Social Media and Public Health: Opportunities in apparent chaos

Sumiko Mekaru, DVM MPVM
HealthMap, Boston Children’s Hospital
Social Media and Public Health

1. How does it fit into the traditional public health structure?
2. How do we find signals in it?
3. How can we use it in research?
4. How can you use it professionally?
Traditional Public Health Reporting

1. Public

2. Public health practitioners
   - Healthcare workers, Clinicians

3. Local Officials
   - Labs

4. Ministry of Health

5. World Bodies (UN, WHO, FAO, OIE)
Traditional Public Health Reporting

1. Public
2. Public health practitioners
3. Healthcare workers, Clinicians
4. Ministry of Health
5. World Bodies (UN, WHO, FAO, OIE)
Potential of Digital Disease Detection

- Epidemic curve
- SMS Messaging
- Micro Blogging
- Social Networking
- Internet Searching
- Emailing
- Blogging
- Internet Chatting
- Online News Reporting
- Video/Radio Reporting
- Health Expert Reporting
Finding a Signal

Wednesday, Sep. 09, 2009

Is a Swine Flu Outbreak Coming? Ask Your iPhone

By Bryan Walsh
H1N1 reports from Outbreaks Near Me and from CDC lab data
Flu-related tweets and ILI-related ED visits in NYC

New York City Flu Season 2012-2013

NYC ED visits data:

Methods for Twitter data:
Using Twitter Streaming API, filtered by profile text location 'loc': NYC, New York, NY, Manhattan, Brooklyn, Queens, Long Island, Staten Island, Bronx; tweet and profile latitude and longitude: 41.12 > 'til' / 'plt' > 40.44, -72.63 > 'tin' / 'pln' > -74.93. Further filtered by keyword in tweet: "flu", "gripe", "influenza", "high fever" and excluded "stomach" / "avian" / "birdflu"

Correlation: 0.779 - for entire timespan, this assumes tweet volume is four days in advance of visits

Max Correlation: 0.915 between 12/23 - 1/17 (Tweets) with 12/27-1/21 (ED Visits)
H7N9: Finding a signal in silence

HealthMap.org @healthmap
Breaking: 2 dead Shanghai, 1 ill Anhui Province from H7N9 Avian Influenza. 1st human cases from this strain #birdflu bit.ly/13li2LK

Collapse ← Reply Retweeted Favorite More

15 RETWEETS 2 FAVORITES

4:22 AM - 31 Mar 13 · Details

Reply to @healthmap
H7N9: Finding a signal in silence

New avian flu strain kills two in China, one in critical condition

BELIING: Two people in China have died after being infected with H7N9 avian influenza - a sub-type that had not previously been transmitted to humans - the government said Sunday.

An 87-year-old man in Shanghai fell ill on February 19 and died on March 4, while a man aged 27 in the city got sick on February 27 and died on March 10, the National Health and Family Planning Commission said on its website.
H7N9 and Social Media

On April 3, 2013, a post on Chinese microblogging site, Weibo, from a Nanjing Hospital employee, reported a confirmed case of H7N9.
April 3 2013

This post forced the Hospital employees to publically confirm the case on Weibo, shortly after.
Unlikely cover-up... insights from Baidu

Flu related search query volume
Research opportunities from social media and crowdsourcing
How it works

Register online by computer or phone.
WEEKLY SURVEY

NOTIFIED BY EMAIL OR PUSH NOTIFICATION

Report Your Health Status

Thank you for registering for the Flu Near You project! Now it's time to start your first survey.

What symptoms have you experienced in the past week?

- Fever
- Cough
- Sore throat
- Shortness of breath
- Chills/night sweats

- I did not have any of the listed symptoms

Did you receive the flu vaccine after July 31, 2011?

- Yes
- No
- Don't know

Did you receive the flu vaccine last year (between July 31, 2010 - July 31, 2011)?

- Yes
- No
- Don't know

Submit
Thank you for registering for the Flu Near You project! Now it’s time to start your first survey.

What symptoms have you experienced in the past week?
- [ ] Fever
- [ ] Cough
- [ ] Sore throat
- [ ] Shortness of breath
- [ ] Chills/night sweats
- [ ] Fatigue
- [ ] Nausea or vomiting
- [ ] Diarrhea
- [ ] Body aches
- [ ] Headache

What was your highest temperature measured?
- [ ] less than or equal to 99.9°F
- [ ] Not measured

What day did you start feeling ill?

[Calendar for October 2011]
- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [ ] 6
- [ ] 7
- [ ] 8
- [ ] 9
- [ ] 10
- [ ] 11
- [ ] 12
- [ ] 13
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- [ ] 26
- [ ] 27
- [ ] 28
- [ ] 29
- [ ] 30
- [ ] 31

[Google Maps placeholder]
SEE THE SPREAD OF FLU THROUGH CROWDSOURCING
VISUALIZE LOCAL ILLNESS

Flu Activity in Your Area

User contributed data: (colors determined by current week of data)
- No symptoms reported
- Some symptoms reported
- At least 1 person with Influenza Like Illness


week ending: 1/22/2012

flu near you
do you have it in you?
VISUALIZE REGIONAL ILLNESS

Flu Activity in Your Area

User contributed data: (colors determined by current week of data)
- No symptoms reported
- Some symptoms reported
- At least 1 person with Influenza Like Illness

Map data ©2012 Google - Terms of Use 
Report a map error
FLU NEAR YOU APP
Some emergency rooms overwhelmed with flu patients: Pennsylvania hospital sets up flu tent outside E.R.

Scores dead after bomb blasts in Quetta
FEVER PEAKS

A comparison of three different methods of measuring the proportion of the US population with an influenza-like illness.

Google Flu Trends
CDC data
Flu Near You

Google's algorithms overestimated peak flu levels this year.

Estimated % of US population with influenza-like illness

Jan 2011
Jan 2012
Jan 2013

Nature 494, 155–156 (14 February 2013)
Integrating Diagnostics

[Map of the United States with various regions highlighted in different colors.]

Week ending 6/24/2012
Social Media for skeptical beginners:
Create a “list” of a few reliable sources
Social Media and Public Health

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Thank you!