

# **More Information, Less Work: EHRs and Public Health Surveillance**

CSTE 2013

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For the ESPnet team, led by Michael Klompas, MD, MPH

## Diseases reportable by providers

Effective July 2008

**COMMUNICABLE AND OTHER INFECTIOUS DISEASES REPORTABLE IN MASSACHUSETTS BY HEALTHCARE PROVIDERS\***

\*The list of reportable diseases is not limited to those designated below and includes only those which are primarily reportable by clinical providers.

A full list of reportable diseases in Massachusetts is detailed in 105 CMR.300.100.

REPORT IMMEDIATELY BY PHONE!

This includes both suspect and confirmed cases.

All cases should be reported to your local board of health;

if unavailable, call the Massachusetts Department of Public Health  
Telephone: (617) 983-6800 Confidential Fax: (617) 983-6813

• REPORT PROMPTLY (WITHIN 1-2 BUSINESS DAYS).

This includes both suspect and confirmed cases.

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Telephone: (617) 983-6800 Confidential Fax: (617) 983-6813

- Anaplasmosis
- ☒ Anthrax ☒☒
- ☒ Any case of an unusual illness thought to have public health implications
- ☒ Any cluster/outbreak of illness, including but not limited to foodborne illness
- ☒ Botulism ☒☒
- ☒ Brucellosis ☒☒
- Chagas disease
- Creutzfeldt-Jakob disease (CJD) and variant CJD
- ☒ Diphtheria
- Ehrlichiosis
- Encephalitis, any cause
- Food poisoning and toxicity (includes poisoning by ciguatera, scorpion toxin, mushroom toxin, tetrodotoxin, paralytic shell fish and amnesic shell fish)
- Glanders ☒☒
- ☒ Group A streptococcus, invasive
- ☒ Haemophilus influenzae, invasive ☒☒
- Hansen's disease (leprosy)
- ☒ Hantavirus
- ☒ Hemolytic uremic syndrome
- ☒ Hepatitis A (IgM+ only)
- HBsAg+ pregnant women
- ☒ Influenza, pediatric deaths (<18 years) ☒☒
- ☒ Infection due to influenza A viruses that are different from currently circulating human influenza A H1 and human influenza A H3 viruses, including those subtyped as non-human in origin and those that cannot be subtyped with standard methods and reagents ☒☒

- Leptospirosis
- Lyme disease
- ☒ Measles
- Melioidosis ☒☒
- ☒ Meningitis, bacterial, community acquired
- Meningitis, viral (aseptic), and other infectious (non-bacterial)
- ☒ Meningococcal disease, invasive (Neisseria meningitidis) ☒☒
- ☒ Monkeypox or other orthopox virus
- Mumps
- Pertussis
- ☒ Plague ☒☒
- ☒ Polio
- Psittacosis
- Q fever
- ☒ Rabies in humans
- Reye syndrome
- ☒ Rheumatic fever
- Rickettsialpox
- Rocky Mountain spotted fever
- ☒ Rubella
- ☒ Severe acute respiratory syndrome (SARS)
- ☒ Smallpox
- ☒ Tetanus
- Toxic shock syndrome
- Trichinosis
- ☒ Tularemia ☒☒
- ☒ Typhoid fever ☒☒
- Varicella (chickenpox)
- ☒ Viral hemorrhagic fevers

Animal bites should be reported immediately to the designated local authority.

☒☒ Isolates should be submitted to Hinton State Laboratory Institute.

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Report Directly to the Massachusetts Department of Public Health,  
Bureau of Communicable Disease Control

“REPORT PROMPTLY  
(WITHIN 1-2 BUSINESS DAYS)”

ceftriaxone  
Granuloma inguinale  
Herpes, neonatal (onset within 42 days after birth)  
Lymphogranuloma venereum

☒ Tuberculosis suspect and confirmed cases ☒☒

• Latent tuberculosis infection

b. Other agents  
Syphilis

Institute.

Report within 24 hours to (617) 983-6801 or Toll Free (1-888) MASS-MTB (627-7682) or Confidential Fax (617) 983-6813

Confidential Fax (617) 983-6220 or mail report to address above

Reportable Diseases Primarily Ascertained Through Laboratory Reporting of Evidence of Infection

Please work with the laboratories you utilize for diagnostic testing to assure complete reporting.


- Amebiasis
- Babesiosis
- Campylobacteriosis
- Cholera
- Cryptococcosis
- Cryptosporidiosis
- Cyclosporiasis
- Dengue
- ☒ Eastern equine encephalitis ☒☒
- Escherichia coli O157:H7, and other shiga-toxin producing E. coli ☒☒
- Enteroviruses (from CSF)
- Giardiasis
- Group B streptococcus, invasive
- Hepatitis B
- Hepatitis C
- Hepatitis – infectious, not otherwise specified
- Influenza ☒☒ if antiviral resistant
- Legionellosis ☒☒

- Listeriosis ☒☒
- Lymphocytic choriomeningitis
- Malaria
- Norovirus
- Pneumococcal disease, invasive (Streptococcus pneumoniae) ☒☒ if patient <18 years
- Pneumococcal disease, invasive, penicillin-resistant
- Salmonellosis ☒☒
- Shiga toxin-producing organisms ☒☒
- Shigellosis ☒☒
- Staphylococcus aureus, methicillin-resistant (MRSA), invasive
- ☒ Staphylococcus aureus, vancomycin-intermediate (VISA) and vancomycin-resistant (VRSA) ☒☒
- Toxoplasmosis
- Typhus
- Vibriosis ☒☒
- ☒ West Nile ☒☒
- Yellow fever
- Yersiniosis ☒☒

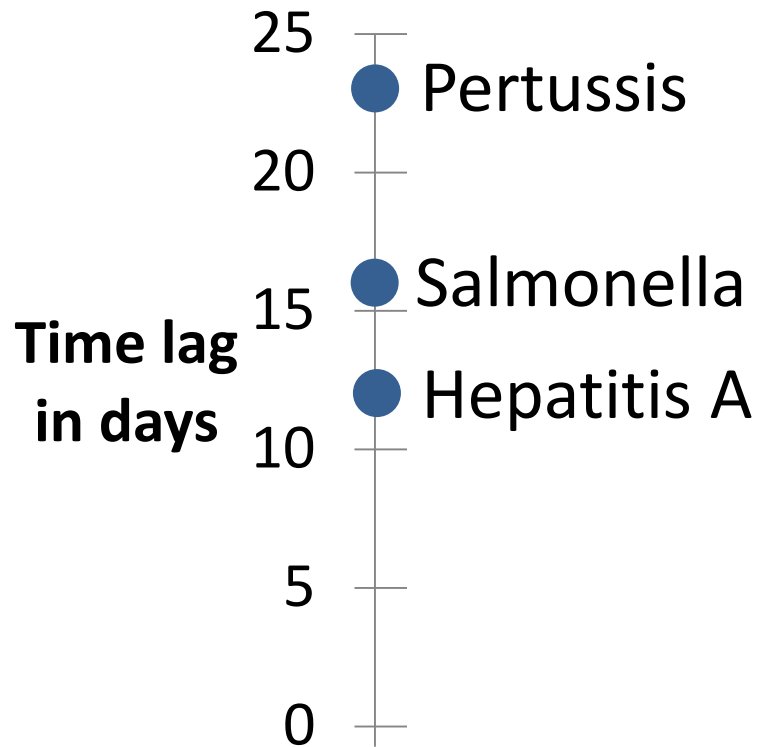
105 CMR.300.000 Reportable Diseases, Surveillance and Isolation and Quarantine Requirements, 2nd Edition, August 2009, Page 1 of 2

105 CMR.300.000 Reportable Diseases, Surveillance and Isolation and Quarantine Requirements, 2nd Edition, August 2009, Page 2 of 2

