

# Updated Hepatitis C Prevalence Estimates Webinar

July 17, 2024

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# Today's Speakers



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**Eric Hall, PhD, MPH**

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National Hepatitis C  
Elimination Plan



**Dan Church, MPH**

Senior Epidemiologist,  
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Viral Hepatitis  
Subcommittee Co-Chair,  
CSTE

# Agenda

Eric Hall, MPH on Estimating HCV Prevalence,  
United States, 2017-2020

Risha Irvin, MD, MPH on A National Initiative  
to Eliminate Hepatitis C in the United States

Dan Church, MPH on Hepatitis C Prevalence  
and Public Health Disease Surveillance

# CAMP Partners & Funding



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# Estimating HCV Prevalence, United States, 2017-2020

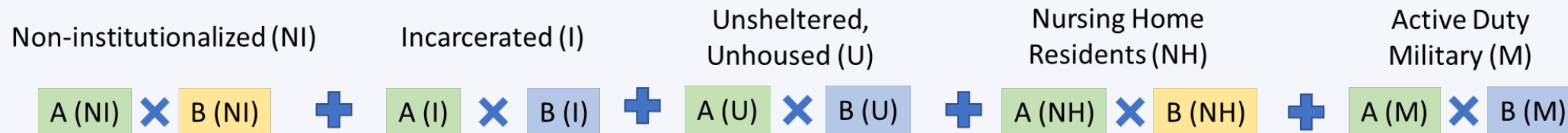
Eric Hall, PhD, MPH  
Assistant Professor,  
Oregon Health & Science University  
OHSU-PSU School of Public Health

# Previous Methodology

## Estimating Prevalence of Hepatitis C Virus Infection in the United States, 2013-2016

Megan G. Hofmeister,<sup>1,2</sup> Elizabeth M. Rosenthal,<sup>3</sup> Laurie K. Barker,<sup>1</sup> Eli S. Rosenberg,<sup>3</sup> Meredith A. Barranco,<sup>3</sup> Eric W. Hall,<sup>4</sup> Brian R. Edlin,<sup>5</sup> Jonathan Mermin,<sup>5</sup> John W. Ward,<sup>1,6</sup> and A. Blythe Ryerson<sup>1</sup>

**Objective:** Estimate anti-HCV and HCV RNA prevalence among US adults 18+ years of age.



Where A=population size and B=prevalence estimate

Published estimate or calculated from estimate

NHANES

Meta-analysis

**TABLE 4. Estimated Population Sizes and Hepatitis C Prevalences Among Adults Aged ≥18 Years, United States 2013-2016**

Population	Estimated Adult Population Size*	HCV Antibody Prevalence				HCV RNA Prevalence			
		Number of Ever Infected Persons <sup>†</sup>		Prevalence		Number of Currently Infected Persons <sup>†</sup>		Prevalence	
		Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
NHANES <sup>‡</sup>	241,152,600	3,721,000	(3,094,000-4,434,800)	1.5%	(1.3%-1.8%)	2,139,000	(1,794,200-2,529,700)	0.9%	(0.7%-1.0%)
Additional populations									
Incarcerated	2,131,000	344,100	(308,800-382,500)	16.1%	(14.5%-17.9%)	227,400	(201,900-255,600)	10.7%	(9.5%-12.0%)
Unsheltered homeless	160,600	23,700	(20,300-27,100)	14.7%	(12.7%-16.9%)	17,400	(14,400-20,500)	10.8%	(8.9%-12.8%)
Active-duty military	1,288,600	13,500	(8,000-18,100)	1.0%	(0.6%-1.4%)	6,900	(2,700-11,200)	0.5%	(0.2%-0.9%)
Nursing homes	1,425,500	18,900	(11,700-21,000)	1.3%	(0.8%-1.5%)	6,900	(4,600-9,300)	0.5%	(0.3%-0.7%)
Additional populations (subtotal) <sup>§</sup>	5,005,700	400,100				258,600			
NHANES (modified estimate excluding additional populations) <sup>§</sup>	239,864,100	3,701,100	(3,077,500-4,411,100)	1.5%	(1.3%-1.8%)	2,127,600	(1,784,600-2,516,200)	0.9%	(0.7%-1.0%)
Total <sup>§</sup>	244,869,800	4,101,200	(3,357,700-4,861,100)	1.7%	(1.4%-2.0%)	2,386,100	(1,983,900-2,807,800)	1.0%	(0.8%-1.1%)

\*Population sizes are estimated as of December 2016 based on the ACS 5-year estimates from 2012-2016.

