# SUPPLEMENTARY TABLES

Supplementary Table 1. Population characteristics by study

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **GWAS Datasets** | **The Cancer Genome Atlas** |
| **Cases** | **Controls** | **Cases** |
| **Total** | 4,512 | 10,582 | 356 |
| GICCa | 2,456 | 3,264 | -- |
| SFAGS-GWASb | 511 | 2,367 | -- |
| MDA-GWASc | 643 | 2,228 | -- |
| Gliomascand | 902 | 2,723 | -- |
| **Male (%)** | 2,832 (62.8%) | 5,167 (48.8%) | 221 (62.1%) |
| GICCa | 1,573 (64.0%) | 1,868 (57.2%) | -- |
| SFAGS-GWASb | 333 (65.2%) | 749 (31.6%) | -- |
| MDA-GWASc | 397 (61.7%) | 1,086 (48.7%) | -- |
| Gliomascand | 529 (58.6%) | 1,464 (53.8%) | -- |
| **Mean Age (SD)** | 57.5 (12.0) | 56.4 (15.4) | 59.8 (12.9) |
| GICCa | 57.8 (11.4) | 54.9 (13.8) | -- |
| SFAGS-GWASb | 56.3 (11.8) | 49.7 (13.8) | -- |
| MDA-GWASc | 52.7 (11.6) | Modal age group:60-69**e** (males); and 65-69f (females) | -- |
| Gliomascand | 60.8 (12.8) | 64.0 (15.4) | -- |

*a. Data from Glioma International Case-Control Study (GICC; Melin, et al.1)*

*b. Data from San Francisco Adult Glioma Study GWAS (SFAGS-GWAS; Wrensch, et al.2)*

 *c. data from MD Anderson Cancer Center GWAS (MDA-GWAS; Shete, et al. 3)*

*d. Data from the National Cancer Institute’s Gliomascan (Gliomascan; Rajaraman, et al.4)*

*e. Data from CGEMS prostate study (Yeager et al.5). Continuous age is not available, age distribution is as follows 50-59: 12.3%, 60-69: 56.7%, 70-79: 30.7%, 80-89: 0.3%*

*f. Data from CGEMS breast study (Hunter et al.6). Continuous age is not available, age distribution is as follows: 0-54: 4.3%, 55-59: 15.0%, 60-64: 23.6%, 65-69: 27.5%, 70-74: 19.0%, 75-99: 10.7%*

