## Supplemental Table 1: Family history of cancer stratified by presence of an *ATM* PV

Columns are not exclusive, as patients could report a family history of multiple cancer types.

|  |  |  |  |
| --- | --- | --- | --- |
| **Family history** | ***ATM* pathogenic variant (PV)****N (%)** | **No *ATM* PV****N (%)** | **Total****N (%)** |
| Breast – Ductal Invasive | 3,307 (71.8) | 423,620 (68.0) | 426,927 (68.0) |
| Breast – DCIS | 30 (0.7) | 2,053 (0.3) | 2,083 (0.3) |
| Breast – Lobular Invasive | 4 (0.1) | 454 (0.1) | 458 (0.1) |
| Breast - Male | 76 (1.6) | 10,913 (1.8) | 10,989 (1.8) |
| Ovarian cancer | 1,025 (22.2) | 175,479 (28.2) | 176,504 (28.1) |
| Colorectal cancer | 1,126 (24.4) | 152,365 (24.5) | 153,491 (24.5) |
| Endometrial cancer | 359 (7.8) | 54,300 (8.7) | 54,659 (8.7) |
| Melanoma | 348 (7.6) | 37,740 (6.1) | 38,088 (6.1) |
| Prostate cancer | 855 (18.6) | 86,682 (13.9) | 87,537 (13.9) |
| Pancreatic cancer | 692 (15.0) | 56,459 (9.1) | 57,151 (9.1) |
| Gastric cancer | 386 (8.4) | 36,383 (5.8) | 36,769 (5.9) |

## Supplemental Table 2: Breast cancer history by *ATM* mutation type

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Breast cancer** | **Nonsense/Frameshift** | **Missense\*** | **All *ATM* PV\*** | **c.7271T>G** |
| **Personal history** |  |  |  |  |
| Ductal Invasive | 837/2548 (32.8) | 120/310 (38.7) | 1360/4155 (32.7) | 101/223 (45.3) |
| Triple-negative | 26/2548 (1.0) | 5/310 (1.6) | 52/4155 (1.3) | 0/223 (0) |
| DCIS | 230/2548 (9.0) | 22/310 (7.1) | 334/4155 (8.0) | 17/223 (7.6) |
| Lobular Invasive | 38/2548 (1.5) | 8/310 (2.6) | 65/4155 (1.6) | 3/223 (1.3) |
| Male | 11/139 (7.9) | 1/15 (6.7) | 18/223 (8.1) | 2/6 (33.3) |
| **Family history** |  |  |  |  |
| Ductal Invasive | 1922/2687 (71.5) | 235/325 (72.3) | 3130/4378 (71.5) | 177/229 (77.3) |
| DCIS | 11/2687 (0.4) | 6/325 (1.8) | 28/4378 (0.6) | 2/229 (0.9) |
| Lobular Invasive | 4/2687 (0.1) | 0/325 (0) | 4/4378 (0.1) | 0/229 |
| Male | 51/2687 (1.9) | 6/325 (1.8) | 72/4378 (1.6) | 4/229 (1.7) |

\*Not including c.7271T>G variant.

Triple-negative breast cancer is a subset of Ductal Invasive for this cohort. All other categories are exclusive.

## Supplementary Table 3: Odds ratios for cancer risk by *ATM* mutation type

|  |  |  |  |
| --- | --- | --- | --- |
| **Breast cancer** | **Nonsense/Frameshift** | **Missense** | **c.7271T>G** |
| **OR** | **95%CI** | **P-value** | **OR** | **95%CI** | **P-value** | **OR** | **95%CI** | **P-value** |
| Ductal Invasive | 1.95 | 1.77-2.14 | <0.0001 | 2.52 | 1.94-3.28 | <0.0001 | 3.76 | 2.76-5.12 | <0.0001 |
| DCIS | 2.05 | 1.78-2.36 | <0.0001 | 1.47 | 0.95-2.29 | 0.0844 | 1.70 | 1.03-2.81 | 0.0375 |
| Lobular Invasive | 0.90 | 0.65-1.24 | 0.5155 | 1.51 | 0.74-3.07 | 0.2561 | 0.82 | 0.26-2.58 | 0.7344 |
| Male | 1.51 | 0.81-2.82 | 0.1988 | 1.17 | 0.15-9.11 | 0.8804 | 8.31 | 1.46-47.27 | 0.0170 |

Note: Odds ratios are adjusted for personal and family cancer histories as well as age, sex and ancestry. All breast cancer categories are exclusive.