

Using Social Media to Understand and Address Substance Use and Addiction

Trans-NIH RFA Concept presentation
to NCI Board of Scientific Advisors

Wen-ying Sylvia Chou, PhD, MPH
Health Communication and Informatics Research Branch

November 7, 2013



Partnership with Collaborative Research on Addiction at NIH (CRAN)

- A trans-NIH Initiative to advance research in substance use and addiction
- IC contributions to CRAN
 - 70% NIDA
 - 25% NIAAA
 - 4% NCI
 - 1% the rest of NIH
- This NCI-led RFA was:
 - Approved by CRAN in June 2013, with a set-aside fund of **\$5M for FY14**
 - Approved by NIDA and NIAAA leadership
 - Approved by NCI's SPL in September 2013

Changes in communication landscape

- Rapid growth of mobile and Web 2.0 technologies
 - US Internet penetration >80% ¹
 - Social media use >72% among Internet users ²
- Changing communication ecology
 - Proliferation of user-generated content blurs boundaries between communicators and public ^{3,4}
- Distilling hype from reality: opportunities for health behavioral research⁴

1. Fox S. 2013. Pew Internet Health.

2. Chou WS et al. 2009. Social media use in the US: Implications for Health Communication. *JMIR*.

3. Centola D. Social Media and the Science of Health Behavior. *Circulation*.

4. Chou WS et al. 2013. Web 2.0 for health communication: Reviewing the current evidence. *AJPH*.

Who uses social networking sites

% of internet users within each group who use social networking sites

	All internet users (n=1,895)	72%
a	Men (n=874)	70
b	Women (n=1,021)	74
Race/ethnicity		
a	White, Non-Hispanic (n=1,331)	70
b	Black, Non-Hispanic (n=207)	75
c	Hispanic (n=196)	80 ^a
Age		
a	18-29 (n=395)	89 ^{bcd}
b	30-49 (n=542)	78 ^{cd}
c	50-64 (n=553)	60 ^d
d	65+ (n=356)	43
Education level		
a	No high school diploma (n=99)	67
b	High school grad (n=473)	72
c	Some College (n=517)	73
d	College + (n=790)	72
Annual household income		
a	Less than \$30,000/yr (n=417)	75
b	\$30,000-\$49,999 (n=320)	72
c	\$50,000-\$74,999 (n=279)	74
d	\$75,000+ (n=559)	71
Urbanity		
a	Urban (n=649)	74
b	Suburban (n=893)	71
c	Rural (n=351)	69

Hispanics significantly more likely to use social media

Tripled since 2009

Source: Pew Internet and American Life Project, 2013.

Changes in communication landscape

- Rapid growth of mobile and Web 2.0 technologies
 - US Internet penetration >80% ¹
 - Social media use >72% among Internet users ²
- Changing communication ecology
 - Proliferation of user-generated content blurs boundaries between communicators and public ^{3,4}
- Distilling hype from reality: opportunities for health behavioral research⁴

1. Fox S. 2013. Pew Internet Health.

2. Chou WS et al. 2009. Social media use in the US: Implications for Health Communication. *JMIR*.

3. Centola D. Social Media and the Science of Health Behavior. *Circulation*.

4. Chou WS et al. 2013. Web 2.0 for health communication: Reviewing the current evidence. *AJPH*.

Stakeholder Recommendations

- **IOM reports** and **Healthy People 2020**^{1, 2, 3} call upon the NIH to support the development of new communication approaches leveraging social media to facilitate patient engagement and alleviate disease burden
- **“Emerging media and cancer prevention”** identified as 2013-14 focus of the President’s Cancer Panel (Dr. Rimer’s presentation to Joint NCAB/BSA Meeting, June 23)

1. For the Public's Health: Investing in a Healthier Future. 2012. The National Academies Press
2. Promoting Health Literacy to Encourage Prevention and Wellness: Workshop Summary. 2011. The National Academies Press.
3. U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy People 2020. Health Communication and Health Information Technology. Washington, DC. Available at <http://www.healthypeople.gov/2020/default.aspx>

Social media interactions reveal public attitudes, perceptions and knowledge about health

 **Anthony** @antsgardiner Follow

eCigarettes. I can sit at my desk and smoke. This instantly makes them a thousand times better than normal cigarettes. Oh, & no cancer.

