**Title**: Cumulative genetic risk and APOE-ε4 are independently associated with dementia status in a multi-ethnic, population-based cohort

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**Supplementary Material**

This document contains 2 supplementary figures and 9 supplementary tables.

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| **A.** | **B.**  **C.** |

**Supplementary Figure 1.** Analytic sample exclusion criteria diagram. The primary sample includes participants in the Health and Retirement Study (HRS) between the years 1995 – 2014 with complete genetic information. The primary analytic sample n=10004 included European ancestry nEuropean=8399 and African ancestry nAfrican=1605 cohorts (Panel A). A sensitivity analysis was performed by removing cases from the AHEAD and CODA cohorts (nEuropean=6492 and nAfrican=1411) (Panel B). An attributable fraction analysis was performed comparing participants by ancestry in the top 20% polygenic score (PGS) to the bottom 20% PGS (Panel C).



**Supplementary Figure 2.** Polygenic score (PGS) distribution across summary cognition status (dementia, cognitive impairment-no dementia (CIND), borderline CIND, and normal), among participants in the Health and Retirement Study (HRS) with more than two waves of cognition measured, in both European and African ancestry participants. Pairwise t-tests were performed between cognition statuses, with dementia status as reference, *P-values* reported in plot. Global ANOVA tests were performed and reported in plot to test overall mean differences between each cognition status.

**Supplementary Table 1.** Summary cognition status classification decision tree. Among participants in the Health and Retirement Study (HRS) with more than two wave specific dementia status values between the years 1995 – 2014 (n=10175), participants’ cumulative cognitive status were determined. The criteria column describes the specifications to inform the designation of the cognition status, found in the outcome decision column. Specific sample sizes for each cognition status (dementia, cognitively impaired no dementia (CIND), borderline CIND, normal cognition, and unclassified) are found in the subsequent columns. Summary cognition status was based on the following criteria: first, participants with the same cognition status in their last two visits were given that cognition classification: dementia, CIND, or cognitively normal status (n=7756). Second, participants with a monotonic descent to dementia or fluctuations between CIND and normal cognition with the most recent visit categorized as dementia were classified in the dementia category (n=460). Third, participants with no dementia status in any wave, who fluctuated between CIND and cognitively normal, were classified as a new category, borderline CIND (n=1568). Next, participants with a majority (>50%) of normal cognition visits or CIND, with one dementia classification in the last two visits, were assigned CIND status (n=198). Next, participants with a majority of dementia classifications and one dementia status in their last two visits were classified as having dementia (n=22). Finally, participants with a normal cognition classification after a dementia classification or those who did not follow any of the above stated patterns were considered unclassified (n=171).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Criteria** | **Outcome decision** | **Dementia cases** | **CIND cases** | **Borderline CIND cases** | **Normal cognition** | **Unclassified** | **Total** |
| 1. Same cognition status in last two visits | dementia, CIND, or normal | 513 | 863 | - | 6380 | - | 7756 |
| 2. Monotonic descent into dementia or fluctuates between CIND/ normal and ending in dementia | dementia | 460 | - | - | - | - | 460 |
| 3. Fluctuates between CIND/normal, with no dementia | borderline CIND | - | - | 1568 | - | - | 1568 |
| 4. Majority (>50%) normal or majority CIND, with one dementia case in last two visits | CIND | - | 198 | - | - | - | 198 |
| 5. Majority dementia, with one dementia case in the last two visits | dementia | 22 | - | - | - | - | 22 |
| 6. Normal appears after dementia | unclassified | **-** | - | - | - | 142 | 142 |
| 7. No apparent pattern | unclassified | **-** | - | - | - | 29 | 29 |
| **Total** |  | 995 | 1061 | 1568 | 6380 | 171 | 10175 |
| Acronyms: CIND: Cognitive impairment – no dementia | | | | | | | |
| Summary cognition status classification decision tree. Among participants in the Health and Retirement Study (HRS) with more than two wave specific dementia status values between the years 1995 – 2014 (n=10175), participants’ cumulative cognitive status were determined. The criteria column describes the specifications to inform the designation of the cognition status, found in the outcome decision column. Specific sample sizes for each cognition status (dementia, cognitively impaired no dementia (CIND), borderline CIND, normal cognition, and unclassified) are found in the subsequent columns. | | | | | | | | |

**Supplementary Table 2.**  Single nucleotide polymorphisms (SNPs) removed from the *Apolipoprotein E* linkage disequilibrium region prior to construction of the polygenic score for Alzheimer’s disease. SNPs were obtained from Kunkle et al. 2019.

Acronyms: Chr: chromosome location, BP: base pair location, A1: allele 1, A2: allele 2, beta: magnitude of association with Alzheimer’s disease, SE: standard error of association with Alzheimer’s disease, P: P-value