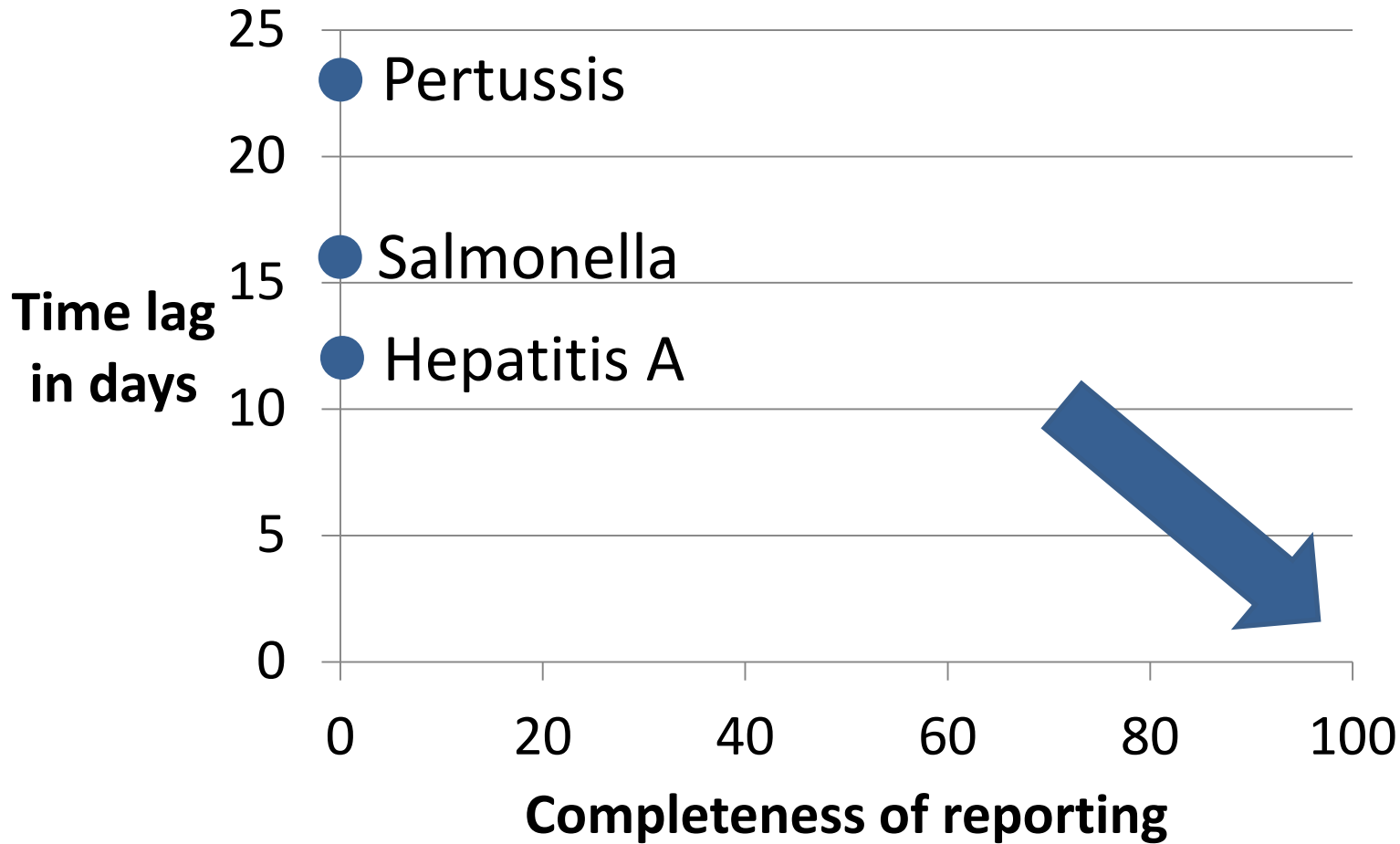
## Chlamydia case report form

Massachusetts Department of Public Health Bureau of Infectious Disease Prevention, Response & Services Division of STD Prevention & HIV/AIDS Surveillance 305 South Street, Jamaica Plain, MA 02130 Phone: (617) 624-6940; TDD/Relay: (617) 624-6942		Fax to (617) 983-6962			
To request Patient Notification Services for your patient, please call the Division of STD Prevention at (617) 983-6940					
<b>CHLAMYDIA</b> <small>CGI should be reported on a separate form, which is available by calling (617) 983-6940.</small>			<b>CASE REPORT FORM</b> Version 12/13/2011		
<b>PATIENT INFORMATION</b>					
Last Name _____ First Name _____		DOB: ___/___/___ Med Rec #: _____		Middle Initial _____ Social Security #: _____	
Street Address: _____		<input type="checkbox"/> Homeless <input type="checkbox"/> Incarcerated		Gender: <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Transgender <input type="checkbox"/> Unknown	
City: _____ Zip: _____		Ethnicity: <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Non-Hispanic Latino <input type="checkbox"/> Unknown		Race (check all that apply):	
Cell Phone #: _____ Home Phone #: _____		<input type="checkbox"/> White <input type="checkbox"/> Black <input type="checkbox"/> Asian		<input type="checkbox"/> Native Hawaiian/Pacific Islander <input type="checkbox"/> American Indian/Alaskan Native <input type="checkbox"/> Other (specify): _____	
Primary Language Spoken: <input type="checkbox"/> English <input type="checkbox"/> Other (specify): _____		Pregnant? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Not applicable		Were any of the patient's sex partners notified of possible exposure to chlamydia?	
<b>CLINICAL INFORMATION</b> Diagnosis Date: ___/___/___		<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		<input type="checkbox"/> Yes, our office notified the partner(s) <input type="checkbox"/> Yes, the patient was asked to notify partner(s) <input type="checkbox"/> No <input type="checkbox"/> Unknown	
Did the patient have any symptoms?		If symptomatic, what was the patient diagnosed with? (check all that apply)		If asymptomatic, why was the patient tested? (check all that apply)	
Males:		<input type="checkbox"/> Urethritis <input type="checkbox"/> Cervicitis <input type="checkbox"/> Epididymitis <input type="checkbox"/> PID <input type="checkbox"/> Proctitis <input type="checkbox"/> Proctitis <input type="checkbox"/> Other (specify): _____		<input type="checkbox"/> Reported contact to chlamydia case <input type="checkbox"/> Screening <input type="checkbox"/> Rescreening after previous positive <input type="checkbox"/> Patient request <input type="checkbox"/> Other (specify): _____	
Females:		<input type="checkbox"/> Urethritis <input type="checkbox"/> Cervicitis <input type="checkbox"/> Epididymitis <input type="checkbox"/> PID <input type="checkbox"/> Proctitis <input type="checkbox"/> Proctitis <input type="checkbox"/> Other (specify): _____		<input type="checkbox"/> Yes, I saw these partner(s) in my office <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/> Yes, I gave extra medication for _____ (0) partner(s) <input type="checkbox"/> Yes, I wrote a prescription for _____ (0) partner(s) <input type="checkbox"/> Yes, some other way (specify): _____	
Does the patient have sex with: <input type="checkbox"/> Men <input type="checkbox"/> Women <input type="checkbox"/> Both <input type="checkbox"/> Unknown					
Has the patient exchanged money for sex and/or drugs? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
Has the patient had sex while intoxicated and/or high? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
Has the patient travelled out of the state in the last two months? <input type="checkbox"/> Yes (specify): _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown					
Has the patient been incarcerated in the last six months? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
Other risk factors: _____					
Treatment Date: ___/___/___ <input type="checkbox"/> Azithromycin 1g PO <input type="checkbox"/> Doxycycline 100 mg PO bid x 7 days <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Not Treated					
<b>TESTING AGENCY INFORMATION</b>					
Provider Name: _____ Facility: _____		City: _____ Zip: _____		Phone #: _____ Fax: _____	
Testing Setting:					
<input type="checkbox"/> Drug Treatment Facility		<input type="checkbox"/> Private Practice or HMO		<input type="checkbox"/> ER or Urgent Care	
<input type="checkbox"/> HM/Counseling, Testing, and Referral Site		<input type="checkbox"/> Community Health Center		<input type="checkbox"/> School-based Clinic including College/University	
<input type="checkbox"/> Blood Bank		<input type="checkbox"/> Hospital-based Clinic		<input type="checkbox"/> Military/VA/Job Corps Clinic	
<input type="checkbox"/> Mental Health Services Site		<input type="checkbox"/> STD, HM, or Family Planning Clinic		<input type="checkbox"/> Correctional Institution	
<input type="checkbox"/> Other (specify): _____					
<b>TESTING CLINICIAN INFORMATION (if different from testing agency):</b> <input type="checkbox"/> Same as testing agency					
Clinician Name: _____ Facility: _____		City: _____ Zip: _____		Phone #: _____ Fax: _____	
Clinician Practice Setting:					
<input type="checkbox"/> Private Practice or HMO		<input type="checkbox"/> STD, HM, or Family Planning Clinic		<input type="checkbox"/> Military/VA/Job Corps Clinic	
<input type="checkbox"/> Community Health Center		<input type="checkbox"/> ER or Urgent Care		<input type="checkbox"/> Correctional Institution	
<input type="checkbox"/> Hospital-based Clinic		<input type="checkbox"/> School-based Clinic including College/University		<input type="checkbox"/> Other (specify): _____	
<b>ADMINISTRATIVE INFORMATION</b> Date Form Completed: ___/___/___ <input type="checkbox"/> Same as treating clinician					
Name/Contact Information of person completing report (if not treating clinician): _____					

# Paper-based reporting

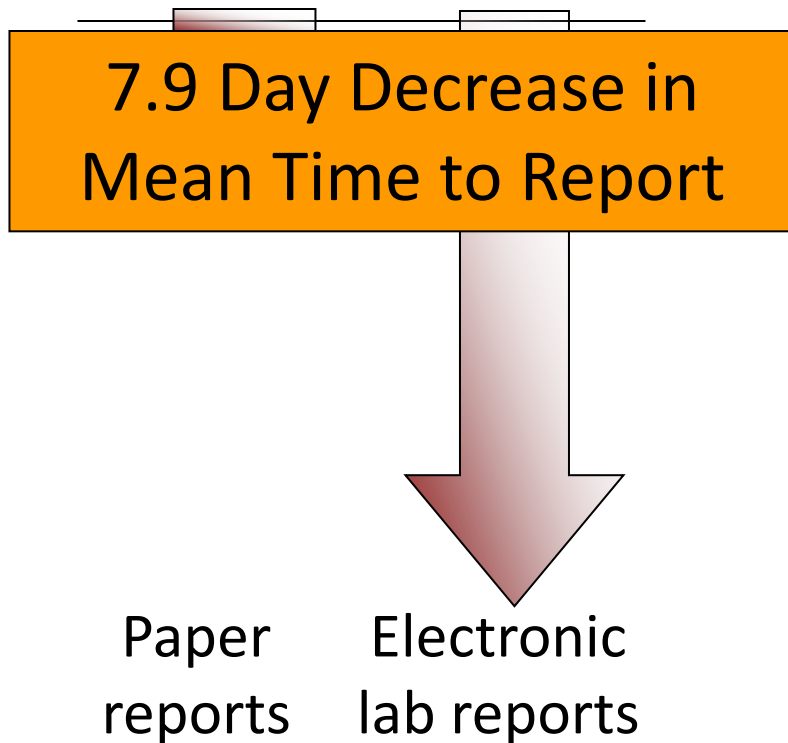


# Paper-based reporting

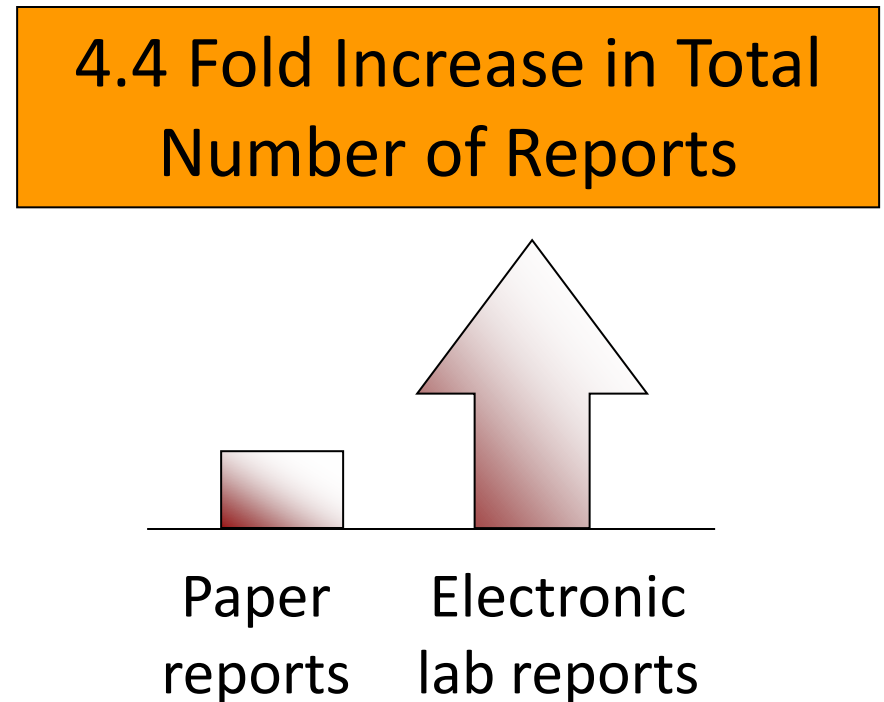


# Electronic Laboratory vs Paper Reporting

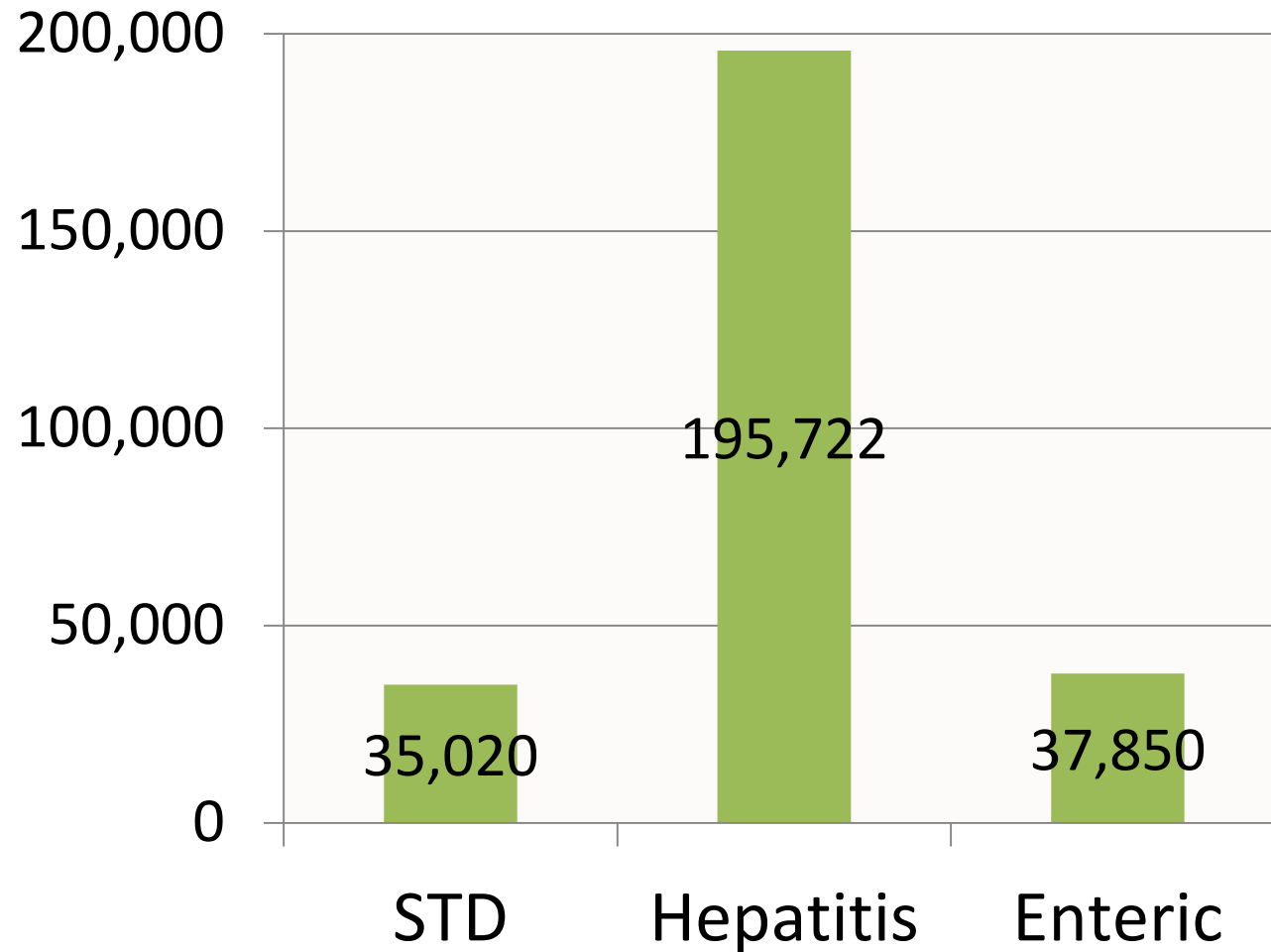
Time from Diagnosis to Report



Number of Reports



# Electronic laboratory reports – MA 2011





from [www.sciencewatch.com](http://www.sciencewatch.com) (November 12, 2010)





# ESPnet

EHR Support for Public Health

[Home](#) [About Us](#) [Getting ESPnet](#) [Contact Us](#)

Overview

ESPnet

Querying

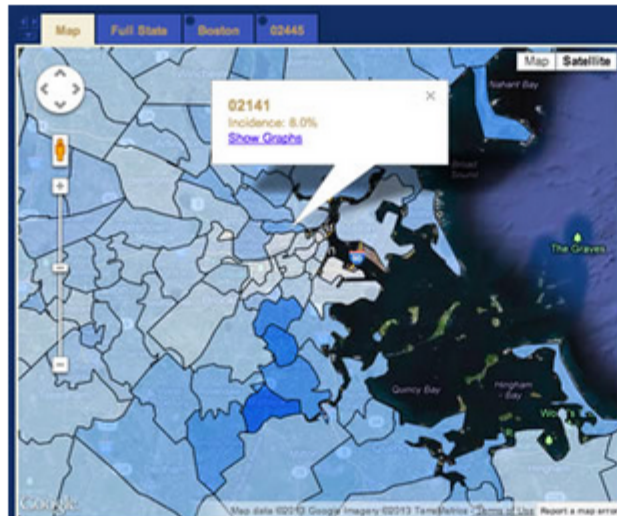
RiskScape

Notifiable Diseases

Syndromic Surveillance

Chronic Diseases

Vaccine Safety



*ESPnet enables medical practices and hospitals to provide **automated, timely** information to public health departments about notifiable conditions, influenza-like illness and chronic diseases.*

*Practices can use ESPnet to query their own data and allow queries from state Departments of Public Health, returning de-identified summary reports.*

*ESPnet uses information in electronic health records. These records remain under the full control of the practice or hospital at all times.*

# ESPnet – EHR Support for Public Health

- Identify conditions of interest, create complete reports, and transmit them securely,  
all automatically
- Compatible with any EHR that can export data
- Compliant with national standards (ONC Query Health)
- Open source

*JAMIA* 2009;16:18-24

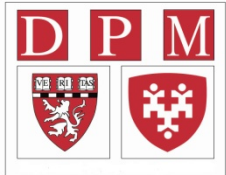
*MMWR* 2008;57:372-375

*Am J Pub Health* 2012;102:S325–S332

## ESPnet Partners



- Massachusetts Dept of Public Health
- Dept of Population Medicine  
Harvard Medical School /  
Harvard Pilgrim Health Care Inst.



