

PCIP  
APPLICATIONS,  
IDEAS and  
RESEARCH  
2014

APPLICATIONS,  
IDEAS, and  
RESEARCH  
2014  
Issue 1



# TABLE OF CONTENTS

## FOREWORD

## OVERVIEW

Timeline of Ideas and Research Questions

PCIP: Integrating Public Health with Primary Care

## RESEARCH

### **Section 1: Early Trends with Health Information Technology**

EHR Data as a Reflection of Provider Performance

EHR Adoption and Early Trends

The Role of Technical Assistance in EHR Adoption

How do Patients Respond to EHRs?

### **Section 2: Increasing the Delivery of Clinical Preventive Services**

Pay for Performance in the Independent Practice Setting

The Patient-Centered Medical Home Model

Using EHRs to Track Delivery and Impact of Smoking Cessation Interventions

Measuring the Impact of Provider Feedback Reports

### **Section 3: Leveraging HIT for Public Health Surveillance and Policies**

Building an Infrastructure for Data Exchange: The Hub

Laying the Foundation for Public Health Surveillance: the Macroscopic Project

Primary Care EHR Data in the Post-Disaster Context

## ON THE HORIZON

## CITATIONS / ARCHIVE OF PCIP PUBLICATIONS

## ACKNOWLEDGEMENTS

# FOREWORD

PCIP was founded with a goal: help providers in medically underserved areas put health information technology to work to increase clinical preventive care. Over PCIP's 9-year history, we have used a wide range of strategies to achieve this goal. Early on, innovative hardware solutions were explored. Next, we co-developed a prevention-oriented electronic health record (EHR) with eClinicalWorks that incorporated public health priorities. As the landscape of health IT has shifted, we've evolved to focus on our providers' needs.

Through funding made available under the HITECH Act, PCIP established the city's Regional Extension Center, NYC REACH, to focus our efforts to assist providers to adopt and implement EHRs. Providers in small practices, and particularly those in medically underserved communities, face barriers to adopting and using HIT. Our model focused on providing the information and assistance these providers needed to successfully adopt, implement, and use HIT in ways that support high-quality care delivery. Through our public health-focused quality improvement strategies, PCIP seeks to leverage HIT in the clinical environment as well as in the public health environment.

Adoption of EHRs among primary care providers has skyrocketed since the introduction of the EHR Incentive Programs, and PCIP has been there every step of the way. Now, most providers have at least a basic EHR, and we've starting to focus on leveraging that technology for quality improvement. The tools now available to providers offer opportunities for improving care delivery, from facilitating identification of patients in need of follow up to enabling the transfer of information between providers and between care settings. Monitoring and surveillance capacities developed through innovative deployment of HIT are enabling us to use clinical data for public health surveillance purposes. These tools enable primary care providers to be a strong partner in creating more connected, coordinated care and new payment models, such as ACOs and Medicaid Health Homes demonstrations can build on the information systems already established.

PCIP continues to refine and explore how information systems can support improvements in population health, piloting and evaluating programs to expand our knowledge and develop new strategies for increasing the delivery of clinical preventive services. Thanks to innovative data acquisition systems, we can also identify 'hot areas of diseases and conditions across the city. We will continue to offer assistance to primary care practices – share best practices for working with high need patients effectively and help patients with health risks stay healthy. We've also learned that 'light touch' communication can have an impact, with actionable provider dashboards serving as feedback on areas of health priorities. PCIP recently launched a new framework for action, focusing interventions on key public health priorities and potential impact on the highest priority health conditions for New Yorkers – prevention and management of diabetes, hypertension, and smoking.

As we continue to implement programs to support primary care, we look to evaluators and policies to identify strategies to make the most difference for nearly 16,000 clinicians. Our long term strategy is to ensure clinical prevention efforts are maximized – especially in primary care to prevent New Yorkers from dying prematurely, and help them to live long and healthful lives. There is more to come – as primary care doesn't operate in isolation. We hope this report gives readers useful ideas and highlights solutions to challenges for integrating a strong health prevention focus in primary care.

**-The PCIP Team**



# OVERVIEW





# TIMELINE OF RESEARCH QUESTIONS

## 2009

What can other cities learn from the experiences of two large urban regional extension centers?

## 2010

How can EHR use increase physician situational awareness?

How can EHR use increase the productivity of large practices?

## 2011

What are the barriers providers face to EHR adoption? What are some of the perceived benefits?

What are some of the methodological concerns around using EHR data in a research /analysis context?

How does EHR use impact the use / delivery of preventive health services?

## 2012

How well is patient record data captured and reflected in EHR-based quality metrics?

How do physicians respond to clinical decision support in the EHR?

How does clinical decision support augment provider/patient encounters?

How do patients feel about EHRs?

## 2013

How can EHR data play a role in the surveillance of respiratory infections?

What predicts successful EHR implementation in small primary care practices?

How can self-blood pressure monitoring play a role in the management of uncontrolled hypertension?

How much do community pharmacists know about Medication Therapy Management?

What is the impact of pay-for-performance incentives on quality of care in small practices?

What impact does the PCMH model have on practices who serve low-income and disadvantaged patients?

What patterns of health care utilization can be observed among primary care providers who are new to EHR?

What kind of assistance do small practice physicians need to succeed with EHR systems?

What early trends do we observe among small practices using EHR systems?

## 2014

What effects do EHR-based quality improvement interventions have on small practices?

How does EHR adoption impact Quality Measure Performance?

How can we create composite quality measures to evaluate primary care services?

What patient characteristics are associated with likelihood of receiving help to quit smoking?

How are providers documenting smoking status and other patient risk factors in EHR data?

What are small practice providers in underserved settings most challenged with after adopting an EHR?

How do influenza vaccination delivery rates vary among providers serving Medicaid patients?

What impact do quality improvement initiatives have on medication adherence?

How do practices seeing large proportions of Asian populations differentially screen for Hepatitis B?

Do demographic characteristics affect a patient's chances of being screened for depression?

How does language competency impact likelihood of being screened and diagnosed for depression?

## PCIP: Integrating Public Health with Primary Care

Primary Care and Public Health are natural allies. The two fields share closely-related goals as well as similar pressures to use limited resources wisely that have led practitioners and thought leaders from both fields to acknowledge the partnership potential between them. A 2012 Institute of Medicine report acknowledges that primary care and public health share many logical points of intersection and asserts that the national needs driving healthcare reform set the stage for meaningful collaboration to occur. The report further acknowledges that the shifting policy landscape is paving the way for opportunities to integrate these fields in ways that will yield substantial benefits to individual and community health. Not only is it becoming increasingly important that public health and primary care find ways to work together to advance common goals, it is becoming increasingly possible.