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **CHR** | **BP** | **SNP** | **A1** | **A2** | **BETA** | **SE** | **P** |
| 19 | 45340021 | rs2972561 | T | C | 0.2991 | 0.0744 | 5.78E-05 |
| 19 | 45340138 | rs2927482 | A | G | 0.1875 | 0.0166 | 1.04E-29 |
| 19 | 45340636 | rs10407755 | A | G | 0.0015 | 0.0179 | 0.935 |
| 19 | 45340647 | rs143825857 | A | G | -0.2114 | 0.0841 | 0.01197 |
| 19 | 45340728 | rs10409208 | T | C | 0.1245 | 0.0154 | 6.07E-16 |
| 19 | 45340736 | rs73048293 | A | G | 0.2702 | 0.0156 | 4.69E-67 |
| 19 | 45341282 | rs35182466 | T | C | 0.0907 | 0.0154 | 3.48E-09 |
| 19 | 45341540 | rs12462274 | A | G | -0.2696 | 0.0156 | 1.29E-66 |
| 19 | 45341759 | rs10415074 | C | G | -0.1904 | 0.0165 | 8.67E-31 |
| 19 | 45341797 | rs11666665 | A | G | -0.1088 | 0.0165 | 4.37E-11 |
| 19 | 45341821 | rs183652603 | A | C | 0.2771 | 0.0524 | 1.22E-07 |
| 19 | 45341904 | rs12459575 | A | G | 0.2707 | 0.0156 | 4.27E-67 |
| 19 | 45341946 | rs11666697 | C | G | -0.0823 | 0.0158 | 1.74E-07 |
| 19 | 45341948 | rs10407439 | A | G | -0.2152 | 0.0169 | 2.89E-37 |
| 19 | 45342007 | rs74579864 | C | G | 0.271 | 0.0157 | 5.01E-67 |
| 19 | 45342114 | rs4803761 | A | G | -0.275 | 0.0158 | 5.56E-68 |
| 19 | 45342124 | rs10408472 | A | G | -0.095 | 0.0154 | 7.12E-10 |
| 19 | 45342161 | rs4803762 | A | G | 0.2453 | 0.0161 | 3.91E-52 |
| 19 | 45342241 | rs4239533 | A | G | -0.1721 | 0.0166 | 3.42E-25 |
| 19 | 45342308 | rs4599021 | A | G | -0.0811 | 0.0157 | 2.63E-07 |
| 19 | 45342630 | rs73572039 | T | C | -0.1255 | 0.0249 | 4.51E-07 |
| 19 | 45342815 | rs1466435 | C | G | -0.2285 | 0.0431 | 1.16E-07 |
| 19 | 45343579 | rs55840414 | A | G | -0.2219 | 0.0241 | 3.48E-20 |
| 19 | 45343664 | rs2972562 | A | G | 0.1225 | 0.0238 | 2.52E-07 |
| 19 | 45344305 | rs2376519 | C | G | 0.0541 | 0.0225 | 0.01619 |
| 19 | 45344458 | rs2972564 | A | G | 0.0543 | 0.0225 | 0.01582 |
| 19 | 45344496 | chr19:45344496:I | A | AT | 0.053 | 0.0226 | 0.01894 |
| 19 | 45344515 | rs75799108 | T | G | -0.1405 | 0.0238 | 3.43E-09 |
| 19 | 45344516 | rs76936640 | A | T | 0.1359 | 0.0239 | 1.24E-08 |
| 19 | 45344722 | rs28615360 | A | G | 0.749 | 0.073 | 1.06E-24 |
| 19 | 45345283 | rs61642202 | A | C | -0.9568 | 0.08 | 6.02E-33 |
| 19 | 45345634 | rs188321596 | C | G | -0.2634 | 0.1278 | 0.03926 |
| 19 | 45345708 | rs2199576 | A | G | 0.0998 | 0.0209 | 1.82E-06 |
| 19 | 45345773 | rs2376518 | T | C | -0.1531 | 0.0241 | 2.16E-10 |
| 19 | 45345787 | rs111371860 | A | T | 0.3797 | 0.0353 | 4.92E-27 |
| 19 | 45345813 | rs140139308 | A | G | -0.2085 | 0.0867 | 0.01624 |
| 19 | 45346069 | rs12610527 | A | G | 0.3153 | 0.146 | 0.03078 |
| 19 | 45346551 | rs1985096 | A | T | -0.0795 | 0.0209 | 0.0001366 |
| 19 | 45346768 | rs1001611 | A | G | -0.1443 | 0.0151 | 1.36E-21 |
| 19 | 45346959 | rs76694045 | A | G | 0.1773 | 0.07 | 0.0113 |
| 19 | 45347561 | rs11668738 | T | G | -0.1462 | 0.0203 | 6.31E-13 |
| 19 | 45347636 | rs41289510 | A | G | -0.1417 | 0.0236 | 1.94E-09 |
| 19 | 45347911 | rs4452060 | A | C | 0.1834 | 0.0153 | 2.82E-33 |
| 19 | 45348253 | rs10426423 | T | C | -0.1439 | 0.0151 | 1.39E-21 |
| 19 | 45348522 | rs12162222 | T | G | 0.2897 | 0.016 | 5.22E-73 |
| 19 | 45349177 | rs77241309 | C | G | -0.1667 | 0.0295 | 1.59E-08 |
| 19 | 45349369 | rs2927472 | T | C | -0.1803 | 0.0219 | 2.00E-16 |
| 19 | 45349402 | rs3810143 | T | C | -0.1952 | 0.015 | 1.26E-38 |
| 19 | 45349963 | rs2306149 | A | C | -0.1533 | 0.0157 | 1.42E-22 |
| 19 | 45351516 | rs41289512 | C | G | -1.1306 | 0.0349 | 2.77E-230 |
| 19 | 45351746 | rs1871047 | A | G | 0.1455 | 0.015 | 2.50E-22 |
| 19 | 45351891 | rs2972569 | A | G | -0.113 | 0.0204 | 2.83E-08 |
| 19 | 45351937 | rs1871046 | T | C | 0.1855 | 0.0161 | 7.74E-31 |
| 19 | 45352419 | rs7255063 | C | G | -0.1507 | 0.0152 | 3.31E-23 |
| 19 | 45352487 | rs12974942 | A | T | -0.2126 | 0.0154 | 1.69E-43 |
| 19 | 45352804 | rs4802240 | T | C | -0.1512 | 0.0152 | 3.06E-23 |
| 19 | 45353261 | rs1531516 | C | G | 0.1519 | 0.0153 | 2.79E-23 |
| 19 | 45354044 | rs57537848 | T | G | 0.2066 | 0.0151 | 2.11E-42 |
| 19 | 45354238 | rs2972566 | C | G | 0.1787 | 0.0212 | 3.76E-17 |
| 19 | 45354296 | rs11666329 | A | G | 0.2065 | 0.0153 | 1.27E-41 |
| 19 | 45355267 | rs76205446 | A | T | 0.9168 | 0.0747 | 1.15E-34 |
| 19 | 45355288 | rs149661872 | T | C | 0.9872 | 0.0762 | 2.16E-38 |
| 19 | 45355552 | rs2927469 | A | G | -0.0654 | 0.0248 | 0.008445 |
| 19 | 45355595 | rs11667610 | T | C | -0.1129 | 0.0188 | 2.00E-09 |
| 19 | 45355721 | rs2972559 | C | G | -0.3443 | 0.017 | 1.20E-91 |
| 19 | 45355743 | rs4802241 | A | C | 0.146 | 0.0211 | 4.26E-12 |
| 19 | 45356141 | rs2972558 | T | C | 0.1864 | 0.0168 | 1.25E-28 |
| 19 | 45356464 | rs73050205 | A | T | 0.3463 | 0.017 | 2.44E-92 |
| 19 | 45356517 | rs140411770 | A | G | -0.7554 | 0.1287 | 4.35E-09 |
| 19 | 45356674 | rs10421035 | A | G | 0.1342 | 0.0185 | 4.13E-13 |
| 19 | 45356752 | chr19:45356752:I | CT | C | 0.3894 | 0.0188 | 3.27E-95 |
| 19 | 45356895 | rs12971462 | A | G | -0.093 | 0.0195 | 1.90E-06 |
| 19 | 45356995 | rs112668175 | T | C | -0.1424 | 0.0624 | 0.02251 |
| 19 | 45357003 | rs35396326 | C | G | -0.3253 | 0.0167 | 2.32E-84 |
| 19 | 45357291 | rs4803763 | C | G | 0.3459 | 0.017 | 3.78E-92 |
| 19 | 45357377 | rs4803764 | T | C | -0.3464 | 0.017 | 2.51E-92 |
| 19 | 45357388 | rs141984622 | A | G | -0.3484 | 0.1035 | 0.0007664 |
| 19 | 45357939 | rs2927468 | A | G | -0.2415 | 0.0159 | 4.15E-52 |
| 19 | 45358026 | rs143459034 | T | C | 0.9094 | 0.0742 | 1.49E-34 |
| 19 | 45358181 | rs71364511 | A | G | -0.1353 | 0.0186 | 3.94E-13 |
| 19 | 45358235 | rs7249933 | T | C | -0.1651 | 0.0244 | 1.40E-11 |
| 19 | 45358353 | rs10410835 | T | C | -0.254 | 0.0162 | 1.41E-55 |
| 19 | 45358448 | rs4803765 | T | C | 0.7165 | 0.061 | 7.13E-32 |
| 19 | 45358500 | rs12981508 | A | G | -0.123 | 0.0189 | 6.89E-11 |
| 19 | 45358575 | rs192849087 | A | G | -0.1662 | 0.0629 | 0.008192 |
| 19 | 45358681 | chr19:45358681:I | CA | C | 0.5239 | 0.1025 | 3.19E-07 |
| 19 | 45359148 | rs2927466 | C | G | 0.1205 | 0.0188 | 1.54E-10 |
| 19 | 45359570 | rs3112438 | A | G | 0.1205 | 0.0188 | 1.54E-10 |
| 19 | 45359586 | rs56317818 | T | C | 0.3503 | 0.017 | 7.60E-94 |
| 19 | 45359667 | rs41289514 | A | G | -0.9354 | 0.0743 | 2.19E-36 |
| 19 | 45359706 | rs12462573 | A | G | 0.3481 | 0.017 | 5.84E-93 |
| 19 | 45359776 | rs75765623 | T | C | -0.1398 | 0.0643 | 0.02973 |
| 19 | 45360573 | rs2972557 | A | G | -0.0701 | 0.0255 | 0.005894 |
| 19 | 45360754 | rs12463239 | A | G | 0.0207 | 0.0217 | 0.3403 |
| 19 | 45360762 | rs8112526 | A | G | 0.1242 | 0.0247 | 5.00E-07 |
| 19 | 45360783 | chr19:45360783:D | CT | C | 0.1871 | 0.0211 | 6.31E-19 |
| 19 | 45361224 | rs440277 | A | G | -0.1709 | 0.0161 | 1.79E-26 |
| 19 | 45361574 | rs3852856 | A | G | -0.0298 | 0.0182 | 0.1028 |
| 19 | 45361632 | rs411920 | T | C | -0.1414 | 0.0148 | 1.72E-21 |
| 19 | 45361646 | rs365653 | A | G | 0.315 | 0.0247 | 3.19E-37 |
| 19 | 45361825 | rs418227 | T | C | -0.1413 | 0.0148 | 1.73E-21 |
| 19 | 45361960 | rs417193 | T | C | -0.1375 | 0.0148 | 2.01E-20 |
| 19 | 45362033 | rs143687838 | A | G | 0.0783 | 0.0689 | 0.2554 |
| 19 | 45362269 | rs2436474 | T | G | 0.1409 | 0.0148 | 2.07E-21 |
| 19 | 45362667 | rs377702 | A | G | 0.1409 | 0.0148 | 1.84E-21 |
| 19 | 45362809 | rs454050 | A | C | 0.1409 | 0.0148 | 1.89E-21 |
| 19 | 45363254 | rs387369 | A | G | 0.1407 | 0.0148 | 2.24E-21 |
| 19 | 45363299 | rs403155 | T | C | 0.1374 | 0.0149 | 2.31E-20 |
| 19 | 45363392 | rs12610257 | T | C | -0.1769 | 0.02 | 9.19E-19 |
| 19 | 45363700 | rs12978931 | A | G | 0.1841 | 0.0193 | 1.52E-21 |
