

**National Health and Nutrition  
Examination Survey 2005–2006**

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**Documentation, Codebook,  
and Frequencies**

**Erythrocyte Protoporphyrin**

**Laboratory**

**Survey Years:  
2005 to 2006**

**SAS Transport File:  
EPP\_D.XPT**



December 2007

# NHANES 2005–2006 Data Documentation

## Laboratory Assessment: Erythrocyte Protoporphyrin (EPP\_D)

First Published: December 2007

Last Revised: N/A

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### Component Description

#### Protoporphyrin

The objectives of this component are: 1) to provide data for monitoring secular trends in measures of nutritional status in the U.S. population; 2) to evaluate the effect of people's habits and behaviors such as physical activity and the use of alcohol, tobacco, and dietary supplements on people's nutritional status; and 3) to evaluate the effect of changes in nutrition and public health policies including welfare reform legislation, food fortification policy, and child nutrition programs on the nutritional status of the U.S. population.

These data will be used to estimate deficiencies and toxicities of specific nutrients in the population and subgroups, to provide population reference data, and to estimate the contribution of diet, supplements, and other factors to serum levels of nutrients. Data will be used for research to further define nutrient requirements as well as optimal levels for disease prevention and health promotion.

### Eligible Sample

Participants aged 3-5 years and females 12-49 years were tested.

### Description of Laboratory Methodology

Porphyrins and heme components are extracted from whole blood into a 4:1 mixture of ethyl acetate-acetic acid. Porphyrins are then separated from heme by back-extraction into a 1.5 M hydrochloric acid solution, and quantitatively determined by molecular fluorometry using a spectrofluorometer calibrated with protoporphyrin IX (PPIX) standard solutions; however, the exact concentration of the standards must first be established using molecular absorbance, Beer's Law, and the millimolar absorptivity of PPIX.

The analytical method for EP routinely employed by the EP Lab is based largely on those originally described by Sassa et al. (1973) and Chisolm and Brown (1975). New York State's extraction method owes much to contributions from other public health labs, including the CDC, and closely follows the key elements of the consensus method for EP as published by the National Committee for Clinical Laboratory Standards (NCCLS C42-A\*, 2001). At the invitation of Dr. Sassa, the

EP Laboratory's routine method for EP was published as Unit 8.8 in Current Protocols in Toxicology, 1999 by J. Wiley & Sons, Inc. Elements of this protocol are reproduced below, but a reprint of the original publication is available from the EP lab director.

There were no changes in the laboratory method or lab site from the previous two years for erythrocyte protoporphyrin.

### **Laboratory Quality Control and Monitoring**

The NHANES quality control and quality assurance protocols (QA/QC) meet the 1988 Clinical Laboratory Improvement Act mandates. A detailed quality control and quality assurance instruction was discussed in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Read the LABDOC file for detailed QA/QC protocols.

### **Data Processing and Editing**

Specimens were processed, stored and shipped to the State of New York Department of Health, Wadsworth Center, Trace Metals Laboratory, Albany, New York. Detailed specimen collection and processing instructions was discussed in the NHANES LPM. Read the LABDOC file for detailed data processing and editing protocols. The analytical methods were described in the **Description of the Laboratory Methodology** section.

One derived variable was created in this data file. The formula for their derivation is as follows:

LBDEPPSI:

The protoporphyrin in  $\mu\text{g/dL RBC}$  (LBXEPP) was converted to  $\mu\text{mol/L}$  (LBDEPPSI) by multiplying by 0.0177.

### **Analytic Notes**

The analysis of NHANES 2005-2006 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2005-2006 Household Questionnaire Data Files contain demographic data, health indicators, and other related information collected during household interviews. They also contain all survey design variables and sample weights for these age groups. The phlebotomy file includes auxiliary information such as the conditions precluding venipuncture. The household questionnaire and phlebotomy files may be linked to the laboratory data file using the unique survey participant identifier SEQN.

## References

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## Locator Fields

**Title:** Erythrocyte Protoporphyrin

**Contact Number:** 1-866-441-NCHS

**Years of Content:** 2005–2006

**First Published:** December 2007

**Last Revised:** N/A

**Access Constraints:** None

**Use Constraints:** None

**Geographic Coverage:** National

**Subject:** Erythrocyte Protoporphyrin

**Record Source:** NHANES 2005–2006

**Survey Methodology:** NHANES 2005–2006 is a stratified multistage probability sample of the civilian non-institutionalized population of the U.S.

**Medium:** NHANES Web site; SAS transport files

**National Health and Nutrition Examination Survey  
Codebook for Data Production (2005-2006)**

**Erythrocyte Protoporphyrin (EPP\_D)**

December 2007





<b>SEQN</b>	<b>Target</b>
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 49 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	Respondent sequence number
<b>English Text:</b> Respondent sequence number.	
<b>English Instructions:</b>	

<b>LBXEPP</b>	<b>Target</b>
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 49 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	Protoporphyrin(ug/dL RBC)
<b>English Text:</b> Protoporphyrin(ug/dL RBC)	
<b>English Instructions:</b>	

Code or Value	Description	Count	Cumulative	Skip to Item
12 to 582	Range of Values	2844	2844	
.	Missing	379	3223	

<b>LBDEPSI</b>	<b>Target</b>
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 49 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	Protoporphyrin (umol/L RBC)
<b>English Text:</b> Protoporphyrin (umol/L RBC)	
<b>English Instructions:</b>	

Code or Value	Description	Count	Cumulative	Skip to Item
0.21 to 10.36	Range of Values	2844	2844	
.	Missing	379	3223	