<sup>†</sup>Number of infected persons is calculated by multiplying the prevalence percentage estimate by the estimated adult population size; values may not multiply due to rounding.

<sup>‡</sup>NHANES prevalence percentage estimates are based on results from 2013-2016 NHANES. Population size includes noninstitutionalized adults eligible for NHANES from the 2012-2016 ACS.

<sup>§</sup>Values may not sum to column subtotal and total due to rounding.

# Previous Limitations and Updates

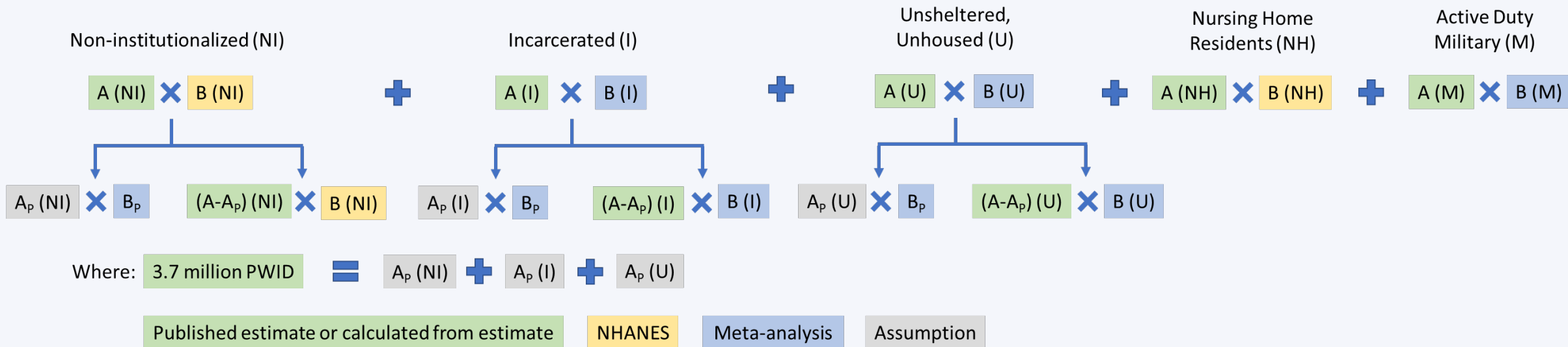
- Outdated data
  - NHANES data: 2013-2016
  - Population size estimates: 2016
  - Prevalence data from literature published 2013 through 2017
- Persons who inject drugs (PWID) are not adequately represented in NHANES.
  - Likely underrepresentation of the true number of PWID in sampling frame
  - HCV prevalence among PWID in NHANES may not reflect HCV prevalence among all non-institutionalized PWID.



# Our Approach

1. Replicate previous methodology with more recent data: *NHANES+ Model*
  - NHANES 2017-March 2020 dataset
  - Most recent population size estimates for additional populations
  - New literature searches and meta-analyses for HCV prevalence studies among additional populations published since January 1, 2017
2. Develop a method to better reflect infections among PWID: *PWID Adjustment Model*
  - Newly available data:
    - Estimated number of PWID in US: 3.7 million (Bradley 2022)
    - HCV RNA prevalence among PWID: 43.7% (Degenhardt 2023)
    - Anti-HCV prevalence among PWID: 53.5% (Degenhardt 2023)

# PWID Adjustment Model



Key assumptions for PWID adjustment model:

- Number of PWID=3,694,500 (95% CI: 1,872,700 - 7,273,300)
- PWID are distributed across non-institutionalized, incarcerated or unsheltered/unhoused populations.
- 10.6% of incarcerated and 7.4% of unsheltered/unhoused are PWID (relaxed in sensitivity analyses).

