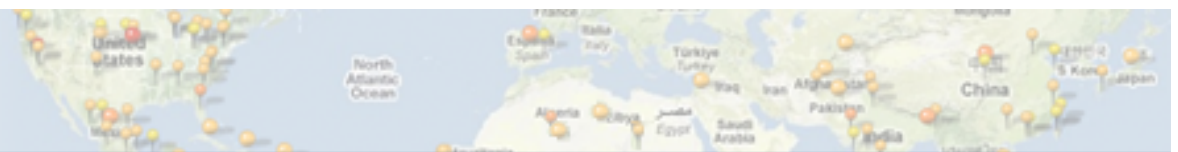


BioMosaic:

Mapping the intersection of migration, demography and emerging infectious disease

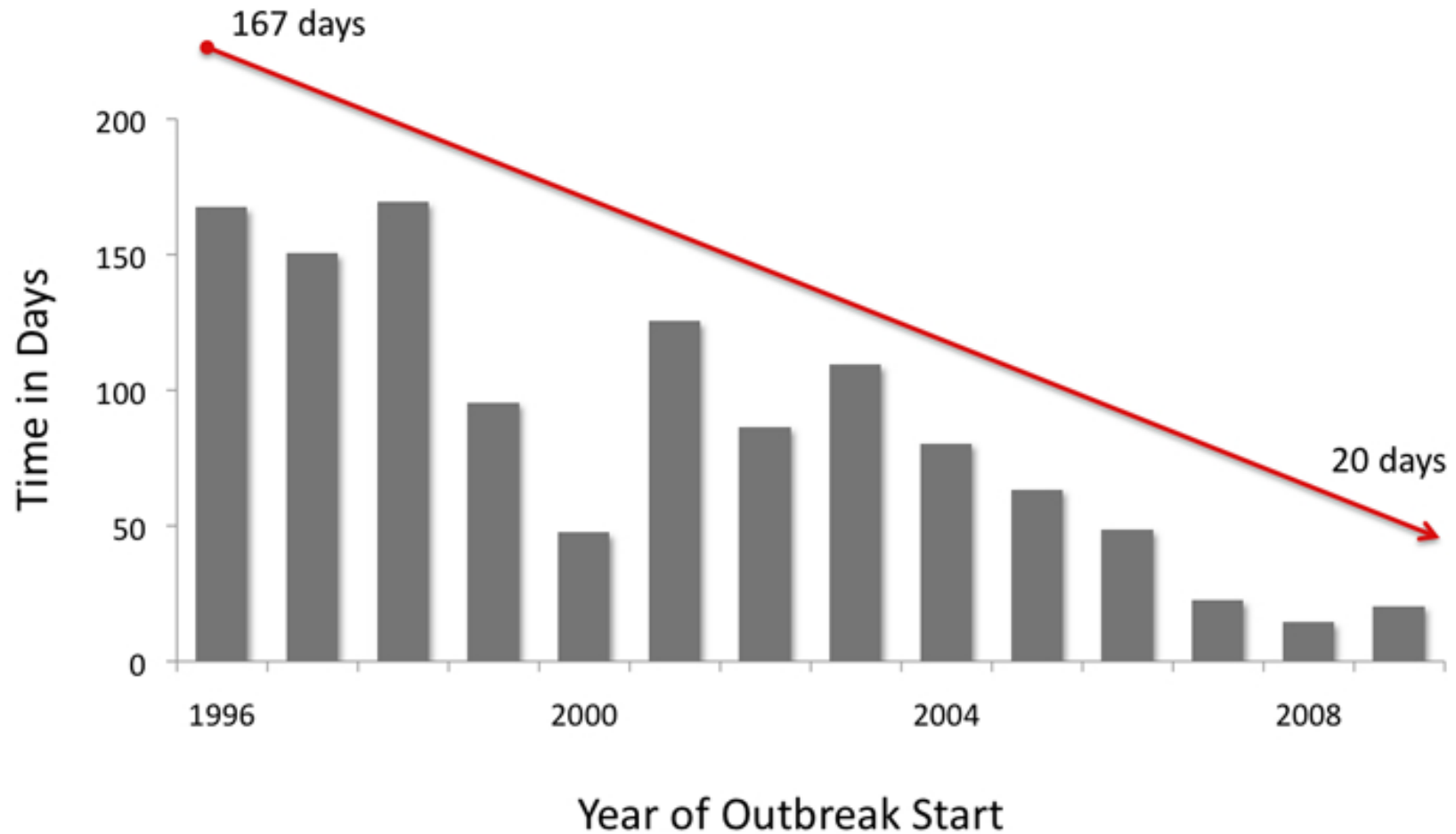
David Scales MD PhD
Research Fellow, Children's Hospital Boston







