



Tennessee NBS Longitudinal Hepatitis B Virus & Hepatitis C Virus Registry

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Agenda

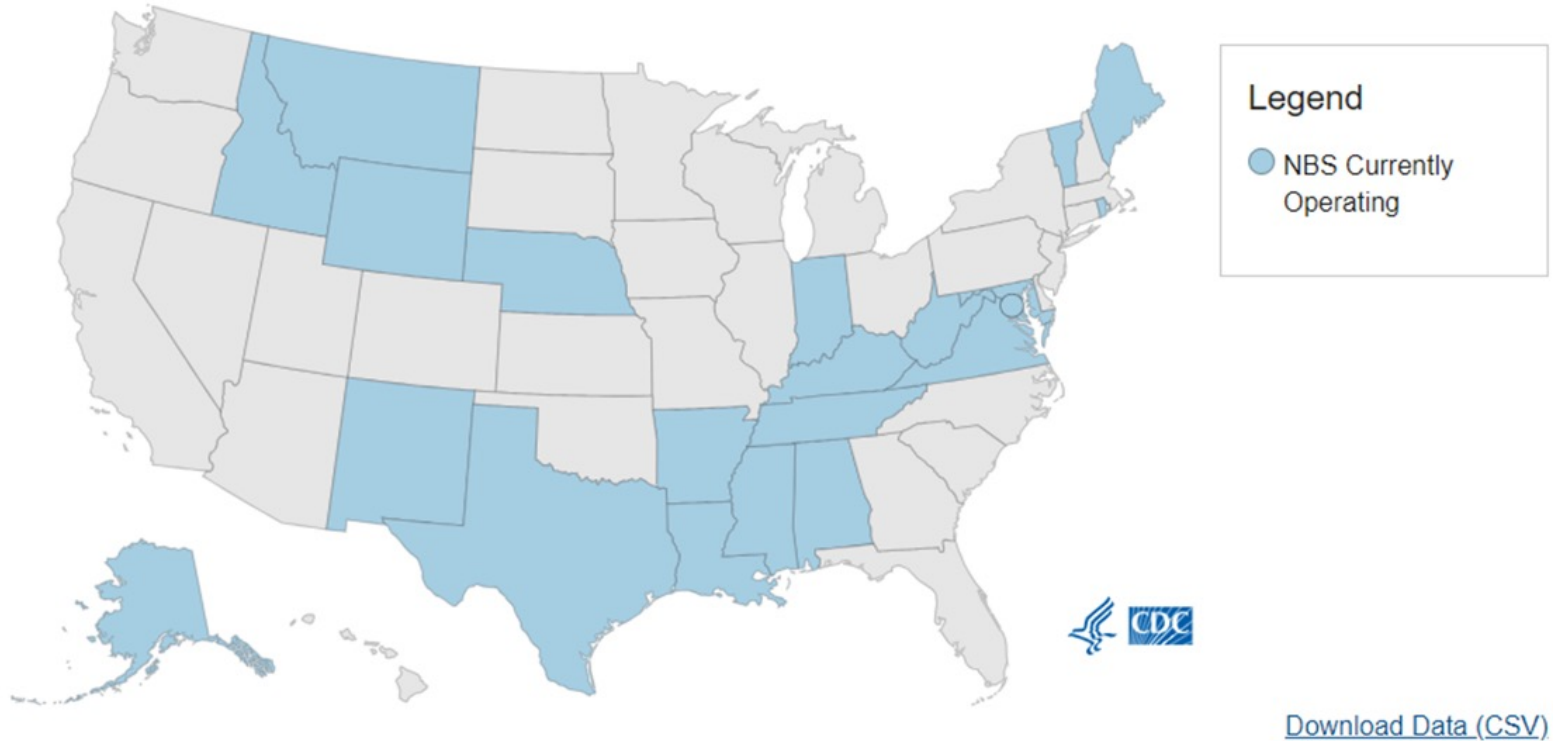
- NBS Registry
- Reportable Labs & Tracked Conditions
- Workflow Decision Support
- Data Cleaning & Quality Assurance
- HCV Continuum of Care



