

# 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

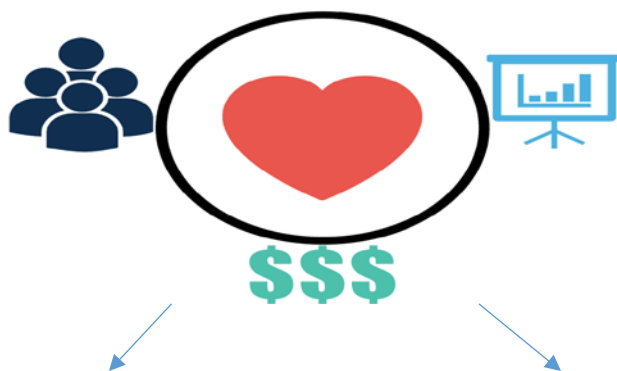
Audio by phone: 1 877 369 0926 (Toll Free)

Webinar ID: 921-559-291



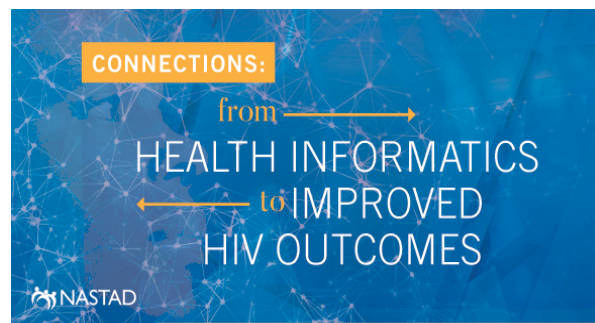
# Emerging Opportunities for Public Health and Health Systems Data

- 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

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- 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)

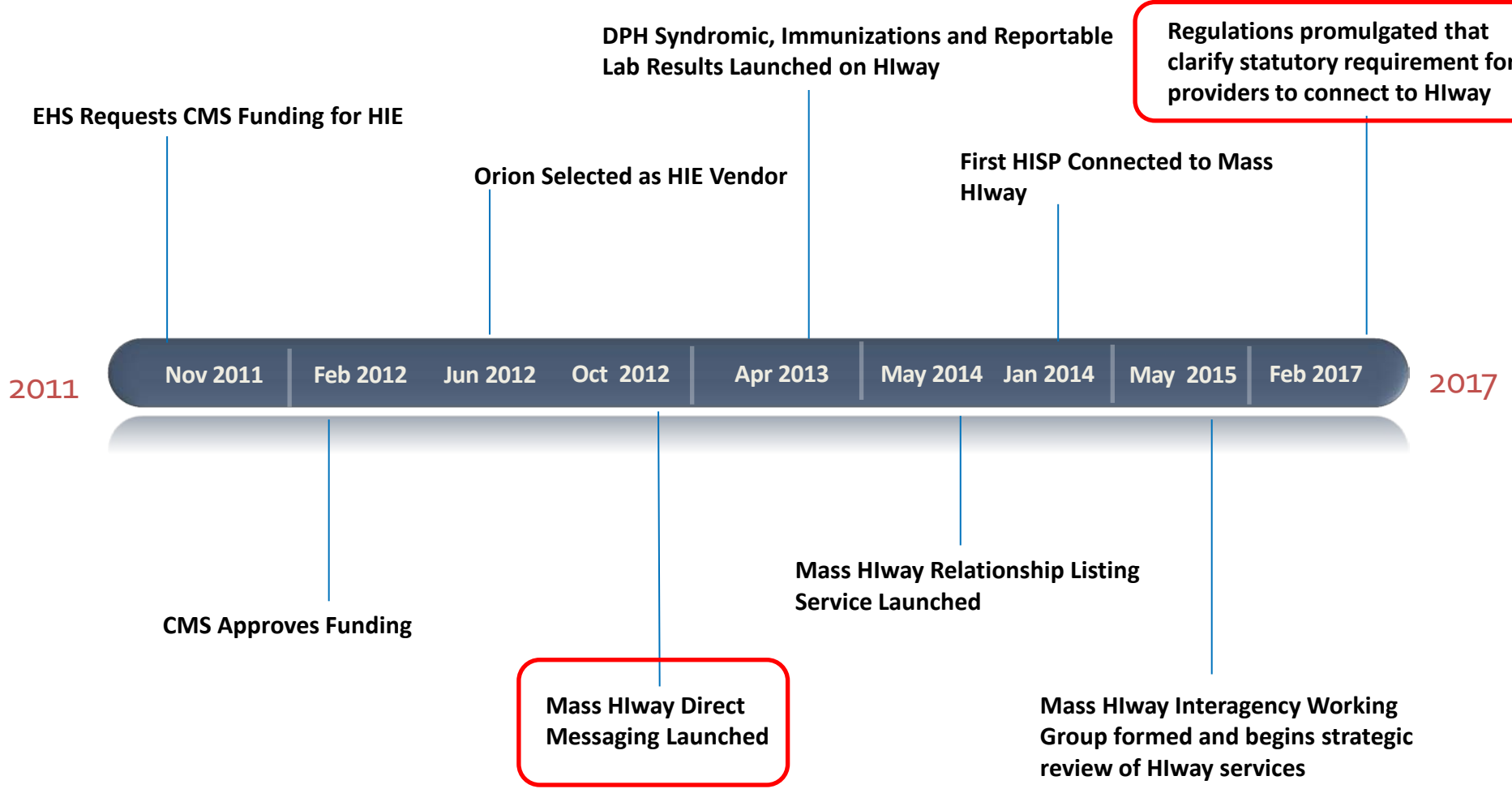
- **Health Information Exchange (HIE) is used both as a *noun* and as a *verb*:**
  - **As a verb:** HIE is the sharing of health-related information between two or more organizations
  - **As a noun:** an HIE is the organization that facilitates the exchange of health-related information between two 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)



