

National Health and Nutrition Examination Survey 2003-2004

Documentation, Codebook, and Frequencies

MEC Exam Component: Balance Examination Data

**Survey Years:
2003 to 2004**

**SAS Export File:
BAX_C.XPT**



December 2005

NHANES 2003–2004 Data Documentation

Exam Component: Balance (BAX_C)

Years of Coverage: 2003–2004

First Published: December 2005

Last Revised: N/A

Component Description

Balance disorders constitute a major public health concern, especially for older persons, who are an increasing segment of the U.S. general population. For example, balance disorders are thought to be causally related to some 200,000 hip fractures that occur annually in Americans over the age of 65. The objectives of the Balance Component are

- to obtain accurate prevalence data on balance problems among a sample of U.S. adults;
- to examine the relationship between balance problems and specific covariates such as certain medical conditions and indicators of health status; and
- to help characterize normal and disordered balance and spatial perception.

The NHANES 2003–2004 Balance Component consists of 2 parts:

1. A pre-exam screening questionnaire. This is a series of questions that identify conditions which would constitute either practical or safety exclusions to performing Balance testing. Please note that more extensive survey questions relating to balance problems are contained in the BAQ section of the NHANES household survey questionnaire; and
2. Balance Testing, consisting of a modified Romberg Test of Standing Balance on Firm and Complaint Support Surfaces.

Eligible Sample

The 2003–2004 Balance Component tested a full sample of U.S. adults 40 years of age and older. There were five principal exclusion criteria applied in the Balance testing protocol. These were:

1. at the time of the exam, an examinee felt unable to stand on his or her own;
2. at the time of the exam, an examinee was currently having dizziness sufficient to cause unsteadiness;
3. weight over 275 lbs;
4. an examinee needed a leg brace in order to stand unassisted;
5. an examinee had an amputation of their feet or legs.

In addition, subjects who were totally blind or visually impaired sufficiently to require assistance in finding the exam room were disqualified, as were those who had a waist circumference either too small or too large to accommodate proper fitting of any standard sized safety gait belt. Also, the Mobile Examination Center (MEC) physician could exclude subjects if it was considered medically contraindicated to perform testing.

Protocol and Procedure

The Romberg Test of Standing Balance on Firm and Compliant Support Surfaces examines the ability of the examinee to stand unassisted under four test conditions, ordered in increasing level of difficulty.

In Test Condition 1, the subject stands making use of all the sensory inputs that contribute to balance: the central vestibular system, vision, and proprioception (leg muscle position sense).

Test Condition 2 tests balance when only vestibular and proprioceptive information is available (the subject closes the eyes to eliminate visual input).

In Test Condition 3, the subject must maintain balance on a foam-padded surface, which reduces the proprioceptive input, leaving only visual and vestibular cues.

Finally, in Test Condition 4 (also using a foam pad), the eyes are again closed (visual input is removed) and the subject's ability to maintain balance is tested using only his vestibular system.

All Balance Testing was scored on a pass/fail basis, with Test Conditions 1 and 2 conducted for a total of 15 seconds, and Test Conditions 3 and 4 conducted for 30 seconds each. Test failure was defined as:

- a subject needed to open the eyes in an eyes-closed Test Condition (#2 or #4);
- the subject moved the arms or feet in order to achieve stability; or
- the subject began to fall or required MEC Technician intervention to maintain balance.

In the standard Balance Testing protocol, each subject is eligible for an initial test and one re-test to pass a specific Test Condition. Within each Test Condition, the protocol for retesting is the same as for the primary examination. Because each successive Test Condition from 1 to 4 is progressively more difficult than the Condition preceding it, the Balance Testing Component is ended whenever a subject fails to pass a Test Condition.

Balance testing was conducted with the utmost consideration for subject safety. The examining MEC Technician stood immediately to the side of the participant prepared to stabilize the subject by the use of a safety gait belt should significant unsteadiness occur. Also, the examination was conducted in a small exam room, with well-padded walls and floor.

For the procedures relevant to this component, please refer to the **Survey Operations Manual, Consent Documents, Brochures** on the NHANES website.

Quality Assurance & Quality Control

All data from each of the sections of the Balance Component were directly entered by MEC technicians into ISIS, a computerized database information system. Technicians selected for the Mobile Examination Centers were professionally trained in the Modified Romberg Testing protocol by an expert consultant in Balance and Vestibular disorders. In addition, Audiologic Consultants from the National Institute of Occupational Safety & Health (NIOSH) and contractor staff provided performance monitoring of each Technician on a regular, periodic basis. Additionally, NCHS staff visited the MECs approximately twice per year to observe the Balance examinations and verify that standard testing procedures were being strictly followed by technicians. All MEC Balance technicians also received annual retraining and updates by the NIOSH consultants. Finally, exclusion rates and outcome statistics were continually monitored by NCHS statisticians according to technician and MEC, and retraining was conducted as necessary to maintain test quality.

