placeholder

Byron C. Jaeger, PhD,1

1Department of Biostatistics and Data Science, Wake Forest School of Medicine, Winston-Salem, NC.

Table: Exclusions

| **Inclusion criteria** | **Total** | **2013-2014** | **2015-2016** | **2017-2020** |
| --- | --- | --- | --- | --- |
| NHANES participants from 2013-2020 | 35,706 | 10,175 | 9,971 | 15,560 |
| Completed the interview and examination | 33,657 | 9,813 | 9,544 | 14,300 |
| Age 30-79 years | 15,235 | 4,337 | 4,200 | 6,698 |
| No history of CVD | 13,582 | 3,922 | 3,756 | 5,904 |
| Have information on SBP, DBP and self-reported antihypertensive medication use | 12,743 | 3,785 | 3,639 | 5,319 |
| Have information on other variables in the PCEs and PREVENT equations | 11,948 | 3,581 | 3,423 | 4,944 |

Table 1. Characteristics of US adults by blood pressure levels and antihypertensive medication use based on the 2013-2020 National Health and Nutrition Examination Survey.

|  | **SBP/DBP categories in mm Hg among US adults not taking antihypertensive medication** | | | |  |
| --- | --- | --- | --- | --- | --- |
| **Characteristic†** | **<120/80 (n = 56.0M)** | **120-129/<80 (n = 19.7M)** | **130-139/80-89 (n = 22.3M)** | **≥140/90 (n = 14.7M)** | **Taking antihypertensive medication (n = 36.6M)** |
| % (95% CI) of US population | 37.5 (36.1, 38.9) | 13.2 (12.2, 14.3) | 14.9 (13.9, 16.0) | 9.87 (8.95, 10.9) | 24.5 (23.2, 25.8) |
| Age, years | 44.9 (44.3, 45.6) | 50.1 (49.3, 51.0) | 49.6 (48.8, 50.4) | 54.3 (53.5, 55.1) | 59.0 (58.5, 59.6) |
| Men | 40.6 | 57.9 | 54.4 | 58.1 | 44.9 |
| Race/ethnicity, % | | | | | |
| Non-Hispanic White | 66.3 | 66.0 | 65.9 | 62.1 | 67.6 |
| Non-Hispanic Black | 7.14 | 8.47 | 10.2 | 13.6 | 14.3 |
| Non-Hispanic Asian | 6.63 | 4.75 | 5.83 | 5.62 | 4.68 |
| Hispanic | 16.3 | 17.9 | 15.2 | 14.9 | 10.6 |
| Other | 3.68 | 2.88 | 2.81 | 3.81 | 2.86 |
| Cigarette smoking, % | 17.2 | 18.7 | 17.4 | 20.2 | 16.8 |
| Total cholesterol, mg/dL | 193 (191, 195) | 199 (196, 201) | 203 (199, 207) | 208 (204, 211) | 192 (190, 195) |
| HDL cholesterol, mg/dL | 56.4 (55.5, 57.4) | 54.1 (52.9, 55.3) | 53.6 (52.5, 54.6) | 54.9 (53.1, 56.7) | 53.0 (52.2, 53.8) |
| Non-HDL cholesterol, mg/dL | 137 (135, 138) | 145 (142, 147) | 149 (146, 153) | 153 (150, 156) | 139 (137, 142) |
| Statin use, % | 7.91 | 12.2 | 9.82 | 11.6 | 39.9 |
| HbA1c, % | 5.44 (5.41, 5.47) | 5.65 (5.58, 5.72) | 5.71 (5.64, 5.77) | 5.80 (5.71, 5.89) | 6.04 (6.00, 6.08) |
| Diabetes, % | 4.66 | 8.59 | 8.51 | 11.9 | 26.1 |
| eGFR, ml/min/1.73 m2 | 99.3 (98.3, 100) | 95.4 (94.2, 96.5) | 96.2 (94.9, 97.4) | 93.1 (91.8, 94.5) | 85.9 (85.0, 86.7) |
| eGFR < 60 ml/min/1.73 m2, % | 1.27 | 2.05 | 1.68 | 4.31 | 10.7 |
| Albumin-to-creatinine ratio, mg/g | 13.4 (11.3, 15.5) | 16.1 (10.7, 21.6) | 21.9 (16.2, 27.5) | 50.0 (36.5, 63.5) | 58.1 (42.7, 73.5) |
| Albumin-to-creatinine ratio > 30 mg/g | 5.10 | 4.92 | 8.11 | 15.4 | 14.7 |
| Systolic blood pressure, mm Hg | 110 (109, 110) | 124 (124, 125) | 129 (129, 130) | 149 (148, 150) | 131 (130, 132) |
| Diastolic blood pressure, mm Hg | 67.1 (66.8, 67.5) | 71.1 (70.6, 71.5) | 79.3 (78.8, 79.9) | 84.2 (83.1, 85.2) | 73.0 (72.4, 73.6) |
| †Population characteristics in the table are percentage or mean (95% confidence interval). US adults were grouped into the higher category of systolic and diastolic blood pressure. For example, if a person had systolic blood pressure of 146 mm Hg and diastolic blood pressure of 82 mm Hg, they were grouped into the ≥140/90 mm Hg category. | | | | | |
| SBP – systolic blood pressure; DBP – diastolic blood pressure; eGFR - estimated glomerular filtration rate. | | | | | |

