

# Third National Health and Nutrition Examination Survey 1988–1994

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## Documentation, Codebook, and Frequencies

### Antibodies to Periodontal Pathogens

Laboratory  
Surplus Sera

Survey Years:  
1988 to 1994

SAS Export File:  
SPSDEPPX.XPT



August 2008

## NHANES III Data Documentation

### Laboratory Assessment: Antibodies to Periodontal Bacteria: NHANES III (Surplus Sera)

Years of Coverage: 1988–1994

First Published: August 2008

Last Revised: N/A

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#### Component Description

All available sera from NHANES III (1988-1994) participants 40+ years were tested for the presence and level of IgG antibodies against a broad panel of periodontal bacteria using a rapid checkerboard immunoblotting technique. All assessed antibody titer levels are reported as gravimetric units in this data release.

#### Eligible Sample

All participants 40+ years from NHANES III with stored sera.

#### Description of Laboratory Methodology

The level of IgG antibody was determined by means of the "checkerboard" immunoassay [1-3]. The following bacterial strains were used to prepare whole cell antigenic extracts:

*Aggregatibacter actinomycetemcomitans* ATCC strains #43718, #29523 and #33384;

*Porphyromonas gingivalis* ATCC #33277 and #53978;

*Tannerella forsythia* ATCC#43037;

*Treponema denticola* OMGS#3271;

*Campylobacter rectus* ATCC#33238;

*Eubacterium nodatum* ATCC#33099;

*Prevotella intermedia* ATCC#25611;

*Prevotella nigrescens* ATCC#33563;

*Prevotella melaninogenica* ATCC#25845;

*Fusobacterium nucleatum* ATCC#10953;

*Micromonas micros* ATCC #33270;

*Selenomonas noxia* ATCC#43541;

*Eikenella corrodens* ATCC#23834;

*Capnocytophaga ochracea* ATCC#33624;

*Streptococcus intermedius* ATCC#27335;

*Streptococcus oralis* ATCC#35037;

*Streptococcus mutans* ATCC#25175;

*Veillonella parvula* ATCC#10790; and

*Actinomyces naeslundii* ATCC#49340.

To assess the level of antibody to *P. gingivalis*, a mixed suspension of ATCC strains #33277 and #53978 was used (*P. gingivalis* mix). For the assessment of antibody to *A. actinomycetemcomitans*, a mixed suspension of three strains (ATCC#43718, #29523 and #33384) was used (*A. actinomycetemcomitans* mix) as well as individual preparations from *A. actinomycetemcomitans* serotype a (ATCC strain #29523) and serotype b (ATCC strain #43718, Y4).

PBS dilutions of sonicated bacterial extracts derived from each of the above species were brought to an optical density of 1, using a spectrophotometer (Ultrospec III, Pharmacia, Sweden) set at a wavelength of 600 nm. Protein-A standards are prepared at a concentration of 5 ug/ml. A Miniblotter™ device (Immunitics, Cambridge, MA) is used to immobilize antigenic extracts and protein-A standards on nitrocellulose membranes (Amersham 2020D). Serially diluted (1/500, 1/1000 and 1/2000) serum from each subject as well as human IgG standards (2000 ng/ml, 1000 ng/ml, 500 ng/ml and 250 ng/ml) are loaded perpendicularly to the bacterial extracts, and are allowed to interact. After several washing steps, membranes are incubated with Fab fragments of anti-human IgG conjugated with horseradish-peroxidase. Membranes are thereafter incubated with a horseradish-peroxidase substrate (ECL Western blotting detection reagents, Amersham-Pharmacia Biotech, Sweden) and the chemiluminescent signal is assessed in a Lumilmager™ Workstation equipped with a CCD camera (Boehringer-Mannheim, Germany). Chemiluminescent signals are quantified in comparison to a curve generated by the protein A and the four human IgG standards by means of a quantification software (LumiAnalyst™ (Boehringer Mannheim) and exported as Excel files.

## Laboratory Quality Control and Monitoring

Checkerboard immunoblotting is a simple, rapid technique that facilitates screening, visualization and quantification of antibody levels to multiple species in large numbers of serum samples. Validation with ELISA has been published [1].

## Data Processing and Editing

Data was received after all the antibody testing was complete. The data were not edited.

Data Access: All data are publicly available.

## Analytic Notes

The antibody variable names and corresponding periodontal bacteria for this release are:

DEPPGMX	P. gingivalis (Pg) mix antibody
DEPPI	P. intermedia (Pi) antibody
DEPPN	P. nigrescens (Pn) antibody
DEPTF	T. forsythia (Tf) antibody
DEPAAMX	A. actinomycetemcomitans (Aa) mix antibody
DEPAA29	A. actinomycetemcomitans (Aa) 29523 antibody
DEPAAY4	A. actinomycetemcomitans (Aa) Y4 antibody
DEPFN	F. nucleatum (Fn) antibody
DEPSO	S. oralis (So) antibody
DEPMM	M. micros (Mm) antibody
DEPCR	C. rectus (Cr) antibody
DEPEC	E. corrodens (Ec) antibody
DEPEN	E. nodatum (En) antibody
DEPSI	S. intermedius (Si) antibody
DEPCO	C. ochracea (Co) antibody
DEPVP	V. parvula (Vp) antibody
DEPAN	A. naeslundii (An) antibody
DEPPM	P. melaninogenica (Pm) antibody
DEPSN	S. noxia (Sn) antibody
DEPTD	T. denticola (Td) antibody
DEPSM	S. mutans (Sm) antibody

## References

1. Sakellari D, Socransky SS, Dibart S, Eftimiadia C, Taubman MA. Estimation of serum antibody to subgingival species using checkerboard immunoblotting. *Oral Microbiol Immunol* 1999; 12: 303-310.
2. Papapanou PN, Neiderued AM, Papadimitriou A, Sandros J, Dahlen G. Checkerboard assessments of periodontal microbiota and serum antibody responses: a case-control study. *J Periodontol* 2000; 71: 885-97.
3. Papapanou PN, Neiderud AM, Sandros J, Dahlen G. Checkerboard assessments of serum antibodies to oral microbiota as surrogate markers of clinical periodontal status. *J Clin Periodontol* 2001; 28: 103-106.