For details on the QA/QC process for this component, please refer to the **Interviewer Procedure Manuals** on the NHANES website.

Data Processing and Editing

As mentioned previously, all data were captured in ISIS, a computerized database. NCHS statisticians performed data reviews on an ongoing basis using a computerized data editing program to check for logical inconsistencies in the data and technician errors, as well as to cross-check other issues affecting data quality. Back-end edits of the data were performed as necessary where errors were detected. The 2003–2004 Balance Examination data were re-reviewed for errors and logical consistency and verified against the primary examination data database prior to public release.

Analytic Notes

Because the NHANES 2003–2004 Balance examination was administered in the MEC, the full sample MEC examination sample weight should be used for data analysis. For information on the use of sample weights in NHANES data analysis, refer to the NHANES 1999–2000 Addendum to the NHANES III Analytic Guidelines. Analysts who wish to combine Balance data from NHANES 1999–2000 with the NHANES 2001–2002 or 2003–2004 Balance examination data should be aware that the sampling frame for NHANES 1999–2000 Balance Examination data differed from that for the 2001–2004 Balance data. Specifically, NHANES 1999–2000 Balance data were collected for a one-half sample of U.S. adults ages 40–69 years, whereas NHANES 2001–2004 Balance was collected for a full sample of U.S. adults ages 40 and older. Special half-sample weights are available on the NHANES 1999–2000 Balance data set and are to be used when analyzing the data for those years. For combined 1999–2000 and 2001–2002 data analysis, special 4-year Balance subsample weights are provided (WTSBA4YR) on the 2001-2002 Balance dataset. Six-year data analysis (1999–2004) is performed by combining the 4-year Balance subsample weights with the 2003–2004 MEC examination weights according to the NHANES Analytic Guidelines.

Data analysts should ideally be familiar with Balance and Vestibular disorders, or have a specialist available for consultation. The systematic differences in testing length (15 seconds for Conditions 1 and 2; 30 seconds for Conditions 3 and 4) may need to be taken into account for the analysis. The variable BAAEXCMT provides coded data summarizing the reasons that an examination was incomplete (partial) or not done.

Please refer to the Analytic Guidelines for further details on the use of sample weights and other analytic issues at

http://www.cdc.gov/nchs/about/major/nhanes/nhanes2003-2004/analytical_guidelines.htm

No data related to this component are in the Research Data Center.

References

1. National Health & Nutrition Examination Survey. Balance Procedures Manual. Revised, January 2001. Available on the NHANES website.
2. Shumway-Cook A, Horak FB. Assessing the influence of sensory interaction of balance. Suggestion from the field. *Phys Ther.* 1986;66(10):1548–1550.
3. Weber PC, Cass SP. Clinical assessment of postural stability. *Am J Otol.* 1993;14(6):566–569.

Locator Record

Title: Balance (BAX_C)

Contact Number: 1-866-441-NCHS

Years of Content: 2003–2004

First Published: December 2005

Revised: N/A

Access Constraints: None

Use Constraints: None

Geographic Coverage: National

Subject: Balance

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)**

**MEC Examination
Balance (BAX_C)
Person Level Data**

December 2005



SEQN	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Respondent sequence number
English Text: Respondent sequence number.	
English Instructions:	

BAAEXSTS	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Status of a MEC exam

English Text: Status of a MEC exam

English Instructions:

Code or Value	Description	Count	Cumulative	Skip to Item
1	Complete	2429	2429	
2	Partial	74	2503	
3	Not done	583	3086	
.	Missing	0	3086	

BAAEXCMT	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Comment code for an exam			
English Text: Comment code for an exam				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
0	None	0	0	
1	Safety exclusion	279	279	
2	SP refusal	145	424	
3	No time	6	430	
4	Physical limitation	66	496	
5	Communication problem	3	499	
6	Equipment failure	0	499	
7	SP ill/emergency	8	507	
72	Error (technician/software/supply)	1	508	
84	SP With Child	12	520	
99	Other, specify	137	657	
.	Missing	2429	3086	

BAQ110	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Can you stand on your own?			
English Text: Can you stand on your own?				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1	Yes	2650	2650	
2	No	40	2690	
.	Missing	396	3086	

BAQ120	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Do you have a leg brace?			
English Text: Do you have a leg brace?				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1	Yes	16	16	
2	No	2634	2650	
.	Missing	436	3086	

BAQ130	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Feeling dizzy or lightheaded now?			
English Text: Are you feeling any dizziness or lightheadedness now?				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1	Yes	131	131	
2	No	2503	2634	
.	Missing	452	3086	

BAXPFC11	Target
	F(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 1 Trial 1 Feet together eyes open

English Text: Feet together eyes open:

English Instructions: Stand in this position with your eyes open, looking at the target for as long as you can or until I ask you to stop. Please do not talk once the test begins. "Begin now."

