

Using Social Media to Detect Potential Foodborne Outbreaks

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Many people get sick, but few report it...

- Every year...
 - 1 in 6 Americans get sick
 - 128,000 are hospitalized
 - 3,000 die of foodborne diseases
 - Negative economic impact of foodborne illness in US, including medical costs, quality-of-life losses, lost productivity, and lost-life expectancy, may be as high as \$77 billion/year

Only 2.9% of people who get sick report their illness

...but they do complain about it on social media




DJ Hickey
@DJHickey_

⚙️ [Follow](#)

Huge shoutout to [@Wendys](#) for the food poisoning. [#bothends](#)

LIKES
9







Brendan Bognar
@bbognar12

⚙️ [Follow](#)

Well food poisoning sucks. Thanks [@olivegarden](#)

LIKE
1





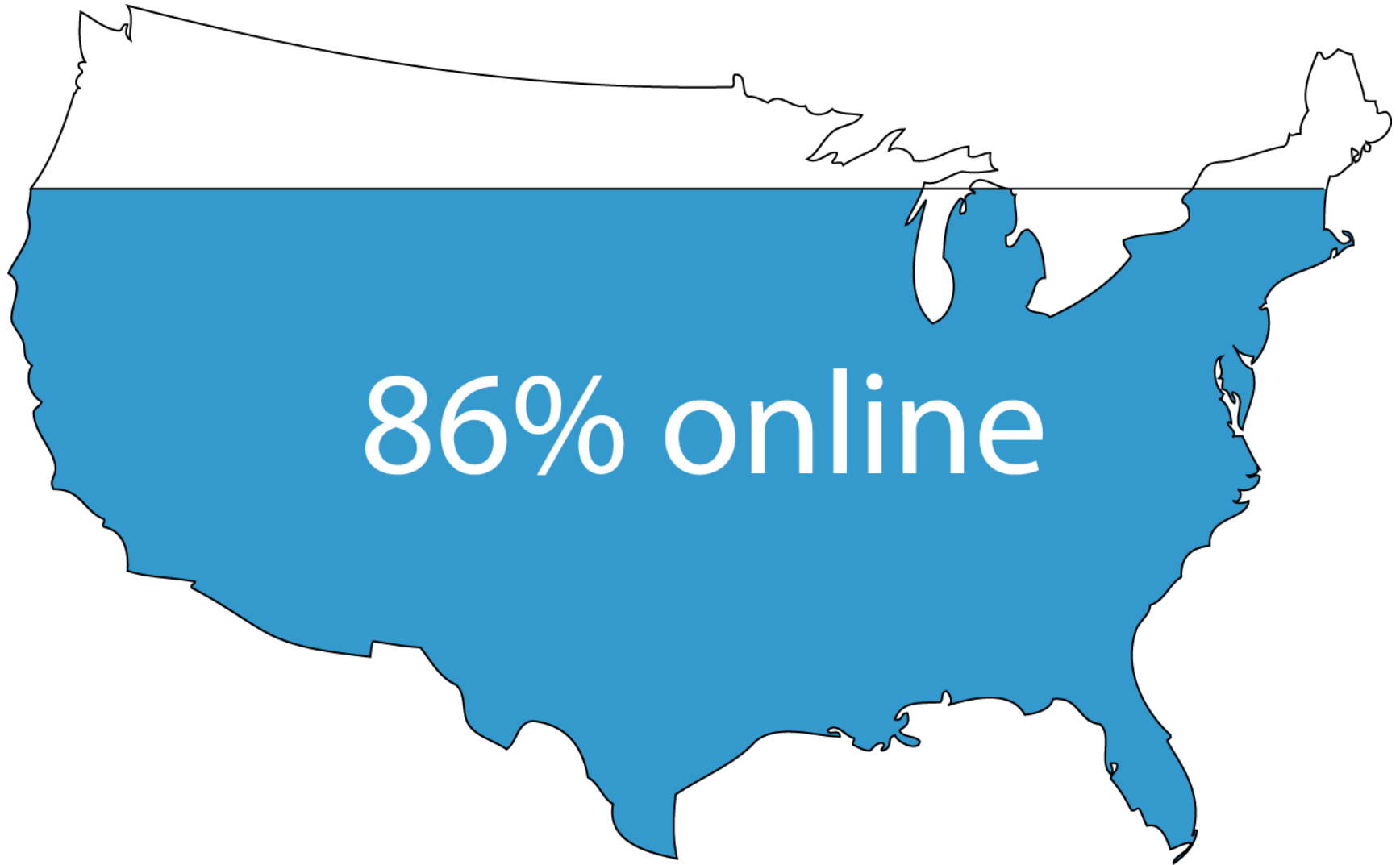
Houston
@GaymerNerd

⚙️ [Follow](#)