Reply Retweet Favorite More

2 FAVORITES 

10:31 PM - 16 Sep 13

Reply to @antsgardiner

 **Matt Green** @c4ncer 16 Sep
@antsgardiner also, you can get ePipes for added sophistication.

Details Reply Retweet Favorite More

 **truthertbot** @truthertbot 11 Sep
The **HPV vaccine** is a national health care scam based on scientific fraud and clever fear mongering by Big Pharma.

Expand Reply Retweet Favorite More

 **National Cancer Inst** @theNCI 11 Sep
What kinds of cancer are related to HPV infection? Get the Facts:
1.usa.gov/18VVivS

Expand Reply Retweet Favorite More

Communication surveillance opportunities

The New York Times

Sunday Review

There's a Fly in My Tweets

By HENRY KAUTZ

Published: June 21, 2013

"...a small but growing number of research groups have initiated similar efforts to leverage the torrent of online information for social good."

"... The millions of people posting to sites like Twitter and Facebook can be viewed as a vast organic sensor network, providing a real-time stream of data about the social, biological and physical worlds."

The New York Times

Research

Social Media Join Toolkit for Hunters of Disease

By BRONWYN GARRITY

Published: June 13, 2011

"Social media — Facebook, Google, Twitter, location-based services like Foursquare and more — are changing the way epidemiologists discover and track the spread of disease..."

Vaccine 28 (2010) 1535–1540



ELSEVIER

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine



An analysis of the Human Papilloma Virus vaccine debate on MySpace blogs

Jennifer Keelan^a, Vera Pavri^b, Ravin Balakrishnan^c, Kumanan Wilson^{d,*}

"Blogs can be seen as ... the unfiltered viewpoints of citizens motivated to write on a subject. Blog dialogue concerning the HPV vaccine provides researchers with a unique opportunity to track opinions and attitudes towards newly recommended immunizations amongst its target population (the parents making decisions for minor children).

This approach could be ... adopted to continuously survey and monitor discourse concerning immunization."



Observational and intervention research using online interactions

2136 *Circulation* May 28, 2013

nature

International weekly journal of science

A 61-million-person experiment in social influence and political mobilization

Robert M. Bond¹, Christopher J. Fariss¹, Jason J. Jones², Adam D. I. Kramer³, Cameron Marlow³, Jaime E. Settle³ & James H. Fowler^{1,4}

“...online messages might influence... offline behaviors...the growing availability of cheap and large-scale online social network data means that these experiments can be easily conducted in the field...it will be important to use these methods to identify which real world behaviors are amenable to online interventions.”

Social Media as a Tool in Medicine

Social Media and the Science of Health Behavior

Damon Centola, PhD

Table 2. Comparison of Methods for Studying Social Influences on Health Behaviors

	Traditional Observational Data	Laboratory Experiment	Digital Observational Data	Internet Experiment
Scale	✓	X	✓	✓
Measurement	X	✓	✓	✓
Structural control	X	✓	X	✓
Replication	X	✓	X	✓
Behavioral fidelity	✓	X	✓	✓

Purpose of the RFA

Investigate the impact of social media (SM) on 'alcohol, tobacco, and other drug' (ATOD) use, abuse and addiction;

2 complementary approaches:

- **Observational studies** using SM as data/surveillance tool to understand risk factors, attitudes, and behaviors associated with ATOD use
- **Interventions** to test reach, engagement, and behavioral and health impact of SM on ATOD screening, prevention, and treatment

New and nimble research methods

- Natural Language Processing (NLP) for content analysis
 - E.g., sentiment analysis
- Social network analysis
- Data visualization techniques
 - E.g., spatial and temporal analyses
- Natural experiments and observational trials
- Private sector partnership
 - Expertise in measures and methods
 - Use of commercially available data mining techniques (e.g., Google Trends; Mechanical Turk)
- Fields traditionally outside of cancer:
 - E.g., Computer science, systems engineering, computational linguistics, behavioral economics, social marketing

