Can Social Media Help Us Reason about Mental Health?

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ABSTRACT

Millions of people each year suffer from depression, which makes mental illness one of the most serious and widespread health challenges in our society today. There is therefore a need for effective policies, interventions, and prevention strategies that enable early detection and diagnosis of mental health concerns in populations. This talk reports some findings on the potential of leveraging social media postings as a new type of lens in understanding mental illness in individuals and populations. Information gleaned from social media bears potential to complement traditional survey techniques in its ability to provide finer grained measurements of behavior over time while radically expanding population sample sizes. The talk highlights how this research direction may be useful in developing tools for identifying the onset of depressive disorders, for use by healthcare agencies; or on behalf of individuals, enabling those suffering from mental illness to be more proactive about their mental health.

Categories and Subject Descriptors

J.4 [Computer Applications]: Social and Behavioral Sciences.

Keywords

depression; emotion; Facebook; language; social media; mental health; Twitter; wellness

1. INTRODUCTION

Today, mental illness is a major cause of disability in the United States [7]. Besides being directly debilitating to sufferers, mental illness can adversely affect chronic health conditions, such as cardiovascular disease, cancer, diabetes, and obesity. It is also known to have negative influences on individuals' family and personal relationships, work or school life, and sleeping and eating habits. The World Health Organization (WHO) now ranks major depression, a common form of mental illness, as one of the most burdensome diseases in the world [1,7]. Although a number of primary care programs have been devised for its detection and treatment, the majority of the millions of Americans who meet depression criteria are untreated or undertreated [6].

As part of a national-scale effort to curb depression, every few years the Centers for Disease Control and Prevention (CDC) administers the Behavioral Risk Factor Surveillance System

(BRFSS) survey via telephone to estimate the rate of depression among adults in the US [1]. However the large temporal gaps across which these measurements are made, as well as the limited number of participant responses makes it difficult for agencies to track and identify risk factors that may be associated with mental illness, or to develop effective intervention programs.

This talk discusses recent research pursuing the potential of social media as a new tool for mental health measurement. Platforms like Twitter and Facebook are increasingly becoming a rich source of "sensors" that record and reflect individual-centric thoughts, feeling or opinions about small and big happenings in one's life. Potentially, the longitudinal records of such behavior can help detect behavioral changes useful not only from a self-refection perspective, but also to reveal otherwise not apparent mental or behavioral health concerns.

Relying on social media as a behavioral health assessment tool has other advantages as well. For instance, in contrast to the self-report methodology in behavioral surveys, where responses are prompted by the experimenter and typically comprise recollection of (sometimes subjective) health facts, social media measurement of behavior captures social activity and language expression in a naturalistic setting. Such activity is real-time, and happens in the course of a person's day-to-day life. Hence it is less vulnerable to memory bias or experimenter demand effects, and can help track concerns at a fine-grained temporal scale.

The talk will present two linked studies. In the first, we will review our prior research examining the use of Twitter and Facebook data to detect and predict postpartum depression in new mothers [2,5]. Our findings reveal that social media derived behavioral signals, like affect, social capital, linguistic style, and measures of engagement and social interactions can identify women at risk, even perhaps in the early stages of PPD, and provide them access to appropriate services and support. In the second, we will focus on a complementary piece of research that investigates the potential of using Twitter as a reliable tool for measuring population-scale depression patterns [3,4]. This research [3] shows that social media contains useful signals for characterizing the onset of depression, as measured through decrease in social activity, raised negative affect, highly clustered egonetworks, heightened relational and medicinal concerns, and greater expression of religious involvement. In this light, we will also discuss how geographical, demographic and seasonal patterns of depression given by social media activity measures confirm psychiatric findings around mental illness, and correlate highly with depression statistics reported by the Centers for Disease Control and Prevention (CDC) using traditional offline methods [4].

2. REFERENCES

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