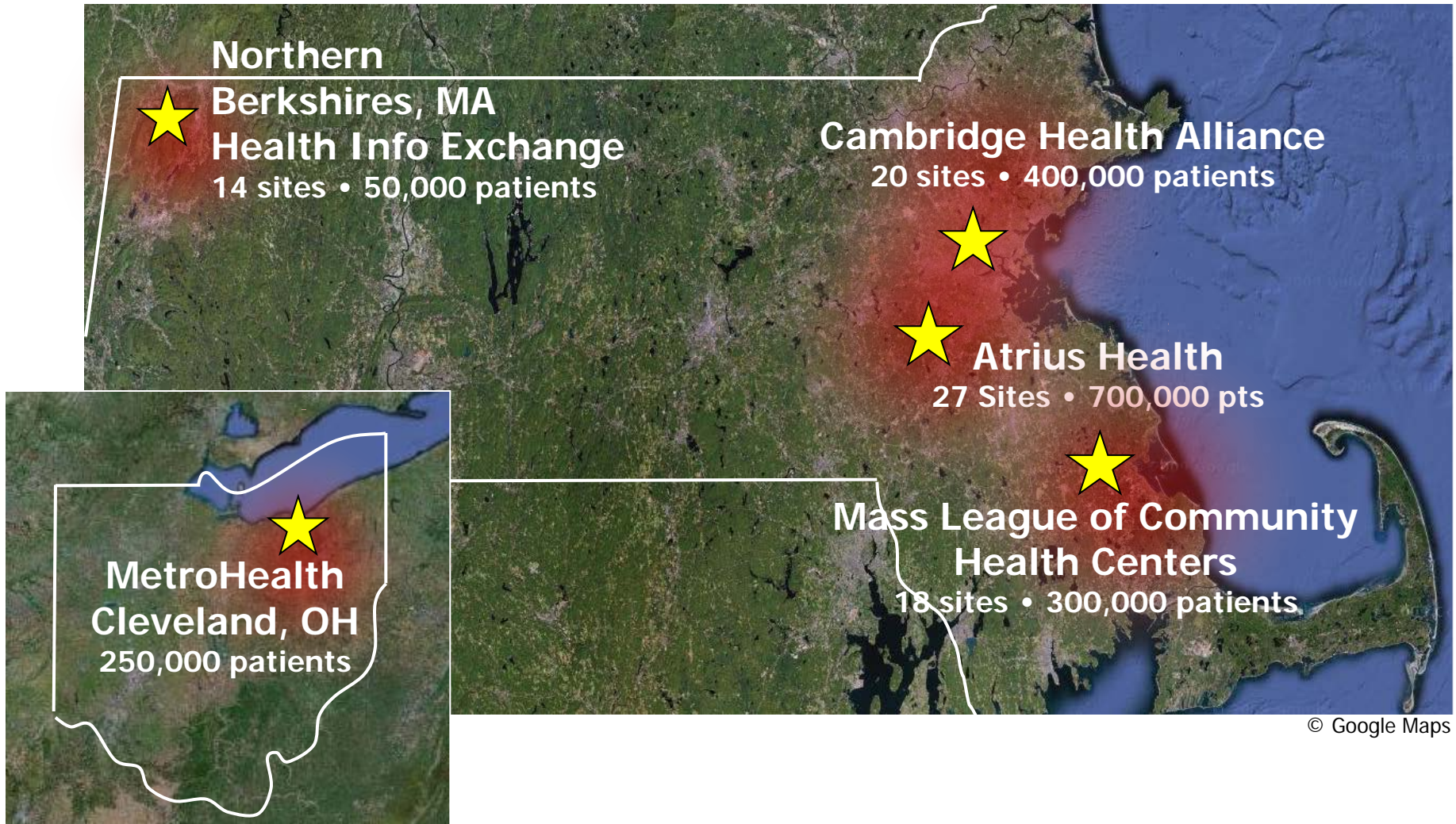
- Massachusetts eHealth Institute



- Atrius Health
- Cambridge Health Alliance
- Mass League of Community Health Centers
- MetroHealth



## Current ESPnet installations



Mass Hlway

Last Mile  
Program

HIE Related  
Projects

IMPACT

MDPHnet

Distributed Data  
Network

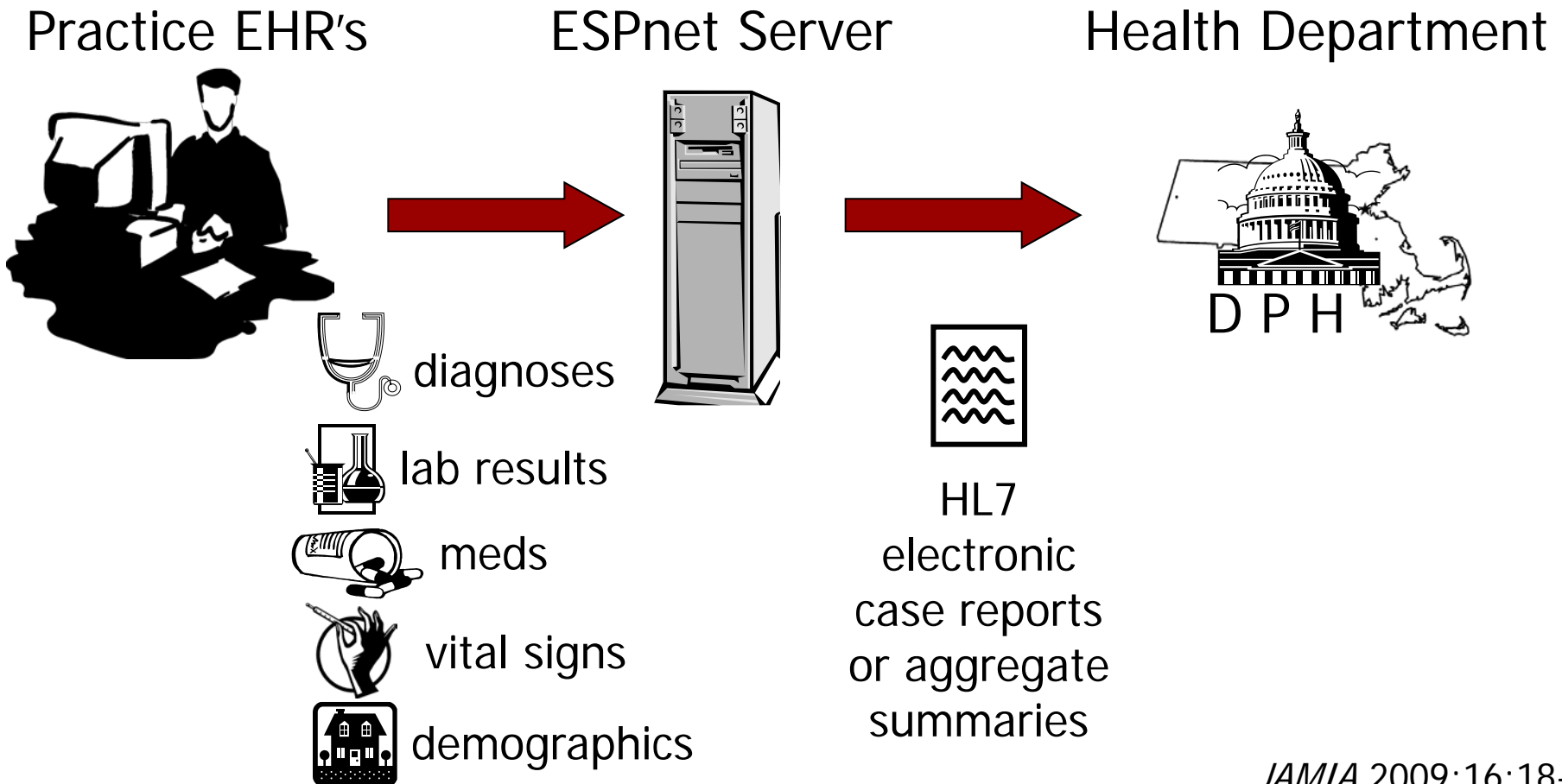
ESP

PopMedNet

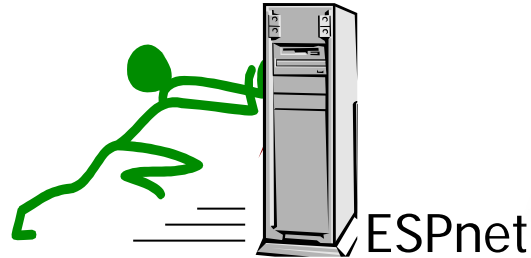
# MDPHnet - Distributed Data Analytics



## Automated disease detection and reporting

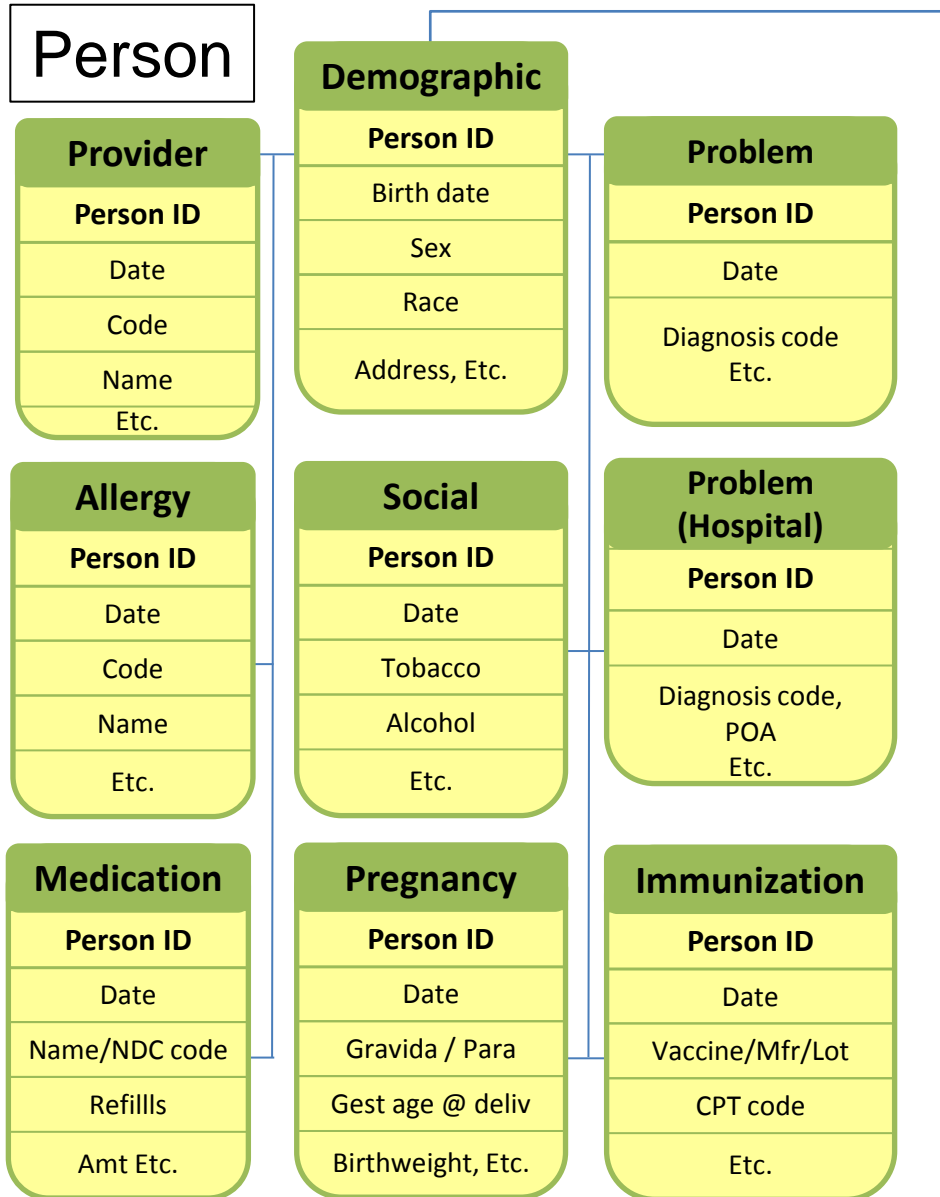


## Decoupled architecture



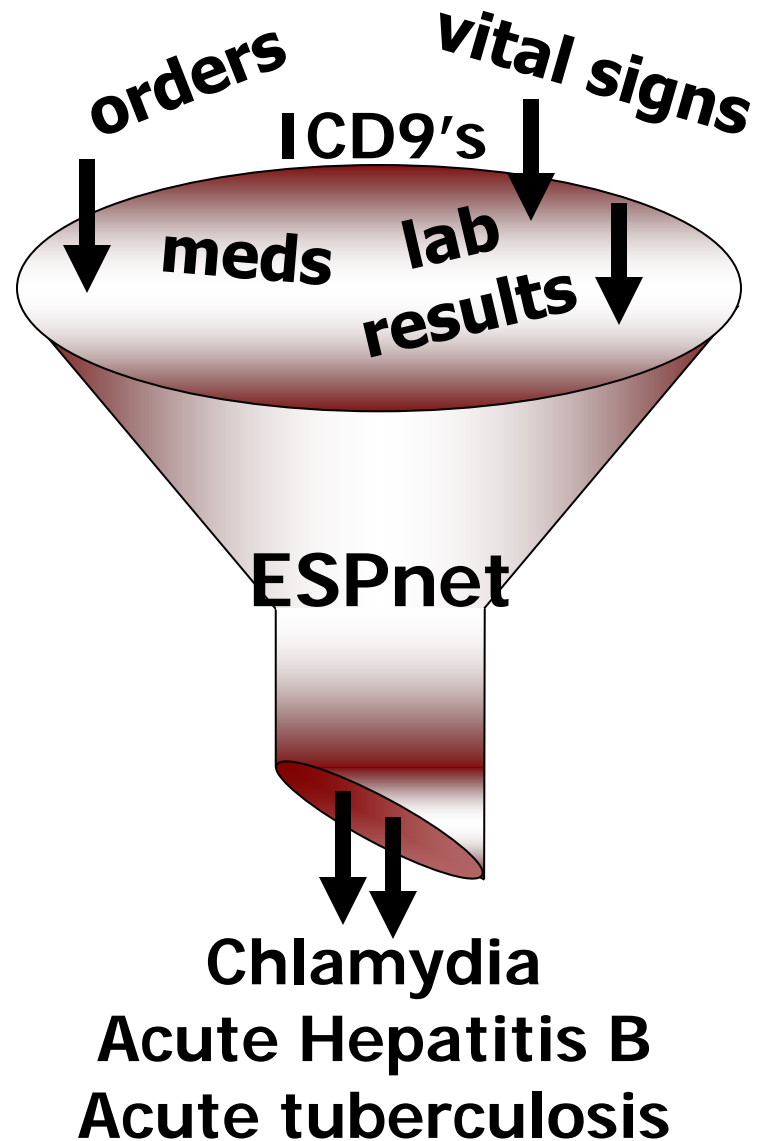
	Implications
Compatible with most EHRs (local codes translated to common nomenclature)	Universal
Offloads computing burden from EHR	Unobtrusive
<u>Clinical practice controls access/use</u>	Secure