NBS Registry

NBS Deployments

Map of Health Departments currently using NBS



NBS in Tennessee

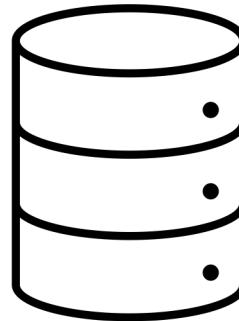
- Hepatitis
- STIs
- HIV
- TB/LTBI
- HAIs
- Foodborne
- Vectorborne
- Zoonotic
- Waterborne
- VPDs
- BT agents
- Emerging Conditions
- Environmental



- Hepatitis A, B (acute and chronic), C (acute and chronic)
- Perinatal Hepatitis B and C
- Hepatitis positive pregnant female B and C
- Hepatitis E
- Delta co-infection
- Hepatitis non-ABC

- Birth Defects
- ~~Cancer~~
- ~~Overdose~~
- Newborn Screening
- Animal Bites

NBS

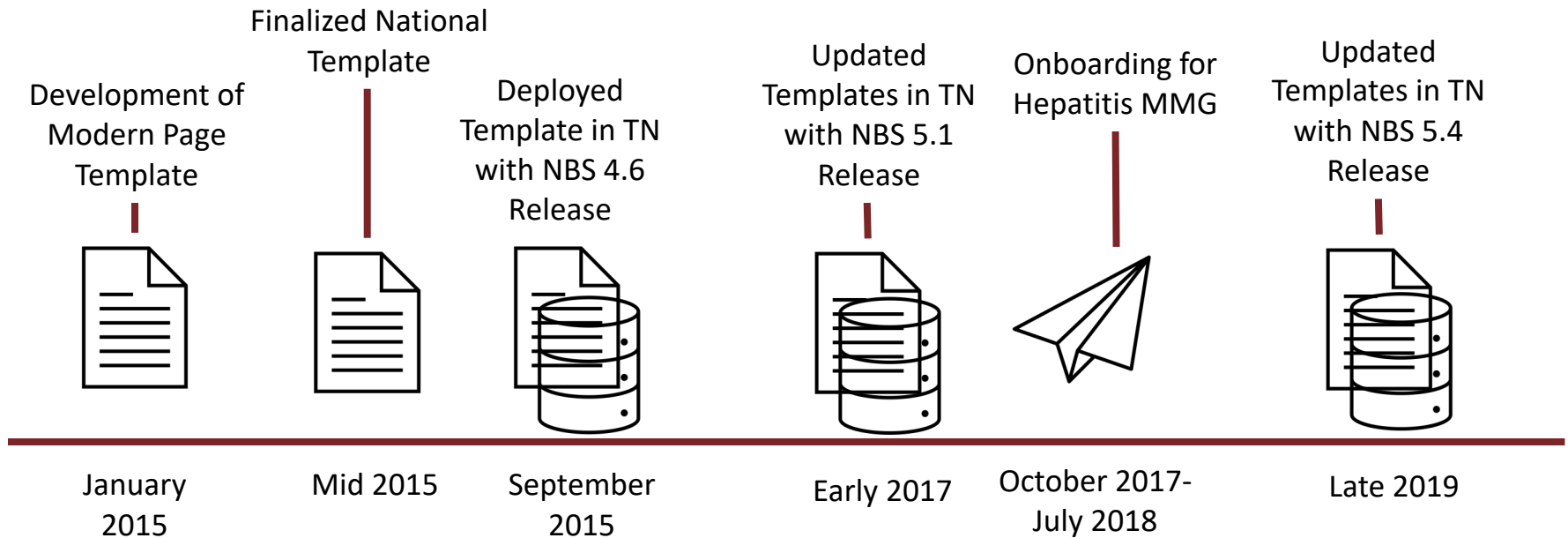


NBS Configurations

Data access



Timeline for Hepatitis Deployment



What Does Deployment Mean?