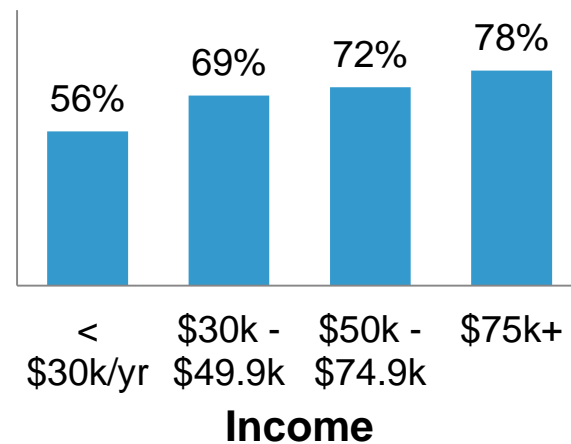
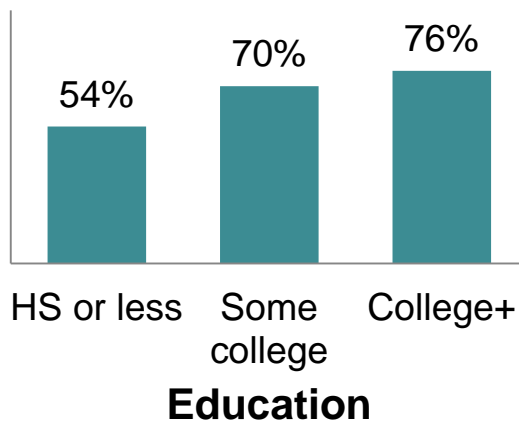
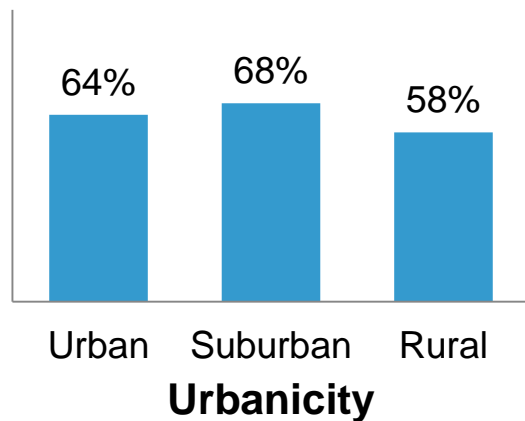
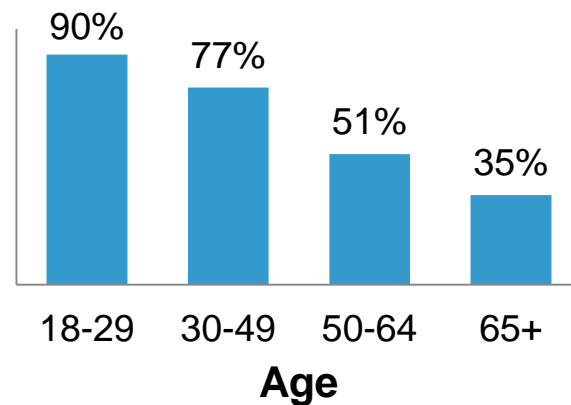
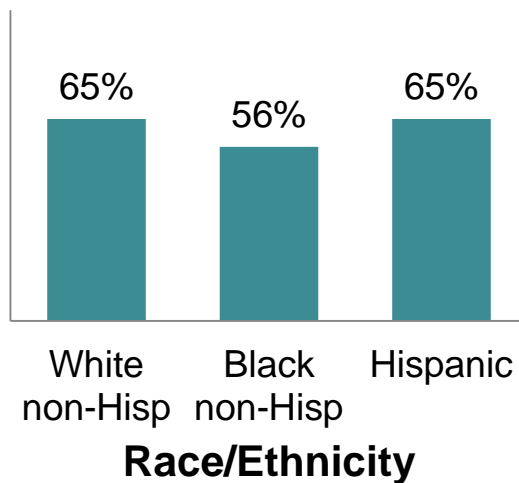
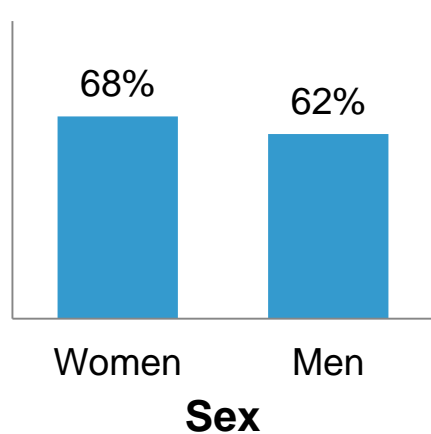
Applied for a place; battled food poisoning (!?);
Forced servitude for the White Queen -
Porcelina. DAY

9:49 PM - 18 Feb 2016

Social media use in the US



US social media users by the numbers



How can we tap into social media to improve surveillance and reporting?

[Home](#)[About](#)[Q&A](#)[Press](#)[Follow @foodbornechi](#)

FOODBORNE CHICAGO

Report food poisoning

A project of the **SmartChicago**
COLLABORATIVE

If you think you have food poisoning in Chicago, please complete this form. The info will be sent to the Chicago Department of Public Health so they can take any necessary action.

Did we @reply you on Twitter? Here's why.