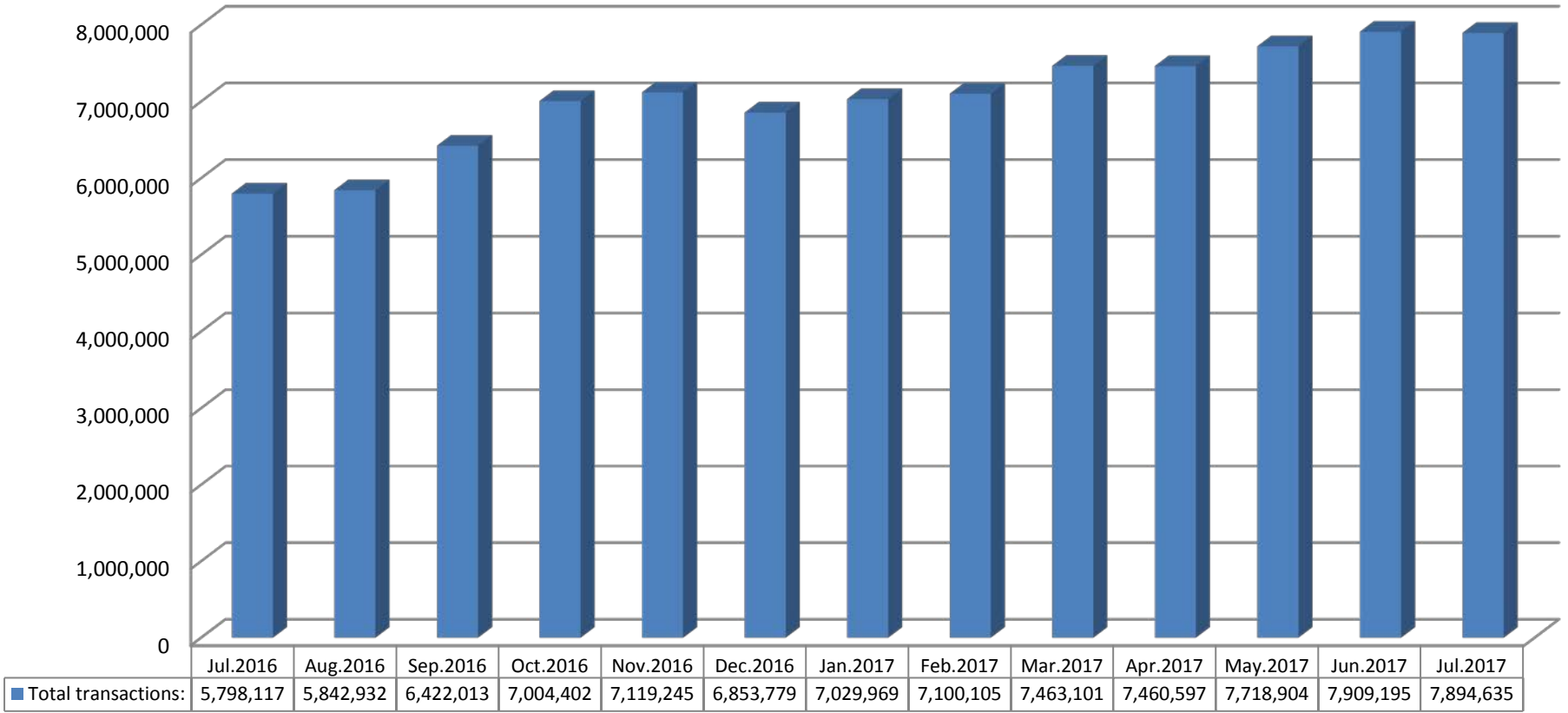
# HIway Transaction Activity



## 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



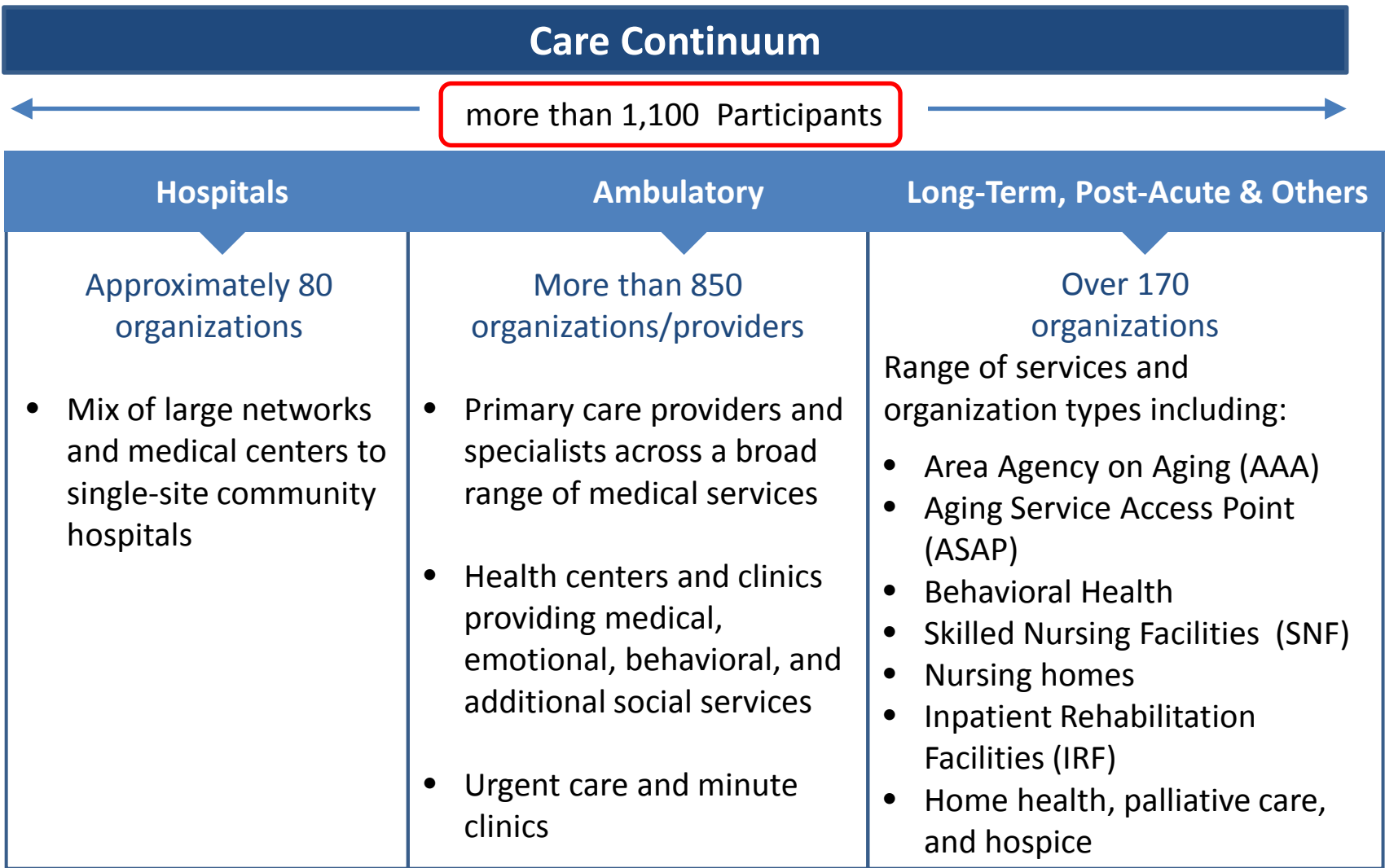
\* Note: Includes all transactions over Mass HIway, both production and test

\*\* Note: Reporting cycle is through the 20<sup>th</sup> 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.

