

## PHSSR Research in Progress Webinar Series Speaker Biographies

Wednesday, February 10, 2016, 12:00–1:00pm ET

### *Implementation and Diffusion of the New York City Macroscopic Electronic Health Record Surveillance System*

#### Presenters



Katharine H. (Tina) McVeigh, PhD, MPH is the Director of Research for the Division of Family and Child Health at the New York City Department of Health and Mental Hygiene (DOHMH). She serves as the Principal Investigator of this PHSSR project pertaining to the implementation and diffusion of the NYC Macroscopic electronic health record surveillance system. Dr. McVeigh has a master's degree in Public Health and a Doctorate in measurement, evaluation and statistics, from Columbia University. She has worked on research and surveillance projects in maternal, infant and reproductive health; HIV/AIDS; substance abuse; mental health; early childhood development and educational outcomes; and the use of electronic health records for population health surveillance. [tmcveigh@health.nyc.gov](mailto:tmcveigh@health.nyc.gov)



**Elizabeth (Liz) Lurie, MPH** is the Project Director and a study investigator on the NYC Macroscopic Chart Review Study in the Division of Epidemiology at the NYC DOHMH. She has a Master of Public Health from Emory University, and has experience with data collection, analysis, public health programs, and evaluation. Prior to joining the NYC Macroscopic team, she worked on the Health and Nutrition Examination Survey in NYC (NYC HANES). Her primary areas of interest are chronic disease prevention, population health surveillance, and the use of technology to improve public health. [elurie@health.nyc.gov](mailto:elurie@health.nyc.gov)

#### Commentary



**Charon Gwynn, PhD** is the Deputy Commissioner for the Division of Epidemiology at the NYC DOHMH where she oversees the Division's efforts to gather, analyze and disseminate information about New Yorkers' health. Previously, Dr Gwynn was Deputy Director of the Strategic Information Unit at ICAP, Columbia University where she provided technical assistance and capacity building support for routine monitoring and evaluation, surveillance, and electronic health information systems for international HIV programs. Prior to ICAP, she was a Research Scientist at the DOHMH working on the first community-level NYC HANES, and an Epidemic Intelligence Service (EIS) officer with CDC-Atlanta on the Behavioral Risk Factor Surveillance System. Dr. Gwynn received her PhD in Environmental Health Sciences from New York University. [cgywnn@health.nyc.gov](mailto:cgywnn@health.nyc.gov)

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# Systems for Action

*Systems and Services Research to Build a Culture of Health*



**Marc N. Gourevitch, MD, MPH** is the Muriel G. and George W. Singer Professor, and founding Chair of the Department of Population Health at the NYU School of Medicine. The focus of Dr. Gourevitch's work is on developing approaches that leverage both healthcare delivery and policy- and community-level interventions to advance the health of populations. He is co-Director of the Community Engagement and Population Health Research Core of the Clinical and Translational Science Institute that bridges NYU and the NYC Health and Hospitals Corporation, and leads NYU's participation in the NYC Clinical Data Research Network funded by PCORI. His research centers on improving health outcomes among drug users and other underserved populations; integrating pharmacologic treatments for opioid and alcohol dependence into primary care; and developing strategies for bridging academic research with applied challenges faced by health care delivery systems and public sector initiatives. Dr. Gourevitch previously served as founding Director of NYU's Division of General Internal Medicine, and led NYU's CDC-funded Fellowship in Medicine and Public Health Research. A graduate of Harvard Medical School, he trained in primary care/internal medicine at NYU and Bellevue and received his MPH from the Mailman School of Public Health.

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# Systems for Action

*Systems and Services Research to Build a Culture of Health*



## ***PHSSR Research In Progress Webinar***

*Wednesday, February 10, 2016*

*12:00-1:00pm ET*

*Bridging Health and Health Care*

# **Implementation and Diffusion of the New York City Macroscopic Electronic Health Record Surveillance System**

**Note:** *Download today's presentation and speaker bios from the 'Resources' box in the top right corner of the screen.*

*Funded by the Robert Wood Johnson Foundation*

# Agenda

**Welcome:** Richard Ingram, DrPH, RWJF *Systems for Action* program; Assistant Professor, U. of Kentucky College of Public Health

***“Implementation and Diffusion of the New York City  
Macroscopic Electronic Health Record Surveillance System”***

**Presenters:** Katharine H. (Tina) McVeigh, PhD, MPH, Director of Research, Division of Family and Child Health [tmcveigh@health.nyc.gov](mailto:tmcveigh@health.nyc.gov)

