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Leveraging EHRs and HIEs for Hepatitis C Surveillance, Prevention and Management:

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University of Massachusetts Medical School

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Leveraging EHRs and HIEs for Hepatitis C Surveillance, Prevention and Management:

Exploring ways that public health departments may utilize these resources

NASTAD & University of Massachusetts Medical School

October 31, 2017

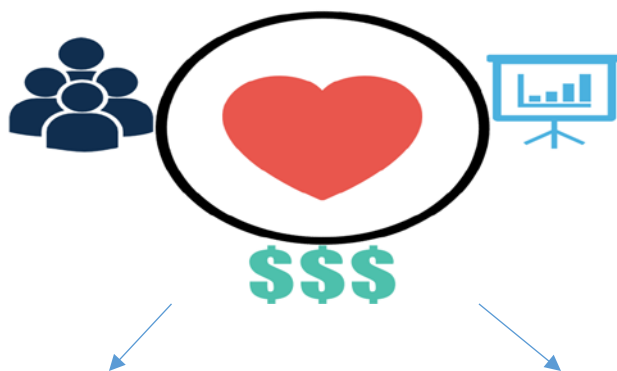
Audio by phone: 1 877 369 0926 (Toll Free)

Webinar ID: 921-559-291



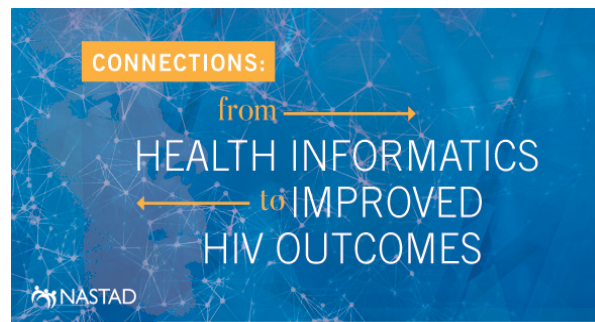
Emerging Opportunities for Public Health and Health Systems Data

- NASTAD's Health Systems Integration program includes a focus area on health systems data and opportunities for public health programs to use that data to improve HIV and hepatitis surveillance and programs



Claims data
(Medicaid, Medicare, commercial insurance, All-Payer Claims Databases)

Encounter data
(Electronic Health Records, Health Information Exchanges)



The Webinar Series & Technical Resources

- NASTAD partnered with informatics experts at the University of Massachusetts Medical School to create a webinar and technical resource series focused on health systems data opportunities for hepatitis C programs
 - Querying Claim Databases for HCV Testing and Treatment
 - *With accompanying technical resource*
 - Data Sharing Agreements 101: What Hepatitis Programs Need to Know
 - *With accompanying technical resource*
 - Leveraging EHRs and HIEs for Hepatitis C Surveillance, Prevention and Management: Exploring Ways that Public Health Departments May Utilize These Resources

Agenda

1. **Introduction from NASTAD**
2. **Mass HIway:** Overview of the Massachusetts statewide HIE
3. **HealthInfoNet:** How the Maine HIE provides population health services, including supporting the surveillance, prevention & management of chronic diseases
4. **Examples of public health departments using data from EHRs or HIEs for Hepatitis C surveillance and programs:**
 - New York City Department of Health and Mental Hygiene
 - Public Health - Seattle & King County
5. **Open discussion:** Ways that public health departments may leverage EHRs and HIEs for Hepatitis C surveillance, prevention and management
6. **Conclusion**

The Mass Hlway:

Overview of the Massachusetts statewide HIE

Michael Chin, MD

*Senior Policy Analyst, MassHealth
Assistant Professor, University of Massachusetts Medical School*

Pre-webinar Survey

- **28 respondents, from 22 locations**
- **Are you using electronic health record (EHR) or health information (HIE) exchange data for your hepatitis program?**
 - 33% yes
 - 29% no
 - 38% not sure
- **How do you use these data?**
 - Funded providers pull data to give to the state health department but do not pull from EHR directly.
 - Just recently received access to an HIE but have not started using these data yet.
 - Use HIE to find data missing in surveillance, but this happens infrequently on a case by case basis.
- **What questions do you have?**
 - Does funding exist to support integration?
 - How to interface EMR to surveillance systems
 - Strategies to support enhancement of EHRs, and utilization of data for CQI.
 - How do states get more access to RHIOs and HIEs so they can support local health departments in their state? Currently this access it not available at the state level but only at the local level.

Health Information Exchange (HIE)

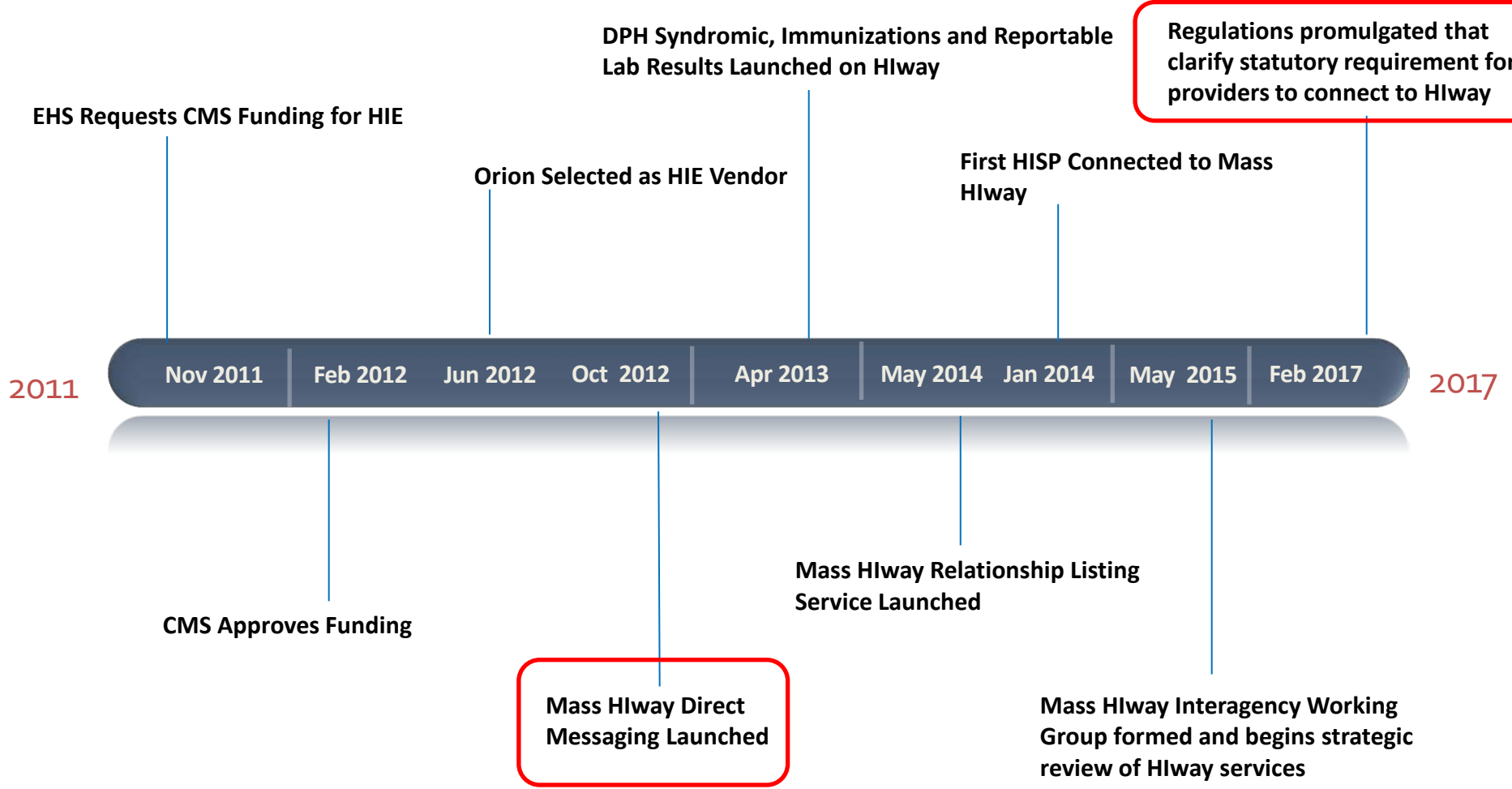
- **Health Information Exchange (HIE) is used both as a *noun* and as a *verb*:**
 - **As a verb:** HIE is the sharing of health-related information between two or more organizations
 - **As a noun:** an HIE is the organization that facilitates the exchange of health-related information between two or more organizations
- **HIEs vary in many ways:**
 - **Architecture:**
 - **Centralized:** Patient data is collected and stored in a centralized repository that the HIE controls
 - **Federated (decentralized):** Patient data is not stored by the HIE (independent databases allow for data sharing)
 - **Hybrid**
 - **Geographical reach:** state-wide vs. regional vs. local
 - **Function:** secure messaging, electronic lab reporting, public health reporting, care summary exchange, e-prescribing, event notifications, predictive analytics, etc.
 - **Consent:** no consent, opt-in, opt-out, opt-in with restrictions, opt-out with exceptions
 - **Applicable legislation:** State laws may enable an HIE and specify their architecture, function &/or consent
 - **Funding:** federal & state government, insurers, provider