## ESP's Data Model





# CASE IDENTIFICATION



# Acute hepatitis B

- Strategy 1: ICD9 070.3 Viral hepatitis B without mention of hepatic coma
  - Review of 50 patients' charts

## Positive Predictive Value

0%

(95% confidence interval, 0-6%)

# Acute hepatitis B

- Strategy 2: current lab tests
  - ALT or AST > 5x normal **AND**
  - Positive hepatitis B surface antigen

## Positive Predictive Value

**47%**

(95% confidence interval, 41-53%)

# Acute hepatitis B

- Strategy 3: current & past lab tests & ICD9 codes
  - ALT or AST > 5x normal **AND**
  - Positive hepatitis B surface antigen **AND**
  - No prior positive hepatitis B surface **AND**
  - No ICD9 code for chronic hepatitis B ever **AND**
  - Total bilirubin >1.5

## Positive Predictive Value

**97%**

(95% confidence interval, 94-100%)

Sensitivity 99%

Specificity 94%

# Hepatitis B Case Finding - ESP versus ELR

**ELR**

**2648 positive test results for hepatitis B**

# Case Definition: Active Tuberculosis

Strategy : drug prescribing & lab test orders & ICD9 codes

- Prescription for pyrazinamide  
or
- Prescription of 2 or more anti-tuberculous medications  
plus  
ICD9 code for TB within 60 days  
or
- Order for (AFB smear or AFB culture)  
plus  
ICD9 code for TB within 60 days

# ESPnet Conditions Currently Being Reporting

<b>Condition</b>
Chlamydia
Gonorrhea
Pelvic inflammatory disease
Acute hepatitis A
Acute hepatitis B
Acute hepatitis C
Tuberculosis
Syphilis

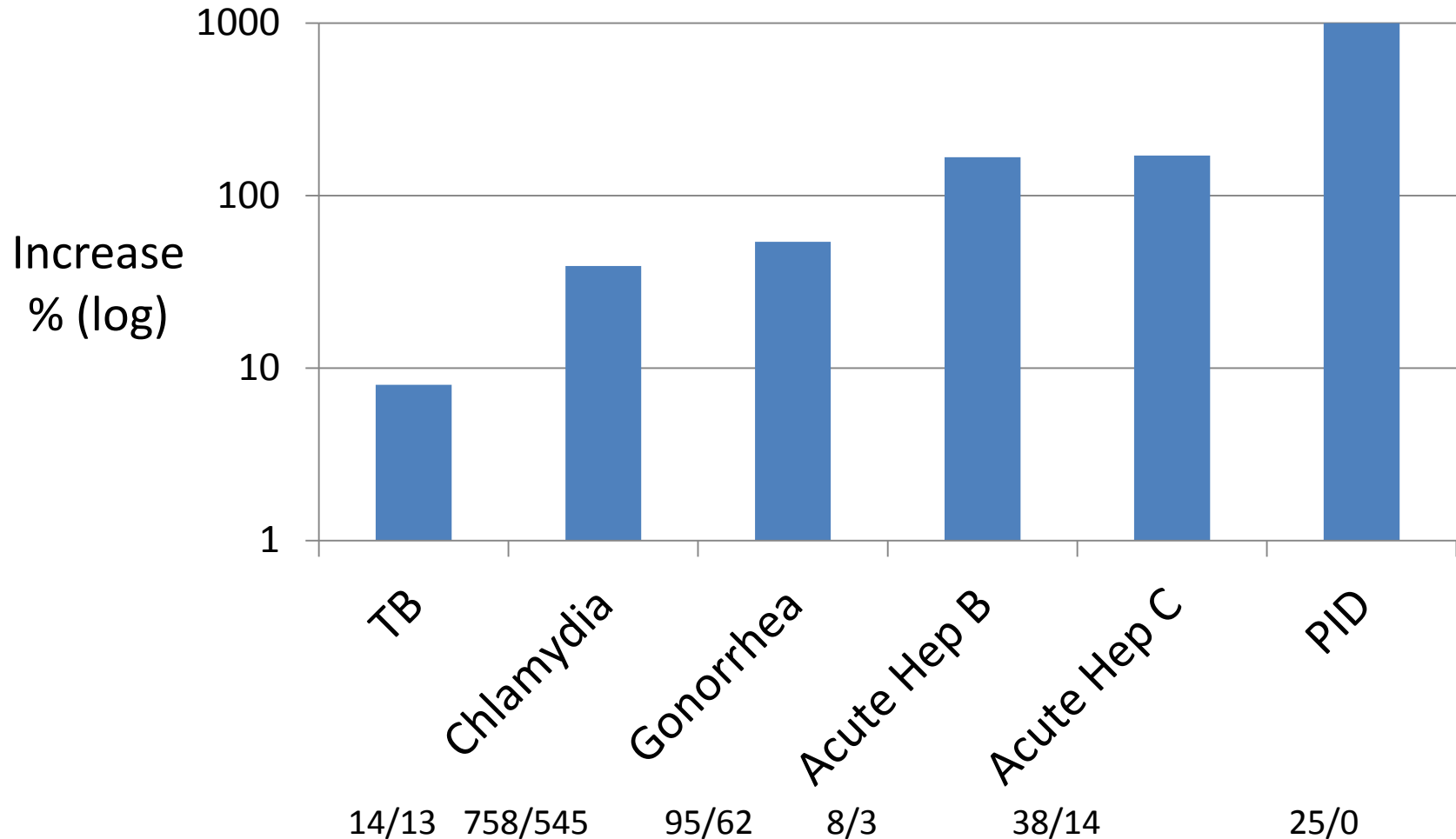


**INFECTIOUS DISEASE  
CASE REPORTING**

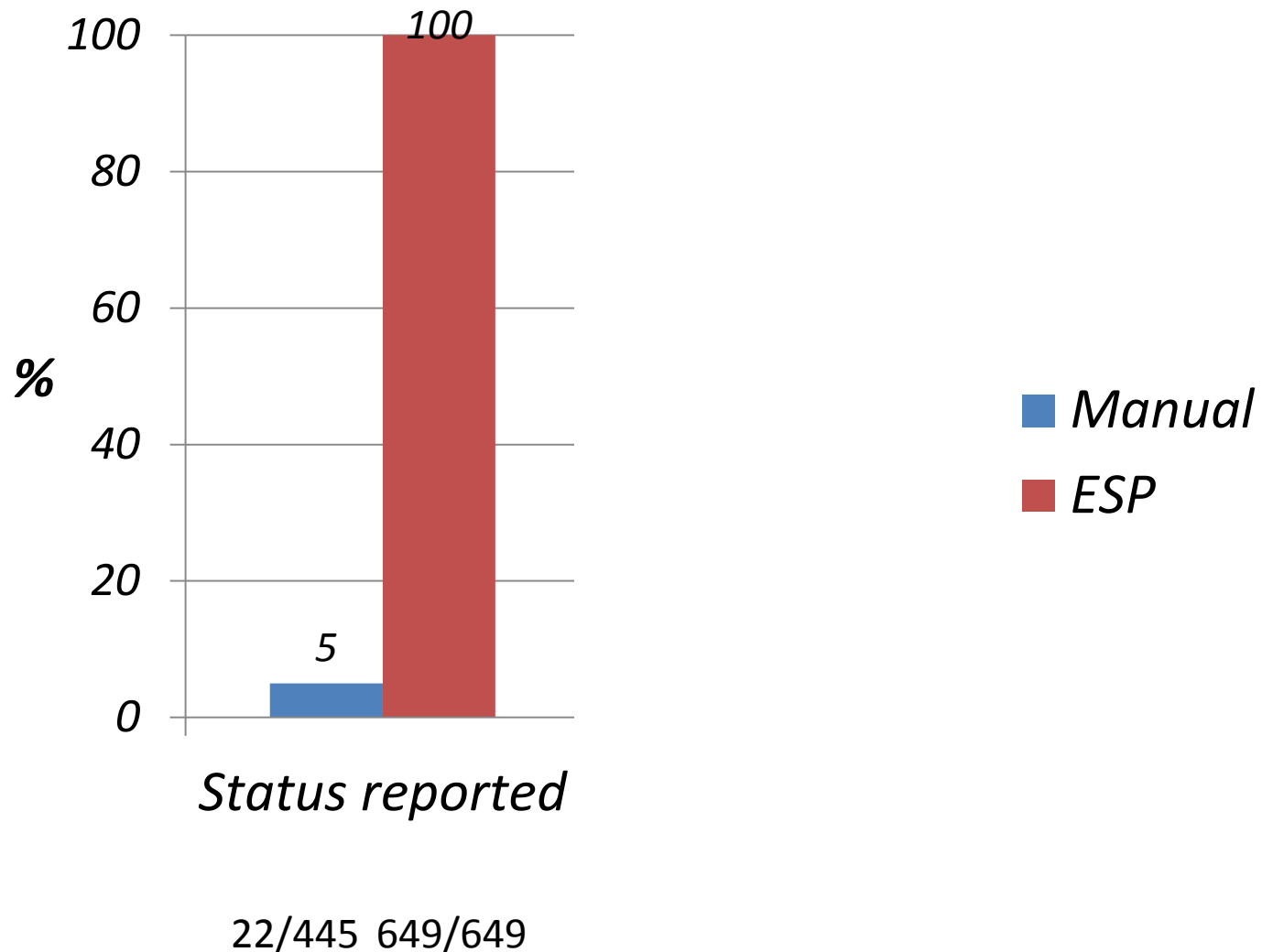
# Report to Health Department – HL7 format

- Patient demographics
- Responsible clinician, site, contact info
- Basis for condition being detected
- Treatment given
- Symptoms (ICD9 code & temperature)
- Pregnancy status (if pertinent)