Elizabeth (Liz) Lurie, MPH, Project Director, NYC Macroscopic Chart Review Study, Division of Epidemiology [elurie@health.nyc.gov](mailto:elurie@health.nyc.gov)  
New York City Department of Health and Mental Hygiene

**Commentary:** Charon Gwynn, Deputy Commissioner, Division of Epidemiology, NYC Department of Health and Mental Hygiene  
[cgwynn@health.nyc.gov](mailto:cgwynn@health.nyc.gov)

Marc Gourevitch, MD, MPH, Chair, Department of Population Health, NYU School of Medicine [Marc.Gourevitch@nyumc.org](mailto:Marc.Gourevitch@nyumc.org)

## Questions and Discussion

# Presenters



**Katharine H. (Tina) McVeigh, PhD, MPH**

Director of Research

Division of Family and Child Health

New York City Department of Health and Mental

Hygiene [tmcveigh@health.nyc.gov](mailto:tmcveigh@health.nyc.gov)



**Elizabeth (Liz) Lurie, MPH**

Project Director,

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Division of Epidemiology, NYC Department of

Health and Mental Hygiene [elurie@health.nyc.gov](mailto:elurie@health.nyc.gov)

# **Implementation and Diffusion of the New York City Macroscopic Electronic Health Record Surveillance System Early Findings**

**Katharine H. McVeigh, PhD, MPH**

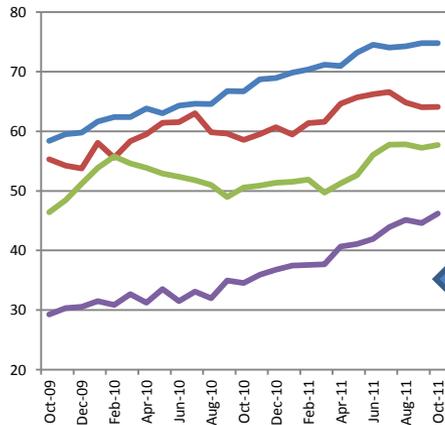
**Elizabeth Lurie, MPH**

**NYC Department of Health and Mental Hygiene**

# Outline of Presentation

- Overview of the NYC Macroscope
  - Description of the NYC Macroscope
  - Summary of population-level validation study results
- NYC Macroscope Chart Review Study
  - Research Questions
  - Methods
  - Results – NYC Macroscope and topline PHSSR
  - Implications and Significance

# Population Health Potential of EHRs

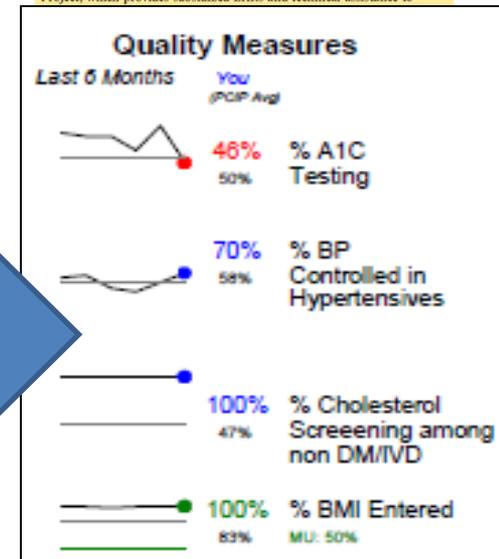
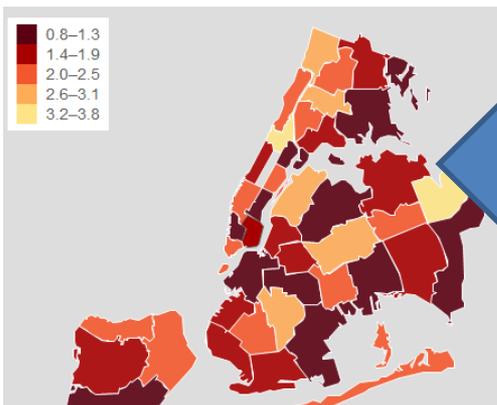


## CARE TRANSFORMATION

By Andrew M. Ryan, Tara F. Bishop, Sarah Shih, and Lawrence P. Casalino

### Small Physician Practices In New York Needed Sustained Help To Realize Gains In Quality From Of Electronic Health Records

**ABSTRACT** The 2009 American Recovery and Reinvestment Act spurred adoption of electronic health records (EHRs) in the United States, through such measures as financial incentives to providers through Medicare and Medicaid and regional extension centers, which provide ongoing technical assistance to practices. Yet the relationship between EHR adoption and quality of care remains poorly understood. We evaluated the early effects on quality of the Primary Care Information Project, which provides subsidized EHRs and technical assistance to