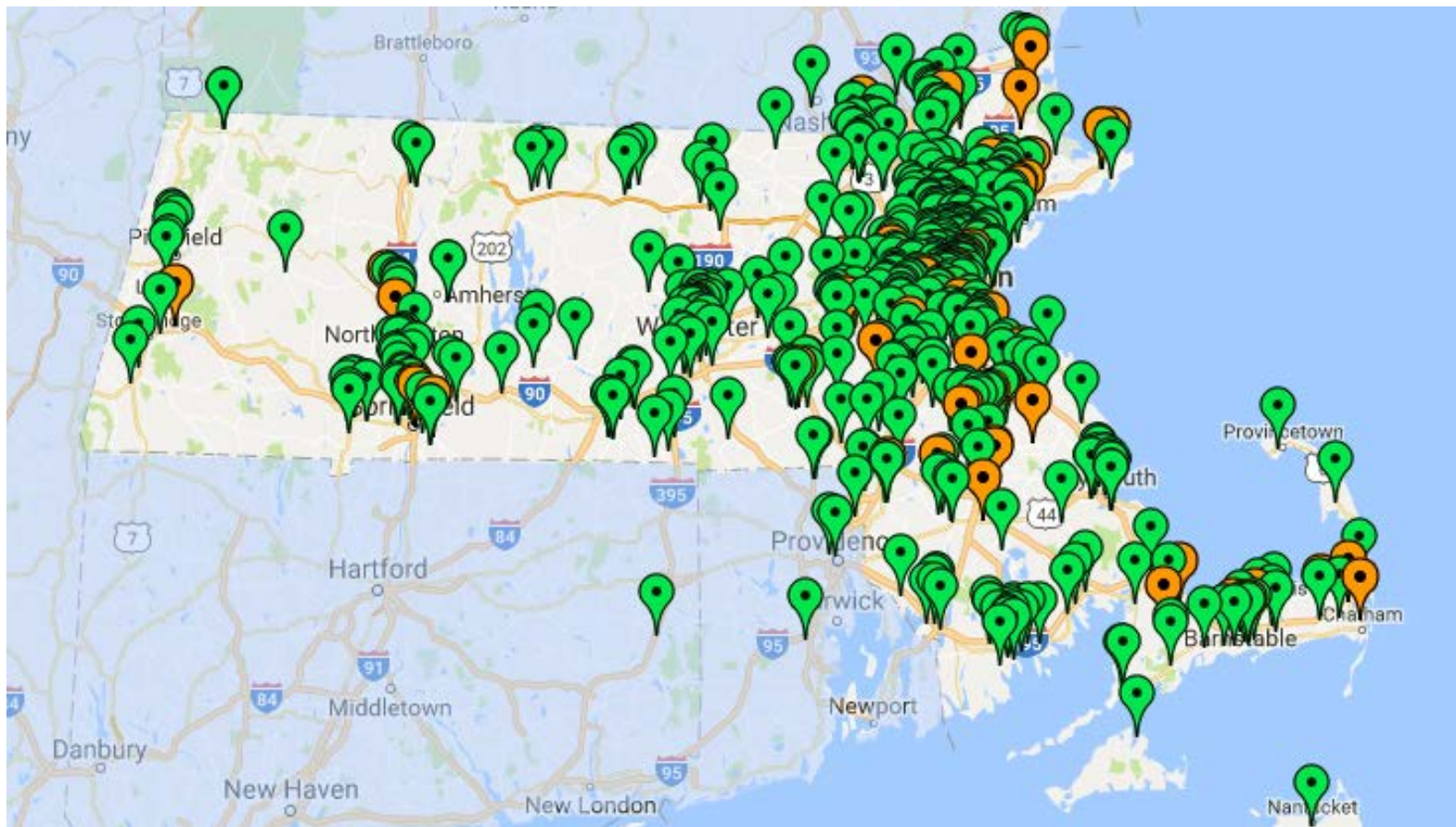


# Participant Map



**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](http://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



EHR connects directly



EHR connects through  
LAND Appliance



Browser access to  
webmail inbox

Vendor HISP

EHR connects through  
another HISP

## Deployment optionality

Direct - (SMTP + S/MIME)

Direct - SOAP Web Services

Direct - XDR TLS

Direct - XDR Double encryption

LAND - Directory Drop

LAND - Web Services

LAND - XDR Web Services

LAND - FTP Interface

LAND - HTTP Interface

Webmail

Webmail - SEE

HISP - Bi-lateral trust bundle

HISP - Direct Trust bundle

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

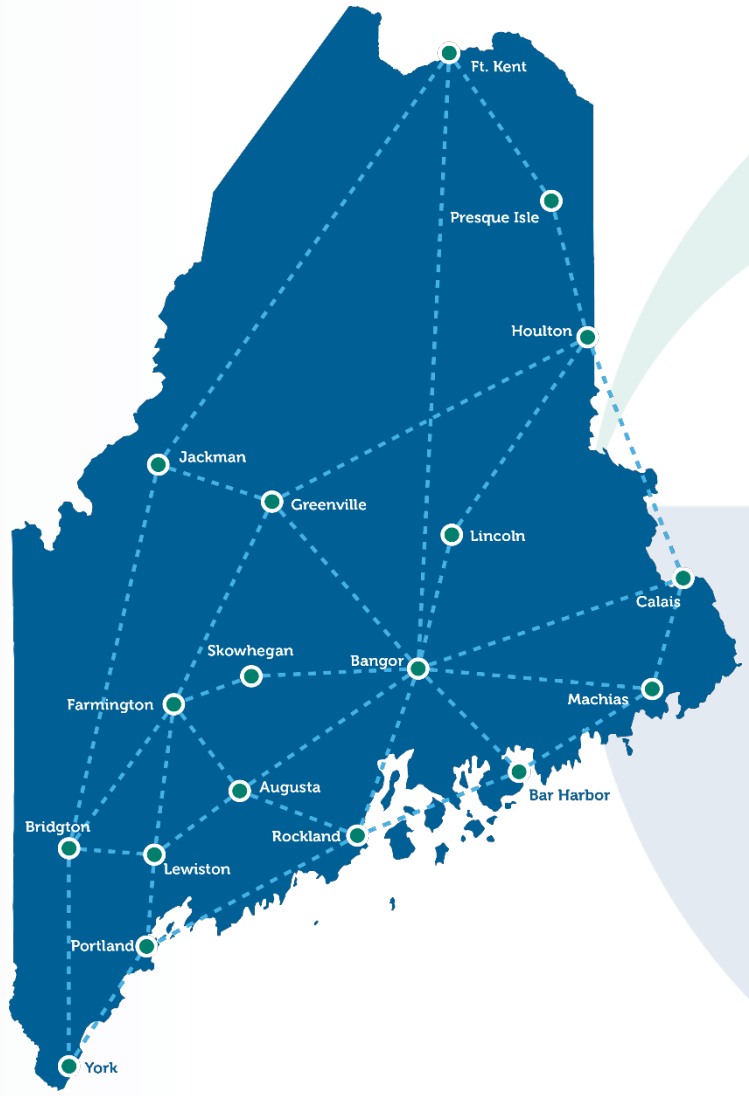
- ACO sends quality metrics to a payer
- Provider sends lab results to a payer
- Provider sends claims data to payer