Primary care is a diverse, dispersed, and largely independently operating segment of the healthcare system. As a consequence, most primary care providers do not easily exchange information with each other and with public health entities that would enable them to tackle community health concerns using a unified approach. Independent practitioners do not readily have resources to reach beyond their care of the individual patients and address public health priorities.

As an innovative model for primary care and public health integration, in 2005 the New York City Department of Health and Mental Hygiene (NYCDOHMH) formed the Primary Care Information Project (PCIP), an agency bureau tasked with helping practitioners improve the quality of care and reduce healthcare disparities through data-driven strategies. PCIP also established a Regional Extension Center – NYC REACH, and in that role, has cultivated relationships with nearly 16,000 area providers, working to help them implement and take advantage of health information technology (HIT) and systems.

PCIP has established programs to assist practitioners to use health information systems and receive actionable, data-driven feedback to improve their ability to meet the healthcare needs of the communities they serve. The information partnership between primary care and PCIP continues to shape practice behaviors, advocate for effective policies, and build lasting and effective ways to measure, analyze, and improve the quality of care. These linkages define a pivotal role public health can offer primary care. This report highlights the applications, ideas, and research questions PCIP has identified and potential solutions for increasing prevention in the primary care context.



# RESEARCH

Section 1: Early Trends  
with Health Information  
Technology

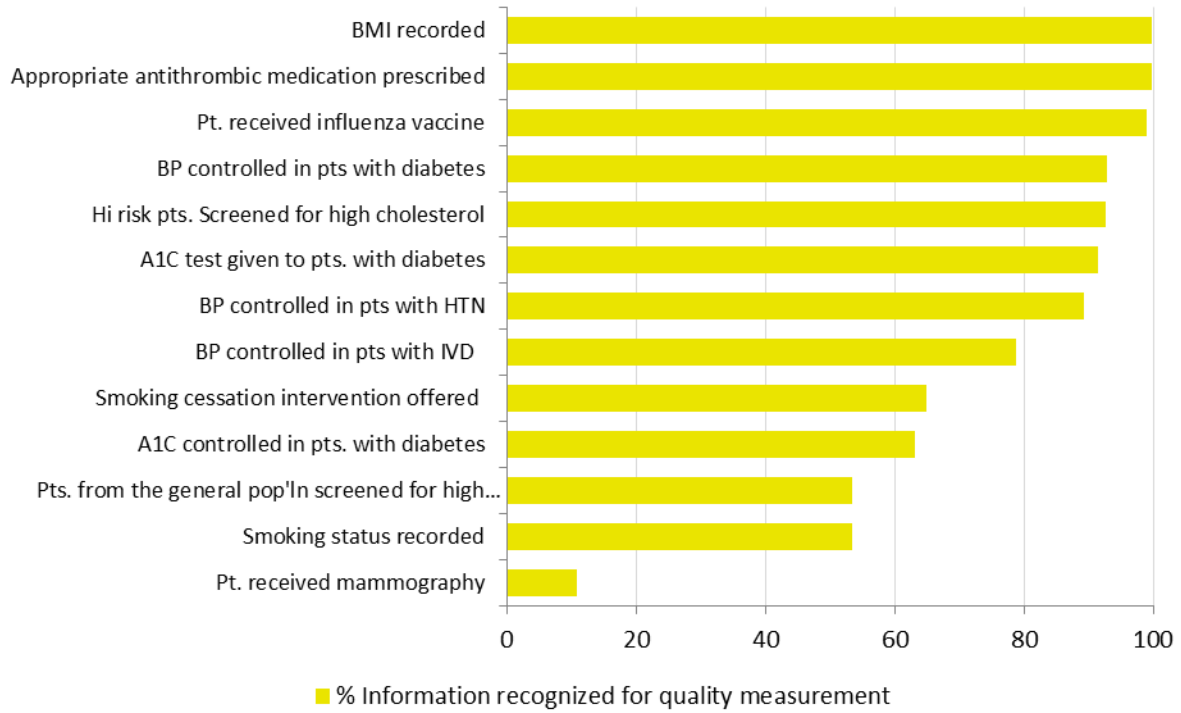
## EHR Data for Measuring Clinical Preventive Services

The 2009 American Recovery and Reinvestment Act (ARRA) spurred widespread adoption of EHRs in the United States, offering financial incentives to providers through Medicare and Medicaid and regional extension centers (RECs) to adopt and gain proficiency in EHR systems. Nationally, EHR adoption has approximately doubled within the past five years, with current penetration of EHR systems in primary care nearing 80%. A concern of using electronic health record data for generating clinical quality measurement is its reliability and variability for reporting on patient receipt of preventive services.

To determine whether quality measures derived from EHRs represent a true reflection of provider performance, PCIP evaluated 11 clinical quality measures developed in partnership with its primary vendor, eClinical Works. Each data element was counted if included in a pre-defined automated structured field and again if identified after manual extraction anywhere in the EHR, including free text areas. We found the presence of automated quality measurements varied widely, ranging from 10.7% to 99.9%. This works suggests that while EHR-derived measures can contribute important information about the quality of care delivery, their reliability can vary widely depending on the structure of the measure and on documentation habits. For instance, we know that procedures performed outside the practice site, such as lab work, tend to be documented less frequently and less reliably than processes completed within the clinical workflow, such as the recording of vitals. Caution should be used when interpreting such measures in the context of public reporting or as the basis for reimbursement.