# PCIP Overview

## EHR Adoption & Meaningful Use

- Regional Extension Center
- Behavioral Health
- Medicaid Specialists

## Quality Improvement

- PCMH
- Pay for Performance
- Pay for Quality
- Patient engagement
- Community Projects

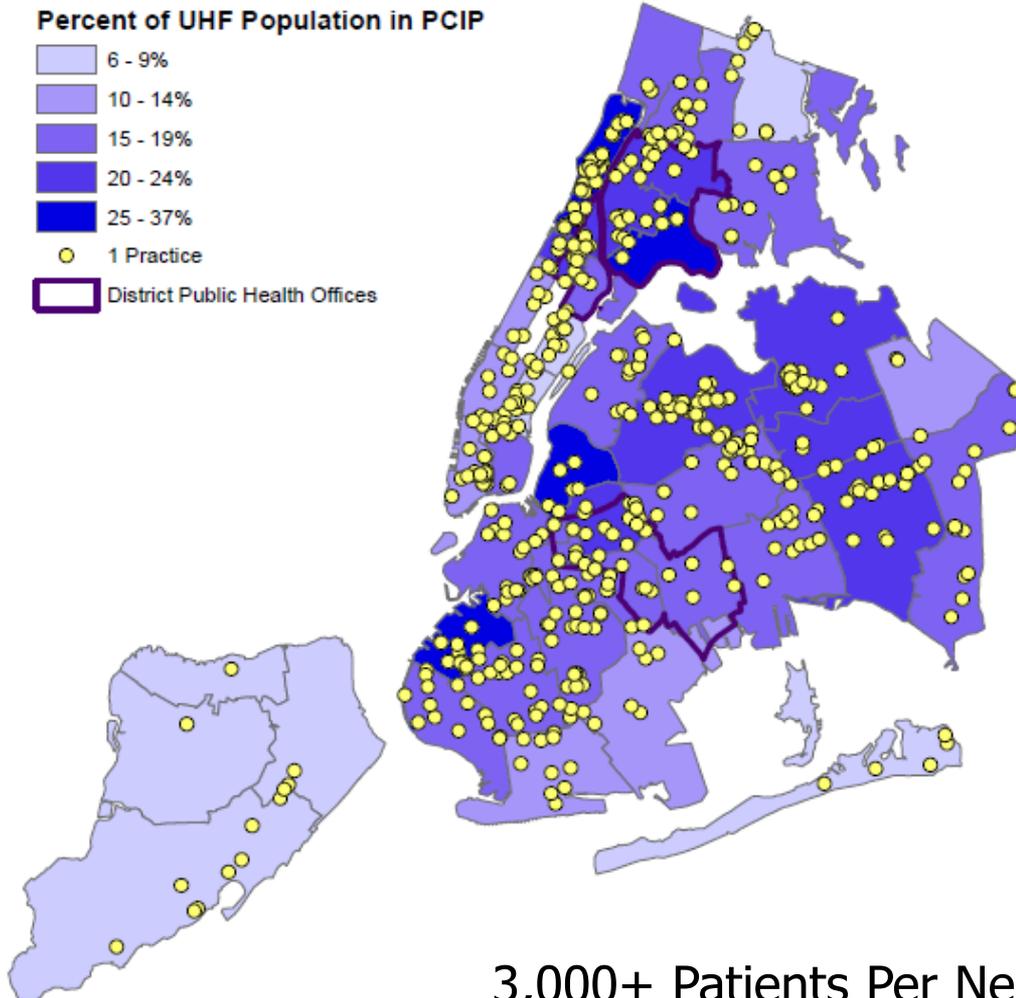
## Interoperability

- Health Information Exchange
- Interfaces
- Accountable Care

## Public Health Monitoring

- Disease Surveillance and Management
- Diabetes Registry
- Query Health
- Data Hub

