Hepatitis C in 2023: Where Do We Go from Here?

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Section of Infectious Diseases

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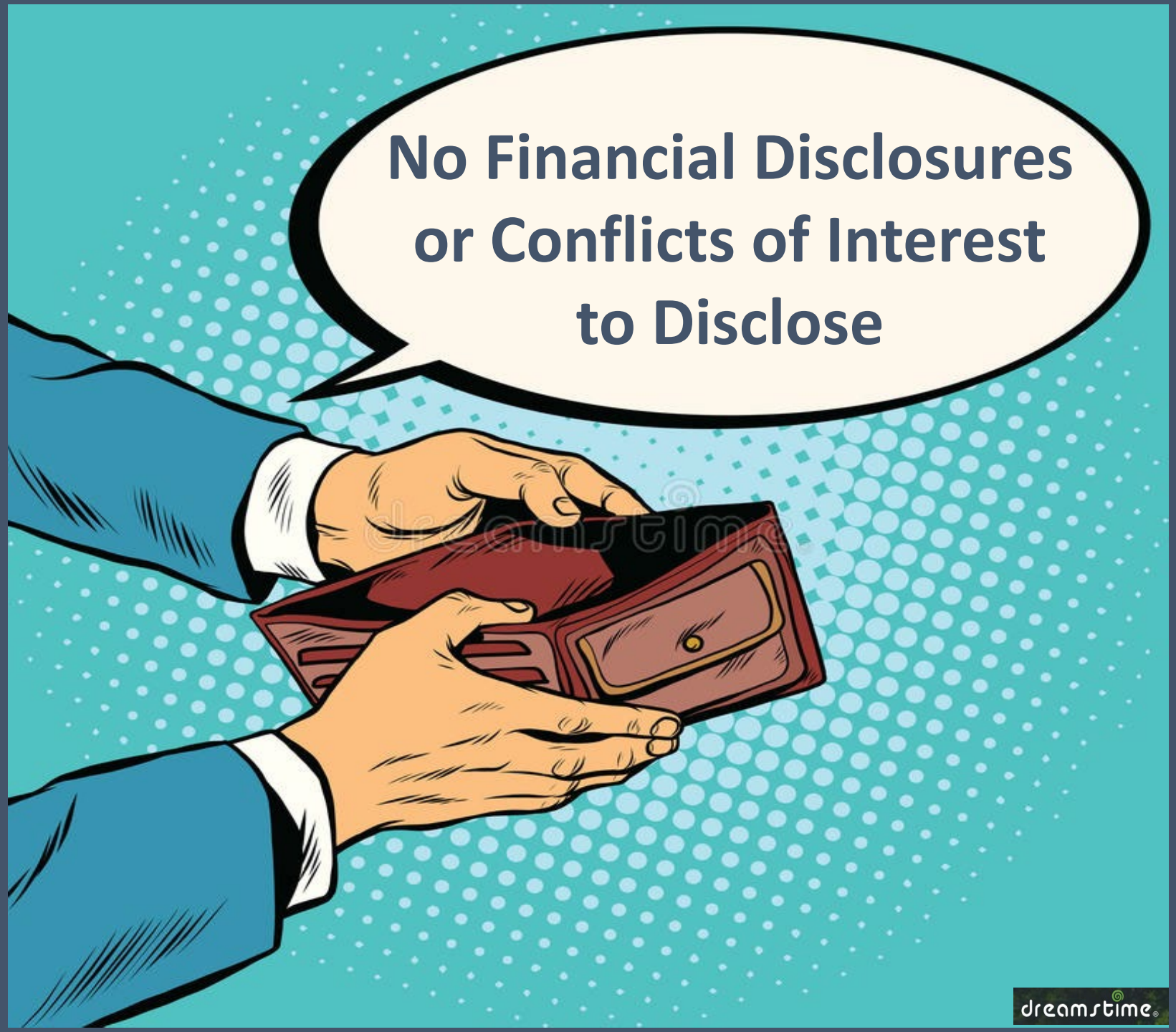
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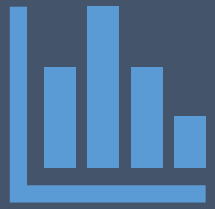
dreamstime

Agenda:

Look Back @ the Accomplishments of Last Decade

Current Treatment Strategies

2030 WHO Targets for Elimination

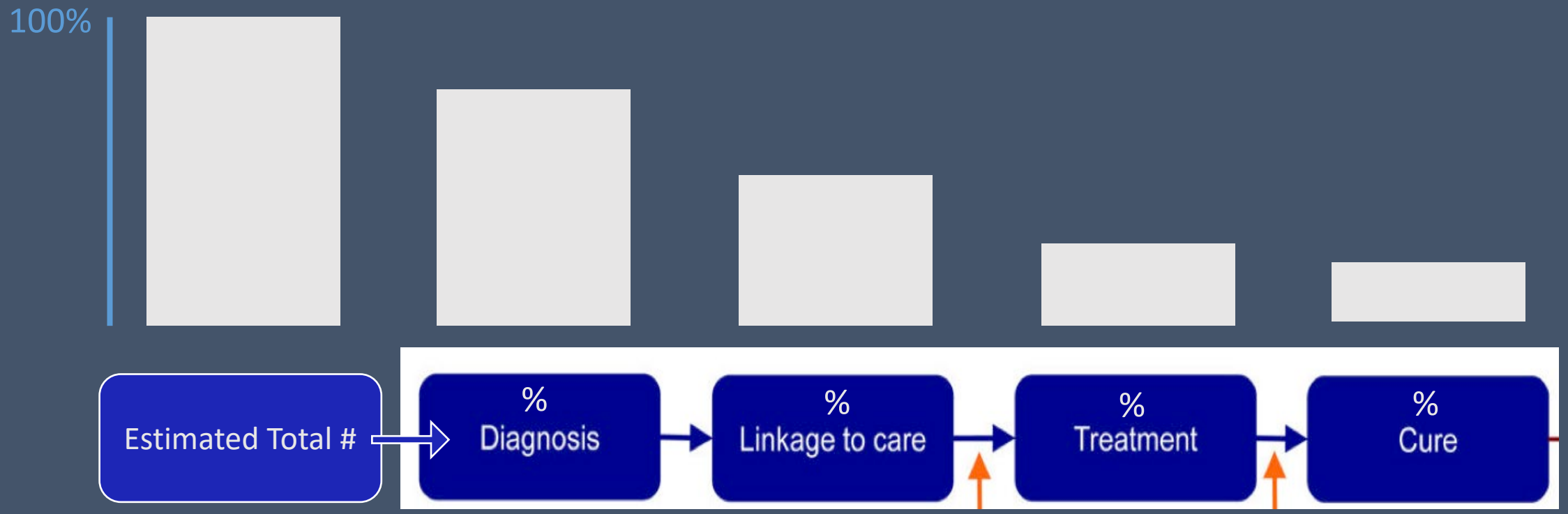


Current Performance and Cascade of Care

Strategies to Reach our Goals for Elimination

What is the HCV Cascade of Care?