#### 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.*



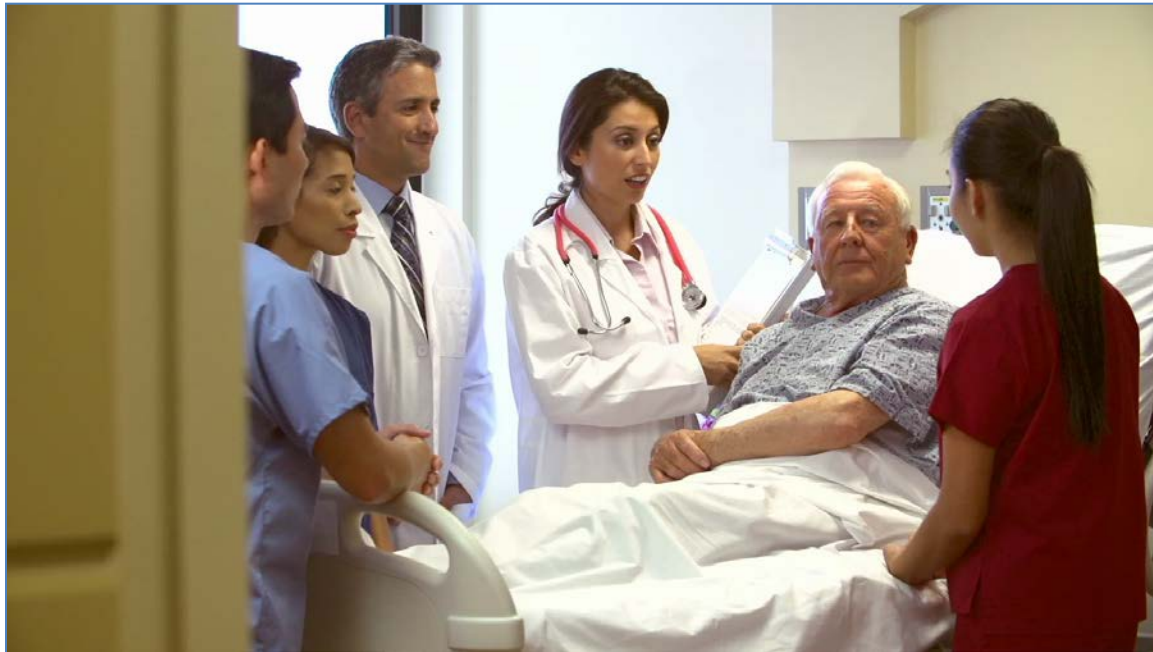
# Automated Laboratory Reporting

- 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

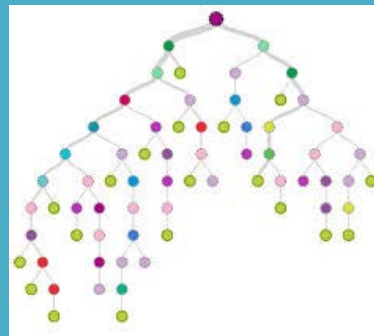
Risk Model Development

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

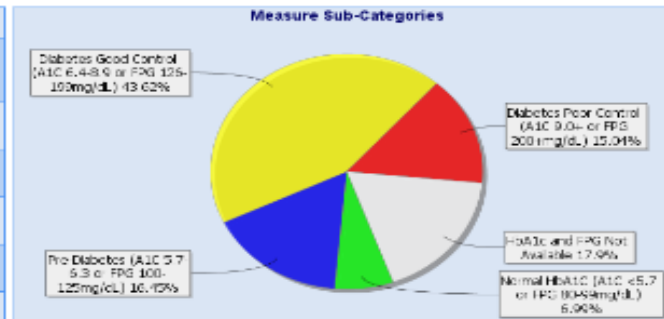
[View Map](#)

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
<b>NQF 59: Comprehensive Diabetes Care: Hemoglobin A1c or Fasting Plasma Glucose</b>	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

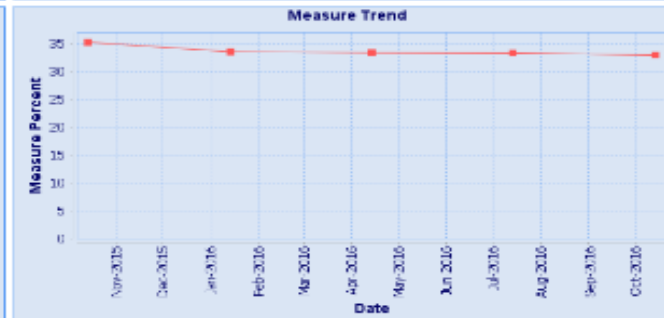
Patients 18-75 years of age by the end of the measurement year who had a diagnosis of diabetes (type 1 or type 2) during the measurement year or the year prior to the measurement year.