- Initially:
 - Review Page Builder format for local customization
 - New questions
 - Reorder questions
 - Create page rules
 - Complete page porting from legacy template to Page Builder
 - Review vocabulary and value sets, complete update scripts from deployment
- Upon update
 - Review conflicts with local customization
 - Complete additional customization as needed
 - Review vocabulary and value sets, complete update scripts from deployment

Staffing

- 1 NBS Coordinator
- 1 NBS Epidemiologist
- 1 Data Support Epidemiologist
- 1 Program Manager
- 1 HSVH Epidemiologist
- Highly variable engagement across projects. We do not track our support via ticketing system.
- For example:
 - A deployment with page porting will require ~20% of time for several months for the NBS Coordinator and NBS Epidemiologist
 - MMG onboarding required ~10% NBS Epidemiologist time across nine months
 - WDS requires initial outlay of ~10% time for 3 epis for 3 months



Reportable Labs & Tracked Conditions

Reportable Labs

HBV

- Positive HBsAg
- Positive IgM anti-HBc
- Positive HBeAg
- Positive HBV DNA
- **Positive anti-HBs**
- **Positive anti-HBc**

HCV

- Positive or negative confirmatory assays (antigen or RNA)
- Positive anti-HCV
- **Positive and negative anti-HCV for ages 0-36 months**

*If any of the above are positive, also report pregnancy status and all associated results for serological markers of hepatitis