Supplementary Table 2. Age-specific odds ratios (OR), 95% confidence intervals (95% CI), and p values from meta-analysis and individual studies.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **RSID (Loci)** | **Risk Allele** | **Associated Gene** | **Study** | **Minor allele frequencies** | **Age-stratified results** |
| **Controls (all ages)** | **Cases** | **Diagnosis Ages 18-53** **(Below Median Age-at-diagnosis)** | **Diagnosis Ages 54-63** **(Median Age-at-diagnosis)** | **Diagnosis Ages 64+** **(Above Median Age-at-diagnosis)** |
| **18-53** | **54-63** | **64+** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** |
| rs723527 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | 0.410 | 0.366 | 0.351 | 0.347 | 1.37x10-5 | 1.19 (1.10-1.29) | 0.2992 | 3.67 | 18.29 | 1.50x10-9 | 1.28 (1.18-1.39) | 0.6193 | 1.78 | 0.00 | 2.14x10-11 | 1.32 (1.21-1.43) | 0.2263 | 4.35 | 30.99 |
| GICC | 0.427 | 0.355 | 0.348 | 0.351 | 2.66x10-5 | 1.28 (1.14-1.43) | -- | -- | -- | 3.72x10-7 | 1.33 (1.19-1.49) | -- | -- | -- | 2.12x10-7 | 1.34 (1.20-1.49) | -- | -- | -- |
| SFAGS-GWAS  | 0.398 | 0.345 | 0.334 | 0.358 | 0.0601 | 1.23 (0.99-1.53) | -- | -- | -- | 0.0360 | 1.29 (1.02-1.64) | -- | -- | -- | 0.3053 | 1.14 (0.89-1.46) | -- | -- | -- |
| Gliomascan | 0.405 | 0.389 | 0.376 | 0.325 | 0.3372 | 1.10 (0.90-1.35) | -- | -- | -- | 0.1460 | 1.15 (0.95-1.39) | -- | -- | -- | 4.84x10-6 | 1.43 (1.23-1.67) | -- | -- | -- |
| MDA-GWAS | 0.403 | 0.390 | 0.346 | 0.382 | 0.4872 | 1.06 (0.89-1.27) | -- | -- | -- | 0.0146 | 1.28 (1.05-1.57) | -- | -- | -- | 0.5770 | 1.08 (0.82-1.44) | -- | -- | -- |
| rs11979158 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | 0.166 | 0.141 | 0.131 | 0.124 | 2.47x10-4 | 1.22 (1.10-1.36) | 0.8084 | 0.97 | 0.00 | 6.13x10-8 | 1.35 (1.21-1.50) | 0.8007 | 1.00 | 0.00 | 2.18x10-10 | 1.42 (1.27-1.58) | 0.8696 | 0.72 | 0.00 |
| GICC | 0.176 | 0.140 | 0.127 | 0.126 | 0.0038 | 1.25 (1.08-1.46) | -- | -- | -- | 5.56x10-6 | 1.42 (1.22-1.64) | -- | -- | -- | 7.99x10-7 | 1.45 (1.25-1.68) | -- | -- | -- |
| SFAGS-GWAS  | 0.152 | 0.120 | 0.126 | 0.125 | 0.0573 | 1.33 (0.99-1.77) | -- | -- | -- | 0.0944 | 1.31 (0.95-1.80) | -- | -- | -- | 0.2050 | 1.24 (0.89-1.74) | -- | -- | -- |
| Gliomascan | 0.166 | 0.155 | 0.149 | 0.120 | 0.3124 | 1.14 (0.88-1.48) | -- | -- | -- | 0.0972 | 1.23 (0.96-1.58) | -- | -- | -- | 5.17x10-4 | 1.43 (1.17-1.76) | -- | -- | -- |
| MDA-GWAS | 0.168 | 0.147 | 0.129 | 0.118 | 0.2420 | 1.15 (0.91-1.44) | -- | -- | -- | 0.0419 | 1.31 (1.01-1.70) | -- | -- | -- | 0.0837 | 1.39 (0.96-2.01) | -- | -- | -- |
| rs55705857 (8q24.21) | A/**G** | *CCDC26* | Meta-analysis | 0.060 | 0.088 | 0.063 | 0.069 | 9.30x10-11 | 1.76 (1.49-2.10) | 0.3040 | 3.63 | 17.41 | 0.4225 | 1.08 (0.90-1.28) | 0.5380 | 2.17 | 0.00 | 0.0280 | 1.21 (1.02-1.44) | 0.0811 | 6.73 | 55.41 |
| GICC | 0.056 | 0.085 | 0.056 | 0.058 | 6.93x10-7 | 1.82 (1.44-2.31) | -- | -- | -- | 0.6121 | 1.06 (0.84-1.36) | -- | -- | -- | 0.4955 | 1.09 (0.86-1.38) | -- | -- | -- |
| SFAGS-GWAS  | 0.054 | 0.099 | 0.067 | 0.049 | 2.88x10-4 | 2.50 (1.52-4.09) | -- | -- | -- | 0.5241 | 1.19 (0.69-2.05) | -- | -- | -- | 0.4330 | 0.79 (0.45-1.41) | -- | -- | -- |
| Gliomascan | 0.065 | 0.087 | 0.084 | 0.090 | 0.1666 | 1.35 (0.88-2.07) | -- | -- | -- | 0.2083 | 1.31 (0.86-1.98) | -- | -- | -- | 0.0138 | 1.48 (1.08-2.02) | -- | -- | -- |
| MDA-GWAS | 0.067 | 0.090 | 0.060 | 0.097 | 0.0151 | 1.63 (1.10-2.41) | -- | -- | -- | 0.4518 | 0.85 (0.56-1.30) | -- | -- | -- | 0.0356 | 1.99 (1.05-3.80) | -- | -- | -- |

