

Tracking Program Electronic Health Records Pilot Projects

Gonza Namulanda, DrPH, MS

Health Scientist, Environmental Public Health Tracking Branch
National Center for Environmental Health, CDC

Public Health Informatics Conference Webinar Series
02/06/2017

Acknowledgements

- New York City (NYC)
 - Katharine H. McVeigh
 - Elizabeth Lurie
 - Remle Newton-Dame
 - Wendy Mckelvey
- California
 - Max Richardson
 - Eric Roberts
 - Paul English
- Massachusetts
 - Robert Knorr
 - Alicia Fraser
- Missouri
 - Roger Gibson
 - Scott Patterson

Environmental Public Health Tracking Network

...a system of integrated health, exposure, and hazard information and data from a variety of national, state, and city sources.

National Environmental Public Health Tracking Network

Glossary A-ZCDC A-Z



Children's Environmental Health
Click to learn more >>>

● ● ● ● ●

The National Environmental Public Health Tracking Network (Tracking Network) is a system of integrated health, exposure, and hazard information and data from a variety of national, state, and city sources.

On the Tracking Network, you can view maps, tables, and charts with data about:

- chemicals and other substances found in the environment
- some chronic diseases and conditions
- the area where you live

[Learn more about the Tracking Network](#)

[Explore Tracking Data](#)

Environments



- Climate Change
- Outdoor Air
- Water
- More

Health Effects



- Asthma
- Cancer
- Childhood Lead Poisoning
- More Health Conditions

Population Data



- Population Characteristics
- Biomonitoring: Population Exposures
- Children's Environmental Health

Info by Location

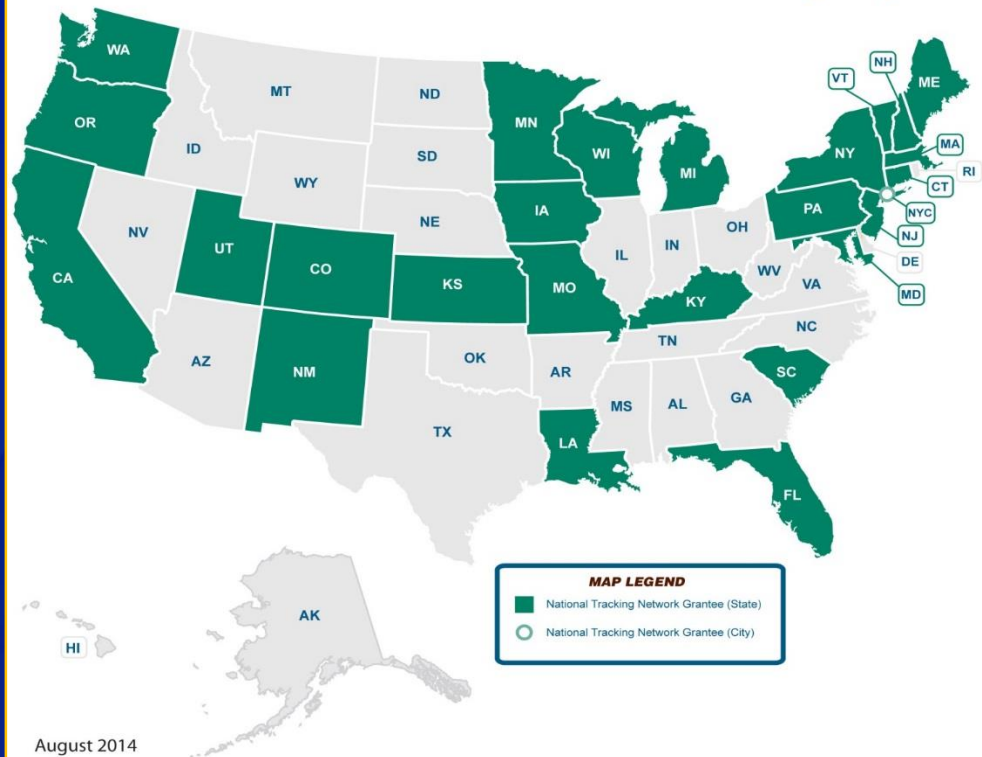


Select State:

Select

Tracking Network Grantees

CDC's National Environmental Public Health Tracking Program



25 States and 1 City

Current Content and Data

Health Effects Data

- Asthma
- Birth Defects
- Cancer
- Carbon Monoxide Poisoning
- Childhood Lead Poisoning
- Developmental Disabilities
- Heart Attacks
- Heat stress illness
- Reproductive and Birth Outcomes



Environment Data

- Climate Change
- Community Design
- Homes
- Outdoor Air Quality
- Community Water Quality
- Pesticide Exposures



Population Health

- Biomonitoring
- Children's Environmental Health
- Health Behaviors
- Population Characteristics



