**Vitamin D adjustment for assay differences**

In 2007-2010, serum 25(OH)D metabolites were assayed using a standardized liquid chromatography-tandem mass spectrometry (LC-MS/MS) method traceable to NIST reference materials [35, 36]. The total concentrations of serum 25(OH)D was calculated as the sum of 25(OH)D2 and 25(OH)D3, excluding the C3-epi-25(OH)D3 metabolite. For 2001-2006, total 25(OH)D concentrations were initially measured using a Diasorin radioimmunoassay (RIA) kit (Stillwater, MN). Due to the concern about imprecision and bias in the method, RIA measurements of 25(OH)D concentration in 2001-2006 were adjusted for assay drifts and converted by using regression (2001-2002: LC-MS/MSequivalent = 6.43435 + 0.95212\*RIAoriginal; 2003-2004: LC-MS/MSequivalent = 1.72786 + 0.98284\*RIAoriginal; 2005-2006: LC-MS/MSequivalent = 8.36753 + 0.97012\*RIAoriginal) to LC-MS/MS method equivalent measurements

Supplemental Table Racial/Ethnic differences in characteristics among US adults aged≥18 years in NHANES 2001-2010

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Characteristics | Proportion (95% confidence interval) | | |  |
| Hispanic | Non-Hispanic white | Non-Hispanic black | Other |
| Age  18-39 (%)  40-59 (%)  ≥60 (%) | 57.1 (54.5, 59.6)  31.6 (30.1, 33.2)  11.3 (9.7, 12.8) | 35.2 (33.9, 36.5)  38.9 (37.8, 40.2)  25.8 (24.5, 27.1) | 46,4 (44.2, 48.5)  36.9 (35.3, 38.5)  16.7 (15.3, 18.2) | 48.3 (44.2, 52.5)  36.1 (32.6, 39.7)  15.6 (13.1, 18.0) |
| Sex  Women (%) | 49.6 (48.5, 50.7) | 51.5 (50.8, 52.2) | 55.4 (54.2, 56.7) | 52.5 (49.3, 55.7) |
| Education  High school or below (%) | 67.4 (64.5, 70.4) | 40.3 (37.5, 43.1) | 53.8 (51.2, 56.5) | 38.6 (33.1, 44.1) |
| Family poverty income ratio  Poor (%) | 29.7 (27.2, 32.3) | 9.3 (8.1, 10.4) | 23.9 (21.6, 26.2) | 14.8 (11.7, 17.9) |
| Body mass index  Obesity (%) | 33.9 (31.8, 36.1) | 31.9 (30.6, 33.1) | 43.9 (42.1, 45.8) | 20.0 (16.5, 23.5) |
| Smoking  Former smoking  Current smoking (%) | 18.9 (17.3, 20.5)  26.6 (25.0, 28.1) | 26.9 (25.7, 28.2)  30.0 (28.5, 31.5) | 15.4 (14.2, 16.6)  34.4 (31.8, 37.0) | 16.7 (13.8, 19.7)  30.0 (25.7, 34.3) |
| Season  Winter time | 62.9 (54.1, 71.9) | 32.8 (27.7, 37.9) | 52.0 (42.9, 61.1) | 53.4 (44.7, 61.9) |
| Alcohol use  Current drinking (%) | 70.4 (68.4, 72.4) | 77.6 (75.1, 80.0) | 62.4 (59.8, 65.1) | 59.8 (55.6, 63.9) |
| Physical activity  Inactivity (%) | 41.8 (39.5, 44.1) | 28.5 (26.8, 30.2) | 40.4 (38.3, 42.5) | 33.1 (29.8, 36.4) |
| Milk drinking  Rarely (%)  Sometimes (%) | 31.1 (29.4, 32.9)  28.1 (26.7, 29.6) | 25.9 (24.8, 26.9)  26.5 (25.5, 27.5) | 37.8 (36.3, 39.2)  31.6 (30.2, 32.9) | 38.6 (34.6, 42.6)  27.3 (24.1, 30.5) |