Tracked Conditions in NBS

- CDC Conditions
 - Acute and chronic HBV (Probable and Confirmed)
 - Acute and chronic HCV (Probable and Confirmed)
 - Perinatal Hepatitis C (Confirmed)
 - NBS houses investigations and allows our program to send investigation notifications to include demographic and risk factor variables
- Local Conditions
 - Possible Hepatitis C Reinfection or Treatment Failure (Confirmed)
 - Hepatitis C Positive Pregnant Female (Confirmed and Probable)
 - Perinatal Hepatitis C (Probable, Suspect, Not a Case)

Longitudinal Case Tracking

- Each NBS record can only have one acute case and one chronic case for each condition
- Investigations are assessed over time and case status is updated as additional laboratory evidence becomes available (as appropriate)
- Reportable labs allow for tracking of continuum of care for HCV, but not HBV due to necessary HBV labs being non-reportable

Persons Living with HCV in Tennessee

**115,608
persons were
living with HCV
in 2021**

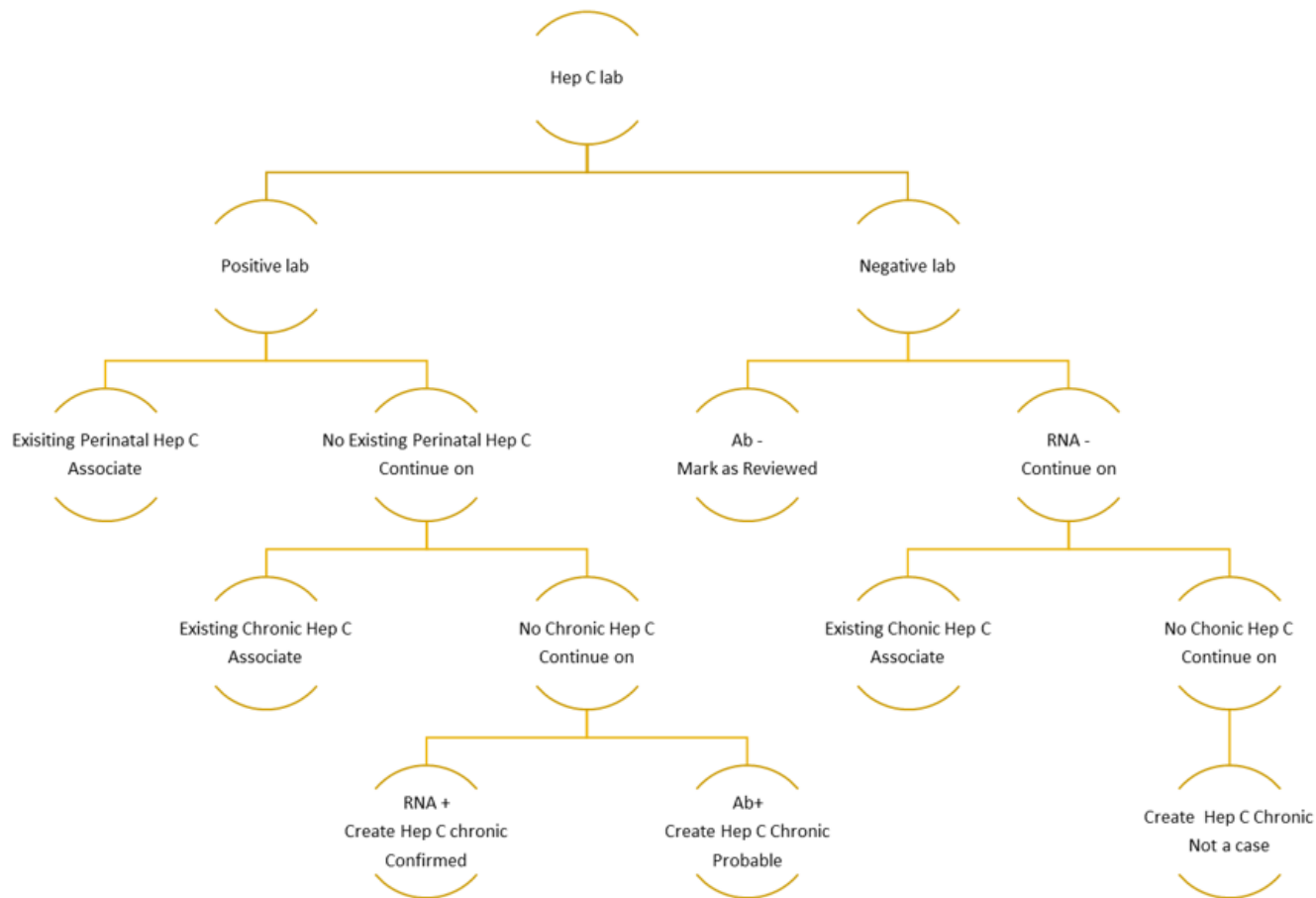
- Total based on lab results reported to the Tennessee Department of Health from 2000 to 2021.
- Includes people with a positive Ab and no HCV RNA result or people whose last HCV RNA result was positive.
- Deceased individuals or those that have relocated outside of Tennessee have been removed from the total.