*Abbreviations: GICC: Glioma International Case-Control Study; SFAGS-GWAS: San Francisco Adult Glioma Study GWAS; MAF: Minor allele frequency; MDA-GWAS: MD Anderson GWAS*

**Supplementary Table 3 Age-specific odds ratios (OR), 95% confidence intervals (95% CI), and p values from meta-analysis and individual studies for rs723527, rs11979158, and rs55705857 for cases diagnosed in 2000 and later**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **RSID (Loci)** | **Risk Allele** | **Associated Gene** | **Study** | **Minor allele frequencies** | **Sample size** | **Age-stratified results** |
| **Controls (all ages)** | **Cases** | **Controls (all ages)** | **Cases** | **Diagnosis Ages 18-53** **(Below Median Age-at-diagnosis)** | **Diagnosis Ages 54-63** **(Median Age-at-diagnosis)** | **Diagnosis Ages 64+** **(Above Median Age-at-diagnosis)** |
| **18-53** | **54-63** | **64+** | **18-53** | **54-63** | **64+** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** | **P** | **OR (95% CI)** | **Phet** | **Q** | **I2** |
| rs723527 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | 0.410 | 0.364 | 0.351 | 0.349 | 10,582 | 1,258 | 1,272 | 1,292 | 3.54x10-5 | 1.21 (1.11-1.33) | 0.1637 | 5.11 | 41.33 | 6.96x10-8 | 1.28 (1.17-1.40) | 0.2731 | 3.89 | 22.96 | 3.68x10-9 | 1.31 (1.20-1.43) | 0.0221 | 9.62 | 68.80 |
| GICC | 0.427 | 0.355 | 0.348 | 0.351 | 3,264 | 795 | 823 | 838 | 2.66x10-5 | 1.28 (1.14-1.43) | -- | -- | -- | 3.72x10-7 | 1.33 (1.19-1.49) | -- | -- | -- | 2.12x10-7 | 1.34 (1.20-1.49) | -- | -- | -- |
| SFAGS-GWAS  | 0.398 | 0.338 | 0.339 | 0.355 | 2,367 | 167 | 143 | 114 | 0.0406 | 1.28 (1.01-1.61) | -- | -- | -- | 0.0718 | 1.26 (0.98-1.62) | -- | -- | -- | 0.3152 | 1.15 (0.87-1.53) | -- | -- | -- |
| Gliomascan | 0.405 | 0.406 | 0.380 | 0.318 | 2,228 | 117 | 175 | 267 | 0.5962 | 0.90 (0.61-1.33) | -- | -- | -- | 0.7554 | 0.95 (0.69-1.31) | -- | -- | -- | 7.36x10-5 | 1.59 (1.26-1.99) | -- | -- | -- |
| MDA-GWAS | 0.403 | 0.397 | 0.344 | 0.438 | 2,723 | 179 | 131 | 73 | 0.7588 | 1.04 (0.83-1.29) | -- | -- | -- | 0.0514 | 1.29 (1.00-1.67) | -- | -- | -- | 0.3839 | 0.86 (0.62-1.21) | -- | -- | -- |