# PCIP Coverage in 2013

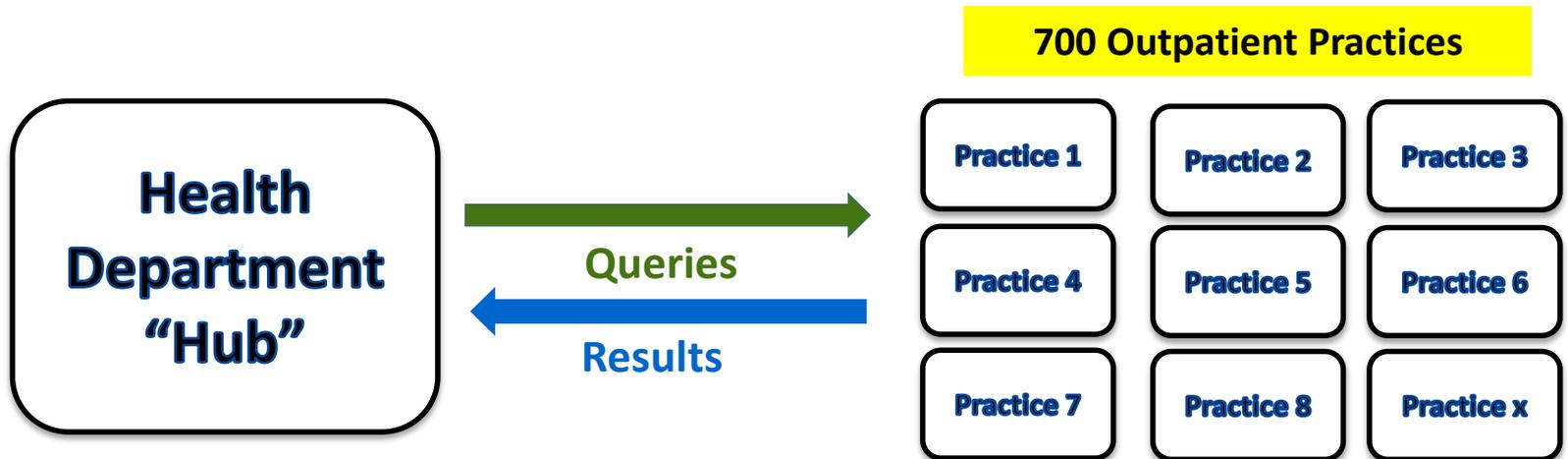


3,000+ Patients Per Neighborhood

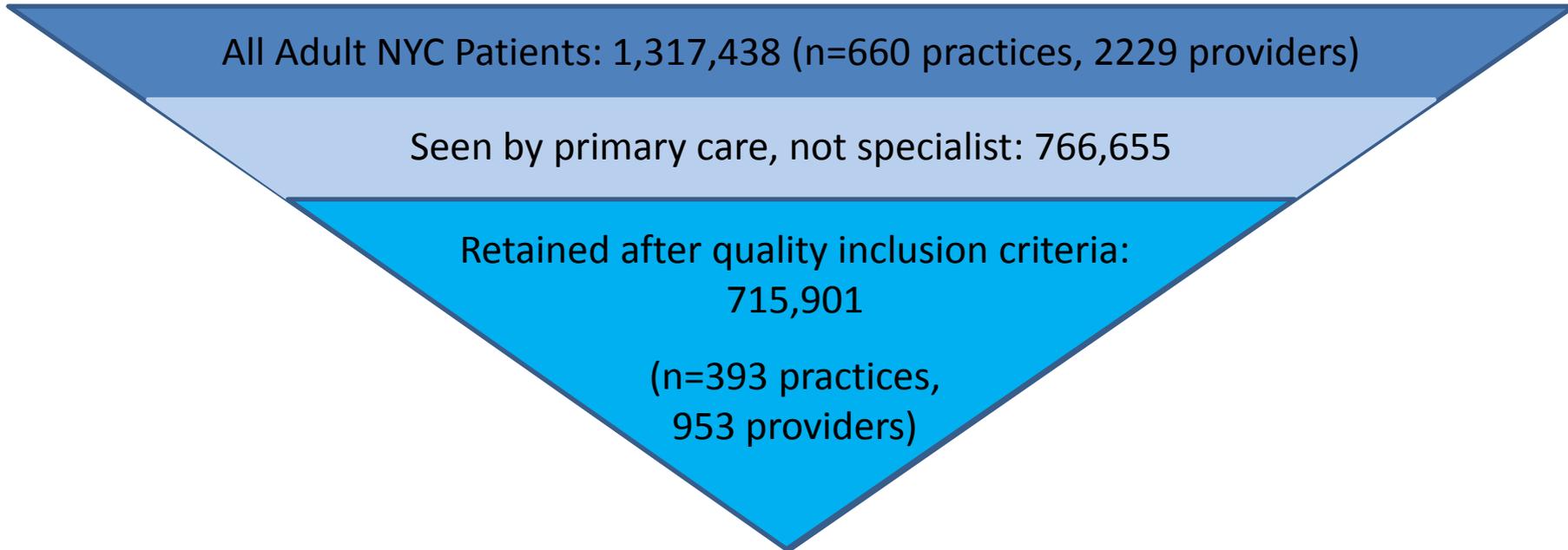
# Mechanics of the Hub

Using a secured HTTPS connection, SQL queries are pushed from the vendor server, run as a scheduled job at each practice, and returned to an internal data warehouse.