Sources:

- *ONC webpage, "[What is HIE?](#)"*
- *HIMSS webpage, "[FAQ: Health Information Exchange \(HIE\)](#)"*
- *NORC report for ONC: [Provider Experiences with HIE: Key Findings from a Six-State Review](#) (2015)*
- *Wikipedia page, "[Health information exchange](#)"*



Mass Hlway Timeline





What is the Mass Hlway?



The Mass Hlway is the statewide, state-sponsored Health Information Exchange (HIE) operated by the Executive Office of Health and Human Services (EOHHS).

- **Mission:** The mission of the Mass Hlway is to enable health information exchange by health care providers and other Mass Hlway Users regardless of affiliation, location or differences in technology.
- **The Mass Hlway has two core functions:**
 - **Function #1 – Hlway Direct Messaging:**
i.e., a secure method of sending a transmission from one Mass Hlway User to another, where the Hlway does not use, analyze or share information in the transmissions
 - **Function #2 – Hlway-Sponsored Services:**
i.e., services such as the forthcoming state-wide Event Notification Service (ENS), where the Hlway may use, analyze, and/or share the minimal amount of information necessary to conduct the service, on behalf of Hlway Participants
- **The Mass Hlway does not currently function as a clinical data repository**
- **The Mass Hlway provides health information exchange across the state:**
 - Over 1,000 Hlway Participants, including organizations across the care continuum (including hospitals from 60+ organizations, ambulatory providers, long-term care facilities)



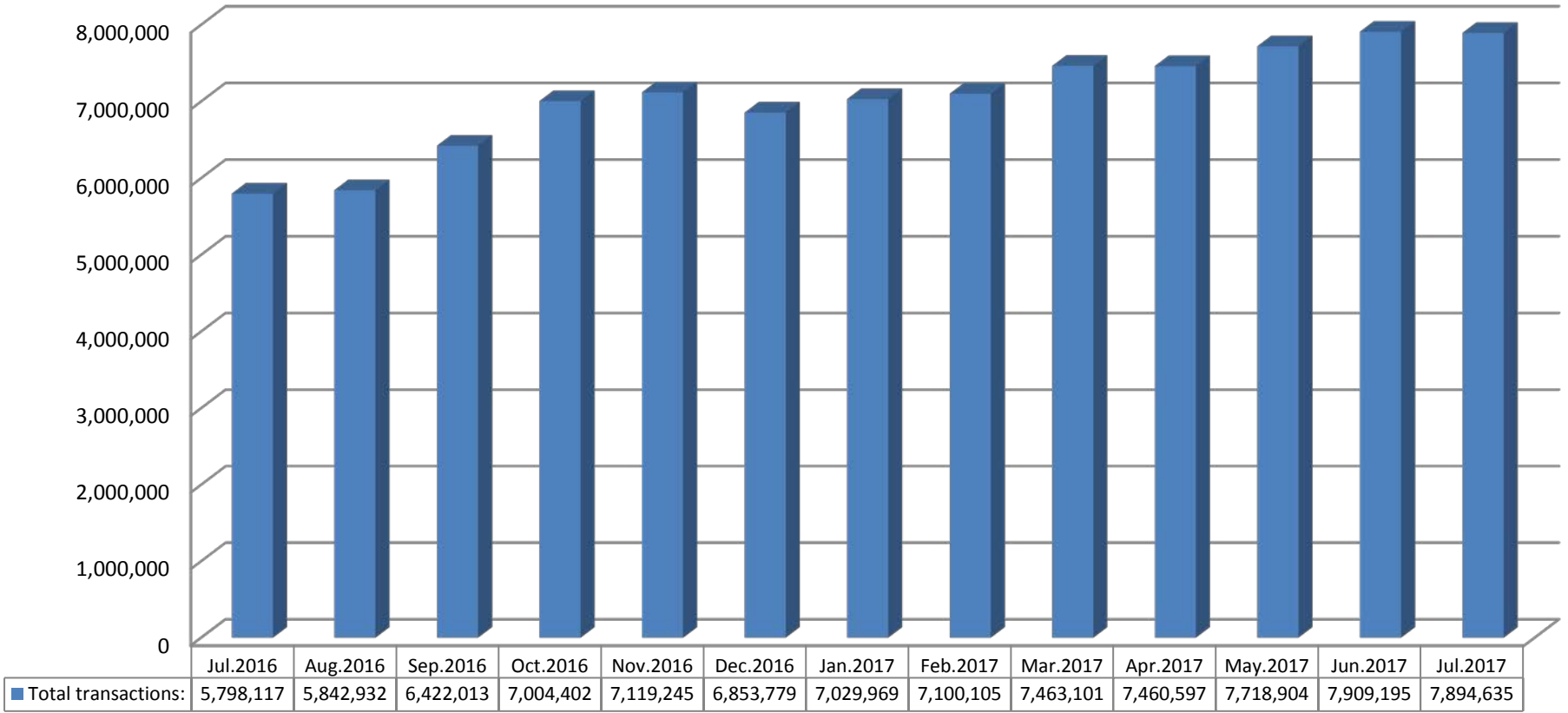
HIway Transaction Activity



13 Month HIway Transaction Activity

7,894,635 Transactions* exchanged in July (06/21/2017 to 07/20/2017**)

158,342,312 Total Transactions* exchanged inception to date



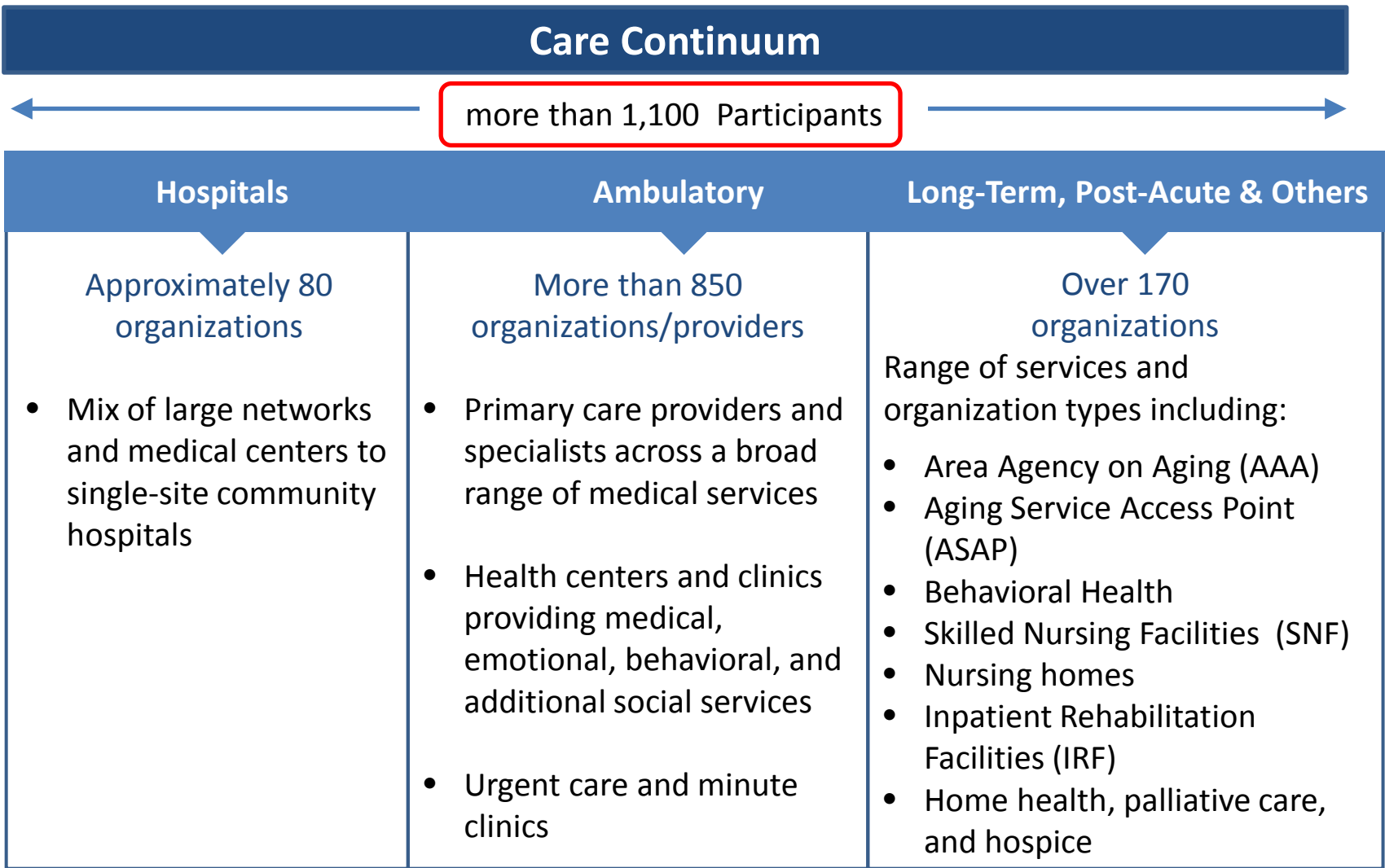
* Note: Includes all transactions over Mass HIway, both production and test

