, genitourinary tract agents, nutritional products, cardiovascular agents, psychotherapeutic agents and others. Three, by detecting mentions of five types of medical concepts: anatomy, physiology, procedures, chemicals and drugs and disorders.

The researchers also studied differences in the discussions' content on the social networks based on whether there was moderation, registration required or a question-and-answer format.

Additional findings include:

- There was an 87 percent increase in discussion of psychotherapeutic agents on non-moderated health social networks. Conversely, gastrointestinal agents, hormones, anti-infectives, and respiratory agents all increased on moderated health social networks.
- There was a 42 percent decrease in discussion of central nervous system agents on health networks that require registration. Conversely, health social networks that require registration had a 225 percent increase in posts about respiratory agents.

- Health social networks that have a question-and-answer format have an increase in posts related to coagulation modifiers (243 percent) and metabolic agents (63 percent), whereas non-question-and-answer health social networks had an increase in posts related to anti-infectives (354 percent) and psychotherapeutic agents (47 percent).

A future paper will look at the demographics of the people who post to the health social networks. Further in the future, Hristidis plans to study sites that allow patients to rate doctors.

Provided by University of California - Riverside

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