| rs11979158 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | 0.166 | 0.138 | 0.129 | 0.126 | 10,582 | 1,258 | 1,272 | 1,292 | 3.24x10-4 | 1.25 (1.11-1.41) | 0.778 | 1.10 | 0.00 | 1.08x10-7 | 1.39 (1.23-1.57) | 0.7724 | 1.12 | 0.00 | 8.09x10-9 | 1.43 (1.26-1.61) | 0.5305 | 2.21 | 0.00 |
| GICC | 0.176 | 0.140 | 0.127 | 0.126 | 3,264 | 795 | 823 | 838 | 0.0038 | 1.25 (1.08-1.46) | -- | -- | -- | 5.56x10-6 | 1.42 (1.22-1.64) | -- | -- | -- | 7.99x10-7 | 1.45 (1.25-1.68) | -- | -- | -- |
| SFAGS-GWAS  | 0.152 | 0.117 | 0.115 | 0.132 | 2,367 | 167 | 143 | 114 | 0.0466 | 1.37 (1.00-1.88) | -- | -- | -- | 0.0384 | 1.42 (1.02-1.99) | -- | -- | -- | 0.3867 | 1.18 (0.81-1.72) | -- | -- | -- |
| Gliomascan | 0.166 | 0.154 | 0.154 | 0.118 | 2,228 | 117 | 175 | 267 | 0.9552 | 1.01 (0.62-1.66) | -- | -- | -- | 0.5762 | 1.12 (0.75-1.69) | -- | -- | -- | 0.0019 | 1.62 (1.19-2.19) | -- | -- | -- |
| MDA-GWAS | 0.168 | 0.140 | 0.118 | 0.137 | 2,723 | 179 | 131 | 73 | 0.1977 | 1.21 (0.91-1.61) | -- | -- | -- | 0.0426 | 1.41 (1.01-1.97) | -- | -- | -- | 0.3922 | 1.21 (0.78-1.88) | -- | -- | -- |
| rs55705857 (8q24.21) | A/**G** | *CCDC26* | Meta-analysis | 0.060 | 0.088 | 0.061 | 0.067 | 10,582 | 1,258 | 1,272 | 1,292 | 5.47x10-10 | 1.84 (1.52-2.23) | 0.2703 | 3.92 | 23.45 | 0.7143 | 1.04 (0.85-1.27) | 0.7178 | 1.35 | 0.00 | 0.1916 | 1.14 (0.94-1.39) | 0.2472 | 4.14 | 27.45 |
| GICC | 0.056 | 0.085 | 0.056 | 0.058 | 3,264 | 795 | 823 | 838 | 6.93x10-7 | 1.82 (1.44-2.31) | -- | -- | -- | 0.6121 | 1.06 (0.84-1.36) | -- | -- | -- | 0.4955 | 1.09 (0.86-1.38) | -- | -- | -- |
| SFAGS-GWAS  | 0.054 | 0.100 | 0.069 | 0.055 | 2,367 | 167 | 143 | 114 | 4.84x10-4 | 2.61 (1.52-4.47) | -- | -- | -- | 0.4708 | 1.24 (0.69-2.21) | -- | -- | -- | 0.8318 | 0.93 (0.48-1.82) | -- | -- | -- |
| Gliomascan | 0.065 | 0.079 | 0.081 | 0.088 | 2,228 | 117 | 175 | 267 | 0.9631 | 1.02 (0.47-2.19) | -- | -- | -- | 0.9968 | 1.00 (0.50-2.00) | -- | -- | -- | 0.5867 | 1.14 (0.71-1.81) | -- | -- | -- |
| MDA-GWAS | 0.067 | 0.097 | 0.056 | 0.107 | 2,723 | 179 | 131 | 73 | 0.0179 | 1.83 (1.11-3.01) | -- | -- | -- | 0.4011 | 0.79 (0.45-1.38) | -- | -- | -- | 0.0248 | 2.37 (1.12-5.06) | -- | -- | -- |

