



# **North Carolina Test, Link, Cure: Collaborating to Address Hepatitis C in At-Risk Populations**

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# Disclosure

I have no actual or potential conflict of interest in relation to this presentation

## What is Viral Hepatitis?

“Hepatitis” means inflammation of the liver. Hepatitis is often caused by a virus. The most common types of viral hepatitis are Hepatitis A, Hepatitis B, and Hepatitis C.



CDC

# Clinical Presentation (any viral hepatitis)

- Symptoms of acute hepatitis:
  - Anorexia
  - Nausea/vomiting
  - Fever
  - Joint Pain
  - Dark urine/clay colored stool
  - Jaundice
  - Upper right quadrant pain
- Labs:
  - LFTs elevated, total bilirubin elevated

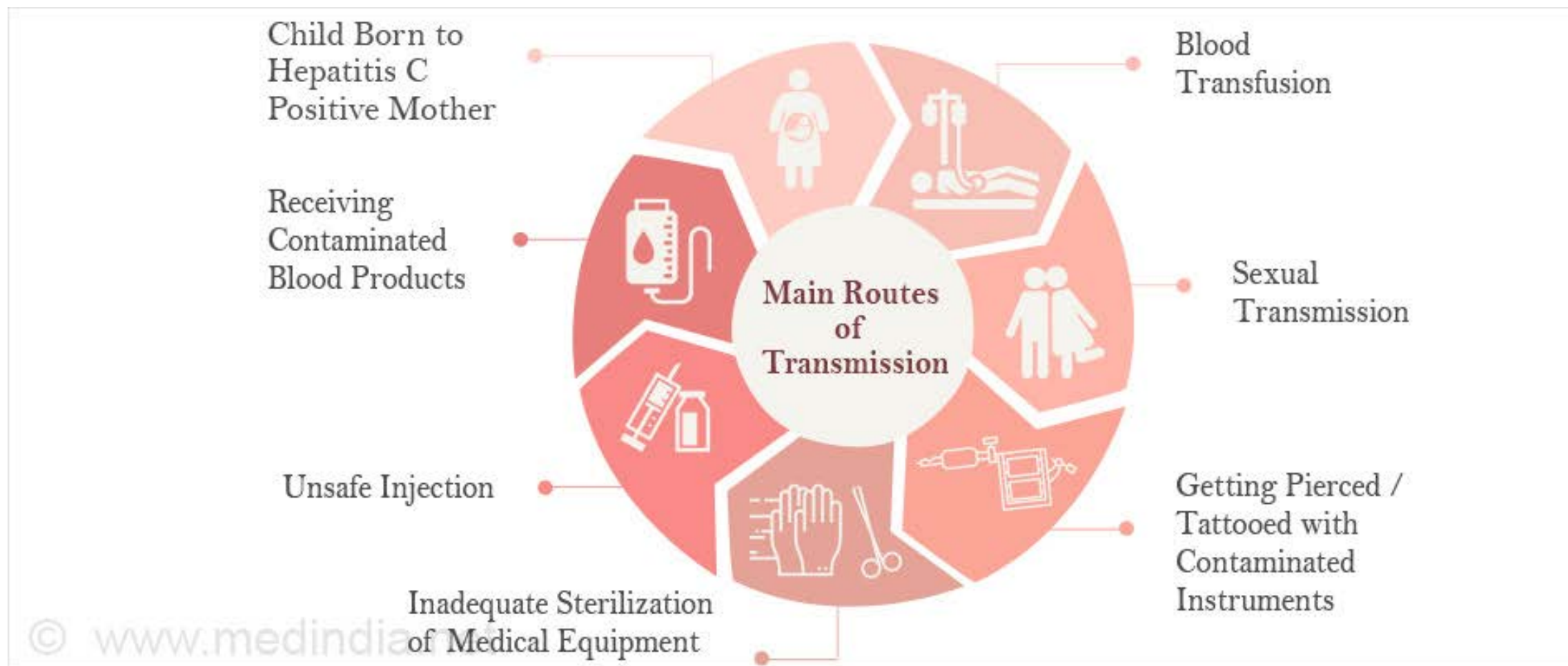
These signs and symptoms are also typical of chronic drug use/overdose

# Hepatitis C (HCV)

- Can be acute and chronic hepatitis (70-80% show no symptoms)
- Estimated 71 million people with chronic HCV infection, significant number of which will develop cirrhosis or liver cancer
- No vaccine
- Effective antiviral meds cure >95%
- Reinfection is possible