Time from outbreak start to outbreak discovery



HealthMap Article Processing

1

Acquisition

Over 20,000 sites, every hour, 24/7

More than 600 alerts per day from 22 sources

Seven languages – English, French, Spanish, Russian, Chinese, Portuguese, Arabic

201 countries & territories and 175 disease categories



HealthMap Article Processing

2

Extraction

1800 disease patterns, 5000 locations



*A **cholera outbreak**
ravaging through two
regions in northern
Cameroon since May...*

HealthMap Article Processing



Categorization

6 million phrases, 91% accuracy

Breaking News



Warning



Old News



Context



Not Disease Related



HealthMap Article Processing

4

Aggregation

Text matching, Similarity Score, Significance Rating

Breaking News



Warning



Rate: ★★★★★ 3 votes

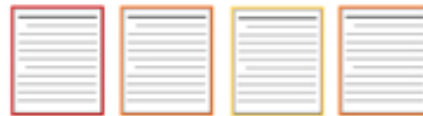
HealthMap Article Processing

4

Aggregation

Text matching, Similarity Score, Significance Rating

Breaking News



Warning



Rate: ★★★★★ 3 votes





HealthMap

Global health, local information

Username

Login

[Register](#) | [Forgot](#)

[Password?](#)



HealthMap for your **SmartPhone** [More »](#)

Search

[Advanced Search](#)

[Full Screen](#)



Activity Index

Low High

Country Level

Local/Province Level

[Latest Alerts](#)

[WorldWide Alerts](#)

[Denque Risk View](#)

[HMCommunity](#)

Alerts Now Showing

Source	Date	Summary	Disease	Location	Cases	Deaths	Related
	29 Apr	PRO/AH/EDR> Rabies, wildlife - USA (07): fox, raccoon	Rabies	United States			»
	29 Apr	Joe Arroyo under strict medical care for respiratory disease - A Day ...	Chronic/Non-Infectious Disease	United States			»
	29 Apr	Association between glycemic index, glycemic load, and fructose with ...	Chronic/Non-Infectious Disease	United States			»
	29 Apr	World Health Organization Dubious About 3-In-1 Flu Shots	Swine Flu H1N1	United States			»

English

[About](#)

[Mobile](#)

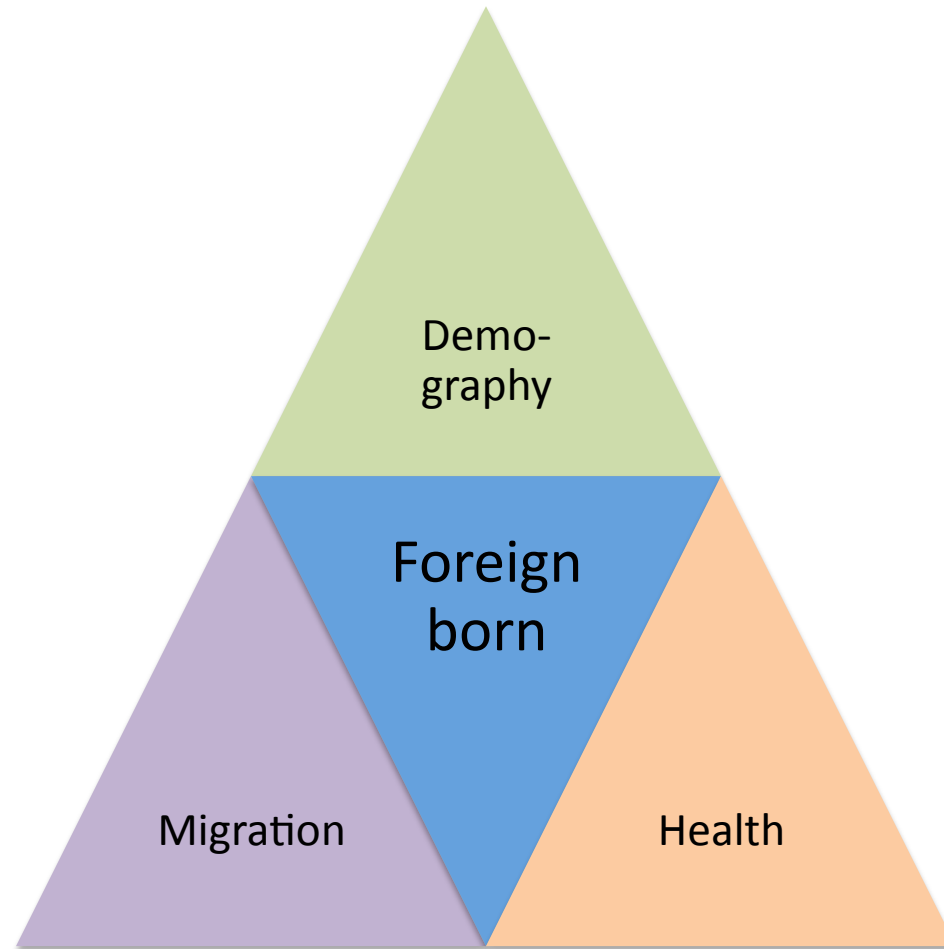
[Partners](#)

