Environment-wide association study on body mass index of 12-18 year-old, US NHANES 2003-2004 2003-2004 and 2013-2014

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# Discovery: 2003-2004 NHANES data

Downloaded from: [***https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2003***](https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2003)

## Introduction - participant selection

* Total number of records/participants in the combined dataset: 10122

Exclusion:

* Records/participants <12 and >18 years-old: 8108
* Pregnant participants: 40
* Diabetics: 10
* Missing BMI: 65

# Replication: 2013-2014 NHANES data

Downloaded from: [***https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2013***](https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2013)

## Introduction - participant selection

* Total number of records/participants in the combined dataset: 10175

Exclusion:

* Records/participants <12 and >18 years-old: 8896
* Pregnant participants: # no filtering for this variable in 2013-2014
  + Diabetics: 8
* Missing BMI: 47

#Check of the variables

# 2003-2004

## Descriptives - Background: unweighted statistics 2003-2004

Background participant characteristics: Descriptives of the categorical variables.

|  |  |
| --- | --- |
|  | Overall |
| n | 1899 |
| sex = Male (%) | 999 (52.6) |
| smoker\_home = Yes (%) | 429 (22.8) |
| ethnicity (%) |  |
| Mexican American | 577 (30.4) |
| Non-Hispanic Black | 683 (36.0) |
| Non-Hispanic White | 514 (27.1) |
| Other | 67 ( 3.5) |
| Other Hispanic | 58 ( 3.1) |
| edu (%) |  |
| High school diploma including GED | 92 ( 4.8) |
| Less than high school | 1750 (92.3) |
| More than high school | 55 ( 2.9) |
| bmxbmi\_cat\_perc (%) |  |
| Underweight | 40 ( 2.1) |
| Healthy Weight | 1149 (60.5) |
| Overweight | 351 (18.5) |
| Obese | 359 (18.9) |

Background participant characteristics: Descriptives of the continuous variables.

|  |  |
| --- | --- |
|  | Overall |
| n | 1899 |
| ridageyr (mean (SD)) | 14.97 (2.00) |
| indfmpir (mean (SD)) | 2.07 (1.54) |

Background participant characteristics: Descriptives of the physical activity variable.

|  |  |
| --- | --- |
|  | Overall |
| n | 1899 |
| physical\_act = Yes (%) | 1294 (70.9) |

## Weighted analysis: Demographics — 2 yr weights

Study participants by sex: Weighted statistics (percentage [95% CI]).

| var\_name | values | perc\_ci\_95 |
| --- | --- | --- |
| sex | Female | 49.3 [46.8%, 51.7%] |
| sex | Male | 50.7 [48.3%, 53.2%] |

Demographic characteristics of study participants overall and by sex: Weighted statistics (mean (se) and median [iqr] presented for the continuous variables and percentage [95% CI] for the categorical variables).

| summary | values | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- | --- |
| Age at Screening Adjudicated |  | 15 (0.1) | 15 [13, 17] | 15 (0.1) | 15 [13, 17] | 14.9 (0.1) | 15 [13, 17] | 0.275 |
| Family PIR |  | 2.6 (0.1) | 2.5 [1.1, 4.1] | 2.6 (0.1) | 2.5 [1.1, 4.1] | 2.6 (0.1) | 2.4 [1.2, 4.2] | 0.834 |
| Ethnicity | Mexican American | 11 [5.4%, 16.5%] | 10.6 [5.1%, 16%] | 11.3 [5.6%, 17.1%] | 0.564 |
| Ethnicity | Non-Hispanic Black | 14.7 [9.7%, 19.8%] | 14.3 [9.5%, 19%] | 15.2 [9.6%, 20.7%] |  |
| Ethnicity | Non-Hispanic White | 64.5 [54.8%, 74.2%] | 66.1 [56.1%, 76%] | 63 [53%, 73.1%] |  |
| Ethnicity | Other | 4.9 [2.9%, 6.8%] | 4.8 [2.2%, 7.4%] | 5 [2.4%, 7.5%] |  |
| Ethnicity | Other Hispanic | 4.9 [2.3%, 7.4%] | 4.2 [1.3%, 7.2%] | 5.5 [3%, 8%] |  |
| Educational level | High school diploma including GED | 5.9 [2.8%, 9%] | 5.1 [2.7%, 7.6%] | 6.7 [2.2%, 11.1%] | 0.474 |
| Educational level | Less than high school | 90.5 [86.9%, 94.1%] | 90.8 [87.6%, 94%] | 90.3 [85.1%, 95.4%] |  |
| Educational level | More than high school | 3.6 [1.9%, 5.2%] | 4.1 [2%, 6.2%] | 3.1 [1%, 5.2%] |  |
| Smokers at home | No | 74.9 [69.6%, 80.1%] | 74 [66.3%, 81.7%] | 75.7 [70.7%, 80.7%] | 0.628 |
| Smokers at home | Yes | 25.1 [19.9%, 30.4%] | 26 [18.3%, 33.7%] | 24.3 [19.3%, 29.3%] |  |

## Weighted analysis: Nutrition day 1 Variables — nutrition weights

Nutrition dietary variables of study participants overall and by sex: Weighted statistics (mean (SD) and median[IQR]).