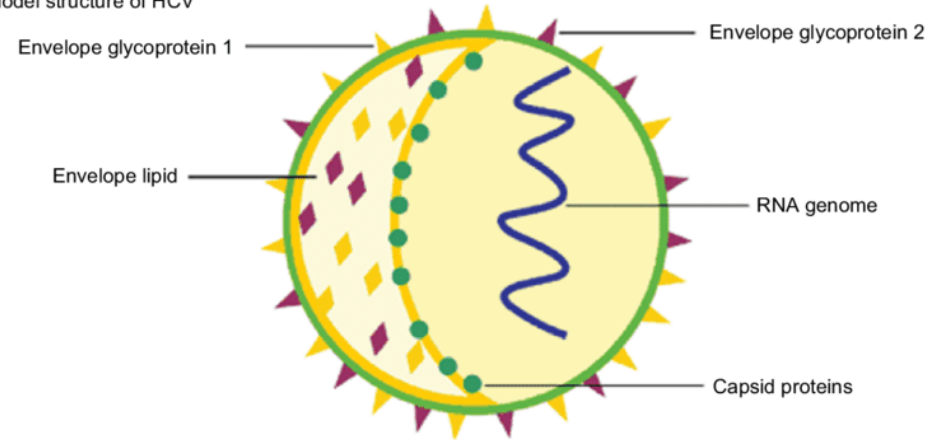


# HCV Transmission

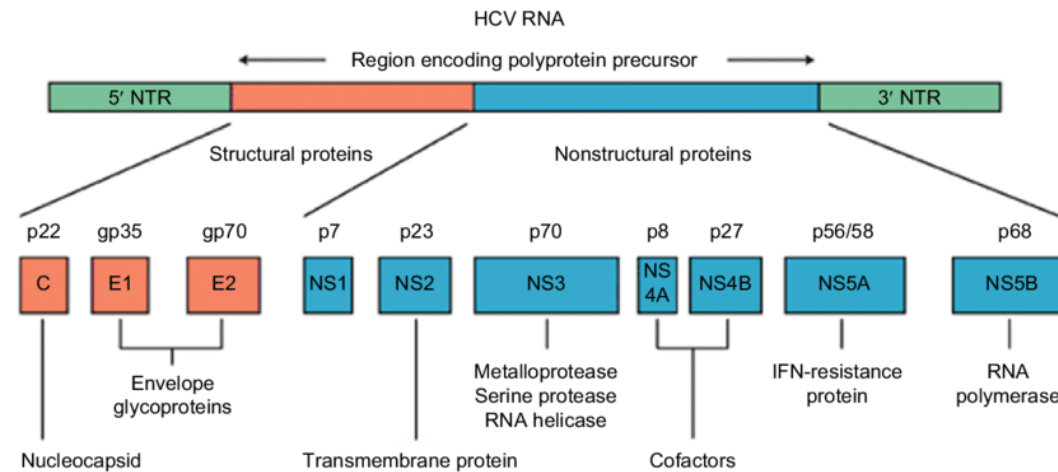


# HCV Structure and Genome

**A** Model structure of HCV

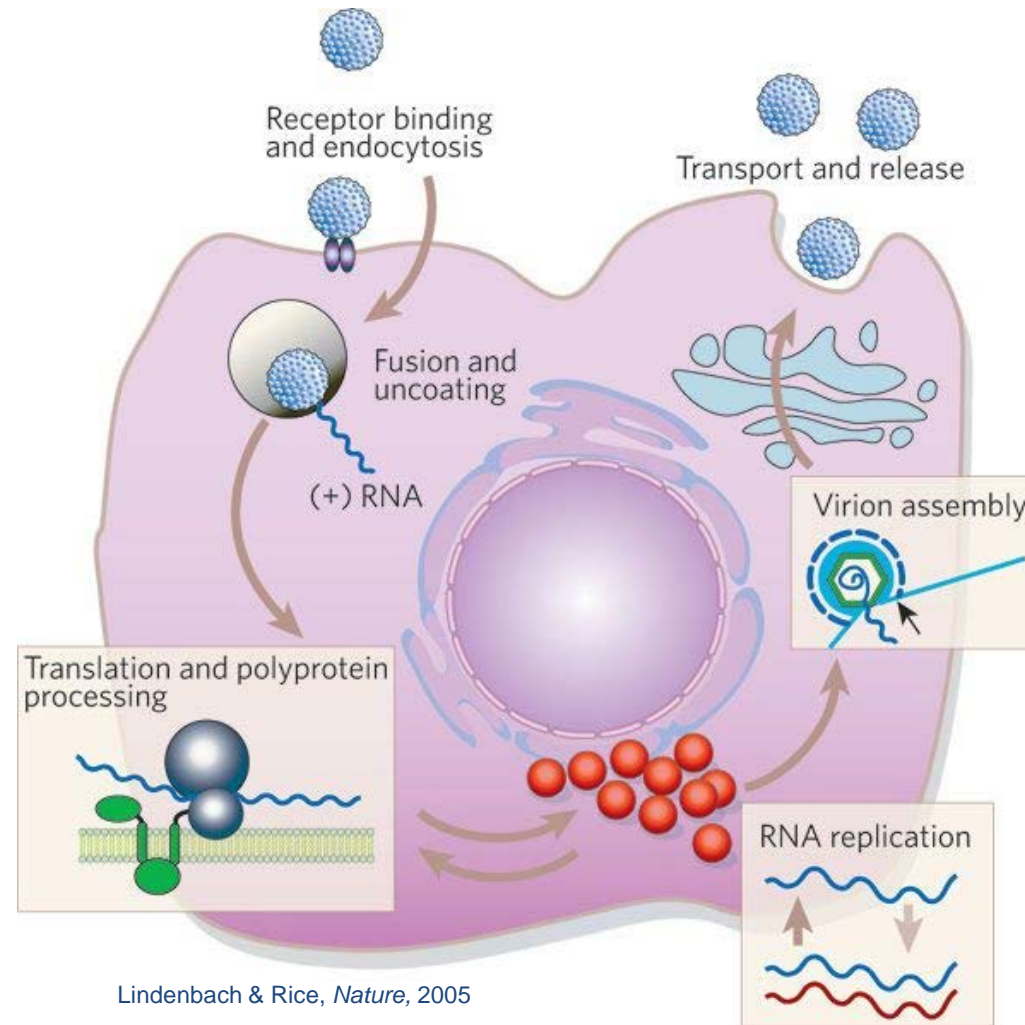


**B** Proteins encoded by the HCV genome



Elgharably, et al, 2016

# HCV Replication

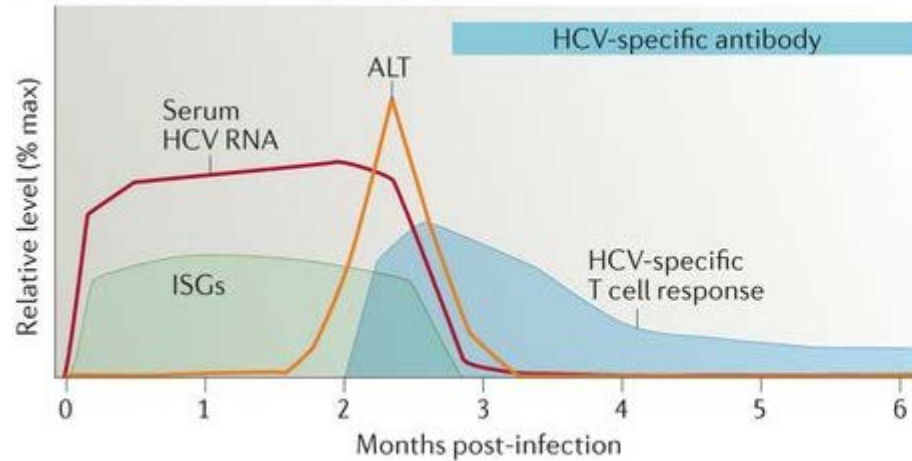


Lindenbach & Rice, *Nature*, 2005



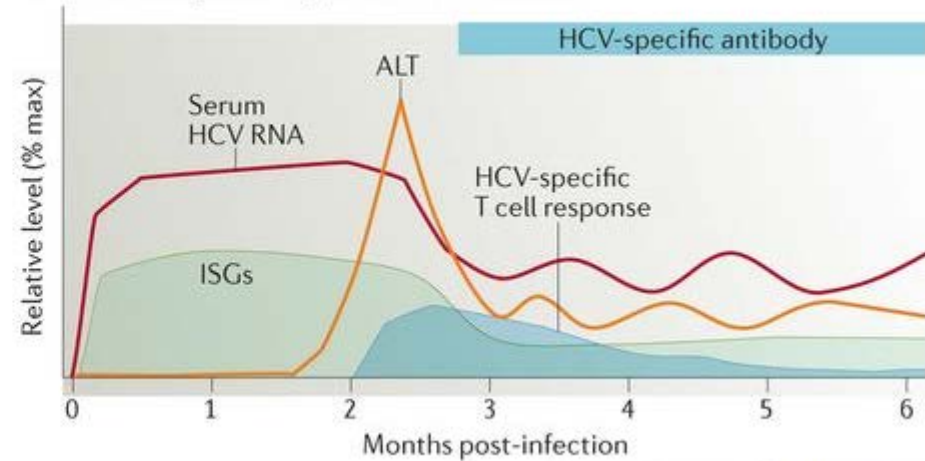
# HCV Infection Kinetics

c Self-limited acute HCV infection

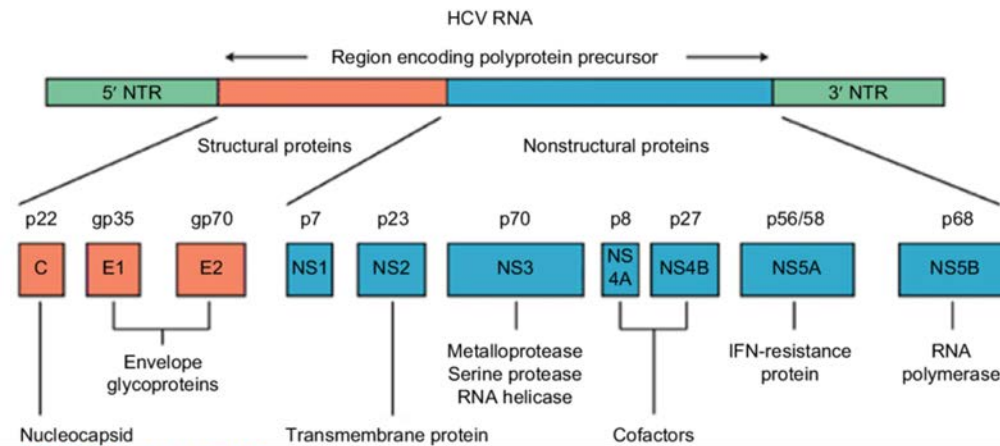


Shin, et al, *Nat. Rev. Immunology* 2016

d Chronically evolving acute HCV infection



Nature Reviews | Immunology

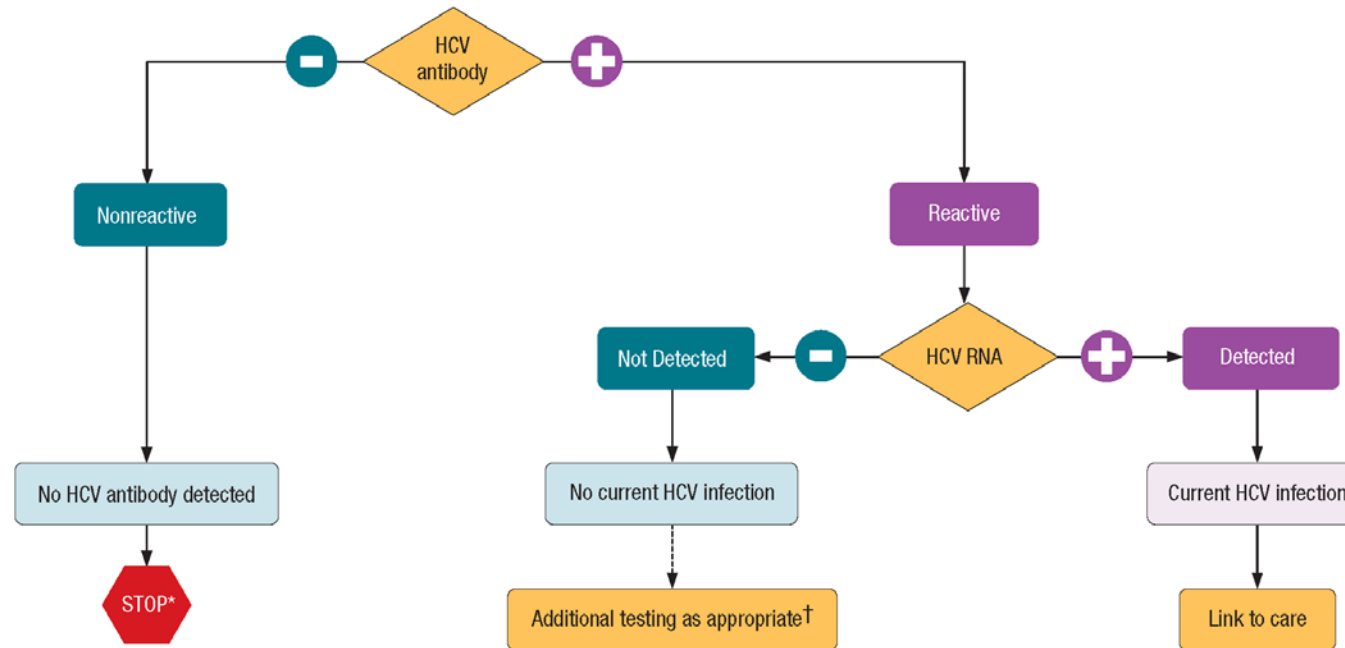


Elgharably, et al, 2016

## Recommended Testing Sequence for Identifying Current Hepatitis C Virus (HCV) Infection



U.S. Department of  
