

# National Health and Nutrition Examination Survey 2003-2004

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## Documentation, Codebook, and Frequencies

Laboratory Component:  
Complete Blood Count with 5-part  
Differential

**Survey Years:**  
**2003 to 2004**

**SAS Export File:**  
**L25\_C.XPT**



First Published: January 2006  
Last Revised: August 2007

# NHANES 2003–2004 Data Documentation

## Laboratory Assessment: Lab 25 - Complete Blood Count with 5-Part Differential in Whole Blood

Years of Coverage: 2003–2004

First Published: January 2006

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### Component Description

The objectives of this component are to:

- 1) Provide data for monitoring secular trends in measures of nutritional status in the U.S. population;
- 2) 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) 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 Whole Blood 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 1 year and over were tested.

### Description of Laboratory Methodology

The methods used to derive CBC parameters are based on the Beckman Coulter method of counting and sizing, in combination with an automatic diluting and mixing device for sample processing, and a single beam photometer for hemoglobinometry. The WBC differential uses VCS technology. See Chapter 7 of the NHANES Laboratory/Medical Technologists Procedures Manual (LPM) for details.

The Beckman Coulter MAXM instrument in the Mobile Examination Centers (MECs) produces a complete blood count on blood specimens and provides a distribution of blood cells for all participants.

There were no changes to the equipment, lab methods, or lab site from the previous 2 years.

A detailed description of the laboratory method used can be found on the NHANES website.

## **Laboratory Quality Control and Monitoring**

The NHANES quality control and quality assurance protocols (QA/QC) meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed quality control and quality assurance instructions are discussed in the NHANES LPM. Read the LABDOC file for detailed QA/QC protocols.

A detailed description of the quality assurance and quality control procedures can be found on the NHANES website.

## **Data Processing and Editing**

Blood specimens were measured at the NHANES MECs. Detailed specimen collection and processing instructions are discussed in the NHANES LPM. Read the LABDOC file for detailed data processing and editing protocols. The analytical methods are described in the **Description of the Laboratory Methodology** section.

This file contains no top coding.

Five derived variables were created in this data file. The formula for their derivation is as follows:

$LBDLYMNO = LBXWBCSI * LBXLYPCT/100$  (round to 1 decimal)

$LBDMONO = LBXWBCSI * LBXMOPCT/100$  (round to 1 decimal)

$LBDNENO = LBXWBCSI * LBXNEPCT/100$  (round to 1 decimal)

$LBDEONO = LBXWBCSI * LBXEOPCT/100$  (round to 1 decimal)

$LBDBANO = LBXWBCSI * LBXBAPCT/100$  (round to 1 decimal)

Detailed instructions on specimen collection and processing can be found on the NHANES website.

**Analytic Notes** The analysis of NHANES 2003–2004 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2003–2004 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** N/A

## Locator Fields

**Title:** Complete Blood Count with 5-Part Differential in Whole Blood

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

**Years of Content:** 2003–2004

**First Published:** January 2006

**Revised:** August 2007

**Access Constraints:** None

**Use Constraints:** None

**Geographic Coverage:** National

**Subject:** Complete Blood Count with 5-Part Differential in Whole Blood

**Record Source:** NHANES 2003–2004

**Survey Methodology:** NHANES 2003–2004 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 (2003-2004)**

**Complete Blood Count with 5-part Differential (L25\_C)  
Person Level Data**

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<b>SEQN</b>	<b>Target</b>
	B(1 Yrs. to 150 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	Respondent sequence number
<b>English Text:</b> Respondent sequence number.	
<b>English Instructions:</b>	

<b>LBXWBCSI</b>		<b>Target</b>		
		B(1 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		White blood cell count (1000 cells/uL)		
<b>English Text:</b> White blood cell count (1000 cells/uL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
2.3 to 99.99	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXLYPCT</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Lymphocyte percent (%)			
<b>English Text:</b> Lymphocyte percent (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
5 to 89.7	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBXMOPCT</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Monocyte percent (%)			
<b>English Text:</b> Monocyte percent (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0.9 to 33.4	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBXNEPCT</b>		<b>Target</b>		
		B(1 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		Segmented neutrophils percent (%)		
<b>English Text:</b> Segmented neutrophils percent (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
2.4 to 92.3	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBXEOPCT</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Eosinophils percent (%)			
<b>English Text:</b> Eosinophils percent (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0 to 27.7	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBXBAPCT</b>		<b>Target</b>		
		B(1 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		Basophils percent (%)		
<b>English Text:</b> Basophils percent (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0 to 17.3	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBDLYMNO</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Lymphocyte number			
<b>English Text:</b> Lymphocyte number				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0.4 to 89.7	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBDMONO</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Monocyte number			
<b>English Text:</b> Monocyte number				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0.1 to 4.4	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBDNENO</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Segmented neutrophils number			
<b>English Text:</b> Segmented neutrophils number				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0.2 to 18.1	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBDEONO</b>		<b>Target</b>		
		B(1 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		Eosinophils number		
<b>English Text:</b> Eosinophils number				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0 to 2.4	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBDBANO</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Basophils number			
<b>English Text:</b> Basophils number				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
0 to 1.1	Range of Values	8353	8353	
.	Missing	826	9179	

<b>LBXRBCSI</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Red blood cell count (million cells/uL)			
<b>English Text:</b> Red blood cell count (million cells/uL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
2.61 to 7.03	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXHGB</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Hemoglobin (g/dL)			
<b>English Text:</b> Hemoglobin (g/dL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
6.2 to 19.2	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXHCT</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Hematocrit (%)			
<b>English Text:</b> Hematocrit (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
21.7 to 57.1	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXMCVSI</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Mean cell volume (fL)			
<b>English Text:</b> Mean cell volume (fL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
58.3 to 117.3	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXMCHSI</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Mean cell hemoglobin (pg)			
<b>English Text:</b> Mean cell hemoglobin (pg)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
17.5 to 40.4	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXMC</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	MCHC (g/dL)			
<b>English Text:</b> Mean cell hemoglobin concentration (g/dL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
28.7 to 42.2	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXRDW</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Red cell distribution width (%)			
<b>English Text:</b> Red cell distribution width (%)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
10.6 to 26.9	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXPLTSI</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Platelet count SI (1000 cells/uL)			
<b>English Text:</b> Platelet count SI (1000 cells/uL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
35 to 999.9	Range of Values	8384	8384	
.	Missing	795	9179	

<b>LBXMPSI</b>	<b>Target</b>			
	B(1 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	Mean platelet volume (fL)			
<b>English Text:</b> Mean platelet volume (fL)				
<b>English Instructions:</b>				
<b>Code or Value</b>	<b>Description</b>	<b>Count</b>	<b>Cumulative</b>	<b>Skip to Item</b>
5.5 to 13.5	Range of Values	8384	8384	
.	Missing	795	9179	