A JURISDICTIONS EXAMPLE

NASTAD

Building a Hepatitis B Continuum of Care Using Enhanced Public Health Surveillance Data

PURPOSE

The example below describes how one jurisdiction developed a laboratory- and public health surveillance-based hepatitis B virus (HBV) Continuum of Care in 2022. The continuum uses routinely collected laboratory data, supplemented with enhanced surveillance information, to assess engagement in HBV care across the population. This surveillance-based approach tracks individuals through key stages of care using longitudinal public health data, providing health departments with a method to monitor retention in care, identify service gaps, and inform public health action.

Data Source	Purpose
HBV Surveillance Registry	Primary source of reportable HBV laboratory results (tracks repeat HBV testing over time) and case information
Negative HBV DNA & HBsAg Database	Identify individuals with evidence of inactive disease or viral suppression
Electronic Death Certificates (Vital Statistics)	Removes deceased individuals from the analytic cohort

Inclusion Criterion	Definition	Justification
Tested Positive for HBV	Included individuals with ≥1 positive HBV laboratory result: HBV DNA, confirmed HBsAg*, HBeAg, OR HBV genotype	Ensures inclusion of individuals with laboratory evidence of HBV infection
Residency	Included individuals who resided in the jurisdiction OR were documented as experiencing homelessness/ unstable housing during the “Ever Screened Positive” period AND “Follow-up” period	Ensures individuals lived in the jurisdiction and could be assessed for engagement across the HBV Continuum of Care
Alive	Included individuals who were alive through the “Ever Screened Positive” AND “Follow-up” periods	Ensures individuals had the opportunity to progress through the continuum and be assessed for linkage to care and retention in care

Note: * *Excluded*: Individuals with only a positive HBsAg EIA followed by a negative confirmatory HBsAg test or additional negative HBV testing, as these results may represent false positives.

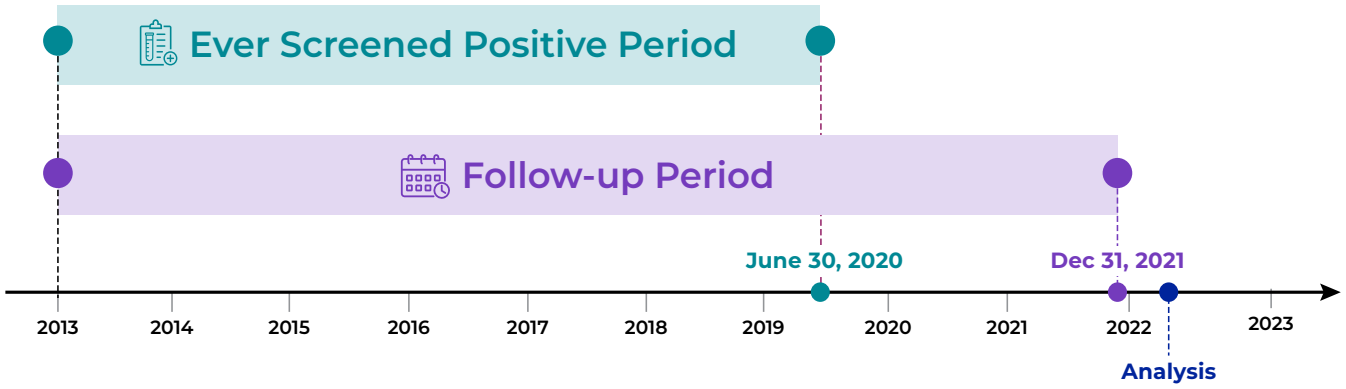
Definitions:

- HBV DNA=hepatitis B virus DNA
- HBsAg= hepatitis B surface antigen
- HBeAg= Hepatitis B e-antigen

CONTINUUM TIMEFRAME

- **Starting point:** The time point when HBV DNA negative/ not detected reporting was fully implemented or was received in the jurisdiction.
- **Follow-up time frame:** The time period from the starting point of the Ever Screened Positive with additional follow-up time (i.e., 18 months, 24 months) before analysis.