Health and Human Services  
Centers for Disease  
Control and Prevention



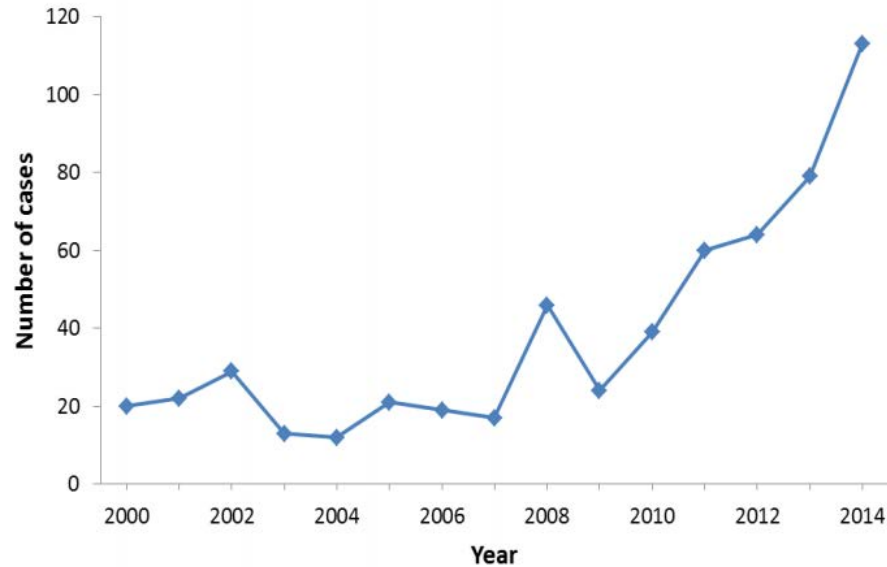
\* For persons who might have been exposed to HCV within the past 6 months, testing for HCV RNA or follow-up testing for HCV antibody is recommended. For persons who are immunocompromised, testing for HCV RNA can be considered.

† To differentiate past, resolved HCV infection from biologic false positivity for HCV antibody, testing with another HCV antibody assay can be considered. Repeat HCV RNA testing if the person tested is suspected to have had HCV exposure within the past 6 months or has clinical evidence of HCV disease, or if there is concern regarding the handling or storage of the test specimen.

Source: CDC. Testing for HCV infection: An update of guidance for clinicians and laboratorians. *MMWR* 2013;62(18).