| 19 | 45363791 | rs384973 | T | G | -0.1405 | 0.0148 | 2.40E-21 |
| 19 | 45363820 | rs138607350 | T | G | -1.0175 | 0.0651 | 4.80E-55 |
| 19 | 45363865 | rs191160523 | A | T | -0.067 | 0.0685 | 0.3277 |
| 19 | 45364623 | rs411856 | T | C | 0.1411 | 0.0148 | 1.70E-21 |
| 19 | 45364782 | rs395683 | A | G | -0.1566 | 0.015 | 1.46E-25 |
| 19 | 45364815 | rs395710 | A | G | -0.1446 | 0.0149 | 2.61E-22 |
| 19 | 45365072 | rs555608 | A | G | -0.141 | 0.0148 | 1.81E-21 |
| 19 | 45365248 | rs2436475 | T | C | -0.1409 | 0.0148 | 1.90E-21 |
| 19 | 45365410 | rs143431312 | T | C | -0.3986 | 0.08 | 6.26E-07 |
| 19 | 45365447 | rs146275714 | A | G | 1.1108 | 0.0341 | 3.17E-233 |
| 19 | 45365476 | rs11669109 | T | C | -0.1602 | 0.0151 | 2.37E-26 |
| 19 | 45365525 | chr19:45365525:D | CACT | C | -0.4191 | 0.0206 | 1.88E-92 |
| 19 | 45365604 | rs12980613 | A | G | -0.1295 | 0.0155 | 7.36E-17 |
| 19 | 45365641 | rs12980631 | A | C | -0.1557 | 0.015 | 2.32E-25 |
| 19 | 45365817 | rs11665829 | A | G | 0.1409 | 0.0148 | 1.89E-21 |
| 19 | 45365961 | rs548011 | A | G | -0.1412 | 0.0148 | 1.51E-21 |
| 19 | 45366178 | rs415637 | A | G | 0.1459 | 0.0149 | 1.10E-22 |
| 19 | 45366275 | rs426555 | T | C | 0.1502 | 0.015 | 1.13E-23 |
| 19 | 45366345 | rs416116 | A | G | 0.1444 | 0.0149 | 2.81E-22 |
| 19 | 45366410 | rs403729 | C | G | 0.1429 | 0.0148 | 4.89E-22 |
| 19 | 45366498 | rs183427010 | A | G | 0.173 | 0.0966 | 0.07315 |
| 19 | 45366603 | rs521629 | A | G | 0.1429 | 0.0148 | 4.61E-22 |
| 19 | 45366656 | rs520566 | A | G | 0.1465 | 0.0149 | 6.89E-23 |
| 19 | 45366779 | rs519825 | T | C | -0.143 | 0.0148 | 4.57E-22 |
| 19 | 45366830 | rs376938 | A | G | -0.1489 | 0.0149 | 1.90E-23 |
| 19 | 45367085 | rs60007782 | T | C | -0.2309 | 0.0764 | 0.002507 |
| 19 | 45367277 | chr19:45367277:I | CG | C | 1.1096 | 0.0362 | 2.19E-206 |
| 19 | 45367430 | chr19:45367430:D | A | AAAAC | 0.0467 | 0.0148 | 0.001565 |
| 19 | 45367473 | rs394353 | A | G | -0.0483 | 0.0148 | 0.001139 |
| 19 | 45367502 | rs73050216 | C | G | -0.1772 | 0.0201 | 1.05E-18 |
| 19 | 45367572 | chr19:45367572:I | G | GA | -0.0443 | 0.0147 | 0.002621 |
| 19 | 45367777 | rs8105340 | T | C | -0.1393 | 0.0235 | 3.10E-09 |
| 19 | 45367888 | rs187585971 | T | C | 0.1346 | 0.1095 | 0.2189 |
| 19 | 45367905 | rs112283362 | A | G | 0.2124 | 0.0603 | 0.0004234 |
| 19 | 45367972 | rs3112439 | C | G | -0.2677 | 0.0215 | 1.72E-35 |
| 19 | 45368010 | rs3112440 | A | G | 0.0687 | 0.02 | 0.0006022 |
| 19 | 45368082 | rs520283 | A | C | 0.146 | 0.0149 | 9.52E-23 |
| 19 | 45368320 | rs419010 | T | C | 0.0441 | 0.0147 | 0.002746 |
| 19 | 45368424 | rs394221 | T | C | 0.0441 | 0.0147 | 0.002754 |
| 19 | 45369203 | rs112422902 | A | G | -0.6177 | 0.0488 | 1.07E-36 |
| 19 | 45369351 | rs182080851 | T | C | 0.546 | 0.0962 | 1.39E-08 |
| 19 | 45370278 | rs41290098 | A | T | 0.1804 | 0.0217 | 8.60E-17 |
| 19 | 45370335 | rs384653 | A | G | -0.0628 | 0.0149 | 2.39E-05 |
| 19 | 45370554 | rs511825 | T | C | 0.1501 | 0.0149 | 7.49E-24 |
| 19 | 45370570 | rs565566 | A | C | 0.1488 | 0.0149 | 1.87E-23 |
| 19 | 45370571 | rs511147 | A | G | -0.1489 | 0.0149 | 1.75E-23 |
| 19 | 45370649 | rs564724 | A | G | 0.1431 | 0.0149 | 5.92E-22 |
| 19 | 45370673 | rs510297 | A | C | -0.1538 | 0.0149 | 5.88E-25 |
| 19 | 45370838 | rs12610605 | A | G | -0.1733 | 0.0195 | 5.38E-19 |
| 19 | 45370854 | rs416041 | A | G | -0.1445 | 0.0148 | 1.81E-22 |
| 19 | 45370941 | rs41290100 | T | C | -0.25 | 0.0708 | 0.0004172 |
| 19 | 45371093 | rs150358728 | T | G | -0.3013 | 0.0866 | 0.0005017 |
| 19 | 45371168 | rs4803766 | A | G | -0.0345 | 0.0146 | 0.01798 |
| 19 | 45371188 | rs41290102 | T | C | -0.2719 | 0.0553 | 8.95E-07 |
| 19 | 45371328 | rs149529419 | A | G | -0.1825 | 0.0645 | 0.004693 |
| 19 | 45371594 | rs390952 | A | G | 0.1375 | 0.0149 | 2.07E-20 |
| 19 | 45371685 | chr19:45371685:I | A | AT | 0.1876 | 0.0195 | 6.76E-22 |
| 19 | 45371705 | chr19:45371705:I | T | TTTTTTC | 0.1859 | 0.0197 | 4.03E-21 |
| 19 | 45371706 | rs144146674 | T | C | -0.1567 | 0.0606 | 0.009705 |
| 19 | 45371716 | rs117877932 | T | C | -0.2551 | 0.0251 | 2.75E-24 |
| 19 | 45372030 | rs147483424 | T | C | -0.093 | 0.0674 | 0.1675 |
| 19 | 45372129 | rs58521715 | A | T | 0.039 | 0.0161 | 0.01517 |
| 19 | 45372184 | rs60389450 | A | C | 0.0297 | 0.0167 | 0.07493 |
| 19 | 45372329 | rs17561351 | A | G | 0.0285 | 0.0302 | 0.3465 |
| 19 | 45372354 | rs8104483 | T | G | 0.04 | 0.016 | 0.01234 |
| 19 | 45372707 | rs8104292 | A | G | -0.0159 | 0.0166 | 0.3365 |
| 19 | 45372794 | rs404935 | A | G | -0.007 | 0.0204 | 0.7308 |
| 19 | 45372798 | rs113793098 | T | C | -0.1273 | 0.0501 | 0.01111 |
| 19 | 45372865 | chr19:45372865:D | A | AAG | -0.2917 | 0.0172 | 3.04E-64 |
| 19 | 45372866 | chr19:45372866:D | A | AG | -0.3004 | 0.0172 | 5.10E-68 |
| 19 | 45372867 | rs387465 | A | G | -0.2626 | 0.0174 | 1.68E-51 |
| 19 | 45372959 | rs4803767 | T | C | -0.0297 | 0.0163 | 0.06806 |
| 19 | 45373276 | rs11879589 | A | G | -0.0583 | 0.0253 | 0.02113 |
| 19 | 45373539 | rs3852857 | C | G | -0.059 | 0.0253 | 0.01974 |
| 19 | 45373565 | rs395908 | A | G | -0.0097 | 0.0202 | 0.6302 |
| 19 | 45373739 | rs4081918 | A | G | 0.0526 | 0.0253 | 0.03721 |
| 19 | 45374350 | rs79074020 | T | C | 0.0617 | 0.0253 | 0.01498 |
| 19 | 45374983 | rs141739979 | T | G | -0.4544 | 0.0855 | 1.07E-07 |
| 19 | 45375413 | rs71352236 | A | G | -0.3084 | 0.07 | 1.07E-05 |
| 19 | 45375522 | rs73936965 | T | C | 0.0774 | 0.3216 | 0.8099 |
| 19 | 45376044 | chr19:45376044:D | G | GTATTTAT | -0.1621 | 0.0171 | 2.52E-21 |
| 19 | 45376284 | rs519113 | C | G | 0.0252 | 0.0173 | 0.1464 |
| 19 | 45376317 | rs11671274 | C | G | 0.0292 | 0.0303 | 0.3346 |
| 19 | 45377098 | rs11672399 | A | C | -0.0424 | 0.0274 | 0.1214 |
| 19 | 45377334 | rs393584 | A | G | -0.1278 | 0.0156 | 2.27E-16 |
| 19 | 45377467 | rs2075642 | A | G | -0.0368 | 0.0177 | 0.03785 |
| 19 | 45377842 | rs41290108 | C | G | -0.3178 | 0.0528 | 1.71E-09 |
| 19 | 45378144 | rs34278513 | T | C | 0.181 | 0.0231 | 5.15E-15 |
| 19 | 45378719 | rs11665676 | T | C | -0.246 | 0.0336 | 2.39E-13 |
| 19 | 45378770 | rs41290110 | A | G | -0.1032 | 0.0673 | 0.1252 |
| 19 | 45379060 | rs387976 | A | C | 0.1241 | 0.0156 | 1.75E-15 |
| 19 | 45379309 | rs3852859 | T | C | 0.0446 | 0.0178 | 0.01217 |
| 19 | 45379336 | rs369599 | T | C | -0.0353 | 0.0163 | 0.02972 |
| 19 | 45379516 | rs412776 | A | G | 0.193 | 0.023 | 4.48E-17 |
| 19 | 45379566 | chr19:45379566:D | A | AC | -0.0385 | 0.0162 | 0.01738 |
| 19 | 45379638 | rs370705 | T | C | -0.0385 | 0.0162 | 0.01742 |
| 19 | 45379682 | rs385982 | A | C | 0.0444 | 0.0162 | 0.006252 |
| 19 | 45379746 | rs73050293 | A | G | 0.2051 | 0.0239 | 1.07E-17 |
| 19 | 45379791 | rs11667640 | T | C | -0.2149 | 0.0296 | 3.95E-13 |
| 19 | 45380126 | rs419925 | C | G | -0.0382 | 0.0162 | 0.01853 |
| 19 | 45380335 | rs77196615 | T | C | 0.2212 | 0.1011 | 0.02865 |
| 19 | 45380545 | rs421812 | T | G | -0.0376 | 0.0163 | 0.02102 |
| 19 | 45380961 | rs3865427 | A | C | 0.1961 | 0.0234 | 4.87E-17 |
| 19 | 45380970 | rs11668861 | T | G | -0.1986 | 0.0148 | 7.26E-41 |
| 19 | 45381292 | rs150639620 | T | G | -0.2604 | 0.0344 | 3.76E-14 |
| 19 | 45381305 | chr19:45381305:D | CCTCCTCCT | C | 0.2679 | 0.0343 | 5.86E-15 |
| 19 | 45381443 | chr19:45381443:D | T | TTC | -0.2256 | 0.1213 | 0.06279 |
| 19 | 45381917 | rs3729640 | T | C | -0.0523 | 0.018 | 0.003719 |
| 19 | 45382034 | rs6859 | A | G | 0.312 | 0.0146 | 1.07E-100 |
| 19 | 45382675 | rs41290120 | A | G | -0.6169 | 0.0411 | 5.20E-51 |
| 19 | 45382717 | rs406456 | A | G | -0.2122 | 0.0152 | 4.09E-44 |
| 19 | 45382966 | rs3852860 | T | C | -0.2314 | 0.0155 | 1.73E-50 |