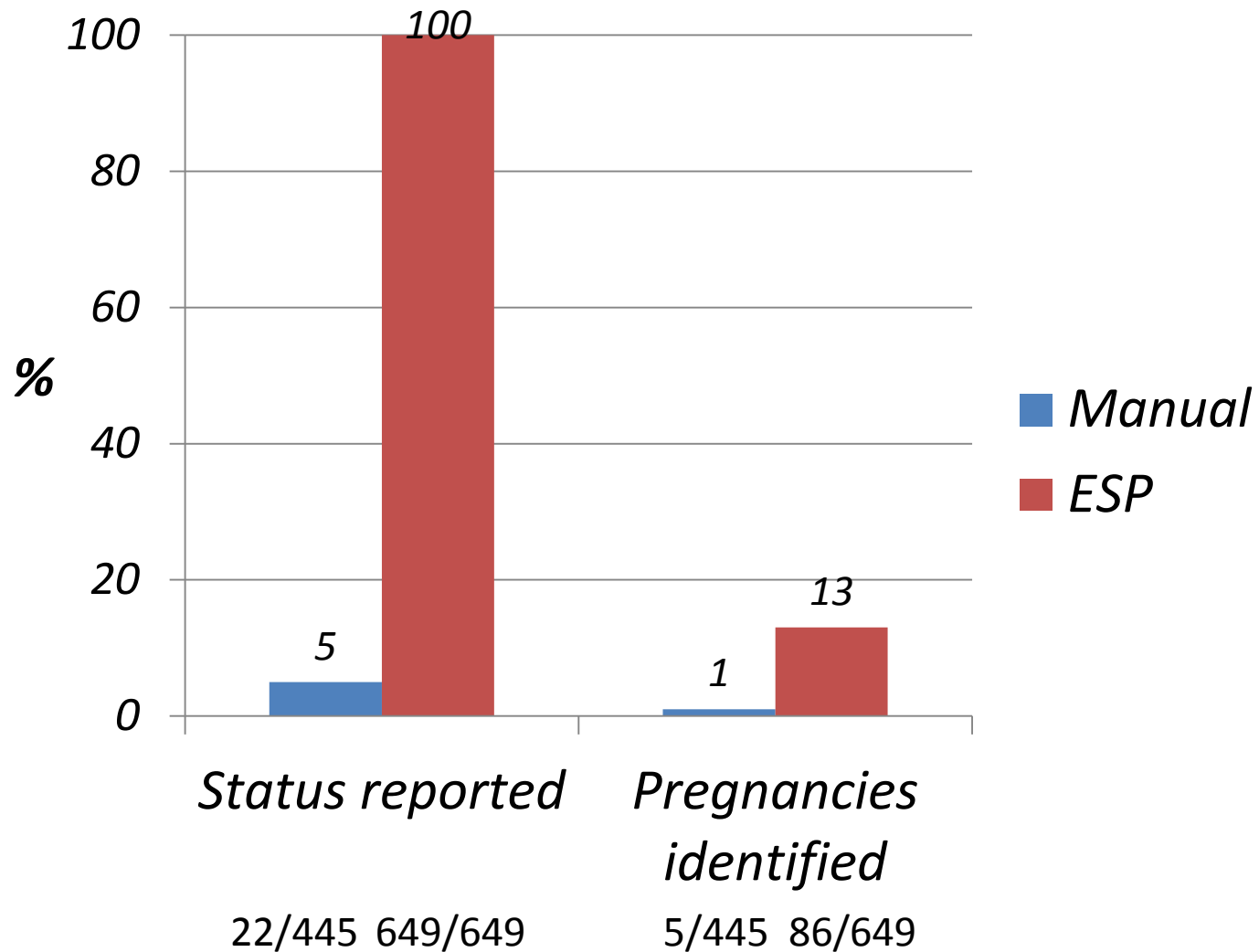
# ESPnet vs manual reporting



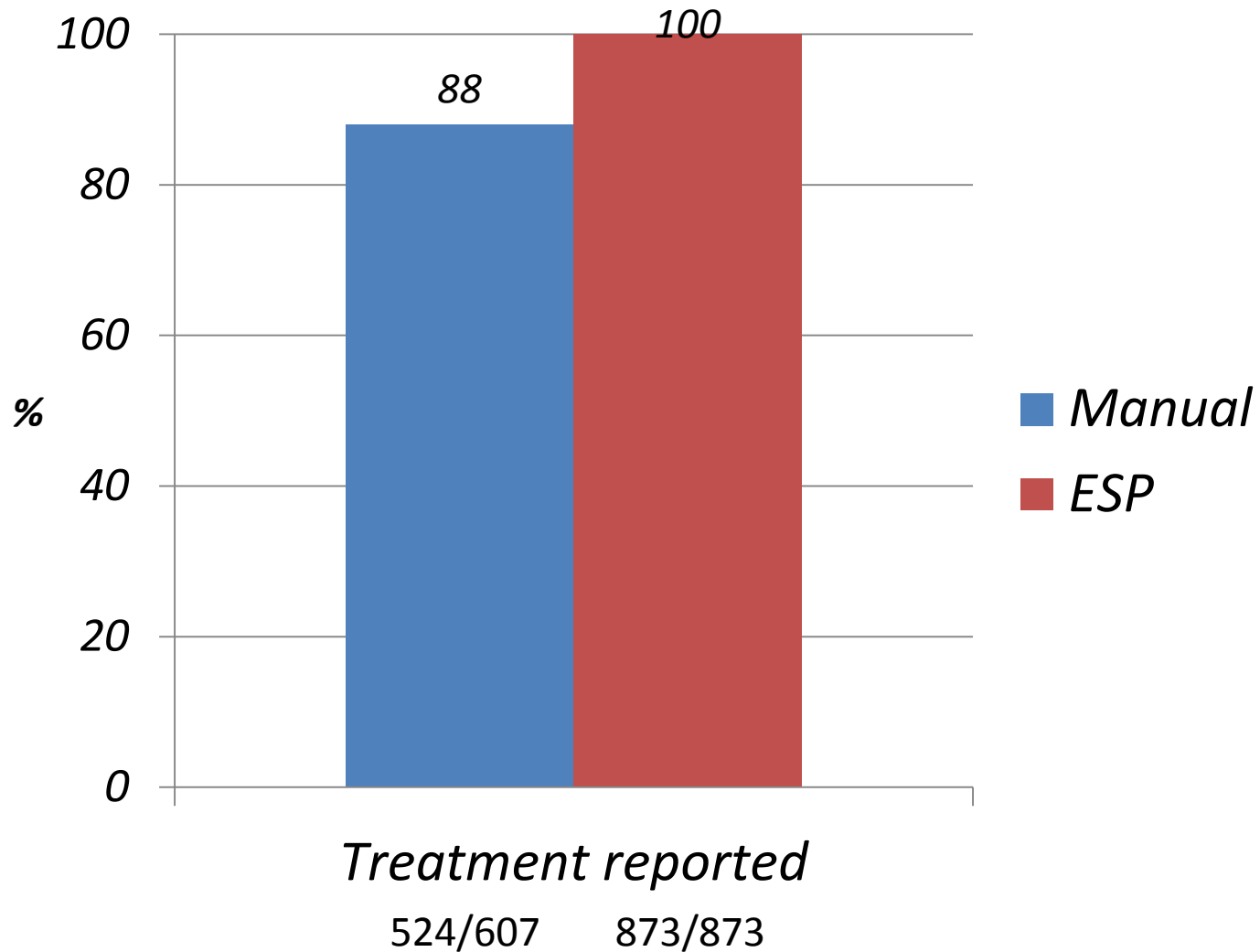
# Pregnancy status: Chlamydia & Gonorrhea



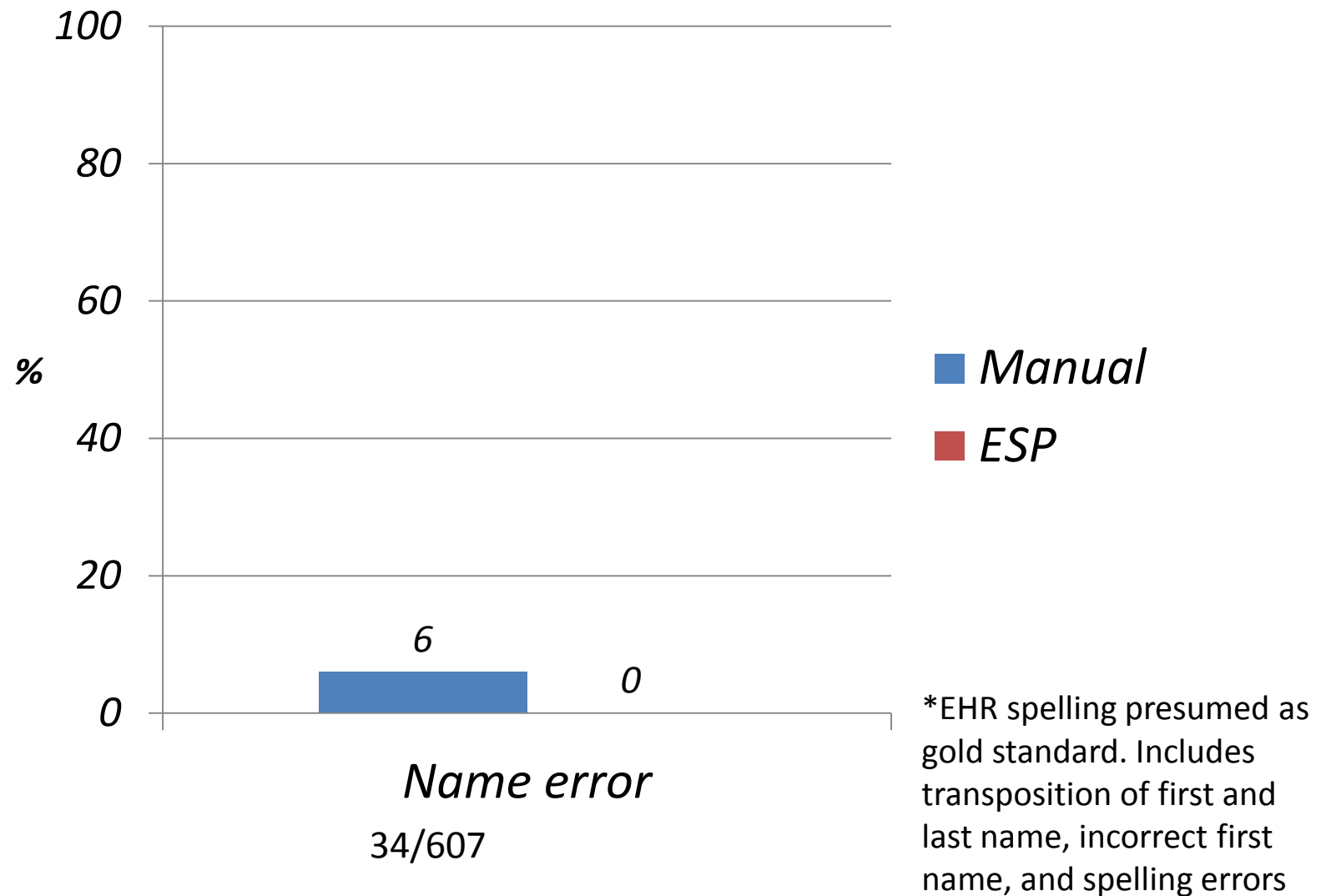
# Pregnancy status: Chlamydia & Gonorrhea



# Treatment reports: Chlamydia & Gonorrhea



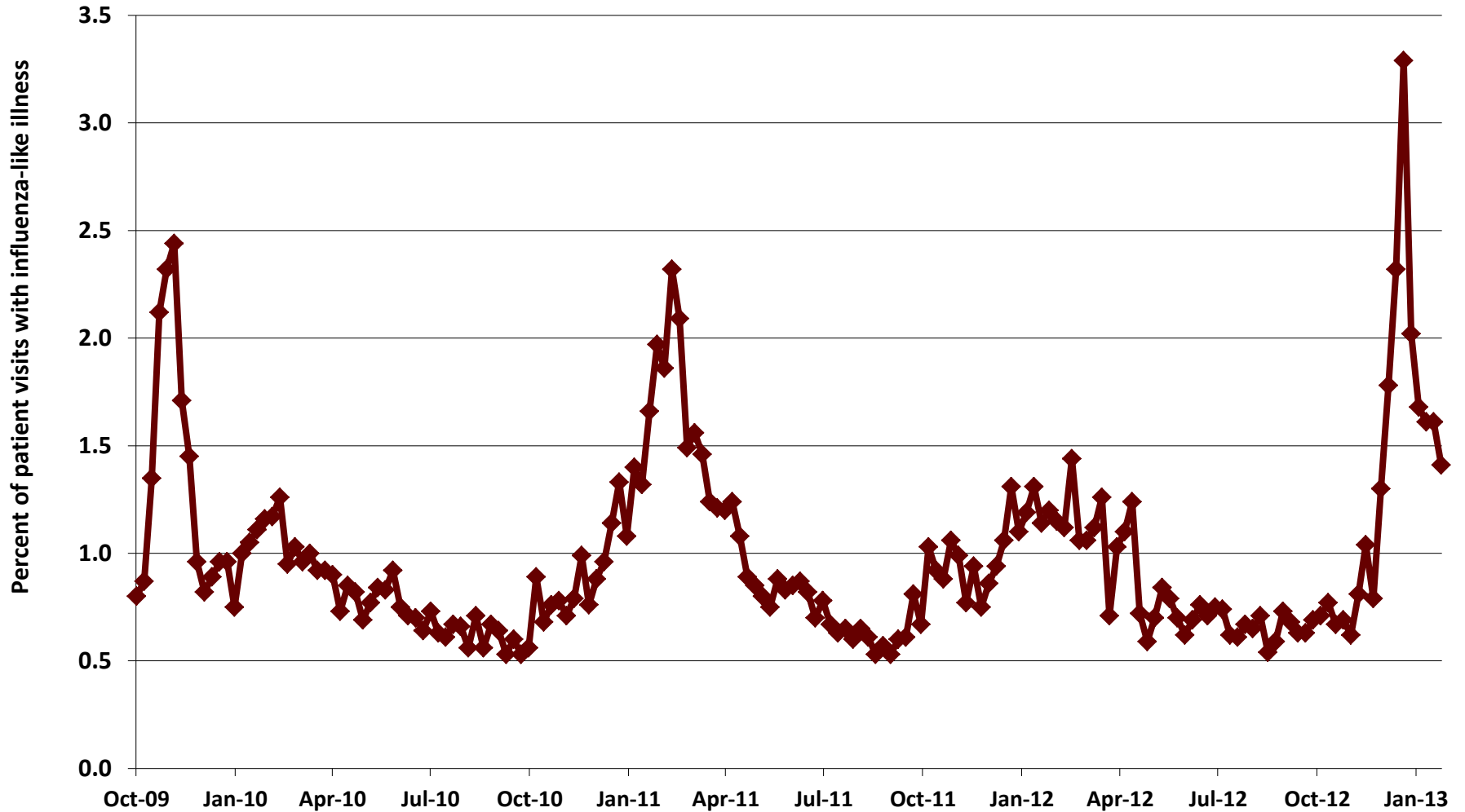
# Patient name error: Chlamydia & Gonorrhea



# **SYNDROMIC SURVEILLANCE**



# Influenza-Like Illness



# CHRONIC DISEASE SURVEILLANCE

# Criteria for Frank Diabetes

- Laboratory tests
  - Hemoglobin A1C  $\geq 6.5$
  - Fasting glucose  $\geq 126$
  - Random glucose  $\geq 200$  on two or more occasions
- Diagnoses
  - ICD9 code 250.x (DM) on two or more occasions
- Prescribing
  - Insulin outside of pregnancy
  - Any of these oral agents:
    - Glyburide, gliclazide, glipizide, glimepiride
    - Pioglitazone, rosiglitazone
    - Repaglinide, nateglinide, meglitinide
    - Sitagliptin
    - Exenatide, pramlintide

# Type 1 versus Type 2 Diabetes

- Among patients with frank diabetes, label as type 1 if any of these:
  - C-peptide negative
  - DM auto-antibodies positive
  - Prescription for urine acetone test strips
  - Ratio of type 1 : type 2 diabetes ICD9s  $> 0.5$  and NOT on oral hypoglycemics
  - Ratio of type 1 : type 2 diabetes ICD9s  $> 0.5$  and Rx for glucagon
- If not type 1 then type 2

## ESPnet: Scheduled reporting

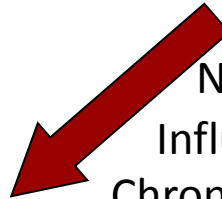
Practice EHR's



Notifiable diseases  
Influenza-like Illness  
Chronic diseases



Notifiable diseases  
Influenza-like Illness  
Chronic diseases



Health Department

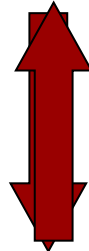
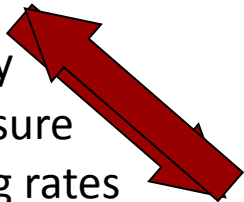
## **SENDING QUERIES TO AN EHR**