## Estimating hepatitis C prevalence in the United States, 2017–2020

Eric W. Hall<sup>1</sup> | Heather Bradley<sup>2</sup> | Laurie K. Barker<sup>3</sup> | Karon C. Lewis<sup>3</sup> |  
 Jalissa Shealey<sup>2</sup> | Eduardo Valverde<sup>4</sup> | Patrick Sullivan<sup>2</sup> | Neil Gupta<sup>3</sup> |  
 Megan G. Hofmeister<sup>3</sup>

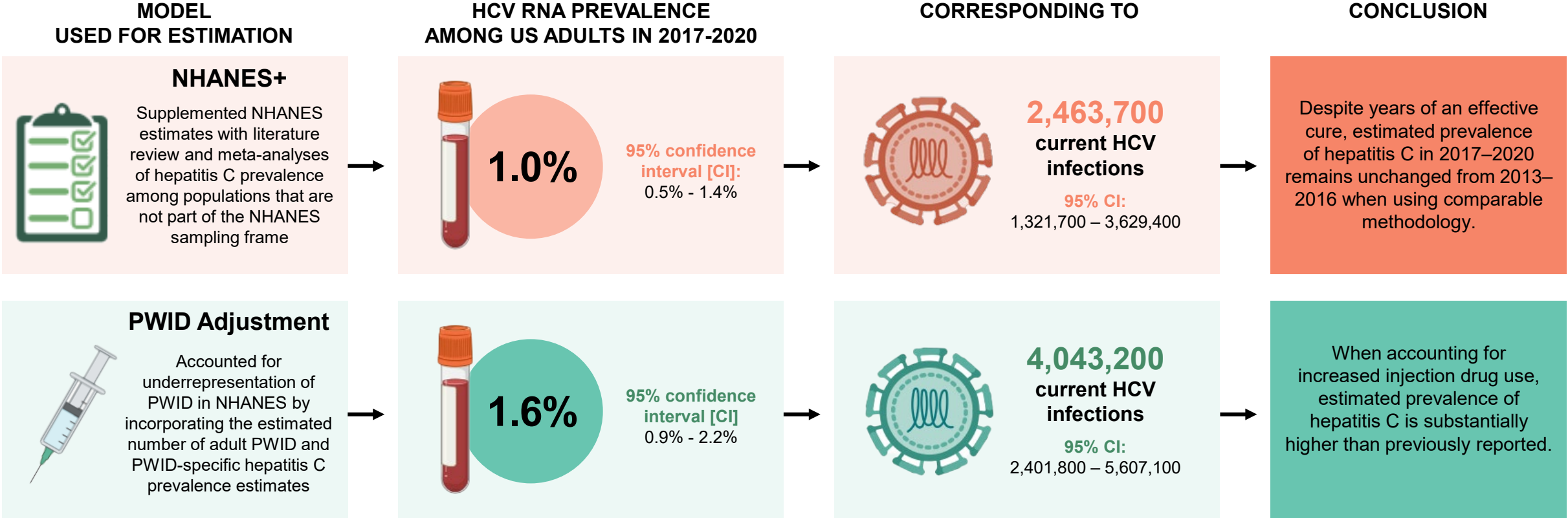
**TABLE 4** Estimated hepatitis C prevalence among adults  $\geq 18$  years of age, United States

Model	Years	N	n	95% CI	%	95% CI		
HCV Antibody								
Hofmeister et al 2018 <sup>[6]</sup>	2013–2016	244,869,800	4,101,200	3,357,700	4,861,100	1.7	1.4	2.0
NHANES+	2017–2020	254,207,169	5,556,400	3,519,100	7,688,100	2.19	1.38	3.02
PWID adjustment	2017–2020	254,207,169	7,411,300	4,917,200	9,979,700	2.92	1.93	3.93
HCV RNA								
Hofmeister et al 2018 <sup>[6]</sup>	2013–2016	244,869,800	2,386,100	1,983,900	2,807,800	1.0	0.8	1.1
NHANES+	2017–2020	254,207,169	2,463,700	1,321,700	3,629,400	0.97	0.52	1.43
PWID adjustment	2017–2020	254,207,169	4,043,200	2,401,800	5,607,100	1.59	0.94	2.21

*Note:* PWID adjustment results assume 10.6% of incarcerated and 7.4% of unsheltered and unhoused are people who inject drugs.  
 Abbreviation: PWID, persons who injected drugs (in the past year).