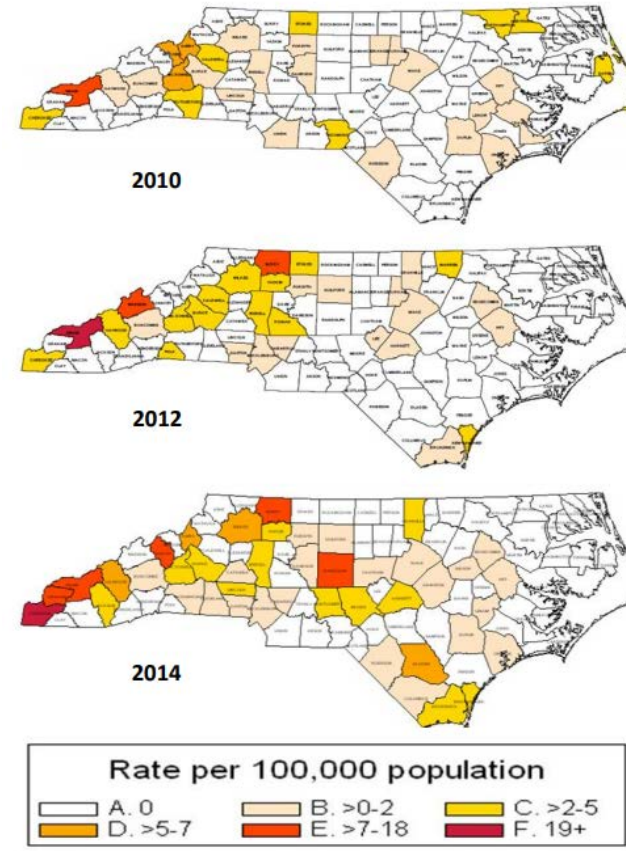
# HCV in NC pre-TLC

Figure 1. Acute Hepatitis C Case Reports, North Carolina—2000 to 2014.



Funding available for HCV in 2014:  
One \$125,000 grant

Figure 2. Rates of reported Acute HCV cases by county, North Carolina, 2010–2014.



# NC-Test, Link, Cure Program Development

## Goals:

- 1) Decrease the prevalence and transmission of HCV
- 2) Decrease the incidence of HCV-associated liver cancer
- 3) Increase number of high risk individuals who know their HCV status
- 4) Increase the number of persons linked to care through collaborative care cascade development

## Strategy:

- 1) Expand risk based testing on the local level
- 2) Provide prevention and linkage education and counseling
  - 1) Incorporate harm reduction messaging and partnerships
  - 2) Vaccine education and administration
  - 3) Take a comprehensive care approach
- 3) HCV bridge counselor program development and expand primary care treatment in communities through CHAMP

\*Program developed with limited hepatitis dedicated funding



# Testing Phases

- **2014**-Expanded HCV risk-based testing to 4 regions with significant disease burden
  - 1) born between 1945-1965
  - 2) past/present IVD use
- **May 2017**-Expansion to entire state
- **October 2018**-Further expansion of risk-based HCV testing
  - 1) Any past/present drug user
  - 2) sexual partners of past/present drug user
  - 3) history of incarceration
- **October 2018**- expanded HBV risk-based testing to entire State to prompt dual testing



# HepC Testing Numbers

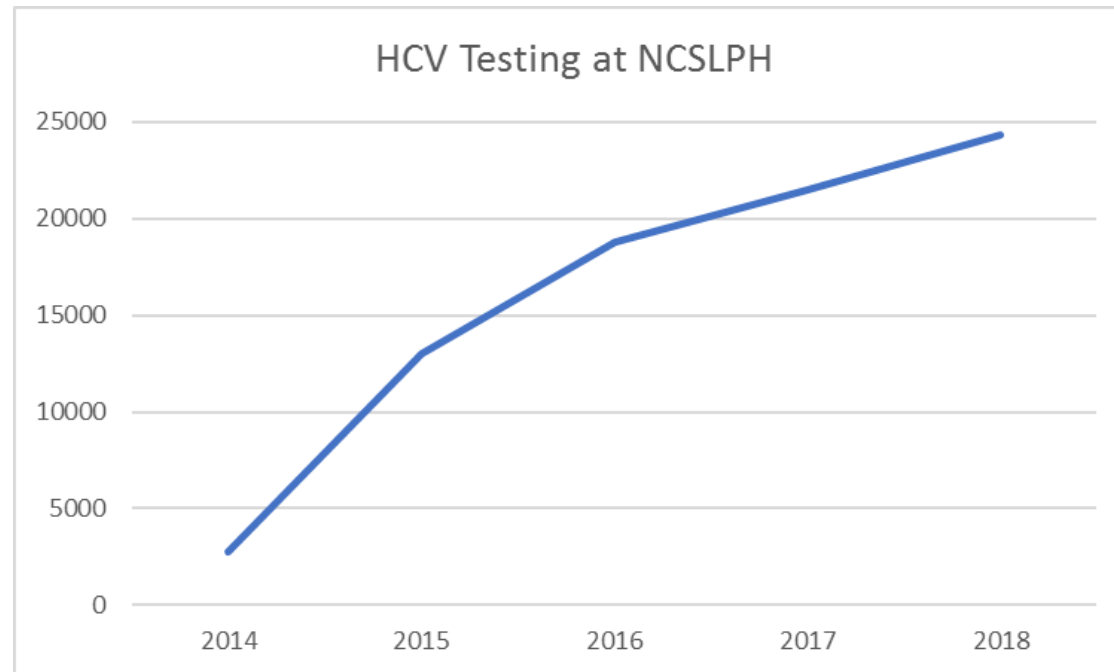
The NCSLPH performs about >20,000 HCV tests per year.

The testing algorithm is able to differentiate between patients who have never been exposed to HCV, patients who have resolved infections, and patients who have current infections.

Results are usually reported in 3-4 days.