*Distributed model - no patient-level data shared*



# Macroscope Sample Size and Coverage



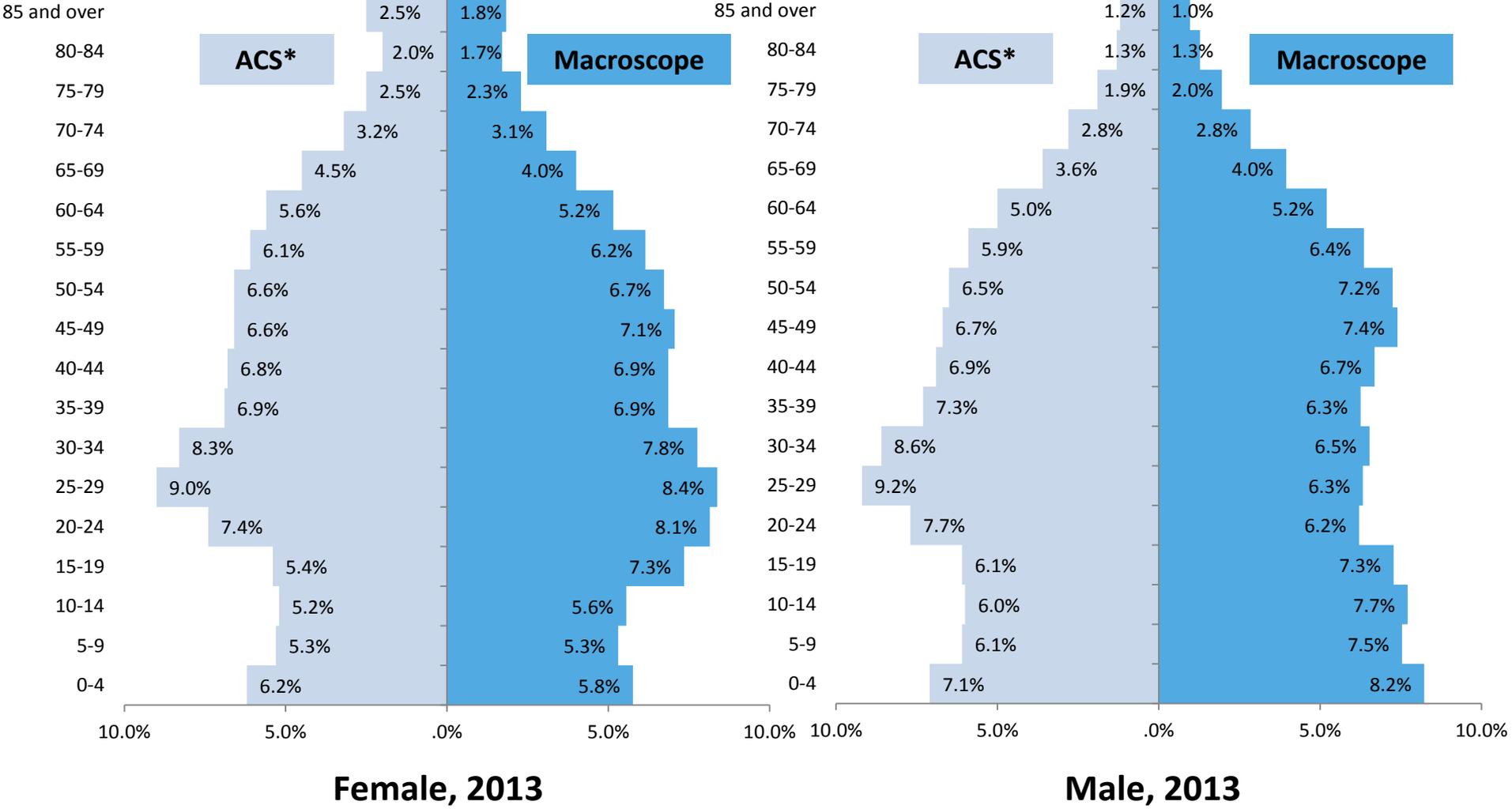
2010 Census: 6,180,203 NYC adults

CHS 2013 estimates 4,229,808 NYC adults (20+) saw their primary care provider in the past year.