# Estimating Hepatitis C Prevalence in the United States, 2017-2020

The National Health and Nutrition Examination Survey (NHANES) underestimates the true prevalence of hepatitis C virus (HCV) infection. By accounting for populations inadequately represented in NHANES, we created two models to estimate the national hepatitis C prevalence among US adults during 2017–2020.



# Partners and Acknowledgements

## CAMP Collaborators:

- Heather Bradley, Emory University
- Patrick Sullivan, Emory University
- Jalissa Shealey, Emory University
- Monica Trigg, Emory University

## CDC Collaborators:

- Megan Hofmeister, DVH
- Neil Gupta, DVH
- Laurie Barker, DVH
- Karon Lewis, DVH
- Eduardo Valverde, NCHHSTP

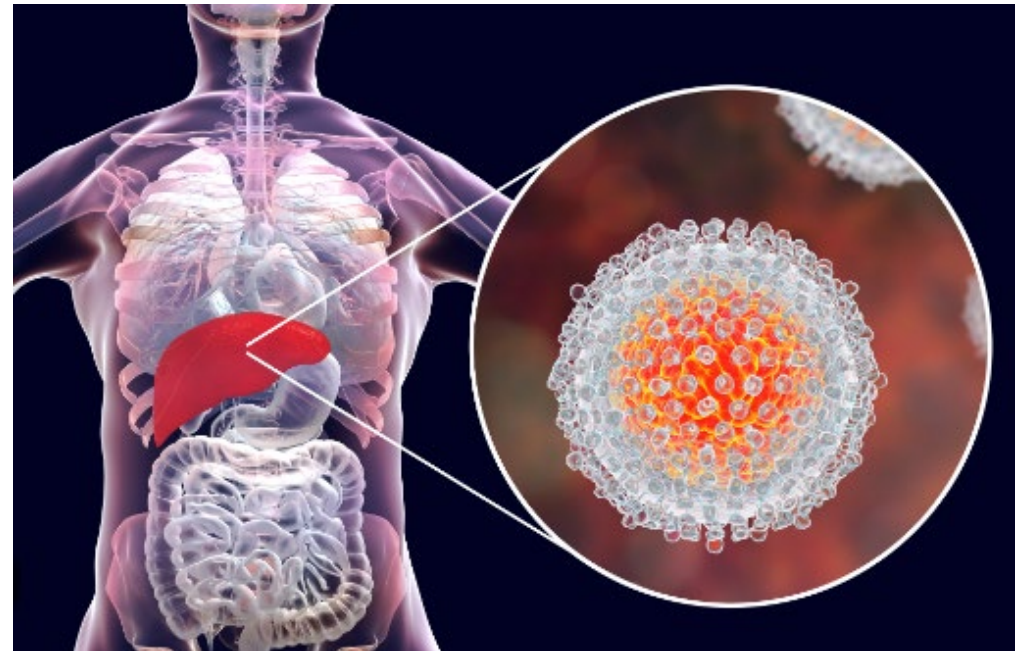
**Questions or Comments:**

Eric Hall  
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# *A National Initiative to Eliminate Hepatitis C in the United States*

**Risha Irvin, MD, MPH**

**Team: Francis Collin, MD, PhD; Rachael Fleurence,  
PhD; Josh Sharfstein, MD**



# Components of the National Initiative on Hepatitis C

## 1) Point-Of-Care (POC) diagnostic tests

- Enable hepatitis C **single-visit “test and treat”** programs to enhance cascade of care
- Obtain FDA approval of fingerstick test already in use in Australia and Europe