| summary | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- |
| Energy (kcal) | 2334.8 (47) | 2213 [1615, 2826] | 1994.1 (37.5) | 1918 [1441, 2418] | 2648.2 (76.7) | 2494 [1820, 3275] | 0.000 |
| Protein (gm) | 81 (2) | 75.8 [51.9, 99.2] | 67.4 (1.4) | 63.1 [44.3, 83.2] | 93.6 (3.4) | 86.6 [63, 120.3] | 0.000 |
| Carbohydrate (gm) | 310 (6.2) | 287.7 [212.3, 377.7] | 265.8 (5.5) | 251.9 [190.9, 325.6] | 350.7 (9.8) | 326.6 [243.8, 432.1] | 0.000 |
| Total sugars (gm) | 157.6 (2.9) | 146.6 [100.8, 200.6] | 136.2 (3.6) | 127.8 [87.5, 170.9] | 177.3 (4.9) | 159.5 [114, 227.6] | 0.000 |
| Dietary fiber (gm) | 13.6 (0.4) | 12.1 [7.8, 17.4] | 12 (0.4) | 10.3 [7.1, 14.7] | 15.1 (0.5) | 13.7 [8.5, 19.3] | 0.000 |
| Total fat (gm) | 87.3 (2) | 78.1 [54.9, 110.9] | 75.7 (2) | 69 [49.1, 96.4] | 98 (3.2) | 90.2 [62, 122.7] | 0.000 |
| Total saturated fatty acids (gm) | 29.9 (0.7) | 27.4 [17.9, 38] | 25.7 (0.7) | 23.6 [15.3, 33.7] | 33.9 (1.2) | 30.5 [20.9, 44.4] | 0.000 |
| Total monounsaturated fatty acids (gm) | 32.5 (0.8) | 29.2 [20, 42.4] | 27.9 (0.8) | 25.7 [17.6, 34.9] | 36.8 (1.2) | 33.8 [22.6, 47.8] | 0.000 |
| Total polyunsaturated fatty acids (gm) | 17.9 (0.5) | 14.7 [9.3, 23] | 16.2 (0.5) | 13.2 [8.6, 20.2] | 19.5 (0.8) | 16.7 [10.1, 25.1] | 0.000 |
| Cholesterol (mg) | 245.7 (6.3) | 196 [122, 312] | 202.5 (8.1) | 167 [106, 245] | 285.5 (9.5) | 225 [143, 352] | 0.000 |
| Vitamin E as alpha-tocopherol (mg) | 6.9 (0.3) | 5.1 [3.4, 8.3] | 6.1 (0.2) | 4.7 [3.1, 7.8] | 7.6 (0.5) | 5.7 [3.6, 8.9] | 0.006 |
| Added alpha-tocopherol (Vitamin E) (mg) | 0.2 (0) | 0 [0, 0] | 0.3 (0.1) | 0 [0, 0] | 0.2 (0.1) | 0 [0, 0] | 0.190 |
| Retinol (mcg) | 458.2 (21.6) | 379 [188, 609] | 396 (22.4) | 336 [160, 539] | 515.4 (24.7) | 428 [215, 676] | 0.000 |
| Vitamin A, RAE (mcg) | 557 (24.2) | 452 [244, 758] | 496 (24.4) | 420 [217, 671] | 613.1 (28.6) | 494 [287, 826] | 0.000 |
| Alpha-carotene (mcg) | 174.5 (18.2) | 20 [4, 59] | 181.7 (22.7) | 20 [5, 65] | 167.9 (25.5) | 19 [2, 58] | 0.269 |
| Beta-carotene (mcg) | 1025.3 (92.6) | 385 [176, 869] | 1050.5 (136.1) | 350 [153, 819] | 1002.1 (104.7) | 420 [204, 889] | 0.167 |
| Beta-cryptoxanthin (mcg) | 151.2 (18.8) | 16 [2, 121] | 121.7 (10.6) | 15 [2, 116] | 178.3 (31.6) | 16 [2, 124] | 0.472 |
| Lycopene (mcg) | 6499.5 (393) | 1840 [4, 9088] | 4600 (322.5) | 932 [0, 6546] | 8246.6 (580.2) | 3080 [311, 11055] | 0.000 |
| Lutein + zeaxanthin (mcg) | 858 (69.6) | 444 [200, 930] | 857 (107.2) | 422 [194, 904] | 858.9 (72.7) | 454 [218, 997] | 0.406 |
| Thiamin (Vitamin B1) (mg) | 1.8 (0.1) | 1.6 [1.1, 2.3] | 1.5 (0.1) | 1.4 [1, 1.8] | 2.1 (0.1) | 1.9 [1.2, 2.6] | 0.000 |
| Riboflavin (Vitamin B2) (mg) | 2.3 (0.1) | 2 [1.4, 2.9] | 1.9 (0.1) | 1.8 [1.1, 2.6] | 2.6 (0.1) | 2.3 [1.6, 3.4] | 0.000 |
| Niacin (mg) | 23.4 (0.7) | 21.4 [14.2, 29.1] | 19.8 (0.6) | 17.9 [12.3, 25.3] | 26.7 (0.9) | 24.5 [16.7, 33.4] | 0.000 |
| Vitamin B6 (mg) | 1.8 (0.1) | 1.6 [1, 2.4] | 1.5 (0.1) | 1.3 [0.8, 1.9] | 2.1 (0.1) | 1.9 [1.2, 2.8] | 0.000 |
| Total Folate (mcg) | 421.3 (13.3) | 351 [231, 537] | 366.3 (12.4) | 314 [212, 439] | 471.9 (15.8) | 417 [268, 600] | 0.000 |
| Folic acid (mcg) | 247.2 (9.9) | 187 [110, 312] | 216.6 (11.1) | 166 [89, 273] | 275.3 (11) | 211 [131, 352] | 0.000 |
| Food folate (mcg) | 174.1 (4.1) | 145 [99, 219] | 149.6 (3.4) | 125 [92, 190] | 196.7 (7.6) | 166 [111, 245] | 0.000 |
| Folate, DFE (mcg) | 594.5 (20.1) | 480 [312, 750] | 518.1 (20) | 426 [286, 638] | 664.8 (23) | 582 [371, 843] | 0.000 |
| Vitamin B12 (mcg) | 5.4 (0.2) | 4.6 [2.5, 7.1] | 4.4 (0.2) | 3.4 [2.1, 6] | 6.3 (0.3) | 5.5 [3.3, 8.2] | 0.000 |
| Added vitamin B12 (mcg) | 1 (0.1) | 0 [0, 1.6] | 0.9 (0.1) | 0 [0, 1.2] | 1.2 (0.1) | 0 [0, 1.7] | 0.154 |
| Vitamin C (mg) | 89.1 (6.1) | 47.3 [17.2, 119.6] | 75.4 (4.4) | 43.8 [15.3, 106.7] | 101.7 (9.7) | 52.6 [19.1, 133.3] | 0.019 |
| Vitamin K (mcg) | 62.5 (4.2) | 40 [23.2, 69.1] | 60.3 (5.9) | 36.4 [21.1, 63.9] | 64.5 (4) | 45.7 [27.3, 72.2] | 0.001 |
| Calcium (mg) | 1044.6 (38.2) | 881 [584, 1410] | 890.5 (37.6) | 791 [504, 1148] | 1186.3 (48.2) | 1019 [628, 1589] | 0.000 |
| Phosphorus (mg) | 1367.4 (36.1) | 1262 [866, 1735] | 1158.7 (31.1) | 1072 [774, 1425] | 1559.3 (53.2) | 1413 [1041, 1932] | 0.000 |
| Magnesium (mg) | 247.9 (6.9) | 218 [156, 316] | 212.2 (6.2) | 189 [144, 258] | 280.7 (10.4) | 261 [180, 340] | 0.000 |
| Iron (mg) | 16.7 (0.5) | 14.3 [10.1, 21.1] | 14.1 (0.5) | 12.4 [8.7, 16.7] | 19.1 (0.6) | 16.6 [11.3, 24.3] | 0.000 |
| Zinc (mg) | 12.5 (0.4) | 11 [7.1, 15.8] | 10.3 (0.4) | 9.3 [6.1, 13.3] | 14.5 (0.5) | 13 [8.5, 18.6] | 0.000 |
| Copper (mg) | 1.2 (0) | 1 [0.7, 1.4] | 1 (0) | 0.9 [0.6, 1.2] | 1.3 (0.1) | 1.2 [0.8, 1.7] | 0.000 |
| Sodium (mg) | 3558.5 (106.4) | 3172 [2238, 4524] | 3000.7 (77.3) | 2740 [2007, 3637] | 4071.6 (170.9) | 3775 [2558, 5170] | 0.000 |
| Potassium (mg) | 2432.3 (77.9) | 2220 [1503, 3078] | 2069.5 (39.5) | 1913 [1369, 2614] | 2766 (120.4) | 2564 [1767, 3663] | 0.000 |
| Selenium (mcg) | 105.8 (2.8) | 96 [65.9, 132.8] | 88.8 (2.5) | 82.4 [57.7, 110.3] | 121.4 (4.3) | 112.8 [78, 151.9] | 0.000 |
| Caffeine (mg) | 58.2 (3) | 30 [1, 84] | 55.1 (5) | 29 [1, 75] | 61.1 (3.9) | 31 [1, 93] | 0.449 |
| Theobromine (mg) | 50.3 (4.3) | 5 [0, 58] | 43.5 (3.1) | 5 [0, 58] | 56.5 (7.4) | 2 [0, 58] | 0.802 |
| Alcohol (gm) | 1.3 (0.2) | 0 [0, 0] | 0.5 (0.2) | 0 [0, 0] | 2 (0.4) | 0 [0, 0] | 0.889 |
| Moisture (gm) | 1614.4 (31.2) | 1455.9 [1070.2, 1969.6] | 1355.2 (30.2) | 1259.8 [974.7, 1678.3] | 1852.9 (51.1) | 1699.1 [1244.1, 2321.8] | 0.000 |
| SFA 4:0 (Butanoic) (gm) | 0.7 (0) | 0.6 [0.3, 1] | 0.6 (0) | 0.5 [0.2, 0.9] | 0.8 (0) | 0.7 [0.3, 1.1] | 0.004 |
| SFA 6:0 (Hexanoic) (gm) | 0.4 (0) | 0.3 [0.1, 0.5] | 0.3 (0) | 0.3 [0.1, 0.5] | 0.4 (0) | 0.4 [0.2, 0.6] | 0.004 |
| SFA 8:0 (Octanoic) (gm) | 0.3 (0) | 0.2 [0.1, 0.4] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.3 (0) | 0.3 [0.1, 0.4] | 0.002 |
| SFA 10:0 (Decanoic) (gm) | 0.5 (0) | 0.4 [0.2, 0.7] | 0.5 (0) | 0.4 [0.2, 0.6] | 0.6 (0) | 0.5 [0.3, 0.8] | 0.003 |
| SFA 12:0 (Dodecanoic) (gm) | 0.7 (0) | 0.5 [0.3, 0.9] | 0.7 (0) | 0.4 [0.2, 0.8] | 0.8 (0) | 0.6 [0.3, 1] | 0.000 |
| SFA 14:0 (Tetradecanoic) (gm) | 2.7 (0.1) | 2.3 [1.3, 3.6] | 2.3 (0.1) | 1.9 [1.1, 3.1] | 3 (0.1) | 2.6 [1.5, 4.1] | 0.000 |
| SFA 16:0 (Hexadecanoic) (gm) | 16.1 (0.4) | 14.7 [9.9, 20.5] | 13.9 (0.4) | 12.8 [8.7, 18.1] | 18.2 (0.6) | 16.5 [11.3, 24.1] | 0.000 |
| SFA 18:0 (Octadecanoic) (gm) | 7.6 (0.2) | 6.9 [4.6, 9.9] | 6.5 (0.2) | 5.8 [3.9, 8.5] | 8.7 (0.3) | 8.1 [5.4, 11.5] | 0.000 |
| MFA 16:1 (Hexadecenoic) (gm) | 1.4 (0) | 1.2 [0.7, 1.9] | 1.1 (0) | 1 [0.6, 1.5] | 1.6 (0.1) | 1.4 [0.9, 2.1] | 0.000 |
| MFA 18:1 (Octadecenoic) (gm) | 30.4 (0.8) | 27.2 [18.5, 39.7] | 26.1 (0.8) | 24.1 [16.3, 32.3] | 34.3 (1.1) | 31.3 [21.1, 44.3] | 0.000 |
| MFA 20:1 (Eicosenoic) (gm) | 0.2 (0) | 0.2 [0.1, 0.3] | 0.2 (0) | 0.2 [0.1, 0.2] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.000 |