# The Amount of Data Captured in Electronic Quality Measures Varies Widely

% Information recognized for quality measurement





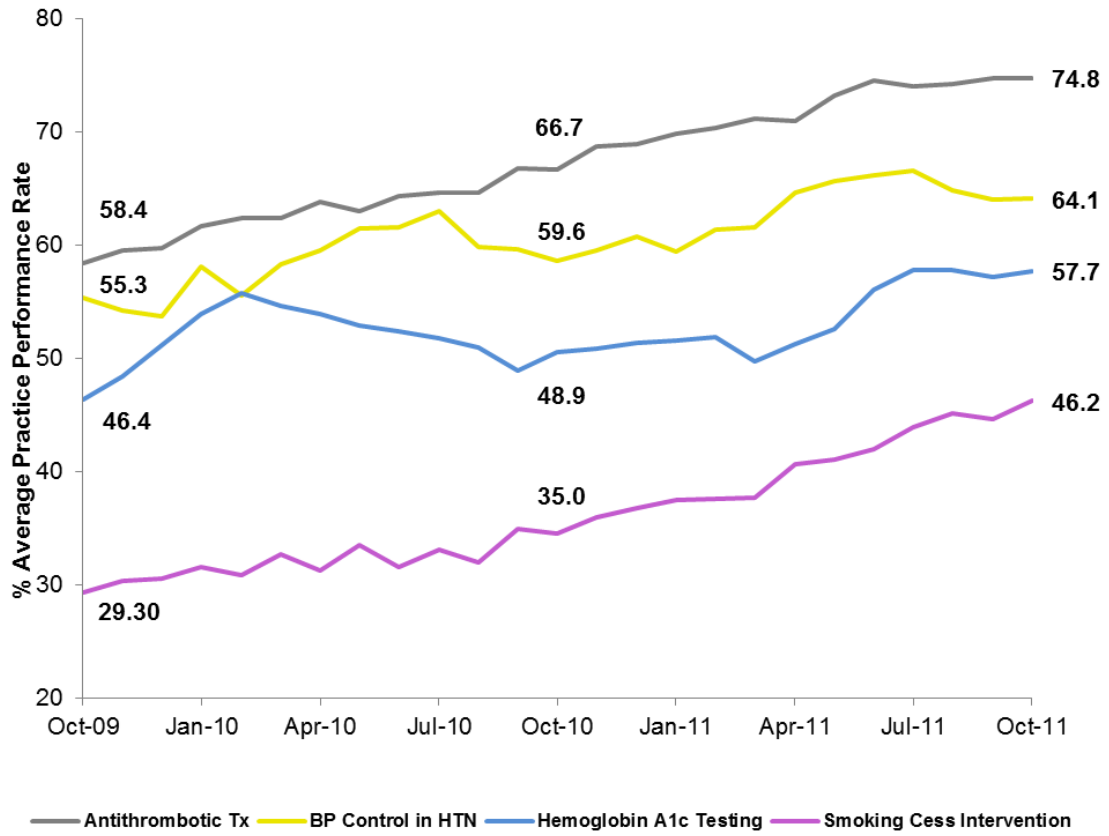
## EHR Adoption and Early Trends

As small, independent practices adapt to their EHR systems, we evaluated early trends in delivery of clinical preventive services through quality measures. We conducted an analysis of data over two-years, post-EHR adoption, on the following key measures that map to public health priorities in New York City:

- delivery of antithrombotic therapy for patients with ischemic vascular disease or diabetes
- blood pressure controlled in hypertensive patients
- smoking cessation interventions offered to smokers
- hemoglobin A1c testing conducted on diabetic patients

Over two years, the delivery of all four quality measures increased significantly. This result should encourage providers and policy makers that small independent practices can keep pace with integrated medical systems in delivering quality preventive care.

## Early Trends Support that Providers Steadily Improve on Quality Measures post-EHR Adoption

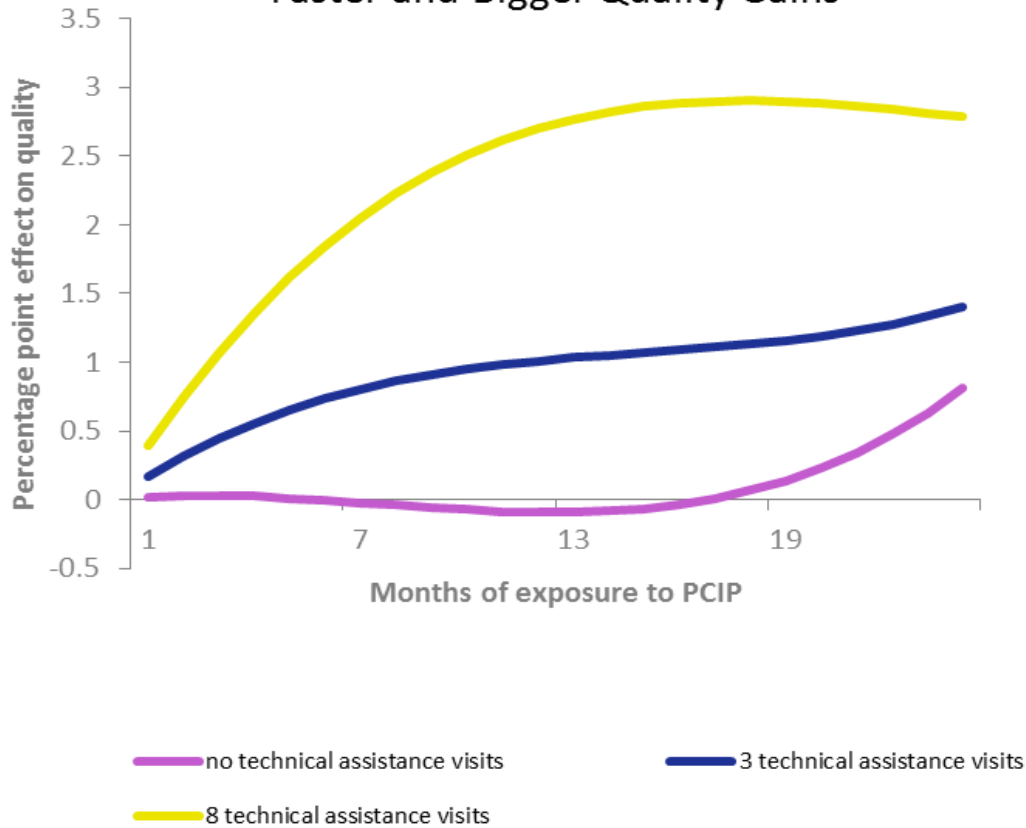


## The Role of Technical Assistance in EHR Adoption

Because EHR implementation is initially disruptive and complex, it can take time as well as technical assistance in order for providers to see improvements in quality. It is critical to understand the extent to which assistance facilitates success with new electronic-driven systems. To understand this, PCIP partnered with Cornell University to explore the impact of technical assistance in predicting successful EHR adoption.

Using claims based data, researchers from Cornell found general participation in PCIP's implementation program was not enough to improve quality of care. Practices with sustained technical assistance were more likely to demonstrate improvement on measures of care most likely to be affected by the use of electronic health records, such as cancer screenings and care for patients with diabetes. Participating in PCIP's program for nine or more months was associated with significantly improved quality on the measures. However, only physicians receiving extensive technical assistance (a minimum of eight visits by a variety of technical assistance staff) experienced significant gains. These results suggest sustained technical support serves a critical role in successful EHR adoption efforts.