Model to assess quality of care being delivered to a population



Falade-Nwulia et al. Understanding and addressing hepatitis C reinfection in the oral direct acting antiviral era. J Viral Hepat. 2018 March ; 25(3): 220–227.

Pre-Direct Acting Antiviral Era

3.5 Million with HCV

16% Treated
(INF-based therapy)

Ferrante et al. The Hepatitis C Care Cascade During the Direct-Acting Antiviral Era in a United States Commercially Insured Population. Open Forum Infect Dis. 2022 Sep 2;9(9)

In the last decade…

Expanded Screening Recommendations: All adults at least once, raising the profile of HCV

Availability of non-invasive fibrosis assessment: Transient elastography, serologic markers

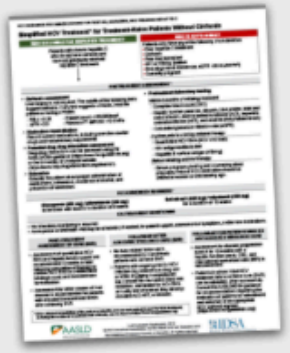
New Therapeutics: First DAAs approved (2011) → First All-DAA regimen (2014)→ First Pan-genotypic regimen (2016) and cure rates ~ 95%

Price reductions in cost of treatment: $160k→26K

Liberalization of who we treat (and who *can* treat)

Oancea CN et al. Global hepatitis C elimination: history, evolution, revolutionary changes and barriers to overcome. Rom J Morphol Embryol. 2020 Jul-Sep;61(3):643-653.
World Health Organization. Global health sector strategies on, respectively, HIV, viral hepatitis and sexually transmitted infections for the period 2022-2030. ISBN 978-92-4-005377-9
Solomon et al. A minimal monitoring approach for the treatment of hepatitis C virus infection (ACTG A5360 [MINMON]): a phase 4, open-label, single-arm trial. Lancet Gastroenterol Hepatol. 2022 Apr;7(4):307-317.

Now…



NOW AVAILABLE

Download: Simplified HCV Treatment* for Treatment-Naive Patients

Without Cirrhosis - Click here to download the PDF, or read more.

With Compensated Cirrhosis - Click here to download the PDF, or read more.

Now…

PRETREATMENT ASSESSMENT*

- **Calculate FIB-4 score.**
- **Cirrhosis assessment**: Liver biopsy is not required. For the purpose of this guidance, a patient is presumed to have cirrhosis if they have a FIB-4 score >3.25 **or** any of the following findings from a previously performed test.
  - Transient elastography indicating cirrh
- **Pretreatment laboratory testing**

  Within 6 months of initiating treatment:
  - Complete blood count (CBC)
  - Hepatic function panel (ie, albumin, total and direct bilirubin, erase [ALT], and aspartate

ON-TREATMENT MONITORING

- Inform patients taking diabetes medication of the potential for symptomatic hypoglycemia. Monitoring for hypoglycemia is recommended
- Inform patients taking warfarin of the potential for changes in their anticoagulation status. Monitoring INR for subtherapeutic anticoagulation is recommended.
- No laboratory monitoring is required for other patients.
- An in-person or telehealth/phone visit may be scheduled, if needed, for patient support, assessment of symptoms, and/or new medications.

transaminase normalization.

- **Potential drug-drug interaction asses**
  interactions can be assessed using the AASLD/IDSA guidance or the University of Liverpool drug interaction checker.
- **Education:** Educate the patient about proper administration of medications, adherence, and prevention of reinfection.

esting and counseling about pregnancy
ication should be offered to women of childbearing age.

https://www.hcvguidelines.org

A minimal monitoring approach for the treatment of hepatitis C virus infection (ACTG A5360 [MINMON]): a phase 4, open-label, single-arm trial

Sunil S Solomon, Sandra Wagner-Cardoso, Laura Smeaton, Leonard A Sowah, Chanelle Wimbish, Gregory Robbins, Irena Brates, Christine Scello, Annie Son, Anchalee Avihingsanon, Benjamin Linas, Donald Anthony, Estevão Portela Nunes, Dimas A Kliemann, Khuanchai Supparatpinyo, Cissy Kityo, Pablo Tebas, Jaclyn Ann Bennet, Jorge Santana-Bagur, Constance A Benson, Marije Van Schalkwyk, Nelson Cheinquer, Susanna Naggie, David Wyles, Mark Sulkowski

Multinational open-label single-arm study of 400 participants including those with HIV, history of substance use and compensated cirrhosis

"minimal monitoring approach"

- SOF-VEL in treatment-naive participants
- No pre-treatment genotype
- Dispense entire treatment course at entry
- No scheduled clinic or laboratory monitoring visits before the outcome assessment
- Two points of remote contact to assess adherence

Primary outcome (SVR-12) was achieved in 95% = comparable to the SOF-VEL registrational trials

WHO Targets for Elimination HCV as a Public Health Threat by 2030

Diagnose 90%
of those with
chronic HCV

Treat 80%
of those with
chronic HCV

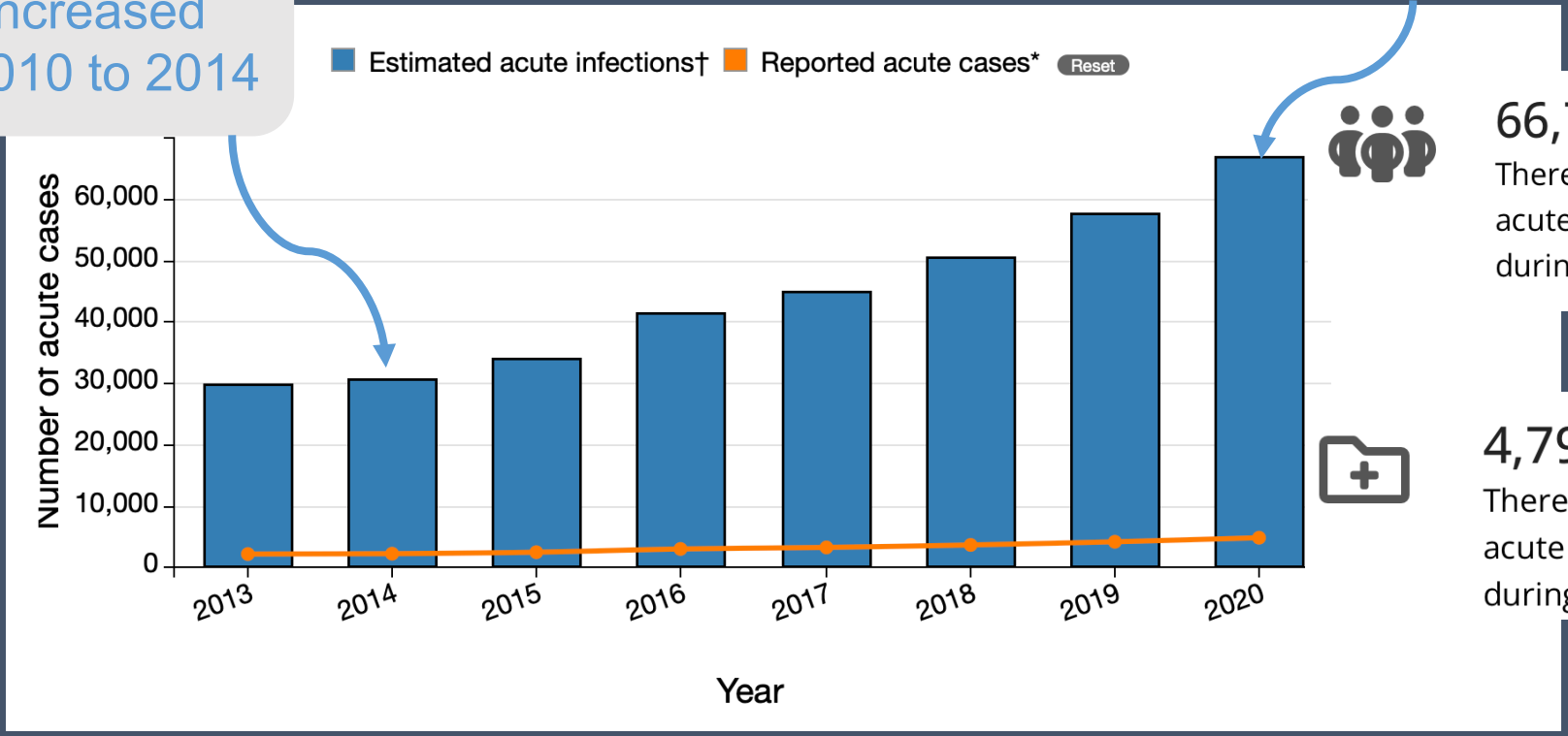
Reduction in 65%
HCV mortality
(compared to 2015)