## 2) Provide broad access to curative hepatitis C medications

- **National subscription “Netflix” model** (successfully piloted in Louisiana)
- Fixed sum for drug access negotiated by the US Government
- Drugs then provided for free to Medicaid, uninsured, incarcerated, opioid treatment programs, Native American reservations



## 3) Empower health care delivery

- **Expand screening settings**, including correctional settings, opioid treatment programs
- Employ innovative telehealth methods, mobile units
- Expand number of community health workers



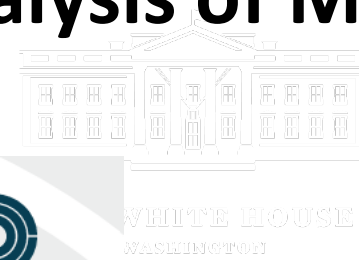
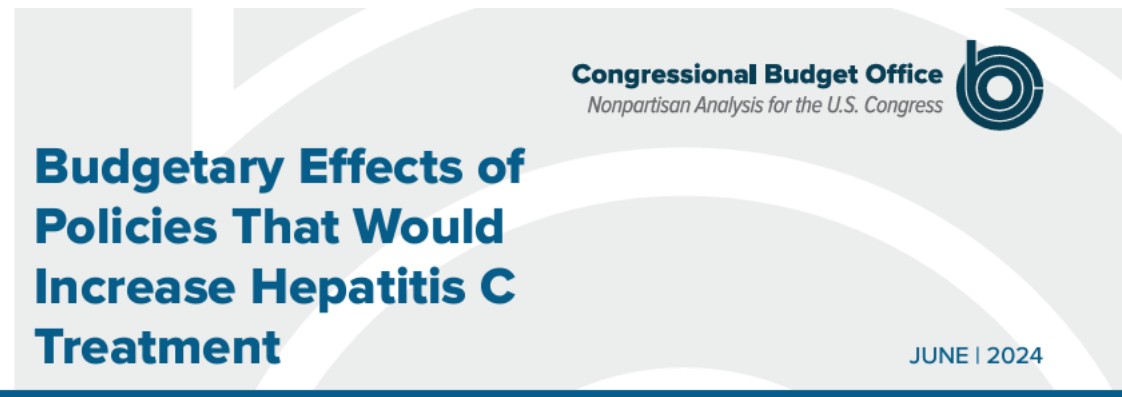


## Status of the National Initiative to Eliminate Hepatitis C

- ✓ Proposed by the **Administration** March 2023
- ✓ Strong **federal agency support** (HHS and Bureau of Prisons)
- ✓ Detailed five-year **implementation plan** prepared
- ✓ Advocates organized: **>126 organizations** have signed letter to Hill leadership
- ✓ **Legislation** developed by Senators **Cassidy (R-LA)** and **Van Hollen D-MD)**
- ✓ **Bipartisan Congressional** interest, including from Leadership
- ✓ **OACT and CBO** predict potential cost savings in 10 years – significant reduction in liver fibrosis, cirrhosis, liver cancer, need for transplants



## CBO publishes initial analysis of Medicaid cost savings



**CBO estimates that a 100% increase in Medicaid enrollees treated for Hepatitis C would reduce federal spending on health care by \$7 billion over 10 years.**

### Summary

In this report, the Congressional Budget Office describes its initial analysis of the potential federal budgetary effects of policies that would increase treatment of hepatitis C, a

treatment rate among Medicaid enrollees during a five-year program would result in averted spending on treatment of complications from hepatitis C of about \$0.7 billion over 10 years; spending on testing and treatment would increase by \$0.5 billion over

**With availability of point-of-care test, implementation of subscription model, and empowerment of healthcare delivery**

**We believe a 200 percent increase is entirely achievable**



**Massachusetts Department of Public Health**

# **Hepatitis C Prevalence and Public Health Disease Surveillance**

July 17, 2024

**Daniel Church, MPH**

**Senior Epidemiologist, MDPH**

**Viral Hepatitis Subcommittee Co-Chair, CSTE**

# Hepatitis C Virus (HCV) Disease Surveillance and Measurement of Prevalence

- Accurate HCV prevalence estimates are essential for improving understanding of how elimination can be achieved nationally and in local jurisdictions
- Current national HCV surveillance infrastructure is inadequate in most cases to fully measure prevalence
- However, public health disease surveillance can support localized prevalence estimates and is essential for implementation of control measures to achieve HCV elimination