## ESPnet: ad hoc queries

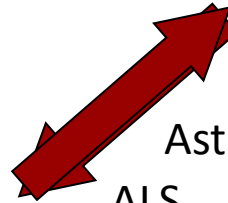
Practice EHR's



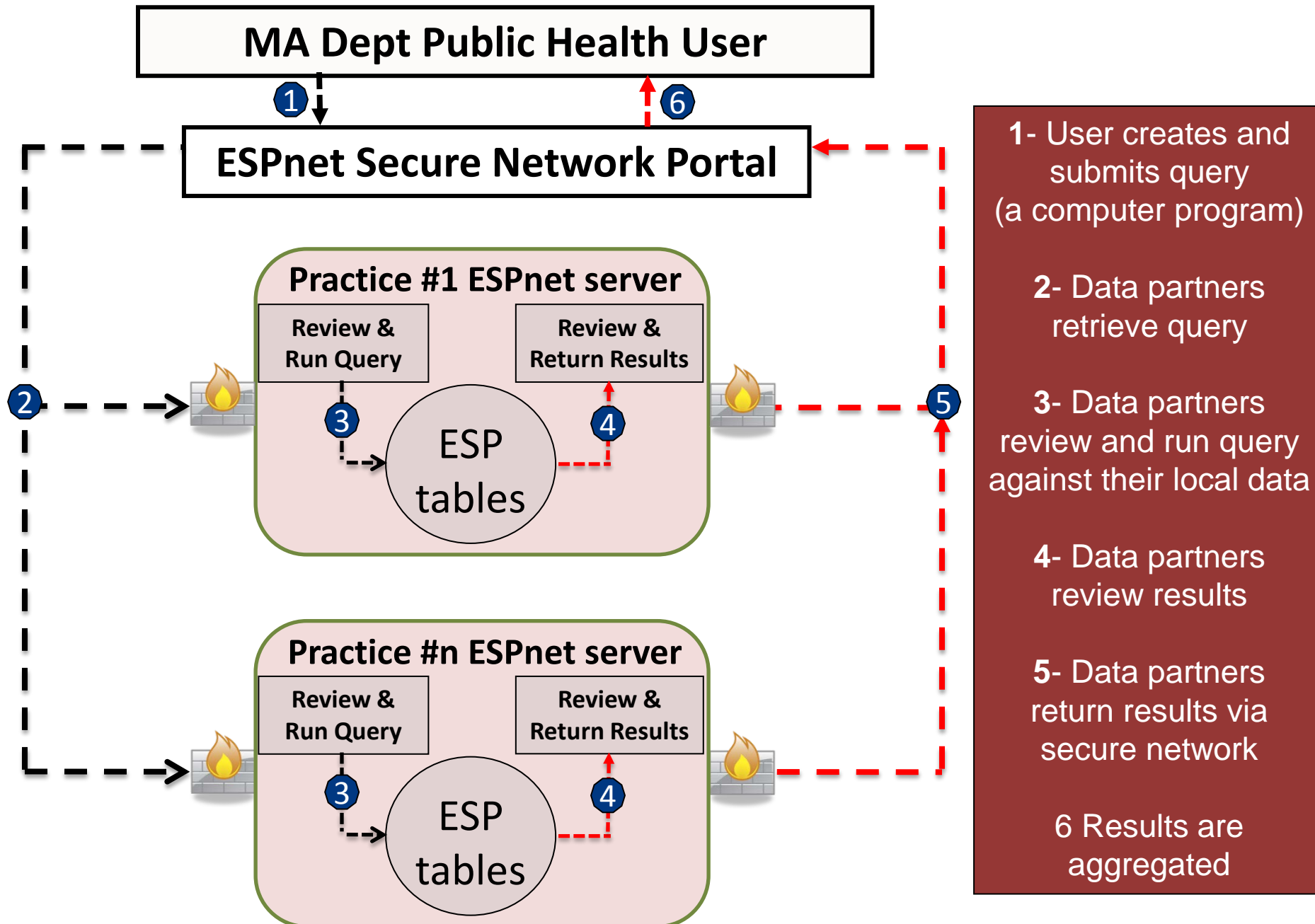
Ectopic pregnancy  
Blood pressure  
Chlamydia screening rates



Infertility  
Asthma  
ALS



Health Department







# ESPnet

EHR Support for Public Health

Home About Us Getting ESPnet Contact Us

Overview

ESPnet

Querying

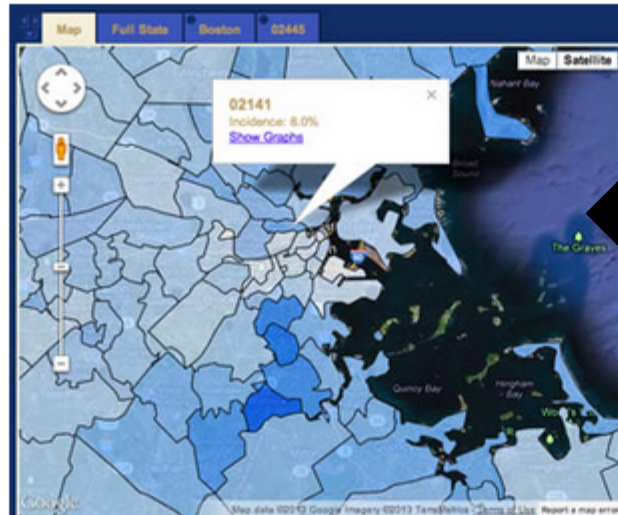
RiskScape

Notifiable Diseases

Syndromic Surveillance

Chronic Diseases

Vaccine Safety



ESPnet enables medical practices and hospitals to provide **automated, timely** information to public health departments about notifiable

## The RiskScape

Public health data and allow queries from state Departments of Public Health, returning de-identified summary reports.

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# Select an Outcome: Example Type 2 Diabetes

*Riskscape*



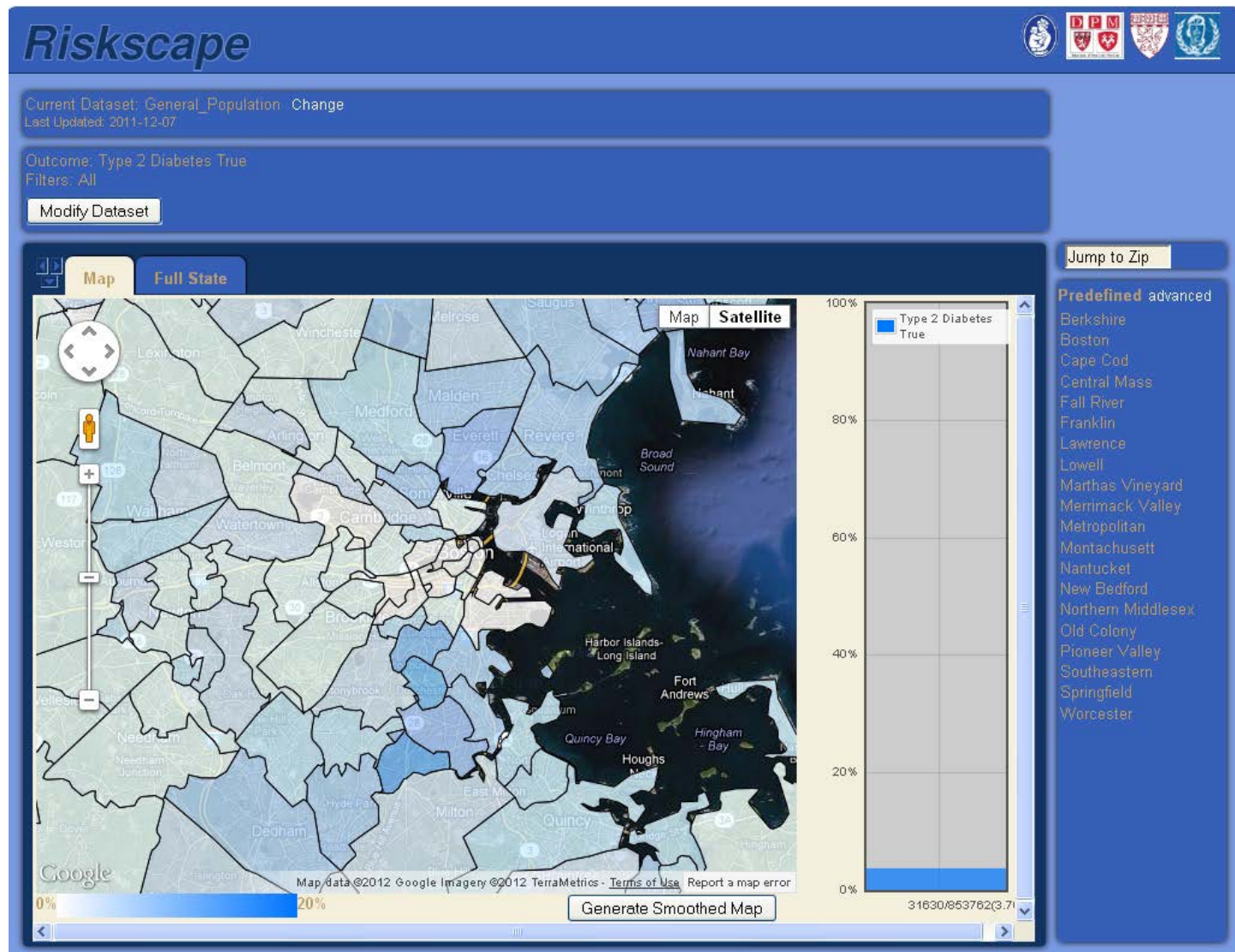
Current Dataset: General\_Population [Change](#)  
Last Updated: 2011-12-07

Outcome of Interest

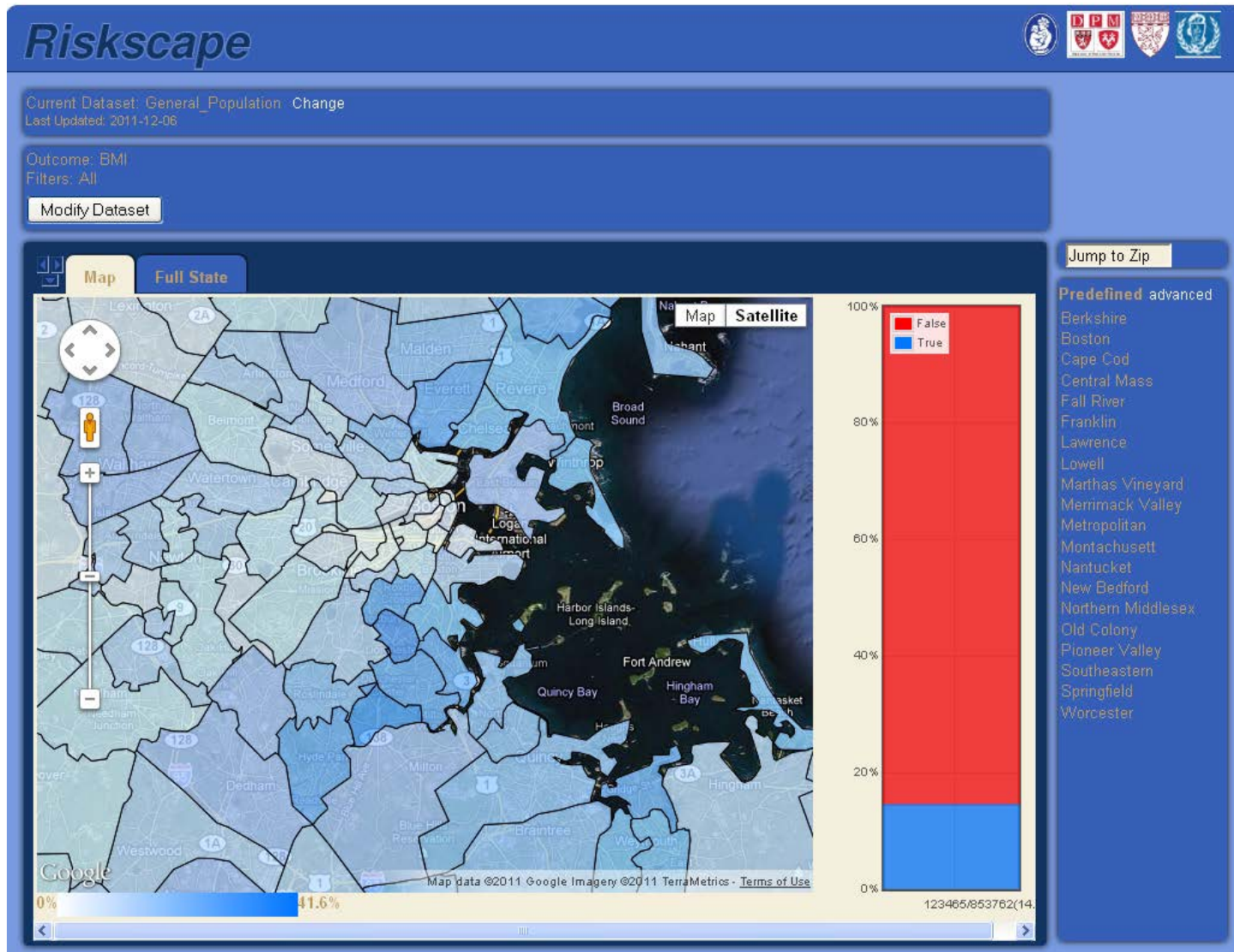
Type 2 Diabetes ▾

- Last Encounter
- Age
- Sex
- Race
- BMI
- Blood Pressure
- Hemoglobin A1C
- Prediabetes
- Type 1 Diabetes
- Type 2 Diabetes
- Insulin
- Metformin
- Influenza Vaccine