| MFA 22:1 (Docosenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.046 |
| PFA 18:2 (Octadecadienoic) (gm) | 15.9 (0.5) | 12.9 [8.3, 20.4] | 14.3 (0.5) | 11.5 [7.5, 17.7] | 17.4 (0.8) | 14.5 [9, 22.4] | 0.001 |
| PFA 18:3 (Octadecatrienoic) (gm) | 1.5 (0) | 1.3 [0.7, 1.9] | 1.4 (0.1) | 1.1 [0.7, 1.7] | 1.6 (0.1) | 1.4 [0.8, 2.1] | 0.000 |
| PFA 18:4 (Octadecatetraenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.983 |
| PFA 20:4 (Eicosatetraenoic) (gm) | 0.1 (0) | 0.1 [0, 0.1] | 0.1 (0) | 0.1 [0, 0.1] | 0.1 (0) | 0.1 [0, 0.2] | 0.001 |
| PFA 20:5 (Eicosapentaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.104 |
| PFA 22:5 (Docosapentaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.089 |
| PFA 22:6 (Docosahexaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.054 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — mec weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Basophils number | 0 (0) | 0 [0, 0.1] | 0 (0) | 0 [0, 0.1] | 0 (0) | 0 [0, 0.1] | 0.060 |
| Eosinophils number | 0.2 (0) | 0.1 [0.1, 0.2] | 0.2 (0) | 0.1 [0.1, 0.2] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.006 |
| Lymphocyte number | 2.2 (0) | 2.1 [1.7, 2.6] | 2.2 (0) | 2.2 [1.8, 2.6] | 2.2 (0) | 2.1 [1.7, 2.5] | 0.148 |
| Monocyte number | 0.6 (0) | 0.5 [0.4, 0.7] | 0.5 (0) | 0.5 [0.4, 0.6] | 0.6 (0) | 0.5 [0.4, 0.7] | 0.125 |
| Segmented neutrophils number | 4.1 (0.1) | 3.8 [2.9, 4.9] | 4.4 (0.1) | 4.2 [3.1, 5.3] | 3.8 (0.1) | 3.4 [2.7, 4.6] | 0.000 |
| Basophils percent (%) | 0.7 (0) | 0.6 [0.4, 0.8] | 0.6 (0) | 0.6 [0.4, 0.8] | 0.7 (0) | 0.6 [0.4, 0.8] | 0.165 |
| Eosinophils percent (%) | 2.9 (0.1) | 2.2 [1.3, 3.7] | 2.5 (0.1) | 1.8 [1.2, 3.2] | 3.3 (0.2) | 2.5 [1.7, 4.1] | 0.000 |
| Hematocrit (%) | 42.3 (0.2) | 42.2 [39.8, 44.9] | 40.1 (0.2) | 40.2 [38.3, 42.1] | 44.5 (0.2) | 44.5 [42.2, 46.6] | 0.000 |
| Hemoglobin (g/dL) | 14.4 (0.1) | 14.4 [13.6, 15.2] | 13.6 (0.1) | 13.7 [13.1, 14.3] | 15.1 (0.1) | 15 [14.4, 15.8] | 0.000 |
| Lymphocyte percent (%) | 32.2 (0.2) | 32.3 [26.5, 37.7] | 31.4 (0.3) | 31.2 [25.6, 36.5] | 33 (0.3) | 32.8 [27.1, 38.7] | 0.001 |
| Mean cell hemoglobin (pg) | 29.7 (0.1) | 29.8 [28.8, 30.8] | 29.7 (0.1) | 29.9 [29, 31] | 29.6 (0.1) | 29.8 [28.7, 30.8] | 0.138 |
| Mean cell volume (fL) | 87.5 (0.2) | 87.9 [85.1, 90.2] | 87.5 (0.2) | 87.9 [85.4, 90.6] | 87.5 (0.2) | 87.9 [84.6, 90.1] | 0.241 |
| Monocyte percent (%) | 8.2 (0.1) | 8 [6.6, 9.4] | 7.7 (0.1) | 7.5 [6.2, 8.9] | 8.6 (0.1) | 8.4 [7.2, 9.7] | 0.000 |
| Mean platelet volume (fL) | 8 (0) | 8 [7.5, 8.5] | 8 (0) | 8 [7.5, 8.4] | 8.1 (0) | 8 [7.6, 8.6] | 0.152 |
| Segmented neutrophils percent (%) | 56 (0.2) | 56.2 [49.4, 62.8] | 57.8 (0.3) | 58.3 [52.1, 64.3] | 54.4 (0.3) | 54.3 [47.4, 61.1] | 0.000 |
| Platelet count SI (1000 cells/uL) | 282.2 (2.4) | 275 [237, 319] | 295.1 (3.1) | 291 [247, 331] | 269.9 (3) | 264 [227, 304] | 0.000 |
| Red blood cell count (million cells/uL) | 4.8 (0) | 4.8 [4.5, 5.1] | 4.6 (0) | 4.6 [4.4, 4.8] | 5.1 (0) | 5.1 [4.9, 5.3] | 0.000 |
| Red cell distribution width (%) | 12.4 (0) | 12.3 [12, 12.7] | 12.4 (0) | 12.2 [11.9, 12.6] | 12.4 (0) | 12.3 [12, 12.7] | 0.061 |
| White blood cell count (1000 cells/uL) | 7.1 (0.1) | 6.9 [5.6, 8.2] | 7.4 (0.1) | 7.2 [5.8, 8.6] | 6.8 (0.1) | 6.6 [5.4, 7.8] | 0.001 |
| Albumin (g/L) | 44.3 (0.1) | 44 [42, 46] | 43.3 (0.2) | 43 [41, 45] | 45.3 (0.2) | 45 [43, 47] | 0.000 |
| Blood urea nitrogen (mmol/L) | 3.5 (0) | 3.2 [2.9, 3.9] | 3.2 (0.1) | 3.2 [2.5, 3.9] | 3.7 (0.1) | 3.6 [2.9, 4.3] | 0.000 |
| Total calcium (mmol/L) | 2.4 (0) | 2.5 [2.4, 2.5] | 2.4 (0) | 2.4 [2.4, 2.5] | 2.5 (0) | 2.5 [2.4, 2.5] | 0.000 |
| Cholesterol (mmol/L) | 4.2 (0) | 4.1 [3.7, 4.7] | 4.3 (0) | 4.2 [3.8, 4.7] | 4.1 (0) | 4.1 [3.6, 4.6] | 0.001 |
| Globulin (g/L) | 28.6 (0.2) | 28 [26, 31] | 29.3 (0.2) | 29 [27, 32] | 27.9 (0.2) | 28 [26, 30] | 0.000 |
| Glucose, serum (mmol/L) | 4.8 (0) | 4.8 [4.5, 5] | 4.7 (0) | 4.7 [4.4, 4.9] | 4.9 (0) | 4.9 [4.6, 5.1] | 0.000 |
| Iron, refigerated (umol/L) | 15.6 (0.3) | 15 [10.6, 20.2] | 14.7 (0.5) | 13.8 [9, 19.3] | 16.5 (0.3) | 15.9 [11.5, 20.8] | 0.008 |
| Phosphorus (mmol/L) | 1.4 (0) | 1.4 [1.3, 1.6] | 1.4 (0) | 1.4 [1.3, 1.5] | 1.5 (0) | 1.5 [1.3, 1.6] | 0.000 |
| Bilirubin, total (umol/L) | 13.3 (0.3) | 12 [10.3, 15.4] | 12 (0.4) | 10.3 [8.6, 13.7] | 14.6 (0.4) | 13.7 [10.3, 17.1] | 0.000 |
| Total protein (g/L) | 72.9 (0.2) | 73 [70, 75] | 72.6 (0.3) | 72 [69, 75] | 73.1 (0.3) | 73 [70, 76] | 0.086 |
| Triglycerides (mmol/L) | 0.9 (0) | 0.8 [0.6, 1.1] | 0.9 (0) | 0.7 [0.5, 1] | 1 (0) | 0.8 [0.6, 1.1] | 0.013 |
| Uric acid (umol/L) | 305.3 (2.4) | 297.4 [249.8, 350.9] | 267.2 (3.5) | 261.7 [232, 303.3] | 341.5 (2.2) | 339 [297.4, 380.7] | 0.000 |
| Alkaline phosphotase (U/L) | 151.1 (4.8) | 110 [73, 214] | 104.7 (3.9) | 81 [63, 123] | 195.1 (6.5) | 171 [101, 267] | 0.000 |
| Aspartate aminotransferase AST (U/L) | 24.3 (0.4) | 22 [20, 26] | 21.9 (0.6) | 20 [18, 23] | 26.5 (0.6) | 24 [21, 28] | 0.000 |
| Alanine aminotransferase ALT (U/L) | 19.2 (0.3) | 17 [14, 21] | 16.9 (0.4) | 15 [13, 18] | 21.4 (0.6) | 18 [15, 23] | 0.000 |
| Bicarbonate (mmol/L) | 24.3 (0.1) | 24 [23, 26] | 23.9 (0.1) | 24 [23, 25] | 24.7 (0.1) | 25 [23, 26] | 0.000 |
| Chloride (mmol/L) | 104 (0.1) | 104 [103, 105] | 104.4 (0.1) | 104 [103, 106] | 103.5 (0.1) | 103 [102, 105] | 0.000 |
| Creatinine (umol/L) | 66.4 (0.6) | 61.9 [53, 70.7] | 61.1 (0.6) | 61.9 [53, 70.7] | 71.3 (0.8) | 70.7 [61.9, 79.6] | 0.000 |
| Gamma glutamyl transferase (U/L) | 13.9 (0.2) | 12 [10, 16] | 12 (0.3) | 11 [9, 14] | 15.6 (0.3) | 14 [11, 18] | 0.000 |
| Potassium (mmol/L) | 4 (0) | 4 [3.8, 4.1] | 3.9 (0) | 3.9 [3.8, 4.1] | 4 (0) | 4 [3.9, 4.2] | 0.000 |
| Lactate dehydrogenase LDH (U/L) | 133.9 (2.3) | 128 [112, 149] | 128.2 (3.5) | 122 [109, 139] | 139.3 (1.6) | 137 [117, 156] | 0.000 |
| Sodium (mmol/L) | 139.1 (0.1) | 139 [138, 140] | 138.9 (0.1) | 139 [138, 140] | 139.3 (0.1) | 139 [138, 140] | 0.000 |
| Osmolality (mmol/Kg) | 276.1 (0.2) | 276 [274, 278] | 275.3 (0.2) | 275 [273, 277] | 276.7 (0.2) | 277 [275, 278] | 0.000 |
| Albumin, urine (mg/L) SI | 29.7 (2.4) | 8.9 [4.9, 18.9] | 31.9 (2.8) | 10.3 [5.7, 23.4] | 27.5 (4) | 8 [4.6, 16] | 0.000 |
| Cotinine (ng/mL) | 19.4 (2.8) | 0.1 [0, 1.1] | 16.8 (2.8) | 0.1 [0, 1] | 21.8 (4) | 0.1 [0, 1.3] | 0.345 |
| Glycohemoglobin (%) | 5.2 (0) | 5.2 [5, 5.3] | 5.1 (0) | 5.1 [5, 5.3] | 5.2 (0) | 5.2 [5, 5.3] | 0.005 |
| Cadmium (nmoL/L) | 2.4 (0.1) | 1.8 [0.9, 2.7] | 2.5 (0.1) | 1.8 [0.9, 2.7] | 2.3 (0.2) | 1.8 [0.9, 2.7] | 0.105 |
| Lead (umoL/L) | 0.1 (0) | 0 [0, 0.1] | 0 (0) | 0 [0, 0] | 0.1 (0) | 0 [0, 0.1] | 0.000 |
| Mercury, total (umoL/L) | 4 (0.4) | 2.5 [1, 4.5] | 3.9 (0.4) | 2.5 [1, 4.5] | 4.1 (0.4) | 2 [1, 5] | 0.849 |
| BMI SDS | 0.6 (0.1) | 0.6 [-0.1, 1.4] | 0.6 (0.1) | 0.6 [0, 1.4] | 0.6 (0.1) | 0.6 [-0.2, 1.5] | 0.922 |
| BMI SDS percentile | 0.7 (0) | 0.7 [0.5, 0.9] | 0.7 (0) | 0.7 [0.5, 0.9] | 0.7 (0) | 0.7 [0.4, 0.9] | 0.946 |