# HCV Prevalence and Public Health Surveillance

- Even with current limitations, the number of reported cases nationally has been high
  - 93,805 newly reported chronic cases in 2022 alone (CDC, 2024)
- Past HCV prevalence estimates, primarily based on NHANES data, have not aligned with data reported to public health departments which typically report higher numbers of reported cases
  - Example: In 2016, the total number of reported cases in Massachusetts was approximately 3 times the NHANES prevalence estimate
- Estimates by Hall, et al, 2024, address underlying problems with prior estimates by considering both people excluded from NHANES, and those who meet inclusion criteria but are less likely to participate in the survey
- The authors address current limitations of public health surveillance for measuring prevalence

# HCV surveillance limitations

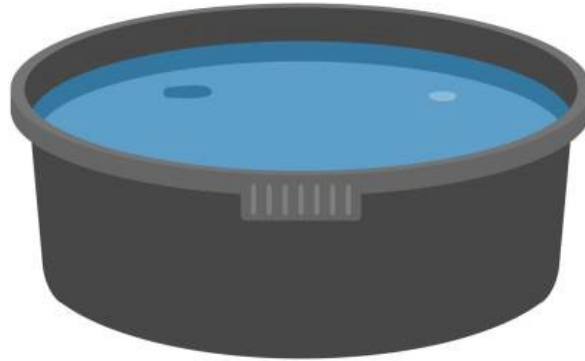
- As detailed in Hall, et al, 2024, funding for HCV surveillance is very limited – this results in missed opportunities to link patients to care and to obtain complete data
- Many but not all jurisdictions require reporting of negative HCV RNA test results
- Results of newly approved point-of-care HCV RNA tests will be challenging to capture in surveillance systems
- Case counts only include those individuals who received care, were tested for HCV, and reported to the state or local health department

# HCV Surveillance

- State and Local Public Health Departments have attempted to address the need for improved HCV prevalence data by revising case classifications and prioritization of investigations
- Case classifications for nationally notifiable conditions are developed in collaboration with CDC subject matter experts and approved by the Council of State and Territorial Epidemiologists
- Current HCV case classifications were implemented in 2020 and increased sensitivity of acute case capture and focused on cases with evidence of current infection and thus improved measurement of reported case prevalence

# The Task of HCV Surveillance

- New/acute infections
  - Injection drug use
  - Health care exposures
  - Re-infections
  - Perinatal transmission