** Note: Reporting cycle is through the 20th of each month.



HIway Participants by Level of Care

(as of June 2017)



Note: 15+ orgs such as Labs, Payers, Imaging Centers, business associates etc.

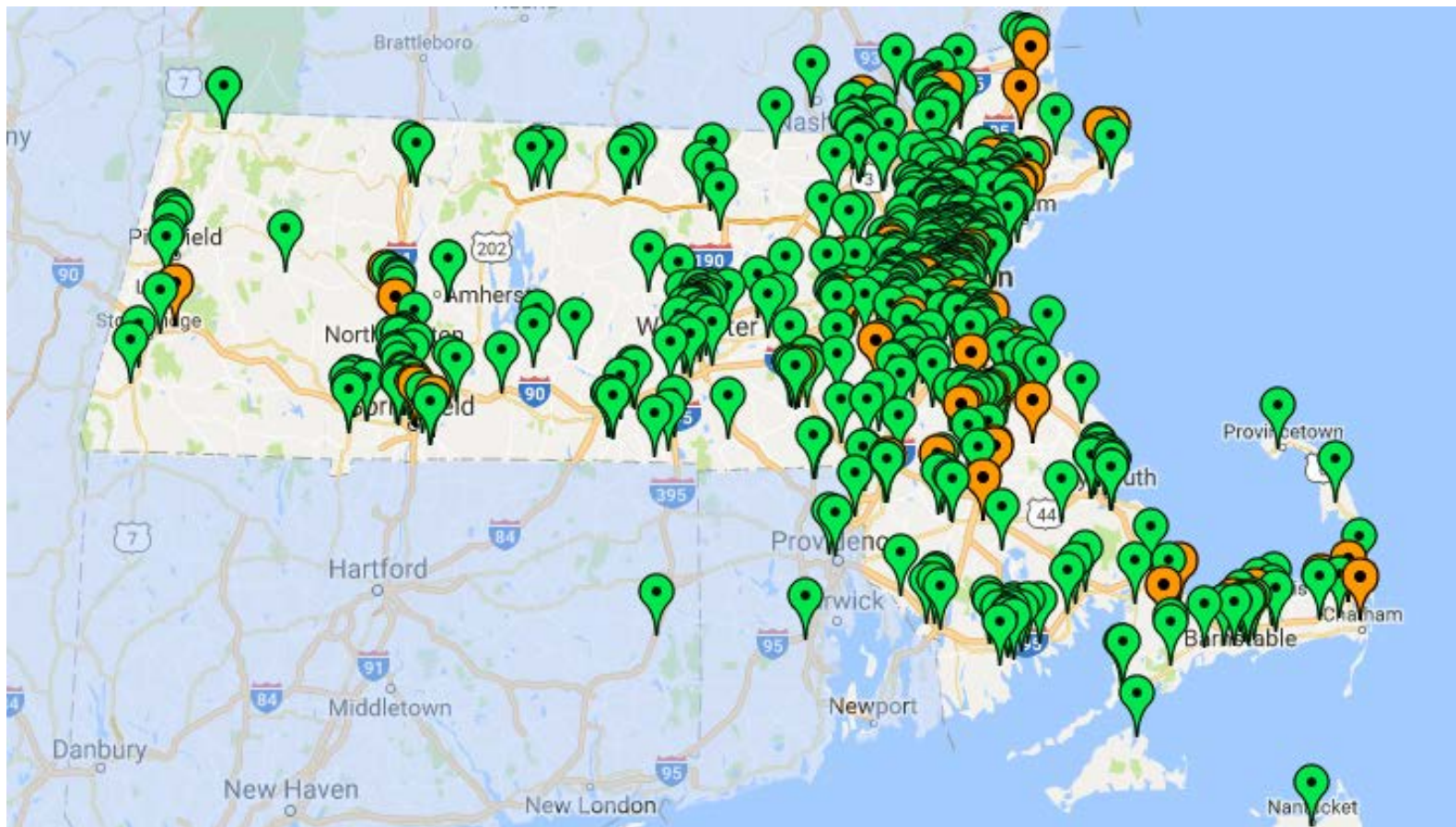


Participant Map



An interactive participant map of all Mass HIway Participants is updated monthly, and is available on the Mass HIway website.

Find the map at the Mass HIway website (www.masshiway.net). Under the [Resources](#) drop-down menu, select [Participant List](#). The map is maintained in partnership with the Massachusetts eHealth Institute (MeHI).