Some Data Gaps

- Timeliness of data
- Finer resolution data
- Linked risk factor data

Electronic Health Records

- Electronic Health Record (EHRs)
 - a longitudinal electronic record of patient health info
 - generated by one or more encounters in any care delivery setting
- Uses
 - automate provider's workflow
 - assist providers in making patient care decisions
 - Access data from other systems: pharmacy & lab



Benefits to Public Health

**Enhance public
health surveillance**



**Improve public
health outcomes**

Electronic Health Records Pilot Projects

- Awardees participating in this optional activity must pilot the use of EHRs within the Tracking Program by
 - Obtaining, evaluating, and using EHRs data
- Awardees must report on the innovative approaches applied for utilizing EHR by addressing:
 - How could EHRs be used in Tracking?
 - What are the technical requirements for integrating EHRs data into the state/local networks and the National Tracking Network?
 - What are core data elements needed to apply EHRs to Tracking?
 - What are the challenges and barriers to acquiring and processing EHRs? and/or
 - What are the innovative and emerging approaches to utilize EHRs within Tracking?

4 Funded Projects

- California – EHRs for public health surveillance of diabetes
- Massachusetts – EHRs for public health surveillance of Asthma and ALS
- New York City – Validity of health status classifications in EHRs compared to NYC HANES survey classifications
- Missouri – Implementation of EHRs data from two systems

California: EHRs for public health surveillance of diabetes

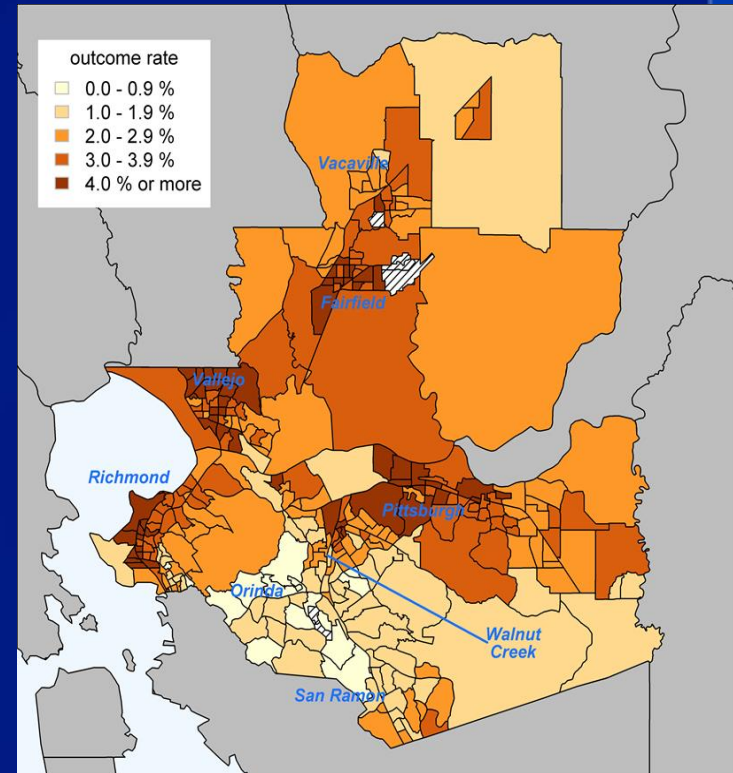
- Analyze the practicality, validity, and surveillance utility of glycohemoglobin as a marker for diabetes risks
 - Timely surveillance
 - Inform community-level prevention efforts
- Partnered with Kaiser Permanente
 - Northern California
- 2 participating counties in San Francisco Bay area
 - 412,400 records included (≥ 18 years)

Methods

- Data: Patient demographics, laboratory data, characteristics of covered patients
- Definitions
 - % of members with maximum glycohemoglobin ≥ 7 , 8 or 9%
 - Sensitivity, specificity, positive predictive value
 - Five-year maximum glycohemoglobin value $\geq 7\%$
 - Diabetes Prevalence

Results

- Disparities in diabetes prevalence
 - Race and income
 - Census tract
- Laboratory data may be sufficient for public health surveillance
 - For some conditions



