

Visualization in Public Health

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What is Public Health?

The screenshot shows a Google search results page with the query "what is public health". The top result is a dictionary definition from Dictionary.com, followed by several educational and professional resources.

Search instead for what is public health?

pub·lic health

noun

the health of the population as a whole, especially as monitored, regulated, and promoted by the state.
"chlorine has been used to disinfect water supplies to protect public health"

Translations, word origin, and more definitions

ASPPH | Discover
www.aspph.org/discover/

Public health is personal. Public health professionals focus on preventing disease and injury by promoting healthy lifestyles. They implement educational programs, develop policies, administer services, conduct research, and regulate health systems to achieve these goals.

[Program Finder - Jobs - Connect](#)

What is Public Health? - American Public Health Association
<https://www.apha.org/what-is-public-health> ▾ American Public Health Association ▾

Public health promotes and protects the health of people and the communities where they live, learn, work and play. While a doctor treats people who are sick, ...

What is Public Health? | CDC Foundation
www.cdcfoundation.org/content/what-public-health ▾

Public health is the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention and detection and control of infectious diseases. Overall, public health is concerned with protecting the health of entire populations.

What is Public Health - About - Johns Hopkins Bloomberg ...
www.jhsph.edu/.../wh... ▾ Johns Hopkins Bloomberg School of Public Health ▾

Public health as a profession is becoming more and more popular—but what exactly is

Master of Public Health
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Since 1989 we have made research to improve health a high priority

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What is Public Health?

Public health

uses epidemiological and biostatistical methods to:

Assess, monitor, evaluate and analyze the health of populations

Typical Questions

- Which groups are affected?
- How cases or death are distributed by population demographics: gender, age
- What is the level or magnitude of the problem
 - How many cases, deaths
 - What is the rate (cases or deaths per total population)
- What are the trends over time?
- How are the cases geographically distributed?
Where are the places with higher risk?

Public Health Analytic Process

1. Question – identify public health issue
2. Identification of data sources (MoH, etc)
3. Selection and application of analytic process
 - Main dimensions: **time, place, person**
4. Analysis and interpretation of results
5. Presentation and sharing of results and key findings (to whom?)
6. Interventions – actions for improving public health

Public Health Analytic Process

Data Connect Visualize Publish



Databases &
Local data in Excel
CSV, Text, Access



Analysis tool
Tableau Desktop
Points to Data



Create interactive
Visualizations and
Dashboards



Publish to Tableau
Server & embed
in the website

How do we get the data?

Public Health Data Flow



Public



Public health
practitioners



Healthcare workers,
Clinicians

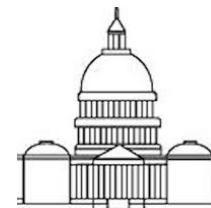


MINISTRY OF HEALTH
SINGAPORE

Local Officials



Labs

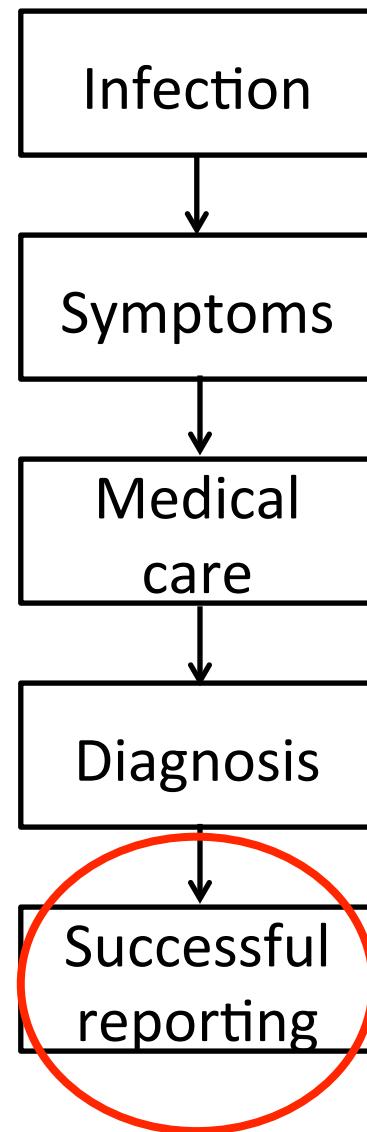


Ministry of Health



World Bodies
(UN, WHO, FAO, OIE)