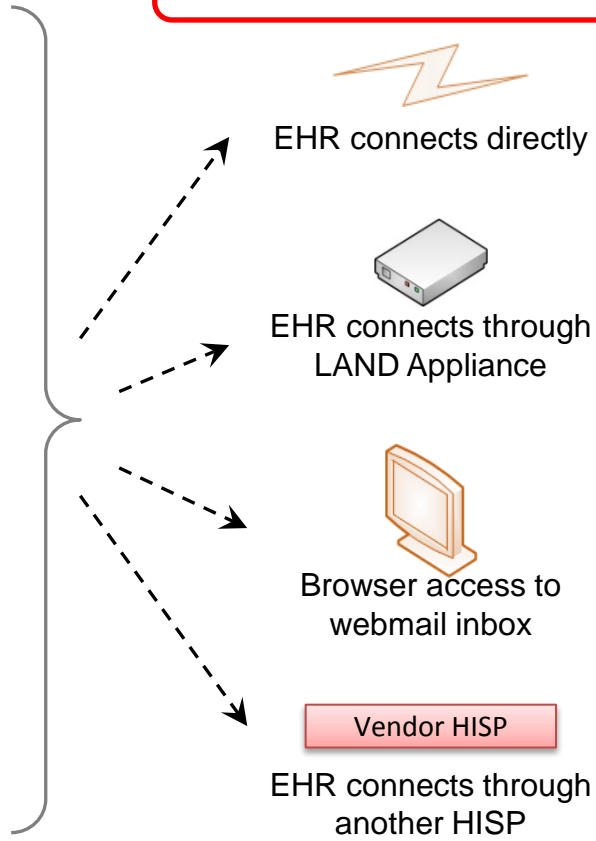
Connectivity Options



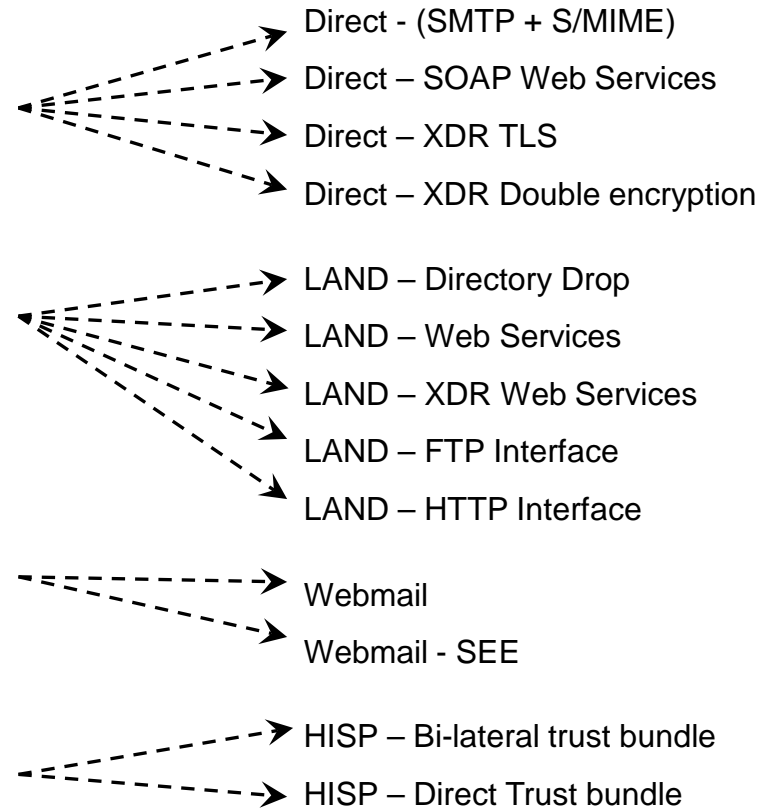
User types

-  Physician practices
-  Hospitals
-  Long-term care
Other providers
Public health
Health plans
-  Labs and Imaging Centers

Connectivity options



Deployment optionality



Providing multiple connectivity options has supported **broad participation in the Mass Hlway.**

The Mass Hlway currently works with more than 44 EHR vendors, 23 HISPs, and 7 integration engines, through **13 deployment variations.**



Use Cases for Hlway Direct Messaging



Use Case Categories

Example Use Cases

Provider-to-Provider Communications

- Hospital sends a discharge summary to a Skilled Nursing Facility (SNF) or Long Term/Post Acute Care (LTPAC) facility
- Primary Care Provider (PCP) sends a referral notice to a specialist
- Specialist sends consult notes & updated medications list to patient's PCP
- Hospital ED requests a patient's medical record from a PCP
- PCP sends a CCD or C-CDA with Problems, Allergies, Medications, and Immunizations (PAMI) to a Hospital caring for their patient

Payer Case Management

- ACO sends quality metrics to a payer
- Provider sends lab results to a payer
- Provider sends claims data to payer

Quality Reporting

- Provider sends clinical data to Business Associate for quality metrics analysis
- Provider sends quality metrics to Business Associate for report preparation

Public Health Reporting

- **Provider sends to DPH:**
 - Massachusetts Immunization Information System (MIIS)
 - Syndromic Surveillance (SS)
 - Opioid Treatment Program (OTP)
 - Childhood Lead Paint Poison Prevention Program (CLPPP)
- **Provider sends to other agencies:**
 - Occupational Lead Poisoning Registry (Adult Lead)
 - Children's Behavioral Health Initiative (CBHI)



HealthInfoNet
How the Maine HIE provides population health services, including surveillance, prevention & management of chronic diseases

October 31, 2017

Who Is HealthInfoNet?

MISSION: *To deliver trusted health information exchange services that help the healthcare community create lasting system-wide improvements in the value of patient care.*

- **Nationally recognized as one of the leading statewide Health Information Exchanges (HIEs) in the country**
 - 98% of Maine residents have some data in the HIE
 - Expanding **connectivity** to pharmacies, social service agencies, public health, etc.
 - **Expanding services** to other states
 - One of the first HIEs to provide the **Veteran's Administration** has direct access to the HIE Portal
- **An independent Maine-based non-profit health information services organization incorporated in 2006**
- **Board of Directors comprised of statewide community leaders**
- **Trusted convener with strong community support**

HIE Connections



Acute Care Hospitals	18
Critical Access Hospitals	16
Mental Health Hospitals	1
Ambulatory Providers	464
Behavioral Health	142
FQHCs	68
Post-Acute Care	46
VA Locations	12
Labs	4
Health Systems	5
Emergency Medical Service	3
Pharmacies	2
Payers	1



Data Acquisition and QA

- HL7 v.2.x data acquired from EHRs and reference laboratories in “near” real time
 - Chief complaint and event of care information is received in seconds
 - Coding data (final dx/px) received 12-36 hrs
- Batch Medicaid eligibility and claims files received via SFTP monthly
- Prescription medication data received from Surescripts
- All data processed through interface engine and then through a language terminology engine for discrete data elements
 - Validation process and user acceptance testing (UAT) conducted with **ALL** sites at initial onboard and subsequently annual
 - Automatic QA for data type, format and site data volume at each site through interface engine and SQL database volume reporting
 - Sites address errors identified in sources systems – HIN does not change data received

Health Information Exchange Clinical Portal

- Connections to electronic health record systems across the state of Maine
- Aggregated and standardized patient level clinical, encounter and diagnostic coding data
- Central resource for accessing patient specific information to support coordination of care and treatment decisions.



Data in HIE Clinical Portal

- Patient Identifier, demographics & PCP (*registration data*)
- Encounter/Visit History
- Laboratory and Microbiology Results
- Vital signs (*new data*)
- Radiology Reports
- Adverse Reactions/Allergies
- Medication History from Pharmacies & Medicaid Claims
- Diagnosis/Conditions/Problems (primary and secondary)
- Immunizations
- Documents (Discharge summaries, office notes, reports, etc.)
- Continuity of Care Documents (CCD)

Notification Services

- Near real-time notifications via e-mail and daily reports
- Specific events of care such as admission to the hospital or emergency room, discharge from the hospital or emergency room, discharge from skilled nursing facilities, etc.
- *Reports pushed to the provider related to specific event of care.*



Automated Laboratory Reporting

- Notifies Maine CDC (Public Health Department) on hospitals and reference labs behalf
- Specific lab results indicating the existence of one of seventy two diseases mandated for reporting



Syndromic Surveillance

Continuous reporting of events of care where the chief complaint indicates possible disease or condition that requires review/intervention by the Maine CDC



Reporting and Analytics

- Near real-time tool to enhance proactive clinical care management to address risk and improve clinical outcomes
- Provides client analysis of statewide market share and volume information along with population level predictive analytics
- Public health measure tool to allow for real-time assessment of diabetes and hypertension
- Medicaid utilization reporting tool to support Medicaid care management and ED utilization



HIE Analytic Predictive Model Design

Patient History

Patient Risk of Event or Outcome

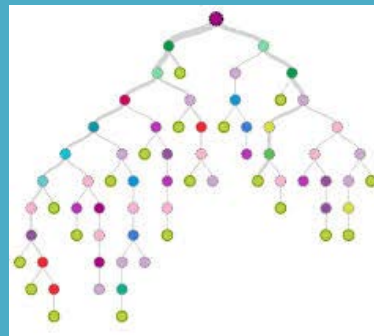
Risk Model Development

Available Risk Models

1000s of Patient Features

- Age
- Gender
- Geography
- Income
- Education
- Race
- Diagnoses
- Procedures
- Chronic conditions
- Visit and admission history
- Outpatient medications
- Vital signs
- Lab orders and results
- Radiology orders
- Social characteristics
- Behavioral characteristics

Multivariate Statistical Modeling –
Decision Tree Analysis
Machine Learning



Population Risk Models
(predicts future 12 months)

- Predicted future cost
- Risk of inpatient admission
- Risk of emergency dept (ED) visit
- Risk of diabetes
- Risk of stroke
- Risk of AMI
- Risk of hypertension
- Risk of mortality

Event Based Risk Models
(predicts future 30 days)

- Risk of 30 day readmission
- Risk of 30 day ED re-visit

St. Joseph Healthcare HIE Analytics Case Study Results

Compared to the state-adjusted rates



15.0%

reduction in emergency room visits



4.2%

reduction in admissions



12.1%

reduction in inpatient days



9.5%

reduction in 30-day ED return rate



13.0%

reduction in 30-day readmissions



5.0%

reduction in cost per person

Maine CDC Quality Reporting Dashboard: NQF 59 Results

Maine CDC Statewide Quality Measures Dashboard



NQF 18: Controlling High Blood Pressure NQF 59: Comprehensive Diabetes Care

Select Parent System(s)