NBC
GIFSec.com

Acute hepatitis C infections increased 250% from 2010 to 2014

2x

The incidence rate of acute hepatitis C has more than doubled since 2013, a 124% increase



66,700

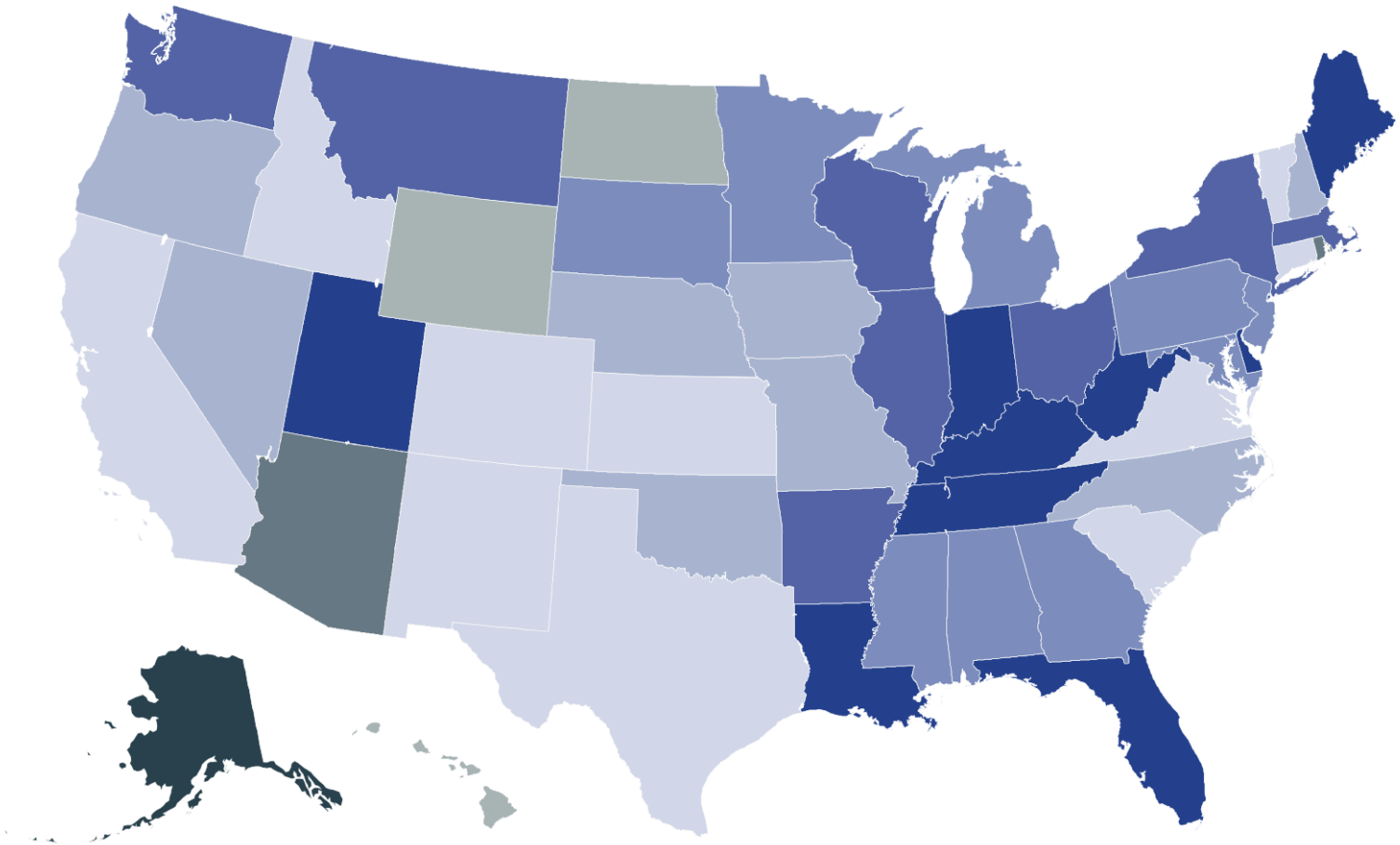
There were 66,700 estimated acute hepatitis C infections during 2020

4,798

There were 4,798 new cases of acute hepatitis C reported during 2020

CDC.Gov “Hepatitis C Surveillance 2020”
HHS.gov

Rates* of reported cases† of acute hepatitis C virus infection, by state or jurisdiction United States, 2020