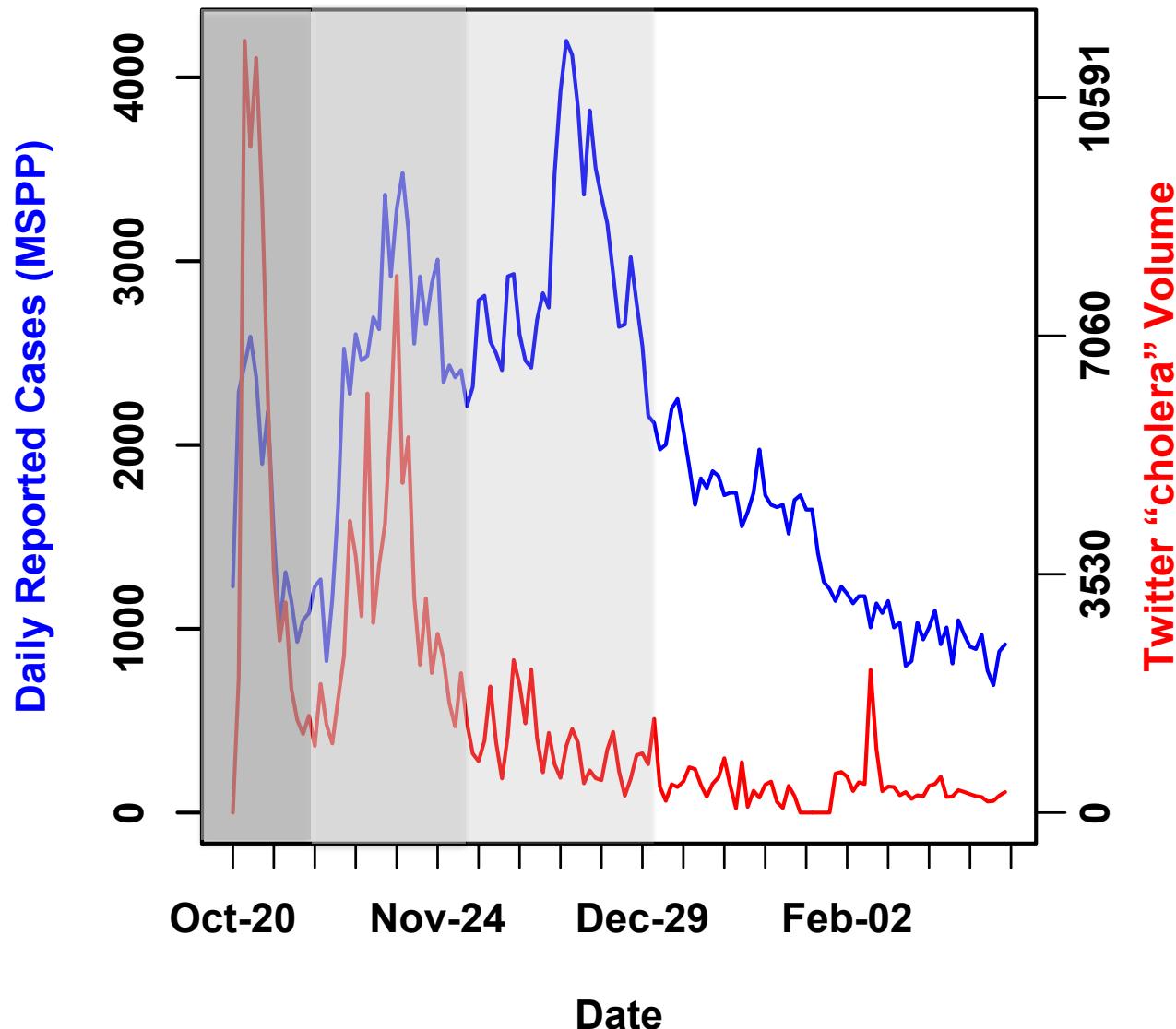
Steps To Obtaining Population Data



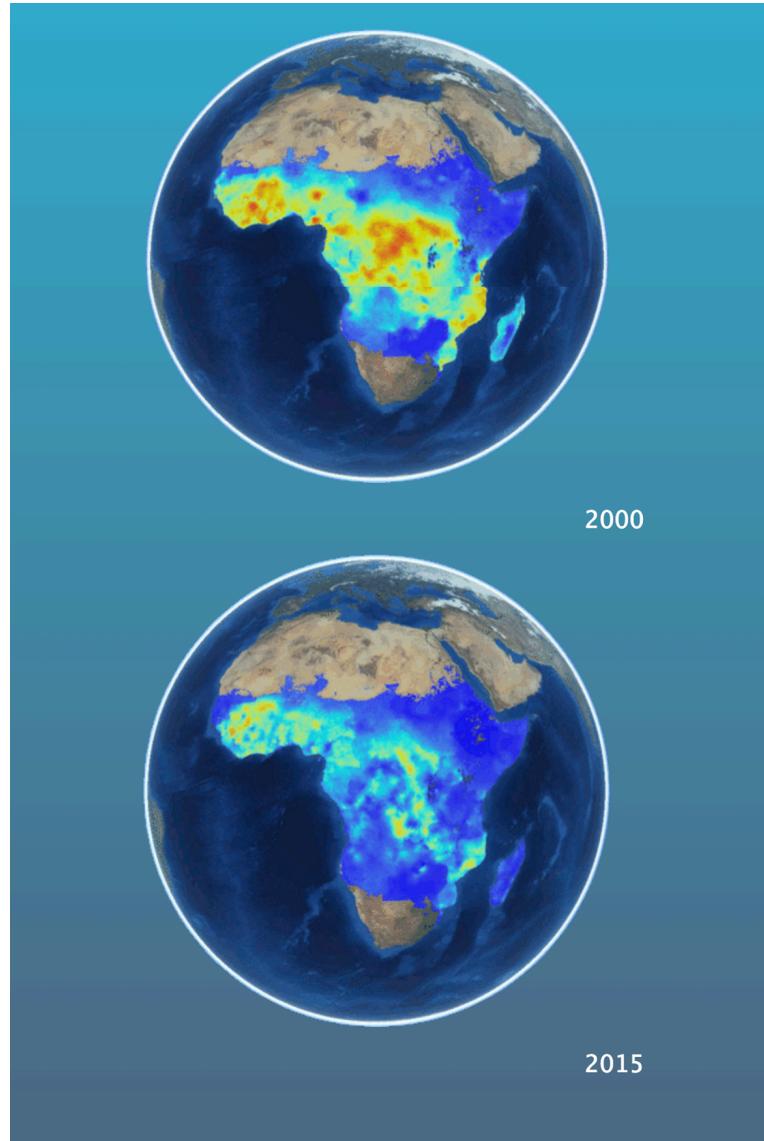
Where is Visualization Used in Public Health