Physical activity and BMI (cat.): Weighted statistics (percentage [95% CI])).

| summary | values | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- | --- |
| Physical activity | No | 25.3 [22.7%, 27.9%] | 33.5 [30.5%, 36.5%] | 17.6 [13.5%, 21.7%] | 0.000 |
| Physical activity | Yes | 74.7 [72.1%, 77.3%] | 66.5 [63.5%, 69.5%] | 82.4 [78.3%, 86.5%] |  |
| BMI categories | Underweight | 2.2 [1.1%, 3.2%] | 1.4 [0.2%, 2.6%] | 2.9 [1.7%, 4.2%] | 0.085 |
| BMI categories | Healthy Weight | 61.4 [55.7%, 67.1%] | 64.9 [57.2%, 72.5%] | 58.1 [52.2%, 63.9%] |  |
| BMI categories | Overweight | 18.4 [15.3%, 21.5%] | 16.8 [12.2%, 21.4%] | 19.9 [16.7%, 23.1%] |  |
| BMI categories | Obese | 18.1 [14.1%, 22.1%] | 16.9 [11.8%, 22.1%] | 19.1 [14.9%, 23.4%] |  |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample A weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Urinary total Arsenic (ug/L) | 16.8 (3.8) | 8.1 [4.5, 14.7] | 20.9 (7.2) | 7.9 [4, 13.7] | 12.8 (0.8) | 8.3 [4.9, 15.8] | 0.222 |
| Mercury, urine (ng/mL) | 0.6 (0.1) | 0.3 [0.1, 0.7] | 0.7 (0.1) | 0.3 [0.1, 0.7] | 0.6 (0.1) | 0.3 [0.1, 0.5] | 0.879 |
| Perfluorohexane sulfonic acid | 4.2 (0.4) | 2.4 [1.3, 4.9] | 4.2 (0.4) | 2.4 [1.2, 5.3] | 4.2 (0.6) | 2.4 [1.4, 4.7] | 0.733 |
| Perfluorobutane sulfonic acid | 0.3 (0) | 0.3 [0.3, 0.3] | 0.3 (0) | 0.3 [0.3, 0.3] | 0.3 (0) | 0.3 [0.3, 0.3] | 0.566 |
| Perfluorodecanoic acid | 0.3 (0) | 0.2 [0.2, 0.2] | 0.3 (0) | 0.2 [0.2, 0.2] | 0.3 (0) | 0.2 [0.2, 0.3] | 0.055 |
| Perfluoroheptanoic acid | 0.3 (0) | 0.2 [0.2, 0.2] | 0.2 (0) | 0.2 [0.2, 0.2] | 0.3 (0) | 0.2 [0.2, 0.2] | 0.228 |
| Perfluorononanoic acid | 1.1 (0.2) | 0.8 [0.6, 1.2] | 0.9 (0.1) | 0.8 [0.5, 1.1] | 1.2 (0.2) | 0.9 [0.6, 1.4] | 0.003 |
| Perfluoroundecanoic acid | 0.2 (0) | 0.2 [0.2, 0.2] | 0.2 (0) | 0.2 [0.2, 0.2] | 0.2 (0) | 0.2 [0.2, 0.2] | 0.124 |
| Perfluorododecanoic acid | 0.7 (0) | 0.7 [0.7, 0.7] | 0.7 (0) | 0.7 [0.7, 0.7] | 0.7 (0) | 0.7 [0.7, 0.7] | 0.338 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample B weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

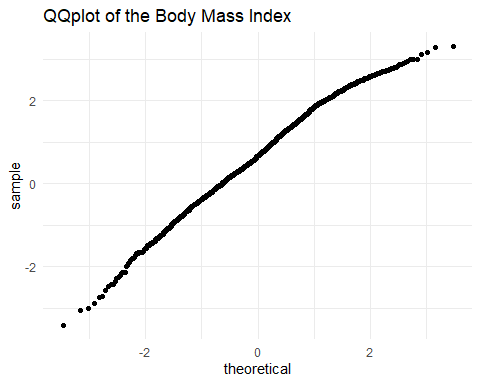
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Mono-2-ethyl-5-carboxypentyl phthalate | 94.3 (12.7) | 42.7 [22.1, 83.7] | 91.5 (19.6) | 42.2 [19, 77.7] | 96.9 (10.2) | 45.8 [22.6, 86.5] | 0.149 |
| Mono-n-butyl phthalate | 48 (2.8) | 28.9 [15.8, 52.4] | 49.5 (3.4) | 32.9 [16.9, 58.4] | 46.6 (3.5) | 25.9 [15.5, 50.4] | 0.030 |
| Mono-(3-carboxypropyl) phthalate | 5.7 (0.3) | 4.2 [2.3, 7.4] | 5.3 (0.3) | 3.9 [2.2, 6.3] | 6.1 (0.5) | 4.6 [2.4, 8.3] | 0.049 |
| Mono-ethyl phthalate | 367.9 (46.9) | 145.3 [53, 362.7] | 344 (44.7) | 150 [54.5, 348] | 390.1 (73.2) | 141 [49.4, 370.6] | 0.798 |
| Mono-(2-ethyl-5-hydroxyhexyl) phthalate | 69.8 (11.8) | 29.8 [13.6, 54.4] | 67.3 (17.7) | 27.4 [11.8, 54.5] | 72.2 (11.6) | 30.2 [14.8, 53.8] | 0.403 |
| Mono-(2-ethyl)-hexyl phthalate | 7.3 (1) | 2.3 [0.6, 5.5] | 6.7 (1.1) | 2.3 [0.6, 5.5] | 7.9 (1.5) | 2.3 [0.6, 5.6] | 0.802 |
| Mono-isobutyl phthalate | 7.8 (0.6) | 5.8 [2.5, 10.1] | 8.2 (0.8) | 5.3 [2.5, 10.1] | 7.5 (0.7) | 5.9 [2.4, 10.2] | 0.777 |
| Mono-isononyl phthalate | 1.3 (0.1) | 1.1 [1.1, 1.1] | 1.2 (0.1) | 1.1 [1.1, 1.1] | 1.3 (0.1) | 1.1 [1.1, 1.1] | 0.772 |
| Mono-benzyl phthalate | 31.6 (2.5) | 17.6 [8.3, 36.5] | 32.5 (3.4) | 17.6 [7.3, 36] | 30.7 (3.5) | 17.5 [8.7, 37.2] | 0.752 |
| 1-napthol (ng/L) | 4618.7 (628.8) | 1644.3 [838.1, 3954.9] | 3742.9 (297.8) | 1599.9 [838.1, 3954.9] | 5432.4 (1153.3) | 1675.7 [868.1, 3899] | 0.584 |
| 2-napthol (ng/L) | 5438.3 (544.9) | 2912 [1651.4, 5343.5] | 5121.1 (387.6) | 3271.1 [1756.1, 6187] | 5732.7 (996.4) | 2651.7 [1564.4, 4920.3] | 0.047 |
| 3-fluorene (ng/L) | 211.4 (19.3) | 110.1 [57.3, 201.6] | 193 (23.5) | 106 [54.2, 193.6] | 228.3 (27.4) | 115.3 [61.2, 203.1] | 0.221 |
| 2-fluorene (ng/L) | 445.6 (37) | 286.8 [145.8, 492.1] | 397.1 (40.1) | 279.7 [129.8, 469.7] | 490.1 (54.1) | 292.3 [158.9, 498.8] | 0.183 |
| 1-phenanthrene (ng/L) | 221.3 (11.1) | 161.6 [88.7, 280.5] | 206.5 (10.4) | 152.8 [79.6, 262.1] | 235.5 (16.1) | 174.2 [96.6, 284.5] | 0.103 |
| 1-pyrene (ng/L) | 198.7 (13.2) | 113.4 [62.9, 241.2] | 190.6 (18.1) | 104.6 [54.6, 223.8] | 206.2 (10.3) | 120 [67.9, 257.5] | 0.081 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample C weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Urinary Benzophenone-3 (ng/mL) | 147.7 (39.5) | 22.1 [7.9, 67.1] | 140 (54) | 25.3 [9.2, 90.3] | 155.2 (66.3) | 17.4 [7.5, 40.4] | 0.058 |
| Iodine, urine (ng/mL) | 241.2 (15.4) | 182.3 [105, 301] | 236.6 (23) | 164 [88, 302] | 245.7 (17.2) | 189 [112, 293] | 0.206 |
| Perchlorate, urine (ng/mL) | 5.4 (0.3) | 4 [2.3, 6.6] | 5.1 (0.5) | 3.8 [2.2, 6.3] | 5.8 (0.5) | 4.4 [2.5, 7.1] | 0.206 |

## QQ-plots



# 2013-2014

## Descriptives - Background: unweighted statistics 2013-2014

Background participant characteristics: Descriptives of the categorical variables.

|  |  |
| --- | --- |
|  | Overall |
| n | 1224 |
| sex = Male (%) | 624 (51.0) |
| smoker\_home = Yes (%) | 277 (22.8) |
| ethnicity (%) |  |
| Mexican American | 287 (23.4) |
| Non-Hispanic Black | 301 (24.6) |
| Non-Hispanic White | 306 (25.0) |
| Other | 203 (16.6) |
| Other Hispanic | 127 (10.4) |
| edu (%) |  |
| High school diploma including GED | 78 ( 6.4) |
| Less than high school | 1120 (91.6) |
| More than high school | 25 ( 2.0) |
| bmxbmi\_cat\_perc (%) |  |
| Underweight | 32 ( 2.6) |
| Healthy Weight | 702 (57.4) |
| Overweight | 232 (19.0) |
| Obese | 258 (21.1) |

Background participant characteristics: Descriptives of the continuous variables.

|  |  |
| --- | --- |
|  | Overall |
| n | 1224 |
| ridageyr (mean (SD)) | 14.97 (2.00) |
| indfmpir (mean (SD)) | 2.00 (1.55) |

Background participant characteristics: Descriptives of the physical activity variable

|  |  |
| --- | --- |
|  | Overall |
| n | 1224 |
| physical\_act = Yes (%) | 723 (60.5) |

## Weighted analysis: Demographics — 2 yr weights

Study participants by sex: Weighted statistics (percentage [95% CI]).

| var\_name | values | perc\_ci\_95 |
| --- | --- | --- |
| sex | Female | 48.2 [44.3%, 52.1%] |
| sex | Male | 51.8 [47.9%, 55.7%] |

Demographic characteristics of study participants overall and by sex: Weighted statistics (mean (SE) and median [IQR] presented for the continuous variables and percentage [95% CI] for the categorical variables).