- ALL
- Androscoggin Home Care and Hospice
- Bridgton Hospital
- Catawba Regional Hospital
- Cary Medical Center

Measure Year End Date

2016-10-14

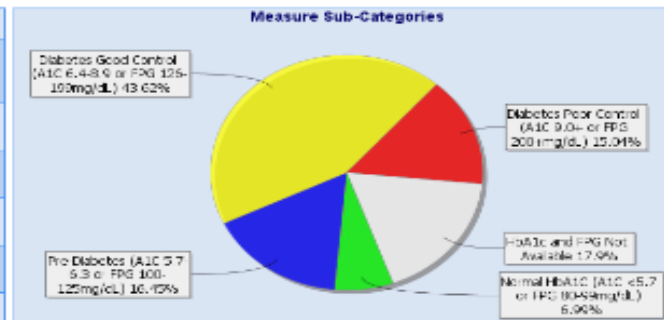
[View Map](#)

Measure Year Start Date

2015-10-14

NQF 59: Comprehensive Diabetes Care: Hemoglobin A1c or Fasting Plasma Glucose Measure Ending 2016-10-14

Measure Name	Population	Numerator	Denominator	Percent
NQF 59: Comprehensive Diabetes Care: Hemoglobin A1c or Fasting Plasma Glucose	36010	9839	29871	32.94
Normal HbA1C (A1C <5.7 or FPG 80-99mg/dL)	36010	2089	29871	6.99
Pre-Diabetes (A1C 5.7-6.3 or FPG 100-125mg/dL)	36010	4913	29871	16.45
Diabetes Good Control (A1C 6.4-8.9 or FPG 126-199mg/dL)	36010	13030	29871	43.62
Diabetes Poor Control (A1C 9.0+ or FPG 200+mg/dL)	36010	4493	29871	15.04
HbA1c and FPG Not Available	36010	5346	29871	17.9



Selected Parent System(s)

- Bridgton Hospital
- Central Maine Medical Center
- Eastern Maine Healthcare Systems

NQF 59: Comprehensive Diabetes Care: Hemoglobin A1c or Fasting Plasma Glucose

Overview

The percentage of patients 18-75 years of age with diabetes (type 1 and type 2) whose most recent HbA1c level during the measurement year was greater than 8.0% (poor control), or if missing an HbA1c result, whose most recent Fasting Plasma Glucose (FPG) is greater than 200 mg/dL, or who was missing both results, or if neither an HbA1c nor an FPG test was not done during the measurement year.

Initial Population

Total patients aged 18 to 75 during the measure year who had a diagnosis of Diabetes at the selected site(s) at any time.

Denominator

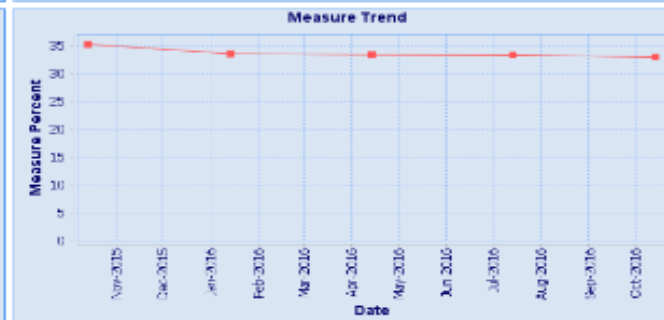
Patients 18-75 years of age by the end of the measurement year who had a diagnosis of diabetes (type 1 or type 2) during the measurement year or the year prior to the measurement year.

Numerator

Patients whose most recent HbA1c level is greater than 8.0%, or if the HbA1c result is missing, whose most recent Fasting Plasma Glucose (FPG) is greater than 200 mg/dL, or who is missing both results, or for whom neither an HbA1c or FPG test was not done during the measurement year. The outcome is an out of range result of an HbA1c test, indicating poor control of diabetes. Poor control puts the individual at risk for complications including renal failure, blindness, and neurologic damage. There is no need for risk adjustment for this intermediate outcome measure.

Exclusions (optional)

- Exclude patients who did not have a diagnosis of diabetes, in any setting, during the measurement year or the year prior to the measurement year.



MaineCare (Medicaid) Emergency Department Reporting

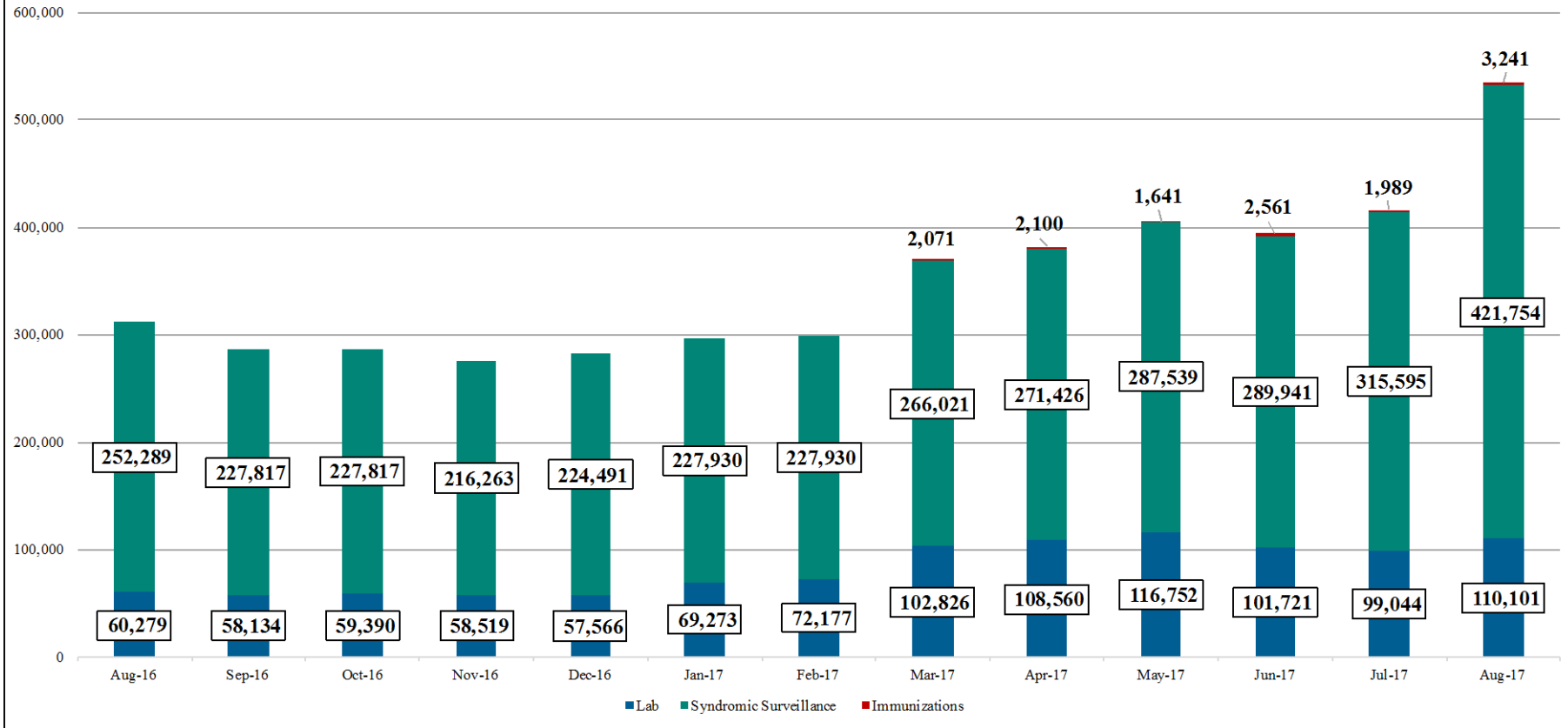


Key Statistics

- **562,348** Maine residents had encounter and clinical content added to the exchange in the past 12 months
- **98%** of all Maine residents have clinical information in the exchange
- **16.5 million** inbound messages received per month
- **85,000** patients are accessed each month by clinical users of the exchange
- **45,000** real time notifications of patient encounter activity generated each month
- **500,000** automated laboratory results and syndromic surveillance messages sent to Maine CDC each month
- **3,500** unique users are accessing the the portal each month