Macroscope annual adult pop coverage: ~12%

Macroscope annual adult primary care patient coverage: ~17%

# The Macroscope's Coverage: Populations in Care



\*American Community Survey 2013



# Goals of the NYC Macroscope

- To develop and validate a system to use data from primary care electronic health records (EHRs) for population health surveillance
- To disseminate the knowledge generated from our work to other jurisdictions

# Research Questions

- Are prevalence estimates produced from EHR data comparable to estimates from well-established surveys?
- Are health status classifications assigned by the EHR algorithm comparable to classifications based on survey data?
  - What is the sensitivity and specificity of records that contribute to NYC Macroscopic?
- Are EHR surveillance indicator definitions generalizable across data sources? (**PHSSR**)

# Data Sources and Sample

- NYC Macroscopic 2013 (EHR data)
  - N = 716,076 patients seen in 2013
- NYC Health and Nutrition Examination Survey 2013-14 (NYC HANES)
  - N = 1,524; 1,135 in care
- NYC HANES 2013-14 Chart Review subsample
  - 48 Macroscopic Charts
  - 167 other charts (PHSSR study population)

# NYC HANES 2013-14

- Modeled on NHANES, “gold standard”
- First conducted in 2004 by NYC DOHMH
- Conducted again in 2013 by NYC DOHMH & City University of New York
- Objective measurements with lab tests
- Standardized measurements of height, weight, girth, blood pressure

# NYC Macroscopic Indicators

## Outcomes

- Prevalence, Treatment and Control
  - Diabetes
  - Hypertension
  - Cholesterol
- Prevalence
  - Obesity
  - Smoking
  - Depression
- Use of Preventive Services
  - Vaccination against Influenza

## Population Subgroups

- Sex
  - Male
  - Female
- Age Group
  - 20-39
  - 40-59
  - 60-100
- Neighborhood Poverty Rate\*
  - < 10%
  - 10-19%
  - 20-29%
  - $\geq$  30%

*\*Derived from American Community Survey data on the percent of individuals living below 100% of the Federal Poverty Line*

# Statistical Analysis

- Construct Validity
  - Are prevalence estimates produced from EHR data comparable to estimates from well-established surveys?
    - T-tests
- Internal Validity
  - Is the relationship between NYC Macroscopic estimates and survey estimates consistent across population subgroups defined by age group and sex?
    - Spearman Correlations
- Criterion-Related Validity
  - Are health status classifications assigned by the EHR algorithm comparable to classifications based on survey data?
    - Sensitivity, Specificity
- External Validity (**PHSSR Question**)
  - Are EHR surveillance indicator definitions generalizable across data sources?
    - Stratified sensitivity and specificity

# NYC Macroscopic Construct Validity\*

## NYC Macroscopic vs. NYC HANES

	Prevalence Comparisons	
	T-Test	Spearman r
Obesity	<b>0.02</b>	1.00
Diabetes Diagnosis	0.19	1.00
Hypertension Diagnosis	0.93	1.00
Smoking	0.09	0.83
Influenza Vaccination	<b>&lt;0.01</b>	1.00
Depression	<b>&lt;0.01</b>	<b>0.71</b>
Cholesterol Diagnosis	0.29	0.80

\*Relative to data from NYC HANES 2013-14

**Bold** values represent fair or poor validity by this criterion

# Conclusions

- Good to excellent results— smoking, obesity, hypertension diagnosis, diabetes diagnosis, cholesterol diagnosis\*
- Poor results – depression, influenza vaccination

\*Restricted sample size, less precision in reference estimate

# CHART REVIEW STUDY

# Chart Review Research Questions

## Global Research Question

Are health status classifications assigned by the EHR algorithm comparable to classifications based on survey data?

## PHSSR-Specific Research Question

Are NYC Macroscopic surveillance indicator definitions generalizable to EHR data from other sources?

Does generalizability, quantified as sensitivity and specificity, improve when records are restricted to those from:

- A subset of practice types?
- Providers who have achieved stage 1 meaningful use?

# Sample

- Nested within NYC HANES 2013-14
- Eligibility:
  - Visited a medical provider within 1 year before their NYC HANES interview date
  - Completed a HIPAA waiver granting access to medical records
  - Provider listed is primary care (not a podiatrist, dentist, psychiatrist, oncologist, etc.)
  - Provider uses electronic medical records