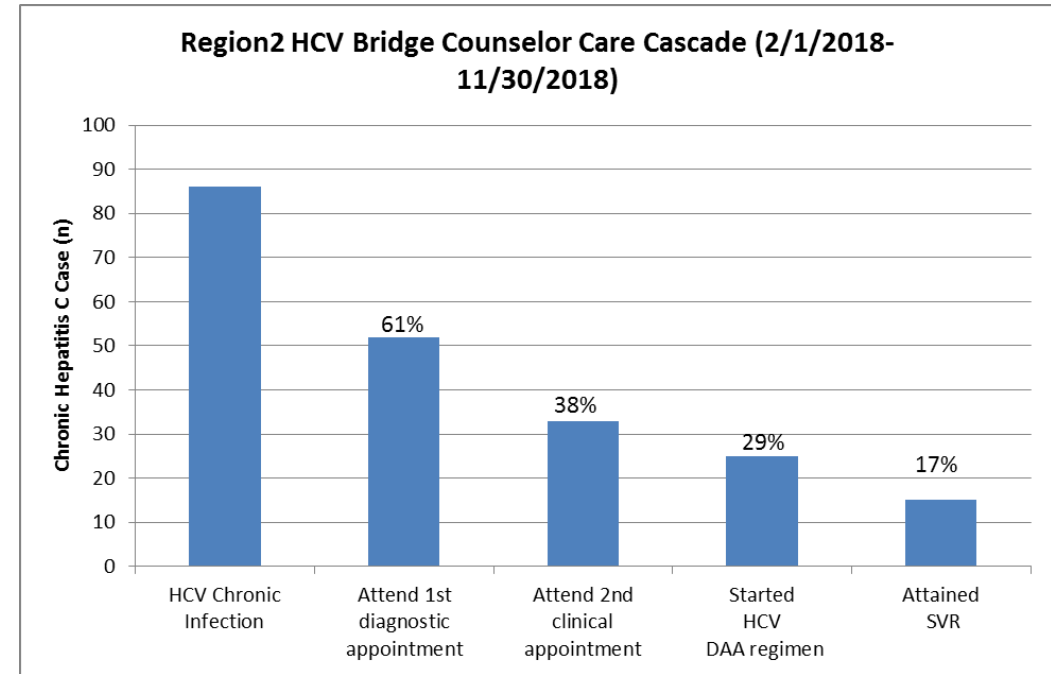
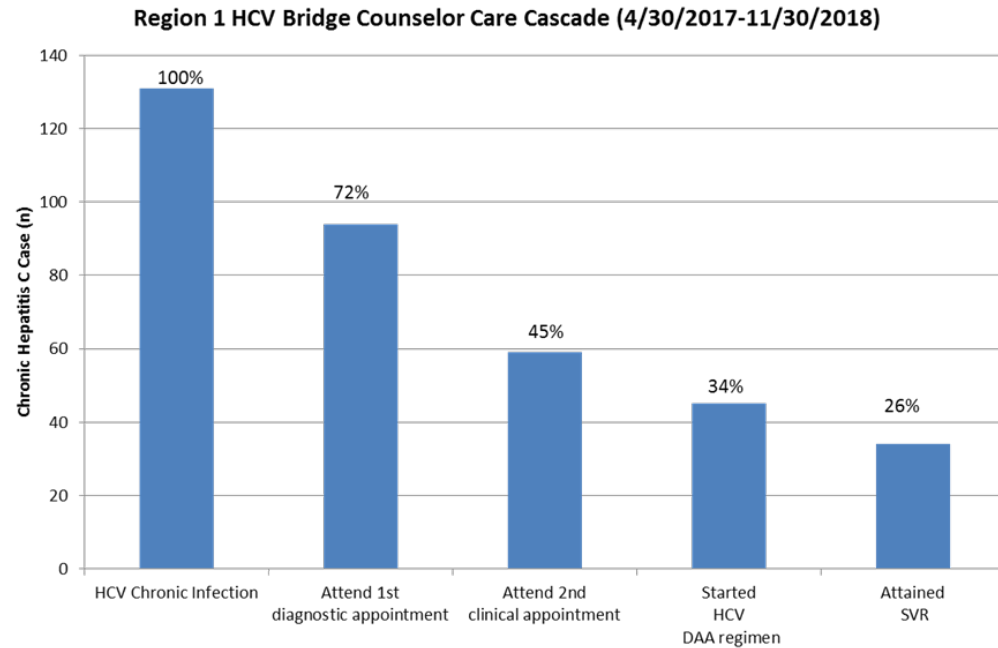
About 20% of samples tested at the NCSLPH are HCV Ab reactive.

About 65% of reactive HCV Ab samples tested at the NCSLPH are NAAT positive.



# Bridge Counselor Program

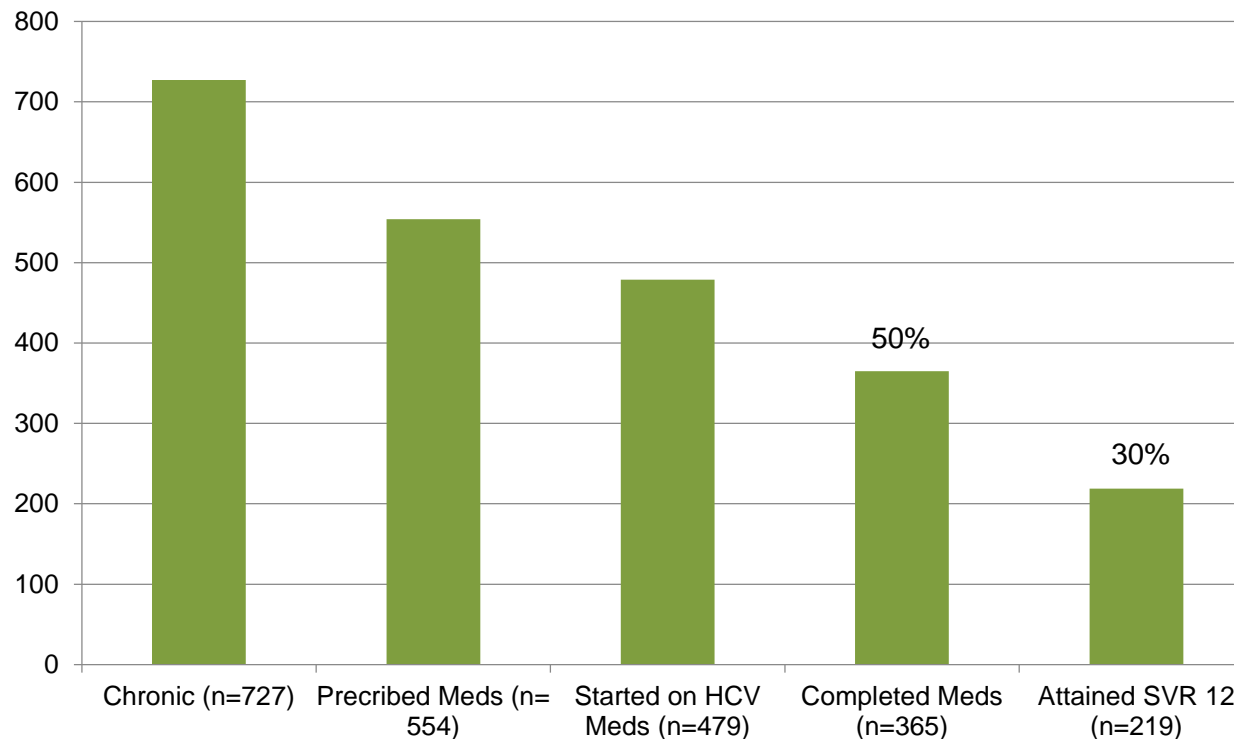
- Placement of Region 1 Hepatitis C Bridge Counselor in Jackson County, March 2017
- Region 2/3 Bridge Counselor developed for placement in Buncombe County January 2018
- Region 8 Bridge Counselor placed in New Hanover June 2018
- State HCV Bridge Counselor July 2018