[Blog](#)



Last update: 29 Apr 2010 12:24 | Next update: 29 Apr 2010 13:24

BioMosaic: Focus



Why Foreign Born?

- CDC Division of Global Migration and Quarantine
- Initially high infectious disease risk
 - Tuberculosis
 - Migration – visits to or visitors from home country
 - Rates of ID decline to native-born levels as length of stay in US increases
- Initially low chronic disease risk
 - Diabetes, obesity risk increases with US residence



HealthMap
Global Health, Local Information



Demography

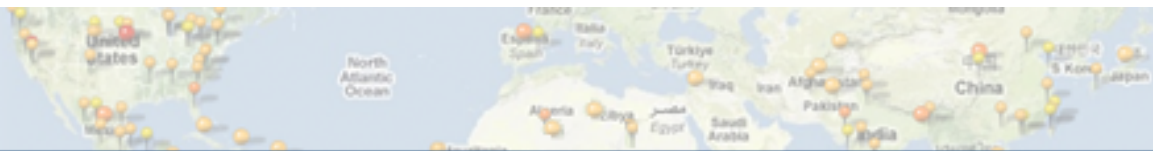
- US Census – ACS 2005-2009
- Foreign-born socio-economic variables
 - Population (by age, sex, country of birth)
 - Education
 - Income/poverty
 - Migration (Arrival in US, movement within US)
 - English speaking ability
- Geospatial queries

Migration

- International Air Transport Association data obtained by BioDiaspora
 - License restrictions limit public use
- Top US destinations receiving international arrivals
 - Sort to see which cities receive most people from particular countries