## Providers Who Receive More Technical Assistance with EHR Adoption Experience Faster and Bigger Quality Gains



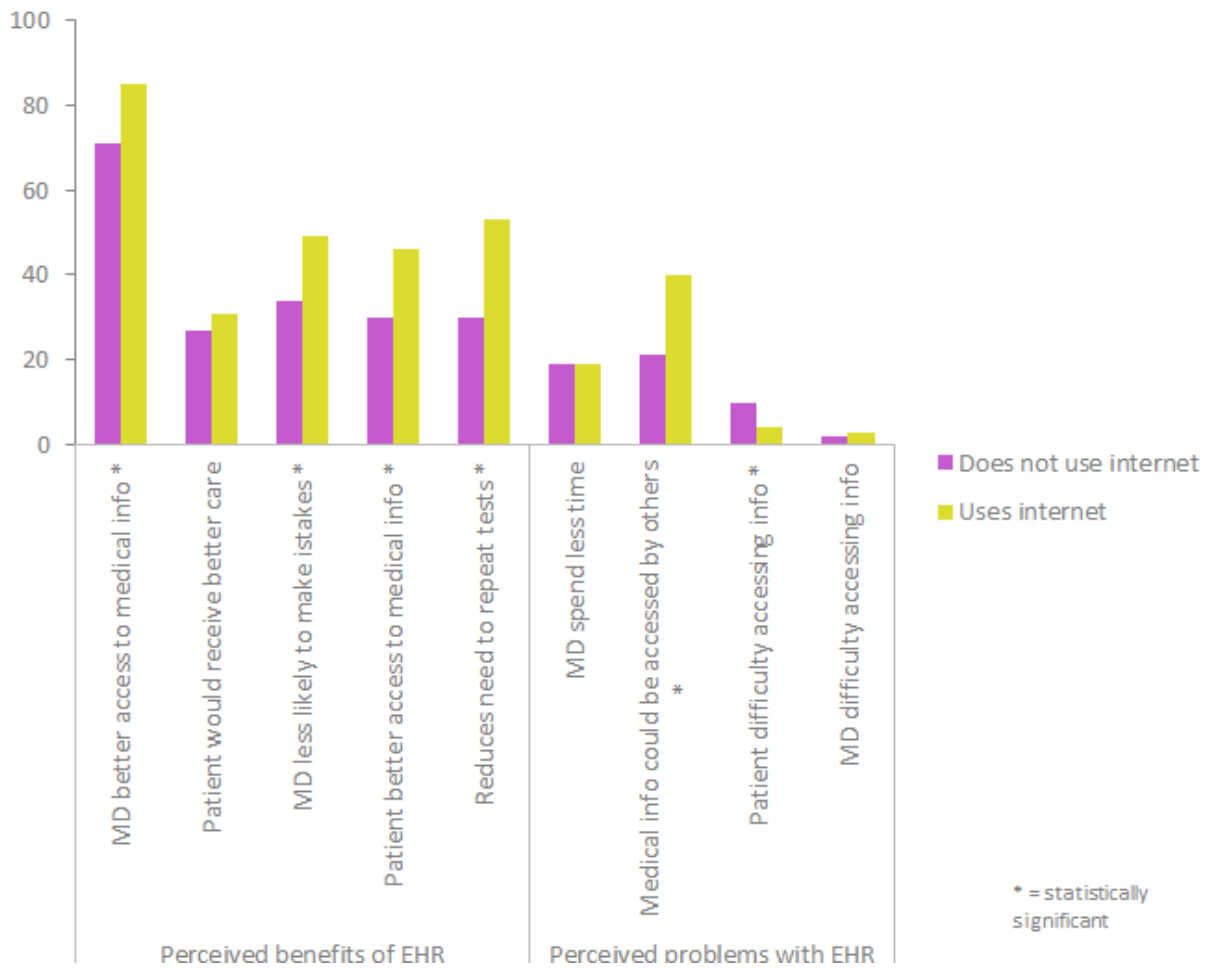
## How do Patients Respond to EHRs?

Patient experience has been shown to affect healthcare quality by influencing patient satisfaction, adherence to treatment, clinical outcomes, and practices' business performance. A study was conducted to understand the impact of EHR adoption on patient experience at urban practices serving large proportions of the medically underserved. Three large community health centers and seven small practices agreed to allow PCIP staff to administer patient surveys before and one year after EHR implementation. Surveys were developed using the Consumer Assessment of Healthcare Providers and Systems (CAHPS), a validated patient experience tool with the option to add supplemental questions; additional survey items requested patient self-report of Internet and e-mail access. Paper-based surveys were available in English, Spanish and Chinese. Voluntary responses from patient were obtained before and after the practices adopted an EHR.

Generally, patients reported positive responses during both periods. After EHR implementation, patients were more likely to want e-mail communication with their doctors' office. The 70% of patients with Internet access were generally more satisfied with their experience and more likely to recognize benefits of EHRs. However, older patients and those with lower education levels or chronic diseases were significantly less likely to use the Internet than their counterparts.

It is important to remember that older, less educated patients, as well as those with chronic diseases, are less likely to have Internet access. While EHR meaningful use criteria emphasize electronic communication with patients, communications need to be tailored to each patient to improve patient experiences. Practices should routinely record patient communication preferences within the EHR, to avoid focusing only on patients who are more tech-savvy.

## Internet Users Perceived Greater Benefits to EHRs than Non-Users, but Both Groups Tended to See More Benefits than Drawbacks