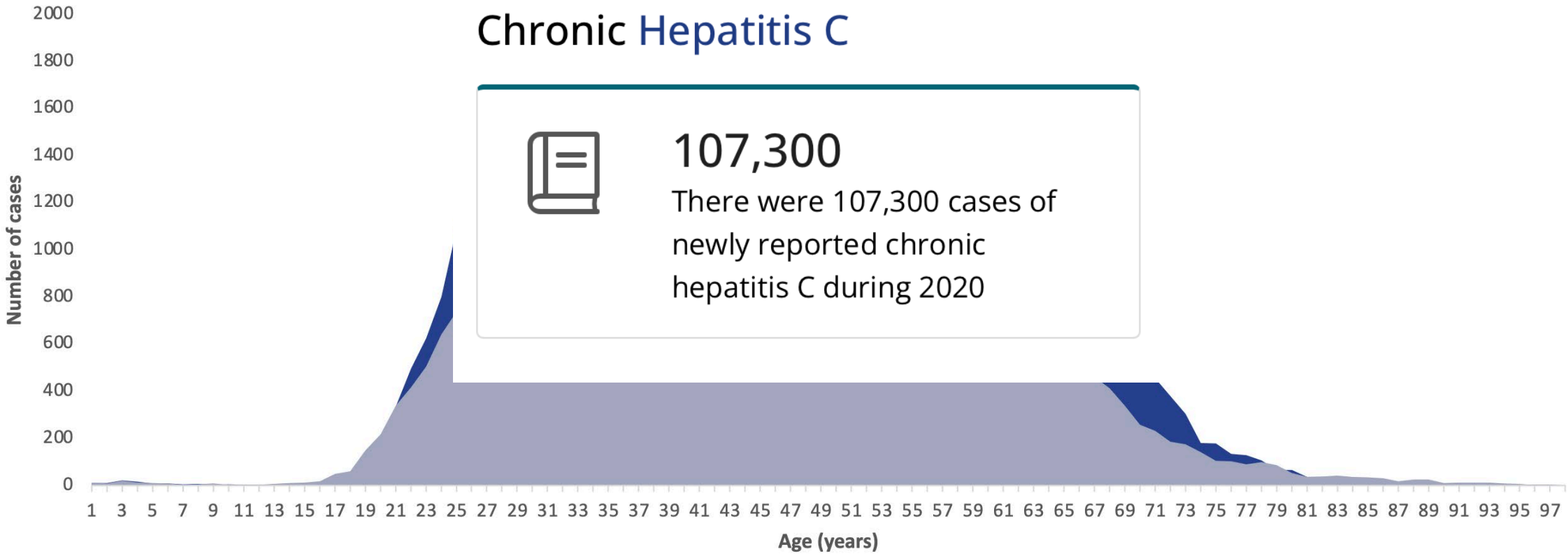
Cases/100,000 Population

- 0.0–0.3
- 0.4–0.7
- 0.8–1.3
- 1.4–2.3
- 2.4–11.9
- No reported cases
- Data unavailable
- Not reportable

Color Key	Cases/100,000 Population	State or Jurisdiction
	0.0–0.3	NM, CA, ID, SC, TX, CO, VT, CT, KS, VA
	0.4–0.7	MO, NH, NV, IA, NE, OK, NC, OR
	0.8–1.3	MD, SD, AL, MN, PA, MI, GA, MS, NJ
	1.4–2.3	WA, IL, MT, OH, WI, NY, AR, MA
	2.4–11.9	TN, KY, UT, IN, DE, WV, LA, FL, ME
	No reported cases	HI, ND, WY
	Data unavailable	AZ, DC, RI
	Not reportable	AK

CDC.Gov “Hepatitis C Surveillance 2020

Number of newly reported* chronic hepatitis C virus infection cases† by sex and age
United States, 2020



1. CDC.Gov “Hepatitis C Surveillance 2020”
2. HHS.gov

Populations Disproportionately Impacted by HCV Epidemic

American Indian/Alaska Native

Rates of acute hepatitis C are highest among American Indian / Alaska Native persons

- American Indian/Alaskan Native
- Black, non-Hispanic
- People who inject drugs
- People with HIV
- People born from 1945 to 1965

Sources: CDC[1,46], Hofmeister et al.[2]

66%

66% of cases with risk information reported injection drug use

Only ~ 1/3 of people diagnosed with hepatitis C have health insurance

CDC.Gov “Hepatitis C Surveillance 2020”
Parums DV. Editorial: Effective Direct-Acting Antiviral Treatments Support Global and National Programs to Eliminate Hepatitis C. Med Sci Monit. 2023 Apr 1;29:e940519.

Number a… United St… …titis C virus …

State or Jurisd…	Rate*
Alabama	90.6
Alaska	54.8
Arizona	36.4
Arkansas	31.4
California§	24.8
Colorado	14.4
Connecticut	88.1
Delaware	79.1
District of Colum…	62.2
Florida	18.3
Georgia	U
Hawaii	3.5
Idaho	28
Illinois	0.1
Indiana	25.1
Iowa	N
Kansas	59.6
Kentucky	

* Rates per 100,000 pop…

Viral Hepatitis Treatment Restrictions

Prior Authorization

State Medicaid programs may require patients to receive prior authorization in order to receive treatment for Hepatitis C.

PA Required — PA Removed

Fibrosis Level Treatment Restrictions

State Medicaid programs may require a patient to reach a certain stage of fibrosis (liver scarring) before being able to access treatment for Hepatitis C.

F3 — F2 — F1 — No Restrictions

Substance Use Treatment Restrictions

State Medicaid programs may require a period of abstinence from drugs or alcohol prior to or during treatment or require providers to counsel their patients regarding drug or alcohol use before being able to access treatment for Hepatitis C.

6 Months — 3 Months — Abstinence — Screening and Counseling — No Restrictions

Prescriber Treatment Restrictions

State Medicaid programs may require a prescription for Hepatitis C treatment to be issued by or in consultation with a specialist.

Specialist — By or In Consultation — No Restrictions

Retreatment Restrictions

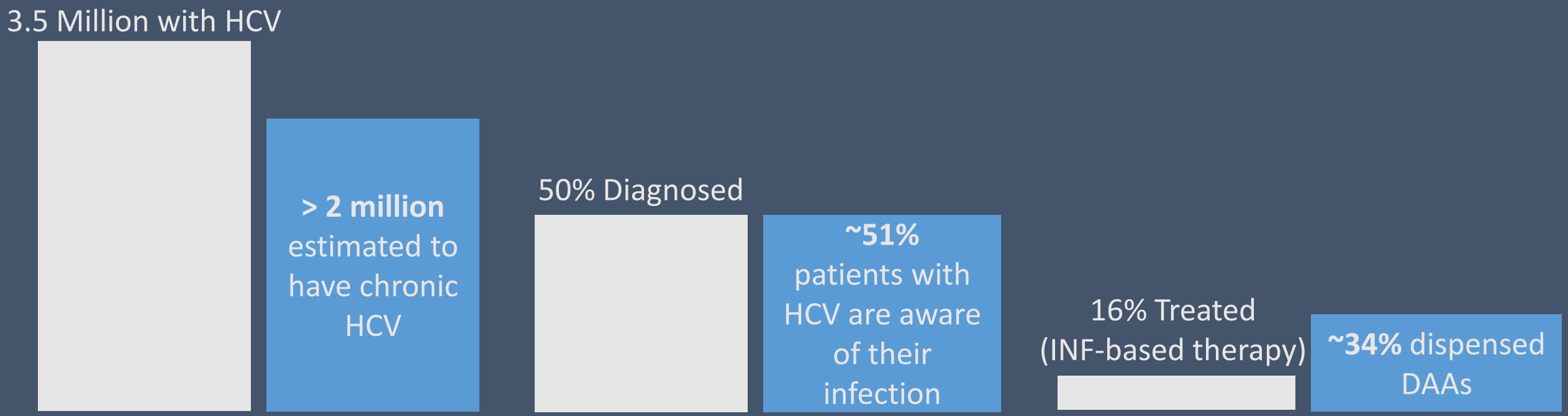
State Medicaid programs may require more severe restrictions for patients seeking retreatment for Hepatitis C.