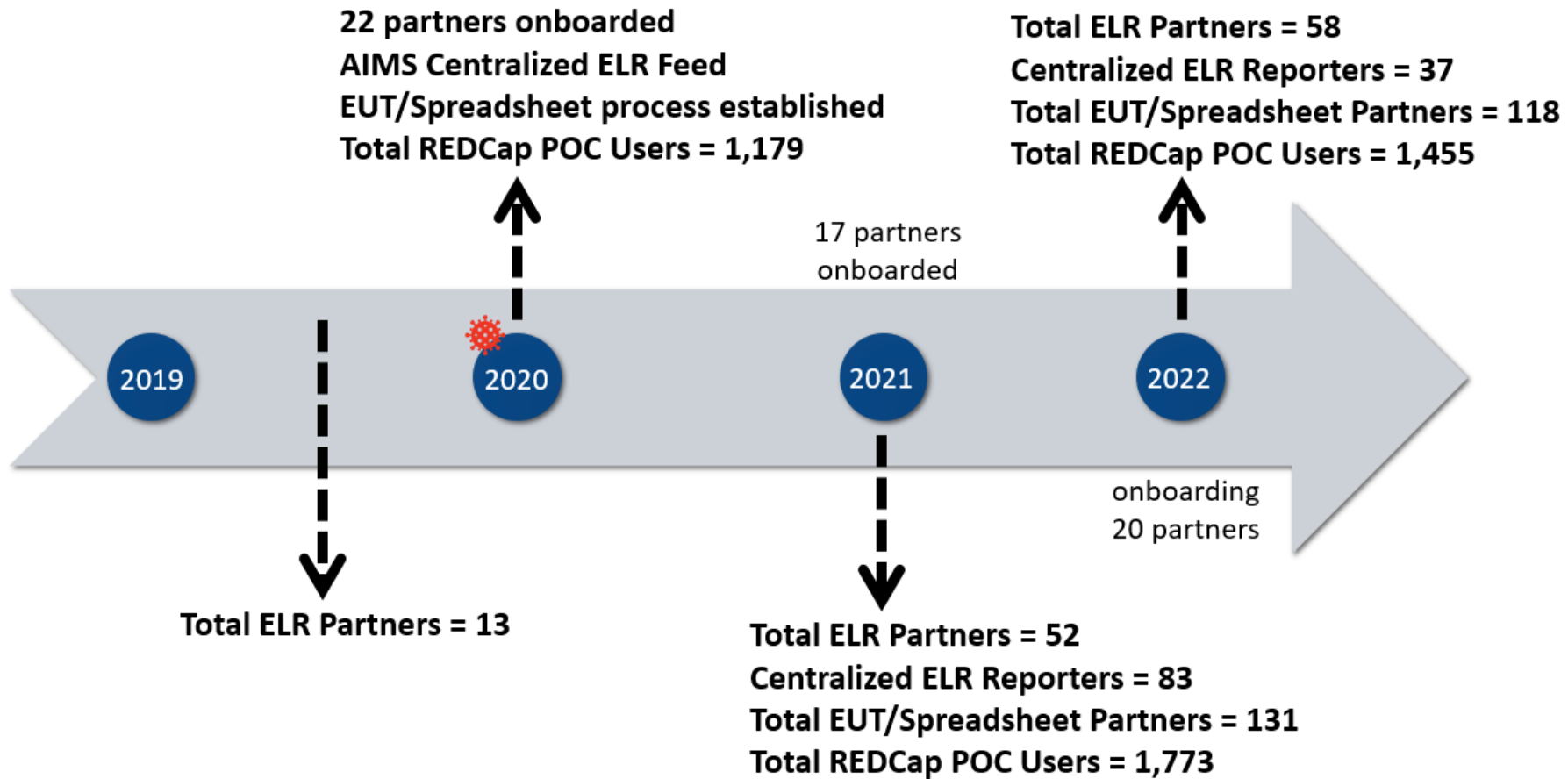
Workflow Decision Support

What is Workflow Decision Support (WDS)?

- WDS is a feature in NBS that supports configuring algorithms to automatically process incoming documents



Electronic Lab Reporting (ELR)



Data Credit: [Abhi Saxena](#), Mary Ellen Travers and the SSI Team

Workflow Decision Support (WDS)

- COVID-19 and MPX paved the way
- NBS algorithms assess incoming hepatitis B and hepatitis C labs
- Automatically marks labs not meeting case definition as reviewed
- Attach labs to existing investigations
- Create probable investigations on newly reported cases



Ongoing Management

- Workflow Decision Support
 - Helps to process lab results within NBS to decrease burden on regional/metro epidemiologists and program area
 - Coordinated with vaccine-preventable disease program area and viral hepatitis
 - Algorithms
 - 2 HAV algorithms
 - 9 HCV algorithms
 - 1 HBV algorithm
 - Updated as needed to better process results
 - So far, have processed 134,098 labs through WDS