| 19 | 45382984 | rs11669338 | T | G | 0.291 | 0.029 | 1.03E-23 |
| 19 | 45383037 | rs11673139 | A | T | 0.2911 | 0.029 | 1.00E-23 |
| 19 | 45383061 | rs3852861 | T | G | -0.232 | 0.0155 | 1.18E-50 |
| 19 | 45383079 | rs71352237 | T | C | -0.2061 | 0.0235 | 1.73E-18 |
| 19 | 45383091 | chr19:45383091:I | A | AC | -0.2087 | 0.0235 | 6.11E-19 |
| 19 | 45383115 | rs34224078 | A | G | -0.2084 | 0.0235 | 6.99E-19 |
| 19 | 45383139 | rs35879138 | A | T | 0.2089 | 0.0235 | 5.71E-19 |
| 19 | 45383583 | rs41290122 | A | G | -0.0999 | 0.0689 | 0.147 |
| 19 | 45383808 | rs183161720 | A | G | -0.3223 | 0.0884 | 0.0002669 |
| 19 | 45383830 | rs148303016 | T | C | -0.267 | 0.0345 | 1.09E-14 |
| 19 | 45384105 | rs11083749 | T | C | -0.0648 | 0.0156 | 3.30E-05 |
| 19 | 45384116 | rs406315 | A | G | -0.2205 | 0.0155 | 9.37E-46 |
| 19 | 45384332 | chr19:45384332:D | G | GC | -0.0534 | 0.0156 | 0.0006083 |
| 19 | 45384337 | chr19:45384337:D | CG | C | 0.05 | 0.0156 | 0.001398 |
| 19 | 45384405 | rs73052307 | T | C | 0.4248 | 0.0241 | 1.98E-69 |
| 19 | 45384700 | rs113743631 | A | G | -0.3281 | 0.0632 | 2.05E-07 |
| 19 | 45384931 | rs79701229 | A | G | 1.4859 | 0.0999 | 4.49E-50 |
| 19 | 45385102 | rs78754926 | A | G | -0.035 | 0.0668 | 0.6001 |
| 19 | 45385356 | rs144261139 | A | C | 1.0422 | 0.0717 | 7.23E-48 |
| 19 | 45385389 | rs116967764 | A | G | -0.4861 | 0.1303 | 0.00019 |
| 19 | 45385759 | rs3745150 | C | G | -0.3376 | 0.0159 | 4.81E-100 |
| 19 | 45386029 | rs10420036 | A | G | -0.0571 | 0.0706 | 0.4183 |
| 19 | 45386460 | rs76725281 | A | G | 0.0709 | 0.0824 | 0.3901 |
| 19 | 45386467 | chr19:45386467:I | G | GTAA | -0.9639 | 0.0193 | 9.70e-546 |
| 19 | 45386634 | rs147636938 | T | C | 0.9803 | 0.0445 | 2.51E-107 |
| 19 | 45387034 | rs283808 | A | C | 0.2826 | 0.0398 | 1.17E-12 |
| 19 | 45387057 | rs283809 | A | G | 0.2825 | 0.0398 | 1.19E-12 |
| 19 | 45387459 | rs12972156 | C | G | -0.9653 | 0.0189 | 9.86e-569 |
| 19 | 45387484 | rs181518580 | T | C | 0.106 | 0.2218 | 0.6328 |
| 19 | 45387596 | rs12972970 | A | G | 0.965 | 0.0189 | 9.33e-569 |
| 19 | 45388130 | rs34342646 | A | G | 0.9638 | 0.0189 | 5.73e-569 |
| 19 | 45388241 | rs283810 | T | G | -0.2657 | 0.0291 | 7.22E-20 |
| 19 | 45389174 | rs283813 | A | T | 0.2625 | 0.0289 | 1.11E-19 |
| 19 | 45389224 | rs283814 | A | G | -0.3225 | 0.0327 | 5.33E-23 |
| 19 | 45389596 | rs7254892 | A | G | -0.3995 | 0.046 | 3.84E-18 |
| 19 | 45389776 | rs142934707 | A | G | -0.0625 | 0.0826 | 0.4493 |
| 19 | 45391505 | rs41290128 | A | G | -0.0612 | 0.0826 | 0.4587 |
| 19 | 45391941 | rs145067941 | T | C | -0.069 | 0.1188 | 0.5617 |
| 19 | 45393516 | rs117310449 | T | C | 0.9879 | 0.0691 | 2.28E-46 |
| 19 | 45394211 | rs76692773 | T | C | -0.273 | 0.0273 | 1.71E-23 |
| 19 | 45394336 | rs71352238 | T | C | -0.9599 | 0.0187 | 2.25e-573 |
| 19 | 45395193 | rs78245864 | A | C | 0.0588 | 0.0825 | 0.4761 |
| 19 | 45395266 | rs157580 | A | G | 0.4072 | 0.0155 | 4.80E-152 |
| 19 | 45395330 | rs2075649 | A | G | 0.34 | 0.0155 | 7.33E-107 |
| 19 | 45395619 | rs2075650 | A | G | -0.9535 | 0.0186 | 6.64e-573 |
| 19 | 45395816 | rs73936968 | A | G | -0.3835 | 0.0676 | 1.38E-08 |
| 19 | 45395844 | rs34095326 | A | G | 0.8857 | 0.021 | 2.38e-389 |
| 19 | 45395875 | rs151285748 | A | G | -0.0801 | 0.1214 | 0.5098 |
| 19 | 45395909 | rs34404554 | C | G | -0.9572 | 0.0187 | 3.34e-574 |
| 19 | 45396144 | rs11556505 | T | C | 0.9576 | 0.0187 | 6.15e-575 |
| 19 | 45396258 | rs142608136 | A | C | -0.2902 | 0.1094 | 0.007992 |
| 19 | 45396899 | rs157584 | T | C | 0.2481 | 0.0148 | 1.04E-62 |
| 19 | 45396973 | rs77301115 | A | G | 0.9486 | 0.0427 | 2.25E-109 |
| 19 | 45397171 | rs73936970 | C | G | -0.0151 | 0.0792 | 0.8492 |
| 19 | 45397229 | rs1160983 | A | G | -0.413 | 0.0465 | 6.80E-19 |
| 19 | 45397307 | rs112849259 | T | C | 0.9277 | 0.0433 | 6.08E-102 |
| 19 | 45397512 | rs157585 | A | C | 0.2632 | 0.0149 | 4.97E-70 |
| 19 | 45397952 | rs116881820 | T | C | -0.8222 | 0.0414 | 1.39E-87 |
| 19 | 45398264 | rs157588 | T | C | -0.2636 | 0.0149 | 2.28E-70 |
| 19 | 45398633 | rs11668327 | C | G | -0.4126 | 0.0223 | 2.65E-76 |
| 19 | 45398716 | rs157590 | A | C | 0.2669 | 0.0149 | 4.79E-72 |
| 19 | 45398785 | rs79398853 | T | C | 0.9265 | 0.0432 | 4.64E-102 |
| 19 | 45398817 | rs2238681 | T | C | -0.361 | 0.0153 | 3.85E-123 |
| 19 | 45399344 | rs75687619 | T | G | 0.9283 | 0.0432 | 1.43E-102 |
| 19 | 45399456 | rs140684051 | T | C | -0.2187 | 0.0742 | 0.003215 |
| 19 | 45399896 | rs76366838 | A | G | 0.9245 | 0.0431 | 6.31E-102 |
| 19 | 45400484 | chr19:45400484:I | T | TG | -0.9333 | 0.043 | 1.84E-104 |
| 19 | 45400725 | rs114536010 | T | C | 0.9274 | 0.0431 | 1.03E-102 |
| 19 | 45400747 | rs61679753 | A | T | -0.3683 | 0.0453 | 4.34E-16 |
| 19 | 45400871 | rs116874600 | A | G | -0.049 | 0.0824 | 0.552 |
| 19 | 45401666 | rs8106922 | A | G | 0.3621 | 0.0152 | 1.53E-125 |
| 19 | 45401868 | rs118170342 | T | C | -0.7315 | 0.0453 | 9.22E-59 |
| 19 | 45402262 | rs111784051 | T | G | 0.4153 | 0.051 | 3.64E-16 |
| 19 | 45402477 | rs34878901 | T | C | -0.3587 | 0.0152 | 2.37E-122 |
| 19 | 45402718 | rs35568738 | C | G | -0.3149 | 0.0331 | 1.69E-21 |
| 19 | 45403216 | rs115881343 | T | C | 0.9298 | 0.0432 | 7.65E-103 |
| 19 | 45403412 | rs1160985 | T | C | -0.3869 | 0.015 | 4.73E-146 |
| 19 | 45403858 | rs760136 | A | G | 0.3869 | 0.015 | 7.12E-146 |
| 19 | 45403924 | rs1160984 | T | C | -0.3143 | 0.0339 | 1.61E-20 |
| 19 | 45404431 | rs741780 | T | C | 0.3815 | 0.0151 | 3.00E-140 |
| 19 | 45404432 | rs117264457 | A | G | -0.3895 | 0.0717 | 5.45E-08 |
| 19 | 45404691 | rs405697 | A | G | -0.3187 | 0.0178 | 1.71E-71 |
| 19 | 45404721 | rs116977783 | T | C | -0.0491 | 0.0835 | 0.5562 |
| 19 | 45404857 | rs112019714 | T | C | -0.93 | 0.0432 | 6.24E-103 |
| 19 | 45404972 | rs1038025 | T | C | 0.3872 | 0.0151 | 6.58E-145 |
| 19 | 45405062 | rs1038026 | A | G | 0.3876 | 0.0151 | 4.32E-146 |
| 19 | 45405113 | rs149311267 | A | C | -0.0508 | 0.0836 | 0.543 |
| 19 | 45405499 | rs141864196 | A | G | -0.3685 | 0.0554 | 2.97E-11 |
| 19 | 45405521 | rs1305062 | C | G | -0.3556 | 0.0153 | 3.64E-119 |
| 19 | 45405634 | rs117843462 | C | G | -0.31 | 0.0882 | 0.0004415 |
| 19 | 45406538 | chr19:45406538:I | CG | C | -0.402 | 0.0152 | 1.06E-153 |
| 19 | 45407655 | rs7256173 | T | C | -0.0381 | 0.0835 | 0.648 |
| 19 | 45407788 | rs7259620 | A | G | -0.3911 | 0.0151 | 4.99E-148 |
| 19 | 45408564 | rs449647 | A | T | 0.3391 | 0.0233 | 5.88E-48 |
| 19 | 45408628 | rs769446 | T | C | 0.2077 | 0.0347 | 2.13E-09 |
| 19 | 45408836 | rs405509 | T | G | 0.3331 | 0.0147 | 3.11E-114 |
| 19 | 45409167 | rs440446 | C | G | -0.3575 | 0.0159 | 2.28E-112 |
| 19 | 45409579 | rs769448 | T | C | -0.312 | 0.0753 | 3.46E-05 |
| 19 | 45410002 | rs769449 | A | G | 1.137 | 0.0199 | 7.52e-715 |
| 19 | 45410444 | rs769450 | A | G | -0.3606 | 0.0155 | 1.94E-120 |
| 19 | 45411941 | rs429358 | T | C | -1.2017 | 0.0189 | 1.17e-881 |
| 19 | 45412079 | rs7412 | T | C | -0.4673 | 0.0305 | 6.40E-53 |
| 19 | 45412741 | rs117656888 | C | G | 0.3763 | 0.0834 | 6.45E-06 |
| 19 | 45412955 | rs1081105 | A | C | -0.942 | 0.0436 | 1.51E-103 |
| 19 | 45413366 | rs1081106 | T | C | 0.2893 | 0.0296 | 1.47E-22 |
| 19 | 45413576 | rs75627662 | T | C | 0.7327 | 0.018 | 1.14e-362 |
| 19 | 45414392 | rs72654472 | T | G | -0.3732 | 0.0559 | 2.35E-11 |
| 19 | 45414399 | rs72654473 | A | C | -0.0138 | 0.0249 | 0.5803 |
| 19 | 45414451 | rs439401 | T | C | -0.3824 | 0.0159 | 7.61E-128 |
| 19 | 45415285 | rs138235833 | T | G | 0.2675 | 0.0402 | 2.78E-11 |
| 19 | 45415640 | rs445925 | A | G | -0.0057 | 0.0249 | 0.82 |