# Data Collection

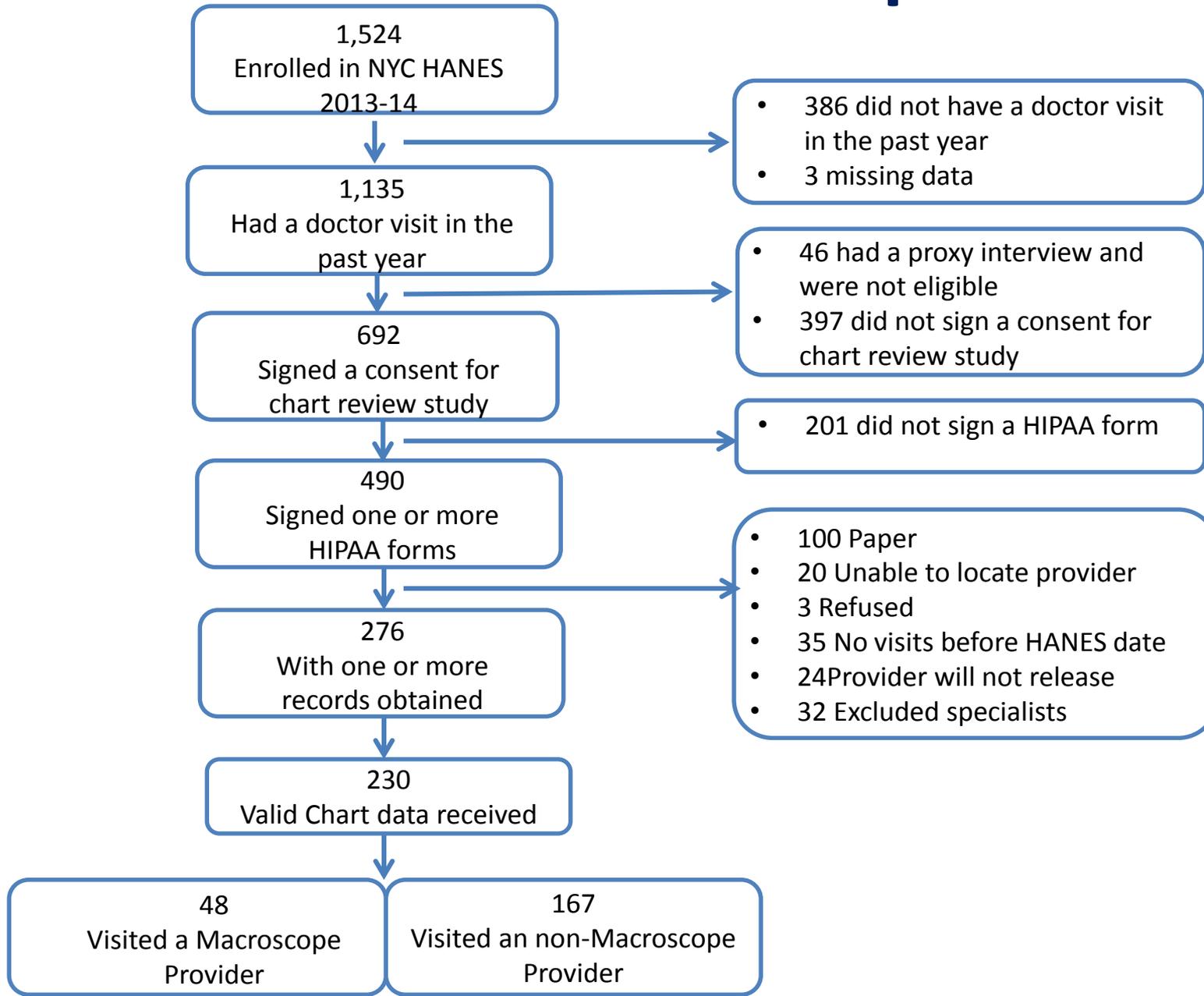
- Requested copies of EHR charts from over 200 providers
- Medical record data was abstracted from the date of their NYC HANES interview back to January 1, 2011
- Structured data, free text notes & scanned PDFs abstracted

# Statistical Analysis

- Compare an individuals' EHR data to their responses and objective clinical measures from NYC HANES
- Compute sensitivity and specificity
- Stratify by practice type and by achievement of Stage 1 Meaningful use

# RESULTS

# Chart Review Sample Size



# Preliminary Results

	Macroscope Charts			All other records		
	Sample Size	Sensitivity	Specificity	Sample Size	Sensitivity	Specificity
Obesity	44	0.92	0.97	130	0.91	0.96
Diabetes Diagnosis	48	1.0	0.95	167	0.79	0.99
HTN Diagnosis	48	1.0	1.0	167	0.61	0.93
Smoking	44	1.0	1.0	121	0.61	0.97
Cholesterol Diagnosis	27	0.69	0.64	98	0.56	0.66
Influenza Vaccination	48	0.64	0.96	167	0.33	0.92
Depression	48	0.31	1.0	166	0.33	0.98

Excellent

Good

Fair

Poor

# Preliminary Results

	Macroscope Charts			All other records		
	Sample Size	Sensitivity	Specificity	Sample Size	Sensitivity	Specificity
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Influenza Vaccination	48	0.64	0.96	167	0.33	0.92
Depression	48	0.31	1.0	166	0.33	0.98

Excellent

Good

Fair

Poor

# Implications and significance

- The NYC Macroscopic indicator definition of obesity is generalizable across EHRs and may be used by other jurisdictions with minimal local validation.