- Spatial Covariates
- Temporal Changes
- Understanding Populations

Temporal Trends

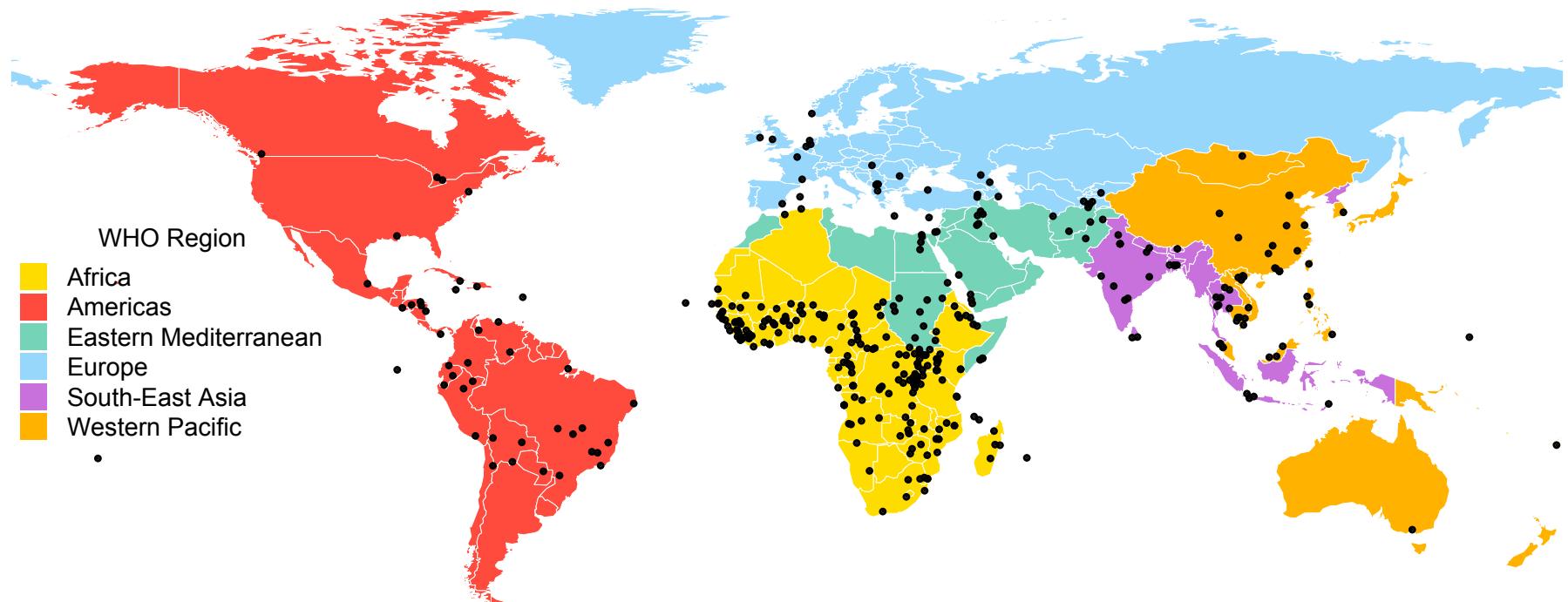


Spatial Covariates



Malaria Atlas Project
(<http://www.map.ox.ac.uk>)

Geographic distribution of outbreaks, 1996-2009



Points mark the reported origin of the outbreak, or if unknown, where the highest reported morbidity and mortality rates were reported.

Population: Global Migration of Pilgrims During the Hajj

Integrated Awareness of Global Population Mobility & Global Infectious Disease Activity



H7N9 and Social Media

- Confirmed case of H7N9 reported on Weibo April 3, 2013
- Hospital confirmed case on Weibo

@菲尼克斯phoenix：病人处于完全隔离治疗状态，大家无需恐慌，院方正在积极治疗抢救，目前还未正式确诊，近期不要吃禽类产品或煮熟再食用。如有感冒发热现象及时就医。

收起 | 查看大图 | 向左转 | 向右转

(2013年第4期)

(2013年第4期)

报 送	市政府总值班室		
报送单位	江宁区政府总值班室		
报送时间	2013年3月31日 00:10		
内 容	江宁区发现一例人感染甲型H7N9流感病毒病例 3月30日晚，我区一居民被省市疾控、卫生部门诊断患有甲型H7N9流感病毒疑似病例，而该亚型感染病例属于国内首次发现。目前患者正在鼓楼医院救治。 患者[REDACTED]，女，45岁，家住江宁区[REDACTED]，[REDACTED]，在江宁区东新农贸市场从事家禽宰杀工作。患者3月23日晚出现发热、咳嗽等症状，23日病情加重，至江宁区中医院就诊。24日病情进一步恶化，予以气管插管、呼吸机辅助通气，25日晚转至鼓楼医院ICU，病情危重。28日下午，鼓楼医院采样送市疾控中心检测。29日，市疾控中心初步检测甲型流感病毒核酸阳性。30日，省疾控中心复核结果阳性。30日下午，省疾控中心检测初步确定为H7N9阳性。30日晚8:00，经省、市专家会诊，初步认为此例病例符合H7N9确诊病例标准。 @新浪江苏 @H7N9 @Jennifer小倩 weibo.com/xinlangjianqiu/weibo.com/u/1785934304		



Emerging and Re-emerging Infections, 1996-2010

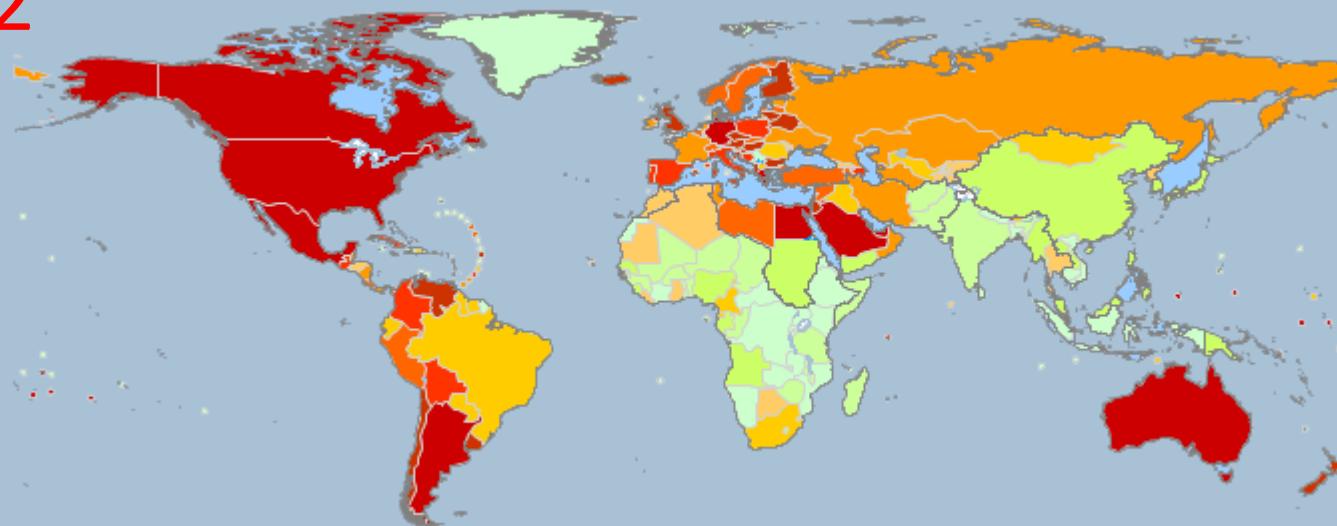
- Cryptosporidiosis
- Human Monkeypox
- E.Coli O157
- Venezuelan Equine Encephalitis
- Dengue Haemorrhagic Fever
- Ebola Haemorrhagic Fever
- Marburg Haemorrhagic Fever
- Ross River Virus
- Hendra Virus
- Reston Virus