Key objectives (1)

- Mine SM content to understand:
 - Risk factors associated with ATOD use
 - Real-time substance use patterns, consequences, triggering social contexts, and peer-to-peer interactions about ATOD use
 - Use and utility of SM for health promotion
 - Use and utility of SM for tobacco/alcohol marketing by industries
- Describe SM use patterns across populations
 - Age, SES, geographic location, network, health & ATOD use
- Test hypotheses on the effect of SM engagement on multiple levels of behavior change

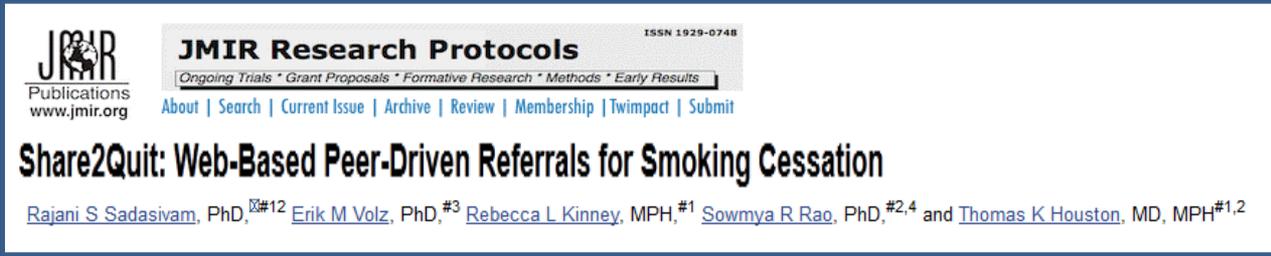
Example:

The image shows a screenshot of a BMJ Open article page. At the top, there are two blue tabs: "Open Access" on the left and "Research" on the right. The BMJ Open logo is on the left, with the text "BMJ open accessible medical research". The article title is "Hookah's new popularity among US college students: a pilot study of the characteristics of hookah smokers and their Facebook displays". Below the title, the authors are listed: "Libby N Brockman,^{1,2} Megan A Pumper,³ Dimitri A Christakis,¹ Megan A Moreno³". There are three sections at the bottom: "To cite: Brockman LN, Pumper MA, Christakis DA, et al. Hookah's new popularity among US college students. (1) To confirm the prevalence of hookah use among US college students. (2) To identify ...", "ABSTRACT", and "ARTICLE SUMMARY". The "ARTICLE SUMMARY" section has a sub-section titled "Article focus".

Key objectives (2)

- Ascertain feasibility and effectiveness of SM for ATOD use identification, prevention, service delivery and treatment
 - Theory-based, dynamic interventions
 - Mobile-based, peer-driven programs
 - Use of SM to overcome barriers to substance abuse treatment (e.g., stigma, cost, and lack of physical access to treatment)
- Identify intervention characteristics that contribute to the diffusion and adoption of addiction and substance use control programs

Example:



The screenshot shows the header of a JMIR Publications article. On the left is the JMIR Publications logo with the website address www.jmir.org. To the right is the 'JMIR Research Protocols' logo with ISSN 1929-0748. Below the logo is a navigation bar with links: About | Search | Current Issue | Archive | Review | Membership | Twimply | Submit. The article title is 'Share2Quit: Web-Based Peer-Driven Referrals for Smoking Cessation'. Below the title is the author list: Rajani S Sadasivam, PhD,^{#12} Erik M Volz, PhD,^{#3} Rebecca L Kinney, MPH,^{#1} Sowmya R Rao, PhD,^{#2,4} and Thomas K Houston, MD, MPH^{#1,2}.

FOA approach

- Mechanism of Support
 - NIH R21s and R01s (up to 3-year; with cap on \$)
- Additional requirements
 - Multi-disciplinary expertise
 - Streamlined and nimble research design
- RFA
 - Creation of Special Emphasis Panel led by NCI
 - One-time receipt date in FY 2014
 - Anticipated number of awards: 8-10

Thank you!