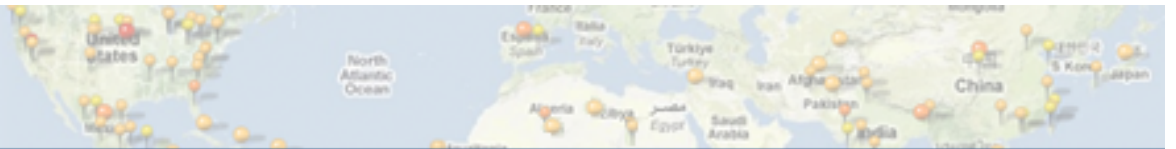


HealthMap
Global Health, Local Information

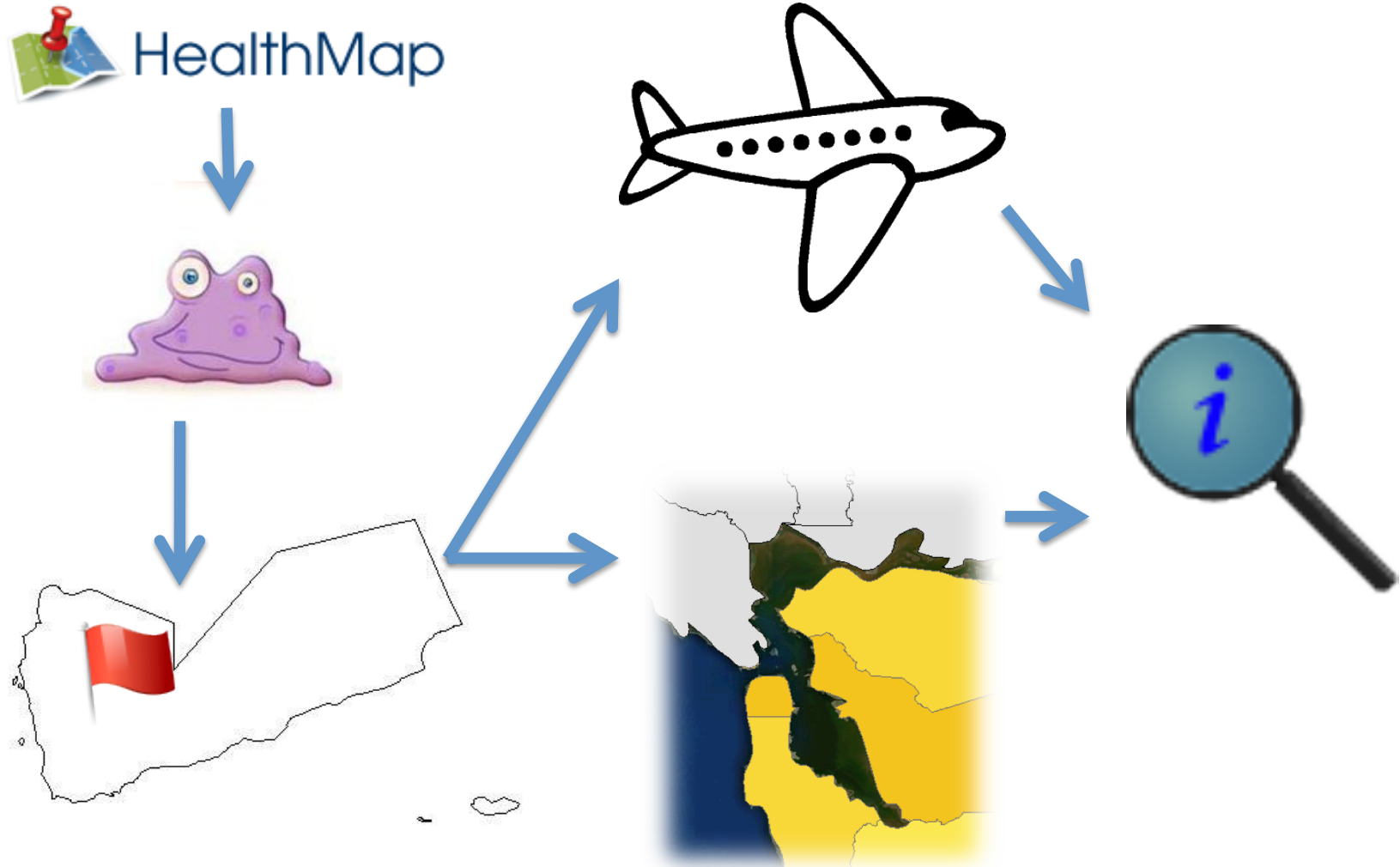


Health

- HealthMap events
 - Infectious disease events reported by WHO, ProMed, newspapers, user submissions
 - Updated every hour
- Choose by disease, timeframe, data source
- Geospatial queries
- Other health data – Tuberculosis, obesity, etc.

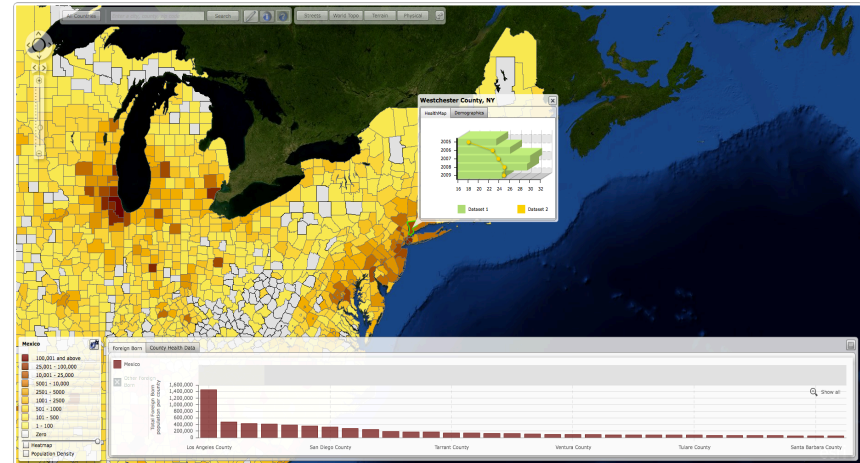


Use-Case Scenario



BioMosaic Prototype(s)

- Web application



- iPad application



BioMosaic: Team

- HealthMap
 - John Brownstein
 - Chris Mahlke
 - David Scales
- BioDiaspora
 - Rose Eckhardt
 - Kamran Kahn
 - Langhi Shen
 - Graham Smith
- CDC/DGMQ
 - Marty Cetron
 - Nancy Gallagher
 - Yoni Haber
 - Ginny Lee
 - Kevin Liske
 - Clelia Pezzi
 - Alfonso Rodriguez