- West Nile Virus
- Legionnaire's Disease
- Severe Acute Respiratory Syndrome (SARS)
- Malaria
- Typhoid
- Cholera
- BSE
- Lassa Fever
- Yellow Fever

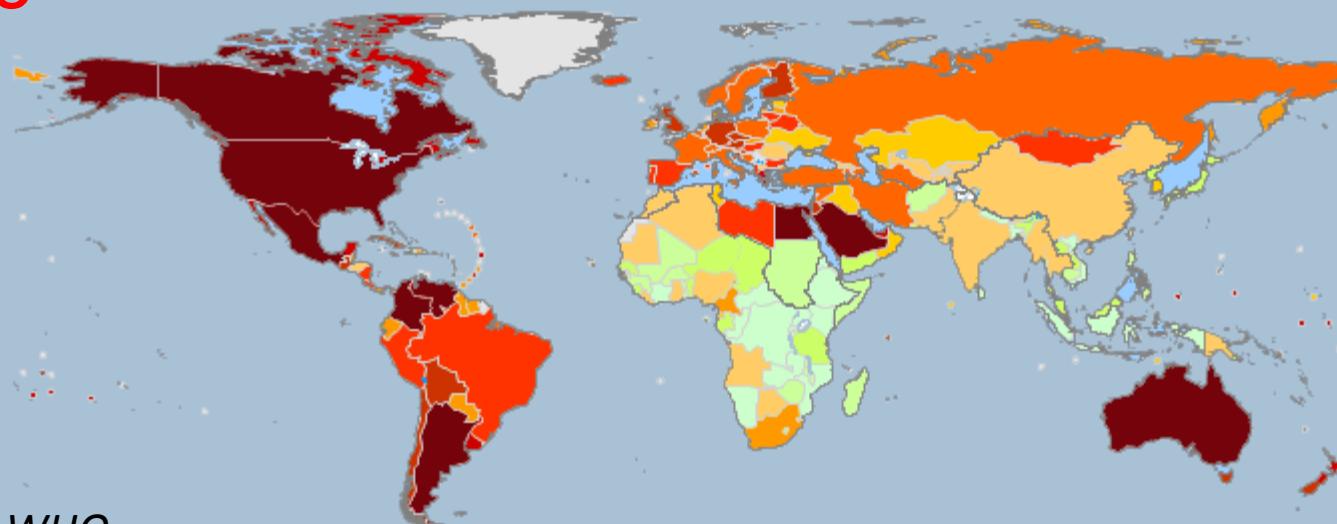
- Lyme Borreliosis
- Echinococcosis
- Diphtheria
- Influenza A (H5N1)
- Nipah Virus
- RVF/VHF
- O'Nyong-Nyong Fever
- Buruli Ulcer
- Multidrug Resistant Salmonella
- nvCJD

Worldwide Obesity Prevalence

2002



2010



Prevalence (%)

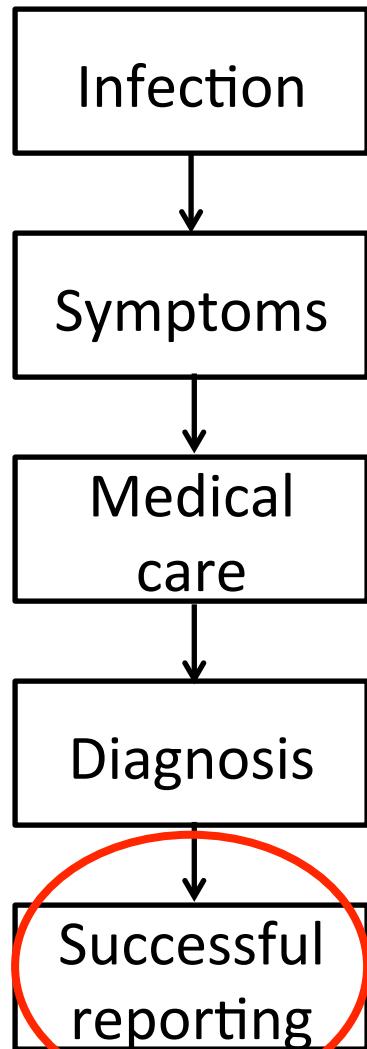
- < 0.5
- 0.5 < 1.5
- 1.5 < 3.6
- 3.6 < 7.3
- 7.3 < 9.0
- 9.0 < 12.1
- 12.1 < 15.5
- 15.5 < 18.7
- 18.7 < 24.5
- > 24.5
- not available

Source: WHO

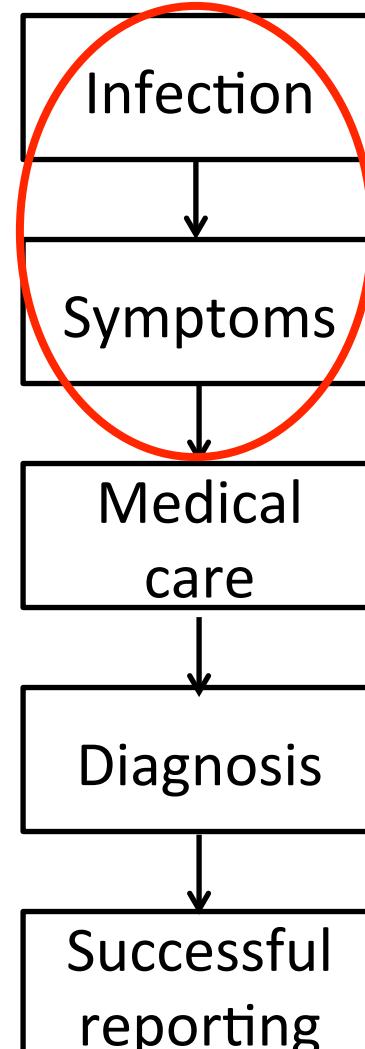
Healthcare Infrastructure Data

Whole population	+
Specificity	+
Doctor/Nurse involvement	+
Speed	-
Sensitivity	-
Cost	-
Public engagement	-