Abbreviations: GICC: Glioma International Case-Control Study; SFAGS-GWAS: San Francisco Adult Glioma Study GWAS; MAF: Minor allele frequency; MDA-GWAS: MD Anderson GWAS

Supplementary Table 4 .Case-only betas, 95% confidence intervals (95% CI), and p values from meta-analysis and individual studies for selected previous GWAS hits

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SNP (Locus)** | **Risk Allele** | **Associated Gene** | **Study** | **All Ages** | **Ages 54+ only** |
| **Beta (95% CI)** | **P** | **Meta-analysis** | **Beta (95% CI)** | **p** | **Meta-analysis** |
| **pFixed** | **pRandom** | **Phet** | **Q** | **I2** | **pFixed** | **pRandom** | **Phet** | **Q** | **I2** |
| rs10069690 (5p15.33) | C/**T** | *TERT* | Meta-analysis | 0.76 (0.24,1.29) | -- | 0.0043 | 0.0053 | 0.3754 | 3.11 | 3.45 | 0.13 (-0.23,0.50) |  | 0.4818 | 0.4814 | 0.0328 | 8.75 | 65.71 |
| GICC | 0.60 (-0.07,1.27) | 0.0812 | -- | -- | -- | -- | -- | 0.06 (-0.40,0.51) | 0.8102 | -- | -- | -- |  |  |
| SFAGS-GWAS  | 1.92 (0.24,3.61) | 0.0255 | -- | -- | -- | -- | -- | 1.32 (0.08,2.57) | 0.0375 | -- | -- | -- |  |  |
| Gliomascan | 1.33 (-0.17,2.84) | 0.0828 | -- | -- | -- | -- | -- | -0.75 (-1.69,0.18) | 0.1144 | -- | -- | -- |  |  |
| MDA-GWAS | 0.31 (-0.93,1.55) | 0.6263 | -- | -- | -- | -- | -- | 0.85 (-0.23,1.94) | 0.1240 | -- | -- | -- |  |  |
| rs723527 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | -0.48 (-0.98,0.01) | -- | 0.0564 | 0.0848 | 0.2490 | 4.12 | 27.14 | -0.02 (-0.37,0.33) |  | 0.9158 | 0.8817 | 0.3719 | 1.00 | 0.00 |
| GICC | -0.14 (-0.81,0.52) | 0.6704 | -- | -- | -- | -- | -- | 0.14 (-0.31,0.59) | 0.5434 | -- | -- | -- |  |  |
| SFAGS-GWAS  | -0.17 (-1.67,1.34) | 0.8276 | -- | -- | -- | -- | -- | -0.32 (-1.51,0.86) | 0.5916 | -- | -- | -- |  |  |
| Gliomascan | -0.70 (-2.02,0.62) | 0.2977 | -- | -- | -- | -- | -- | -0.63 (-1.46,0.21) | 0.1409 | -- | -- | -- |  |  |
| MDA-GWAS | -1.44 (-2.55,-0.33) | 0.0111 | -- | -- | -- | -- | -- | 0.29 (-0.71,1.29) | 0.5736 | -- | -- | -- |  |  |
| rs11979158 (7p11.2) | **A**/G | *EGFR* | Meta-analysis | -1.08 (-1.76,-0.39) | -- | 0.0021 | 0.0021 | 0.6140 | 1.80 | 0.00 | -0.05 (-0.55,0.45) |  | 0.8507 | 0.8507 | 0.7327 | 3.13 | 4.17 |
| GICC | -0.83 (-1.76,0.10) | 0.0809 | -- | -- | -- | -- | -- | 0.10 (-0.55,0.74) | 0.7628 | -- | -- | -- |  |  |
| SFAGS-GWAS  | -0.84 (-3.03,1.35) | 0.4519 | -- | -- | -- | -- | -- | -0.84 (-2.52,0.85) | 0.3305 | -- | -- | -- |  |  |
| Gliomascan | -0.80 (-2.65,1.04) | 0.3936 | -- | -- | -- | -- | -- | -0.30 (-1.48,0.89) | 0.6252 | -- | -- | -- |  |  |