Hepatitis B Continuum of Care Timeframe



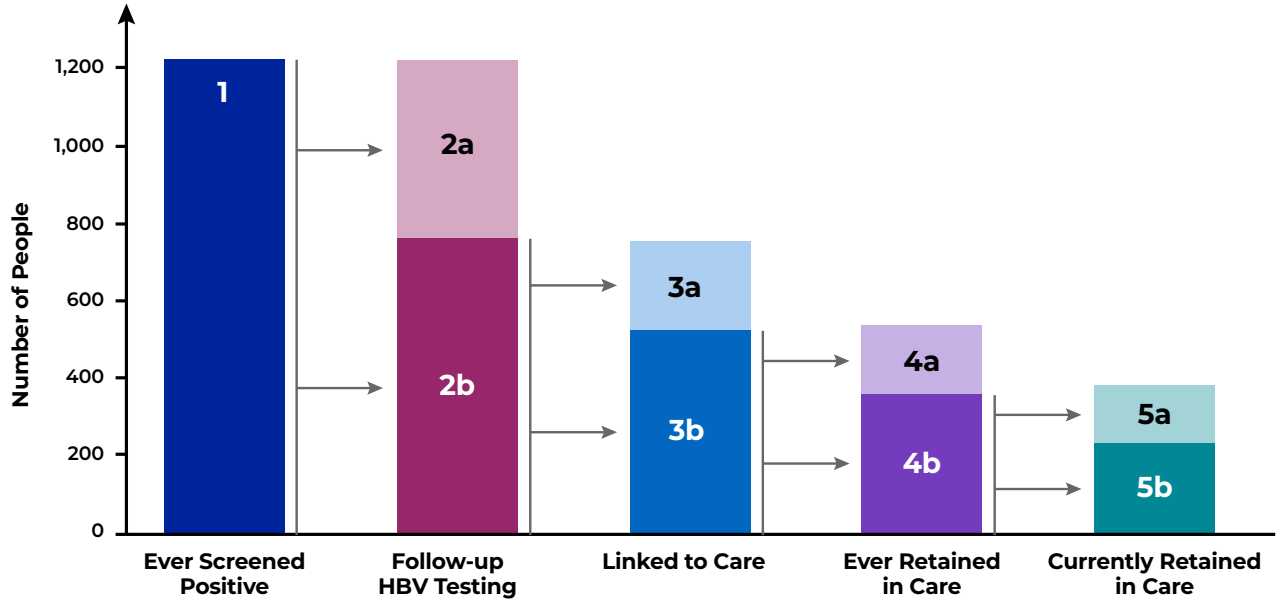
Ever Screened Positive Period
Identify individuals with a first positive HBV test between January 1, 2013 and June 30, 2020.

Follow-up Period
The time period from the starting point of Ever Screened Positive to the additional 18 months through December 31, 2021.

Analysis
Conduct analysis at least 3 months after the follow-up period ends to allow for complete laboratory reporting and data processing.

Note: An additional 18-month follow-up period (July 1, 2020–December 31, 2021) from the Ever Screened Positive period was added to allow sufficient time for linkage to specialty care or other providers capable of monitoring and treating HBV, and to assess retention in care.

Surveillance-Based Hepatitis B Virus (HBV) Continuum of Care



Continuum Steps	Surveillance Definition
STEP 1: **Ever Screened Positive**	Positive HBV DNA, HBsAg (with confirmation), HBeAg, OR HBV genotype (1)
STEP 2: **Follow-up HBV Testing**	Second positive HBV laboratory test after initially screening positive. (2a=No & 2b= Yes)
STEP 3: **Linked to Care**	Positive HBV genotype OR another **HBV laboratory test ordered by a provider capable of monitoring or treating HBV**. (3a=No & 3b=Yes)
STEP 4: **Ever Retained in Care**	Positive HBV laboratory test occurring 6–24 months after the initial positive test, OR HBV genotype ever OR another HBV laboratory test ever reported by an **HBV specialist** (excluding acute HBV that has resolved). (4a=No & 4b=Yes)
STEP 5: **Currently Retained in Care**	Continued consecutive HBV laboratory results throughout the Follow-up period with no evidence of being out of care (excluding acute HBV that has resolved). (5a= No & 5b=Yes)

Notes

- [■] represents enhanced surveillance measures.
- Step 3 primarily requires enhanced surveillance data. If this information is not available or feasible to obtain, consider omitting Step 3 from the Continuum.

ADDITIONAL DEFINITION

Out of Care	No additional HBV laboratory testing during the 18-month follow-up period.

LIMITATIONS

- Incomplete reporting of negative HBV laboratory results, particularly HBV DNA and HBsAg
  - Historically negative HBV test backfill was likely incomplete despite requests and improved electronic reporting beginning in 2018
- Surveillance data have limited ability to ascertain out-migration. Even with linkage to multiple data sources, some individuals who have moved out of the jurisdiction may remain in the registry and be misclassified as out of care.
- Treatment is not reportable and is not captured through routine and automated HBV surveillance.

THOUGHTS AND CONSIDERATIONS

- Develop and maintain a person-based longitudinal laboratory registry with analytic code that links all laboratory results over time and accurately distinguishes positive and negative laboratory result pairs.
    - The program followed up with all acute and perinatal HBV cases, as well as a subset of chronic HBV cases, to obtain demographic, clinical (including care and treatment), and risk factor information.
    - The prevention program compiled a list of HBV specialists and other providers who monitor and treat HBV, which was used to inform the construction of the continuum SAS code.
- If surveillance capacity is limited, consider beginning the continuum with individuals who meet the Probable and Confirmed Chronic HBV case definition rather than all persons ever screened positive.
- If negative HBV DNA results are not available through routine surveillance, consider constructing the continuum using a defined subpopulation (e.g., a clinic, provider network, or healthcare system) with complete longitudinal positive and negative laboratory data.
- Consider including a Viral Suppression measure representing the proportion of individuals with an HBV DNA test who achieved viral suppression (HBV DNA not detected).

ACKNOWLEDGEMENTS

NASTAD is grateful to Eman Addish and Danica Kuncio for the development of this resource and to the following persons that facilitated the review whose contributions and support made this publication possible: Rita Isabel Lechuga, Zakiya Grubbs, Phillip Rideoutt II