| summary | values | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- | --- |
| Age in years at screening |  | 15 (0.1) | 15 [13, 17] | 15.1 (0.1) | 15 [14, 17] | 15 (0.1) | 15 [13, 17] | 0.641 |
| Ratio of family income to poverty |  | 2.4 (0.1) | 2.2 [1, 3.8] | 2.4 (0.1) | 2.1 [1, 3.6] | 2.5 (0.2) | 2.2 [1, 4] | 0.633 |
| Ethnicity | Mexican American | 15.4 [8.9%, 22%] | 15.2 [9.3%, 21%] | 15.6 [8.1%, 23.2%] | 0.936 |
| Ethnicity | Non-Hispanic Black | 14.3 [9.6%, 19%] | 14 [9.3%, 18.8%] | 14.5 [9%, 20%] |  |
| Ethnicity | Non-Hispanic White | 54.2 [43.3%, 65%] | 54.3 [42.5%, 66.1%] | 54 [43.1%, 64.8%] |  |
| Ethnicity | Other | 9.2 [6.6%, 11.8%] | 9.8 [6.8%, 12.8%] | 8.7 [5.1%, 12.3%] |  |
| Ethnicity | Other Hispanic | 6.9 [4.4%, 9.4%] | 6.7 [3.7%, 9.6%] | 7.1 [4.2%, 10%] |  |
| Educational level | High school diploma including GED | 6.6 [4.4%, 8.8%] | 6.1 [2.1%, 10%] | 7.2 [4.5%, 9.8%] | 0.751 |
| Educational level | Less than high school | 91.8 [89.3%, 94.3%] | 92.4 [87.9%, 96.9%] | 91.2 [88.6%, 93.8%] |  |
| Educational level | More than high school | 1.6 [0.7%, 2.5%] | 1.5 [0.4%, 2.7%] | 1.6 [0.7%, 2.6%] |  |
| Smokers at home | No | 76.4 [70.4%, 82.5%] | 77.6 [70.5%, 84.7%] | 75.3 [68.7%, 81.9%] | 0.462 |
| Smokers at home | Yes | 23.6 [17.5%, 29.6%] | 22.4 [15.3%, 29.5%] | 24.7 [18.1%, 31.3%] |  |

## Weighted analysis: Nutrition day 1 Variables — nutrition weights

Nutrition dietary variables of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR]).