| 19 | 45415713 | rs10414043 | A | G | 1.1368 | 0.0201 | 1.74e-697 |
| 19 | 45415935 | rs7256200 | T | G | 1.1368 | 0.0201 | 7.52e-697 |
| 19 | 45416099 | rs72654437 | A | G | -0.2929 | 0.049 | 2.28E-09 |
| 19 | 45416291 | rs59325138 | T | C | -0.336 | 0.016 | 8.32E-98 |
| 19 | 45416478 | rs584007 | A | G | -0.3825 | 0.016 | 7.83E-127 |
| 19 | 45416831 | rs390082 | T | G | 0.0054 | 0.025 | 0.8298 |
| 19 | 45417200 | rs72654445 | A | G | -0.5425 | 0.0811 | 2.27E-11 |
| 19 | 45418196 | rs72654453 | C | G | 0.3637 | 0.0916 | 7.21E-05 |
| 19 | 45418486 | rs12691088 | A | G | 1.2217 | 0.0371 | 2.69E-238 |
| 19 | 45418961 | rs3826688 | T | C | -0.367 | 0.0162 | 5.36E-114 |
| 19 | 45420082 | rs73052335 | A | C | -1.1322 | 0.0209 | 7.04e-643 |
| 19 | 45421100 | rs3925681 | A | G | -0.4147 | 0.0174 | 2.61E-125 |
| 19 | 45421155 | rs184663600 | T | C | 0.2499 | 0.0708 | 0.0004188 |
| 19 | 45421156 | rs190542817 | A | G | 0.1838 | 0.1006 | 0.06755 |
| 19 | 45421204 | rs150966173 | T | C | 0.9332 | 0.044 | 8.86E-100 |
| 19 | 45421254 | rs12721046 | A | G | 1.0057 | 0.0197 | 2.37e-568 |
| 19 | 45421650 | rs140480140 | A | G | 0.9342 | 0.0439 | 2.62E-100 |
| 19 | 45421744 | rs12721056 | T | G | -0.3522 | 0.0178 | 4.26E-87 |
| 19 | 45421877 | rs484195 | A | G | -0.403 | 0.0163 | 1.80E-134 |
| 19 | 45421972 | chr19:45421972:D | A | AG | -0.349 | 0.0177 | 1.40E-86 |
| 19 | 45422561 | rs1064725 | T | G | 0.2724 | 0.0386 | 1.81E-12 |
| 19 | 45423636 | rs78959900 | A | G | -0.3486 | 0.0178 | 1.60E-85 |
| 19 | 45423944 | rs144311893 | T | C | -0.6358 | 0.0646 | 7.60E-23 |
| 19 | 45424351 | rs814573 | A | T | -0.9961 | 0.0225 | 1.45e-427 |
| 19 | 45425066 | rs188535946 | A | G | 0.9648 | 0.0454 | 2.38E-100 |
| 19 | 45425133 | rs193163858 | T | C | 0.4474 | 0.0564 | 2.10E-15 |
| 19 | 45425142 | rs185367012 | A | G | -0.1431 | 0.1337 | 0.2845 |
| 19 | 45425175 | rs157594 | T | G | -0.4352 | 0.0176 | 1.30E-134 |
| 19 | 45425178 | rs190712692 | A | G | -0.536 | 0.0733 | 2.68E-13 |
| 19 | 45425185 | rs140567345 | A | C | -0.067 | 0.055 | 0.2236 |
| 19 | 45425190 | rs191138207 | A | G | 0.4289 | 0.0631 | 1.07E-11 |
| 19 | 45425460 | rs157595 | A | G | -0.4329 | 0.017 | 2.43E-143 |
| 19 | 45425762 | rs75654248 | T | G | 0.2958 | 0.0615 | 1.52E-06 |
| 19 | 45425954 | rs182067414 | T | C | -0.3085 | 0.275 | 0.2619 |
| 19 | 45426792 | rs141622900 | A | G | -0.5237 | 0.0405 | 3.18E-38 |
| 19 | 45427125 | rs111789331 | A | T | 1.0592 | 0.0208 | 4.13e-564 |
| 19 | 45427136 | rs139136389 | T | C | -0.4938 | 0.0851 | 6.43E-09 |
| 19 | 45427353 | rs4803770 | C | G | 0.3645 | 0.0177 | 6.97E-94 |
| 19 | 45427648 | rs4803771 | C | G | 0.4446 | 0.085 | 1.72E-07 |
| 19 | 45427779 | rs117664574 | C | G | 0.3764 | 0.058 | 8.55E-11 |
| 19 | 45428234 | rs66626994 | A | G | 1.0665 | 0.0211 | 4.27e-556 |
| 19 | 45428459 | rs4803772 | T | C | -0.363 | 0.0186 | 1.55E-84 |
| 19 | 45429543 | rs71352239 | T | C | -0.3427 | 0.0196 | 2.20E-68 |
| 19 | 45429708 | rs60049679 | C | G | 0.7838 | 0.0379 | 5.75E-95 |
| 19 | 45430280 | rs5112 | C | G | 0.0749 | 0.02 | 0.0001834 |
| 19 | 45430417 | rs11878790 | T | C | 0.3011 | 0.0792 | 0.0001432 |
| 19 | 45431403 | rs73033507 | T | C | -0.362 | 0.0657 | 3.65E-08 |
| 19 | 45431453 | rs114448690 | A | G | -0.0134 | 0.0371 | 0.7167 |
| 19 | 45431636 | rs113345881 | A | G | -0.1768 | 0.0328 | 7.07E-08 |
| 19 | 45431658 | rs8106813 | A | G | 0.1861 | 0.021 | 9.23E-19 |
| 19 | 45431674 | rs118060185 | A | G | -0.1803 | 0.0621 | 0.00366 |
| 19 | 45431897 | rs112871012 | A | G | 0.1668 | 0.0327 | 3.36E-07 |
| 19 | 45432089 | rs111271293 | T | C | -0.1594 | 0.0323 | 7.74E-07 |
| 19 | 45432227 | chr19:45432227:D | G | GATT | -0.391 | 0.1037 | 0.0001616 |
| 19 | 45432278 | rs7259350 | T | C | -0.1753 | 0.0329 | 1.02E-07 |
| 19 | 45432505 | chr19:45432505:I | A | AT | 0.2396 | 0.0215 | 7.56E-29 |
| 19 | 45432505 | rs9636134 | A | T | 0.2132 | 0.0228 | 9.86E-21 |
| 19 | 45432557 | rs7259004 | C | G | 0.1653 | 0.0328 | 4.79E-07 |
| 19 | 45433148 | chr19:45433148:D | A | AAGGG | -0.0179 | 0.0366 | 0.6235 |
| 19 | 45435466 | chr19:45435466:I | CT | C | -0.0286 | 0.0375 | 0.4465 |
| 19 | 45435525 | rs140082891 | T | G | 0.2254 | 0.0871 | 0.009633 |
| 19 | 45436037 | rs74924179 | C | G | -0.3674 | 0.0676 | 5.44E-08 |
| 19 | 45436216 | rs7260330 | A | G | 0.0963 | 0.0218 | 9.98E-06 |
| 19 | 45436657 | rs28795074 | A | G | -0.047 | 0.0383 | 0.2192 |
| 19 | 45436753 | rs114533385 | T | C | 0.8281 | 0.0661 | 5.43E-36 |
| 19 | 45438554 | rs7254133 | T | C | 0.2905 | 0.0242 | 4.24E-33 |
| 19 | 45438575 | rs141441332 | A | C | 0.8399 | 0.0678 | 3.37E-35 |
| 19 | 45438643 | rs4263041 | A | G | 0.0501 | 0.0251 | 0.04603 |
| 19 | 45438842 | chr19:45438842:I | A | AG | 0.0889 | 0.0585 | 0.1284 |
| 19 | 45438842 | rs56308506 | A | G | 0.0522 | 0.057 | 0.3605 |
| 19 | 45439163 | rs35136575 | C | G | -0.0368 | 0.0268 | 0.1697 |
| 19 | 45439498 | rs118004808 | T | C | -0.5523 | 0.1015 | 5.27E-08 |
| 19 | 45440145 | chr19:45440145:D | CTG | C | 0.0501 | 0.0278 | 0.0718 |
| 19 | 45440529 | rs73045691 | A | G | 0.1563 | 0.0173 | 1.45E-19 |
| 19 | 45440761 | rs34810028 | A | T | -0.1028 | 0.0162 | 2.18E-10 |
| 19 | 45441283 | rs78592970 | T | G | -0.0351 | 0.0242 | 0.1474 |
| 19 | 45441438 | chr19:45441438:I | CTTGTT | C | 0.1287 | 0.018 | 9.71E-13 |
| 19 | 45441475 | rs190921611 | A | G | 0.139 | 0.0237 | 4.82E-09 |
| 19 | 45441482 | chr19:45441482:D | CG | C | -0.1258 | 0.0232 | 6.19E-08 |
| 19 | 45441608 | rs8106814 | T | C | 0.0322 | 0.0214 | 0.1324 |
| 19 | 45442349 | rs34041051 | T | C | -0.141 | 0.0169 | 6.84E-17 |
| 19 | 45442519 | rs35336243 | A | T | -0.1393 | 0.0168 | 1.16E-16 |
| 19 | 45442528 | rs12977604 | C | G | -0.0993 | 0.0159 | 4.46E-10 |
| 19 | 45442962 | rs10413096 | A | G | 0.0978 | 0.0159 | 7.13E-10 |
| 19 | 45443088 | rs73045696 | C | G | 0.1367 | 0.0167 | 3.24E-16 |
| 19 | 45443504 | rs59859410 | A | G | -0.134 | 0.0166 | 7.08E-16 |
| 19 | 45443647 | rs111809714 | T | C | -0.1176 | 0.0239 | 8.13E-07 |
| 19 | 45443917 | chr19:45443917:I | A | ATTGTT | -0.117 | 0.0171 | 8.94E-12 |
| 19 | 45443934 | rs71352241 | T | G | -0.2225 | 0.054 | 3.75E-05 |
| 19 | 45444524 | chr19:45444524:I | CT | C | 0.1006 | 0.0177 | 1.30E-08 |
| 19 | 45444566 | rs112784534 | T | G | 0.1352 | 0.0165 | 2.06E-16 |
| 19 | 45444627 | chr19:45444627:D | T | TCTC | 0.0196 | 0.0225 | 0.3854 |
| 19 | 45444646 | rs112391061 | A | G | 0.0519 | 0.0187 | 0.005492 |
| 19 | 45444742 | rs4803773 | A | G | -0.0863 | 0.0155 | 2.91E-08 |
| 19 | 45445506 | rs76214972 | A | G | 0.2581 | 0.0641 | 5.66E-05 |
| 19 | 45445517 | rs79429216 | A | G | 0.5984 | 0.0827 | 4.67E-13 |
| 19 | 45445860 | chr19:45445860:D | CGTG | C | 0.0112 | 0.0237 | 0.6381 |
| 19 | 45446261 | rs10409808 | C | G | -0.2212 | 0.0241 | 3.89E-20 |
| 19 | 45446271 | rs12721111 | T | C | 0.1087 | 0.0228 | 1.90E-06 |
| 19 | 45447161 | rs5157 | T | C | -0.0919 | 0.0149 | 6.67E-10 |
| 19 | 45447178 | rs5158 | T | C | -0.024 | 0.0225 | 0.2865 |
| 19 | 45447221 | rs12721109 | A | G | -0.4976 | 0.0646 | 1.32E-14 |
| 19 | 45447241 | rs12721108 | T | G | -0.2246 | 0.1292 | 0.08208 |
| 19 | 45448036 | rs1132899 | T | C | -0.116 | 0.0148 | 5.01E-15 |
| 19 | 45448084 | chr19:45448084 | A | G | 0.1274 | 0.138 | 0.3558 |
| 19 | 45448465 | rs5167 | T | G | -0.1286 | 0.0149 | 6.14E-18 |
| 19 | 45449166 | rs12721063 | A | G | -0.158 | 0.106 | 0.1363 |
| 19 | 45449199 | rs2288912 | C | G | -0.0913 | 0.0146 | 4.33E-10 |
| 19 | 45449284 | rs2288911 | T | G | -0.0904 | 0.0146 | 6.01E-10 |
| 19 | 45449491 | rs7249138 | A | T | 0.1164 | 0.0167 | 3.44E-12 |
| 19 | 45449693 | rs12709886 | T | C | -0.221 | 0.0636 | 0.00051 |