Table 2. Ten-year predicted cardiovascular disease risk by blood pressure levels and antihypertensive medication use based on the 2013-2020 National Health and Nutrition Examination Survey.

|  | **SBP/DBP categories in mm Hg among US adults not taking antihypertensive medication** | | | | **Taking antihypertensive medication** |
| --- | --- | --- | --- | --- | --- |
| **Mean (95% CI) 10-year predicted risk** | **<120/80** | **120-129/<80** | **130-139/80-89** | **≥140/90** |
| ASCVD | | | | | |
| Pooled cohort equations | 2.56 (2.35, 2.78) | 5.53 (5.01, 6.04) | 5.48 (5.05, 5.90) | 10.3 (9.53, 11.1) | 13.5 (12.9, 14.0) |
| PREVENT base equation | 1.49 (1.39, 1.59) | 2.93 (2.70, 3.15) | 2.92 (2.74, 3.10) | 5.34 (5.02, 5.66) | 6.61 (6.38, 6.83) |
| PREVENT full equation | 1.49 (1.39, 1.59) | 2.93 (2.71, 3.16) | 3.01 (2.81, 3.22) | 5.58 (5.18, 5.98) | 6.66 (6.42, 6.91) |
| Total CVD | | | | | |
| PREVENT base equation | 2.37 (2.20, 2.54) | 4.53 (4.19, 4.88) | 4.48 (4.18, 4.79) | 8.34 (7.84, 8.85) | 11.4 (11.0, 11.8) |
| PREVENT full equation | 2.36 (2.20, 2.52) | 4.50 (4.16, 4.85) | 4.62 (4.27, 4.97) | 8.66 (8.01, 9.30) | 11.5 (11.1, 12.0) |

Table 3. Distribution of 10-year predicted risk by blood pressure levels and antihypertensive medication use based on the 2013-2020 National Health and Nutrition Examination Survey.

|  | **SBP/DBP categories in mm Hg among US adults not taking antihypertensive medication** | | | | **Taking antihypertensive medication** |
| --- | --- | --- | --- | --- | --- |
| **10-year risk categories, %** | **<120/80** | **120-129/<80** | **130-139/80-89** | **≥140/90** |
| Pooled cohort equations - ASCVD | | | | | |
| <5% | 85.0 | 64.6 | 64.6 | 37.5 | 27.7 |
| 5% to <10% | 9.66 | 18.6 | 19.1 | 24.7 | 23.0 |
| 10% to <15% | 3.18 | 6.78 | 8.19 | 13.7 | 15.6 |
| ≥ 15% | 2.13 | 9.96 | 8.07 | 24.2 | 33.7 |
| PREVENT base equation - ASCVD | | | | | |
| <5% | 94.7 | 82.2 | 83.6 | 58.3 | 45.6 |
| 5% to <10% | 4.38 | 14.7 | 12.8 | 28.2 | 34.0 |
| 10% to <15% | 0.86 | 2.53 | 3.21 | 10.2 | 14.5 |
| ≥ 15% | 0.05 | 0.60 | 0.38 | 3.33 | 5.96 |
| PREVENT full equation - ASCVD | | | | | |
| <5% | 94.7 | 82.0 | 83.1 | 57.9 | 46.7 |
| 5% to <10% | 4.32 | 14.0 | 13.4 | 28.4 | 32.2 |
| 10% to <15% | 0.94 | 3.30 | 2.42 | 8.79 | 14.5 |
| ≥ 15% | 0.06 | 0.73 | 1.12 | 4.98 | 6.64 |
| PREVENT base equation - Total CVD | | | | | |
| <5% | 87.3 | 68.5 | 69.4 | 38.8 | 24.4 |
| 5% to <10% | 9.07 | 18.5 | 20.3 | 30.2 | 27.4 |
| 10% to <15% | 1.99 | 8.85 | 6.76 | 15.0 | 20.1 |
| ≥ 15% | 1.68 | 4.12 | 3.53 | 16.0 | 28.1 |
| PREVENT full equation - Total CVD | | | | | |
| <5% | 87.4 | 70.9 | 70.9 | 40.3 | 25.8 |
| 5% to <10% | 8.78 | 16.4 | 18.1 | 29.6 | 27.8 |
| 10% to <15% | 2.21 | 7.46 | 6.59 | 14.4 | 17.9 |
| ≥ 15% | 1.64 | 5.18 | 4.42 | 15.6 | 28.5 |

