BioAge Codebook
NHANES III and NHANES 1999-2018
June 14, 2020

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| **Demographic** | | | | |
| sampleID | NHANES ID | Character | 'NHANES conducted year_seqn' Because NHANES III and NHANES 1999-2018 seqn is duplicated | 1991 1999-2018 |
| year | NHANES conducted year | Character | '1991' '1999' '2001' ⋮ '2017' | 1991 1999-2018 |
| wave | Recoded year | Numeric | 0: 1991 1: 1999-2000 2: 2001-2002 ⋮ 10: 2017-2018 | 1991 1999-2018 |
| gender | Gender of the sample person | Numeric | 1: male 2: female | 1991 1999-2018 |
| age | Age at screening | Numeric | 20-90 | 1991 1999-2018 |
| annual_income | Annual family income | Numeric | 1: $0 to $4,999 2: $5,000 to $9,999 3: $10,000 to $14,999 4: $15,000 to $19,999 5: $20,000 to $24,999 6: $25,000 to $34,999 7: $35,000 to $44,999 8: $45,000 to $54,999 9: $55,000 to $64,999 10: $65,000 to $74,999 11: $75,000 and over | 1999-2018 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| income_recode | Recoded Annual family income | Numeric | 1: $0 to $4,999<br>2: $5,000 to $9,999<br>3: $10,000 to $14,999<br>4: $15,000 to $19,999<br>5: $20,000 to $24,999<br>6: $25,000 to $34,999<br>7: $35,000 to $44,999<br>8: $45,000 and over | 1991<br>1999-2018 |
| education | The highest degree received | Numeric | 1: less than 9$^{th}$ grade<br>2: 9-11$^{th}$ grade<br>3: high school graduate/GED<br>4: some college<br>5: college graduate or higher | 1991<br>1999-2018 |
| edu | Recoded education | Numeric | 1: less than high school<br>2: high school graduate<br>3: some college<br>4: bachelor's degree or higher | 1991<br>1999-2018 |
| ethnicity | Reported ethnicity and race information | Numeric | 1: non-Hispanic white<br>2: non-Hispanic black<br>3: Mexican American<br>4: other | 1991<br>1999-2018 |
| race | Recoded ethnicity | Numeric | 1: white<br>2: black<br>3: Hispanic and other | 1991<br>1999-2018 |
| poverty_ratio | Poverty income ratio (PIR) - a ratio of family income to poverty threshold | Numeric | | 1991<br>1999-2018 |
| pregnant | Currently pregnant | Numeric | 0: not pregnant<br>1: pregnant | 1991<br>1999-2018 |
| adl | Activities of daily livings | Numeric | | 1999-2018 |
| bmi | Body mass index (kg/m$^2$) | Numeric | | 1991<br>1999-2018 |
| height | Standing height (cm) | Numeric | | 1991<br>1999-2018 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| waist | Waist circumference (cm) | Numeric | | 1991 1999-2018 |
| weight | Weight (kg) | Numeric | | 1991 1999-2018 |
| btotpf | Estimated percent body fat (%) | Numeric | | 1999-2004 |
| ffm | Estimated fat-free mass (kg) | Numeric | | 1999-2004 |
| fm | Estimated fat mass (kg) | Numeric | | 1999-2004 |
| fev | Forced Expiratory Volume in the first 1.0 second (mL) | Numeric | | 1991 2007-2012 |
| fev_1000 | FEV1/1000 (mL) | Numeric | | 1991 1999-2018 |
| grip_r | Grip strength, right hand (kg) | Numeric | | 2001-2004 |
| grip_l | Grip strength, left hand (kg) | Numeric | | 2001-2004 |
| grip_d | Grip strength, dominant hand (kg) | Numeric | | 2001-2004 |
| grip_scaled | Grip strength, dominant hand, scale by gender (kg) | Numeric | | 2001-2004 |
| health | Self-rated health | Numeric | 1: excellent 2: very good 3: good 4: fair 5: poor | 1991 2001-2018 |
| lnwalk | Log (time to complete 20ft walk) (seconds) | Numeric | | 1999-2002 |
| vomeas | Estimated VO2 max (ml/kg/min) | Numeric | | 1999-2004 |
| **Biomarkers** | | | | |
| albumin | Albumin (g/dL) | Numeric | | 1991 1999-2018 |
| albumin_gL | Albumin (g/L) | Numeric | | 1991 1999-2018 |
| alp | Alkaline phosphatase (U/L) | Numeric | | 1991 1999-2018 |
| bun | Blood urea nitrogen (mg/dL) | Numeric | | 1991 1999-2018 |
| creat | Creatinine (mg/dL) | Numeric | | 1991 1999-2018 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| creat_umol | Creatinine (umol/L) | Numeric | | 1991<br>1999-2018 |
| lncreat | Log (creatinine) (mg/dL) | Numeric | | 1991<br>1999-2018 |
| lncreat_umol | Log (creatinine) (umol/L) | Numeric | | 1991<br>1999-2018 |
| glucose | Serum glucose (mg/dL) | Numeric | | 1991<br>1999-2018 |
| glucose_mmol | Serum glucose (mmol/L) | Numeric | | 1991<br>1999-2018 |