We use computers & code to search Twitter for tweets related to food poisoning in Chicago. We do as much as we can to automatically zero-in on the tweets we think are really about a possible food poisoning case and really coming from Chicago. Then real humans review the tweets and @reply back to people with a link back to this page. [More detail here.](#)

Identify and reply to tweets...

 **Tamara Ramirez**
@__MaraMilady

Food poisoning is a bitch. Never eating Chinese again. And I hate this damn hospital 😞 😞

👤 Reply 🔄 Retweet ★ Favorite ... More

3:45 AM - 2 Nov 2013

Reply to @__MaraMilady

 **Foodborne Chicago** @foodbornechi · Nov 5
@__MaraMilady We're sorry to hear you're so sick. We can help you by clicking on this link to report it:
foodborne.smartchicagoapps.org/39655870105558...

Details 👤 Reply 🔄 Retweet ★ Favorite ... More

 **LovelyStars**
@jazhearts

Yep doctor said I had food poisoning 😞 😞 😞

📍 from Chicago, IL

👤 Reply 🔄 Retweet ★ Favorite ... More

5:51 PM - 13 Apr 2014

Reply to @jazhearts

 **Foodborne Chicago** @foodbornechi · Apr 17
@jazhearts Sorry to hear you're ill. The Chicago health department can help.
foodborne.smartchicagoapps.org/45547842393093...

Details 👤 Reply 🔄 Retweet ★ Favorite ... More

 **DaMediaGuy**
@DaMediaGuy

UPDATE: I'm back, after 5 days of having what my doctor says is a stomach virus/food poisoning from eating at @LouMalnatis Lincoln Park 😞 😞 😞 😞

👤 Reply 🔄 Retweet ★ Favorite ... More

2:16 PM - 24 Apr 2013

Reply to @DaMediaGuy @LouMalnatis

 **Foodborne Chicago** @foodbornechi · 24 Apr 2013
@DaMediaGuy Sorry to hear you were sick. The city can help you here:
foodborne.smartchicagoapps.org/32713895154459...

Details 👤 Reply 🔄 Retweet ★ Favorite ... More

 **DaMediaGuy** @DaMediaGuy · 25 Apr 2013
@foodbornechi Thanks!

Details 👤 Reply 🔄 Retweet ★ Favorite ... More

 **Foodborne Chicago** @foodbornechi · 26 Apr 2013
@DaMediaGuy You're welcome!

Details 👤 Reply 🔄 Retweet ★ Favorite ... More

Foodborne Chicago first 10 months

- **2,241** Tweets identified and classified
- **270** Response tweets
- **193** Reports submitted
- **179** Food establishments identified
- **137** Inspections

FoodborneSTL

Purpose

- Improve St. Louis foodborne illness surveillance and reporting

Specific Aims

- Implement the HealthMap Foodborne Dashboard in the City of St. Louis Department of Health to identify and respond to food poisoning tweets on Twitter
- Evaluate the implementation and effectiveness of the Dashboard in a practice setting

The Team

- Washington University in St. Louis
- Harvard Medical School
- City of St. Louis Department of Health
- Chicago Department of Public Health



FOOD SAFETY STL

A NEW WAY TO HELP PROTECT ST. LOUIS FROM FOODBORNE ILLNESS
BROUGHT TO YOU BY THE CITY OF ST. LOUIS DEPARTMENT OF HEALTH

Outline

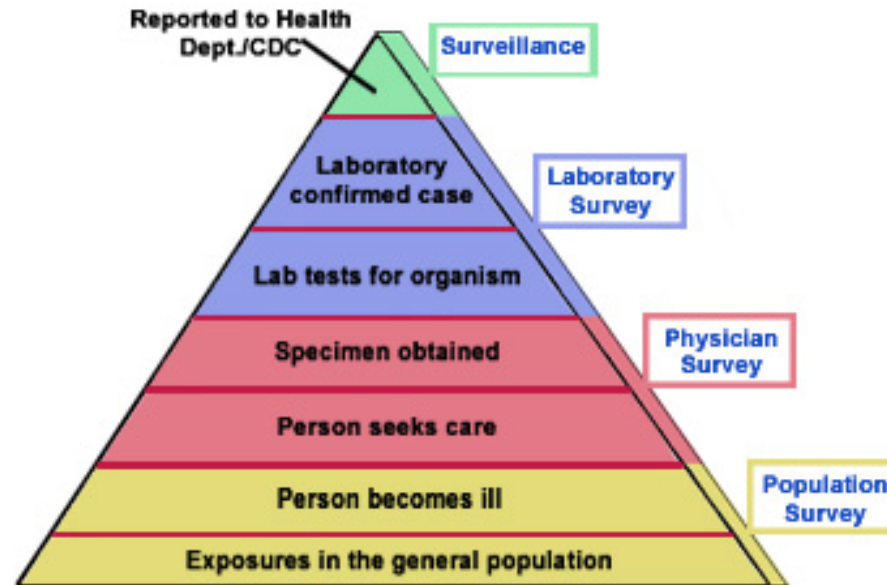
- Existing Surveillance
- Food Safety STL
- Implementation in LHD