Table 4. Cross-categorization of 10-year predicted risk by the PREVENT and pooled cohort equations based on the 2013-2020 National Health and Nutrition Examination Survey.

|  | | **SBP/DBP categories in mm Hg among US adults not taking antihypertensive medication** | | | | **Taking antihypertensive medication** |
| --- | --- | --- | --- | --- | --- | --- |
| **PREVENT** | **PCE** | **<120/80** | **120-129/<80** | **130-139/80-89** | **≥140/90** |
| PREVENT base equation - Total CVD | | | | | | |
| < 10% | < 10% | 94.5 | 82.8 | 83.1 | 60.4 | 45.5 |
| ≥ 10% | < 10% | 0.22 | 0.45 | 0.63 | 1.72 | 5.18 |
| < 10% | ≥ 10% | 1.86 | 4.23 | 6.60 | 8.58 | 6.30 |
| ≥ 10% | ≥ 10% | 3.45 | 12.5 | 9.66 | 29.3 | 43.0 |
| PREVENT full equation - ASCVD | | | | | | |
| < 10% | < 10% | 94.7 | 83.2 | 83.7 | 61.8 | 50.4 |
| ≥ 10% | < 10% | 0.02 | 0.04 | 0.00 | 0.37 | 0.25 |
| < 10% | ≥ 10% | 4.42 | 13.7 | 12.7 | 24.7 | 29.1 |
| ≥ 10% | ≥ 10% | 0.90 | 3.09 | 3.60 | 13.1 | 20.2 |
| PREVENT base equation - Total CVD | | | | | | |
| < 15% | < 10% | 94.6 | 83.2 | 83.7 | 61.8 | 49.9 |
| ≥ 15% | < 10% | 0.04 | 0.04 | 0.00 | 0.37 | 0.81 |
| < 15% | ≥ 10% | 3.67 | 12.7 | 12.7 | 22.2 | 22.1 |
| ≥ 15% | ≥ 10% | 1.64 | 4.07 | 3.53 | 15.6 | 27.2 |

Table 5: Characteristics of US adults with SBP of 130-139 mm Hg or DBP of 80-89 mm Hg by predicted risk use based on the 2013-2020 National Health and Nutrition Examination Survey