Retreatment Restrictions — No Restrictions

Statuses of state Medicaid restrictions are as of February 2023. Source: CHLPI and NVHR.

CDC.Gov “Hepatitis C Surveillance 2020
Hepvu.org

Current Performance Cascade



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Ferrante et al. The Hepatitis C Care Cascade During the Direct-Acting Antiviral Era in a United States Commercially Insured Population. Open Forum Infect Dis. 2022 Sep 2;9(9)
HHS.gov

Current Performance Cascade

Open Forum Infectious Diseases
MAJOR ARTICLE

The Hepatitis C Care Cascade During the Direct-Acting Antiviral Era in a United States Commercially Insured Population

Nicole D. Ferrante,[1,2] Craig W. Newcomb,[2] Kimberly A. Forde,[3] Charles E. Leonard,[2,4] Jessie Torgersen,[2,5] Benjamin P. Linas,[6] Sarah E. Rowan,[7] David L. Wyles,[7] Jay Kostman,[8] Stacey B. Trooskin,[5,8] and Vincent Lo Re III[2,5]

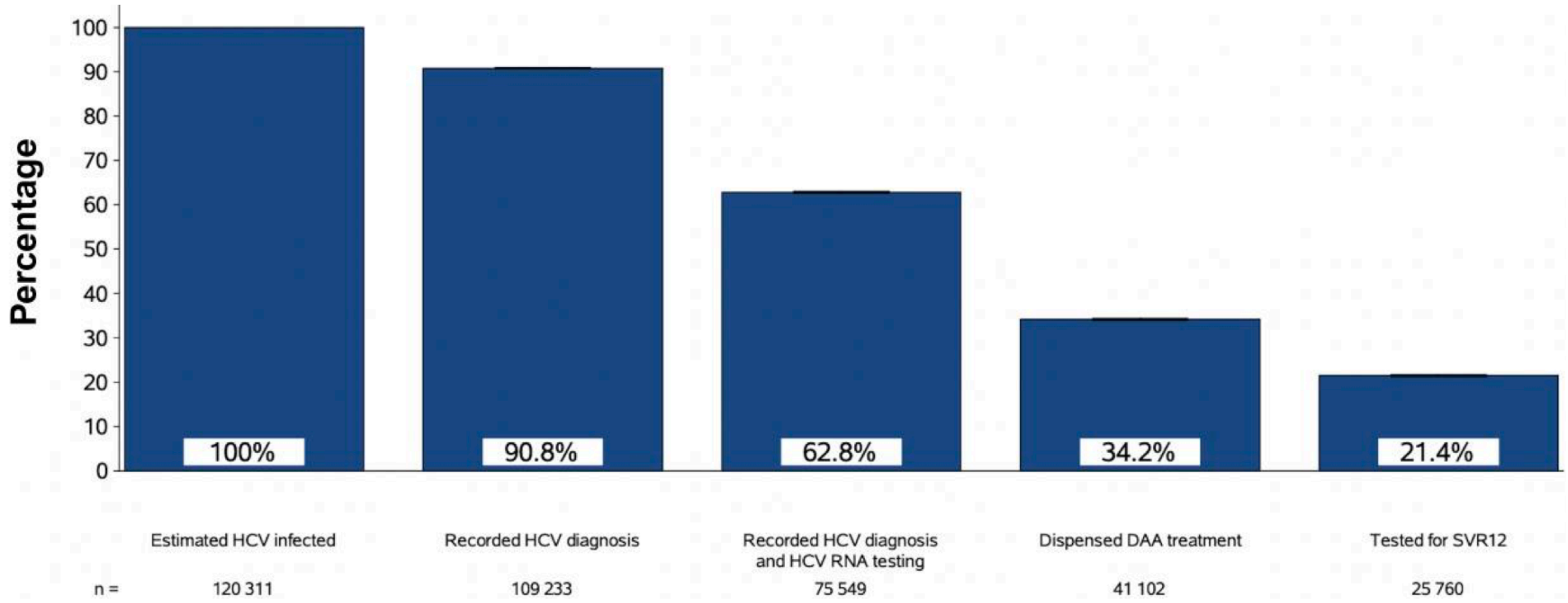


Figure 2. Hepatitis C care cascade within the Optum de-identified Clinformatics® Data Mart Database between January 1, 2014 and December 31, 2019. The proportion dispensed direct-acting antiviral therapy and assessed for sustained virologic response was determined through May 31, 2020. Bars indicate 95% CI. Abbreviations: DAA, direct-acting antiviral; HCV, hepatitis C virus; SVR12, sustained virologic response ≥12 weeks after completing therapy.