## RESEARCH

Section 2: Increasing  
Delivery of Clinical  
Preventive Services



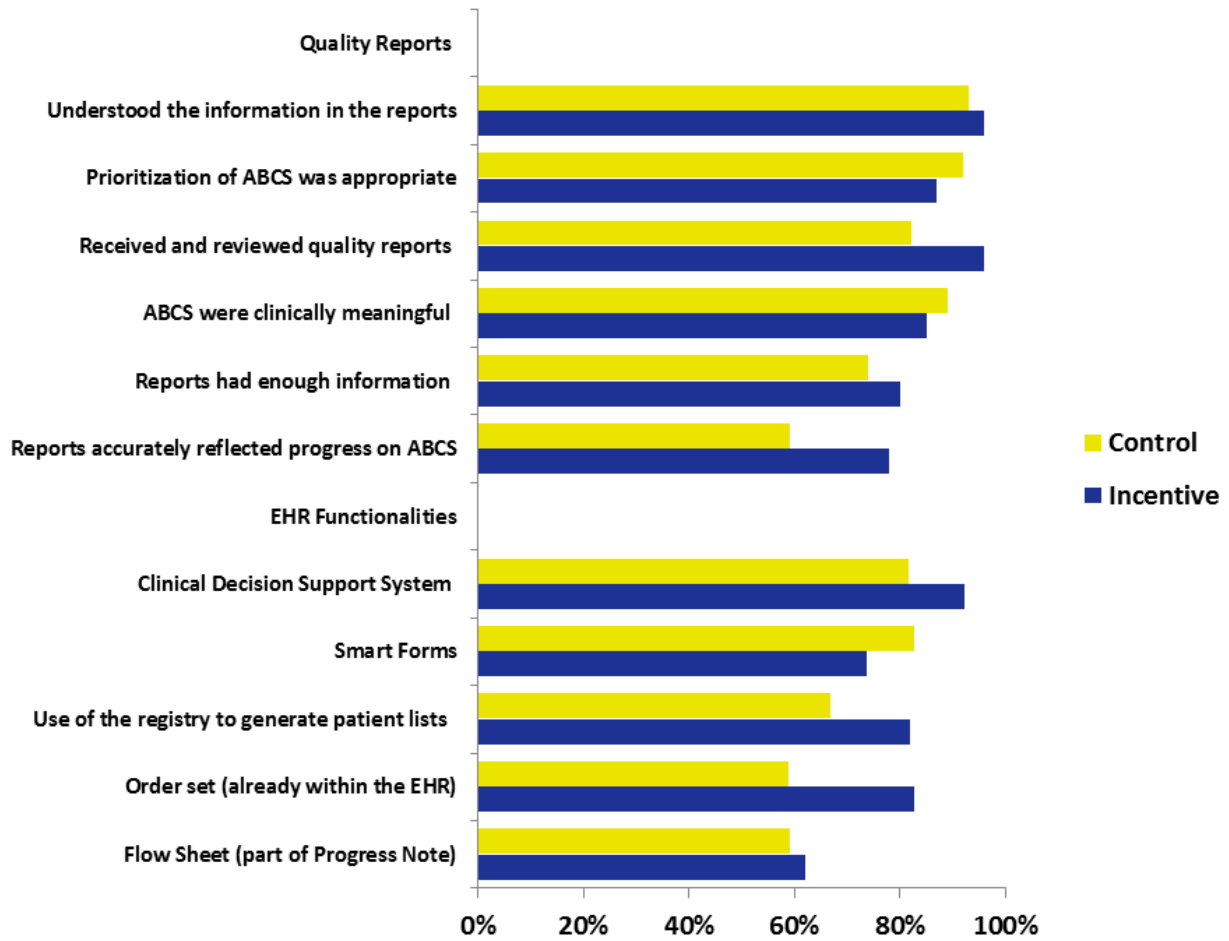
## Pay for Performance in the Independent Practice Setting

Most pay-for-performance (P4P) efforts have focused on large group practices. However, PCIP's small practices (<10 providers) are a more accurate reflection of where Americans get healthcare. By randomizing half of participating practices to receive special financial incentives for pre-defined quality measures related to the prevention of heart disease (the ABCS: antithrombotic therapy, blood pressure control, cholesterol control, smoking cessation intervention), this project evaluated the impact of pay-for-performance incentives on chronic disease management. Financial incentives were higher for patients with co-morbidities (diabetes, ischemic vascular disease), and those with Medicaid insurance or the uninsured. EHR-derived quality reports were issued quarterly to both intervention and control practices.

Practices in the study that received incentives, compared with those that did not, had greater improvements in cardiovascular care processes and outcomes, including patients with co-morbidities. Small practices using electronic health records with clinical management tools demonstrated improved in quality measures in response to financial incentives. Demonstrating that financial incentives improved intermediate outcomes in patients with co-morbidities allows payers to focus on important prevention goals, potentially reducing complications and saving additional lives in patients who are often considered harder to treat.

Practitioner respondents surveyed on PCIP's Health eHearts initiative were overwhelmingly positive towards the program, even those who had not received incentive payments. The majority of respondents agreed with the priorities of the program and thought the measures were clinically meaningful for their patients. Recent studies have shown that financial incentive programs are not always effective at improving quality, but participating in a multi-intervention program like this can lead to sustainable, quality-driven workflows for providers. We found the high level of agreement with the priorities of the program and general buy-in with the EHR-based reporting mechanism may be important in implementing and sustaining new workflows.

## Whether or not They Received Incentives, Physicians Responded Positively to Quality Reports and EHR Components of a Comprehensive Improvement Program



## The Patient Centered Medical Home Model

The Patient Centered Medical Home (PCMH) is a practice organizational framework designed to redirect healthcare services toward more coordinated and comprehensive patient centric care. The PCMH model has been widely promoted as a way to enhance primary care and improve care delivery, especially in patients with chronic conditions. The Agency for Healthcare Research and Quality has endorsed PCMH as “hold[ing] promise as a way to improve health care in America by transforming how primary care is organized and delivered” and the framework is increasingly adopted by practices across the country. However, most of the research on PCMH implementation and outcomes has focused on larger practices. Less is known about whether the adoption of PCMH principles and processes can be achieved in the small practice setting, where the majority of Americans receive their primary care. Understanding the way these very small practices interpret and successfully implement dimensions of PCMH in their practices, either formally (through the NCQA recognition process) or informally, is key to understanding the potential reach of PCMH-oriented care.

Research led by NYU surveyed providers from 94 very small practices (defined as five providers or less) that had been using an EHR system since before October 2009 and had access to support from PCIP Quality Improvement specialists before 2011, to understand how different aspects of the PCMH model are expressed in this type of practice environment. The survey asked about six dimensions of PCMH, including patients ability to identify their primary care giver, whole-person orientation, team-based care, care-coordination across the health care system, focus on quality and safety, and timely access to care and communication.

The majority of respondents reported having incorporated most of these dimensions into their practice in some way, though not always as formal processes. Some clinicians from small practices reported that the extensive documentation process involved in achieving PCMH recognition discourages them from completing the process. These findings suggest that even practices with limited resources can functionally achieve PCMH recognition; however, these types of practices stand to benefit from a more streamlined formal recognition process.