WDS Timeline

Discussions began

•August 2022

Hepatitis C negative labs marked as reviewed

•January 2023

Hepatitis B negative labs marked as reviewed

•October 2023

Hepatitis A program discussion

•October 2022

Attaching hepatitis C labs and creating investigations

•July 2023



Data Cleaning & Quality Assurance

Data Cleaning & Quality Assurance

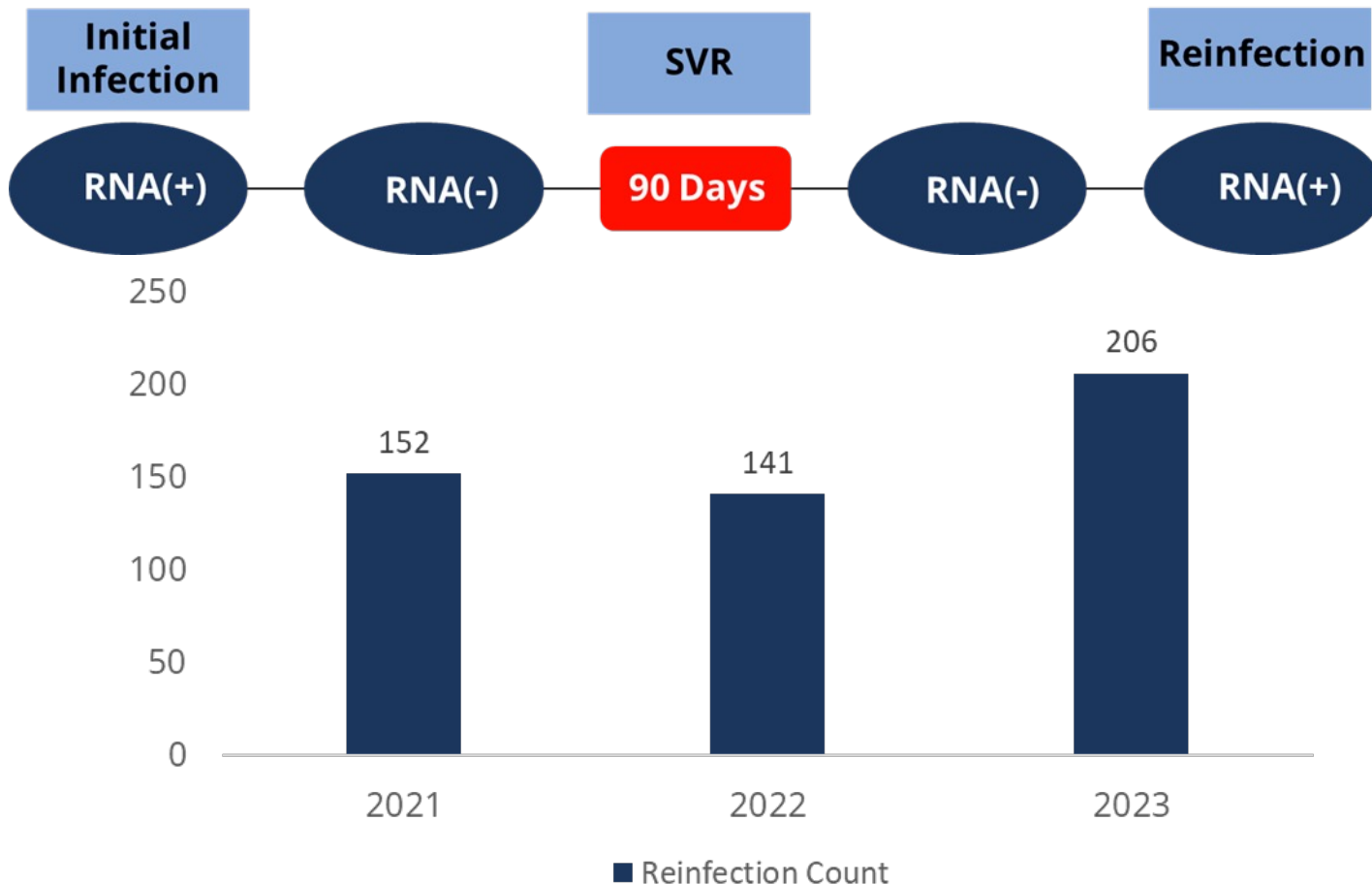
- Weekly
 - Update WDS created investigations with a new RNA+/-
 - Deduplicate records with multiple chronic investigations
- Monthly
 - Review labs received and reporting facilities to assess for potential drop-offs in reporting
- Quarterly
 - Update date of death
 - Update any missing or mismatched county, region, state
 - Merge duplicate records
 - Review instances of possible seroconversion and reinfection