Existing Surveillance

- **Passive Surveillance**
 - Reportable diseases, complaints called in
- **Active Surveillance**
 - FoodNet (laboratory confirmed cases only)
- **Outbreak Surveillance**
 - Foodborne Disease Outbreak Surveillance System
- **Surveys**
 - FoodNet Population Survey, FoodNet Laboratory Survey, National Ambulatory Medical Care Survey, National Health and Nutrition Survey, etc
- **Vital Statistics**
 - Census data, cause-of-death data

Existing Surveillance

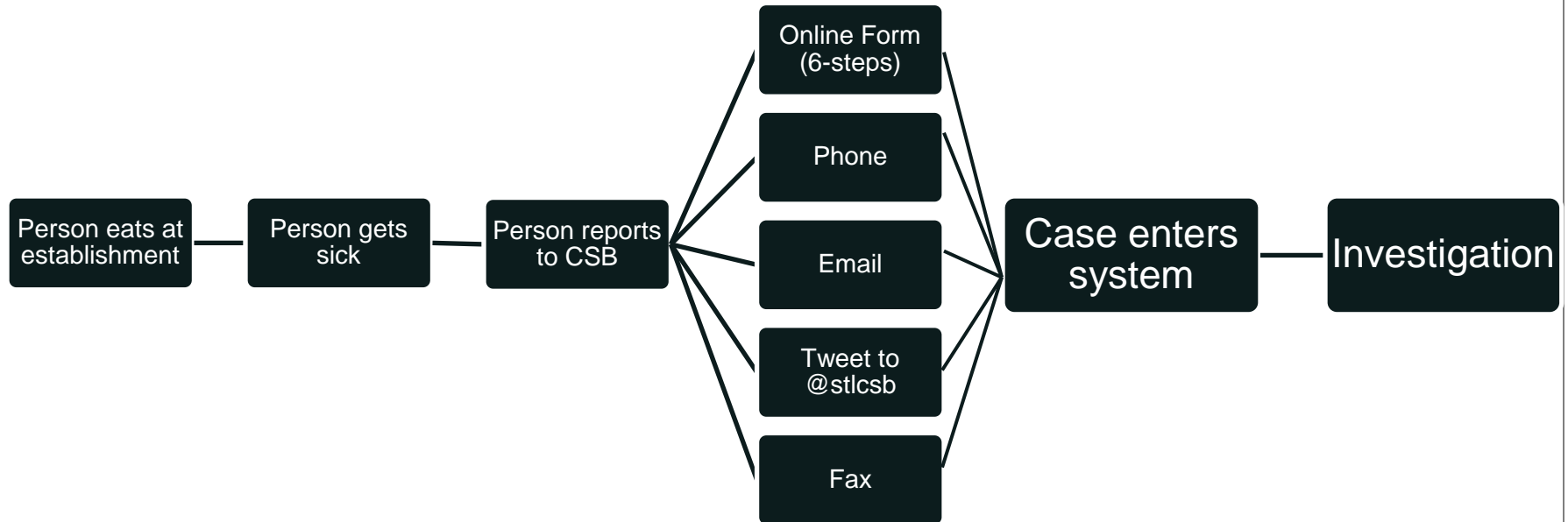
- Burden of illness pyramid*: Steps that must occur for a case to reach existing surveillance:



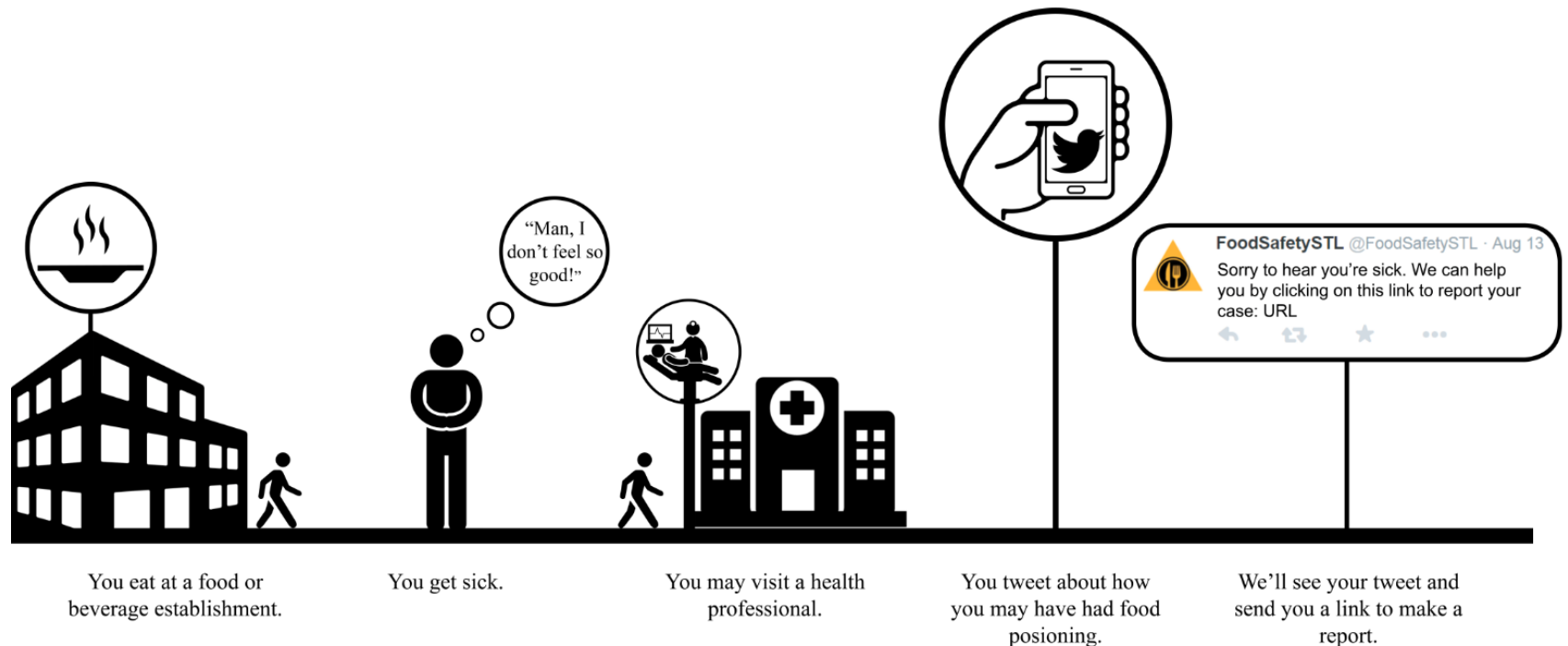
- Complaints reported

Existing Surveillance

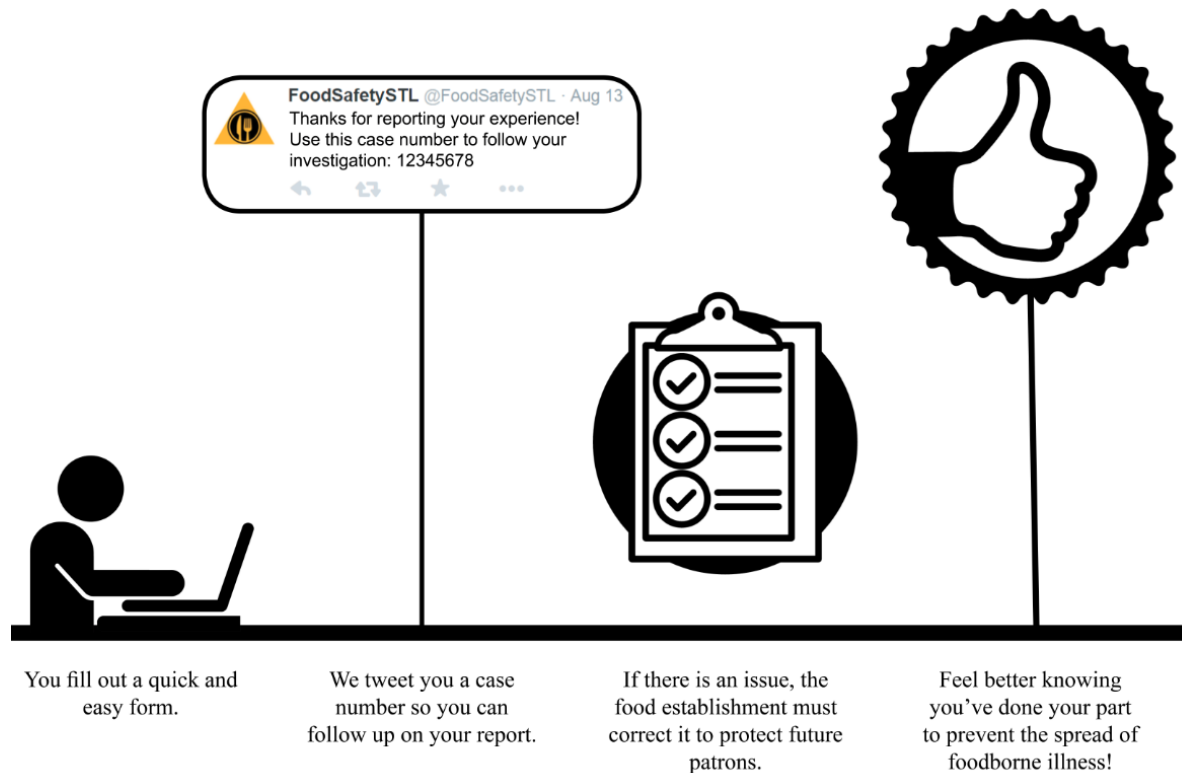
- Complaints: through Citizen Service Bureau (CSB)