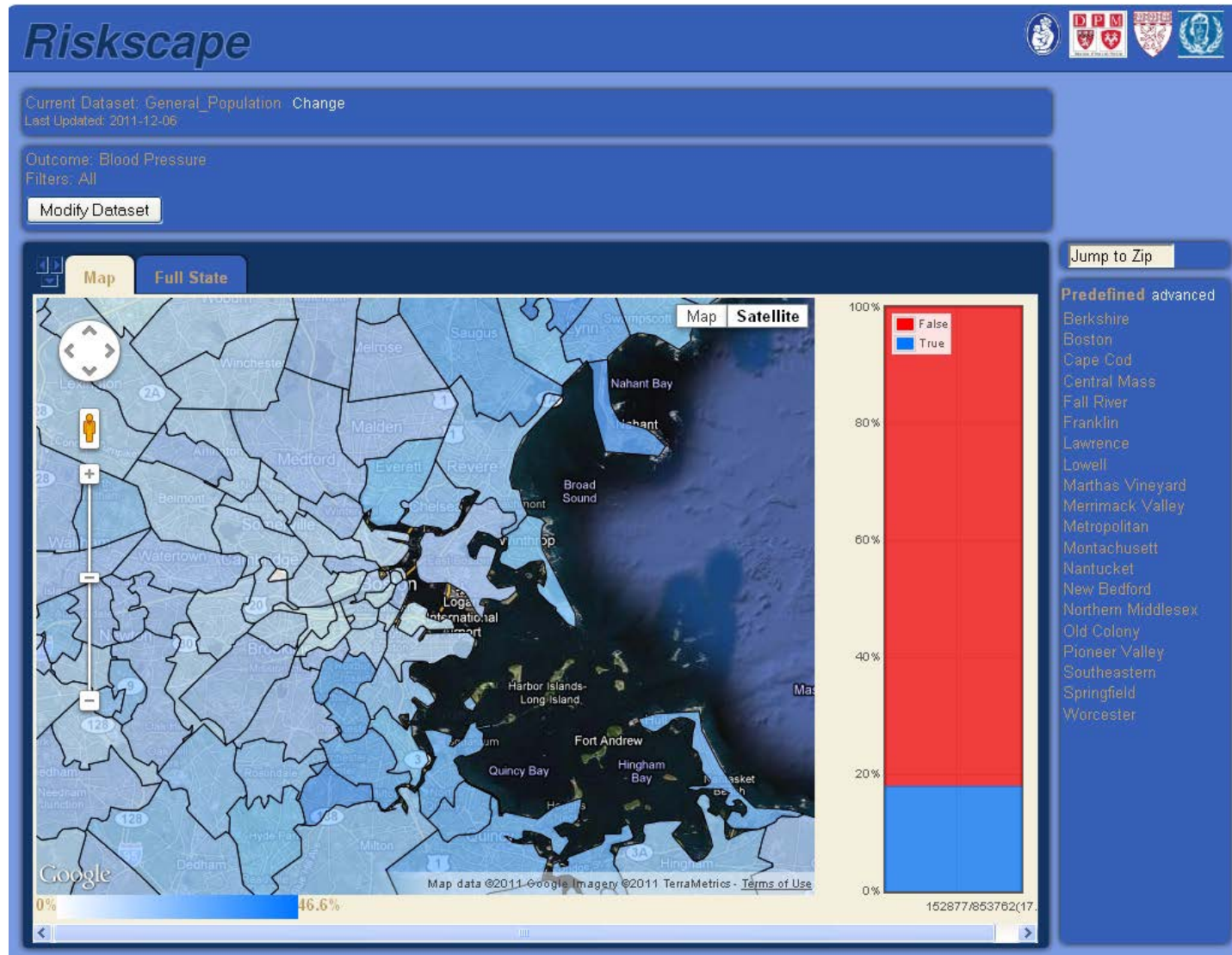
## Type 2 Diabetes in Eastern Massachusetts



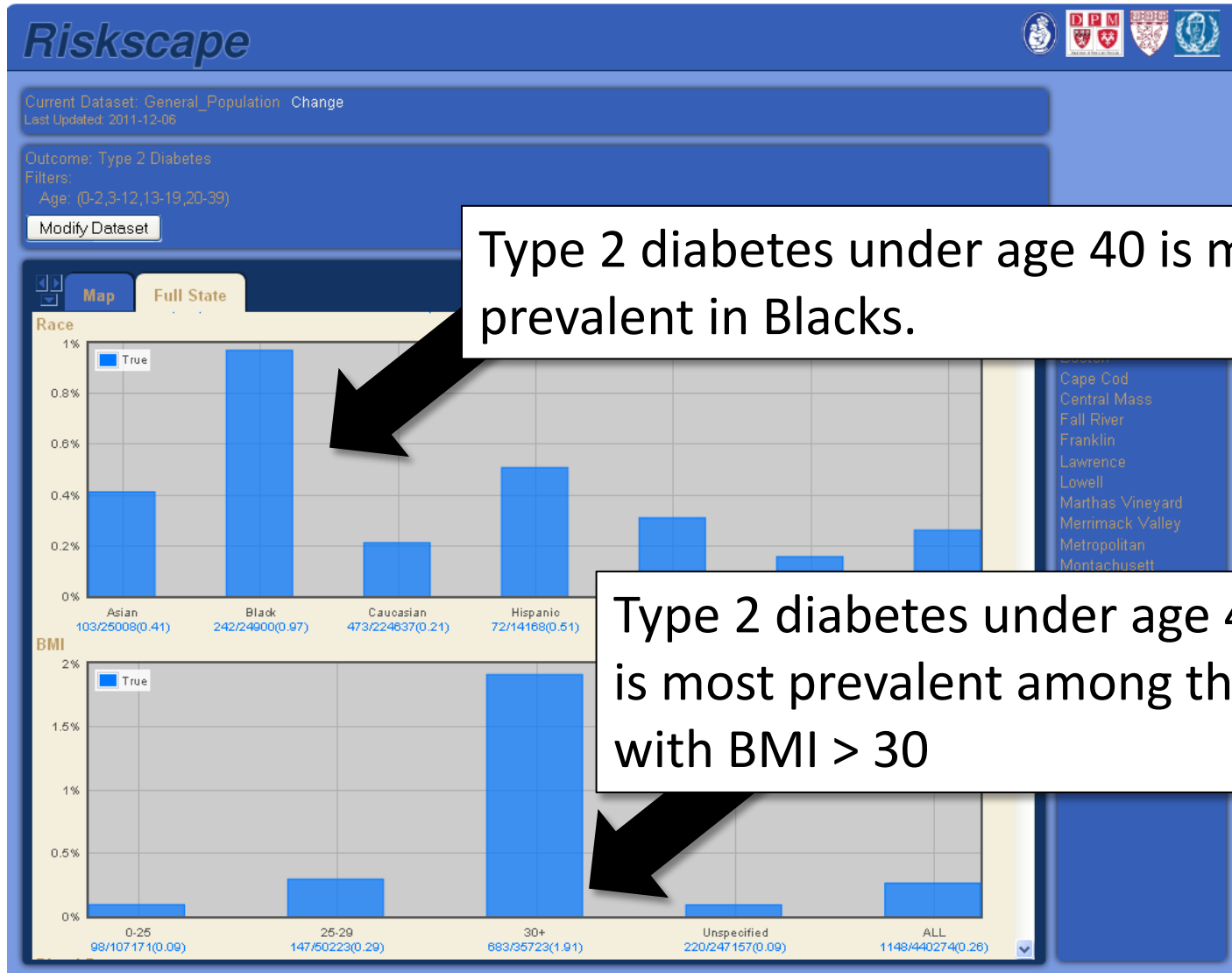
## Obesity (BMI >30)



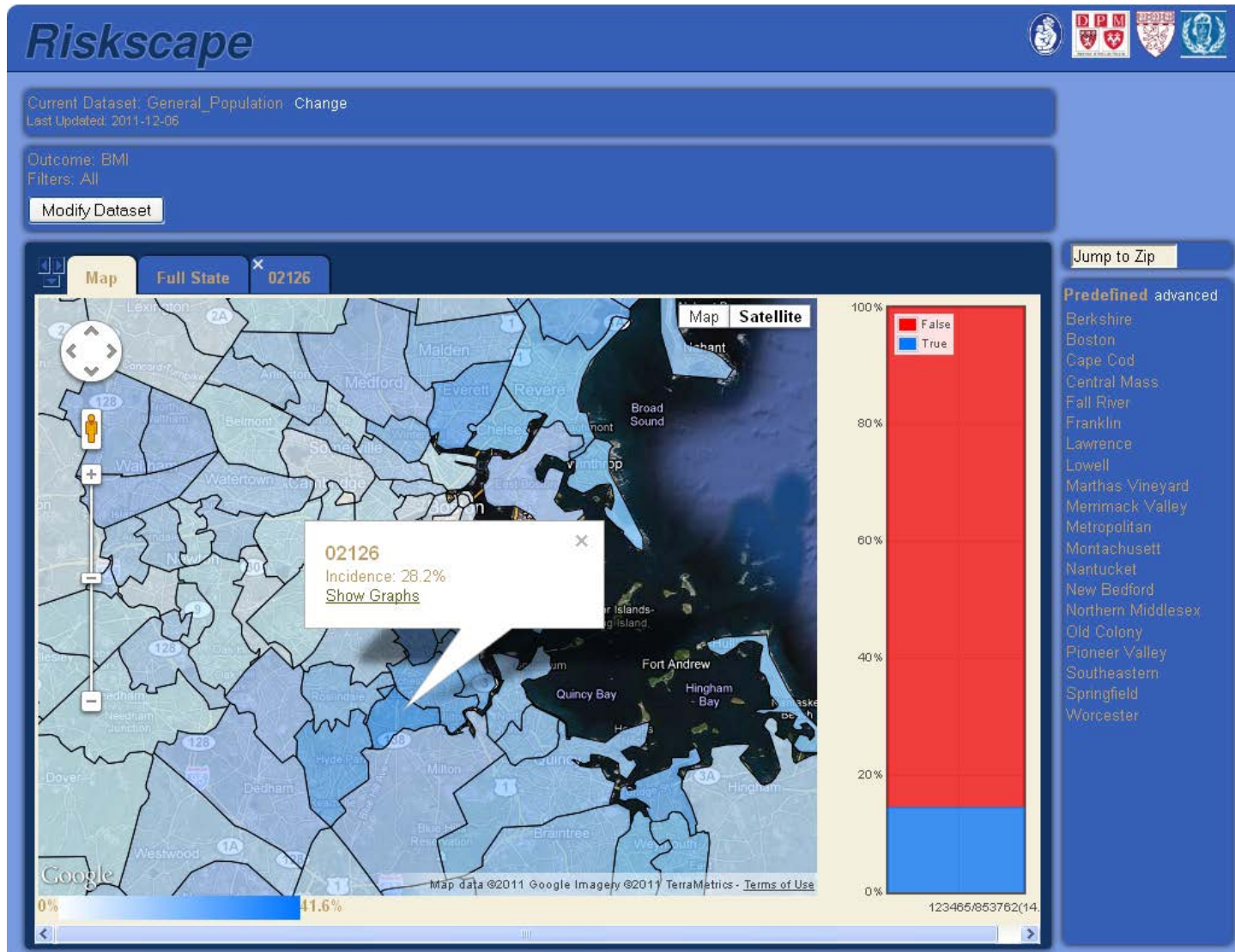
## High blood pressure



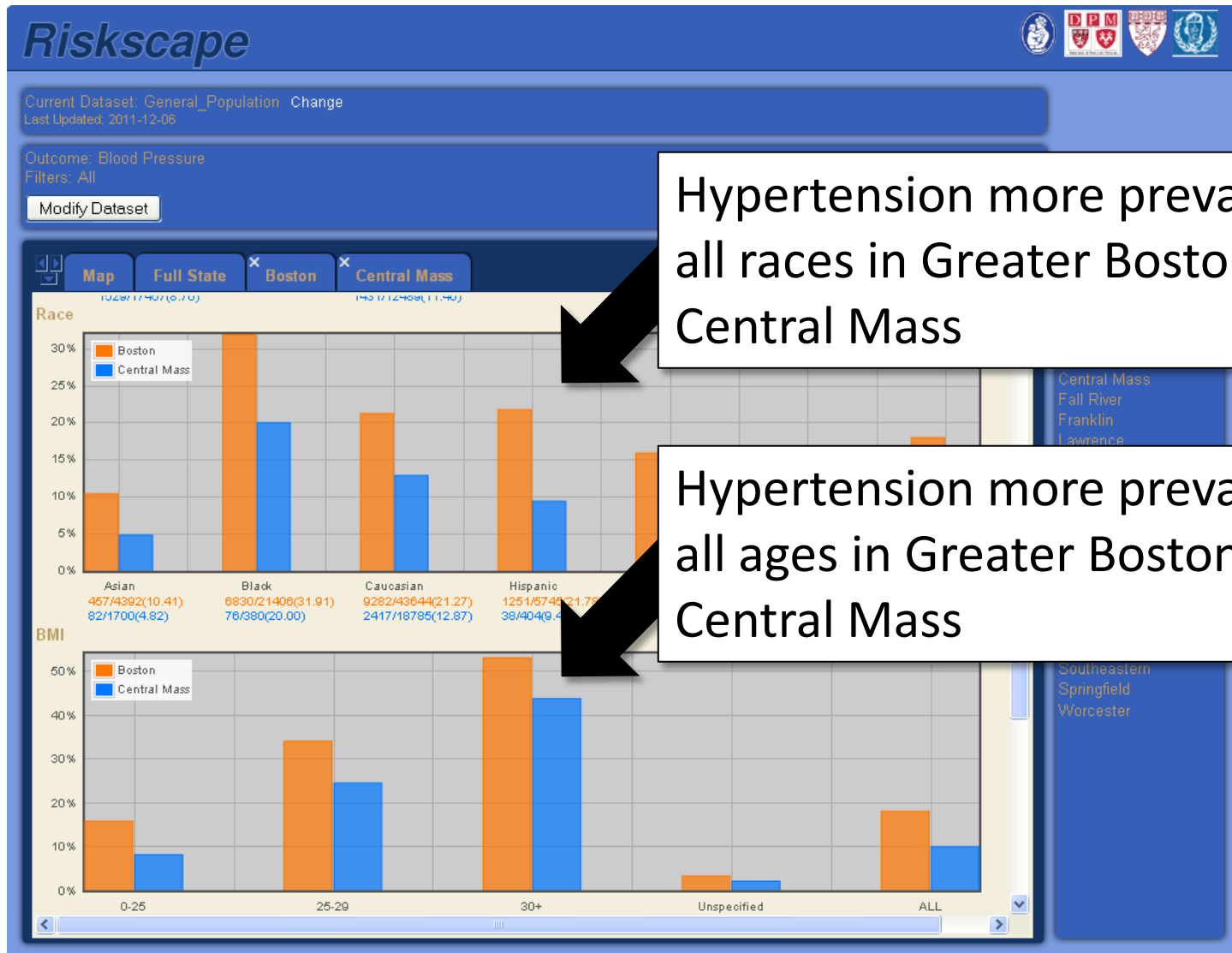
## Stratify by age, sex, race, BMI, BP, etc.