HCV Continuum of Care

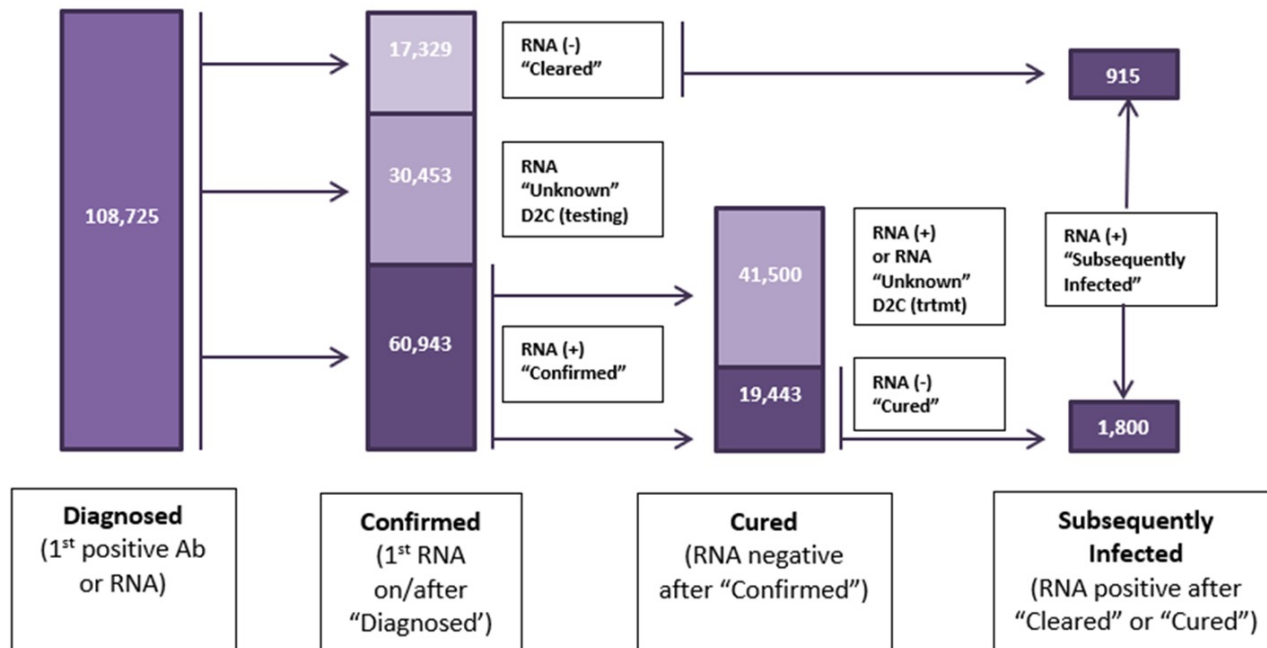
HCV Reinfections

- Currently we use a strict definition of HCV reinfection
- These investigations are housed in NBS, but not sent to CDC

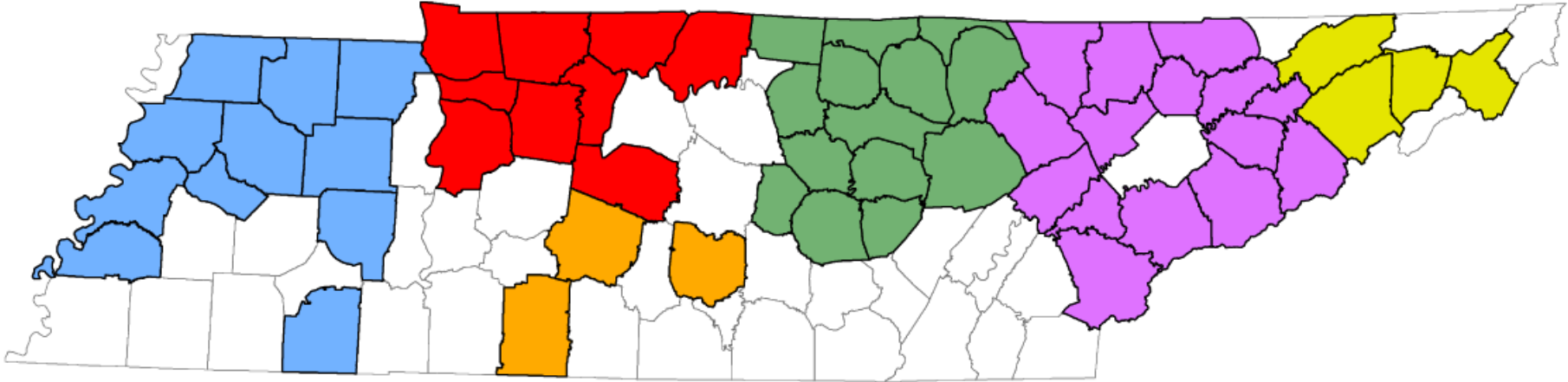


HCV Continuum of Care

- We follow CDC proposed care cascade
- Cases classified as “subsequently infected” are housed in a REDCap project
- Data will be used to determine Tennessee's reinfection case definition



Tracking Treatment



- There are 59 Tennessee Department of Health hepatitis C treatment sites
- Patients that the regions report as having initiated treatment are monitored for SVR using reported HCV RNA negative labs in NBS
- SVR timeframe is calculated based on medication regimen, treatment start date, and HCV RNA specimen collection dates
- Project housed in a REDCap project

Questions?

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