## Locator Fields

**Title:** Antibodies to Periodontal Bacteria

**Contact Number:**

**Years of Content:** 1988-1994

**First Published:** August 2008

**Revised:** N/A

**Access Constraints:** None

**Use Constraints:** None

**Geographic Coverage:** National

**Subject:** Periodontal Bacteria

**Record Source:** NHANES III (1988-1994)

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

**Medium:**

**National Health and Nutrition Examination Survey  
Codebook for Data Production (1988-1994)  
(NHANES III)**

**Antibodies to Periodontal Pathogens (SPSDEPPX)  
Person Level Data**

August 2008



<b>SEQN</b>	<b>Target</b>
	B(40 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>DEPPGMX</b>	<b>Target</b>
	B(40 Yrs. to 150 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	P. Gingivalis (Pg) mix antibody
<b>English Text:</b> Porphyromonas gingivalis mix bacterial antigens ATCC#33277 and 53978	
<b>English Instructions:</b>	

Code or Value	Description	Count	Cumulative	Skip to Item
0 to 1549000	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPPI</b>	<b>Target</b>
	B(40 Yrs. to 150 Yrs.)
<b>Hard Edits</b>	<b>SAS Label</b>
	P. Intermedia (Pi) antibody
<b>English Text:</b> Prevotella intermedia bacterial antigen ATCC#25611	
<b>English Instructions:</b>	

Code or Value	Description	Count	Cumulative	Skip to Item
0 to 119387	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPPN</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		P. Nigrescens (Pn) antibody		
<b>English Text:</b> Prevotella nigrescens bacterial antigen ATCC#33563				
<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 92253	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPTF</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		T. Forsythia (Tf) antibody		
<b>English Text:</b> Tannerella forsythia bacterial antigen ATCC#43037				
<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 17409	Range of Values	8153	8153	
.	Missing	0	8153	



<b>DEPAAMX</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	A. Actinomycetemcomitans (Aa) mix			
<b>English Text:</b> Actinobacillus actinomycetemcomitans mix bacterial antigens ATCC#				
<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 1922000	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPAA29</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	A. Actinomycetemcomitans (Aa) 29523			
<b>English Text:</b> Actinobacillus actinomycetemcomitans 29523 bacterial antigen ATCC#29523				
<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 444369	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPAAY4</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	A. Actinomycetemcomitans (Aa) Y4			
<b>English Text:</b> Actinobacillus actinomycetemcomitans Y4 bacterial antigen ATCC#43718				
<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 235654	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPFN</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	F. Nucleatum (Fn) antibody			
<b>English Text:</b> Fusobacterium nucleatum bacterial antigen ATCC#10953				
<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 138403	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPSO</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		S. Oralis (So) antibody		
<b>English Text:</b> Streptococcus oralis bacterial antigen ATCC#35037				
<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 32376.1	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPMM</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		M. Micros (Mm) antibody		
<b>English Text:</b> Micromonas micros bacterial antigen ATCC#33270				
<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 970499	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPCR</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		C. Rectus (Cr) antibody		
<b>English Text:</b> Campylobacter rectus bacterial antigen ATCC#33238				
<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 304643	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPEC</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		E. Corrodens (Ec) antibody		
<b>English Text:</b> Eikenella corrodens bacterial antigen ATCC#23834				
<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 36215.7	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPEN</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		E. Nodatum (En) antibody		
<b>English Text:</b> Eubacterium nodatum bacterial antigen ATCC#33099				
<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 666542	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPSI</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		S. Intermedius (Si) antibody		
<b>English Text:</b> Streptococcus intermedius bacterial antigen ATCC#27335				
<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 299884	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPCO</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		C. Ochracea (Co) antibody		
<b>English Text:</b> Capnocytophaga ochracea bacterial antigen ATCC#33624				
<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 127751	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPVP</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		V. Parvula (Vp) antibody		
<b>English Text:</b> Veillonella parvula bacterial antigen ATCC#10790				
<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 5640.19	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPAN</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		A. Naeslundii (An) antibody		
<b>English Text:</b> Actinomyces naeslundii bacterial antigen ATCC#49340				
<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 413149	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPPM</b>		<b>Target</b>		
		B(40 Yrs. to 150 Yrs.)		
<b>Hard Edits</b>		<b>SAS Label</b>		
		P. Melaninogenica (Pm) antibody		
<b>English Text:</b> Prevotella melaninogenica bacterial antigen ATCC#25845				
<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 120008	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPSN</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	S. Noxia (Sn) antibody			
<b>English Text:</b> Selenomonas noxia bacterial antigen ATCC#43541				
<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 683924	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPTD</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	T. Denticola (Td) antibody			
<b>English Text:</b> Treponema denticola bacterial antigen OMGS#3271				
<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 79860.5	Range of Values	8153	8153	
.	Missing	0	8153	

<b>DEPSM</b>	<b>Target</b>			
	B(40 Yrs. to 150 Yrs.)			
<b>Hard Edits</b>	<b>SAS Label</b>			
	S. Mutans (Sm) antibody			
<b>English Text:</b> Streptococcus mutans bacterial antigen ATCC#25175				
<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 45199.4	Range of Values	8153	8153	
.	Missing	0	8153	