## Drill Down on ZIP Codes



## Compare locations

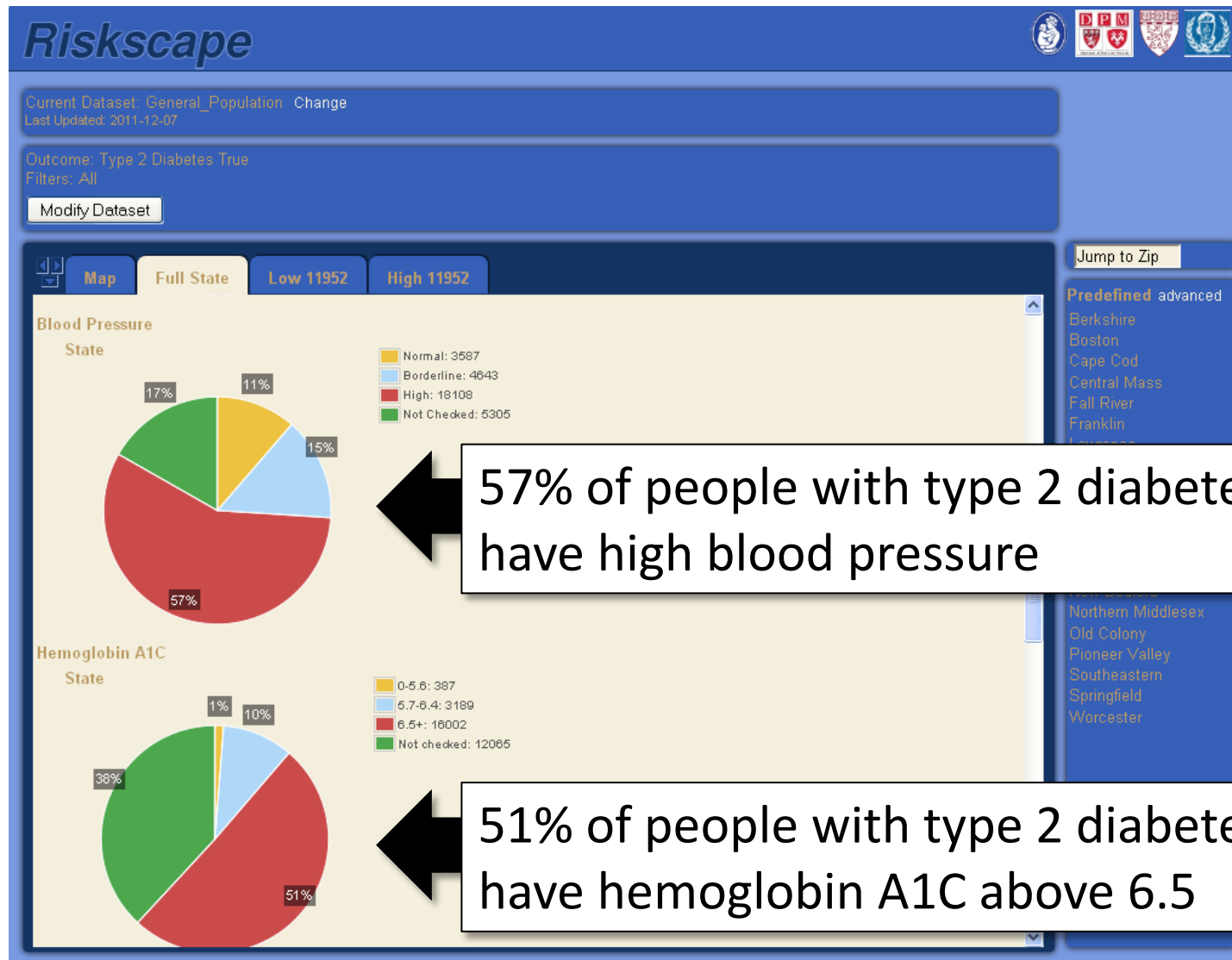


Hypertension more prevalent for all races in Greater Boston vs Central Mass

Hypertension more prevalent for all ages in Greater Boston vs Central Mass



## Evaluate whether patients meet clinical targets




## In progress

- Vaccine adverse event detection and reporting to CDC VAERS
- Send messages to clinician's inbox to elicit additional information
  - via link to secure external site
- Ability to insert reports in EHR

## Eliciting clinician input and reporting in EHR



 diagnoses

 lab results

 meds

 allergies

vaccines

# Clinician inbox message

Dear Dr. **JONES**

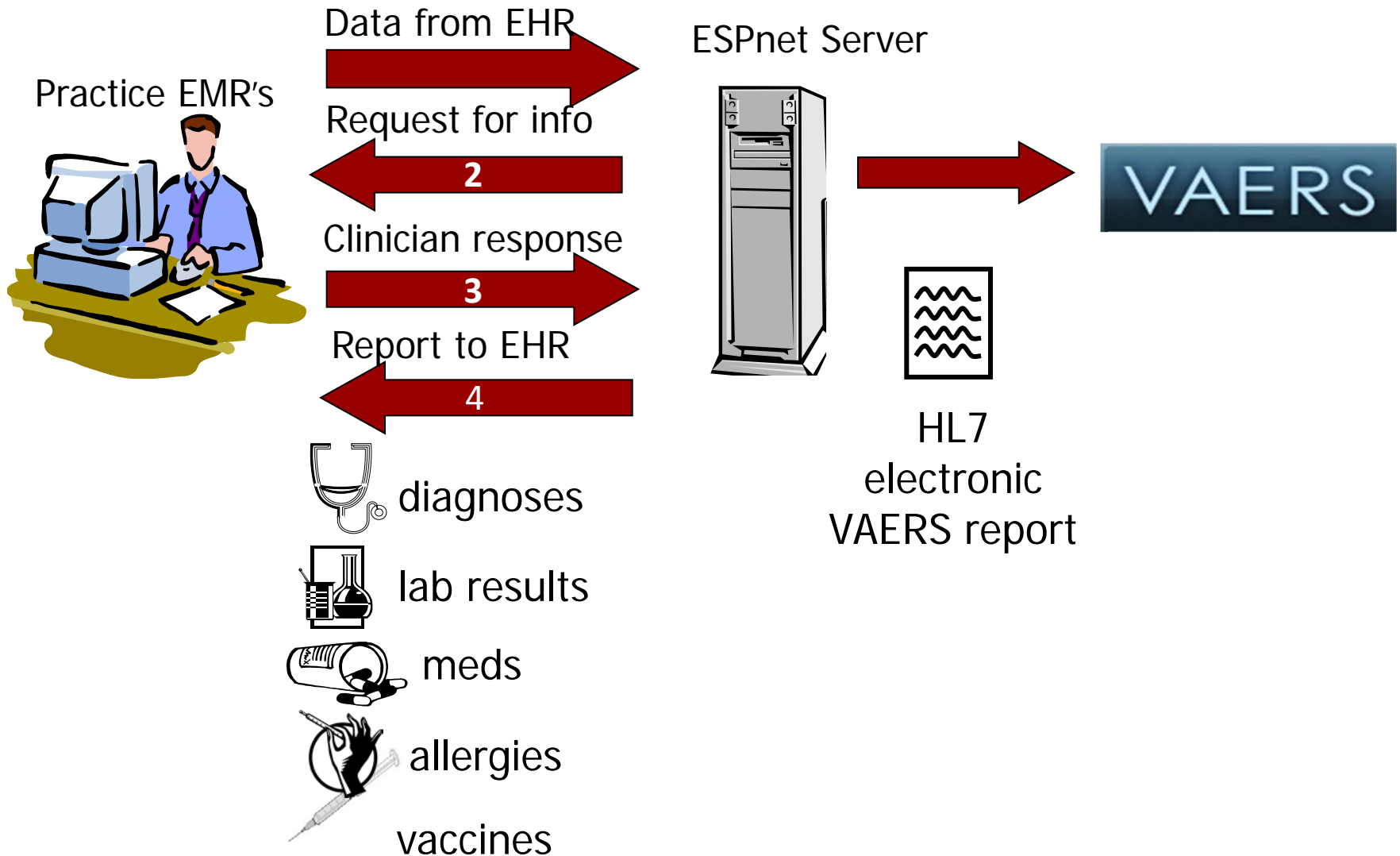
Your patient **BOB WIGGINS** may have suffered an adverse effect from a recent vaccine. **BOB WIGGINS** was diagnosed with **MENINGITIS** on **AUGUST 12**, 7 days after receiving **MEASLES VACCINE**. If you think the **MENINGITIS** might have been due to the vaccine, we can automatically submit an electronic report to CDC / FDA's Vaccine Adverse Event Reporting System on your behalf.

Please provide any additional clinical details on this event that you think might be helpful to CDC and FDA vaccine safety investigators:

DECLINE

SUBMIT

## Eliciting clinician input and reporting in EHR



## On the horizon

- Meaningful use stage 2 certification for ELR reporting
- Monitoring response to community-focused obesity prevention program

## Just over the horizon

- Notification about overdue follow up (STD test of cure, gestational diabetes post-partum glucose tolerance test...)
- Meaningful use stage 3 certification
- Research support, e.g., comparative effectiveness, clinical trials

*“No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring”*

Introductory statement printed each week in  
*Public Health Reports, 1913-1951*





**CDC Center of Excellence in Public Health Informatics**  
**Electronic Support For Public Health**

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## Welcome to the ESP Project web site, Wiki, and source code (Subversion) repository

This is a web site for the Electronic medical record Support for Public health (ESP) project, part of a [CDC funded Center of Excellence in Public Health Informatics](#). The ESP project is a collaboration between [Harvard Medical School](#), [Harvard Pilgrim Health Care](#), [Massachusetts Department of Public Health](#), [Atrius Health](#), and [the Channing Laboratory](#) of Brigham and Women's Hospital.

ESP is a secure, automate Public Health. This [pre-priv](#) valid, comprehensive, sec

The growing use of electro unparalleled opportunity to patient demographic data. record systems to public h

The system currently repo collaboration with the Mas orders and results, ICD9 d

# Source code and documentation available free of charge from esphealth.org

Massachusetts Department of continuously since, providing

practice, offering an ent information, as well as gng from electronic medical

ctive tuberculosis. In combinations of laboratory ment.

### Project Publications

Electronic Support for Pu	<a href="#">PDF</a>
Automated Identification of Acute Hepatitis B Using Electronic Medical Record Data to Facilitate Public Health Surveillance	<a href="#">HTML</a>
Automated Detection and Reporting of Notifiable Diseases Using Electronic Medical Records Versus Passive Surveillance: Massachusetts, June 2006--July 2007	<a href="#">PDF</a>
Electronic medical record Support for Public health (ESP: Automated Detection and Reporting of Statutory Notifiable Diseases to Public Health Authorities	<a href="#">PDF</a>
Invited Commentary: Automated Public Health Reporting-- A Familiar but Cantankerous Friend	<a href="#">PDF</a>
Klompas et al. Respond: Automated Public Health Reporting-- Possible with a Coalition of the Willing	<a href="#">PDF</a>

### Key personnel in the project include:

- Richard Platt - principal investigator (Richard\_Platt at harvard dot edu)
- Ross Lazarus - ESP informatics lead and ESP:VAERS principal investigator (Ross.Lazarus at channing dot harvard dot edu)
- Michael Klompas - clinical lead (mklompas at partners dot org)
- Julie Dunn - administrative lead (Julie\_Dunn at harvardpilgrim dot org)

### Project Details and resources

- [Discussion Forums](#) Once you've [registered](#) and confirmed your email address, you can post to the forums
- [Software dependencies](#)

## ESPnet Team

### **Harvard Dept of Population Medicine**

- Michael Klompas
- Ross Lazarus
- Emma Eggleston
- Julie Lankiewicz
- Michael Murphy
- Meghan Baker
- Richard Platt

### **Massachusetts Dept of Public Health**

- Alfred DeMaria
- Gillian Haney
- Kathy Hsu
- Sita Smith
- Josh Vogel
- Paul Oppedisano

### **Ohio Department of Health**

- Lilith Tatham

### **Massachusetts eHealth Institute**

- Keely Benson
- Laurance Stuntz

### **MetroHealth, OH**

- David Kaelber
- Guptha Baskaran

### **Atrius Health**

- Ben Kruskal
- Mike Lee

### **Cambridge Health Alliance**

- Michelle Weiss
- Brian Herrick
- Jim LaPlante

### **Northern Berkshires eHealth Collaborative**

- Don LeBreux

### **Massachusetts League of Community Health Centers**

- Ellen Hafer
- Mark Josephson

### **Commonwealth Informatics**

### **LincolnPeak Partners**

Thank you!