## Small Practices Were Able to Successfully Adopt Many Dimensions of PCMH Care, but Often Did So Informally



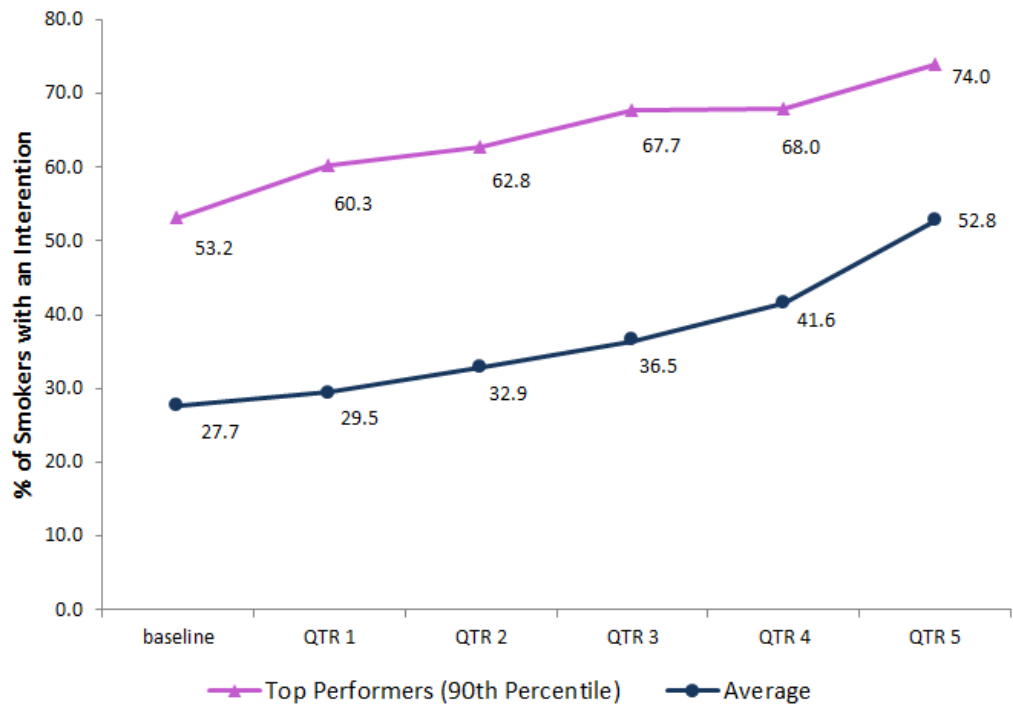
## Using EHRs to Track Delivery & Impact of Smoking Cessation Interventions

New York City (NYC) has experienced a substantial decline in smoking rates, from 21.5% in 2002 to 14.8% in 2011. This decline is attributed to a comprehensive tobacco control program that included cigarette tax increases; legislation and regulation, requiring almost all workplaces, bars and restaurants, and public areas to be smoke free; providing cessation services via the New York State Quit line and an annual large-scale nicotine patch and gum giveaway; educating the public about harmful health effects from both smoking and secondhand smoke through hard-hitting media campaigns; and evaluating tobacco control efforts to understand what strategies are the most effective. However, recently reductions in rates of smoking have slowed and new strategies are being developed to further drive cessation rates. Providers' advice to quit smoking can be an important motivating influence for patients' cessation attempts. However, providers do not regularly ask about or subsequently document patients' smoking status, leading to a missed opportunity to reduce smoking prevalence.

With funding from the Centers for Disease Control and Prevention grant, PCIP developed a pilot pay-for-improvement program to increase smoking status documentation and smoking cessation interventions at community health centers treating low-income and Medicaid recipients, expected to have a higher smoking prevalence than the general population. The program, known as Health eQuits, sought to increase identification and treatment of tobacco users by 25% and promote the treatment of 18,000 additional smokers over a 2-year period. Interventions were defined as medication, counseling or referral to a state quit line; a modest financial incentive of \$20 per additional intervention over baseline was offered to each center, and additional training and resources were offered for integrating cessation strategies and optimizing clinical workflow and billing procedures. The program used EHR data to increase clinicians' awareness of their patients' smoking status, and therefore to increase cessation interventions offered to smokers. Quarterly feedback served to harness the competitive spirit among staff to improve performance.

Smoking documentation rates among the practices ranged from 0% to 75% at the start of the pilot, but 10 practices had documented smoking rates that were lower than the city's overall smoking prevalence of 14.8%. These data helped practices and their leaders recognize the disparity between their practices' presumed smoking prevalence and actual EHR documentation rates. Initial cessation intervention rates recorded in the EHR ranged from 0% to 54% among the centers. Reviewing these data with practice administrators provided a teachable moment that smoking cessation interventions could be improved.

## Smoking Cessation Interventions Increased by 20 Percentage Points During the E-Quits Program

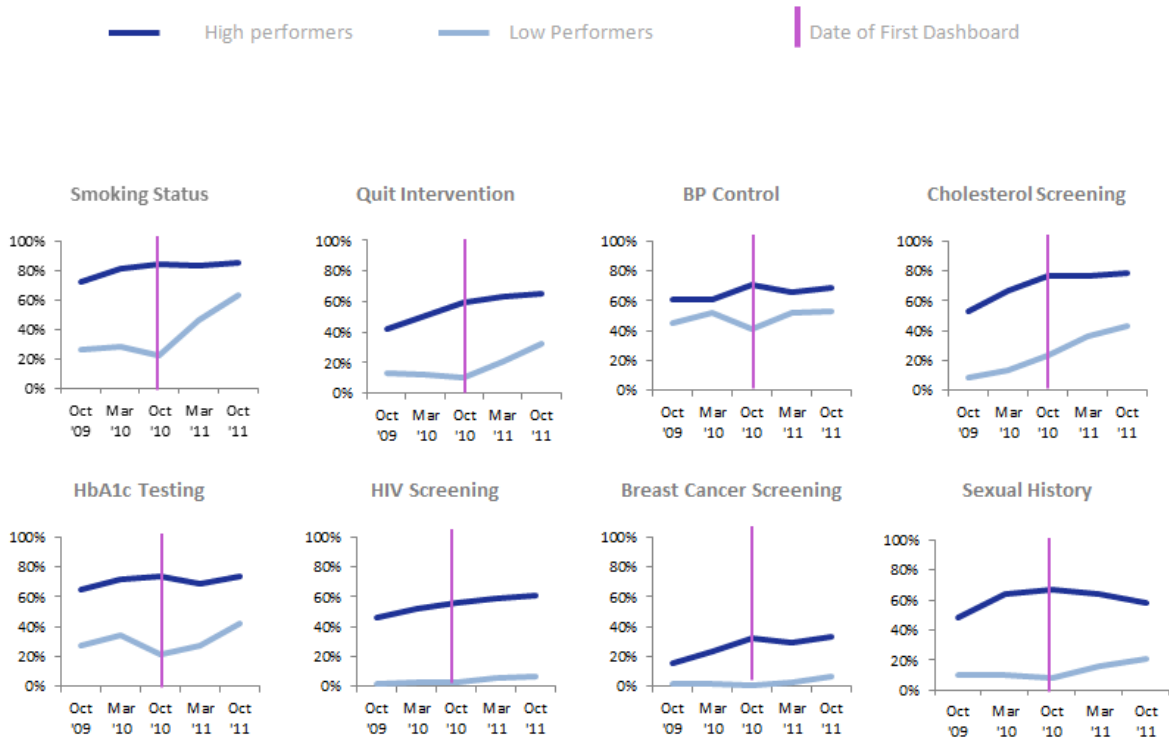


## Evaluating the Impact of Provider Feedback Reports

EHR data has the potential to serve as a valuable source of actionable information, enabling clinicians to understand data derived from their own practice records and to observe trends about population-level aspects of the health of their patient panels. In order for this to occur, it is necessary to find ways for this data to make its way into the hands of providers in a format that can be quickly and easily absorbed. Provider feedback reports offer one such mechanism for efficient and meaningful data exchange.