Healthcare Infrastructure Data



Personally Generated Data



Current Public Health Surveillance

Personally Generated Data

	Current Public Health Surveillance	Personally Generated Data
Whole population	+	-
Specificity	+	-
Doctor/Nurse involvement	+	-
Speed	-	+
Sensitivity	-	+
Cost	-	+
Public engagement	-	+



Where Visualization **Can** Be Used in Public Health

- Communication
- Using Information
- Assessing Privacy

Communication



World > North America > United States > Illinois > Chicago



for Chicago, IL



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English (US), °F ▾

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United States
WEATHER

Chicago, IL
LOCAL WEATHER



Now 10:21 am CDT

Weekend

Extended

Month



Mostly cloudy
56°

Migraine Headache

Current Weather



Yesterday
Temp
63°



Pressure
30.27 inHg



Relative
Humidity
72%



✓ Neutral
weather for migraines



Hi
RealFeel
62°



4 - Moderate



Cloud
Cover
33%

Day Details >



✓ Beneficial
weather for migraines



Hi
RealFeel
66°



4 - Moderate



Cloud
Cover
69%

Day Details >



✓ Beneficial
weather for migraines



Hi
RealFeel
63°



UV
2 - Low



Cloud
Cover
64%

Day Details >

Rain and thunderstorms late tomorrow afternoon through late tomorrow night

Disease Risks (100)

↑ Elevated Risks	Your Risk	Average Risk
Gallstones 	11.1%	7.0%
Restless Legs Syndrome	2.5%	2.0%
more »		
↓ Decreased Risks	Your Risk	Average Risk
Prostate Cancer 	12.7%	17.8%
Alzheimer's Disease 	4.9%	7.2%
Colorectal Cancer	4.2%	5.6%
more »		
See all 100 risk reports...		

Carrier Status (24)

Hemochromatosis	Variant Present
Alpha-1 Antitrypsin Deficiency	Variant Absent
Bloom's Syndrome	Variant Absent
BRCA Cancer Mutations (Selected)	Variant Absent
Canavan Disease	Variant Absent
Cystic Fibrosis	Variant Absent
Familial Dysautonomia	Variant Absent
Factor XI Deficiency	Variant Absent

[See all 24 carrier status...](#)

Traits (50)

Alcohol Flush Reaction	Does Not Flush
Bitter Taste Perception	Can Taste
Earwax Type	Wet
Eye Color	Likely Brown
Hair Curl 	Slightly Curlier Hair on Average

[See all 50 traits...](#)

Drug Response (19)

Warfarin (Coumadin®) Sensitivity	Increased
Abacavir Hypersensitivity	Typical
Alcohol Consumption, Smoking and Risk of Esophageal Cancer	Typical
Clopidogrel (Plavix®) Efficacy	Typical
Fluorouracil Toxicity	Typical

[See all 19 drug response...](#)