#### 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

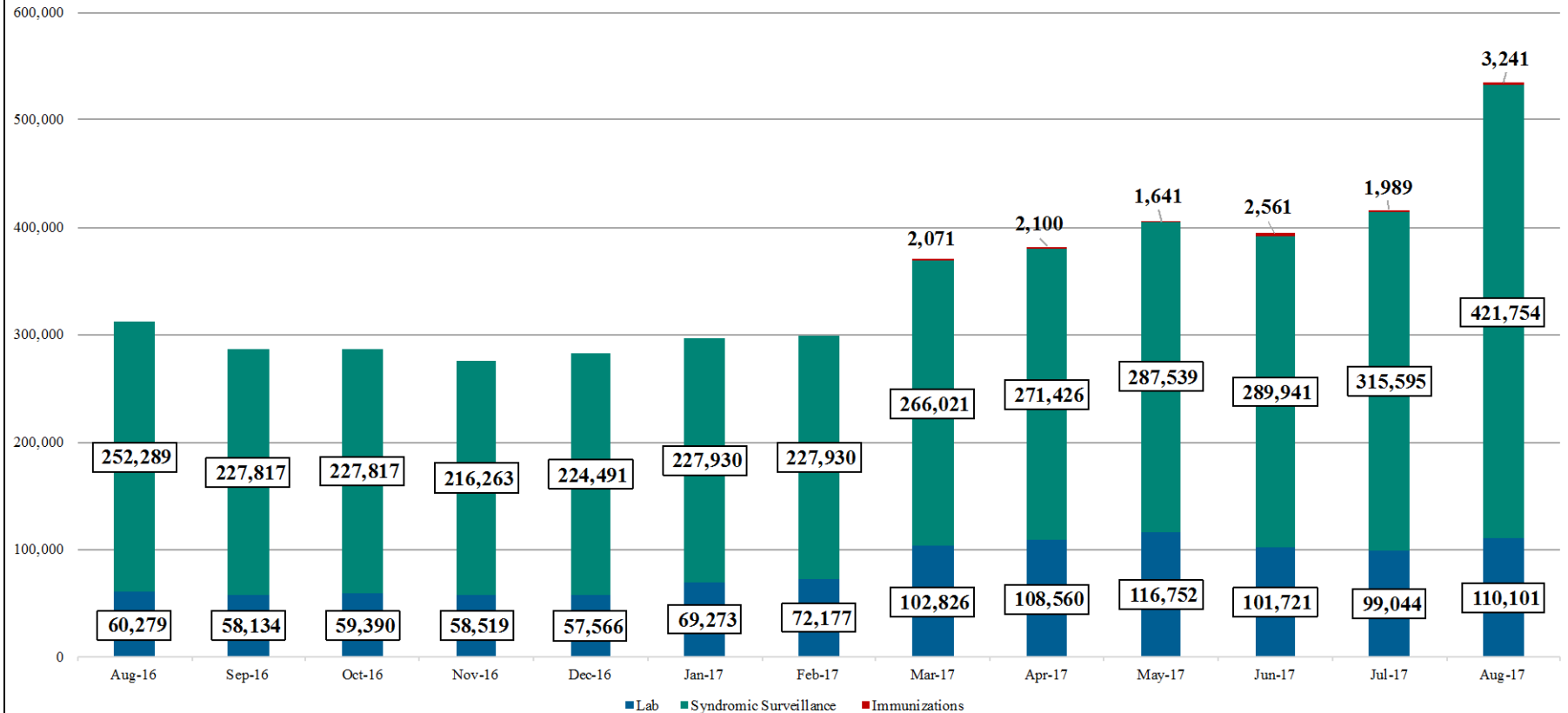


# Key Statistics

- **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

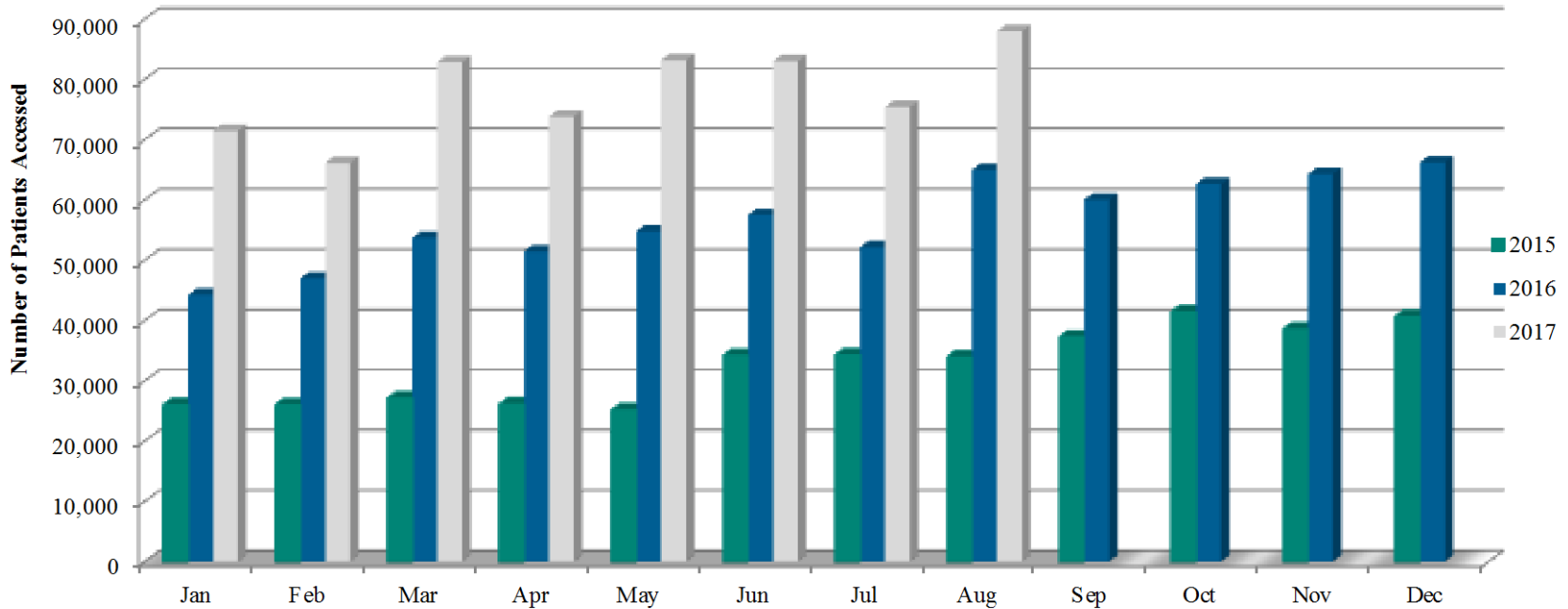
# Public Health Messages Last 12 mos.

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](http://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 <sup>(1,2)</sup>
  - 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 1<sup>st</sup> 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



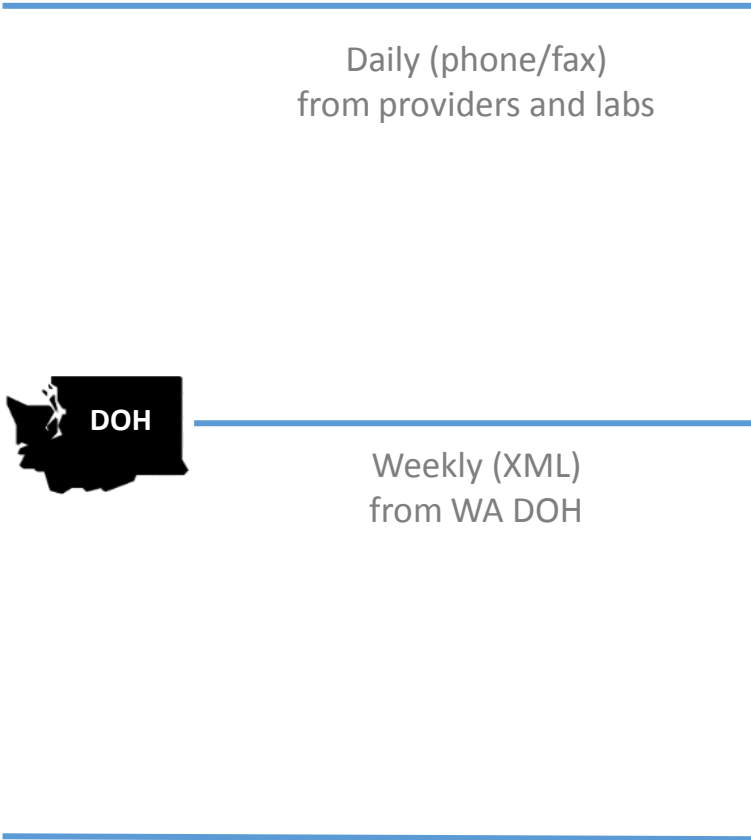
**Traditional reporting**



**ELR**



**EHR**



Daily (phone/fax)  
from providers and labs



Weekly (XML)  
from WA DOH

**Person deduplication and upload**



**Local surveillance database**

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

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

Add Record  
Remove Record  
Cancel Record  
Clone Record

Lab Order

Lab Name  Date Collected  Date Received   
 Patient ID 1  Patient ID 2  Patient ID 3   
 ID 1 Assigned By  ID 2 Assigned By  ID 3 Assigned By

Ordering Facility

Facility Name   
 Address  City  State  Zip Code  Phone

Ordering Provider

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

Testing

Requested Test  Result Test   
 Request Notes   
 Result Date  Result  Not Coded Result  Units   
 Reference Range  Abnormal Flag  Result Status   
 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