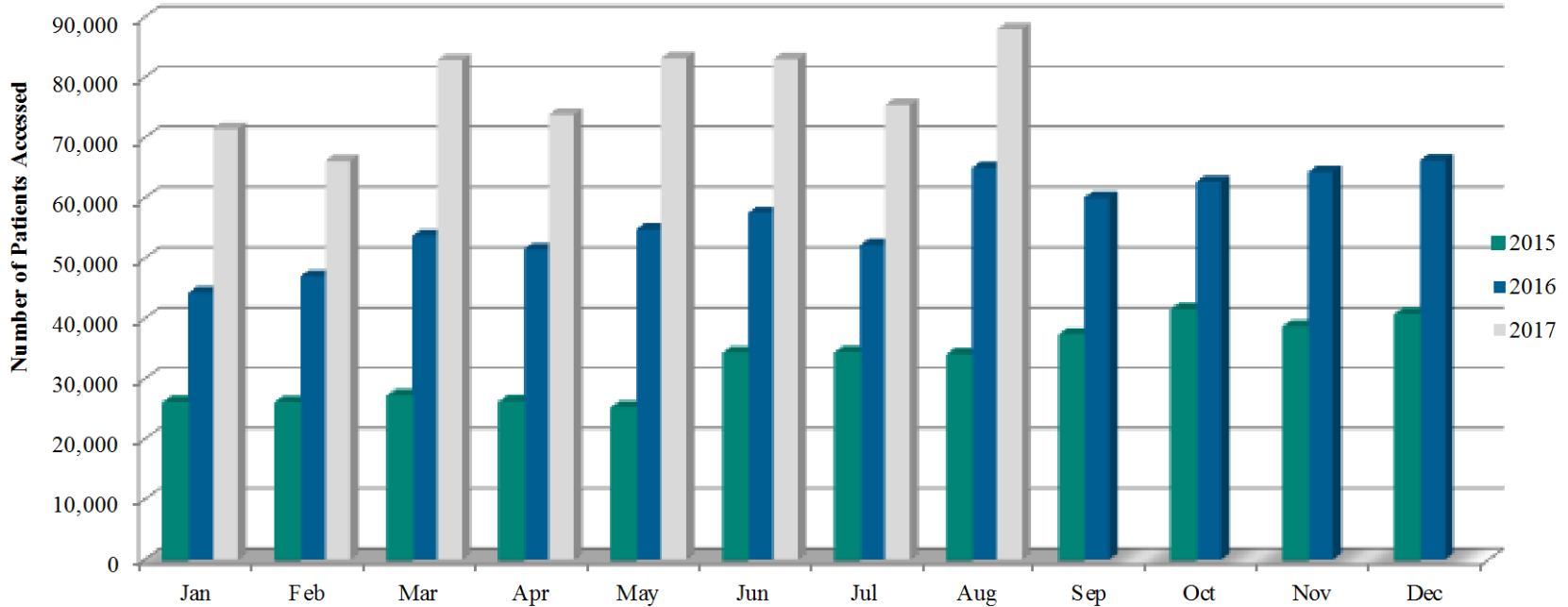
Public Health Messages Last 12 mos.

Message Forwarded to the CDC by Type
Last 12 Months



HIE Monthly Usage 2015-Aug 2017

Number of Patients Accessed Per Month 2015 - 2017





Contact Information

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www.hinfonet.org

New York City (NYC) Department of Health and Mental Hygiene (DOHMH) and HIEs - Background

- NYC and HIEs
 - Covered by three HIEs
 - Front end access and analytic database capabilities at different stages
 - Statewide HIE not yet functional
- DOHMH and HIEs
 - Partnerships are key
 - Evaluation: determined availability and reliability of data
 - Compared HIE data to case investigation and electronic lab reporting (ELR) data
 - HIEs are best for lab and imaging data, not as good for symptoms, onset/diagnosis dates and medications
 - HIE front ends are regularly used for case investigations (Legionella, Hepatitis A)
 - Users must confirm they are accessing data for public health purposes

Hepatitis C and HIEs

- 2016: over 11,000 newly reported cases of hepatitis C
 - Given high number and limited resources, higher risk persons may need to be prioritized for linkage to care
- FIB-4 and APRI scores have been shown to be indicators of liver disease ^(1,2)
 - Calculated using AST, ALT and platelets - labs readily available in EHRs/HIEs
- Mutual Partnership
 - HIE: certifies as reporting to public health
 - DOHMH: receives supplemental lab information to calculate FIB-4 and APRI scores

1) Anand V, Hyun C, Khan Q, Hall C, Hessefort N, et al. Identification and Fibrosis Staging of Hepatitis C Patients Using the Electronic Medical Record System. *J Clin Gastroenterol*. 2016 Sep;50(8):664-9

2) 2) McCombs J, Matsuda T, Tonnu-Mihara I, Saab S, Hines P, et al. Using the Fib-4 Score to Monitor Morbidity and Mortality Risk in Chronic Hepatitis C Patients. *J Virol Retrovirol*. 2016. 2(1): 1-10.

Data Process

- Every six months: HIE sends supplementary lab information (AST, ALT, platelets) for any patient who had a lab test, ICD 9/10, or medication indicative of hepatitis C
 - Text file is sent via secure file transfer to a secure folder with limited access
 - Evaluation: Compared HIE file to lab records received by ELR from facilities that report to the HIE
- FIB-4 and APRI calculated
 - Evaluation: Compared HIE FIB-4 and APRI scores to fibrosis scores from a linkage to care program's patient navigators/physicians clinical assessment
- HIE data matched to DOHMH hepatitis C surveillance data
 - Persons identified with high FIB-4/APRI scores and not treated according to surveillance data

Next Steps:

- Linkage to Care
- Evaluation:
 - Does the supplementary lab data received from the HIE help identify high risk people who need linkage to care?
- Look at additional ways to use HIE data (race and ethnicity)
- Continue to support all NYC HIEs to create analytic databases and increase data availability (lab feeds, medications)
 - Is funding needed to help HIEs with this effort?
- Continue to pursue Electronic Case Reporting
 - Many challenges!

Hepatitis C Test and Cure Program:

**Data Collection and Integration to Support
Disease Surveillance and Linkage to Care**

Public Health – Seattle & King County

Project goal:

Increase capacity to identify and follow-up on reports of HCV cases by improving the quality, timeliness and completeness of HCV surveillance data

Problem:

Our local surveillance database was not designed to capture data from ELR and EHRs

- No ability to capture data electronically – manual data entry exclusively
- Not a relational database – no demographic, clinical, or lab histories
- Due to administrative burden, only 1st lab reports for patients were being entered
- Not person-based, so lab/clinical data not shared across hepatitis “events”

Objective

Integrate data from
EHRs, labs, and surveillance reports
into a

unified public health data management system

Approach

- 1) **Reconfigure** hepatitis surveillance database to a **relational model**, allowing multiple lab and clinical reports per person to be recorded
- 2) Redesign local surveillance database to include placeholders for **data elements captured from ELR and EHR**
- 3) Implement algorithms to **match incoming lab and clinical records** to persons in surveillance database
- 4) For labs already reporting to WA state's ELR system, replace manual data entry with **automated upload** to our local surveillance database
- 5) For HCV-TAC partner sites, capture lab and clinical reports extracted from EHRs on a quarterly basis via **upload** to local surveillance database



