Published in final edited form as:

Psychiatr Serv. 2014 February 1; 65(2): 271–272. doi:10.1176/appi.ps.201300211.

A Time-Series Analysis of Google Searches for Suicide and the Risk of Completed Suicide in England and Wales, 2004–2010

Tim A Bruckner, PhD, MPH,

University of California, Irvine, Public Health & Planning, Policy and Design, 202 Social Ecology I,
Irvine, California, 92697-7075

Christopher McClure, and

University of Iceland - Centre of Public Health Sciences

Yonsu Kim

University of California, Irvine - Planning, Policy and Design, 202 Social Ecology I University of
California, Irvine, Irvine, California 92697-7075

Tim A Bruckner: tim.bruckner@uci.edu

Routine surveillance of the incidence of disease comprises a core function of federal and regional public health programs (1). Surveillance systems for mental disorders, however, remain underdeveloped despite strong temporal variation in their incidence. Recently Google, the most commonly used search engine in the world, launched “Google Trends.” This website allows the public to gather statistics on queries to the Google.com search engine. To the extent that depression—a key risk factor for suicide—and suicidal ideation presage an increased risk of suicide completion, surveillance of Google Trends queries may assist with focused bursts of suicide prevention efforts. We tested whether suicide-related Google searches predict the monthly incidence of completed suicides. We examined England and Wales given their publicly available suicide database and their high societal cost of premature death due to suicide (i.e., \$9.2 billion in 2009 alone) (2).

We retrieved the incidence of suicide in England and Wales for January 2004 to December 2010, the longest series that overlaps with internet-based suicide queries. We defined suicide using conventional ICD-10 classification schemes. We used as independent variables the monthly internet-based queries on a series of search terms within England and Wales, drawn from previous literature, that relate to suicide ideation (3,4). We examined three distinct sets of terms: suicide methodology (“suicide”, “suicide” and “methods”), depressive symptoms (terms: “suicide” and “depression”, “depression”, “depression” and “help”), and suicide help (terms: “suicide” and “help”). To statistically control for temporal patterns in suicide (e.g., seasonality, trend), we applied rigorous time-series routines (see Appendix) (5). We further controlled for the unemployment rate and Google searches in the news, which often peak following suspected suicides of popular personalities (e.g., Amy Winehouse) but may not signal increased help-seeking or depression.

Disclosures of Conflicts of Interest: None for any author.

In the three searches that included the term “*depression*,” we find a positive relation with search volume and suicide in that same month (see Appendix). The strongest positive relation occurs between the “*depression* and *help*” Google Trends query and suicide incidence in the same month (coef. at lag 0 months = .0045, standard error [SE] = .0014, $p=.002$). We estimate that Google searches statistically account for a seven percent increase in suicides during months in which search volume for “*depression*” increased. However, none of the internet searches predict the incidence of suicide in the following month. We, moreover, find no relation between “*suicide*” or “*suicide* and *methods*” searches and suicide incidence

We caution the reader against inferring an individual’s internet search behavior, depressive symptoms and their risk of suicide from our population-level tests. Temporal fluctuations in Google searches, rather, gauge a population-level interest which cannot shed light on individual differences in suicide risk. In addition, our findings of a positive relation between internet search volume for “*suicide* and *depression*” and completed suicide in the same month cannot definitively establish that suicide-related searches precede suicide completion. Nevertheless, our findings in England and Wales indicate that current surveillance efforts for suicide may benefit from the real-time use of Google-based internet searches for depression.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This study is supported by a National Institutes of Health Fellowship (NOT-OD-09-107).

References

1. World Health Organization. International Health Regulations. 2. Geneva: WHO; 2005.
2. Knapp, M.; McDaid, D. Mental health promotion and prevention: The economic case. Parsonage, M., editor. London: Personal social services research unit, London School of Economics and Political Science; 2011.
3. McCarthy M. Internet Monitoring of Suicide Risk in the Population. *J Affective Disorders*. 2010; 122:277–279.
4. Sueki H. Does the volume of internet searches during suicide-related search terms influence the suicide death rate: data from 2004–2009 in Japan. *Psychiatry and Clinical Neuroscience*. 2011; 65:392–394.
5. Box, G.; Jenkins, G.; Reinsel, G. Time series analysis: forecasting and control. London: Prentice Hall; 1994.