|  | | | **Prevalence ratio (95% CI)** | |
| --- | --- | --- | --- | --- |
| **level** | **PCE ≥ 10% Prevent <15%** | **PCE ≥ 10% Prevent ≥15%** | **Unadjusted** | **Adjusted** |
| Age, years | 61.7 (60.4, 63.0) | 73.1 (71.8, 74.5) | 1.18 (1.13 1.24) | 1.21 (1.15 1.27) |
| Men | 75.0 | 74.2 | 0.97 (0.54 1.74) | 1.94 (1.12 3.35) |
| Race/ethnicity, % | | | | |
| Non-Hispanic White | 71.2 | 64.7 | 1 (ref) | 1 (ref) |
| Non-Hispanic Black | 9.99 | 10.2 | 1.10 (0.52 2.30) | 1.60 (0.89 2.89) |
| Non-Hispanic Asian | 5.20 | 4.44 | 0.95 (0.39 2.34) | 1.52 (0.83 2.77) |
| Hispanic | 12.9 | 13.7 | 1.13 (0.62 2.06) | 1.98 (1.23 3.18) |
| Other | 0.70 | 6.95 | 3.64 (1.93 6.87) | 2.14 (1.38 3.34) |
| Cigarette smoking, % | 28.4 | 21.4 | 0.74 (0.44 1.23) | 3.20 (1.93 5.30) |
| Total cholesterol, mg/dL | 219 (204, 234) | 196 (188, 204) | 0.99 (0.99 1.00) | 1.00 (0.99 1.00) |
| HDL cholesterol, mg/dL | 50.5 (48.3, 52.7) | 51.0 (47.3, 54.8) | 1.00 (0.99 1.02) | 0.97 (0.95 0.98) |
| Non-HDL cholesterol, mg/dL | 168 (153, 184) | 145 (135, 155) | 0.99 (0.99 1.00) | 1.00 (0.99 1.01) |
| Statin use, % | 16.1 | 15.8 | 0.98 (0.53 1.84) | 0.68 (0.42 1.10) |
| HbA1c, % | 6.08 (5.81, 6.35) | 6.43 (6.03, 6.83) | 1.09 (0.98 1.21) | 1.34 (1.22 1.47) |
| Diabetes, % | 18.4 | 38.9 | 2.15 (1.18 3.92) | 2.48 (1.74 3.54) |
| eGFR, ml/min/1.73 m2 | 87.6 (84.9, 90.3) | 78.6 (75.2, 82.0) | 0.97 (0.96 0.98) | 0.99 (0.98 1.01) |
| eGFR < 60 ml/min/1.73 m2, % | 1.31 | 11.1 | 3.51 (2.23 5.51) | 1.79 (1.24 2.59) |
| Albumin-to-creatinine ratio, log mg/g | 2.28 (2.02, 2.54) | 2.56 (2.27, 2.85) | 1.17 (0.94 1.45) | 1.17 (0.97 1.40) |
| Albumin-to-creatinine ratio > 30 mg/g | 11.3 | 11.9 | 1.05 (0.48 2.31) | 1.10 (0.69 1.75) |
| Systolic blood pressure, mm Hg | 132 (131, 133) | 134 (133, 135) | 1.08 (1.02 1.14) | 1.03 (0.98 1.08) |
| Diastolic blood pressure, mm Hg | 75.4 (73.9, 77.0) | 70.7 (67.7, 73.8) | 0.97 (0.95 0.99) | 1.01 (0.99 1.03) |

Table 6: Characteristics of US adults by BP category and predicted risk use based on the 2013-2020 National Health and Nutrition Examination Survey.