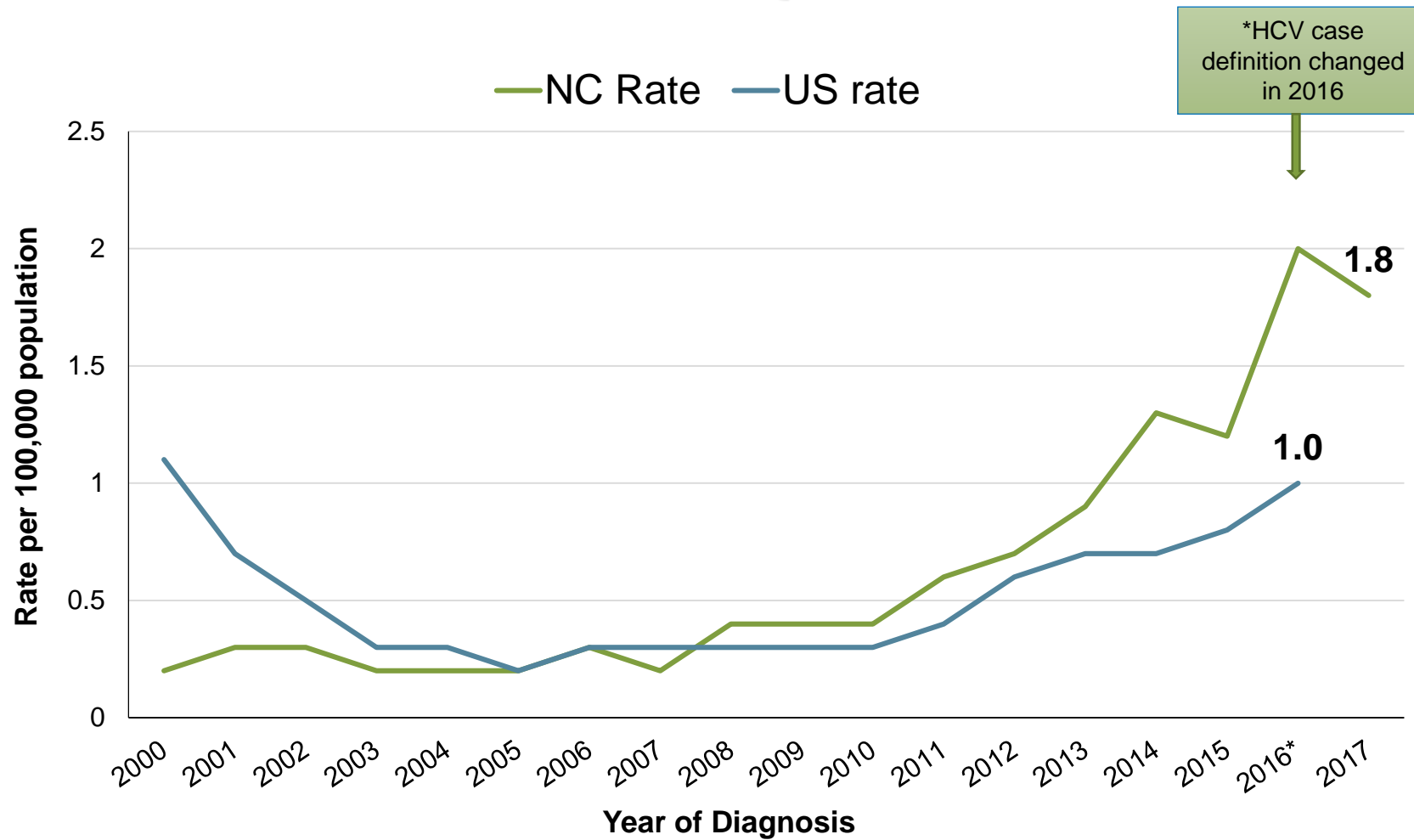
# CHAMP

Carolina Hepatitis Academic Mentorship Program (CHAMP) is a dynamic telemedicine training platform whose mission is to improve the health of rural and underserved communities in North Carolina by building a primary care workforce with the expertise to manage and cure hepatitis C

**CHAMP Hepatitis C care continuum, 1/1/2017 through 9/30/2018.**  
**Total Screened (non-SLPH) for HCV= 10,083**



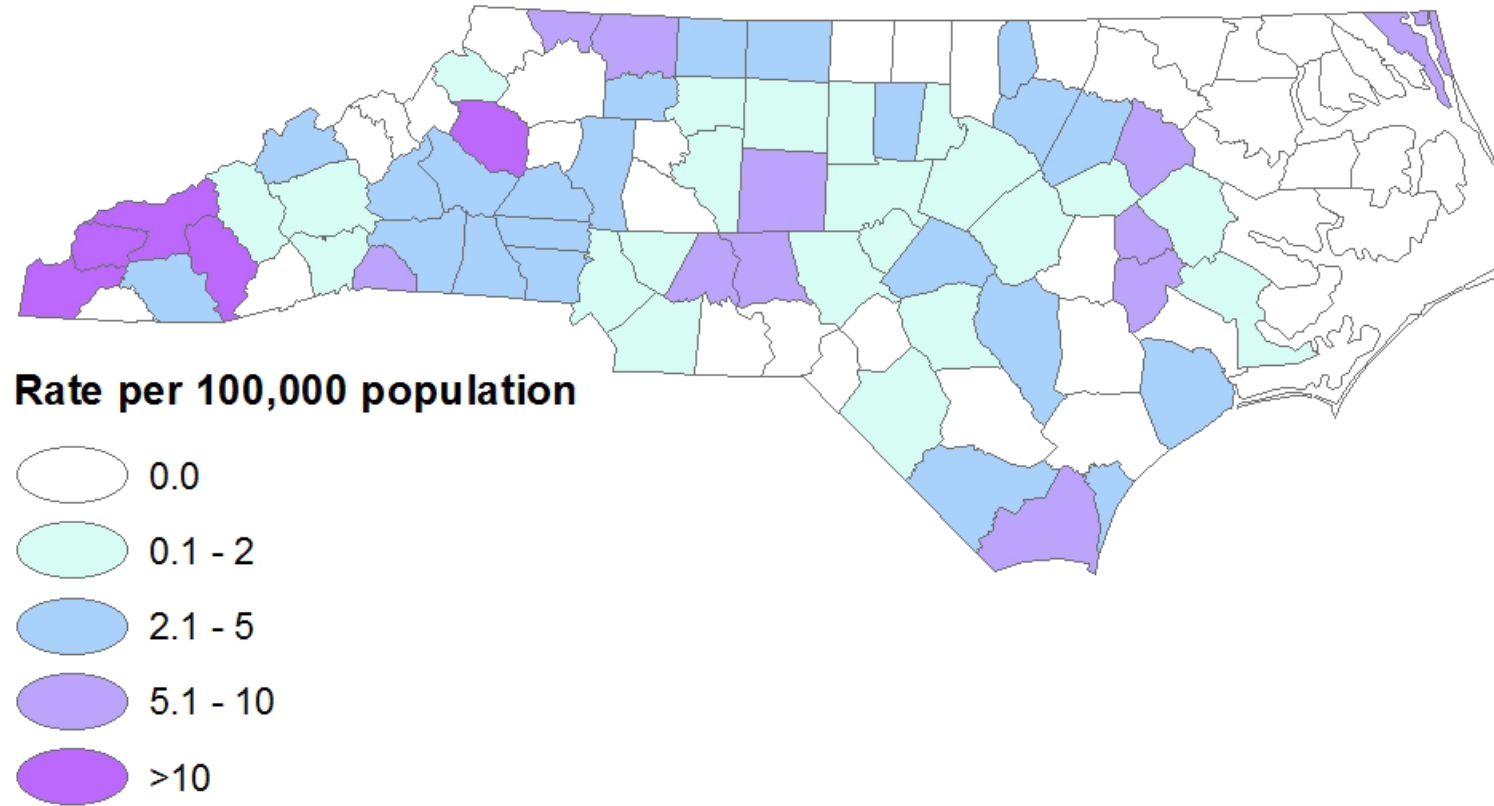
# Acute HCV Rates in North Carolina and United States, 2000-2017