**Supplementary Table 3.** Univariate analyses of covariates among Health and Retirement study (HRS) participants with core measurements taken from 1995-2014. The study sample consists of participants with genetic data collected during their time in HRS. The analytic sample further restricts to participants with at least three visits of cognition measured from ages 60 and above that were assigned a cognition status. Analysis was split by genetic ancestry determined by principal component analysis: European ancestry (n=8399) and African ancestry (n=1605). Categorical variables are represented by n (%) with Chi-square test for association. Continuous variables are represented by mean (SD) with ANOVA test for association.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Study Sample** | **Excluded Sample** | **Analytic Sample** | ***P-value*** | **Analytic Sample European Ancestries** | **Analytic Sample African Ancestries** | ***P-value*** |
| **n = 12268** | **n=2051** | **n=10217** | **n=8399** | **n=1605** |
| **Summary cognitive status** |  |  |  | < 0.001 |  |  | <0.001 |
| Dementia | 1030 (9.90%) | 35 (8.82%) | 995 (9.95%) |  | 724 (8.62%) | 271 (16.9%) |  |
| CIND | 1090 (10.5%) | 29 (7.30%) | 1061 (10.6%) |  | 711 (8.47%) | 350 (21.8%) |  |
| Borderline CIND | 1610 (15.5%) | 42 (10.6%) | 1568 (15.7%) |  | 1256 (15.0%) | 312 (19.4%) |  |
| Normal | 6498 (62.5%) | 118 (29.7%) | 6380 (63.8%) |  | 5708 (68.0%) | 672 (41.9%) |  |
| Unclassified | 173 (1.66%) | 173 (43.6%) | 0 (0.00%) |  | . | . | . |
| **Polygenic score\*** |  |  |  |  |  |  |  |
| AD polygenic score(no *APOE*) | 0.00 (1.00) | 0.01 (1.00) | 0.00 (1.00) | 0.442 | 0.00 (1.00) | -0.02 (1.00) | . |
| AD polygenic score (with *APOE*) | 0.00 (1.00) | 0.02 (1.00) | 0.00 (1.00) | 0.35 | 0.00 (1.00) | -0.02 (1.00) | . |
| ***APOE* variant status †** |  |  |  | <0.001 |  |  | <0.001 |
| ε2/ ε2 | 97 (0.79%) | 30 (1.33%) | 67 (0.67%) |  | 47 (0.56%) | 20 (1.25%) |  |
| ε2/ ε3 | 1617 (13.2%) | 319 (14.1%) | 1298 (13.0%) |  | 1079 (12.8%) | 219 (13.6%) |  |
| ε2/ ε4 | 331 (2.70%) | 71 (3.14%) | 260 (2.60%) |  | 183 (2.18%) | 77 (4.80%) |  |
| ε3/ ε3 | 7062 (57.6%) | 1223 (54.0%) | 5839 (58.4%) |  | 5065 (60.3%) | 774 (48.2%) |  |
| ε3/ ε4 | 2853 (23.3%) | 544 (24.0%) | 2309 (23.1%) |  | 1861 (22.2%) | 448 (27.9%) |  |
| ε4/ ε4 | 308 (2.51%) | 77 (3.40%) | 231 (2.31%) |  | 164 (1.95%) | 67 (4.17%) |  |
| ***APOE-ε4* binary status ‡** |  |  |  | 0.015 |  |  | <0.001 |
| No ε4 | 8776 (71.5%) | 1572 (69.4%) | 7204 (72.0%) |  | 6191 (73.7%) | 1013 (63.1%) |  |
| ε4 present | 3492 (28.5%) | 692 (30.6%) | 2800 (28.0%) |  | 2208 (26.3%) | 592 (36.9%) |  |
| Age at last visit | 74.9 (9.11) | 75.4 (9.69) | 74.8 (9.08) | 0.242 | 75.3 (9.04) | 72.2 (8.83) | <0.001 |
| Year of last visit | 2013 (2.10) | 2012 (2.45) | 2013 (2.07) | <0.001 | 2013 (2.09) | 2013 (1.98) | 0.006 |
| **Sex** |  |  |  | 0.001 |  |  | <0.001 |
| Male | 5066 (41.3%) | 861 (38.0%) | 4205 (42.0%) |  | 3613 (43.0%) | 592 (36.9%) |  |
| Female | 7202 (58.7%) | 1403 (62.0%) | 5799 (58.0%) |  | 4786 (57.0%) | 1013 (63.1%) |  |
| **Education years** | 13.0 (2.67) | 13.1 (2.62) | 13.0 (2.69) | 0.075 | 13.2 (2.52) | 11.8 (3.18) | <0.001 |
| **Ancestry** |  |  |  | <0.001 |  |  |  |
| African | 9989 (81.4%) | 1590 (70.2%) | 8399 (84.0%) |  | 8399 (100%) | - |  |
| European | 2279 (18.6%) | 674 (29.8%) | 1605 (16.0%) |  | - | 1605 (100%) |  |
| **Cohort** |  |  |  | <0.001 |  |  | <0.001 |
| AHEAD | 1216 (9.91%) | 67 (2.96%) | 1149 (11.5%) |  | 1034 (12.3%) | 115 (7.17%) |  |
| CODA | 1000 (8.15%) | 48 (2.12%) | 952 (9.52%) |  | 873 (10.4%) | 79 (4.92%) |  |
| Remaining HRS cohorts | 10052 (81.9%) | 2149 (94.9%) | 7903 (79.0%) |  | 6492 (77.3%) | 1411 (87.9%) |  |
| **BMI (kg/m2) at last visit** | 28.9 (6.47) | 29.6 (6.81) | 28.8 (6.40) | <0.001 | 28.4 (6.17) | 30.4 (7.30) | <0.001 |
| Missing | 486 | 386 | 0 | . | - | - | . |
| **Ever hypertension** |  |  |  | 0.176 |  |  | <0.001 |
| No | 3176 (30.5%) | 113 (27.4%) | 3063 (30.6%) |  | 2796 (33.3%) | 267 (16.6%) |  |
| Yes | 7241 (69.5%) | 300 (72.6%) | 6941 (69.4%) |  | 5603 (66.7%) | 1338 (83.4%) |  |
| Missing | 1851 | 1851 | 0 | . | - | - | . |
| **Ever diabetes** |  |  |  | 0.162 |  |  | <0.001 |
| No | 7617 (73.1%) | 296 (70.0%) | 7321 (73.2%) |  | 6358 (75.7%) | 963 (60.0%) |  |
| Yes | 2810 (26.9%) | 127 (30.0%) | 2683 (26.8%) |  | 2041 (24.3%) | 642 (40.0%) |  |
| Missing | 1841 | 1841 | 0 | . | - | - | . |
| **Stroke** |  |  |  | <0.001 |  |  | <0.001 |
| No | 9177 (88.0%) | 344 (80.8%) | 8833 (88.3%) |  | 7461 (88.8%) | 1372 (85.5%) |  |
| Yes | 1253 (12.0%) | 82 (19.2%) | 1171 (11.7%) |  | 938 (11.2%) | 233 (14.5%) |  |
| Missing | 1838 | 1838 | 0 | . | - | - | . |
| **Depression status** |  |  |  | <0.001 |  |  | 0.005 |
| Low CESD § | 6620 (63.4%) | 228 (51.8%) | 6392 (63.9%) |  | 5417 (64.5%) | 975 (60.7%) |  |
| High CESD | 3824 (36.6%) | 212 (48.2%) | 3612 (36.1%) |  | 2982 (35.5%) | 630 (39.3%) |  |
| Missing | 1824 | 1824 | 0 |  | - | - |  |
| **Smoking** |  |  |  | 0.118 |  |  | <0.001 |
| Never | 4419 (42.6%) | 157 (42.0%) | 4262 (42.6%) |  | 3608 (43.0%) | 654 (40.7%) |  |
| Former | 4921 (47.4%) | 168 (44.9%) | 4753 (47.5%) |  | 4037 (48.1%) | 716 (44.6%) |  |
| Current | 1038 (10.0%) | 49 (13.1%) | 989 (9.89%) |  | 754 (8.98%) | 235 (14.6%) |  |
| Missing | 1890 | 1890 | 0 | . | - | - | . |
| **Alcohol** |  |  |  | 0.002 |  |  | <0.001 |
| No | 5524 (52.9%) | 259 (60.4%) | 5265 (52.6%) |  | 4198 (50.0%) | 1067 (66.5%) |  |
| Yes | 4909 (47.1%) | 170 (39.6%) | 4739 (47.4%) |  | 4201 (50.0%) | 538 (33.5%) |  |
| Missing | 1835 | 1835 (81.1%) | 0 | . | - | - | . |