| MDA-GWAS | -1.97 (-3.44,-0.50) | 0.0087 | -- | -- | -- | -- | -- | 0.15 (-1.27,1.58) | 0.8344 | -- | -- | -- |  |  |
| rs55705857 (8q24.21) | A/**G** | *CCDC26* | Meta-analysis | -3.21 (-4.14,-2.28) | -- | 1.51x10-11 | 3.70x10-6 | 0.1267 | 5.71 | 47.44 | 0.21 (-0.50,0.92) |  | 0.5659 | 0.6331 | 0.0469 | 1.28 | 0.00 |
| GICC | -2.66 (-3.92,-1.40) | 3.41x10-5 | -- | -- | -- | -- | -- | -0.09 (-1.00,0.82) | 0.8419 | -- | -- | -- |  |  |
| SFAGS-GWAS  | -5.54 (-8.51,-2.56) | 2.64x10-4 | -- | -- | -- | -- | -- | -1.96 (-4.67,0.76) | 0.1572 | -- | -- | -- |  |  |
| Gliomascan | -1.57 (-4.31,1.18) | 0.2640 | -- | -- | -- | -- | -- | 0.45 (-1.09,2.00) | 0.5672 | -- | -- | -- |  |  |
| MDA-GWAS | -4.30 (-6.21,-2.39) | 1.01x10-5 | -- | -- | -- | -- | -- | 2.56 (0.50,4.62) | 0.0150 | -- | -- | -- |  |  |
| rs634537 (9p21.3) | T/**G** | *CDKN2B* | Meta-analysis | 0.17 (-0.30,0.64) | -- | 0.4835 | 0.8009 | 0.0602 | 7.40 | 59.45 | -0.23 (-0.56,0.11) |  | 0.1826 | 0.3170 | 0.1067 | 7.96 | 62.30 |
| GICC | 0.25 (-0.38,0.88) | 0.4309 | -- | -- | -- | -- | -- | -0.16 (-0.58,0.27) | 0.4736 | -- | -- | -- |  |  |
| SFAGS-GWAS  | 0.72 (-0.75,2.19) | 0.3365 | -- | -- | -- | -- | -- | -0.03 (-1.17,1.12) | 0.9644 | -- | -- | -- |  |  |
| Gliomascan | -1.37 (-2.64,-0.11) | 0.0329 | -- | -- | -- | -- | -- | 0.19 (-0.61,0.98) | 0.6463 | -- | -- | -- |  |  |
| MDA-GWAS | 0.72 (-0.33,1.77) | 0.1804 | -- | -- | -- | -- | -- | -1.28 (-2.21,-0.34) | 0.0075 | -- | -- | -- |  |  |
| rs498872 (11q23.3) | **A**/G | *PHLDB1* | Meta-analysis | 1.44 (0.93,1.95) | -- | 2.91x10-8 | 0.0034 | 0.0138 | 10.65 | 71.83 | 0.52 (0.15,0.88) |  | 0.0056 | 0.0225 | 0.1739 | 6.10 | 50.85 |
| GICC | 0.97 (0.29,1.66) | 0.0055 | -- | -- | -- | -- | -- | 0.30 (-0.17,0.77) | 0.2043 |  |  | -- |  |  |
| SFAGS-GWAS  | 1.45 (-0.06,2.96) | 0.0595 | -- | -- | -- | -- | -- | 1.51 (0.35,2.68) | 0.0110 |  |  | -- |  |  |
| Gliomascan | 0.87 (-0.51,2.25) | 0.2147 | -- | -- | -- | -- | -- | 0.98 (0.07,1.89) | 0.0350 |  |  | -- |  |  |
| MDA-GWAS | 3.11 (1.97,4.25) | 8.89x10-8 | -- | -- | -- | -- | -- | 0.19 (-0.83,1.21) | 0.7106 |  |  | -- |  |  |
| rs12803321 (11q23.3) | **G**/C | *PHLDB1* | Meta-analysis | 1.49 (0.99,1.99) | -- | 6.00x10-9 | 0.0148 | 5.15x10-5 | 22.49 | 86.66 | 0.35 (-0.01,0.70) |  | 0.0554 | 0.0554 | 0.4408 | 4.97 | 39.66 |
| GICC | 0.61 (-0.06,1.29) | 0.0754 | -- | -- | -- | -- | -- | 0.15 (-0.30,0.61) | 0.5089 | -- | -- | -- |  |  |
| SFAGS-GWAS  | 1.37 (-0.12,2.87) | 0.0716 | -- | -- | -- | -- | -- | 1.15 (-0.02,2.32) | 0.0548 | -- | -- | -- |  |  |
