Using Social Media to Understand and Address Substance Use and Addiction

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

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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
Overview

- Background & rationale
- RFA purpose and scope
- RFA approach

What is social media?
- User-generated content as part of social interaction through web technologies (including mobile)
- Transparency and accessibility of interactions
- Examples: Facebook, YouTube, Twitter, CaringBridge, Patientslikeme, online support groups and discussion forums
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 research \(^4\)

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

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

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**

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¹ Fox S. 2013. Pew Internet Health.
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)

Social media interactions reveal public attitudes, perceptions and knowledge about health.
Communication surveillance opportunities

"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."

"...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."

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

"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

“...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.”
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:
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:

Share2Quit: Web-Based Peer-Driven Referrals for Smoking Cessation

Rajani S. Sadasivam, PhD,1,2 Erik M. Volz, PhD,3 Rebecca L. Kinney, MPH,1 Sowmya R. Rao, PhD,4 and Thomas K. Houston, MD, MPH1,2
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!