

National Health and Nutrition Examination Survey

2001-2002 Data Documentation, Codebook, and Frequencies

Telomere Mean and Standard Deviation (Surplus) (TELO_B)

Data File: TELO_B.xpt

First Published: November 2014

Last Revised: February 2015

Component Description

Blood samples are obtained from participants in the NHANES surveys. Most of the findings from the analyses of the blood samples are available immediately such as the data on cholesterol and triglyceride levels in the population. A small portion of the blood samples is stored to conduct later analyses on DNA samples. DNA provides important information on genetic or hereditary patterns of disease or risk of disease. This information leads to advances in the prevention and treatment of disease.

Telomeres are a protective nucleoprotein structure at each chromosome end. Telomeres naturally shorten with age. The telomere length assay was performed in the laboratory of Dr. Elizabeth Blackburn at the University of California, San Francisco, using the quantitative polymerase chain reaction (PCR) method to measure telomere length relative to standard reference DNA (T/S ratio), as described in detail elsewhere (Needham et al, 2013; Cawthon, 2002). Each sample was assayed 3 times on 3 different days. The samples were assayed on duplicate wells, resulting in 6 data points. Sample plates were assayed in groups of 3 plates, and no 2 plates were grouped together more than once. Each assay plate contained 96 control wells with 8 control DNA samples. Assay runs with 8 or more invalid control wells were excluded from further analysis (< 1% of runs). Control DNA values were used to normalize between-run variability. Runs with more than 4 control DNA values falling outside 2.5 standard deviations from the mean for all assay runs were excluded from further analysis (< 6% of runs). For each sample, any potential outliers were identified and excluded from the calculations (< 2% of samples). The mean and standard deviation of the T/S ratio were then calculated normally. The interassay coefficient of variation was 6.5%.

Eligible Sample

All participants aged 20 years and older examined in 1999-2000 or in 2001-2002 who had blood collected for DNA purification were eligible.

Laboratory Quality Assurance and Monitoring

Five 96-well quality control plates which represent 5% of the complete set were provided. These duplicate samples are blinded to the investigators.

If more than 5% of the duplicate samples on the quality control plates are discordant with their pair in the complete set, the variant fails quality control (i.e., >95% duplicate concordance required).

Data Processing and Editing

N/A

Analytic Notes

TeloMean: Mean T/S ratio which is measured telomere length relative to standard reference DNA.

For researchers who wish to convert T/S ratio to base pairs (bp), the formula is $(3,274 + 2,413 * (T/S))$. The conversion from T/S ratio to bp is calculated based on comparison of telomeric restriction fragment (TRF) length from Southern blot analysis and T/S ratios using DNA samples from the human diploid fibroblast cell line IMR90 at different population doublings. It is important to note that there is wide variance in telomere length measures across labs and types of assays. While they tend to be highly correlated, they often have different means. Base pair estimates are only comparable for T/S ratio data produced with the same reference standard and the same lab procedures. In this case, results from NHANES are comparable to other studies performed in the Blackburn Lab and may be similar to other PCR-derived measures of telomere length if they used the same methods as written here. While comparisons across studies of telomere length in base pairs are commonly done, it is not highly accurate.

TeloSTD: Asso. Std. Dev. For Mean T/S Ratio refers to the standard deviation corresponding to the mean of the 3 T/S ratio values obtained for each sample.

MEC exam weights are appropriate for this subsample.

References

- Cawthon, R., Telomere measurement by quantitative PCR. *Nucleic Acids Res*, 2002. 30(e47).
- Needham BL, Adler N, Gregorich S, Rehkopf D, Lin J, Blackburn EH, Epel ES. Socioeconomic status, health behavior, and leukocyte telomere length in the National Health and Nutrition Examination Survey, 1999-2000. *Soc Sci Med*. 2013 May;85:1-8. doi: 10.1016/j.socscimed.2013.02.023. Epub 2013 Feb 21.

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 20 YEARS - 150 YEARS

TeloMean - Mean T/S ratio

Variable Name: TeloMean

SAS Label: Mean T/S ratio

English Text: Mean T/S ratio

Target: Both males and females 20 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.4533547745 to 3.0005485574	Range of Values	4260	4260	
.	Missing	9	4269	

TeloStd - Asso. Std. Dev. of Mean T/S ratio

Variable Name: TeloStd

SAS Label: Asso. Std. Dev. of Mean T/S ratio

English Text: Asso. Std. Dev. of Mean T/S ratio

Target: Both males and females 20 YEARS - 150 YEARS

Code or Value	Value Description	Count	Cumulative	Skip to Item
0.0020484511 to 2.8256059456	Range of Values	4260	4260	
.	Missing	9	4269	

