**Table S1. Relationship between clinical trial PFS/OS and real-world OS, ordinary least squares regressions**

(Dependent variable: Real-world OS)

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| --- | --- | --- | --- | --- |
|   |   |   | **Baseline Cohort** | **Full Cohort** |
| **Cancer Type**(Number of tumor-treatments pairs) | **Independent Variable** | **Statistic** | **PFS/TTP** | **OS** | **PFS/TTP & OS** | **PFS/TTP** | **OS** | **PFS/TTP & OS** |
| **All 5 Cancers**(n=29) | Constant | Coefficient | 5.293 | 3.503 | 2.959 | 9.486 | 5.701 | 5.534 |
| p-value  | 0.018 | 0.121 | 0.187 | 0.121 | 0.376 | 0.406 |
| SE | 2.106 | 2.185 | 2.184 | 5.931 | 6.333 | 6.557 |
| Clinical Trial PFS/TTP | Coefficient | 1.382 |  | 0.608 | 1.496 |  | 0.186 |
| p-value  | <0.001 |  | 0.176 | 0.102 |  | 0.888 |
| SE | 0.314 |  | 0.438 | 0.884 |  | 1.314 |
| Clinical Trial OS | Coefficient |  | 0.702 | 0.487 |  | 0.890 | 0.825 |
| p-value  |  | <0.001 | 0.026 |  | 0.036 | 0.194 |
| SE |  | 0.139 | 0.206 |  | 0.403 | 0.619 |
| R-squared | 0.418 | 0.485 | 0.521 | 0.096 | 0.153 | 0.154 |
| **Breast**(n=8) | Constant | Coefficient | 20.319 | 15.771 | 18.760 | 36.289 | 30.532 | 35.350 |
| p-value  | 0.087 | 0.089 | 0.185 | 0.303 | 0.271 | 0.416 |
| SE | 9.952 | 7.787 | 12.219 | 32.246 | 25.200 | 39.882 |
| Clinical Trial PFS/TTP | Coefficient | -0.530 |  | -0.649 | -0.975 |  | -1.047 |
| p-value  | 0.768 |  | 0.749 | 0.867 |  | 0.874 |
| SE | 1.721 |  | 1.921 | 5.576 |  | 6.268 |
| Clinical Trial OS | Coefficient |  | 0.098 | 0.136 |  | 0.021 | 0.082 |
| p-value  |  | 0.833 | 0.795 |  | 0.989 | 0.962 |
| SE |  | 0.446 | 0.496 |  | 1.443 | 1.618 |
| R-squared | 0.016 | 0.008 | 0.030 | 0.005 | <.0001 | 0.006 |

 Note: PFS = progression-free survival, TTP = time to progression, OS = overall survival

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| --- | --- | --- | --- | --- |
|   |   |   | **Baseline Cohort** | **Full Cohort** |
| **Cancer Type**(Number of tumor-treatments pairs) | **Independent Variable** | **Statistic** | **PFS/TTP** | **OS** | **PFS/TTP & OS** | **PFS/TTP** | **OS** | **PFS/TTP & OS** |
| **Colorectal**(n=5) | Constant | Coefficient | 6.945 | 12.346 | 12.627 | 9.082 | 21.216 | 21.641 |
| p-value | 0.065 | 0.268 | 0.016 | 0.392 | 0.342 | 0.309 |
| SE | 2.432 | 9.099 | 1.607 | 9.097 | 18.850 | 16.005 |
| Clinical Trial PFS/TTP | Coefficient | 1.161 |  | 1.545 | 1.482 |  | 2.331 |
| p-value | 0.044 |  | 0.010 | 0.337 |  | 0.279 |
| SE | 0.347 |  | 0.159 | 1.298 |  | 1.585 |
| Clinical Trial OS | Coefficient |  | 0.129 | -0.513 |  | -0.165 | -1.134 |
| p-value |  | 0.832 | 0.050 |  | 0.896 | 0.438 |
| SE |  | 0.558 | 0.119 |  | 1.155 | 1.182 |
| R-squared | 0.789 | 0.018 | 0.980 | 0.303 | 0.007 | 0.523 |
| **Lung**(n=7) | Constant | Coefficient | 6.083 | 2.087 | -0.047 | 5.101 | 0.712 | -1.076 |
| p-value | 0.043 | 0.417 | 0.963 | 0.087 | 0.770 | 0.552 |
| SE | 2.264 | 2.357 | 0.968 | 2.400 | 2.304 | 1.657 |
| Clinical Trial PFS/TTP | Coefficient | 0.465 |  | -1.717 | 0.760 |  | -1.438 |
| p-value | 0.444 |  | 0.005 | 0.256 |  | 0.052 |
| SE | 0.559 |  | 0.308 | 0.593 |  | 0.527 |
| Clinical Trial OS | Coefficient |  | 0.686 | 1.719 |  | 0.867 | 1.732 |
| p-value |  | 0.054 | 0.001 |  | 0.023 | 0.009 |
| SE |  | 0.273 | 0.212 |  | 0.267 | 0.362 |
| R-squared | 0.122 | 0.558 | 0.950 | 0.247 | 0.679 | 0.888 |

 Note: PFS = progression-free survival, TTP = time to progression, OS = overall survival

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| --- | --- | --- | --- | --- |
|   |   |   | **Baseline Cohort** | **Full Cohort** |
| **Cancer Type**(Number of tumor-treatments pairs) | **Independent Variable** | **Statistic** | **PFS/TTP** | **OS** | **PFS/TTP & OS** | **PFS/TTP** | **OS** | **PFS/TTP & OS** |
| **Ovarian**(n=6) | Constant | Coefficient | 3.513 | -0.695 | 0.575 | 3.301 | 2.118 | 5.878 |
| p-value  | 0.273 | 0.850 | 0.869 | 0.528 | 0.818 | 0.451 |
| SE | 2.764 | 3.443 | 3.194 | 4.781 | 8.603 | 6.795 |
| Clinical Trial PFS/TTP | Coefficient | 1.523 |  | 0.798 | 1.726 |  | 2.362 |
| p-value  | 0.005 |  | 0.249 | 0.021 |  | 0.141 |
| SE | 0.270 |  | 0.559 | 0.467 |  | 1.188 |
| Clinical Trial OS | Coefficient |  | 0.915 | 0.483 |  | 0.858 | -0.423 |
| p-value  |  | 0.005 | 0.246 |  | 0.101 | 0.595 |
| SE |  | 0.162 | 0.335 |  | 0.404 | 0.714 |
| R-squared | 0.889 | 0.889 | 0.934 | 0.774 | 0.530 | 0.797 |
| **Pancreatic**(n=3) | Constant | Coefficient | 3.431 | 0.380 | -1.921 | 4.882 | 2.602 | -3.146 |
| p-value  | 0.243 | 0.823 | NA | 0.254 | 0.577 | NA |
| SE | 1.374 | 1.329 | NA | 2.061 | 3.320 | NA |
| Clinical Trial PFS/TTP | Coefficient | 0.588 |  | -0.590 | 0.294 |  | -1.473 |
| p-value  | 0.333 |  | NA | 0.667 |  | NA |
| SE | 0.340 |  | NA | 0.510 |  | NA |
| Clinical Trial OS | Coefficient |  | 0.770 | 1.431 |  | 0.495 | 2.147 |
| p-value  |  | 0.155 | NA |  | 0.488 | NA |
| SE |  | 0.191 | NA |  | 0.476 | NA |
| R-squared | 0.750 | 0.942 | 1.000 | 0.250 | 0.519 | 1.000 |

 Note: PFS = progression-free survival, TTP = time to progression, OS = overall survival