In 2010, PCIP initiated a program to share provider feedback reports with a subset of its member providers using ECW software. One-page feedback reports highlighting six-month trend data on twenty clinical quality measures, alongside a benchmark peer average, were emailed to providers beginning in October of 2010. PCIP evaluated the impact of this monthly report among high- and low-performing providers. In this preliminary analysis, we observed that, while pre-PFR receipt, improvement between high and low performers varied per measure; post-PFR receipt, low performers consistently improved more than high performers on all measures, and more than themselves in the pre-PFR period. This finding resonated with prior research that supports that this type of feedback is most effective for low performers. PCIP continues to expand its provider feedback program, with several additional reports in development or currently in circulation that highlight additional dimensions of clinical care. Alongside these efforts, we will continue to evaluate impact and use this knowledge to better inform report design and distribution strategies.

## Lower Performers Improved More Post-Receipt of PCIP's Provider Feedback Report







## RESEARCH

Section 3: Leveraging HIT  
for Public Health  
Surveillance and Policies

## Building an Infrastructure for Data Exchange: The Hub

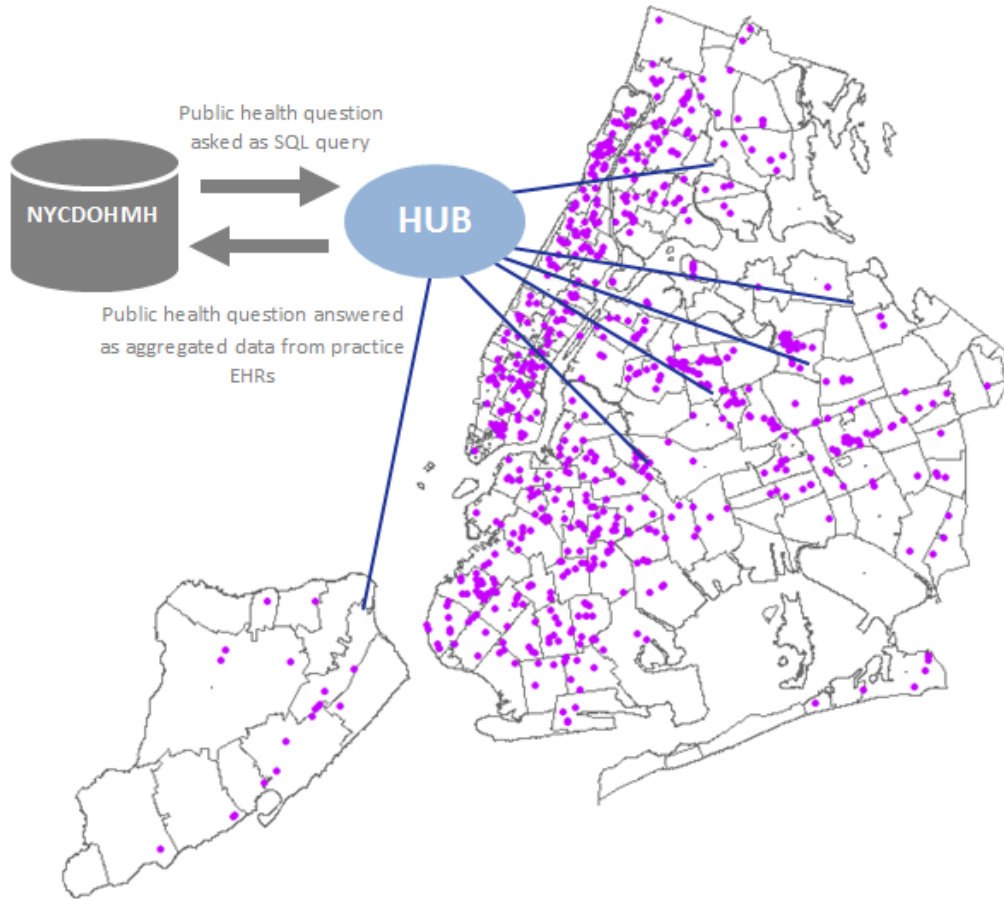
The Hub Population Health System ('the Hub') is an innovative public health tool that connects PCIP to its member providers' EHR systems to enable remote and safe exchange of data in virtual real time. Developed in collaboration with the eClinicalWorks EHR vendor, the Hub connects to 700 eClinicalWorks practices, of which about 650 transmit data on a given night. These practices represent over 3000 healthcare providers and 4 million patients, 1.9 million of whom had visits in 2013.

The Hub uses an ad hoc distributed query model where SQL queries written by PCIP are pushed from the vendor server and run as a scheduled job at each practice. Data is returned securely to an internal data warehouse, aggregated at the practice level or the provider level. No patient-level data is received by PCIP, a system that ensures protected health information remains exclusively in the hands of the provider.

Most practices on the Hub are small, independent practices. 38 CHCs and 3 hospital outpatient departments are also represented. Approximately 20% of residents living in the city's three DPHOs came to PCIP Hub practices in 2013.

PCIP uses the Hub to explore patterns of EHR usage, track provider behavior, obtain quality measure data to feed back to providers in the form of dashboards, carry out influenza-like illness syndromic surveillance on a weekly basis, and to help PCIP and other bureaus track performance on NYCDOHMH priorities. Recent and ongoing projects include an analysis examining the impact of the NYS HIV testing law on HIV screening rates; an exploration of Hepatitis C screening and treatment among baby boomers; the monitoring of pediatric BMI trends and syndromic surveillance; and an external-facing website that will share primary care data trends with the public.

