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

Legend:
- NBS Currently Operating

Download Data (CSV)

https://www.cdc.gov/nbs/overview/index.html
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 Configurations

Data access

- Role
- Jurisdiction
- Disease Area

Disease Family
Timeline for Hepatitis Deployment

- Development of Modern Page Template: January 2015
- Finalized National Template: Mid 2015
- Deployed Template in TN with NBS 4.6 Release: September 2015
- Updated Templates in TN with NBS 5.1 Release: Early 2017
- Onboarding for Hepatitis MMG: October 2017 - July 2018
- Updated Templates in TN with NBS 5.4 Release: Late 2019
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

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.
What is Workflow Decision Support (WDS)?

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

Data Credit: Jenna Strathdee
Electronic Lab Reporting (ELR)

2019
Total ELR Partners = 13

2020
22 partners onboarded
AIMS Centralized ELR Feed
EUT/Spreadsheet process established
Total REDCap POC Users = 1,179

2021
17 partners onboarded
Total ELR Partners = 52
Centralized ELR Reporters = 83
Total EUT/Spreadsheet Partners = 131
Total REDCap POC Users = 1,773

2022
onboarding 20 partners
Total ELR Partners = 58
Centralized ELR Reporters = 37
Total EUT/Spreadsheet Partners = 118
Total REDCap POC Users = 1,455

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 A program discussion
• October 2022

Hepatitis C negative labs marked as reviewed
• January 2023

Attaching hepatitis C labs and creating investigations
• July 2023

Hepatitis B negative labs marked as reviewed
• October 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 Reinfections

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

![Diagram showing the process of HCV reinfection with counts for 2021, 2022, and 2023]
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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