Food Safety STL



Food Safety STL



Food Safety STL

Identify
Tweets

Validate
Tweets

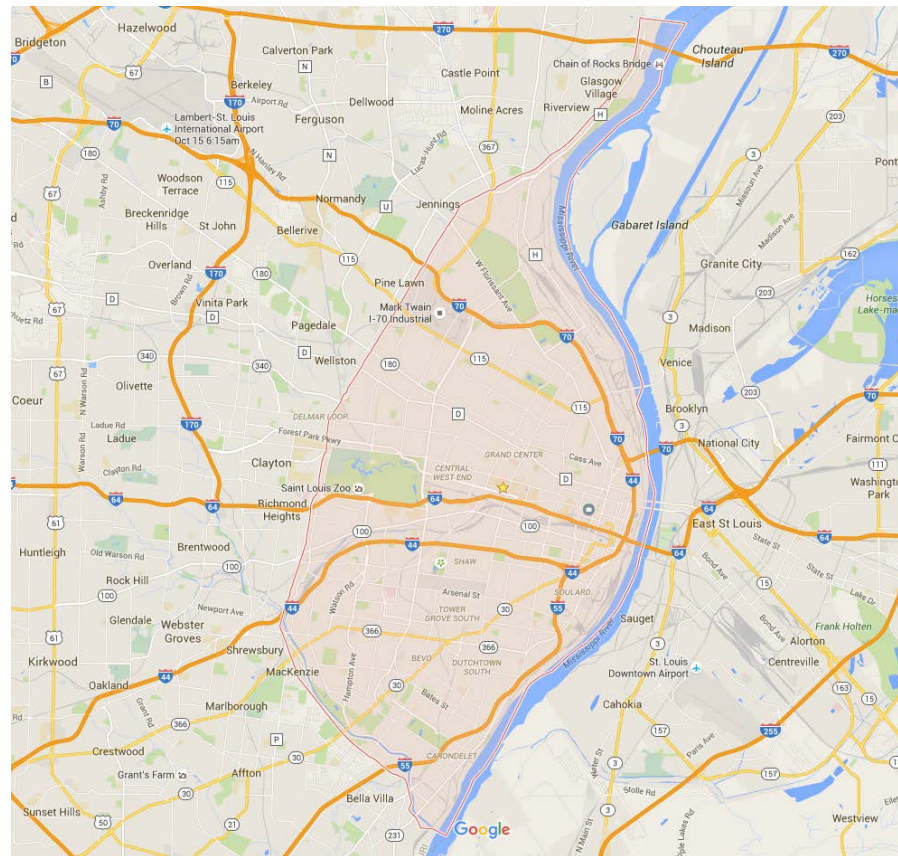
Respond to
Tweets

Determine
Jurisdiction

Send to CSB,
respond
with Case #

Inspector
Investigates,
closes case

CSB closes
case



Dashboard for classifying tweets

Identify
Tweets

Validate
Tweets


Respond to
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Determine
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 **HealthMap Foodborne Illness** STL test (Logout)



Location: City [This user was determined to be reside within this city based on their Twitter profile]


validate

   09.17.15 Food poisoning is never fun. 05:22:34 PM

respond




































Dashboard for classifying tweets



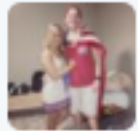
 HealthMap Foodborne Illness: St. Louis STL test (Logout)

Classified Tweets

get tweets!

validate	  	09.17.15	Food poisoning is never fun.	details  	respond
validate	  	09.17.15	Between the sinus headache and food poisoning last night, not a lot got done. But hey, we introduced our new roommate to Stardust.	details  	respond
validate	  	09.17.15	@JohnNewsham1 I had food poisoning which left me not quite myself for 2 weeks so the champagne was a celebration drink ..convincing??	details  	respond
validate	  	09.15.15	Chipotle Faces Food Poisoning Lawsuits in California and Minnesota - http://t.co/Y7tkJOHN59	details  	respond
validate	  	09.15.15	It's complete horse shit that I still have to go to school with food poisoning!	details  	respond
validate	  	09.15.15	I might have food poisoning	details  	respond
validate	  	09.15.15	I love, love, love food poisoning. 😊👍❤️	details  	respond

Example of a tweet response



Matthew Kissel @STLMANIAC · Oct 15

Hey @ChickfilA thank you. Thank you for the food poisoning. All I wanted was a nice chicken sandwich dinner and you do me like this. Wow.



FoodSafetySTL @FoodSafetySTL · Oct 16

@STLMANIAC Sorry to hear you're ill. The City of STL Dept. of Health can help. Report here: <http://foodborne.healthmap.org/requestInfo?tw...>

Reporting form linked in each response tweet

Identify
Tweets

Validate
Tweets


Respond to
Tweets

Determine
Jurisdiction

Send to CSB,
respond
with Case #

Inspector
Investigates,
closes case

CSB closes
case

 HealthMap Foodborne Illness

Food Safety STL: Foodborne Illness Reporting

Additional Case Details

Was this food eaten at home or at a restaurant?

☐ Home ☒ Restaurant

* Required Fields

What restaurant did you eat at? (Name, Address/Neighborhood)*

What type of food did you eat?*

When did you eat it?*

What happened?

Please be as specific as possible, e.g. "I purchased a hot dog from the Kwik-E-Mart at 6pm. From 10pm-4am I had multiple bouts of diarrhea and vomiting. I was up all night and felt horrible until the next afternoon."

How many people got sick?*

The City of St. Louis Department of Health would like the following information in order to contact you directly if needed:

Name

Phone number*

Email address

☐ By clicking here, you agree to the contents outlined in our [Privacy Policy](#).