| ttbl | Total bilirubin (mg/dL) | Numeric | | 1991<br>1999-2018 |
| uap | Uric acid (mg/dL) | Numeric | | 1991<br>1999-2018 |
| bap | Bone alkaline phosphatase (ug/L) | Numeric | | 1999-2004 |
| basopa | Basophils percent (%) | Numeric | | 1999-2018 |
| eosnpa | Eosinophils percent (%) | Numeric | | 1999-2018 |
| lymph | Lymphocyte percent (%) | Numeric | | 1991<br>1999-2018 |
| mcv | Mean cell volume (fL) | Numeric | | 1991<br>1999-2018 |
| monopa | Monocyte percent (%) | Numeric | | 1991<br>1999-2018 |
| neut | Segmented neutrophils percent (%) | Numeric | | 1999-2018 |
| rbc | Red blood cell count (million cells/uL) | Numeric | | 1991<br>1999-2018 |
| rdw | Red cell distribution width (%) | Numeric | | 1991<br>1999-2018 |
| wbc | White blood cell count (1000 cells/uL) | Numeric | | 1991<br>1999-2018 |
| cadmium | Cadmium (nmol/L) | Numeric | | 1991<br>1999-2016 |
| crp | C-reactive protein (mg/dL) | Numeric | | 1991 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| | | | | 1999-2010 2015-2018 |
| crp_cat | Dichotomous c-reactive protein (mg/dL) | Numeric | 0: crp < 3 1: crp ≥ 3 | 1991 1999-2010 2015-2018 |
| lncrp | Log (c-reactive protein) (mg/dL) | Numeric | | 1991 1999-2010 2015-2018 |
| cycst | Cystatin C (mg/L) | Numeric | | 1999-2002 |
| dbp | Diastolic blood pressure (mm Hg) | Numeric | | 1991 1999-2018 |
| sbp | Systolic blood pressure (mm Hg) | Numeric | | 1991 1999-2018 |
| meanbp | Mean blood pressure (mm Hg) | Numeric | | 1991 1999-2018 |
| pulse | Pulse | Numeric | | 1991 1999-2018 |
| ggt | Gamma glutamyl transferase (U/L) | Numeric | | 1991 2001-2018 |
| glucose_fasting | Plasma fasting glucose (mg/dL) | Numeric | | 1999-2016 |
| insulin | Insulin (uU/mL) | Numeric | | 1991 1999-2016 |
| phpfast | Number of hours since last ate or drank (hours) | Numeric | | 1991 1999-2018 |
| hba1c | Glycohemoglobin (%) | Numeric | | 1991 1999-2018 |
| hdl | HDL (mg/dL) | Numeric | | 1991 1999-2018 |
| ldl | LDL (mg/dL) | Numeric | | 1991 1999-2016 |
| trig | Triglyceride (mg/dL) | Numeric | | 1991 1999-2016 |
| totchol | Total cholesterol (mg/dL) | Numeric | | 1991 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| | | | | 1999-2018 |
| vitaminA | Vitamin A (umol/L) | Numeric | | 1991 1999-2006 |
| vitaminE | Vitamin E (umol/L) | Numeric | | 1991 1999-2006 |
| vitaminB12 | Vitamin B12 (pmol/L) | Numeric | | 1991 1999-2014 |
| vitaminC | Vitamin C (umol/L) | Numeric | | 1991 2003-2006 |
| **Mortality** | | | | |
| eligstat | Eligibility status for mortality follow-up | Numeric | 1: eligible 2: under age 18 3: ineligible | 1991 1999-2010 |
| status | Final mortatlity status | Numeric | 0: assumed alive 1: assumed deceased | 1991 1999-2010 |
| ucod_leading | Underlying leading cause of death | Numeric | 1: diseases of heart 2: malignant neoplasms 3: chronic lower respiratory diseases 4: accidents 5: cerebrovascular diseases 6: Alzheimer's disease 7: diabetes mellitus 8: influenza and pneumonia 9: nephritis, nephrotic syndrome and nephrosis 10: all other causes | 1991 1999-2010 |
| diabetes | Diabetes flag from multiple cause of death | Numeric | 0: no 1: yes | 1991 1999-2010 |
| hyperten | Hypertension flag from multiple cause of death | Numeric | 0: no 1: yes | 1991 1999-2010 |
| permth_int | Number of person months of follow-up from NHANES interview date (months) | Numeric | | 1991 1999-2010 |

| Variable Name | Description | C/N | Format | Comments |
|---|---|---|---|---|
| time | Number of person months of follow-up from NHANES Mobile Examination Center date | Numeric | | 1991 1999-2010 |
| **The following variables are also included in the dataset from the bioage results:** | | | | |
| kdm0 | Original KDM biological age | Numeric | | 1991 2007-2010 |
| kdm_advance0 | Original KDM biological age advancement | Numeric | | 1991 2007-2010 |
| kdm_residual0 | Original KDM biological age residual | Numeric | | 1991 2007-2010 |
| phenoage0 | Original Levine's phenotypic age | Numeric | | 1991 1999-2010 2015-2018 |
| phenoage_advance0 | Original Levine's phenotypic age advancement | Numeric | | 1991 1999-2010 2015-2018 |
| phenoage_residual0 | Original Levine's phenotypic age residual | Numeric | | 1991 1999-2010 2015-2018 |