- Prevalence



- Treatment
- Spontaneous clearance
- Death
- Outmigration

Health equity considerations throughout

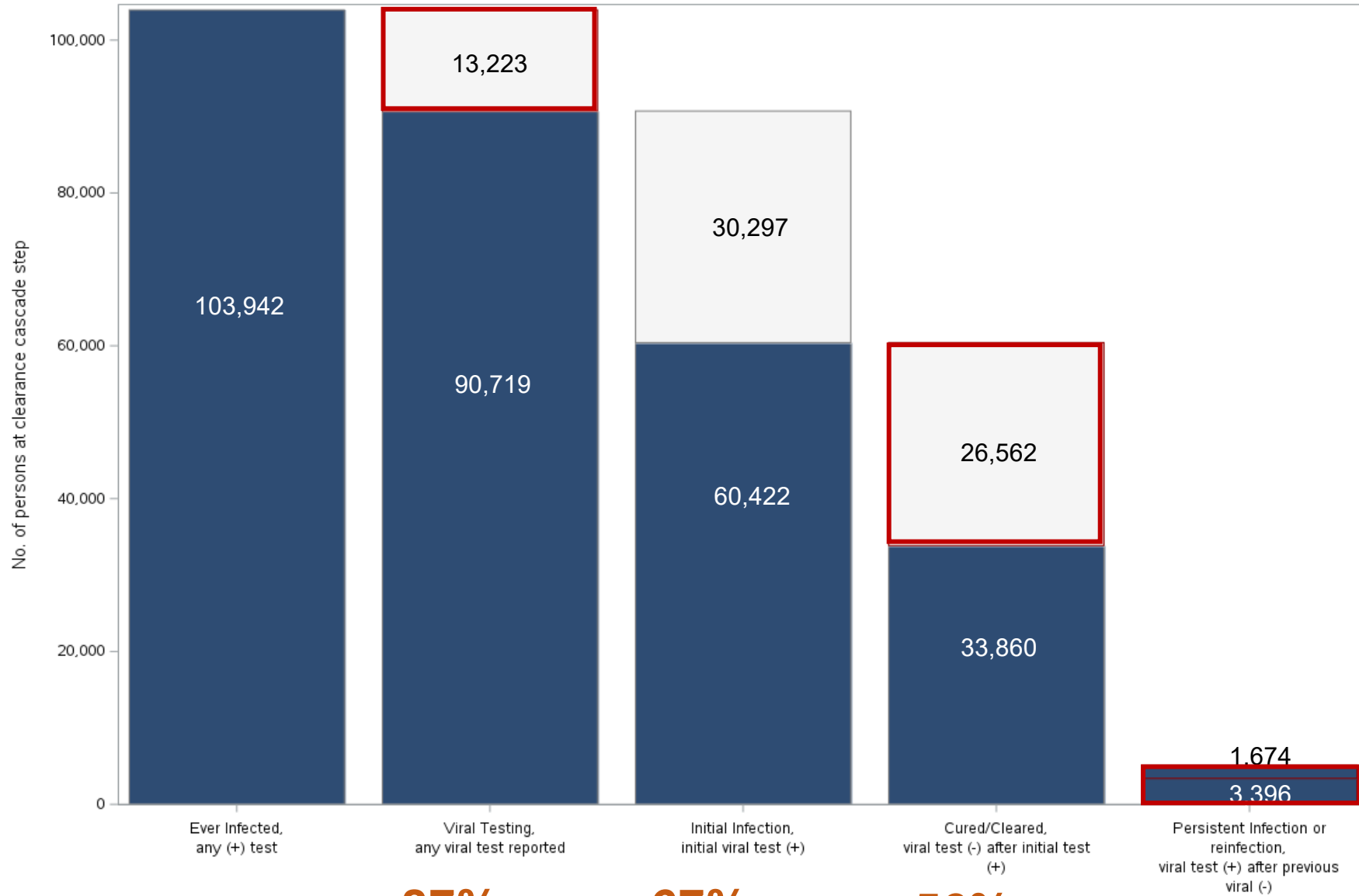
# HCV Surveillance Opportunities

With adequate funding...

- Obtain and analyze population-based data including demographic, lab test, clinical, and risk history data
- Identify chronic HCV cases that need to be linked to additional testing and/or treatment
- Identify clusters of acute HCV cases and target control measures
- Prioritize populations for testing/linkage services, focus on health equity
- Develop local and regional prevalence estimates
- Determine co-infection prevalence (HBV, HIV, etc.)
- Evaluate efforts to eliminate HCV infection