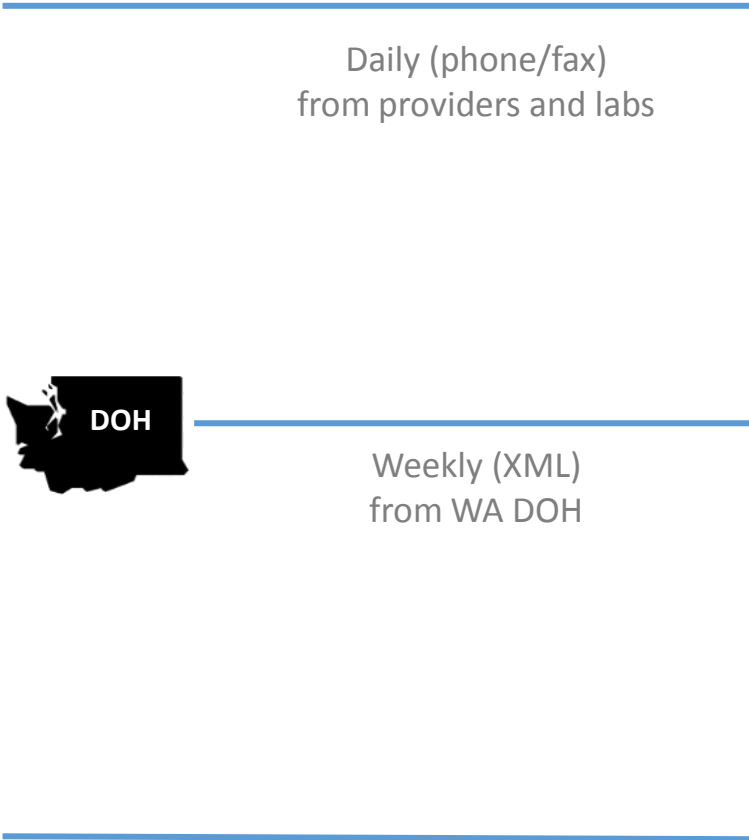
Traditional reporting



ELR



EHR



Daily (phone/fax)
from providers and labs

Weekly (XML)
from WA DOH

Quarterly (XML)
clinical and lab data
from HCV TAC partner sites for
patients identified as HCV+

**Person
deduplication
and upload**



**Local
surveillance
database**

Laboratory Tests

Facility Name	Date Collected	Lab Name	Requested Test	Result Test	Result/Not Coded	Abnormal Flag
Unknown	11/17/2016 1...	GROUP HEALTH COOP...	HEPATITIS C RNA QUANTITATION	Hepatitis C virus RNA [Units/...	NOT DETECTED	NORMAL (APPLIES T...
Unknown	11/17/2016 1...	GROUP HEALTH COOP...	HEPATITIS C RNA QUANTITATION	Hepatitis C virus RNA [log uni...	NOT DETECTED	NORMAL (APPLIES T...
Unknown	11/17/2016 1...	GROUP HEALTH COOP...	HEPATITIS C RNA QUANTITATION	HCV TREATMENT MONITO...	Yes	
Unknown	11/17/2016	GROUP HEALTH COOP...	HEPATITIS C RNA QUANT (GHC)	HEP C RNA QUANTITATION	NOT DETECTED	
Unknown	11/17/2016	GROUP HEALTH COOP...	HEPATITIS C RNA QUANT (GHC)	HEP C RNA LOG	NOT DETECTED	
Unknown	08/19/2016 1...	GROUP HEALTH COOP...	HEPATITIS C RNA QUANTITATION	HCV RNA SerPI bDNA-aCnc	NOT DETECTED	NORMAL (APPLIES T...
Unknown	08/19/2016 1...	GROUP HEALTH COOP...	HEPATITIS C RNA QUANTITATION	HCV RNA SERPL PCR-LOG ...	NOT DETECTED	NORMAL (APPLIES T...

New
Save
Cancel
Close
Facsheet

Laboratory Test Information

PHRED ID XXXXXXXXXX Medical Record # Accession # Data Source Partner Lab Load

Add Record
Remove Record
Cancel Record
Clone Record

Lab Order

Lab Name 203 Date Collected 11/17/2016 13:48 Date Received 11/17/2016 17:21
 Patient ID 1 XXXXXXXXXX Patient ID 2 Patient ID 3
 ID 1 Assigned By GROUP HEALTH COOPERATIVE ID 2 Assigned By ID 3 Assigned By

Ordering Facility

Facility Name Unknown
 Address City State Zip Code Phone

Ordering Provider

Last Name XXXXXXXXXX First Name XXXXXXXXXX Middle Name S Degree
 Address City State Zip Code Phone

Testing

Requested Test HEPATITIS C RNA QUANTITATION Result Test Hepatitis C virus RNA [Units/volume] (viral load) in Serum or Plasma by I
 Request Notes
 Result Date 11/17/2016 13:48 Result Not Coded Result NOT DETECTED Units IU/ML
 Reference Range 0-15 Abnormal Flag NORMAL (APPLIES TO NON-NUMERIC RESULTS) Result Status Final results - Can only be changed with a corrected result.
 Notes

Visits

Date of Visit	Facility Name	Provider
05/06/2013	Harborview	Strate, Lisa MD
05/31/2013	Harborview	Cox-North, Paula ARNP
09/23/2013	Harborview	
09/27/2013	Harborview	
11/25/2013	Harborview	Cox-North, Paula ARNP
03/24/2014	Harborview	Cox-North, Paula ARNP
05/06/2014	Harborview	Leveque, Thellea MD
03/09/2015	Harborview	Cox-North, Paula ARNP

Add Record
Remove Record
Cancel Record

New
Save
Cancel
Close

Facesheet

Visit Information

Data Source: Partner Clinic Load

Visit Date: 05/06/2013 Medical Record No: [REDACTED] Medicaid ID: [REDACTED] Insured: Uninsured

Visit Details

Insurance Information

Insurance Plan ID	Insurance Company ID	Insurance Plan Type
UNKNOWN		UNKNOWN

Plan ID: UNKNOWN Company ID: [REDACTED] Plan Type: UNKNOWN

Visit Assessment
Visit Treatment
Visit Notes

Provider Information

Facility: Harborview Clinic Name: HMC APA-GI ENDOSCOPY

Last Name: Strate First Name: Lisa Middle Name: Lynn

Degree: MD

Specialty Type: 5010-GASTROENTEROLOGY MEDICARE

Address: 325 9th Ave~Mailstop 359773 City: SEATTLE

State: WA Zip Code: 98104-9773 Phone: [REDACTED]

Visits

Date of Visit	Facility Name	Provider
09/23/2013	Harborview	
09/27/2013	Harborview	
11/25/2013	Harborview	Cox-North, Paula ARNP
03/24/2014	Harborview	Cox-North, Paula ARNP
05/06/2014	Harborview	Leveque, Thellea MD
03/09/2015	Harborview	Cox-North, Paula ARNP
09/24/2015	Harborview	Cox-North, Paula ARNP
09/14/2016	Harborview	Cox-North, Paula ARNP

Add Record
Remove Record
Cancel Record

New
Save
Cancel
Close

Facsheet

Visit Information

Diagnosis/Treatment
 Acute HCV Diagnosis Date Chronic HCV Diagnosis Date
 Previously Treated for HCV Year of Prior Treatment Previously Achieved SVR

Visit Details

Visit Assessment

Visit Treatment

Visit Notes

Immunizations
 History of HEP A Immunized for HEP A # Imms for HEP A at Onset Counseled for HEP A
 History of HEP B Immunized for HEP B # Imms for HEP B at Onset Counseled for HEP B

Risk Factors
 IDU History IDU Last 12 Months IDU Counseling Provided IDU Counseling Date
 Alcohol History Current Alcohol Abuse Alcohol Counseling Provided Alcohol Counseling Date

Co-Morbidities
 Cirrhosis Decompensated Cirrhosis Liver Transplant Renal Dialysis
 Hepatitis B Chronic Kidney Disease Diabetes Type 2 Opioid History
 HIV Pregnant

Visits

Date of Visit	Facility Name	Provider
09/23/2013	Harborview	
09/27/2013	Harborview	
11/25/2013	Harborview	Cox-North, Paula ARNP
03/24/2014	Harborview	Cox-North, Paula ARNP
05/06/2014	Harborview	Leveque, Thellea MD
03/09/2015	Harborview	Cox-North, Paula ARNP
09/24/2015	Harborview	Cox-North, Paula ARNP
09/14/2016	Harborview	Cox-North, Paula ARNP

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Facesheet

Visit Information

Treatments

Regimen	Date Started	Date Stopped	Started?	Reason Not Started	Reason Stopped
LEDIPASVIR/SOFOSBUVIR 90-...	09/14/2016		Yes		

Add Treatment
Remove Treatment

Visit Details
Visit Assessment
Visit Treatment
Visit Notes

Treatment Details

Treatment Regimen: LEDIPASVIR/SOFOSBUVIR 90-400MG PEGINTERFER ALFA-2A 180MCG/0.5ML peginterferon alfa-2a ribavirin RIBAVIRIN 200MG sofosbuvir SOFOSBUVIR 400

Treatment Started: Yes Date Started: 09/14/2016 Reason Not Started:

Treatment Completed: Date Completed: Reason Treatment Not Completed:

Treatment Outcome:

Visits

Date of Visit	Facility Name	Provider
5/2/2016	SWEDISH FIRST HILL	SCOTT, JOHN D

Add Record
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Facesheet

Visit Information

Past Medical History

Up to date on vaccinations for Hepatitis A but not Hepatitis B. Patient was previously treated for HCV in 2009 but did not achieve SVR. Patient comes with a long list of medical conditions but with minimal detail about each.