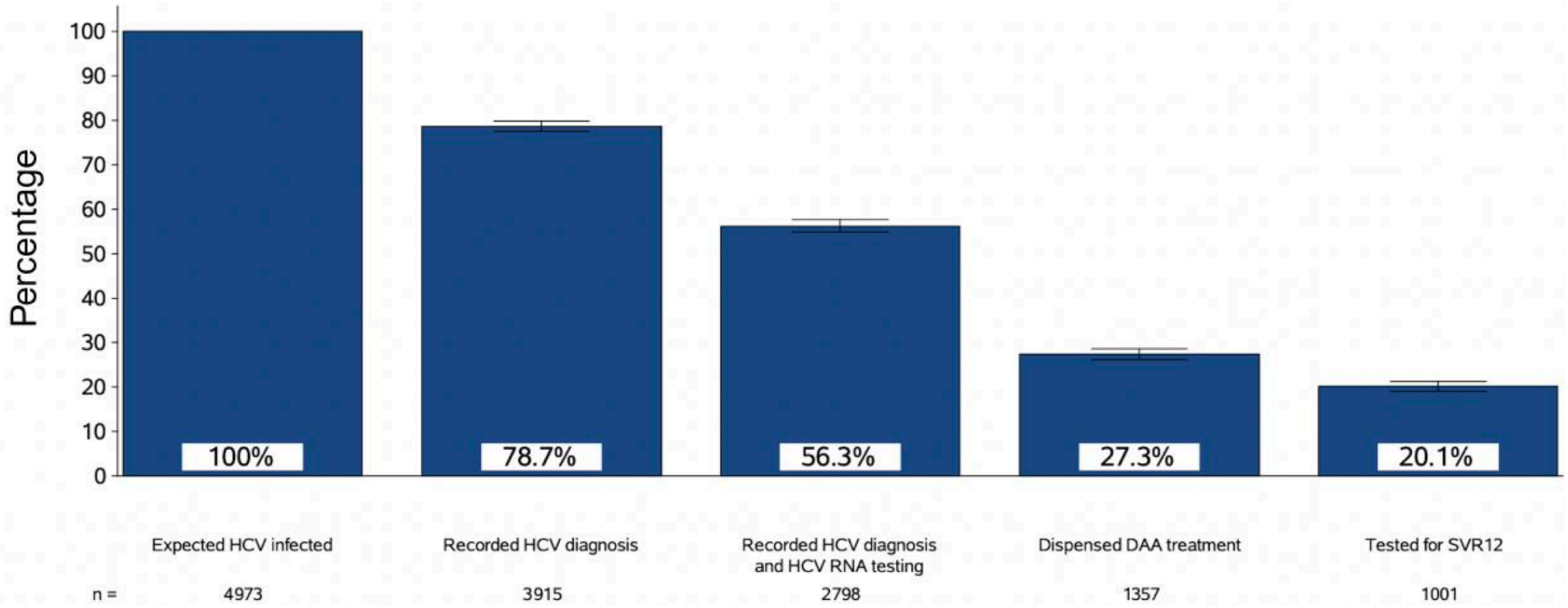


Figure 3. Hepatitis C care cascade for people with HIV coinfection within the Optum de-identified Clinformatics® Data Mart Database between January 1, 2014 and December 31, 2019. The proportion dispensed direct-acting antiviral therapy and assessed for sustained virologic response was determined through May 31, 2020. Bars indicate 95% CI. Abbreviations: DAA, direct-acting antiviral; HCV, hepatitis C virus; SVR12, sustained virologic response ≥12 weeks after completing therapy.

Ferrante et al. The Hepatitis C Care Cascade During the Direct-Acting Antiviral Era in a United States Commercially Insured Population. Open Forum Infect Dis. 2022 Sep 2;9(9)

VIRAL HEPATITIS

National Strategic Plan

A Roadmap to Elimination

for the United States | **2021–2025**

Plan Goals

1. **Prevent new viral hepatitis infections**
2. **Improve viral hepatitis–related health outcomes of people with viral hepatitis**
3. **Reduce viral hepatitis–related disparities and health inequities**
4. **Improve viral hepatitis surveillance and data usage**
5. **Achieve integrated, coordinated efforts that address the viral hepatitis epidemics among all partners and stakeholders**

Strategies

- **Improve Access to HCV Treatment**
- **Reduce Risk of Reinfection**
- **Take a "Syndemic" Approach**

U.S. Department of Health and Human Services. 2020. Viral Hepatitis National Strategic Plan for the United States: A Roadmap to Elimination (2021–2025). Washington, DC

Improve Access to Treatment

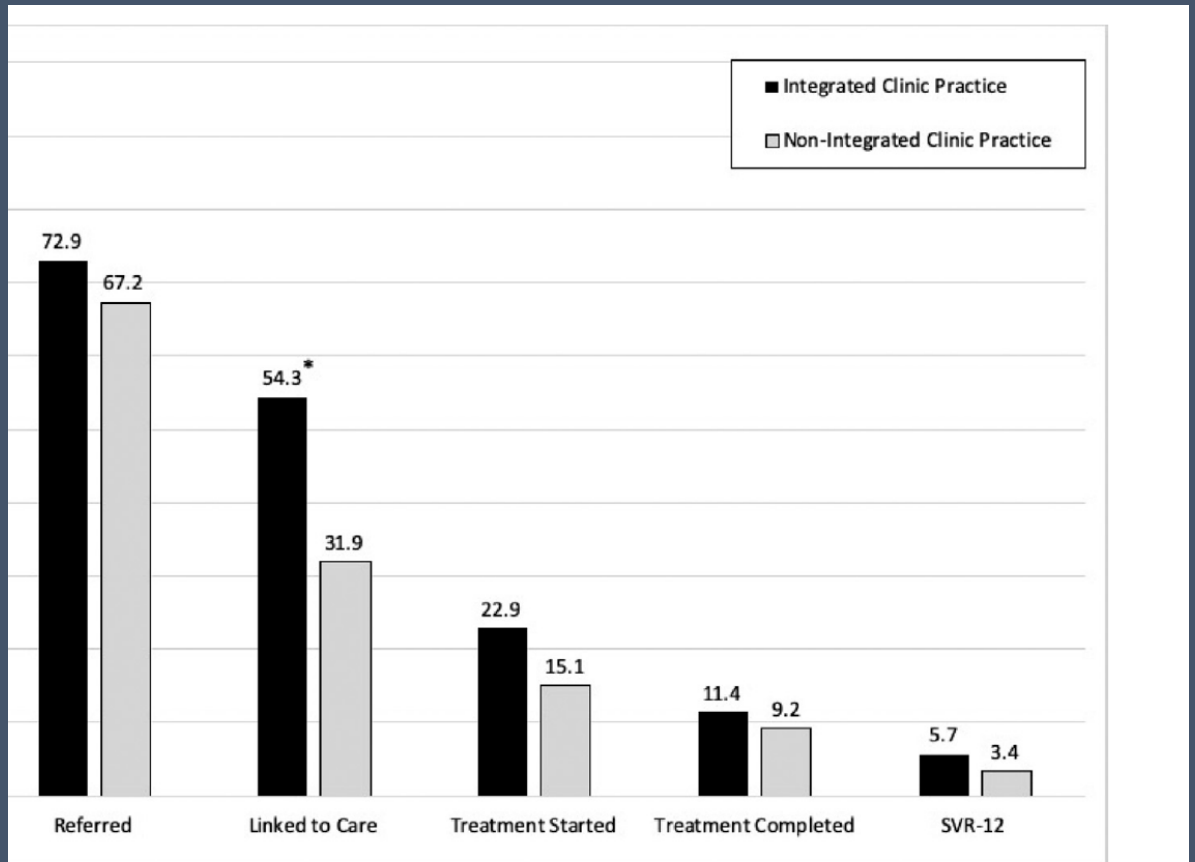
Co-localized models: bringing treatment to patients

CLINICAL RESEARCH STUDY

THE AMERICAN JOURNAL of MEDICINE®

A Colocalized Hepatitis C Virus Clinic in a Primary Care Practice Improves Linkage to Care in a High Prevalence Population

Paul C. Adamson, MD, MPH,[a,b] Janet Miceli, MPH,[c] Bethel Shiferaw, MD, MPH,[c,d] Merceditas S. Villanueva, MD,[c] Joseph E. Canterino, MD[c]



Improve Access to Treatment

Expand the workforce of providers treating HCV

Medical Science Educator (2020) 30:1373–1377
https://doi.org/10.1007/s40670-020-01096-8

SHORT COMMUNICATION

Training to Cure—Implementing a Hepatitis C Clinic Curriculum in Primary Care Residency Training

Yihan Yang[1] · Jeffrey M. Luk[2] · Andre N. Sofair[1] · Siyuan Ma[3] · Yanhong Deng[4] · Joseph Canterino[5]

New HCV curriculum comprised of a primer, didactics, and supervised patient care

Surveyed 34 residents who were exposed to the curriculum

HCV knowledge scores improved from **58%** to **76%** immediately ($p < 0.001$) and **66%** 3-months post curriculum ($p = 0.006$).