Determine jurisdiction

Identify
Tweets

Validate
Tweets

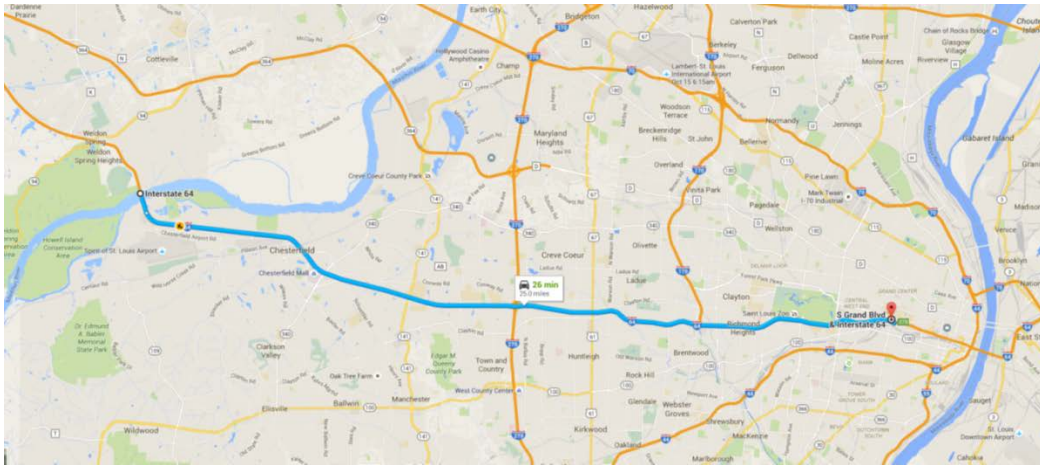
Respond to
Tweets

Determine
Jurisdiction

Send to CSB,
respond
with Case #

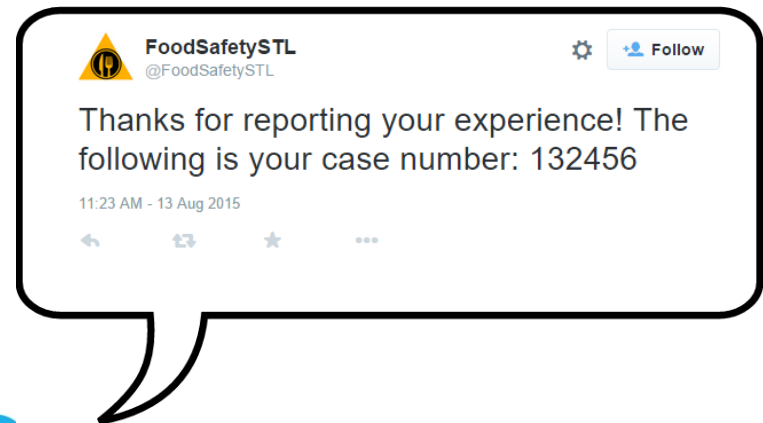
Inspector
Investigates,
closes case

CSB closes
case

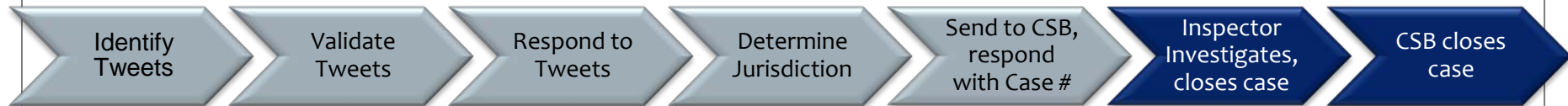


St. Louis County
St. Charles County
Jefferson County
Lincoln County
Warren County
Madison County
Pike County
St. Clair County
Franklin County
Washington County