| summary | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- |
| Energy (kcal) | 2023.9 (36) | 1833 [1356, 2474] | 1661.7 (51.9) | 1509 [1169, 2082] | 2371.2 (43.5) | 2137 [1665, 2871] | 0.000 |
| Protein (gm) | 77.9 (2.1) | 67.9 [49, 96.7] | 60.2 (2.3) | 58.2 [39.8, 75.8] | 94.9 (3.8) | 81.6 [59.9, 113.1] | 0.000 |
| Carbohydrate (gm) | 259.1 (5.2) | 238.2 [170.1, 323.8] | 217.4 (5.6) | 200.6 [149.6, 271.4] | 299.1 (8.4) | 269.8 [208.7, 359.2] | 0.000 |
| Total sugars (gm) | 120.6 (2.9) | 102.2 [70.4, 150.7] | 99.2 (2.9) | 88.9 [62.4, 125.8] | 141.1 (4.9) | 124.5 [85.8, 174.5] | 0.000 |
| Dietary fiber (gm) | 14.5 (0.5) | 12.6 [8.4, 18.5] | 12.4 (0.6) | 10.8 [7.4, 16] | 16.5 (0.5) | 14.2 [9.6, 19.9] | 0.000 |
| Total fat (gm) | 76.9 (1.8) | 67.8 [46.6, 94.9] | 63.1 (2.8) | 57.8 [36.8, 80.6] | 90 (1.7) | 77.4 [57.9, 115.8] | 0.000 |
| Total saturated fatty acids (gm) | 25.8 (0.7) | 22.5 [14.9, 33] | 20.9 (1) | 18.3 [11.4, 27] | 30.4 (0.8) | 27.2 [17.4, 38.8] | 0.000 |
| Total monounsaturated fatty acids (gm) | 26 (0.7) | 22.1 [14.8, 32.8] | 21 (1.1) | 18.7 [11.9, 26.8] | 30.8 (0.9) | 25.5 [18.3, 38.9] | 0.000 |
| Total polyunsaturated fatty acids (gm) | 17.6 (0.7) | 14.7 [9.5, 22.6] | 15.2 (0.8) | 12.6 [7.9, 20.3] | 19.9 (0.8) | 16.9 [11.7, 24.4] | 0.000 |
| Cholesterol (mg) | 246.6 (9.1) | 176 [102, 317] | 181.1 (8.7) | 139 [83, 235] | 309.5 (16.6) | 244 [135, 385] | 0.000 |
| Vitamin E as alpha-tocopherol (mg) | 8 (0.6) | 6 [3.9, 9.4] | 6.6 (0.3) | 5.1 [3, 8.5] | 9.3 (1.1) | 7 [4.5, 9.8] | 0.000 |
| Added alpha-tocopherol (Vitamin E) (mg) | 0.7 (0.3) | 0 [0, 0] | 0.4 (0.1) | 0 [0, 0] | 1.1 (0.6) | 0 [0, 0] | 0.145 |
| Retinol (mcg) | 450.9 (14.2) | 387 [191, 609] | 361.8 (20.6) | 311 [140, 503] | 536.4 (22.2) | 460 [248, 732] | 0.000 |
| Vitamin A, RAE (mcg) | 570.9 (21.6) | 486 [267, 744] | 495.4 (39.7) | 414 [217, 689] | 643.3 (20.1) | 557 [332, 819] | 0.001 |
| Alpha-carotene (mcg) | 269.2 (58.9) | 19 [2, 79] | 296.4 (101.8) | 17 [2, 77] | 243.2 (41.2) | 23 [2, 79] | 0.245 |
| Beta-carotene (mcg) | 1279.2 (170.1) | 418 [200, 1021] | 1428.9 (321.6) | 352 [179, 984] | 1135.6 (108.6) | 473 [226, 1030] | 0.105 |
| Beta-cryptoxanthin (mcg) | 69.1 (6.4) | 19 [4, 88] | 64.7 (10.2) | 15 [2, 63] | 73.3 (7.9) | 27 [7, 92] | 0.019 |
| Lycopene (mcg) | 4713.3 (250.5) | 1890 [4, 5365] | 3979.4 (270.2) | 1750 [5, 4392] | 5416.9 (363.1) | 2097 [0, 6535] | 0.193 |
| Lutein + zeaxanthin (mcg) | 921 (83.1) | 491 [237, 940] | 903.8 (167.1) | 411 [206, 845] | 937.6 (75.3) | 562 [284, 1030] | 0.076 |
| Thiamin (Vitamin B1) (mg) | 1.7 (0.1) | 1.4 [1, 2.1] | 1.3 (0) | 1.2 [0.8, 1.6] | 2 (0.1) | 1.7 [1.2, 2.4] | 0.000 |
| Riboflavin (Vitamin B2) (mg) | 2.1 (0.1) | 1.8 [1.2, 2.6] | 1.7 (0.1) | 1.5 [1, 2.1] | 2.5 (0.1) | 2.2 [1.4, 3.1] | 0.000 |
| Niacin (mg) | 25.3 (0.7) | 21.3 [14, 30.8] | 19.5 (0.8) | 18.1 [11.8, 23.8] | 30.9 (1.2) | 26.4 [17.6, 38.1] | 0.000 |
| Vitamin B6 (mg) | 2 (0.1) | 1.6 [1, 2.5] | 1.5 (0.1) | 1.3 [0.9, 1.9] | 2.5 (0.1) | 2 [1.2, 3.1] | 0.000 |
| Total folate (mcg) | 389.5 (13.9) | 316 [201, 504] | 321 (13) | 275 [176, 430] | 455.2 (22.2) | 367 [242, 582] | 0.000 |
| Folic acid (mcg) | 217.8 (12.1) | 151 [78, 270] | 175.5 (10) | 127 [60, 232] | 258.3 (20.3) | 183 [93, 299] | 0.001 |
| Food folate (mcg) | 171.7 (4.9) | 145 [95, 219] | 145.5 (6.9) | 127 [77, 187] | 196.8 (5.6) | 162 [115, 250] | 0.000 |
| Folate, DFE (mcg) | 541.9 (22.1) | 423 [262, 683] | 443.8 (19.3) | 358 [229, 590] | 635.9 (36.1) | 500 [323, 780] | 0.000 |
| Vitamin B12 (mcg) | 5.2 (0.2) | 4 [2.3, 6.3] | 3.8 (0.1) | 3.2 [1.9, 5.1] | 6.5 (0.4) | 5 [2.8, 8.3] | 0.000 |
| Added vitamin B12 (mcg) | 1.5 (0.2) | 0 [0, 1.7] | 1 (0.1) | 0 [0, 1.4] | 2 (0.3) | 0 [0, 2.3] | 0.200 |
| Vitamin C (mg) | 70.6 (3.4) | 39.8 [14.2, 101.8] | 62.7 (4.2) | 32.2 [12.5, 91.7] | 78.2 (5.3) | 47.2 [16.7, 114.5] | 0.054 |
| Vitamin K (mcg) | 79.1 (6) | 50.7 [29, 91.2] | 77.5 (11.4) | 43.6 [22.7, 78.8] | 80.6 (4.7) | 58.5 [33.3, 97.9] | 0.007 |
| Calcium (mg) | 1021.7 (26.3) | 895 [561, 1323] | 832.5 (37.3) | 777 [476, 1094] | 1203 (35.5) | 1066 [680, 1546] | 0.000 |
| Phosphorus (mg) | 1352.4 (26.5) | 1230 [898, 1663] | 1082 (39.2) | 1051 [732, 1347] | 1611.6 (32.5) | 1418 [1067, 1965] | 0.000 |
| Magnesium (mg) | 252.1 (5.4) | 223 [158, 309] | 207.7 (6.9) | 191 [137, 268] | 294.8 (7.2) | 266 [187, 371] | 0.000 |
| Iron (mg) | 14.7 (0.4) | 12.4 [8.2, 18.3] | 11.6 (0.4) | 9.9 [6.8, 15] | 17.7 (0.8) | 15 [10.1, 21.1] | 0.000 |
| Zinc (mg) | 11.1 (0.4) | 9.1 [6.1, 13.6] | 8.2 (0.3) | 7.3 [5.1, 10.6] | 13.8 (0.7) | 11.3 [7.7, 16.2] | 0.000 |
| Copper (mg) | 1 (0) | 0.9 [0.6, 1.2] | 0.8 (0) | 0.7 [0.5, 1.1] | 1.1 (0) | 1 [0.7, 1.4] | 0.000 |
| Sodium (mg) | 3367.2 (66.9) | 2979 [2183, 4129] | 2788.2 (93.9) | 2690 [1865, 3458] | 3922.2 (106.7) | 3700 [2537, 5005] | 0.000 |
| Potassium (mg) | 2263.1 (47.3) | 2031 [1441, 2889] | 1847.8 (66.4) | 1742 [1191, 2380] | 2661.2 (48.4) | 2453 [1722, 3281] | 0.000 |
| Selenium (mcg) | 108.1 (2.3) | 97.3 [65, 135.8] | 85.8 (2.5) | 78.3 [54.1, 110] | 129.6 (4.2) | 117.4 [78.6, 157.7] | 0.000 |
| Caffeine (mg) | 46.7 (4.5) | 8 [0, 57] | 44.1 (7.8) | 8 [0, 47] | 49.1 (4.3) | 8 [0, 67] | 0.317 |
| Theobromine (mg) | 40.8 (3.9) | 2 [0, 51] | 33.9 (6) | 0 [0, 37] | 47.5 (3.8) | 8 [0, 65] | 0.011 |
| Alcohol (gm) | 0.9 (0.5) | 0 [0, 0] | 0.6 (0.3) | 0 [0, 0] | 1.3 (0.9) | 0 [0, 0] | 0.601 |
| Moisture (gm) | 2181.5 (46.7) | 1931.1 [1357.6, 2800.5] | 1963.1 (69.7) | 1740.1 [1266.6, 2369.6] | 2390.8 (59.8) | 2086.9 [1505.4, 3029.2] | 0.000 |
| SFA 4:0 (Butanoic) (gm) | 0.5 (0) | 0.4 [0.2, 0.7] | 0.4 (0) | 0.3 [0.1, 0.6] | 0.6 (0) | 0.5 [0.2, 0.8] | 0.001 |
| SFA 6:0 (Hexanoic) (gm) | 0.3 (0) | 0.2 [0.1, 0.4] | 0.3 (0) | 0.2 [0.1, 0.4] | 0.4 (0) | 0.3 [0.1, 0.5] | 0.002 |
| SFA 8:0 (Octanoic) (gm) | 0.3 (0) | 0.2 [0.1, 0.3] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.3 (0) | 0.2 [0.1, 0.4] | 0.004 |
| SFA 10:0 (Decanoic) (gm) | 0.5 (0) | 0.4 [0.2, 0.7] | 0.4 (0) | 0.3 [0.2, 0.6] | 0.6 (0) | 0.5 [0.3, 0.8] | 0.002 |
| SFA 12:0 (Dodecanoic) (gm) | 0.8 (0) | 0.5 [0.3, 1] | 0.7 (0) | 0.5 [0.2, 0.8] | 0.9 (0.1) | 0.6 [0.4, 1.1] | 0.008 |
| SFA 14:0 (Tetradecanoic) (gm) | 2.2 (0.1) | 1.8 [0.9, 3] | 1.8 (0.1) | 1.5 [0.7, 2.5] | 2.6 (0.1) | 2 [1.3, 3.6] | 0.000 |
| SFA 16:0 (Hexadecanoic) (gm) | 14 (0.3) | 12 [8.1, 17.3] | 11.3 (0.5) | 10 [6.5, 15] | 16.6 (0.4) | 14.2 [9.9, 21.2] | 0.000 |
| SFA 18:0 (Octadecanoic) (gm) | 6.1 (0.2) | 5.4 [3.5, 7.7] | 4.9 (0.2) | 4.4 [2.7, 6.3] | 7.3 (0.2) | 6.3 [4.2, 9.7] | 0.000 |
| MFA 16:1 (Hexadecenoic) (gm) | 1 (0) | 0.8 [0.5, 1.3] | 0.7 (0) | 0.6 [0.4, 1] | 1.2 (0.1) | 1 [0.6, 1.6] | 0.000 |
| MFA 18:1 (Octadecenoic) (gm) | 23.4 (0.7) | 19.6 [13.5, 28.8] | 19.2 (1) | 16.8 [11, 24.7] | 27.5 (0.9) | 22.8 [16.3, 34.8] | 0.000 |
| MFA 20:1 (Eicosenoic) (gm) | 0.3 (0) | 0.2 [0.1, 0.3] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.3 (0) | 0.3 [0.2, 0.4] | 0.000 |
| MFA 22:1 (Docosenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.158 |
| PFA 18:2 (Octadecadienoic) (gm) | 15.7 (0.6) | 13.2 [8.3, 20.3] | 13.6 (0.7) | 11.4 [6.9, 18.4] | 17.8 (0.7) | 15.1 [10.4, 21.9] | 0.000 |
| PFA 18:3 (Octadecatrienoic) (gm) | 1.5 (0.1) | 1.2 [0.7, 2] | 1.3 (0.1) | 1.1 [0.6, 1.7] | 1.7 (0.1) | 1.4 [0.9, 2.2] | 0.001 |
| PFA 18:4 (Octadecatetraenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.189 |
| PFA 20:4 (Eicosatetraenoic) (gm) | 0.1 (0) | 0.1 [0, 0.2] | 0.1 (0) | 0.1 [0, 0.1] | 0.2 (0) | 0.1 [0.1, 0.2] | 0.000 |
| PFA 20:5 (Eicosapentaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.077 |
| PFA 22:5 (Docosapentaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.002 |
| PFA 22:6 (Docosahexaenoic) (gm) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.004 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — mec weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Basophils number (1000 cells/uL) | 0 (0) | 0 [0, 0.1] | 0 (0) | 0 [0, 0.1] | 0 (0) | 0 [0, 0.1] | 0.242 |
| Eosinophils number (1000 cells/uL) | 0.2 (0) | 0.2 [0.1, 0.2] | 0.2 (0) | 0.1 [0.1, 0.2] | 0.2 (0) | 0.2 [0.1, 0.3] | 0.000 |
| Lymphocyte number (1000 cells/uL) | 2.3 (0) | 2.2 [1.9, 2.7] | 2.3 (0) | 2.2 [1.9, 2.7] | 2.3 (0) | 2.2 [1.8, 2.6] | 0.216 |
| Monocyte number (1000 cells/uL) | 0.6 (0) | 0.6 [0.5, 0.7] | 0.6 (0) | 0.5 [0.4, 0.7] | 0.6 (0) | 0.6 [0.5, 0.7] | 0.257 |
| Segmented neutrophils num (1000 cell/uL) | 3.9 (0.1) | 3.6 [2.8, 4.7] | 4.1 (0.1) | 3.8 [3, 5.2] | 3.8 (0.1) | 3.5 [2.7, 4.4] | 0.006 |
| Basophils percent (%) | 0.7 (0) | 0.6 [0.4, 0.8] | 0.6 (0) | 0.6 [0.4, 0.8] | 0.7 (0) | 0.6 [0.5, 0.8] | 0.618 |
| Eosinophils percent (%) | 3 (0.1) | 2.3 [1.5, 3.5] | 2.5 (0.1) | 2 [1.2, 3] | 3.4 (0.2) | 2.5 [1.7, 4.3] | 0.000 |
| Hematocrit (%) | 41.4 (0.2) | 41.2 [39, 43.8] | 39.4 (0.2) | 39.5 [38, 41.2] | 43.2 (0.2) | 43.4 [41.2, 45.3] | 0.000 |
| Hemoglobin (g/dL) | 14 (0.1) | 13.9 [13.1, 15] | 13.3 (0.1) | 13.3 [12.7, 13.9] | 14.7 (0.1) | 14.8 [13.9, 15.5] | 0.000 |
| Lymphocyte percent (%) | 33.9 (0.3) | 33.9 [28.3, 39.2] | 33.6 (0.4) | 33 [27.5, 39.2] | 34.2 (0.3) | 34.7 [28.6, 39.5] | 0.195 |
| Mean cell hemoglobin (pg) | 29.4 (0.1) | 29.7 [28.4, 30.6] | 29.2 (0.1) | 29.6 [28.3, 30.5] | 29.5 (0.1) | 29.7 [28.6, 30.7] | 0.278 |
| Mean cell volume (fL) | 86.6 (0.3) | 87.1 [84.1, 89.6] | 86.8 (0.3) | 87.3 [84.2, 90.3] | 86.5 (0.4) | 86.8 [84.1, 89.1] | 0.075 |
| Monocyte percent (%) | 8.4 (0.1) | 8.1 [6.8, 9.5] | 8.1 (0.2) | 7.9 [6.5, 9.1] | 8.6 (0.1) | 8.4 [7.1, 9.9] | 0.000 |
| Mean platelet volume (fL) | 8.4 (0.1) | 8.4 [7.8, 8.9] | 8.5 (0.1) | 8.5 [7.9, 9] | 8.3 (0) | 8.2 [7.8, 8.8] | 0.009 |
| Segmented neutrophils percent (%) | 54.1 (0.4) | 53.8 [47.6, 60.4] | 55.3 (0.6) | 55 [48.1, 62.2] | 53.1 (0.4) | 52.8 [47, 58.8] | 0.003 |
| Platelet count (1000 cells/uL) | 250.3 (1.3) | 246 [215, 282] | 258.5 (1.8) | 255 [226, 285] | 242.8 (2.3) | 242 [207, 273] | 0.001 |
| Red blood cell count (million cells/uL) | 4.8 (0) | 4.7 [4.5, 5.1] | 4.6 (0) | 4.6 [4.3, 4.7] | 5 (0) | 5 [4.7, 5.2] | 0.000 |
| Red cell distribution width (%) | 13.3 (0) | 13.1 [12.7, 13.7] | 13.3 (0.1) | 13.1 [12.6, 13.7] | 13.3 (0) | 13.2 [12.8, 13.7] | 0.010 |
| White blood cell count (1000 cells/uL) | 7.1 (0.1) | 6.9 [5.6, 8.1] | 7.3 (0.1) | 7.1 [5.9, 8.4] | 6.9 (0.1) | 6.6 [5.4, 7.9] | 0.022 |
| Albumin (g/L) | 44.8 (0.1) | 45 [43, 47] | 44.2 (0.1) | 44 [43, 46] | 45.4 (0.2) | 46 [44, 47] | 0.000 |
| Blood urea nitrogen (mmol/L) | 3.8 (0.1) | 3.6 [2.9, 4.6] | 3.7 (0.1) | 3.6 [2.9, 4.3] | 4 (0.1) | 3.9 [3.2, 4.6] | 0.001 |
| Total calcium (mmol/L) | 2.4 (0) | 2.4 [2.4, 2.5] | 2.4 (0) | 2.4 [2.4, 2.5] | 2.4 (0) | 2.4 [2.4, 2.5] | 0.002 |
| Cholesterol (mmol/L) | 4.1 (0) | 4 [3.5, 4.5] | 4.2 (0.1) | 4.1 [3.7, 4.6] | 3.9 (0) | 3.9 [3.4, 4.4] | 0.001 |
| Globulin (g/L) | 26.9 (0.3) | 27 [24, 29] | 27.6 (0.3) | 27 [25, 30] | 26.4 (0.3) | 26 [24, 28] | 0.000 |
| Glucose, refrigerated serum (mmol/L) | 5 (0) | 4.9 [4.7, 5.3] | 5 (0) | 4.9 [4.7, 5.2] | 5 (0) | 5 [4.7, 5.3] | 0.012 |
| Iron, refrigerated serum (umol/L) | 15 (0.2) | 14.1 [10.6, 19] | 14 (0.4) | 12.9 [9.5, 18.3] | 15.9 (0.4) | 15.2 [11.8, 19.3] | 0.006 |
| Phosphorus (mmol/L) | 1.4 (0) | 1.4 [1.3, 1.6] | 1.4 (0) | 1.4 [1.3, 1.5] | 1.5 (0) | 1.5 [1.3, 1.6] | 0.000 |
| Total bilirubin (umol/L) | 11.1 (0.2) | 10.3 [6.8, 13.7] | 10.2 (0.3) | 8.6 [6.8, 12] | 12 (0.4) | 10.3 [8.6, 13.7] | 0.002 |
| Total protein (g/L) | 71.7 (0.3) | 72 [69, 74] | 71.8 (0.3) | 72 [69, 75] | 71.7 (0.3) | 72 [69, 74] | 0.886 |
| Triglycerides, refrigerated (mmol/L) | 1.1 (0) | 0.9 [0.6, 1.3] | 1.1 (0.1) | 0.8 [0.6, 1.2] | 1.2 (0.1) | 0.9 [0.6, 1.4] | 0.007 |
| Uric acid (umol/L) | 301.5 (3.3) | 297.4 [243.9, 350.9] | 269.6 (5.5) | 267.7 [226, 309.3] | 331.2 (4.2) | 327.1 [285.5, 374.7] | 0.000 |
| Alkaline phosphatase (IU/L) | 138.3 (3.5) | 100 [70, 188] | 97.7 (2.9) | 79 [59, 112] | 176 (4.8) | 148 [92, 239] | 0.000 |
| Aspartate aminotransferase AST (U/L) | 23.3 (0.3) | 22 [19, 26] | 21.7 (0.5) | 20 [18, 23] | 24.8 (0.3) | 24 [21, 27] | 0.000 |
| Alanine aminotransferase ALT (U/L) | 19.6 (0.4) | 16 [14, 22] | 17.3 (0.6) | 15 [13, 18] | 21.7 (0.6) | 19 [15, 24] | 0.000 |
| Bicarbonate (mmol/L) | 24.5 (0.2) | 25 [23, 26] | 23.8 (0.2) | 24 [23, 25] | 25.2 (0.2) | 25 [24, 26] | 0.000 |
| Chloride (mmol/L) | 104.8 (0.2) | 105 [103, 106] | 105.5 (0.2) | 105 [104, 107] | 104.2 (0.2) | 104 [103, 105] | 0.000 |
| Creatinine (umol/L) | 64.2 (0.7) | 62.8 [53.9, 72.5] | 59.6 (0.9) | 59.2 [51.3, 66.3] | 68.5 (1) | 68.1 [58.3, 78.7] | 0.000 |
| Gamma glutamyl transferase (U/L) | 14 (0.3) | 12 [10, 16] | 12.7 (0.4) | 11 [9, 14] | 15.3 (0.4) | 13 [11, 17] | 0.000 |
| Potassium (mmol/L) | 4.1 (0) | 4 [3.8, 4.3] | 4 (0) | 4 [3.8, 4.2] | 4.1 (0) | 4.1 [3.9, 4.3] | 0.004 |
| Lactate dehydrogenase (U/L) | 129.2 (1.5) | 126 [110, 143] | 123 (1.7) | 122 [106, 134] | 134.9 (1.6) | 132 [116, 153] | 0.000 |
| Sodium (mmol/L) | 139.9 (0.1) | 140 [139, 141] | 139.8 (0.1) | 140 [139, 141] | 140.1 (0.1) | 140 [139, 141] | 0.044 |
| Osmolality (mmol/Kg) | 278.1 (0.2) | 278 [276, 280] | 277.7 (0.3) | 277 [275, 280] | 278.5 (0.2) | 279 [276, 281] | 0.002 |
| Albumin, urine (mg/L) | 34.3 (3.6) | 9.9 [5.3, 21] | 36.5 (4.3) | 13.5 [5.8, 27.2] | 32.3 (6.5) | 8.6 [4.9, 15.4] | 0.000 |
| Cotinine, Serum (ng/mL) | 11.2 (2.2) | 0 [0, 0.2] | 7.8 (3.1) | 0 [0, 0.1] | 14.4 (3.6) | 0 [0, 0.5] | 0.075 |
| Glycohemoglobin (%) | 5.2 (0) | 5.2 [5, 5.4] | 5.2 (0) | 5.2 [5, 5.4] | 5.2 (0) | 5.2 [5, 5.4] | 0.251 |
| BMI CDC normalization | 0.7 (0.1) | 0.7 [0, 1.6] | 0.7 (0.1) | 0.7 [0, 1.6] | 0.7 (0.1) | 0.7 [-0.1, 1.6] | 0.923 |
| BMI CDC normalization percentage | 0.7 (0) | 0.8 [0.5, 0.9] | 0.7 (0) | 0.8 [0.5, 0.9] | 0.7 (0) | 0.8 [0.5, 0.9] | 0.909 |