Residents reported feeling more confident managing HCV after the curriculum

Reduce Risk of Reinfection

Reinfection: the reoccurrence of HCV viremia after a previously cleared infection

Falade-Nwulia et al. Understanding and addressing hepatitis C reinfection in the oral direct acting antiviral era. J Viral Hepat. 2018 March ; 25(3): 220–227.

Preventing Drug Use Reduces Reinfection

Research Article
Viral Hepatitis

JOURNAL OF HEPATOLOGY

Hepatitis C reinfection after successful antiviral treatment among people who inject drugs: A meta-analysis

Behzad Hajarizadeh[1,*], Evan B. Cunningham[1], Heather Valerio[1], Marianne Martinello[1], Matthew Law[1], Naveed Z. Janjua[2,3], Håvard Midgard[4], Olav Dalgard[5], John Dillon[6], Matthew Hickman[7], Julie Bruneau[8], Gregory J. Dore[1], Jason Grebely[1]

Reinfection rates

- **Recent drug use, not receiving Opiate Agonist Therapy = 6.6/100** person-years
- **No recent drug use, receiving Opiate Agonist Therapy = 1.4/100** person-years

Those with recent drug use had **~ 3x higher reinfection rates** than people receiving with no recent drug use

Preventing Drug Use Reduces Reinfection

Annals of Internal Medicine

ORIGINAL RESEARCH

Reinfection and Risk Behaviors After Treatment of Hepatitis C Virus Infection in Persons Receiving Opioid Agonist Therapy

A Cohort Study

Jason Grebely, PhD; Gregory J. Dore, MD; Frederick L. Altice, MD; Brian Conway, MD; Alain H. Litwin, MD; Brianna L. Norton, DO; Olav Dalgard, MD; Edward J. Gane, MD; Oren Shibolet, MD; Ronald Nahass, MD; Anne F. Luetkemeyer, MD; Cheng-Yuan Peng, MD; David Iser, MD; Isaias Noel Gendrano, MPH; Michelle M. Kelly, MS; Peggy Hwang, PhD; Ernest Asante-Appiah, PhD; Barbara A. Haber, MD; Eliav Barr, MD; Michael N. Robertson, MD; and Heather Platt, MD

- 3-year observational study for HCV reinfection after successful DAA therapy.
- Overall low levels of reinfection (1.7 per 100 person- years)
  - **Recent injecting drug use** = **1.9/100 person years**
  - **No recent injecting drug use** = **0.5/100 person-years**
- Most reinfections occurred within 24 weeks of completing DAA treatment (target window for prevention services).

Grebely et al. Reinfection and Risk Behaviors After Treatment of Hepatitis C Virus Infection in Persons Receiving Opioid Agonist Therapy : A Cohort Study. Ann Intern Med. 2022 Sep;175(9):1221-1229

Preventing Drug Use Reduces Reinfection

The of HCV reinfection **should be considered as part of the initial treatment evaluation** to tailor risk reduction:

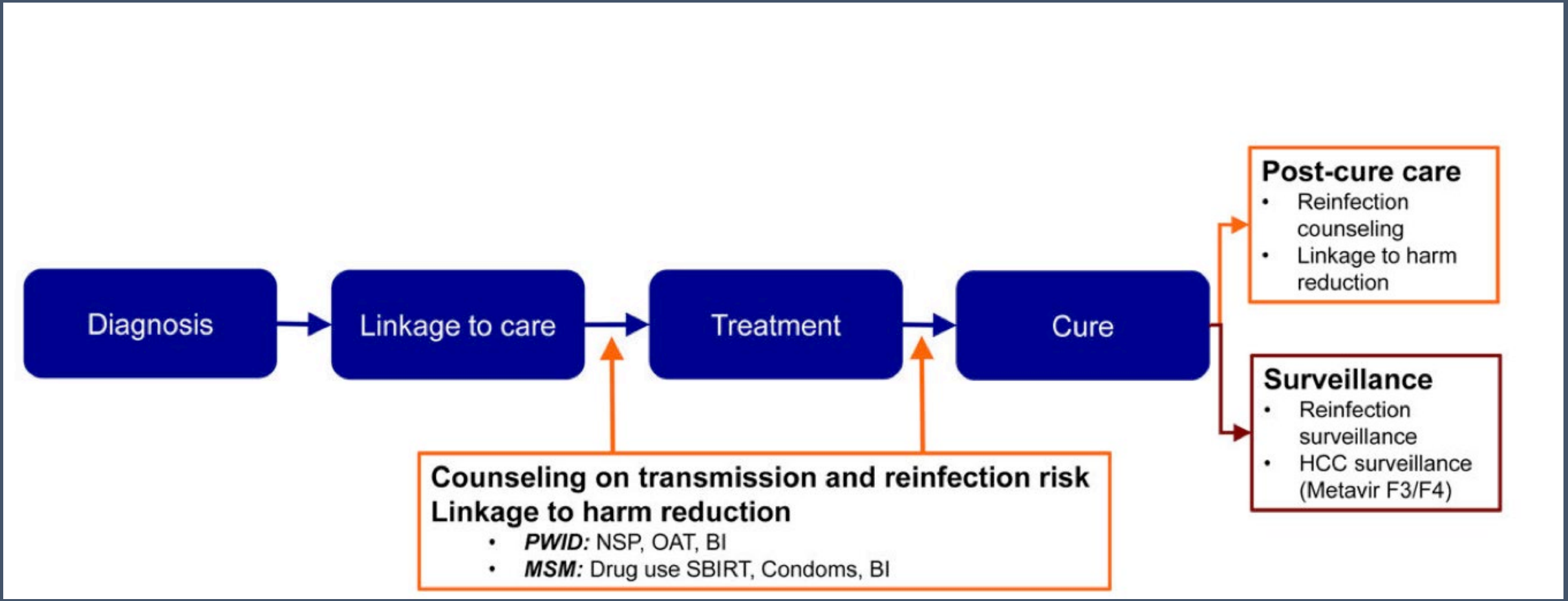
- Education on risk of reinfection
- Counselling and linkage to harm reduction services: Syringe exchange programs, Opioid use disorder treatment
- Screening for and treatment of mental illness
- Providing social services for homelessness

Can prevent approximately 75% of hepatitis C infections

U.S. Department of Health and Human Services. 2020. Viral Hepatitis National Strategic Plan for the United States: A Roadmap to Elimination (2021–2025). Washington, DC

Grebely et al. Reinfection and Risk Behaviors After Treatment of Hepatitis C Virus Infection in Persons Receiving Opioid Agonist Therapy : A Cohort Study. Ann Intern Med. 2022 Sep;175(9):1221-1229