Massachusetts: EHRs for public health surveillance of Asthma and ALS

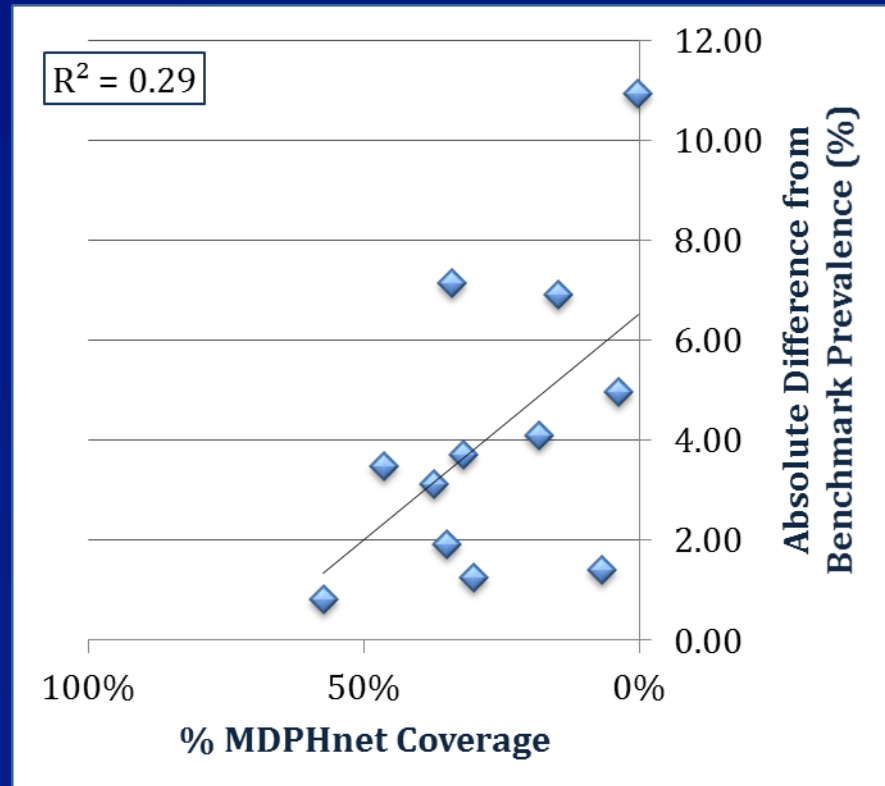
- Evaluate the utility of EHRs data as a tool for routine public health surveillance of Amyotrophic lateral sclerosis (ALS) and pediatric Asthma
- MDPHnet – share EHRs data with public health agencies
- 3 health care practice groups participating
 - Approximately 1.3 million (15% of MA population)

Methods

- Asthma and ALS case definitions
 - Compared ICD-9 only with ICD-9 *and* drug prescription
- EHR based prevalence vs. traditional surveillance methods
 - Pediatric Asthma benchmark data from state-wide school-based nurse survey
 - ALS benchmark data from comprehensive ALS Registry involving full medical record review
- Evaluated impact of MDPHnet coverage on reliability of asthma prevalence
 - Asthma prevalence for 12 towns
 - Compared MDPHnet estimates with benchmark

Results

- Results varied greatly by case definition algorithms
- Surprisingly, ICD9 based algorithms fared better for both asthma and ALS
- Independent validation may be needed for each outcome prior to use of EHR-based surveillance
- Rare disease surveillance possible, more research is needed
- Correlation between MDPHnet coverage and accuracy of asthma prevalence estimates



NYC: Validity of health status classifications in EHRs compared to population-based estimates

- To assess the diagnostic validity of health indicators from EHRs relative to NYC HANES
 - Smoking, obesity, hypertension, diabetes and elevated cholesterol
- NYC Macroscopic - transforms EHR data into population-based prevalence estimates for the “in-care” population
- Population covered
 - In-care population, >700 ambulatory practices
 - 38 included in this study

Methods

- Definitions
 - BMI (obesity), diagnosis/ICD 9 (diabetes, hypertension, elevated cholesterol), or self report (smoking, hypertension, elevated cholesterol)
- Compared with NYC Health and Nutrition Examination Survey (NYC HANES) survey classifications
 - Reviewed medical charts for NYC HANES represented in EHRs
 - Sensitivity, specificity, positive and negative predictive value

Results

- Diagnostic validity
 - High for smoking, obesity, and hypertension
 - Lower for diabetes
 - Poor for for cholesterol
- Limitations
 - Small sample size

Missouri: Implementing use of EHRs data from two systems

- Develop a secure data portal and warehouse to
 - Receive, validate and process EHRs data
- Integrate EHRs data in Tracking
 - Missouri health strategic architectures and information cooperative (MOHSAIC)
 - Centralized EHRs database
 - Standardizing electronic laboratory reporting
 - Blood lead testing
 - Electronic surveillance system for the early notification of community-based epidemics (ESSENCE)
 - ED visits: Heat related, CO poisonings, Asthma

Methods

- Created a back end for storing EHRs data
- Developed a front end to allow interaction with the data

Results

- Demonstrated a live query page that pulled data from the data cubes in back-end
- When complete, work on analysis of real-time data (e.g., Asthma ED) and air pollution

Some observations

- Accessing EHRs data
 - Need for health information exchanges
 - Challenges may be more policy than technical
 - Privacy policies to allow sharing of data with public health
- Validation of EHRs estimates
 - Reference data sources
- Different algorithms for different outcomes

Next steps

- Synthesize the case studies to develop
 - Utility of EHRs data for Tracking
 - Lessons learned
 - Recommendations for Tracking

Thank you!

Contact: fos0@cdc.gov

Visit the Tracking Network today!
www.cdc.gov/ephtracking

Info about the Tracking Program
www.cdc.gov/nceh/tracking

Contact Us
TrackingSupport@cdc.gov

