National Health and Nutrition Examination Survey

August 2021-August 2023 Data Documentation, Codebook, and Frequencies

Hepatitis A (HEPA_L)

Data File: HEPA_L.xpt

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Component Description

Hepatitis viruses constitute a major public health problem because of the morbidity and mortality associated with the acute and chronic consequences of these infections. Because of the high rate of asymptomatic infection with these viruses, information about the prevalence of these diseases is needed to monitor prevention efforts. By testing a nationally representative sample of the U.S. population, NHANES provides the most reliable estimates of age-specific prevalence needed to evaluate the effectiveness of the strategies to prevent these infections. In addition, NHANES provides the means to better define the epidemiology of other hepatitis viruses. NHANES testing for markers of infection with hepatitis viruses is used to determine secular trends in infection rates across most age and racial/ethnic groups and provides a national picture of the epidemiologic determinants of these infections.

Hepatitis is inflammation of the liver most often caused by a virus. Viral hepatitis is a major public health problem of global importance because of the ongoing transmission of viruses that cause the disease and increased morbidity and mortality associated with the acute and chronic consequences of these infections. Global and U.S. goals have been established for elimination of viral hepatitis as a public health threat by 2030 (HHS, 2020).

In the U.S., the most common types of viral hepatitis are hepatitis A, B, and C. Effective vaccines are available to help prevent hepatitis A and hepatitis B. No vaccine is available for hepatitis C; however, highly effective, well-tolerated treatment can cure hepatitis C virus infection. Hepatitis D virus infection is less common in the U.S. and can occur only among persons with hepatitis B virus infection. Hepatitis E infection also is less common in the U.S. These five hepatitis viruses, also called hepatitides, are well-characterized for detection with laboratory assays and are monitored in U.S. public health surveillance systems.

NHANES viral hepatitis data are used to monitor progress toward goals in *Healthy People* and the Health and Human Services (HHS) Viral Hepatitis National Strategic Plan, which in turn support U.S. and global viral hepatitis elimination goals. The viral hepatitis laboratory and interview components of NHANES complement data from outbreak, case-based surveillance, vital statistics, health care systems, and cohort studies that can provide timely, detailed, or longitudinal information for subnational geographic areas and disproportionately affected populations, such as persons experiencing homelessness or living in correctional facilities; however, these sources lack information available from NHANES, such as race, ethnicity, education, income, and health status and behaviors (HHS Healthy People, 2022 and National Academies of Science, Engineering and Medicine, 2017).

Viral hepatitis data from NHANES are available beginning with NHANES II conducted in 1976-1980 for hepatitis A and hepatitis B, and with NHANES III conducted during 1988-1994 for hepatitis C, hepatitis D, and hepatitis E.

Hepatitis A virus (HAV) infection is a cause of morbidity and socio-economic loss in many parts of the world. Transmission is typically via the fecal-oral route associated with contaminated water or food. In areas where sanitation is poor, infections often occur early in life. In childhood, HAV infection is generally mild or asymptomatic and results in lifelong immunity. With improved sanitation and hygiene, infections are delayed and consequently the number of adolescents and adults susceptible to the virus increases. In adolescents and adults, HAV infection is more serious leading to hepatitis and an increased mortality rate.

Anti-HAV IgM is detectable during the acute stage of illness, while anti-HAV IgG may be present for many years after recovery or following vaccination. The presence of anti-HAV (IgG or IgM) in human serum or plasma is indicative of past or present infection with hepatitis A virus (HAV) or vaccination against HAV. The test for total anti-HAV is primarily used to determine exposure to HAV either naturally or due to vaccination. No test can differentiate between exposure naturally or due to vaccination.

The total anti-HAV test is used for the NHANES viral hepatitis component.

Eligible Sample

Examined participants aged 2 years and older were eligible.

Description of Laboratory Methodology

Hepatitis A antibody (anti-HAV) is measured using the VITROS Anti-HAV Total assay. The test is performed using the VITROS Immunodiagnostic Products Anti-HAV Total Reagent Pack and the VITROS Immunodiagnostic Products Anti-HAV Total Calibrator on the VITROS 3600 Immunodiagnostic System.

Refer to the Laboratory Method Files section for a detailed description of the laboratory methods used.

There were no changes to the lab method, lab equipment, or lab site for this component in the NHANES August 2021-August 2023 cycle.

Laboratory Method Files

Hepatitis A Antibody Laboratory Procedure Manual (September 2024)

Laboratory Quality Assurance and Monitoring

Serum specimens were processed, stored, and shipped to the Division of Viral Hepatitis, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA for analysis.