|  | **<120/80** | | **120-129/<80** | | **130-139/80-89** | | **≥140/90** | | **Taking antihypertensive medication** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **level†** | **PCE ≥ 10% PREVENT < 15%** | **PCE ≥ 10% PREVENT ≥ 15%** | **PCE ≥ 10% PREVENT < 15%** | **PCE ≥ 10% PREVENT ≥ 15%** | **PCE ≥ 10% PREVENT < 15%** | **PCE ≥ 10% PREVENT ≥ 15%** | **PCE ≥ 10% PREVENT < 15%** | **PCE ≥ 10% PREVENT ≥ 15%** | **PCE ≥ 10% PREVENT < 15%** | **PCE ≥ 10% PREVENT ≥ 15%** |
| Age, years | 63.6 (60.7, 66.4) | 73.1 (72.0, 74.2) | 65.1 (63.7, 66.4) | 71.8 (70.0, 73.5) | 61.7 (60.4, 63.0) | 73.1 (71.8, 74.5) | 61.3 (60.1, 62.4) | 68.9 (67.6, 70.1) | 61.6 (60.6, 62.6) | 69.7 (69.1, 70.3) |
| Men | 78.4 | 81.3 | 76.0 | 74.5 | 75.0 | 74.2 | 69.7 | 56.7 | 59.6 | 50.7 |
| Race/ethnicity, % | | | | | | | | | | |
| Non-Hispanic White | 74.9 | 83.7 | 73.7 | 78.0 | 71.2 | 64.7 | 61.6 | 64.0 | 66.4 | 67.1 |
| Non-Hispanic Black | 3.41 | 2.02 | 6.70 | 3.69 | 9.99 | 10.2 | 17.3 | 10.9 | 20.7 | 14.7 |
| Non-Hispanic Asian | 5.42 | 4.84 | 4.88 | 1.83 | 5.20 | 4.44 | 4.49 | 7.71 | 4.58 | 4.38 |
| Hispanic | 12.4 | 7.28 | 9.70 | 11.6 | 12.9 | 13.7 | 13.3 | 12.4 | 7.44 | 10.8 |
| Other | 3.92 | 2.13 | 5.01 | 4.92 | 0.70 | 6.95 | 3.29 | 4.91 | 0.95 | 2.98 |
| Cigarette smoking, % | 33.9 | 28.0 | 27.8 | 24.6 | 28.4 | 21.4 | 26.9 | 25.9 | 20.6 | 18.5 |
| Total cholesterol, mg/dL | 204 (194, 214) | 175 (164, 186) | 208 (200, 215) | 202 (183, 220) | 219 (204, 234) | 196 (188, 204) | 217 (209, 224) | 197 (189, 206) | 199 (194, 204) | 185 (181, 190) |
| HDL cholesterol, mg/dL | 50.5 (45.2, 55.8) | 47.4 (42.8, 52.0) | 51.6 (47.3, 56.0) | 45.9 (42.5, 49.3) | 50.5 (48.3, 52.7) | 51.0 (47.3, 54.8) | 56.5 (54.0, 59.0) | 49.5 (46.9, 52.1) | 53.8 (52.1, 55.6) | 50.6 (49.2, 52.1) |
| Non-HDL cholesterol, mg/dL | 154 (141, 167) | 128 (116, 140) | 156 (147, 165) | 156 (137, 175) | 168 (153, 184) | 145 (135, 155) | 160 (154, 167) | 148 (140, 156) | 146 (141, 150) | 135 (131, 139) |
| Statin use, % | 31.2 | 41.9 | 24.5 | 41.6 | 16.1 | 15.8 | 14.8 | 22.5 | 45.3 | 50.3 |
| HbA1c, % | 6.05 (5.78, 6.32) | 6.14 (5.91, 6.37) | 6.09 (5.83, 6.35) | 6.34 (5.95, 6.73) | 6.08 (5.81, 6.35) | 6.43 (6.03, 6.83) | 5.80 (5.66, 5.94) | 6.54 (6.27, 6.80) | 6.05 (5.93, 6.16) | 6.43 (6.32, 6.55) |
| Diabetes, % | 24.4 | 36.7 | 19.9 | 42.7 | 18.4 | 38.9 | 9.48 | 41.0 | 22.7 | 49.3 |
| eGFR, ml/min/1.73 m2 | 89.2 (86.6, 91.9) | 74.4 (69.8, 79.1) | 85.3 (81.9, 88.8) | 75.6 (70.6, 80.6) | 87.6 (84.9, 90.3) | 78.6 (75.2, 82.0) | 89.5 (87.3, 91.8) | 78.8 (75.3, 82.2) | 86.7 (84.7, 88.6) | 74.7 (73.3, 76.1) |
| eGFR < 60 ml/min/1.73 m2, % | 2.01 | 21.0 | 3.58 | 17.1 | 1.31 | 11.1 | 1.50 | 17.6 | 4.53 | 26.6 |
| Albumin-to-creatinine ratio, mg/g | 13.9 (7.75, 20.0) | 27.9 (-2.44, 58.2) | 21.4 (-0.96, 43.7) | 63.6 (-9.11, 136) | 33.0 (4.37, 61.6) | 45.5 (15.4, 75.6) | 35.2 (14.0, 56.4) | 130 (75.5, 184) | 26.9 (20.4, 33.4) | 109 (64.4, 153) |
| Albumin-to-creatinine ratio > 30 mg/g | 7.56 | 14.2 | 5.44 | 11.3 | 11.3 | 11.9 | 9.24 | 28.6 | 14.9 | 23.8 |
| Systolic blood pressure, mm Hg | 113 (112, 114) | 111 (109, 113) | 125 (125, 126) | 126 (125, 127) | 132 (131, 133) | 134 (133, 135) | 152 (151, 154) | 158 (155, 161) | 135 (133, 137) | 138 (136, 140) |
| Diastolic blood pressure, mm Hg | 66.3 (64.8, 67.7) | 63.3 (62.0, 64.6) | 68.2 (66.9, 69.4) | 65.2 (63.4, 67.0) | 75.4 (73.9, 77.0) | 70.7 (67.7, 73.8) | 82.2 (80.0, 84.4) | 77.2 (74.7, 79.8) | 73.6 (72.0, 75.1) | 69.7 (68.7, 70.6) |
| †Population characteristics in the table are percentage or mean (95% confidence interval). US adults were grouped into the higher category of systolic and diastolic blood pressure. For example, if a person had systolic blood pressure of 146 mm Hg and diastolic blood pressure of 82 mm Hg, they were grouped into the ≥140/90 mm Hg category. | | | | | | | | | | |
| SBP – systolic blood pressure; DBP – diastolic blood pressure; eGFR - estimated glomerular filtration rate. | | | | | | | | | | |