\*Case definition for HCV changed in 2016.

Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of June 3, 2018) and Surveillance for Viral Hepatitis, United States, 2009-2015 CDC reports (<https://www.cdc.gov/hepatitis/statistics/index.htm>).

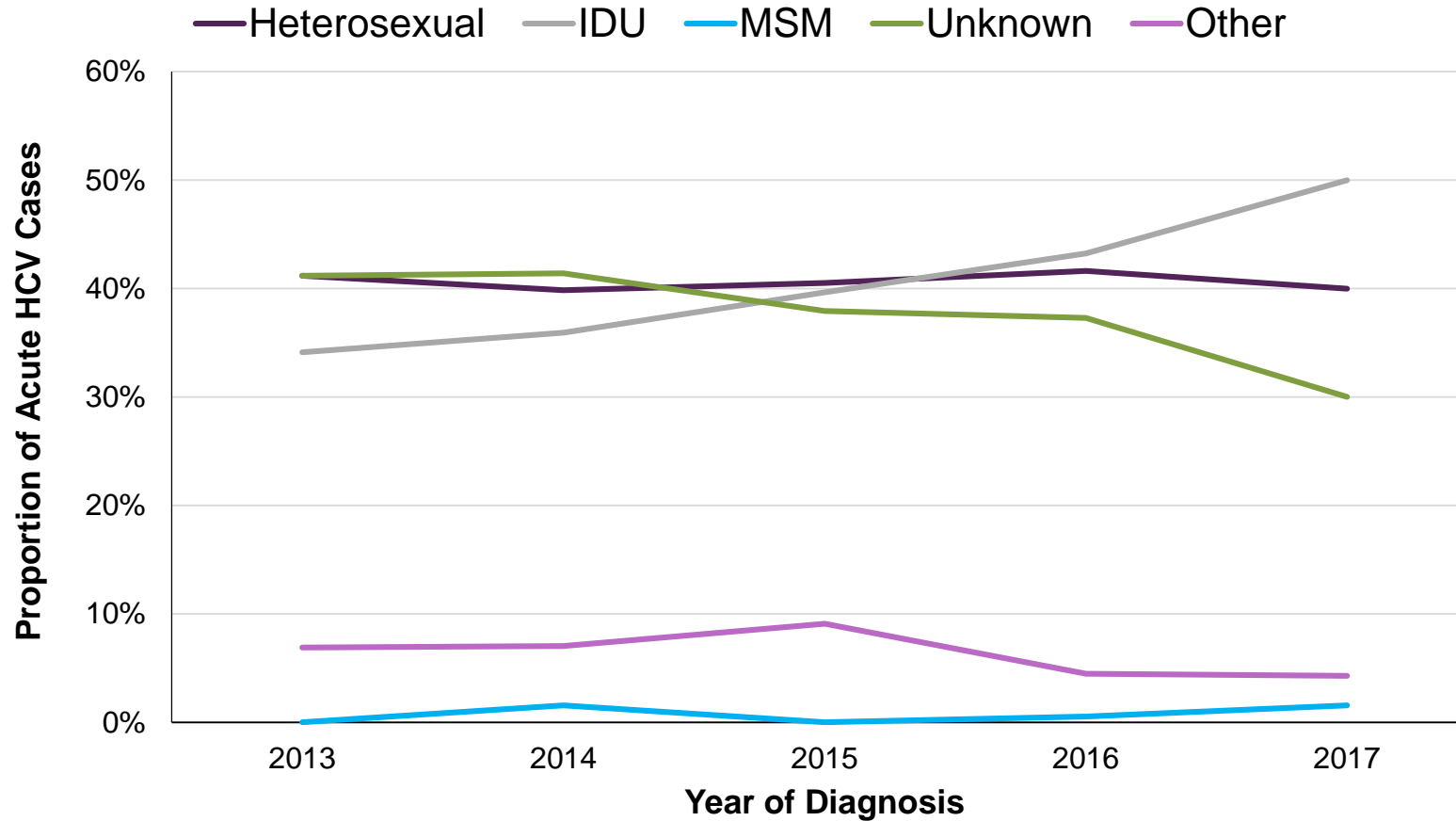
# Acute HCV County Rates in North Carolina 2017



Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of June 3, 2018).