# Implications and significance

- We are currently exploring if the EHR vendor, or practice size impacts the generalizability.
- In the next phase we will evaluate whether indicators for diabetes, hypertension diagnosis and smoking can also be generalized to other EHRs once inclusion/exclusion criteria have been applied with regard to:
  - Achievement of stage 1 meaningful use
  - Practice type

# Next steps

- Stratify results by practice type and meaningful use within each practice type
- Create inclusion/exclusion rules based on the results
- Generate factsheets presenting validity of Macroscope indicator definitions across settings

# NYC Macroscope Team

## **DOHMH Division of Epidemiology**

Katharine H. McVeigh, PhD, MPH

Elizabeth Lurie, MPH

Katherine Bartley, PhD

Kathleen Tatem

Sharon E. Perlman, MPH

Claudia Chernov, MPH

Pui Ying Chan, MPH

Sungwoo Lim, DrPH

## **DOHMH Primary Care Information Project**

Sarah Shih, MPH

Lauren Schreibstein, MA

Laura Jacobson, MSPH

## **CUNY School of Public Health**

Lorna Thorpe, PhD

Special thanks to Carolyn Greene, Remle Newton-Dame, Jesse Singer, Elisabeth Snell, Jay Bala, Mathew Romo, and Byron Alex

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# Population Health Community of Practice (PopCoP)

October 17, 2014 meeting to establish a community of practice working on using EHR data for public health

Academy Health manages the group, and has monthly meetings

- Pillars of Action
  - Share best practices and updates
  - Provide thought leadership
  - Tackle shared challenges
  - Seek formal funding opportunities

To join:

<http://www.edm-forum.org/collaborate/cop/popcop>

# Commentary



## **Charon Gwynn, PhD**

Deputy Commissioner, Division of Epidemiology  
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## **Marc N. Gourevitch, MD, MPH**

Muriel G. and George W. Singer Professor  
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# Questions and Discussion

# Webinar Archives

<http://www.publichealthsystems.org/phssr-research-progress-webinars>

## Upcoming Webinars

Thurs, Feb 18 (1-2p ET/ 11a-12p MT)

**STATE DISSEMINATION AND IMPLEMENTATION STRATEGIES ON LOCAL HEALTH DEPARTMENT ACCREDITATION READINESS AND QUALITY IMPROVEMENT MATURITY** *[MULTI-PBRN DIRECTIVE STUDY]*

Adam J. Atherly, PhD, Colorado School of Public Health & Lisa N. VanRaemdonck, MPH, MSW, Colorado Assn. of Local PH Officials, and CO Public Health PBRN

Thurs, Feb 25 (12-1p ET/ 9-10a PT)

**INTER-ORGANIZATIONAL COLLABORATION IN LOCAL PUBLIC HEALTH SYSTEMS: IMPLICATIONS FOR COSTS, IMPACT, AND MANAGEMENT CAPACITY** *[MULTI-PBRN DIRECTIVE STUDY]*

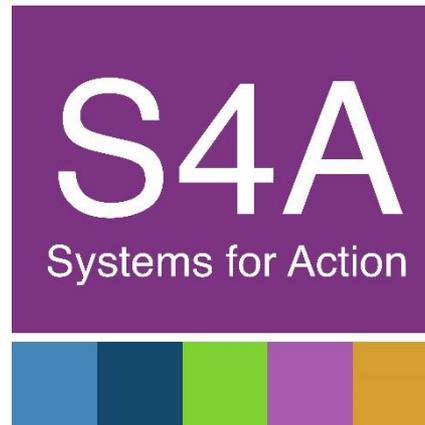
Justin Marlowe, PhD, MPA, and Betty Bekemeier, PhD, MPH, RN, U. of Washington, and WA Public Health PBRN

Wed, Mar 16 (12-1p ET)

**ECONOMIC, ORGANIZATIONAL, AND NETWORK VARIATION IN PUBLIC HEALTH SERVICES DELIVERY**

Glen Mays, PhD and Cezar B. Mamaril, PhD, U. of Kentucky College of Public Health

Thank you for participating in today's webinar!



For more information about the webinars, contact:

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