Physical activity and BMI (cat.): Weighted statistics (percentage [95% CI])).

| summary | values | Overall | Female | Male | p\_val |
| --- | --- | --- | --- | --- | --- |
| Physical activity | No | 39 [34.8%, 43.2%] | 48.5 [42.5%, 54.6%] | 30.1 [26.5%, 33.8%] | 0.000 |
| Physical activity | Yes | 61 [56.8%, 65.2%] | 51.5 [45.4%, 57.5%] | 69.9 [66.2%, 73.5%] |  |
| BMI categories | Underweight | 2.4 [1.1%, 3.8%] | 1.8 [0.7%, 3%] | 3 [0.9%, 5.1%] | 0.634 |
| BMI categories | Healthy Weight | 58.5 [53.8%, 63.2%] | 59.4 [51.3%, 67.4%] | 57.7 [52.9%, 62.5%] |  |
| BMI categories | Overweight | 18.5 [15.5%, 21.5%] | 17.6 [13.8%, 21.4%] | 19.3 [14.9%, 23.7%] |  |
| BMI categories | Obese | 20.6 [16.2%, 24.9%] | 21.2 [14.3%, 28%] | 20 [15%, 25.1%] |  |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample A weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Urinary arsenic, total (ug/L) | 13.9 (3) | 5.1 [3, 9] | 10.3 (1.7) | 4.9 [3, 8] | 17.3 (5.5) | 5.5 [3.1, 9.4] | 0.384 |
| Mercury, urine (ug/L) | 0.3 (0) | 0.1 [0.1, 0.2] | 0.3 (0.1) | 0.1 [0.1, 0.2] | 0.3 (0) | 0.1 [0.1, 0.2] | 0.905 |
| 1-Hydroxynaphthalene (ng/L) | 2552.4 (406.1) | 866 [451, 1673] | 2720.7 (786.3) | 866 [449, 1472] | 2396.4 (427) | 859 [487, 1971] | 0.624 |
| 2-Hydroxynaphthalene (ng/L) | 8110.1 (639.3) | 5014 [2248, 10090] | 9660.2 (975.3) | 6553 [2691, 13570] | 6672.5 (631) | 3933 [2069, 8398] | 0.022 |
| 3-Hydroxyfluorene (ng/L) | 142.2 (19.2) | 76 [39, 150] | 137.5 (29.6) | 76 [36, 128] | 146.5 (22.6) | 76 [40, 166] | 0.803 |
| 2-Hydroxyfluorene (ng/L) | 284.4 (34.1) | 171 [81, 318] | 299 (56.5) | 177 [79, 335] | 270.7 (32.9) | 166 [84, 318] | 0.734 |
| 1-Hydroxyphenanthrene (ng/L) | 134.5 (8.4) | 96 [48, 176] | 141.3 (13.8) | 105 [48, 192] | 128.3 (11.5) | 84 [47, 154] | 0.361 |
| 1-Hydroxypyrene (ng/L) | 229.8 (18.1) | 164 [84, 275] | 222.6 (21.9) | 182 [87, 289] | 236.6 (28.7) | 142 [83, 272] | 0.290 |
| Iodine, urine (ug/L) | 193.1 (14.2) | 136 [70.4, 249.3] | 155.9 (14.1) | 129.6 [70.3, 190.9] | 227.6 (23) | 151.3 [79.4, 305.9] | 0.081 |
| Urinary perchlorate (ng/mL) | 5.4 (0.8) | 2.9 [1.4, 5] | 4.8 (0.7) | 3.2 [1.5, 5] | 6 (1.4) | 2.9 [1.3, 5] | 0.707 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample B weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