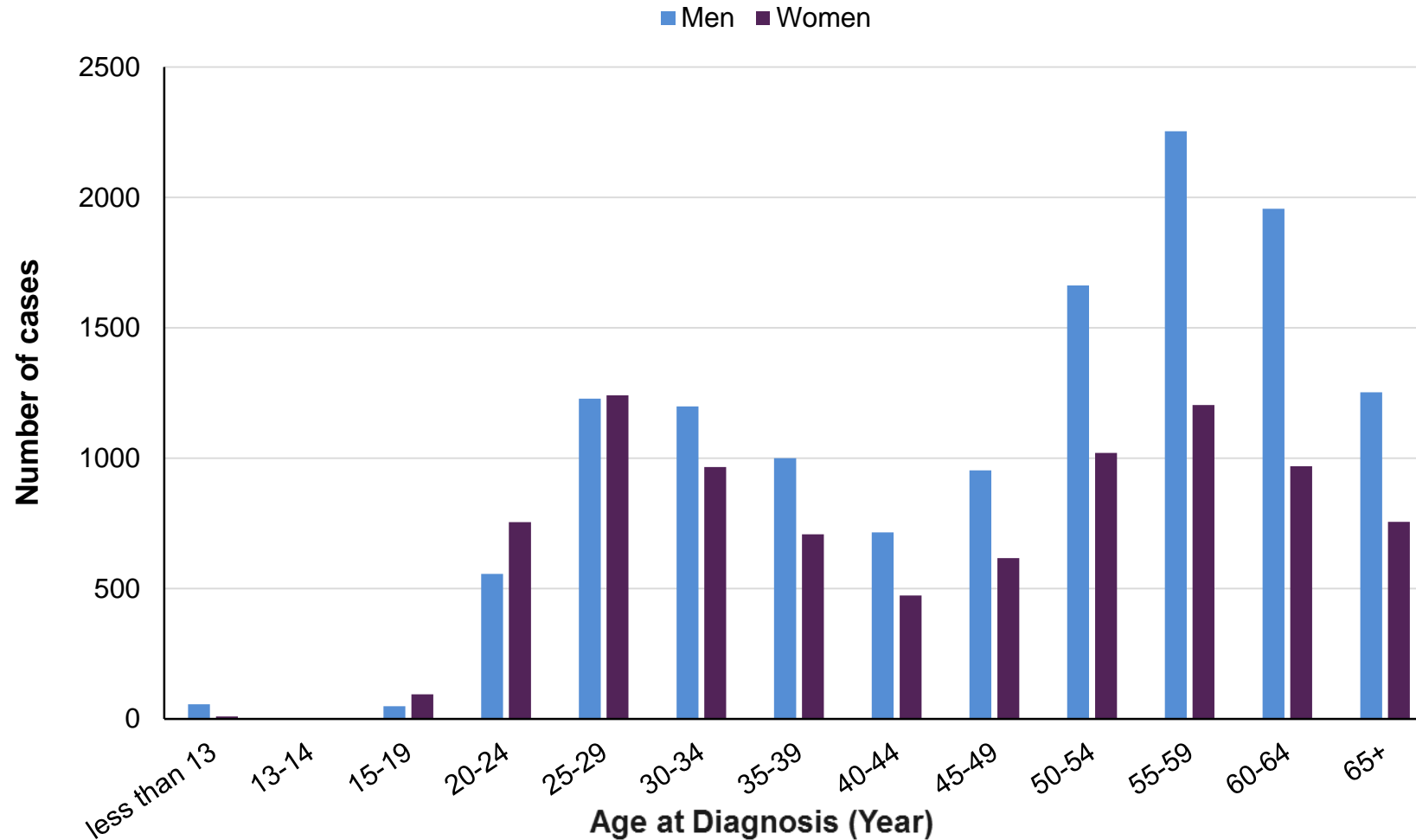


# Acute HCV Cases by Reported Risk\* North Carolina 2013-2017



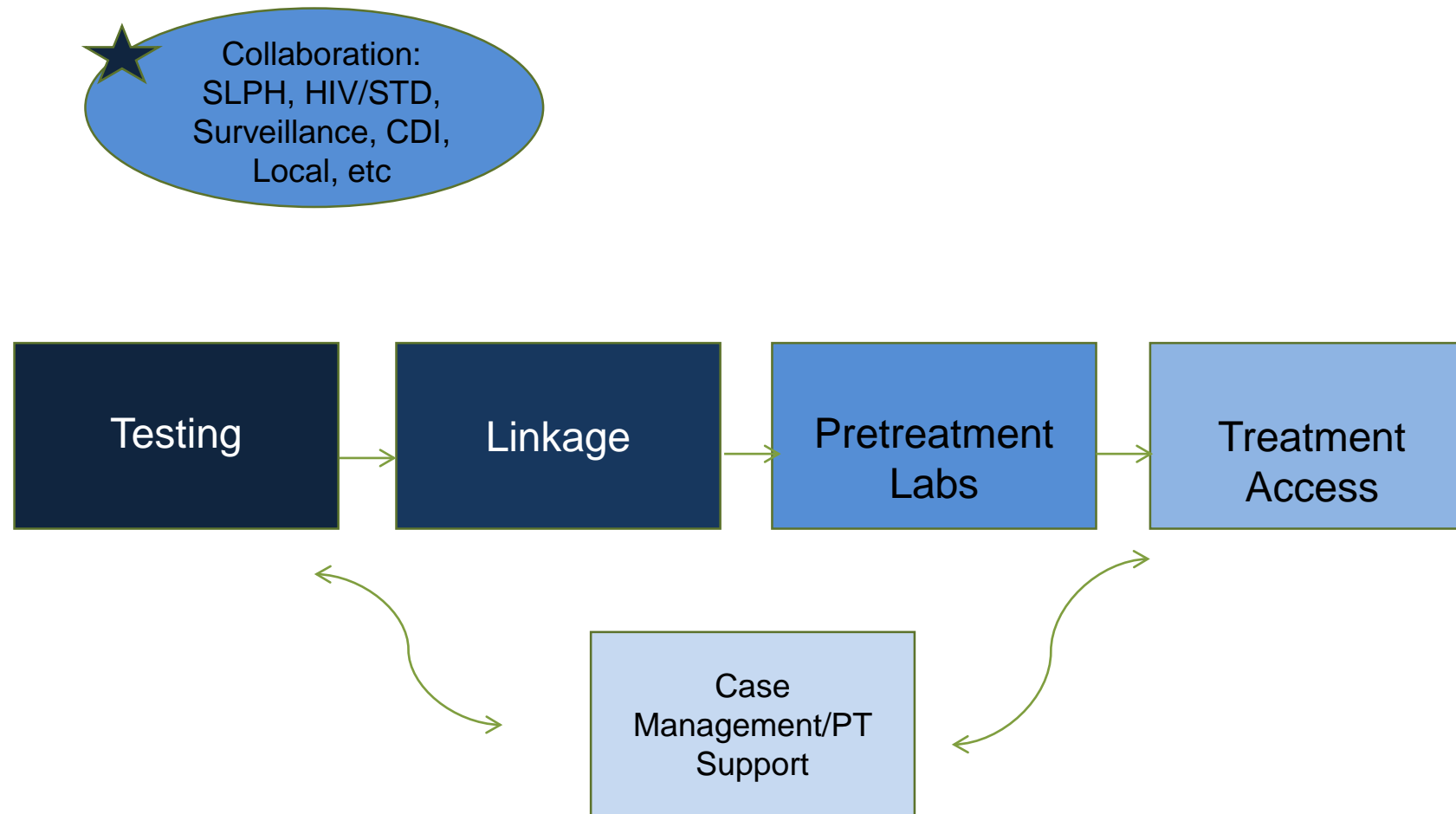
\*People may report more than one risk, so totals may not add up to the case total. Rates are not presented due to the lack of population data for the exposure groups. Other risk includes healthcare exposure, or contact with a positive HCV individual.  
Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of June 3, 2018).

# Age Distribution of Chronic HCV Cases by Gender, North Carolina, 2017



Data Source: North Carolina Electronic Disease Surveillance System (NC EDSS) (data as of June 3, 2018).

# NC TLC: Now



# Thanks!

## NCSLPH

Amorie Parker  
Amanda Smith  
Scott Zimmerman

## CDB

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Evelyn Foust  
Brian Gravlin  
Victoria Mobley  
Heidi Swygard

## CHAMP

Andrew Muir (Duke)  
Michael Fried (UNC)

## APHL/CDC



# Questions?

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*"BY THE WAY, I HAVE HEPATITIS C"*