Acronyms: CIND: Cognitive impairment – no dementia; AHEAD: Asset and Health Dynamics among the Oldest Old; CODA: Children of the Depression study; CESD: Center for Epidemiologic Studies for Depression Scale.

\*: Weights derived from Kunkle (IGAP2, 2019)

†: APOE status was genotyped using two SNPs (rs7412 and rs429358) resulting in three alleles of APOE. The frequencies listed are of the possible allelic combinations

‡: Binary status was determined by the presence of the ε4 allele in participants

§: Binary cutoff determined by ancestry specific median of all CESD measures prior to last cognitive assessment

Polygenic risk score (PGS) was standardized within ancestry

Univariate analyses of covariates among Health and Retirement study (HRS) participants with core measurements taken from 1995-2014. The study sample consists of participants with genetic data collected during their time in HRS. The analytic sample further restricts to participants with at least three visits of cognition measured from ages 60 and above that were assigned a cognition status. Analysis was split by genetic ancestry determined by principal component analysis: European ancestries (n=8399) and African ancestries (n=1605). Categorical variables are represented by n (%) with Chi-square test for association. Continuous variables are represented by mean (SD) with ANOVA test for association.

**Supplemental Table 4.** Pearson’s correlation coefficients between Alzheimer’s disease polygenic scores (PGS) created from the Kunkle et al., 2019 Alzheimer’s GWAS meta-analysis Stage 1 at different P-value thresholds for SNPs included in the AD PGS (pT=1.0, 0.3, 0.1, 0.05, 0.01, 0.001). All these AD PGSs are created after removing the linkage disequilibrium block of the *APOE* gene (chr19:45384477-45432606, GRCh37/hg19) from the summary statistics. Upper triangle (gray) contains correlation coefficients from European ancestry, lower triangle (no shading) from African ancestry. All correlations are significantly different than 0 (*P <* .0001).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **P-value inclusion threshold** | | | | | | |
|  |  | **1** | **0.3** | **0.1** | **0.05** | **0.01** | **0.001** |
| **P-value inclusion threshold** | **1** |  | 0.98 | 0.89 | 0.8 | 0.56 | 0.3 |
| **0.3** | 0.99 |  | 0.94 | 0.86 | 0.61 | 0.33 |
| **0.1** | 0.96 | 0.97 |  | 0.96 | 0.73 | 0.43 |
| **0.05** | 0.93 | 0.94 | 0.97 |  | 0.82 | 0.51 |
| **0.01** | 0.76 | 0.77 | 0.81 | 0.85 |  | 0.76 |
| **0.001** | 0.41 | 0.42 | 0.44 | 0.46 | 0.57 |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Pearson’s correlation coefficients between Alzheimer’s disease polygenic scores (PGS) created from the Kunkle et al., 2019 Alzheimer’s GWAS meta-analysis Stage 1 at different P-value thresholds for SNPs included in the AD PGS (pT=1.0, 0.3, 0.1, 0.05, 0.01, 0.001). All these AD PGSs are created after removing the linkage disequilibrium block of the APOE gene (chr19:45384477-45432606, GRCh37/hg19) from the summary statistics. Upper triangle (gray) contains correlation coefficients from European ancestries, lower triangle (no shading) from African ancestries. All correlations are significantly different than 0 (P < .0001). | | | | | | | | | |

**Supplemental Table 5.** Odds ratios (OR) of cognitive status, relative to normal status, explained by one standard deviation increase of polygenic score (PGS) and the presence of a *APOE-ε4* allele in participants in the Health and Retirement study (HRS), of European and African ancestry, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components. Examining different P-value thresholds for the Kunkle et al., 2019 GWAS meta-analysis Stage 1 for SNPs included in the AD PGS (pT=1.0, 0.3, 0.1, 0.05, 0.01, 0.001). Results shown are for Model 2a only.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **pT=1.0** |  |  | **pT=0.3** |  |  | **pT=0.1** |  |  | | **pT=0.05** | |  | |  | | **pT=0.01** | |  | |  | | **pT=0.001** | |  | |
|  | **N** | **OR** | **95% CI** | ***P-value*** | **OR** | **95% CI** | ***P-value*** | **OR** | **95% CI** | ***P-value*** | | **OR** | | **95% CI** | | ***P-value*** | | **OR** | | **95% CI** | | ***P-value*** | | **OR** | | **95% CI** | | ***P-value*** | |
| **European ancestry polygenic score** |  |  |  |  |  |  |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| Normal | 5708 | ref |  |  | ref |  |  | ref |  |  | | ref | |  | |  | | ref | |  | |  | | ref | |  | |  | |
| Borderline CIND | 1256 | 1.144 | (1.07, 1.23) | 0.0002 | 1.142 | (1.07, 1.22) | 0.0002 | 1.156 | (1.08, 1.24) | <0.0001 | | 1.147 | | (1.07, 1.23) | | <0.0001 | | 1.151 | | (1.08, 1.23) | | <.0001 | | 1.088 | | (1.02, 1.16) | | 0.0103 | |
| CIND | 711 | 1.041 | (0.95, 1.14) | 0.393 | 1.033 | (0.94, 1.13) | 0.5002 | 1.024 | (0.93, 1.12) | 0.6148 | | 1.029 | | (0.94, 1.13) | | 0.5425 | | 1.061 | | (0.97, 1.16) | | 0.188 | | 1.066 | | (0.98, 1.16) | | 0.1434 | |
| Dementia | 724 | 1.087 | (0.99, 1.2) | 0.0959 | 1.092 | (0.99, 1.21) | 0.0791 | 1.092 | (0.99, 1.2) | 0.0723 | | 1.091 | | (0.99, 1.2) | | 0.0704 | | 1.131 | | (1.03, 1.24) | | 0.0083 | | 1.154 | | (1.05, 1.26) | | 0.0019 | |
| **African ancestry polygenic score** |  |  |  |  |  |  |  |  |  |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |
| Normal | 672 | ref |  |  | ref |  |  | ref |  |  | | ref | |  | |  | | ref | |  | |  | | ref | |  | |  | |
| Borderline CIND | 312 | 0.952 | (0.63, 1.43) | 0.8108 | 0.903 | (0.62, 1.32) | 0.6002 | 0.889 | (0.65, 1.22) | 0.4665 | | 0.868 | | (0.65, 1.15) | | 0.3296 | | 1.061 | | (0.87, 1.29) | | 0.5625 | | 0.918 | | (0.79, 1.07) | | 0.276 | |
| CIND | 350 | 0.865 | (0.55, 1.35) | 0.5251 | 0.881 | (0.58, 1.35) | 0.5588 | 0.917 | (0.64, 1.31) | 0.6381 | | 0.84 | | (0.61, 1.17) | | 0.2983 | | 0.957 | | (0.76, 1.2) | | 0.7017 | | 0.911 | | (0.77, 1.08) | | 0.2816 | |
| Dementia | 271 | 1.106 | (0.65, 1.89) | 0.7146 | 1.151 | (0.69, 1.92) | 0.5905 | 1.092 | (0.71, 1.69) | 0.6928 | | 1.122 | | (0.75, 1.68) | | 0.5752 | | 1.289 | | (0.98, 1.7) | | 0.0721 | | 0.989 | | (0.81, 1.21) | | 0.9159 | |

Model 2a: β0 + β1(Polygenic score) + β2(age at last visit) + β3(sex) + β4(educational attainment) + β5(year of last visit) + β6(PC1) + β7(PC2)

Acronyms: CIND: Cognitive impairment – no dementia

Odds ratios (OR) of cognitive status, relative to normal status, explained by one standard deviation increase of polygenic score (PGS) and the presence of a APOE-ε4 allele in participants in the Health and Retirement study (HRS), of European and African ancestries, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components. Examining different P-value thresholds for the Kunkle et al., 2019 GWAS meta-analysis Stage 1 for SNPs included in the AD PGS (pT=1.0, 0.3, 0.1, 0.05, 0.01, 0.001). Results shown are for Model 2a only.

**Supplemental Table 6.** Odds ratios (OR) of cognitive status, relative to normal status, explained by one standard deviation increase of polygenic score (PGS) and the presence of a *APOE-ε4* allele in participants in the Health and Retirement study (HRS), of European and African ancestry, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components, excluding cases that are part of the AHEAD and CODA cohorts from the HRS. Logistic regressions were performed on data subsets by cognitive status, relative to normal cognition (ref).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Model 3** | | | | | | **Model 3 without AHEAD/CODA cohorts** | | |
|  | **N** | **OR** | **95% CI** | ***P-value*** | **N** | **OR** | | **95% CI** | ***P-value*** |
| **European ancestries** |  |  |  |  |  |  | |  |  |
| Polygenic score |  |  |  |  |  |  | |  |  |
| Normal | 5708 | ref |  |  | 4909 | ref | |  |  |
| Borderline CIND | 1256 | 1.14 | (1.07, 1.21) | <.0001 | 872 | 1.13 | | (1.05, 1.22) | 0.002 |
| CIND | 711 | 1.05 | (0.96, 1.14) | 0.298 | 409 | 1.05 | | (0.94, 1.17) | 0.377 |
| Dementia | 724 | 1.1 | (1.00, 1.20) | 0.049 | 302 | 1.05 | | (0.92, 1.20) | 0.447 |
| *APOE-ε4* |  |  |  |  |  |  | |  |  |
| Normal | 5708 | ref | - | - | 4909 | ref | | - | - |
| Borderline CIND | 1256 | 1.43 | (1.24, 1.65) | <.0001 | 872 | 1.42 | | (1.21, 1.68) | <.0001 |
| CIND | 711 | 1.73 | (1.43, 2.10) | <.0001 | 409 | 1.67 | | (1.32, 2.11) | <.0001 |
| Dementia | 724 | 2.42 | (1.99, 2.95) | <.0001 | 302 | 2.6 | | (2.00, 3.38) | <.0001 |
| **African ancestries** |  |  |  |  |  |  | |  |  |
| Polygenic score |  |  |  |  |  |  | |  |  |
| Normal | 672 | ref |  |  | 665 | ref | |  |  |
| Borderline CIND | 312 | 1.06 | (0.87, 1.30) | 0.555 | 291 | 1.03 | | (0.84, 1.26) | 0.803 |
| CIND | 350 | 0.96 | (0.76, 1.20) | 706 | 278 | 0.9 | | (0.71, 1.15) | 0.392 |
| Dementia | 271 | 1.29 | (0.97, 1.70) | 0.076 | 187 | 1.26 | | (0.93, 1.70) | 0.134 |
| *APOE-ε4* |  |  |  |  |  |  | |  |  |
| Normal | 672 | ref |  |  | 665 | ref | |  |  |
| Borderline CIND | 312 | 1.1 | (0.82, 1.47) | 0.534 | 291 | 1 | | (0.74, 1.35) | 0.994 |
| CIND | 350 | 1.08 | (0.78, 1.50) | 0.648 | 278 | 1.02 | | (0.72, 1.44) | 0.917 |
| Dementia | 271 | 1.77 | (1.20, 2.61) | 0.004 | 187 | 1.55 | | (1.02, 2.34) | 0.039 |

Model 3: β0 + β1(Polygenic score) + β2(APOE-ε4) + β3(age at last visit) + β4(sex) + β5(educational attainment) + β6(year of last visit) + β7(PC1) + β8(PC2)

Acronyms: CIND: Cognitive impairment – no dementia

Odds ratios (OR) of cognitive status, relative to normal status, explained by one standard deviation increase of polygenic score (PGS) and the presence of a APOE-ε4 allele in participants in the Health and Retirement study (HRS), of European and African ancestries, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components, excluding cases that are part of the AHEAD and CODA cohorts from the HRS. Logistic regressions were performed on data subsets by cognitive status, relative to normal cognition (ref).