Facsheet

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  
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Close

Facesheet

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

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

Visit Treatment

Visit Notes

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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Remove Record  
Cancel Record

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Cancel  
Close  
  
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  
Remove Record  
Cancel Record

New  
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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**

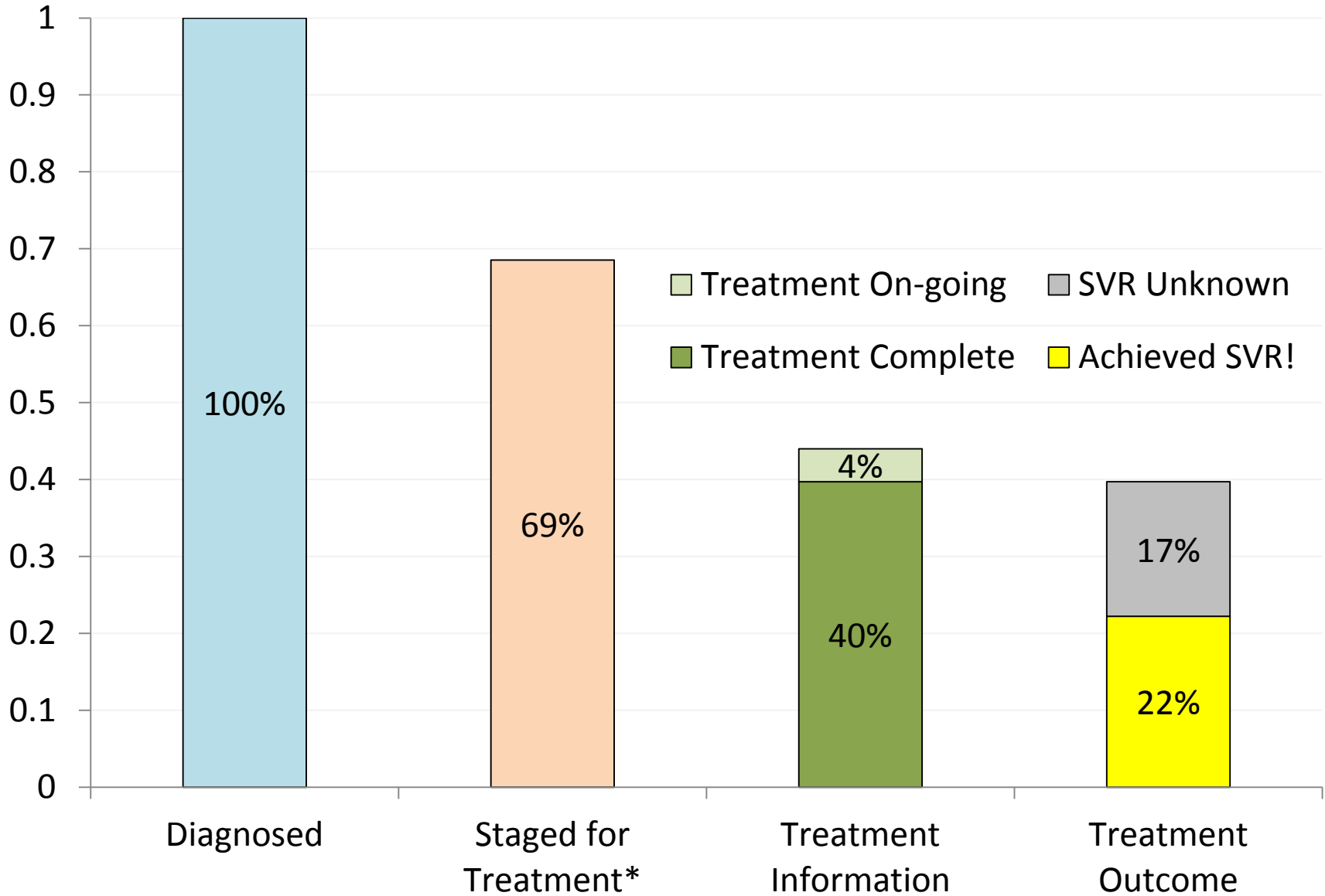
Continue his current meds. I have counseled him today about injection drug and alcohol use. He will follow up with us in 4 weeks.

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

## Public Health - Seattle & King County Test & Cure Team

Jeff Duchin (PI)  
Sara Glick  
Elizabeth Barash  
Meaghan Munn  
Atar Baer

## King County IT

Curt Drake  
Beth Sohlberg  
Casey Cassidy

## Clinical partners - technical leads

Scott Terry, Christine Fong, Steve Senter  
Harborview

Ron Johnson  
Kaiser Permanente (formerly Group Health  
Cooperative)

Yan Bai and Troy Hanninen  
Swedish/Providence

Adam Ledvina, Eric Grendell, Jerry Wilkinson  
Neighborcare, Country Doctor, HealthPoint

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## Further questions

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# 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!

## Contact information for today's presenters:

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# The Webinar Series & Technical Resources

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- 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

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## ■ 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](#)