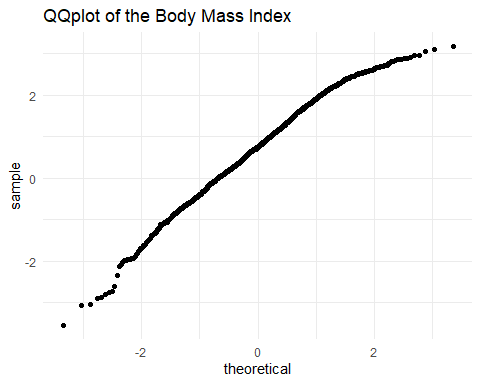
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Perfluorohexane sulfonic acid (ug/L) | 2 (0.3) | 1.1 [0.7, 2.1] | 1.4 (0.2) | 0.9 [0.7, 1.8] | 2.5 (0.5) | 1.3 [0.8, 2.4] | 0.011 |
| Perfluorobutane sulfonic acid (ug/L) | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.335 |
| Perfluorodecanoic acid (ug/L) | 0.2 (0) | 0.1 [0.1, 0.2] | 0.2 (0) | 0.1 [0.1, 0.2] | 0.2 (0) | 0.1 [0.1, 0.2] | 0.406 |
| Perfluoroheptanoic acid (ug/L) | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.060 |
| Perfluorononanoic acid (ug/L) | 0.8 (0.1) | 0.6 [0.4, 0.9] | 0.7 (0.1) | 0.5 [0.4, 0.9] | 0.8 (0.1) | 0.6 [0.4, 0.9] | 0.052 |
| Perfluoroundecanoic acid (ug/L) | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.404 |
| Perfluorododecanoic acid (ug/L) | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.1 (0) | 0.1 [0.1, 0.1] | 0.147 |
| Urinary Benzophenone-3 (ng/mL) | 153.5 (32.5) | 26.1 [8.7, 90.3] | 184.6 (52.5) | 42.3 [13.7, 143] | 124.5 (46.3) | 17.1 [6.7, 47.1] | 0.005 |
| MECP phthalate (ng/mL) | 30.8 (8) | 13.8 [8, 24.5] | 43 (15.7) | 13.6 [6.2, 26.6] | 19.4 (1.9) | 13.8 [8.6, 23] | 0.682 |
| Mono-n-butyl phthalate (ng/mL) | 19.5 (1.3) | 13.9 [6.2, 24.5] | 19.5 (2.4) | 13.6 [5.6, 26] | 19.5 (1.6) | 15.5 [7.5, 24.4] | 0.454 |
| Mono-(3-carboxypropyl) phthalate (ng/mL) | 6.9 (1.5) | 2.3 [1.1, 5.1] | 6.8 (2.1) | 2.1 [0.9, 6] | 7 (1.6) | 2.3 [1.3, 4.8] | 0.390 |
| Mono-ethyl phthalate (ng/mL) | 82.6 (9.1) | 30.8 [12.8, 77.7] | 77.5 (9.5) | 31 [11.4, 77.7] | 87.4 (13.9) | 28.8 [13.7, 73.4] | 0.818 |
| MEHP phthalate (ng/mL) | 20.1 (5.2) | 7.3 [3.8, 15.4] | 29.4 (10.2) | 8 [2.7, 16.1] | 11.5 (1.1) | 7.3 [5.3, 14.8] | 0.390 |
| Mono-(2-ethyl)-hexyl phthalate (ng/mL) | 3.3 (0.9) | 1.2 [0.6, 2.6] | 4.8 (1.8) | 1.2 [0.6, 3.2] | 1.9 (0.2) | 1.2 [0.6, 2.2] | 0.858 |
| Mono-isobutyl phthalate (ng/mL) | 17.1 (1.5) | 10.3 [4.7, 19.7] | 19.4 (2.6) | 10.2 [4, 21.6] | 15 (1.4) | 11 [5.4, 19.1] | 0.825 |
| Mono-isononyl phthalate (ng/mL) | 4.3 (0.9) | 0.6 [0.6, 2.8] | 4.3 (1.2) | 0.6 [0.6, 2.6] | 4.4 (1.1) | 0.6 [0.6, 3] | 0.976 |
| Mono-benzyl phthalate (ng/mL) | 12.4 (1.1) | 7.5 [3, 14.6] | 11.3 (1.8) | 6 [2.2, 14.2] | 13.5 (1.1) | 8.3 [4, 15.4] | 0.096 |

## Weighted analysis: Laboratory Categorical and Continuous Variables — subsample B weights

Laboratory characteristics of study participants overall and by sex: Weighted statistics (mean (SD) and median [IQR])).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| summary | Overall | Female | Male | p\_val |
| Blood cadmium (umol/L) | 1.6 (0.2) | 1.1 [0.6, 1.6] | 1.5 (0.1) | 1.2 [0.6, 1.6] | 1.7 (0.3) | 1.1 [0.6, 1.5] | 0.475 |
| Blood lead (umol/L) | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0 (0) | 0 [0, 0] | 0.000 |
| Blood mercury, total (umol/L) | 2.9 (0.2) | 1.7 [1, 3.1] | 2.5 (0.2) | 1.5 [1, 2.7] | 3.2 (0.3) | 1.9 [1, 3.3] | 0.020 |

## QQ-plots



# Session Information

sessionInfo()

## R version 4.1.2 (2021-11-01)  
## Platform: x86\_64-w64-mingw32/x64 (64-bit)  
## Running under: Windows 10 x64 (build 19043)  
##   
## Matrix products: default  
##   
## locale:  
## [1] LC\_COLLATE=English\_United Kingdom.1252   
## [2] LC\_CTYPE=English\_United Kingdom.1252   
## [3] LC\_MONETARY=English\_United Kingdom.1252  
## [4] LC\_NUMERIC=C   
## [5] LC\_TIME=English\_United Kingdom.1252   
##   
## attached base packages:  
## [1] grid stats graphics grDevices utils datasets   
## [7] methods base   
##   
## other attached packages:  
## [1] report\_0.5.1 knitr\_1.37 broom\_0.7.12   
## [4] tableone\_0.13.0 survey\_4.1-1 Matrix\_1.4-0   
## [7] childsds\_0.8.0 srvyr\_1.1.1 flextable\_0.7.0   
## [10] DT\_0.21 Hmisc\_4.7-0 Formula\_1.2-4   
## [13] survival\_3.3-1 lattice\_0.20-45 data.table\_1.14.2  
## [16] tictoc\_1.0.1 XML\_3.99-0.9 janitor\_2.1.0   
## [19] forcats\_0.5.1 stringr\_1.4.0 dplyr\_1.0.8   
## [22] purrr\_0.3.4 readr\_2.1.2 tidyr\_1.2.0   
## [25] tibble\_3.1.6 ggplot2\_3.3.5 tidyverse\_1.3.1   
## [28] haven\_2.4.3   
##   
## loaded via a namespace (and not attached):  
## [1] readxl\_1.3.1 uuid\_1.0-3 backports\_1.4.1   
## [4] systemfonts\_1.0.4 plyr\_1.8.6 splines\_4.1.2   
## [7] TH.data\_1.1-0 digest\_0.6.29 htmltools\_0.5.2   
## [10] fansi\_1.0.2 magrittr\_2.0.2 checkmate\_2.0.0   
## [13] cluster\_2.1.2 tzdb\_0.2.0 ggfittext\_0.9.1   
## [16] modelr\_0.1.8 xslt\_1.4.3 officer\_0.4.2   
## [19] sandwich\_3.0-1 prettyunits\_1.1.1 jpeg\_0.1-9   
## [22] colorspace\_2.0-3 rvest\_1.0.2 mitools\_2.4   
## [25] xfun\_0.30 crayon\_1.5.0 jsonlite\_1.8.0   
## [28] lme4\_1.1-28 zoo\_1.8-9 glue\_1.6.2   
## [31] gtable\_0.3.0 emmeans\_1.7.2 sjstats\_0.18.1   
## [34] sjmisc\_2.8.9 scales\_1.1.1 mvtnorm\_1.1-3   
## [37] DBI\_1.1.2 ggeffects\_1.1.1 Rcpp\_1.0.8.2   
## [40] xtable\_1.8-4 progress\_1.2.2 performance\_0.8.0   
## [43] htmlTable\_2.4.0 foreign\_0.8-82 proxy\_0.4-26   
## [46] datawizard\_0.3.0 htmlwidgets\_1.5.4 httr\_1.4.2   
## [49] RColorBrewer\_1.1-2 ellipsis\_0.3.2 pkgconfig\_2.0.3   
## [52] farver\_2.1.0 nnet\_7.3-17 dbplyr\_2.1.1   
## [55] utf8\_1.2.2 tidyselect\_1.1.2 labeling\_0.4.2   
## [58] rlang\_1.0.2 effectsize\_0.6.0.1 munsell\_0.5.0   
## [61] cellranger\_1.1.0 tools\_4.1.2 cli\_3.2.0   
## [64] generics\_0.1.2 sjlabelled\_1.1.8 evaluate\_0.15   
## [67] fastmap\_1.1.0 yaml\_2.3.5 fs\_1.5.2   
## [70] zip\_2.2.0 nlme\_3.1-155 equatags\_0.1.1   
## [73] xml2\_1.3.3 compiler\_4.1.2 rstudioapi\_0.13   
## [76] png\_0.1-7 e1071\_1.7-9 reprex\_2.0.1   
## [79] stringi\_1.7.6 highr\_0.9 parameters\_0.17.0   
## [82] gdtools\_0.2.4 nloptr\_2.0.0 vctrs\_0.3.8   
## [85] pillar\_1.7.0 lifecycle\_1.0.1 locatexec\_0.1.1   
## [88] inspectdf\_0.0.11 estimability\_1.3 insight\_0.16.0   
## [91] R6\_2.5.1 latticeExtra\_0.6-29 gridExtra\_2.3   
## [94] codetools\_0.2-18 boot\_1.3-28 MASS\_7.3-55   
## [97] assertthat\_0.2.1 withr\_2.5.0 multcomp\_1.4-18   
## [100] bayestestR\_0.11.5 hms\_1.1.1 rpart\_4.1.16   
## [103] sjPlot\_2.8.10 coda\_0.19-4 class\_7.3-20   
## [106] minqa\_1.2.4 rmarkdown\_2.13 snakecase\_0.11.0   
## [109] gamlss.dist\_6.0-3 lubridate\_1.8.0 base64enc\_0.1-3

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