Re-thinking the Cascade of Care



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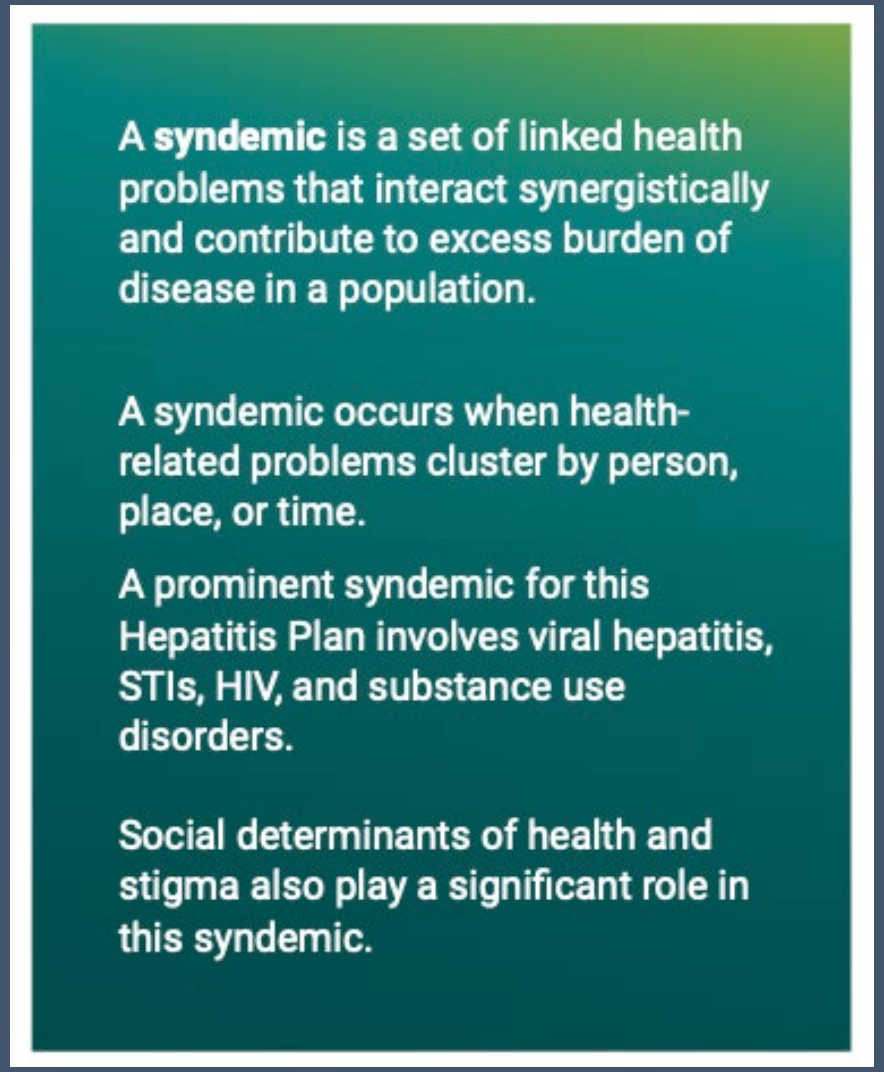
"Syndemic" Approach



Provide multiple services at the same location, cross-train staff, and providing linkage to care and patient navigation services across programs to eliminate duplication of efforts and best meet patients' needs

HIGH-IMPACT SETTINGS

- Substance Use treatment programs
- Syringe Service Programs
- Correctional institutions
- Homeless service providers
- Refugee health centers
- HIV clinics

U.S. Department of Health and Human Services. 2020. Viral Hepatitis National Strategic Plan for the United States: A Roadmap to Elimination (2021–2025). Washington, DC

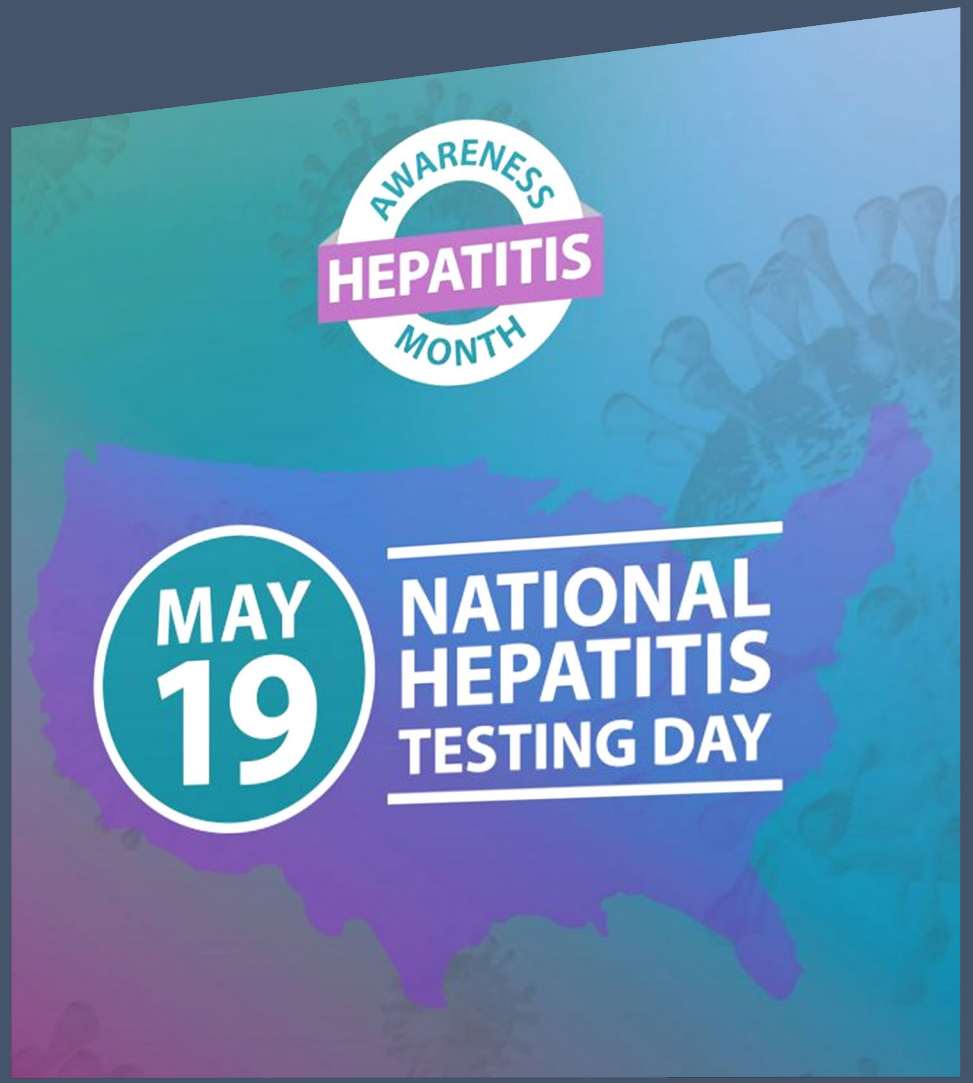
Take Aways

1. We have transformed the way we treat HCV in the last 10 years

2. In order to reach the elimination goals set forth by the WHO a huge effort needs to be made to reach and treat the millions still infected

3. In your own practices and institutions work to increase access to care, reduce reinfection risk by screening and linking patients to harm reduction services, and consider “syndemic” approach to treating these synergistic epidemics


AWARENESS
HEPATITIS
MONTH
LOVE
your liver!


AWARENESS
HEPATITIS
MONTH
MAY
19
NATIONAL
HEPATITIS
TESTING DAY