New York City Practices Exchange Secured Data  
with the Health Department via the Hub  
(individual dots represent PCIP practice sites)

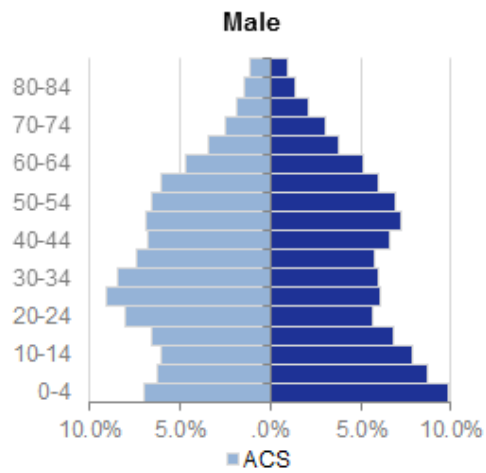
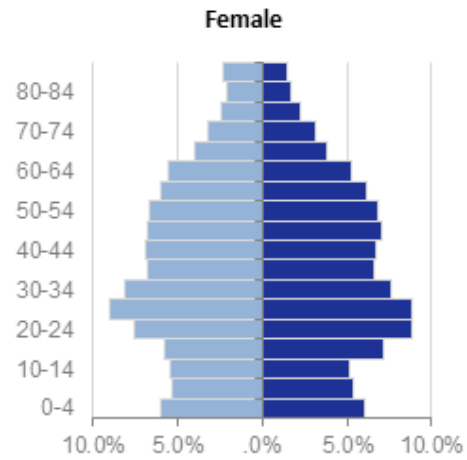


## Laying the Foundation for Public Health Surveillance: The Macroscope Project

Before using the data from the Hub to conduct population-level surveillance and research, we asked: How can EHR data be meaningfully harnessed for population surveillance, taking into account representativeness, bias and data quality issues, in New York City and across the country? The Macroscope project will seek to answer this and to develop and validate best practices for using data from ambulatory EHRs for chronic disease surveillance.

In partnership with CUNY School of Public Health, the NYC Health Department will create EHR-based estimates and compare them to a “gold standard” 2013 local HANES survey. High performing measures will be selected as the basis of the NYC Macroscope EHR surveillance system. Current measures include provider, treatment and control of hypertension, diabetes, cholesterol, BMI, smoking status, depression status, and influenza vaccination status. All metrics will be weighed to the New York City population by age, gender, and neighborhood poverty quartiles.

## Patient Age Distribution in PCIP's Hub Data Compared to New York City Census Data (2011)

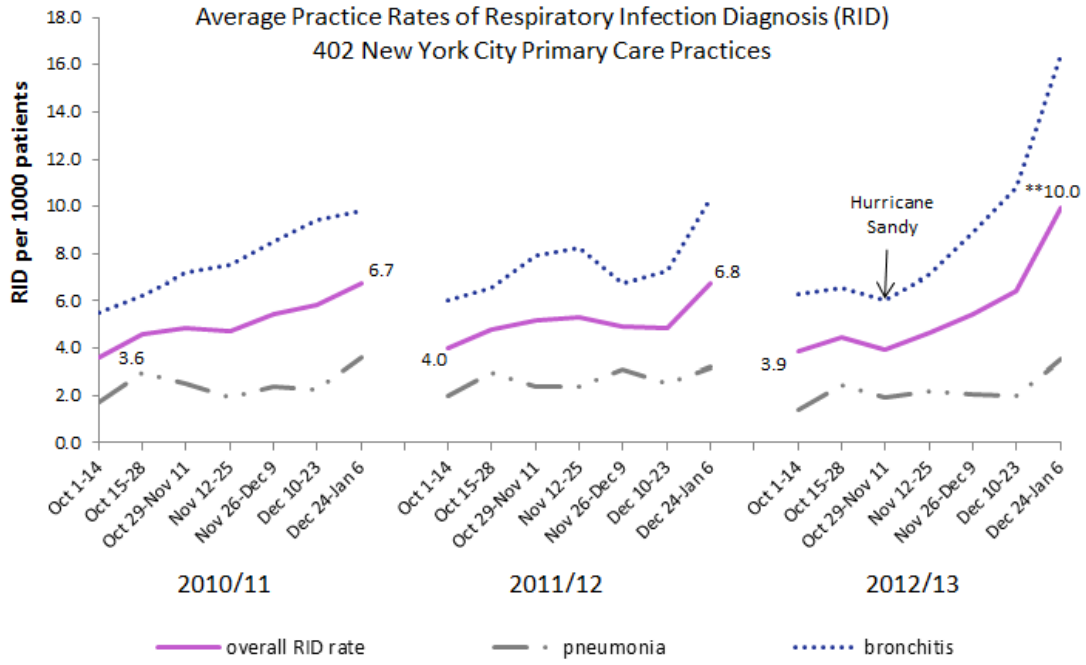


## Surveillance in the Post-Disaster Context

In 2012, an estimated 106 million people were impacted by natural disasters. As such events have increased in frequency and magnitude, urban areas in particular have become invested in building infrastructure that can generate timely and useful data to guide quick decision-making when disasters occur. The ability to track post-disaster trends in primary care may contribute significantly to the overall picture of post-disaster health, although the data derived from primary care setting remains largely unexplored in disaster response literature. We conducted an analysis of Hub data in the wake of Hurricane Sandy to explore potential for EHR data to contribute to post-disaster surveillance. We explored three key data sources: transmission data, which allow us to know if area primary care practices had maintained the ability to electronically exchange information after the event; care seeking data, which helped us to understand how patterns of primary care utilization might have shifted; and disease diagnosis data, which provided insights into the post-disaster incidence of acute respiratory infections in non-emergency settings.

Our data enabled us to see where primary care capacity was most affected in the weeks following Sandy and to take into account practices that were not able to share data with us due to transmission issues. We also observed rates of bronchitis diagnosis in our data that were similar to those observed in other sources of syndromic surveillance, suggesting our data may have some potential to track the incidence of relevant diseases in a post-disaster situation. This exploration of post-Sandy primary care data allowed us to explore the strengths and weaknesses of ambulatory EHR data in emergency situations. Data from ambulatory EHR networks can contribute to surveillance efforts by providing sentinel population profiles on clinical indicators in near real time.

## EHR Data May Play an Important Role in a Post-Disaster Surveillance Context







ON THE HORIZON



# ON THE HORIZON

Over the past six years, PCIP has been establishing relationships with primary care providers for improving health with a focus on prevention. As of September 2014, nearly 16,000 providers from over 1,300 ambulatory settings have joined the city's regional extension center, NYC REACH. Over 90 percent of these settings have adopted health information systems and roughly a quarter have received incentives from the Centers for Medicare and Medicaid Services' Meaningful Use incentive programs.

In the coming years, PCIP has many new opportunities in evaluating the effectiveness of its programs for assisting primary care improve its delivery of preventive care, test new models for improving care coordination or connecting back with communities and continue to establish new tools for transforming data into actionable information.

New York State is implementing multiple health care payment changes across Medicaid and other sectors. The various initiatives build upon health IT, information exchange, and primary care practice transformation. In the next four years, PCIP will have access to a unique laboratory to testing models to inform implementation science, understand how payment reform could be used to promote prevention, and leverage biomedical data sources for ways to reduce health disparities.



CITATIONS/  
PUBLICATION  
ARCHIVE

# Citations/Publication Archive

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### Primary Care EHR Data in the Post-Disaster Context

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