Procedure codes-

NoOrderDat ^ 20130619 ^ 76705 ^ Ultrasound Abdomen ^ normal liver. mild aneurysmal dilation of proximal aorta 3.1 cm I20131205 ^ 20140114 ^ 76700 ^ Ultrasound, abdomen, B-scan/real time, c ^ renal cysts, no aneurysm I20140304 ^ 20140312 ^ 76700 ^ Ultrasound, abdomen, B-scan/real time, c ^ slight dilatation. Renal-no artery stenosis. I20150312 ^

Problem List

B18.2, I85.10, N18.1, J09.X1, B20, F33.1, I27.01. HIV stable.2. Hepatitis C chronic.3. History of depression, stable off meds.4. Hypertension, moderately controlled.

Assessment Notes

1. Human immunodeficiency virus, stable on Trizivir.2. Hepatitis C with stable transaminases.3. History of depression, stable off meds.4. Hypertension, moderately controlled on meds.

Plan Notes

Continue his current meds. I have counseled him today about injection drug and alcohol use. He will follow up with us in 4 weeks.

Visit Details

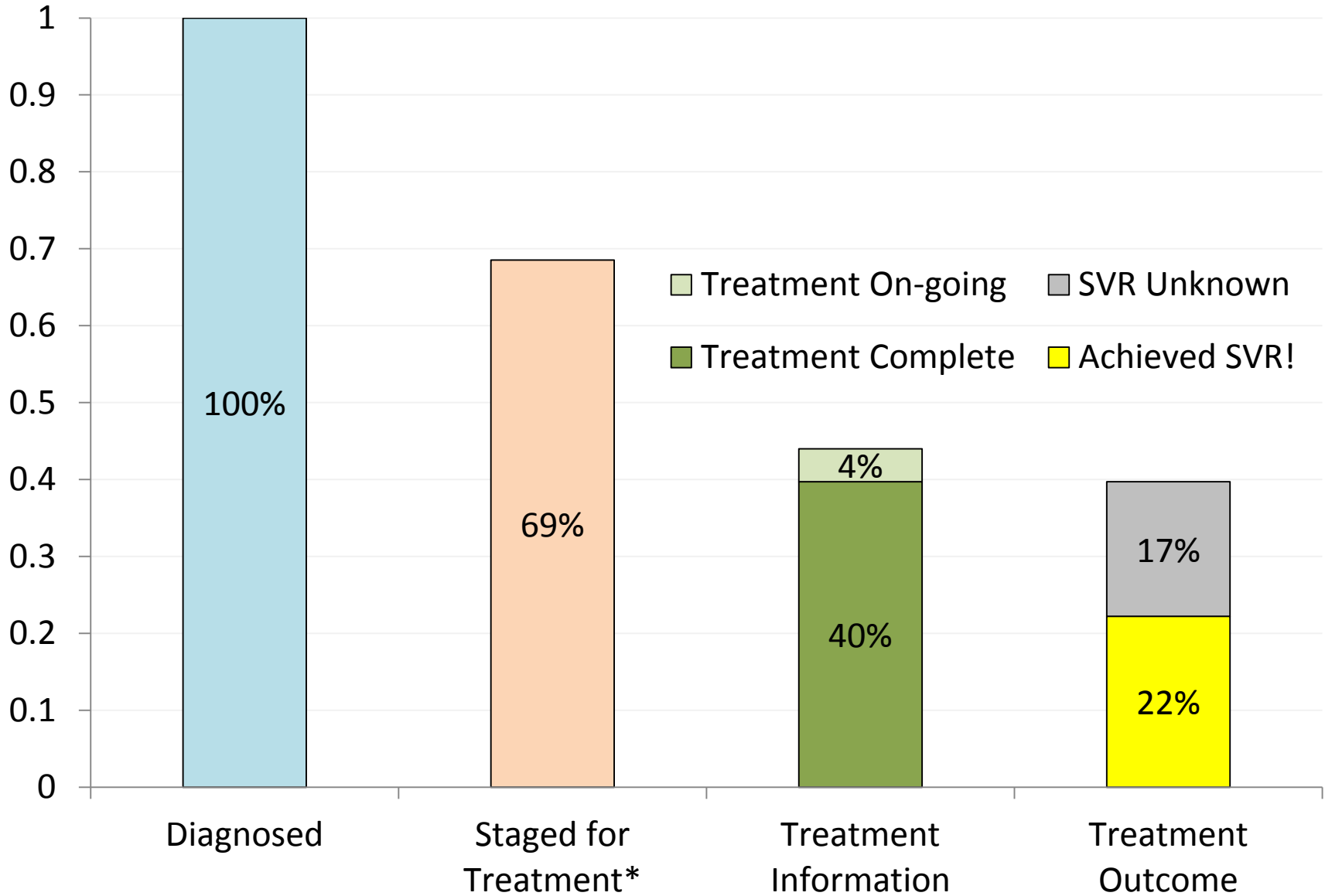
Visit Assessment

Visit Treatment

Visit Notes

Putting it all **together**...

Continuum of care for diagnosed HCV patients across all HCV-TAC partner sites, 9/30/2013 – 9/30/2017



*Genotype or fibrosis test

Challenges

Database redesign

- Time- and resource-intensive process; costly

Data integration

- High volume of input from ELR and EHR; requires significant time to de-duplicate ambiguous person matches without a unique patient key

Data extraction from EHRs

- Partners had a difficult time identifying patients of interest, and an even more difficult time assembling the data in the XML format we requested
- Partners can only report on what's captured in their EMRs – we have missing data on risk factors, co-morbidities, biopsy/fibrosan results, start/stop treatment dates
- Patients bounce around healthcare systems; records are scanned in (difficult to extract data), if available at all
- Free-text notes are hard to interpret

Data analysis

- Extensive recoding required to support analysis/surveillance needs

Acknowledgements

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Jeff Duchin (PI)
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Meaghan Munn
Atar Baer

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Harborview

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Further questions

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Atar Baer: atar.baer@kingcounty.gov

Agenda

1. **Introduction from NASTAD**
2. **Mass HIway:** Overview of the Massachusetts statewide HIE
3. **HealthInfoNet:** How the Maine HIE provides population health services, including supporting the surveillance, prevention & management of chronic diseases
4. **Examples of public health departments using data from EHRs or HIEs for Hepatitis C surveillance and programs:**
 - New York City Department of Health and Mental Hygiene
 - Public Health – Seattle & King County
5. **Open discussion:** Ways that public health departments may leverage EHRs and HIEs for Hepatitis C surveillance, prevention and management
6. **Conclusion**

Conclusion

Thank you!

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The Webinar Series & Technical Resources

- Querying Claim Databases for HCV Testing and Treatment
 - *With accompanying technical resource*
- Data Sharing Agreements 101: What Hepatitis Programs Need to Know
 - *With accompanying technical resource*
- Leveraging EHRs and HIEs for Hepatitis C Surveillance, Prevention and Management: Exploring Ways that Public Health Departments May Utilize These Resources
- *All resources from this series are available here:*
<https://www.nastad.org/informatics>

Resources

■ NASTAD Resources

- NASTAD primer on health systems data opportunities for HIV programs: [Connections: From Health Informatics to Improved HIV Outcomes](#)
- [NASTAD's Health Systems Integration Informatics Page](#)

■ Additional Health Systems Data Resources

- [HIV Health Improvement Affinity Group; HRSA, CDC, and CMS](#)
- [Health Information Technology and Informatics, NACCHO](#)
- [Public Health Informatics, ASTHO](#)
- [Joint Public Health Informatics Taskforce \(JPHIT\)](#)
- [Digital Bridge](#)