**Supplemental Table 7.** Odds ratios (OR) of cognitive status, relative to normal status, explained by a one standard deviation increase of polygenic score (PGS) and *APOE-ε4* status based on *ε4* allele copies (0, 1, or 2 copies of *ε4*)of participants in the Health and Retirement study (HRS), of European and African ancestry, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components. Final model was additionally adjusted for by BMI, diabetes, hypertension, smoking, and depression status. Logistic regressions were performed on data subsets based on cognition status, relative to normal cognition (ref).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  | **Model 2a** |  |  | **Model 2b** |  |  | **Model 3** |  |
|  | ***APOE* status** | **N** | **OR** | **95% CI** | ***P-value*** | **OR** | **95% CI** | ***P-value*** | **OR** | **95% CI** | ***P-value*** |
| **European ancestries** |  |  |  |  |  |  |  |  |  |  |  |
| Polygenic score |  |  |  |  |  |  |  |  |  |  |  |
| Normal |  | 5708 | ref |  |  |  |  |  | ref |  |  |
| Borderline CIND |  | 1256 | 1.15 | (1.08, 1.23) | <.0001 | ~~-~~ | ~~-~~ | ~~-~~ | 1.14 | (1.06, 1.21) | <.0001 |
| CIND |  | 711 | 1.06 | (0.97, 1.16) | 0.188 | ~~-~~ | ~~-~~ | ~~-~~ | 1.05 | (0.96, 1.14) | 0.3 |
| Dementia |  | 724 | 1.13 | (1.03, 1.24) | 0.008 | ~~-~~ | ~~-~~ | ~~-~~ | 1.09 | (1.00, 1.20) | 0.06 |
| *APOE-ε4* |  |  |  |  |  |  |  |  |  |  |  |
| Reference |  | - |  |  |  | ref |  |  | ref |  |  |
| Borderline CIND | *~/ ε4* | 329 |  |  |  | 1.41 | (1.21, 1.64) | <.0001 | 1.38 | (1.19, 1.61) | <.0001 |
| CIND | *~/ ε4* | 200 | ~~-~~ | ~~-~~ | ~~-~~ | 1.72 | (1.41, 2.10) | <.0001 | 1.71 | (1.41, 2.09) | <.0001 |
| Dementia | *~/ ε4* | 237 |  |  |  | 2.32 | (1.90, 2.85) | <.0001 | 2.29 | (1.87, 2.81) | <.0001 |
| Borderline CIND | *ε4/ ε4* | 33 |  |  |  | 2.27 | (1.47, 3.49) | <.0001 | 2.19 | (1.42, 3.38) | <.0001 |
| CIND | *ε4/ ε4* | 15 | ~~-~~ | ~~-~~ | ~~-~~ | 1.99 | (1.06, 3.74) | 0.032 | 1.98 | (1.05, 3.71) | 0.034 |
| Dementia | *ε4/ ε4* | 23 |  |  |  | 5.09 | (2.92, 8.88) | <.0001 | 4.93 | (2.82, 8.62) | <.0001 |
| **African ancestries** |  |  |  |  |  |  |  |  |  |  |  |
| Polygenic score |  |  |  |  |  |  |  |  |  |  |  |
| Normal |  | 672 | ref |  |  | ~~-~~ | ~~-~~ | ~~-~~ | ref |  |  |
| Borderline CIND |  | 312 | 1.06 | (0.87, 1.29) | 0.562 | ~~-~~ | ~~-~~ | ~~-~~ | 1.06 | (0.87, 1.30) | 0.55 |
| CIND |  | 350 | 0.96 | (0.76, 1.20) | 0.702 | ~~-~~ | ~~-~~ | ~~-~~ | 0.96 | (0.76, 1.20) | 0.701 |
| Dementia |  | 271 | 1.29 | (0.98, 1.70) | 0.072 |  |  |  | 1.3 | (0.98, 1.72) | 0.07 |
| *APOE-ε4* |  |  |  |  |  |  |  |  |  |  |  |
| Reference |  | - | ~~-~~ | ~~-~~ | ~~-~~ | ref |  |  | ref |  |  |
| Borderline CIND | *~/ ε4* | 99 |  |  |  | 1.08 | (0.80, 1.47) | 0.61 | 1.08 | (0.80, 1.47) | 0.607 |
| CIND | *~/ ε4* | 111 |  |  |  | 1.12 | (0.79, 1.57) | 0.527 | 1.11 | (0.79, 1.57) | 0.53 |
| Dementia | *~/ ε4* | 104 | ~~-~~ | ~~-~~ | ~~-~~ | 1.68 | (1.12, 2.52) | 0.012 | 1.68 | (1.12, 2.51) | 0.013 |
| Borderline CIND | *ε4/ ε4* | 14 |  |  |  | 1.19 | (0.60, 2.39) | 0.617 | 1.2 | (0.60, 2.40) | 0.602 |
| CIND | *ε4/ ε4* | 10 |  |  |  | 0.79 | (0.32, 1.96) | 0.609 | 0.79 | (0.32, 1.96) | 0.605 |
| Dementia | *ε4/ ε4* | 14 | ~~-~~ | ~~-~~ | ~~-~~ | 2.58 | (1.09, 6.12) | 0.032 | 2.65 | (1.11, 6.33) | 0.028 |

Odds ratios (OR) of cognitive status, relative to normal status, explained by a one standard deviation increase of polygenic score (PGS) and APOE-ε4 status based on ε4 allele copies (0, 1, or 2 copies of ε4) of participants in the Health and Retirement study (HRS), of European and African ancestries, adjusted for age, sex, education, year of last cognition visit, and two genetic principal components. Final model was additionally adjusted for by BMI, diabetes, hypertension, smoking, and depression status. Logistic regressions were performed on data subsets based on cognition status, relative to normal cognition (ref). Acronyms: CIND: Cognitive impairment – no dementia

**Supplementary Table 8.** Receiver operating characteristic (ROC) contrast statistics for logistic regression models, looking at the association between polygenic risk score (PGS) and presence of *APOE-ε4* allele (APOE), with summary cognition statuses (dementia only) relative to normal status. This is among participants in the Health and Retirement Study (HRS) with more than two waves of cognition measured at or after age 60, by ancestry (nEuropean=6432 and nAfrican=943).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Model** | **C** | **Difference** | **Standard** | **Lower** | **Upper** | **Chi2** | ***P-value*** |
| **Error** | **CI** | **CI** |
| **European Ancestries** |  |  |  |  |  |  |  |  |
| Dementia ~ age + sex + education + year + PC1 + PC2 | 1 | 0.866 | ref | - | - | - | - | - |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS | 2a | 0.867 | 0.000624 | 0.000607 | -0.00057 | 0.00181 | 1.0548 | 0.3044 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + APOE | 2b | 0.874 | 0.00753 | 0.00198 | 0.00366 | 0.0114 | 14.5236 | 0.0001 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS + APOE | 3 | 0.874 | 0.00779 | 0.00202 | 0.00383 | 0.0118 | 14.8448 | 0.0001 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS+ APOE † | 3 | 0.874 | 0.000258 | 0.000431 | -0.00059 | 0.0011 | 0.3595 | 0.5488 |
|  |  |  |  |  |  |  |  |  |
| **African Ancestries** |  |  |  |  |  |  |  |  |
| Dementia ~ age + sex + education + year + PC1 + PC2 | 1 | 0.89 | ref | - | - | - | - | - |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS | 2a | 0.891 | 0.000747 | 0.00145 | -0.0021 | 0.0036 | 0.2635 | 0.6077 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + APOE | 2b | 0.892 | 0.00174 | 0.00248 | -0.00313 | 0.00661 | 0.4915 | 0.4832 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS + APOE | 3 | 0.893 | 0.00317 | 0.00277 | -0.00226 | 0.0086 | 1.3126 | 0.2519 |
| Dementia ~ age + sex + education + year + PC1 + PC2 + PGS+ APOE † | 3 | 0.893 | 0.00143 | 0.00137 | -0.00126 | 0.00412 | 1.0897 | 0.2965 |

† Relative to Model 2b

Receiver operating characteristic (ROC) contrast statistics for logistic regression models, looking at the association between polygenic risk score (PGS) and presence of APOE-ε4 allele (APOE), with summary cognition statuses (dementia only) relative to normal status. This is among participants in the Health and Retirement Study (HRS) with more than two waves of cognition measured at or after age 60, by ancestry: European and African ancestries (nEuropean=6432 and nAfrican=943)

**Supplementary Table 9.** Attributable fraction (AF) for logistic regression models, looking at the association between Alzheimer’s disease polygenic risk score (PGS) and presence of *APOE-ε4* allele (APOE), with summary cognition status relative to normal status. This is among a subset of participants in the Health and Retirement Study (HRS) with more than two waves of cognition measured at or after age 60 and in the top 20% or bottom 20% of Alzheimer’s disease polygenic score, by ancestry: European (n=3359) and African ancestries (n=642). PGSs are dichotomized into top 20% and bottom 20% of Alzheimer’s disease polygenic score and *APOE-ε4* is modeled as any copy of *APOE-ε4* versus none. Crude models include only the variable of interest (AD PGS top 20% vs bottom 20% or *APOE-ε4* carrier) as predictors. Fully adjusted models include age at last cognition visit, sex, education, year of last cognition visit, two genetic principal components, *APOE-ε4* status, and the AD PGS (top 20% vs bottom 20%).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Borderline CIND** | | | **CIND** | | | **Dementia** | | |
| **European ancestries** | **PAF (%)** | **(95%CI)** | **P** | **PAF** | **(95%CI)** | **P** | **PAF** | **(95%CI)** | **P** |
| Crude |  |  |  |  |  |  |  |  |  |
| Polygenic score | 15.61 | (5.0, 26.2) | 0.004 | 4.64 | (-10.8, 20.1) | 0.56 | 5.36 | (-9.8, 20.5) | 0.48 |
| APOE-ε4 | 6.96 | (-0.2, 15.9) | 0.13 | 4.77 | (-7.5, 17.0) | 0.45 | 15.52 | (5.1, 26.0) | 0.004 |
| Fully adjusted |  |  |  |  |  |  |  |  |  |
| Polygenic score | 18.99 | (8.5, 29.5) | <.0001 | 3.78 | (-13.2, 20.7) | 0.66 | 9.62 | (-6.1, 25.4) | 0.23 |
| APOE-ε4 | 9.58 | (0.9, 18.2) | 0.030 | 8.93 | (2.7, 20.5) | 0.13 | 21.39 | (11.9, 30.8) | <.0001 |
|  | **n=2766** | | | **n=2547** | | | **n=2562** | | |
|  |  |  |  |  |  |  |  |  |  |
| **African ancestries** | **PAF** | **(95%CI)** | **P** | **PAF** | **(95%CI)** | **P** | **PAF** | **(95%CI)** | **P** |
| Crude |  |  |  |  |  |  |  |  |  |
| Polygenic score | 13.31 | (-7.4, 34.0) | 0.21 | 9.43 | (-11.7, 35.6) | 0.31 | 39.6 | (21.7, 57.5) | <.0001 |
| APOE-ε4 | 4.33 | (-15.7, 24.4) | 0.67 | -2.35 | (-23.3, 18.6) | 0.19 | 9.46 | (-12.1, 31.0) | 0.39 |
| Fully adjusted |  |  |  |  |  |  |  |  |  |
| Polygenic score | 11.14 | (-20.3, 42.6) | 0.49 | -2.82 | (-45.8, 40.1) | 0.40 | 53.88 | (35.7, 72.0) | <.0001 |
| APOE-ε4 | 6.46 | (-13.1, 26.0) | 0.52 | -1.34 | (-24.4, 21.7) | 0.22 | 12.14 | (-11.6, 35.8) | 0.32 |
|  | **n=405** | | | **n=410** | | | **n=379** | | |

Acronyms: CIND: Cognitive impairment – no dementia

Population attributable fraction (PAF) for logistic regression models, looking at the association between polygenic risk score (PGS) and presence of APOE-ε4 allele (APOE), with summary cognition status relative to normal status. This is among participants in the Health and Retirement Study (HRS) with more than two waves of cognition measured at or after age 60, by ancestry: European and African ancestries. PGSs are dichotomized into top 20% and bottom 20% of Alzheimer’s disease polygenic score andAPOE-ε4 is modeled as any copy of APOE-ε4 versus none. Crude models include only the variable of interest (AD PGS top 20% vs bottom 20% or APOE-ε4 carrier) as predictors. Fully adjusted models include age at last cognition visit, sex, education, year of last cognition visit, two genetic principal components, APOE-ε4 status, and the AD PGS (top 20% vs bottom 20%).