| Gliomascan | 1.85 (0.53,3.17) | 0.0061 | -- | -- | -- | -- | -- | 0.55 (-0.30,1.39) | 0.2025 | -- | -- | -- |  |  |
| MDA-GWAS | 3.80 (2.66,4.94) | 7.42x10-11 | -- | -- | -- | -- | -- | 0.39 (-0.59,1.38) | 0.4320 | -- | -- | -- |  |  |
| rs78378222 (17p13.1) | T/**G** | *TP53* | Meta-analysis | -0.61 (-2.04,0.81) | -- | 0.3987 | 0.4353 | 0.0977 | 6.30 | 52.42 | 0.35 (-0.67,1.36) |  | 0.5020 | 0.5233 | 0.3621 | 2.70 | 0.00 |
| GICC | -0.11 (-1.99,1.77) | 0.9084 | -- | -- | -- | -- | -- | 0.18 (-1.11,1.47) | 0.7844 | -- | -- | -- |  |  |
| SFAGS-GWAS  | -5.63 (-10.37,-0.90) | 0.0197 | -- | -- | -- | -- | -- | -1.73 (-6.16,2.69) | 0.4420 | -- | -- | -- |  |  |
| Gliomascan | 1.88 (-2.10,5.85) | 0.3556 | -- | -- | -- | -- | -- | 2.04 (-0.31,4.39) | 0.0883 | -- | -- | -- |  |  |
| MDA-GWAS | -1.34 (-4.45,1.77) | 0.3987 | -- | -- | -- | -- | -- | -0.38 (-3.08,2.31) | 0.7814 | -- | -- | -- |  |  |
| rs2297440 (20q13.33) | T/**C** | *RTEL1* | Meta-analysis | 0.79 (0.16,1.43) | -- | 0.0144 | 0.0512 | 0.0607 | 7.38 | 59.35 | -0.19 (-0.65,0.26) |  | 0.4031 | 0.4031 | 0.6680 | 3.20 | 6.19 |
| GICC | 0.05 (-0.80,0.90) | 0.9105 | -- | -- | -- | -- | -- | -0.11 (-0.68,0.47) | 0.7200 | -- | -- | -- |  |  |
| SFAGS-GWAS  | 1.11 (-0.97,3.19) | 0.2958 | -- | -- | -- | -- | -- | -1.01 (-2.71,0.69) | 0.2442 | -- | -- | -- |  |  |
| Gliomascan | 1.58 (-0.06,3.21) | 0.0583 | -- | -- | -- | -- | -- | 0.10 (-1.00,1.20) | 0.8534 | -- | -- | -- |  |  |
| MDA-GWAS | 2.15 (0.72,3.58) | 0.0032 | -- | -- | -- | -- | -- | -0.54 (-1.77,0.69) | 0.3888 | -- | -- | -- |  |  |

Abbreviations: GICC: Glioma International Case-Control Study; SFAGS-GWAS: San Francisco Adult Glioma Study GWAS; MAF: Minor allele frequency; MDA-GWAS: MD Anderson GWAS

# SUPPLEMENTARY Figures

Supplementary Figure 1 Manhattan plot of -log(p) values for glioblastoma in A) ages 18-53, B) ages 54-63, and C) ages 64+



Supplementary Figure 2. Age-specific odds ratios, 95% CI and p values for selected previous GWAS hits



Supplementary Figure 3 Age-specific odds ratios and 95% CI from meta-analysis and by study for rs55705857 (8q24.21, CCDC26)



Supplementary Figure 4 Manhattan plot of -log(p) values for case-only analysis of age of diagnosis glioblastoma by meta-analysis using A) fixed effects and B) random effects



Supplementary Figure 5 Age-specific odds ratios and 95% CI from meta-analysis and by study for rs723527 (7p11.2, EGFR)



Supplementary Figure 6 Age-specific odds ratios and 95% CI from meta-analysis and by study for rs11979158 (7p11.2, EGFR)



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