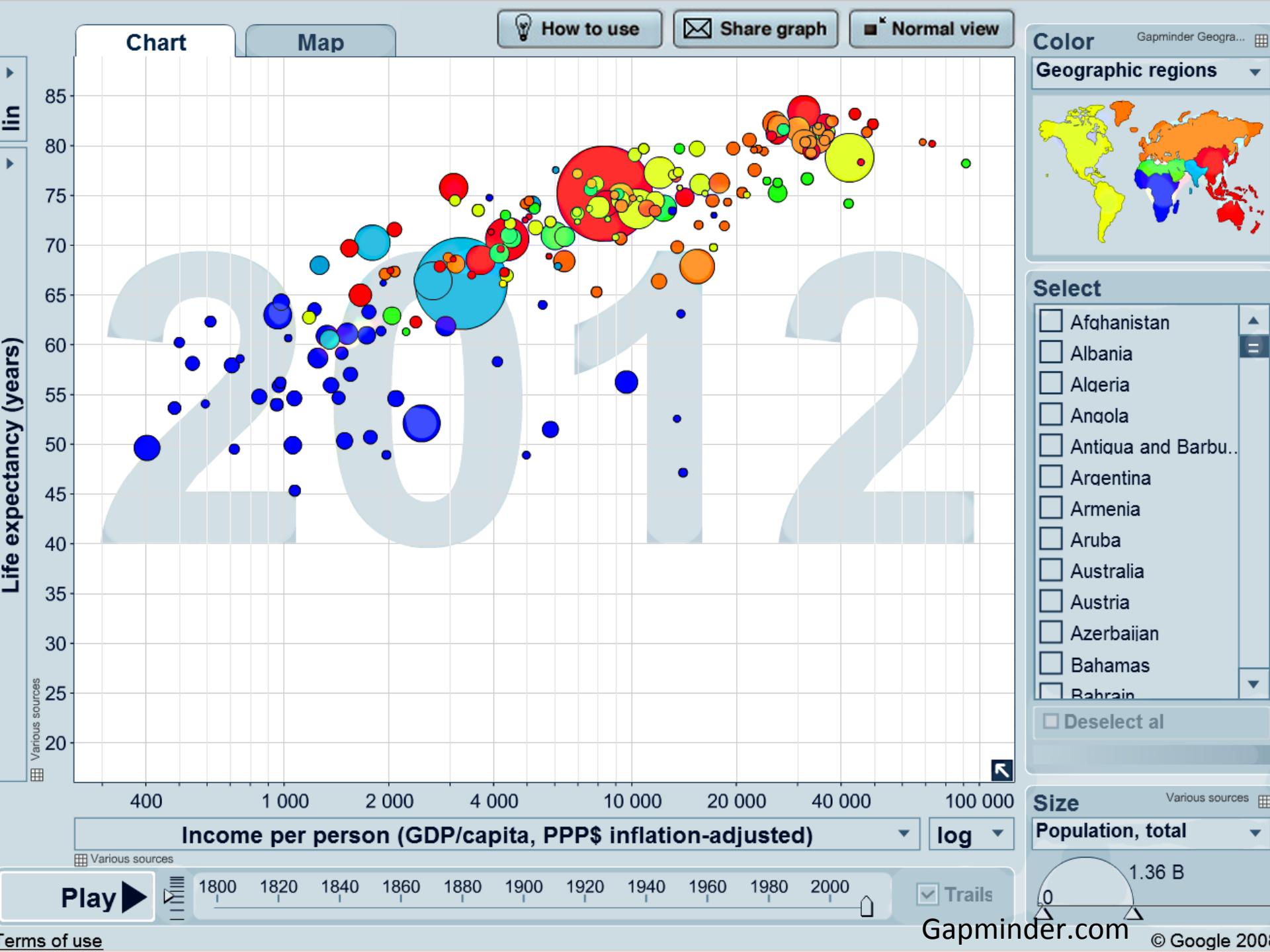
TIME
IN PARTNERSHIP WITH **CNN**

Wednesday, Sep. 09, 2009

Is a Swine Flu Outbreak Coming? Ask Your iPhone

By Bryan Walsh

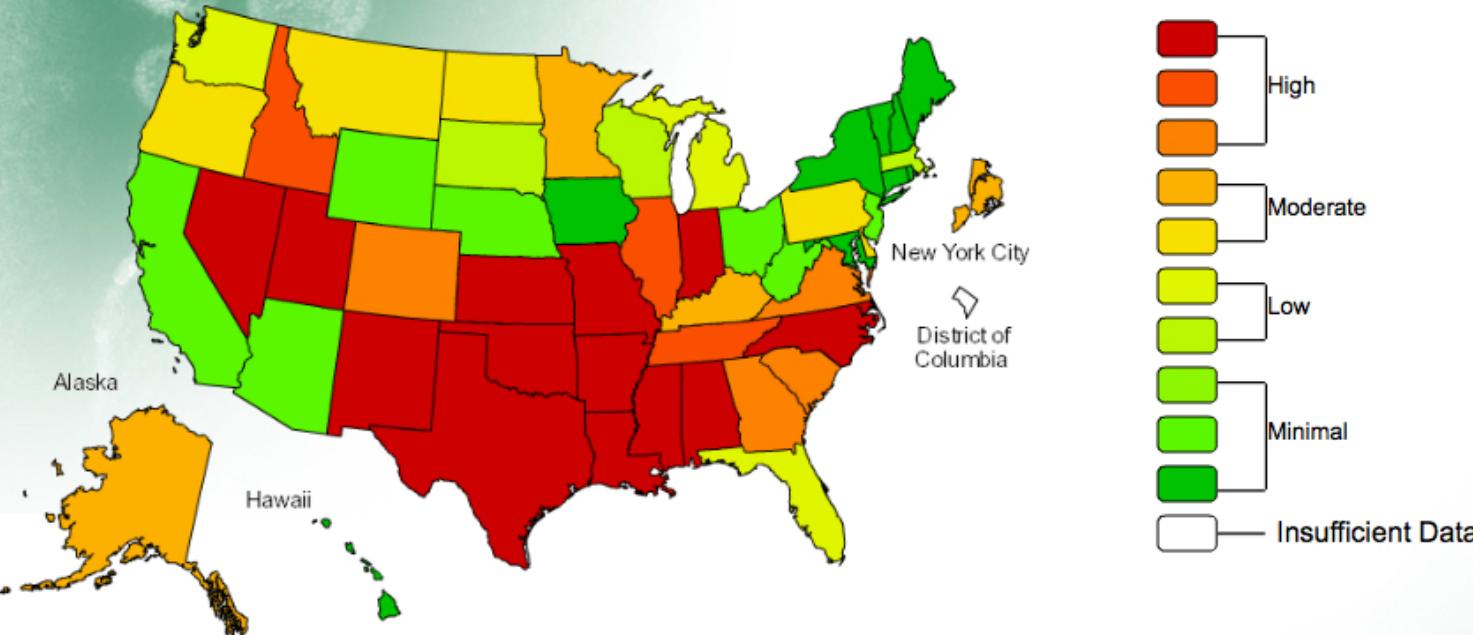
Using Information



FLUVIEW



A Weekly Influenza Surveillance Report Prepared by the Influenza Division
Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILIN
2013-14 Influenza Season Week 52 ending Dec 28, 2013



*This map uses the proportion of outpatient visits to healthcare providers for influenza-like illness to measure the ILI activity level within a state. It does not, however, measure the extent of geographic spread of flu within a state. Therefore, outbreaks occurring in a single city could cause the state to display high activity levels.

*Data collected in ILINet may disproportionately represent certain populations within a state, and therefore may not accurately depict the full picture of influenza activity for the whole state.

*Data displayed in this map are based on data collected in ILINet, whereas the State and Territorial flu activity map are based on reports from state and territorial epidemiologists. The data presented in this map is preliminary and may change as more data is received.

*Differences in the data presented by CDC and state health departments likely represent differing levels of data completeness with data presented by the state likely being the more complete.

*For the data download you can use Activity Level for the number and Activity Level Label for the text description.

