National Health and Nutrition Examination Survey

2015-2016 Data Documentation, Codebook, and Frequencies

Herpes Simplex Virus Type-1 & Type-2 (HSV_I)

Data File: HSV_I.xpt

First Published: December 2017

Last Revised: NA

Component Description

HSV-2 infection is one of the best markers of sexual risk factors leading to sexually transmitted infections, because: (a) HSV-2 infections are common and, thus, HSV-2 rates are a measure of sexual risk in the broader population beyond high risk groups; (b) HSV-2 infection is almost always a result of sexual transmission and, thus, a specific measure of sexually transmitted infection; (c) HSV-2 infections are not curable and, thus, HSV-2 risk is not influenced by health care-seeking factors; and (d) sensitive, specific, and relatively inexpensive tests for HSV-2 antibody are available. HSV-2 is a very important marker for monitoring the impact of large national efforts, motivated by the HIV epidemic, to reduce risky sexual behaviors.

NHANES laboratory data can be linked to NHANES sexual behavior ACASI questions to assist in the understanding of national trends in HIV and sexually transmitted diseases. The availability of sexually transmitted infection and risk factors data in a national sample over time is a unique and invaluable resource for evaluation of national HIV/STD risk-reduction efforts and for risk-based modeling of the burden and trends of sexually transmitted infections.

Herpes Simplex Virus Type 1 (HSV-1)

Sera from NHANES participants aged 14–49 were tested for antibody to herpes simplex virus type 1 (HSV-1). HSV-1 is a common chronic infection that is the cause of most oral herpes or cold sores.

Herpes Simplex Virus Type 2 (HSV-2)

Sera from NHANES participants aged 14–49 were tested for antibody to herpes simplex virus type 2 (HSV-2). HSV-2 is a sexually transmitted infection and can be used as a marker for sexual transmission of other infectious agents. HSV-2 infections are rarely life threatening, but morbidity due to painful genital ulcerations is significant.

Eligible Sample

Examined participants aged 14–49 years were eligible. This public data file includes examined participants aged 14-49 for HSV-1 and 18-49 for HSV-2. See Analytic Notes for information on participants aged 14–17 for HSV-2.

Description of Laboratory Methodology

Although extensive antigenic cross-reactivity exists between the two viral types of herpes, a viral glycoprotein specific for HSV-2 (designated gG-2) and a glycoprotein

specific for HSV-1 (designated gG-1) have been identified. Monoclonal antibodies and affinity chromatography have been used to purify these glycoproteins and thus provide antigens for type-specific herpes serologic assays. Solid-phase enzymatic immunodot assays are used to detect antibodies reactive to these antigens. The purified glycoprotein, gG-1 or gG-2, is adsorbed to the center of a nitrocellulose disk. The rest of the disk surface is coated with bovine serum albumin to prevent further nonspecific protein adsorption. Incubation of test serum with the disk allows specific antibodies, if present, to bind to the immobilized antigen. After extensive washing to remove non-reactive antibodies, the bound antibodies are detected by sequential treatment with peroxidase-conjugated goat-anti-human IgG and the enzyme substrate (H2O2 with chromogen 4-chloro-1-naphthol). A positive reaction is demonstrated by the appearance of a blue dot at the center of the disk. Serum reactive to an immunodot charged with gG-1 indicates the person being tested has HSV-1 infection. Serum reactive to an immunodot charged with gG-2 indicates the person being tested has HSV-2 infection.

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 2015-2016 cycle.

Laboratory Method Files

Herpes Simplex Virus Type 1 & 2 (December 2017)

Laboratory Quality Assurance and Monitoring

Serum samples are processed, stored, and shipped to Emory University, Atlanta, GA for analysis.

Detailed instructions on specimen collection and processing are discussed in the NHANES Laboratory Procedures Manual (LPM). Vials are stored under appropriate frozen (–30°C) conditions until they are shipped to Emory University for testing.

The NHANES quality assurance and quality control (QA/QC) protocols meet the 1988 Clinical Laboratory Improvement Act 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 quality-control 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.

NCHS developed and distributed a quality control protocol for all CDC and contract laboratories, which outlined the use of Westgard rules (Westgard, et al. 1981) when running NHANES specimens. Progress reports containing any problems encountered during shipping or receipt of specimens, summary statistics for each control pool, QC graphs, instrument calibration, reagents, and any special considerations are submitted

to NCHS quarterly. The reports are reviewed for trends or shifts in the data. The laboratories are required to explain any identified areas of concern.

All QC procedures recommended by the manufacturers were followed. Reported results for all assays meet Emory's quality control and quality assurance performance criteria for accuracy and precision, similar to the Westgard rules.

Data Processing and Editing

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

Analytic Notes

Refer to the 2015-2016 Laboratory Data Overview for general information on NHANES laboratory data.

Demographic and Other Related Variables

The analysis of NHANES laboratory data must be conducted using the appropriate survey design and demographic variables. The NHANES 2015-2016 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.

The Fasting Questionnaire File includes auxiliary information such as fasting status, length of fast and the time of venipuncture.

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

The items LBXHE1 and LBXHE2 represent type-specific enzymatic immunodot assay results. The type-specific immunodot assays used to detect antibodies reactive to HSV-1 & HSV-2 antigens in NHANES 2015–2016 are the same assays as those used in NHANES 1999–2012 and NHANES III. Therefore, HSV-1 and HSV-2 results from these surveys are identical and comparable for trend analyses.

The public release data file includes HSV-1 data for participants aged 14–49 and HSV-2 data for participants aged 18–49. HSV-2 data for youth aged 14–17 years are available through the NCHS Research Data Center (RDC).

Detection Limits

Since this data is reported as qualitative data the use of lower limits of detection (LLODs) is not applicable.

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.

References

- Ashley RL, Militoni J, Lee F, Nahmias A, Corey L. Comparison of western blot (immunoblot) and glycoprotein G-specific immunodot enzyme assay for detecting antibodies to herpes simplex virus type 1 and type 2 in human sera. J Clin Microbiol 1988; 26:662-667.
- Lee FK, Pereira L, Griffin C, Reid E, Nahmias A. A novel glycoprotein (gG-1) for detection of

herpes simplex virus specific antibodies. J Virol Methods. 1986; 14:111-118.

- Westgard J.O., Barry P.L., Hunt M.R., Groth T. A multi-rule Shewart chart for quality control in clinical chemistry. Clin Chem (1981) 27:493-501.

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 14 YEARS - 49 YEARS

LBXHE1 - Herpes Simplex Virus Type 1

binary

Variable Name: LBXHE1

SAS Label: Herpes Simplex Virus Type 1

English Text: Herpes Simplex Virus Type 1

Target: Both males and females 14 YEARS - 49 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Positive	1840	1840	
2	Negative	1546	3386	
3	Indeterminate	7	3393	
.	Missing	317	3710	

LBXHE2 - Herpes Simplex Virus Type 2

binary

Variable Name: LBXHE2

SAS Label: Herpes Simplex Virus Type 2

English Text: Herpes Simplex Virus Type 2

Target: Both males and females 18 YEARS - 49 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
1	Positive	478	478	
2	Negative	2335	2813	
3	Indeterminate	2	2815	
.	Missing	895	3710	