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	2476	2476	BAXPFC21
2	Dnp(did not pass)	11	2487	
.	Missing	599	3086	

BAXFTC11	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 14	Cond 1 Trial 1 Failure Time(seconds)			
English Text: Number of Seconds:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
2 to 13	Range of Values	11	11	
.	Missing	3075	3086	

BAXPFC12	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
	Cond 1 Trial 2 Feet together eyes open			
English Text: Feet together eyes open:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	8	8	BAXPFC21
2	Dnp(did not pass)	3	11	
.	Missing	3075	3086	

BAXFTC12	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 14	Cond 1 Trial 2 Failure Time(seconds)			
English Text: Number of Seconds:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
0 to 7	Range of Values	3	3	
.	Missing	3083	3086	

BAXPFC21	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 2 Trial 1 Feet together eyes closed

English Text: Feet together eyes closed:

English Instructions: Stand in this position with your eyes closed, facing the target for as long as you can or until I ask you to stop. First assume this position with your eyes open, and then close your eyes. Please do not talk once the test begins. "Begin now."

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	2287	2287	BAXPFC31
2	Dnp(did not pass)	193	2480	
.	Missing	606	3086	

BAXFTC21	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
0 to 14	Cond 2 Trial 1 Failure Time(seconds)

English Text: Number of Seconds:

English Instructions:

Code or Value	Description	Count	Cumulative	Skip to Item
1 to 14	Range of Values	193	193	
.	Missing	2893	3086	

BAXPFC22	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 2 Trial 2 Feet together eyes closed
English Text: Feet together eyes closed:	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	105	105	BAXPFC31
2	Dnp(did not pass)	88	193	
.	Missing	2893	3086	

BAXFTC22	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 14	Cond 2 Trial 2 Failure Time(seconds)			
English Text: Number of Seconds:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
1 to 14	Range of Values	88	88	
.	Missing	2998	3086	

BAXPFC31	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 3 Trial 1 Foam Pad Eyes Open

English Text: Feet together eyes open:

English Instructions: Stand in this position with your eyes open, looking at the target for as long as you can or until I ask you to stop. Please do not talk once the test begins. "Begin now."

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	2277	2277	BAXPFC41
2	Dnp(did not pass)	94	2371	
.	Missing	715	3086	

BAXFTC31	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
0 to 29	Cond 3 Trial 1 Failure Time(seconds)

English Text: Number of Seconds:

English Instructions:

Code or Value	Description	Count	Cumulative	Skip to Item
0 to 28	Range of Values	93	93	
.	Missing	2993	3086	

BAXPFC32	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 3 Trial 2 Foam Pad Eyes Open
English Text: Feet together eyes open:	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	36	36	BAXPFC41
2	Dnp(did not pass)	47	83	
.	Missing	3003	3086	

BAXFTC32	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 29	Cond 3 Trial 2 Failure Time(seconds)			
English Text: Number of Seconds:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
0 to 28	Range of Values	44	44	
.	Missing	3042	3086	

BAXPFC41	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 4 Trial 1 Foam Pad Eyes Closed

English Text: Feet together eyes closed:

English Instructions: Stand in this position with your eyes closed, facing the target for as long as you can or until I ask you to stop. First assume this position with your eyes open, and then close your eyes. Please do not talk once the test begins. "Begin now."

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	884	884	End of Section
2	Dnp(did not pass)	1426	2310	
.	Missing	776	3086	

BAXFTC41	Target			
	B(40 Yrs. to 150 Yrs.)			
Hard Edits	SAS Label			
0 to 29	Cond 4 Trial 1 Failure Time(seconds)			
English Text: Number of Seconds:				
English Instructions:				
Code or Value	Description	Count	Cumulative	Skip to Item
0 to 29	Range of Values	1425	1425	
.	Missing	1661	3086	

BAXPFC42	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
	Cond 4 Trial 2 Foam Pad Eyes Closed

English Text: Feet together eyes closed:

English Instructions:

Code or Value	Description	Count	Cumulative	Skip to Item
1	Pass	318	318	End of Section
2	Dnp(did not pass)	1095	1413	
.	Missing	1673	3086	

BAXFTC42	Target
	B(40 Yrs. to 150 Yrs.)
Hard Edits	SAS Label
0 to 29	Cond 4 Trial 2 Failure Time(seconds)

English Text: Number of Seconds:

English Instructions:

Code or Value	Description	Count	Cumulative	Skip to Item
0 to 29	Range of Values	1094	1094	
.	Missing	1992	3086	