HELP FIGHT DISEASE NOW:
JOIN US



Flu Map

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Flu Activity in: United States

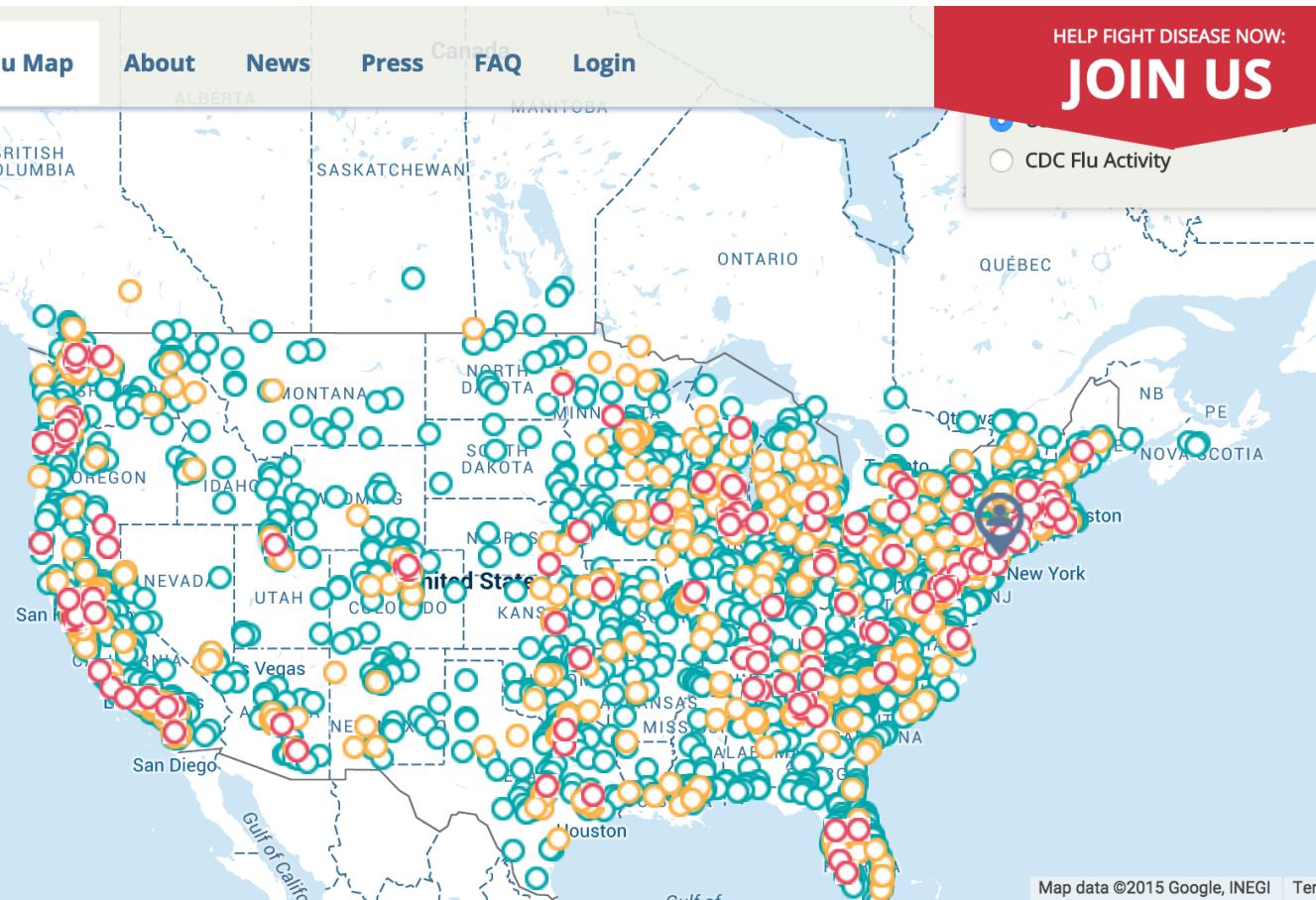


Minimal

Source: CDC

9387 reports this week

○	144	Flu-Like Symptoms 2%
○	963	Any symptoms 10%
○	8424	No Symptoms 90%

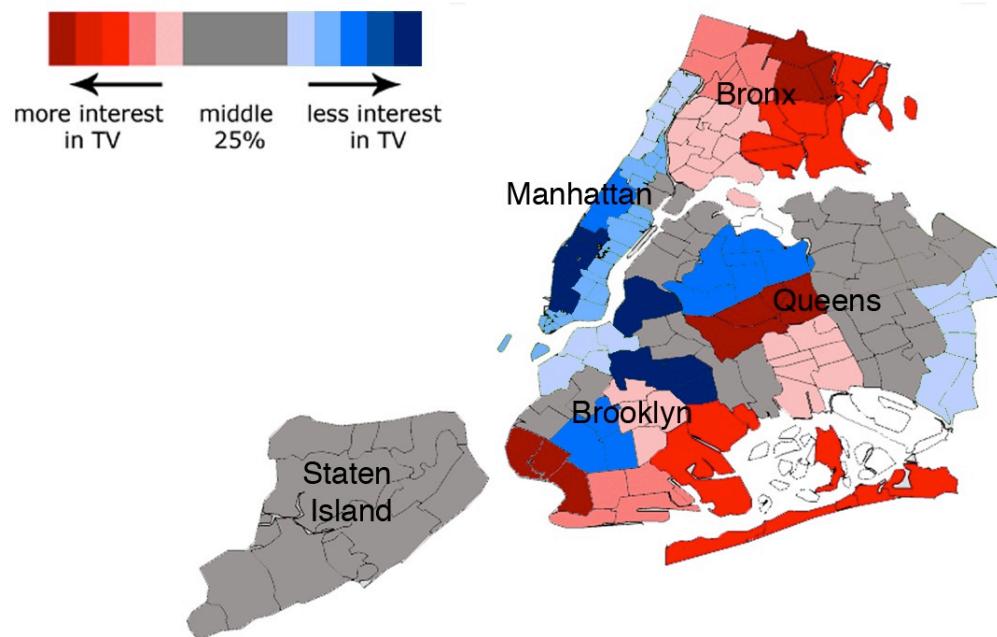


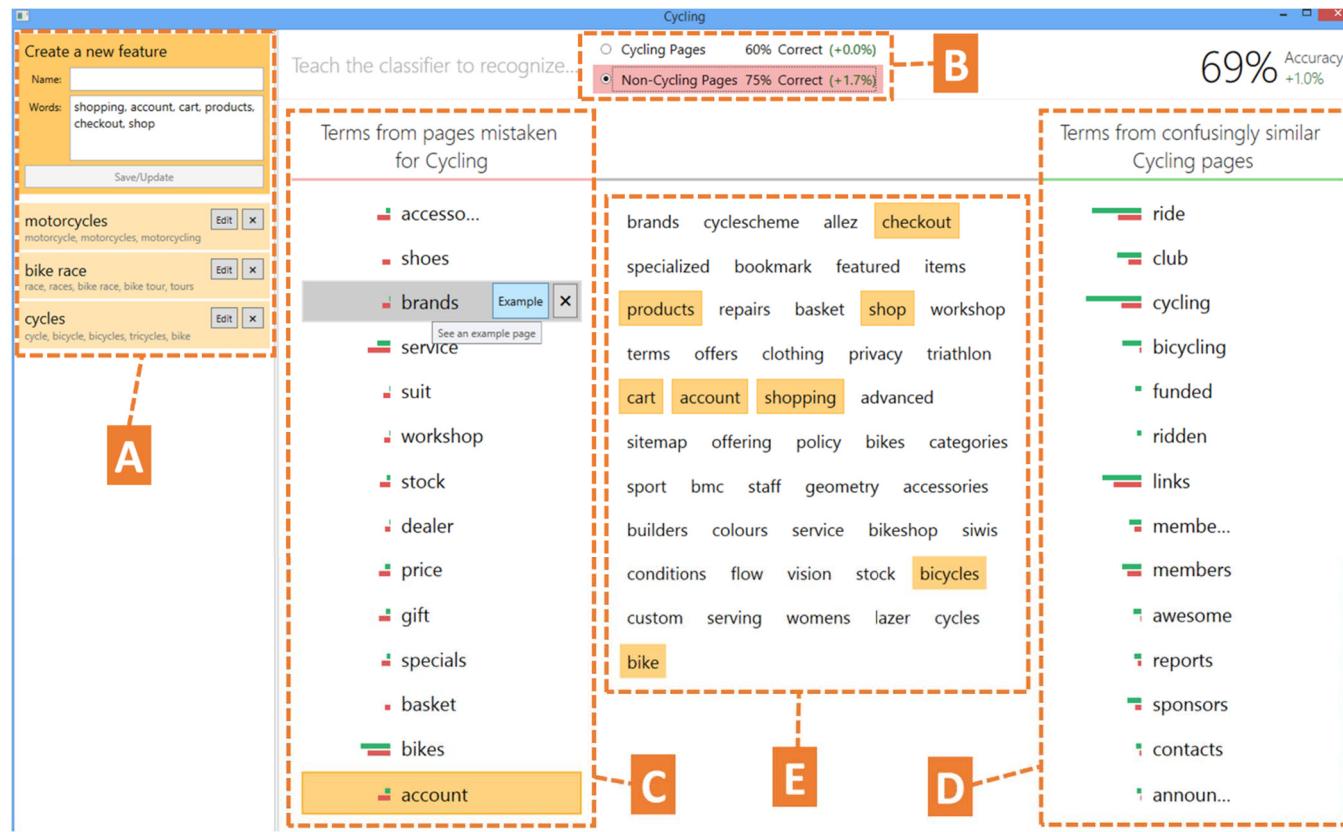
Google

Map data ©2015 Google, INEGI Ter

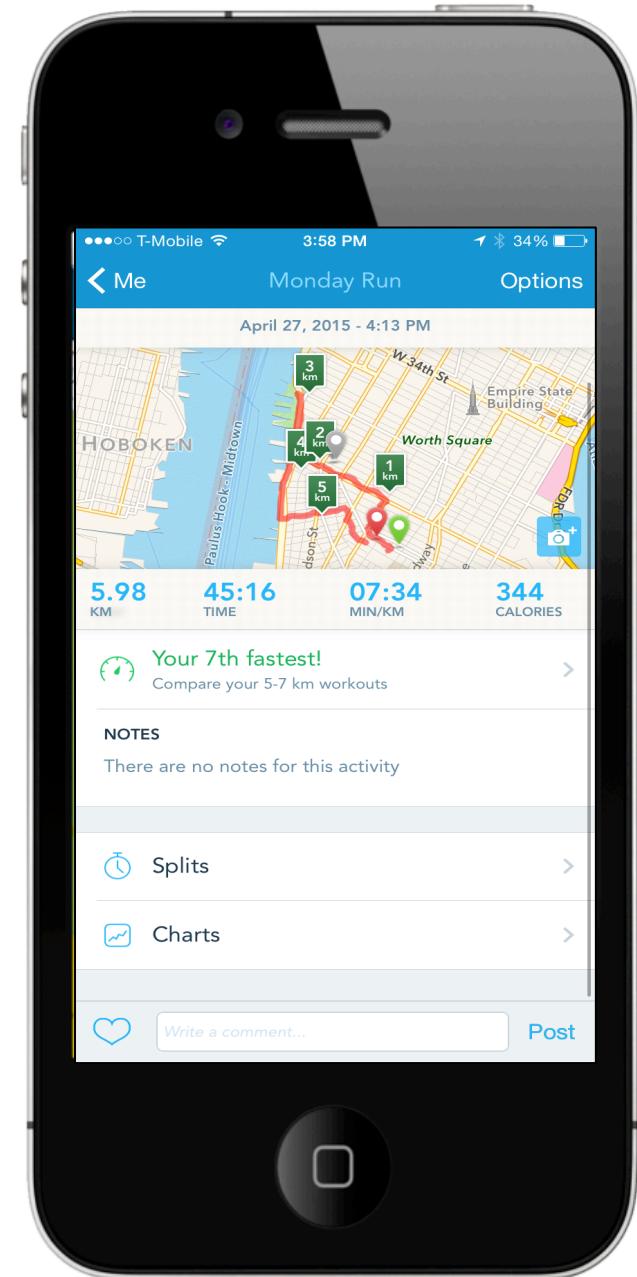
Flu Near You is a community health project for North America. [Learn more about how it works](#) >

Tracking obesity with Facebook: neighborhood level





Assessing Privacy



Acknowledgements

- Aaron Rowe, PhD
- Bisakha Ray
- Dustin Duncan, PhD
- Jennifer Goff, MPH
- Julia Clark, Bsc

Funding and Data:



Visualization in Public Health

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- Temporal Changes
- Understanding Populations
- Communication
- Using Information
- Assessing Privacy

Questions?

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