Detailed instructions on specimen collection and processing are discussed in the NHANES Laboratory Procedure Manual (LPM). Vials were stored under appropriate frozen (−30°C) conditions until they were shipped to Division of Viral Hepatitis, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention for testing.

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Amendments mandates. Detailed QA/QC instructions are discussed in the NHANES LPM.

Mobile Examination Centers (MECs)

Laboratory team performance is monitored using several techniques. NCHS and contract consultants use a structured competency assessment evaluation during visits to evaluate both the quality of the laboratory work and the QC procedures. Each laboratory staff member is observed for equipment operation, specimen collection and preparation; testing procedures and constructive feedback are given to each staff member. Formal retraining sessions are conducted annually to ensure that required skill levels were maintained.

Analytical Laboratories

NHANES uses several methods to monitor the quality of the analyses performed by the contract laboratories. In the MEC, these methods include performing blind split samples collected on "dry run" sessions. In addition, contract laboratories randomly perform repeat testing on 2% of all specimens.

Data Processing and Editing

The data were reviewed. Incomplete data or improbable values were sent to the performing laboratory for confirmation.

Analytic Notes

There are over 800 laboratory tests performed on NHANES participants. However, not all participants provided biospecimens or enough volume for all the tests to be performed. The specimen availability can also vary by age or other population characteristics. Analysts should evaluate the extent of missing data in the dataset related to the outcome of interest as well as any predictor variables used in the analyses to determine whether additional re-weighting for item non-response is necessary.

Please refer to the NHANES Analytic Guidelines and the on-line NHANES Tutorial for further details on the use of sample weights and other analytic issues.

Phlebotomy Weights

For the August 2021-August 2023 cycle, analysis of nonresponse patterns for the phlebotomy component in the MEC examination revealed differences by age group and race/ethnicity, among other characteristics. For example, approximately 67% of children aged 1-17 years who were examined in the MEC provided a blood specimen through phlebotomy, while 95% of examined adults aged 18 and older provided a blood specimen. Therefore, an additional phlebotomy weight, WTPH2YR, has been included in this data release to address possible nonresponse bias. Participants who are eligible but did not provide a blood specimen have their phlebotomy weight assigned a value of "0" in their records. The phlebotomy weight should be used for analyses that use variables derived from blood analytes, and is included in all relevant data files.

Demographic and Other Related Variables

The analysis of NHANES laboratory data must be conducted using the appropriate survey design and demographic variables. The NHANES August 2021-August 2023 Demographics File contains demographic data, health indicators, and other related information collected during household interviews as well as the sample design variables. The recommended procedure for variance estimation requires use of stratum and PSU variables (SDMVSTRA and SDMVPSU, respectively) in the demographic data file.

This laboratory data file can be linked to the other NHANES data files using the unique survey participant identifier (i.e., SEQN).

Detection Limits

The assay used in this study cannot differentiate between natural infection and vaccination; therefore, seropositivity for anti-HAV reflects either natural or vaccine-induced immunity.

This data is qualitative. The use of lower limits of detection (LLODs) isn't applicable.

References

- National Academies of Sciences, Engineering, and Medicine. 2017. A national strategy for the elimination of hepatitis B and C. Washington, DC: The National Academies Press. Available from: http://www.nationalacademies.org/hmd/reports/2017/national-strategy-for-the-elimination-of-hepatitis-b-and-c.aspx.

- 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. Available from: https://www.hhs.gov/hepatitis/viral-hepatitis-national-strategic-plan/index.html.

- U.S. Department of Health and Human Services. Healthy People. 2022. Available from: https://health.gov/our-work/national-health-initiatives/healthy-people.

Codebook and Frequencies

SEQN - Respondent sequence number

Variable Name:	SEQN
SAS Label:	Respondent sequence number
English Text:	Respondent sequence number
Target:	Both males and females 2 YEARS - 150 YEARS

WTPH2YR - Phlebotomy 2 Year Weight

Variable Name: WTPH2YR

SAS Label: Phlebotomy 2 Year Weight

English Text: Phlebotomy 2 Year Weight

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
4391.8220579 to 253478.77765	Range of Values	7583	7583	
0	No blood sample provided	1028	8611	
.	Missing	0	8611	

LBXHA - Hepatitis A antibody

Variable Name: LBXHA

SAS Label: Hepatitis A antibody

English Text: Hepatitis A antibody

Target: Both males and females 2 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Positive	3791	3791	
2	Negative	3511	7302	
3	Indeterminate	64	7366	
.	Missing	1245	8611	