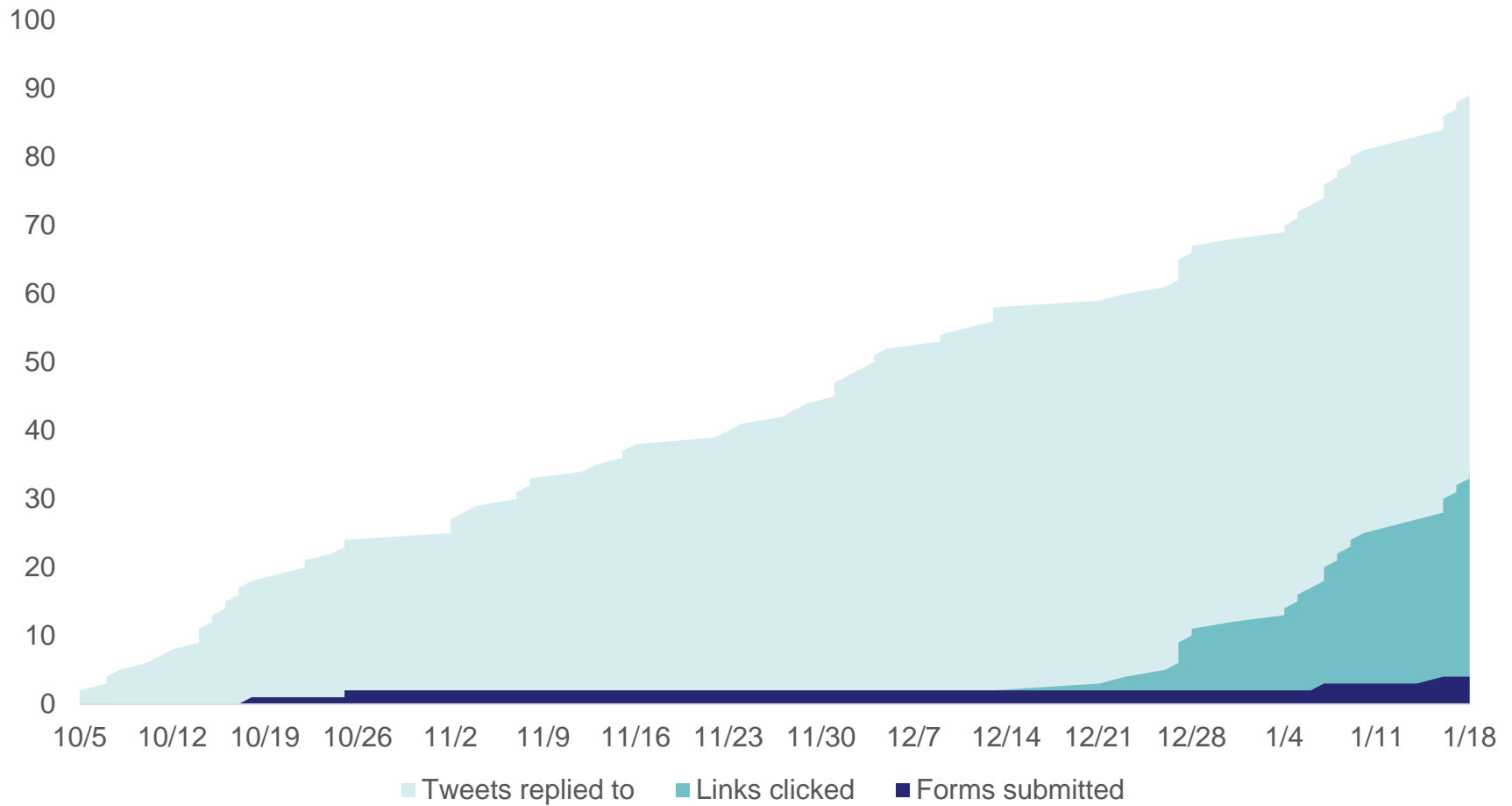
Complaint is tracked through system



Investigation & Complaint Resolution



So far...



Implementation in LDH

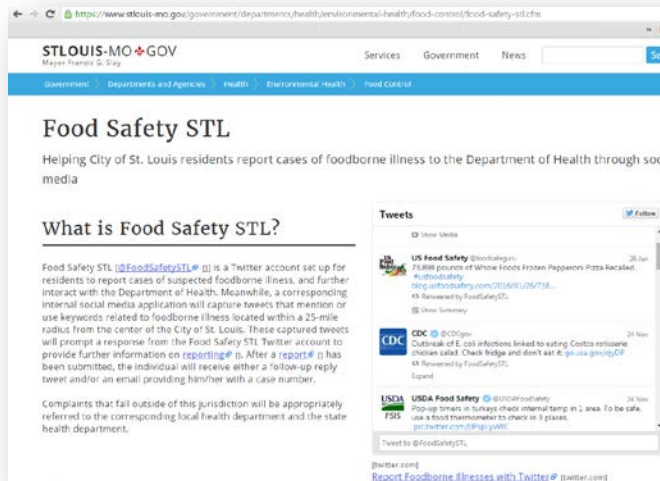
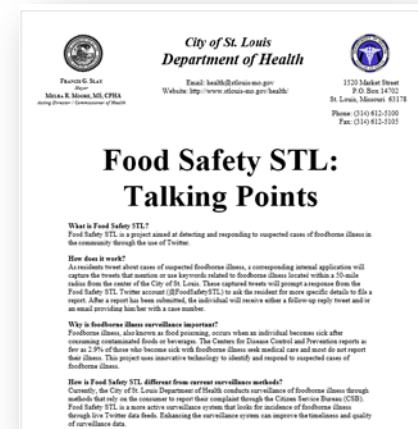
What should the LHD staff expect?

- Increase in the number of foodborne illness complaints
- Increase in the number of foodborne illness complaints resulting in finding of violations at establishment
- Increase in the number of foodborne illness cases being reported to surveillance systems

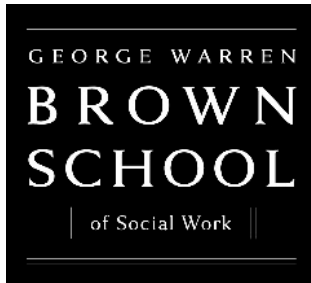


Implementation in LDH

- Social Media surveillance prep
 - Website pages, live feed
 - Twitter handle posts
 - Talking points prepared
 - Knowledge, training, troubleshooting



FoodborneSTL team



Contact me at harrisj@wustl.edu
Follow me @jenineharris