# Laboratory-based Hepatitis C Virus Clearance Cascade, Massachusetts, 2014-2022



**87%**  
of people ever infected had a confirmatory test

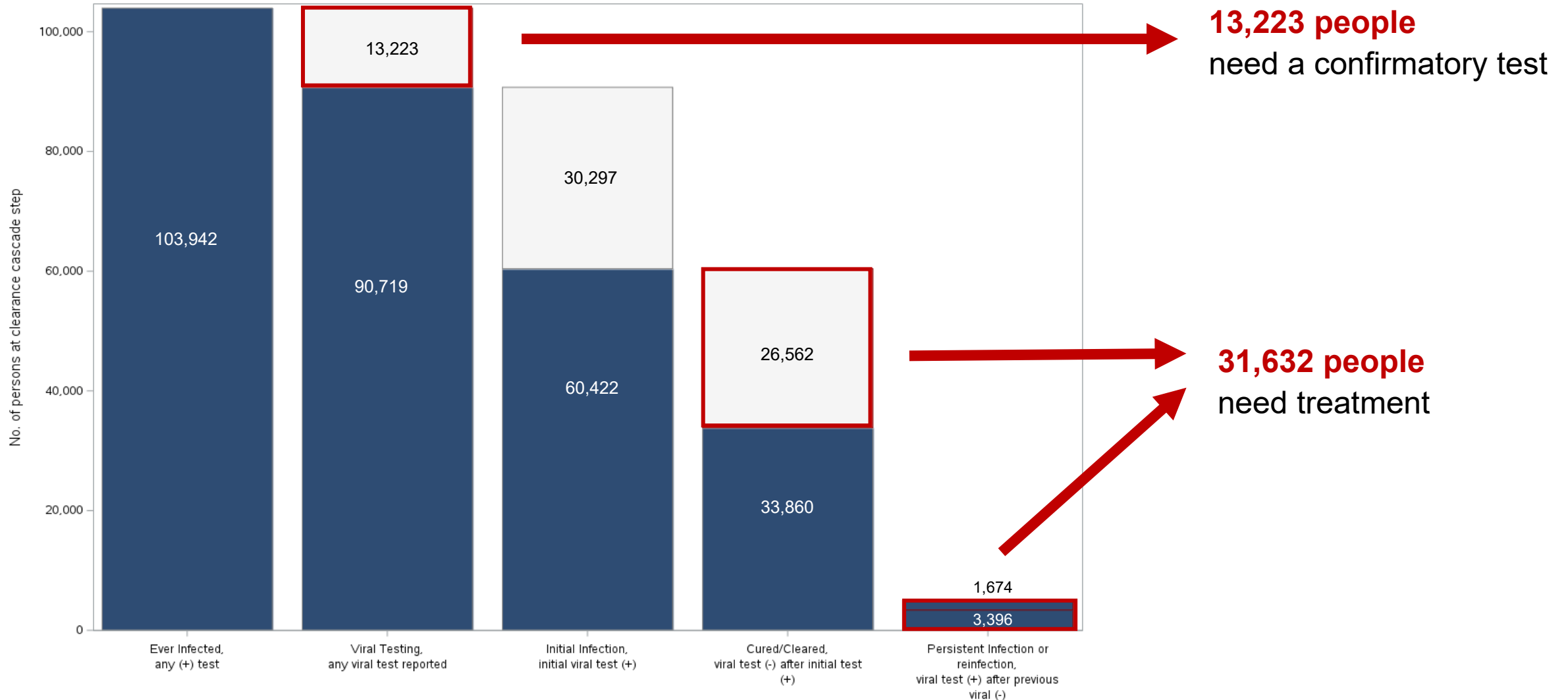
**67%** of those with a confirmatory test resulted positive (initial infection)

**56%** of those testing positive cleared infection

**8%** later had a persistent infection or reinfection

Schubert, et al, 2024  
Data as of 11/2023 and subject to change

# Data to Care Opportunities



# Where to?

- **Strengthening surveillance & surveillance policy**

- Not just what we know, but...

- How well we know it.

- Also assessing what we don't know.

- Ensuring reporting mechanisms for novel diagnostics, including point-of-care RNA tests

Validation of data streams

Gauge denominators

- ESTIMATE PREVALENCE
- Negative reporting
- Claims data

Improved ascertainment of race/ethnicity

# Looking Ahead

- As incidence and prevalence decrease, timely diagnosis and follow-up with individuals with HCV infection will become more challenging by targeting those less likely to be engaged in care and at higher risk of reinfection
  - Best achieved with population-based surveillance data, including individual case investigations with linkage to care.
- Assess state and local surveillance data in contrast to national prevalence estimates – what is being missed and best means to address those needs
- Will have to: continue to think of new and creative strategies, evaluate them, and adapt



# Discussion and Q&A

Moderated by Heather Bradley, Ph.D

Associate Professor, Department of  
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