| **Supplementary Table 1. Associations between HLA mismatch and diffuse large B-cell lymphoma among kidney transplant recipients (only)** |
| --- |
| **Antigen** | **Mismatch number** | **Transplant recipients with DLBCL** | **Transplant recipients without DLBCL** | **SIR** | **IRRa** | **95% CI** | **P for trend** |
| **n (%)** | **n (%)** |
| **A** | 0 | 138 (25.05) | 30,236 (22.79) | 10.51 | 1.01 | (0.80-1.28) | 0.9222 |
|  | 1 | 243 (44.10) | 56,650 (42.70) | 10.25 | 1.01 | (0.83-1.25) |  |
|  | 2  | 169 (30.67) | 45,196 (34.06) | 9.29 | 1.00 | reference |  |
| **B** | 0 | 110 (19.96) | 25,213 (19.00) | 9.52 | 0.94 | (0.74-1.19) | 0.6432 |
|  | 1 | 243 (44.10) | 51,717 (38.98) | 10.75 | 1.01 | (0.82-1.23) |  |
|  | 2  | 197 (35.75) | 55,153 (41.57) | 9.45 | 1.00 | reference |  |
| **DR** | 0 | 132 (23.96) | 31,841 (24.00) | 9.28 | 0.77 | (0.60-0.97) | 0.0265 |
|  | 1 | 254 (46.10) | 62,765 (47.31) | 9.66 | 0.78 | (0.64-0.96) |  |
|  | 2 | 161 (29.22) | 37,187 (28.03) | 11.21 | 1.00 | reference |  |
| **A+B+DR** | 0 | 60 (10.89) | 14,423 (10.87) | 9.65 | 0.75 | (0.51-1.08) | 0.2812 |
|  | 1 | 36 (6.53) | 7,036 (5.30) | 10.83 | 0.77 | (0.50-1.18) |  |
|  | 2 | 71 (12.89) | 15,329 (11.55) | 10.17 | 0.69 | (0.48-1.00) |  |
|  | 3 | 120 (21.78) | 27,624 (20.82) | 9.90 | 0.72 | (0.52-1.01) |  |
|  | 4 | 117 (21.23) | 26,616 (20.06) | 10.54 | 0.83 | (0.61-1.15) |  |
|  | 5 | 88 (15.97) | 27,336 (20.60) | 8.47 | 0.72 | (0.52-1.01) |  |
|  | 6 | 58 (10.53) | 13,749 (10.36) | 11.81 | 1.00 | reference |  |
| SIR=Standardized incidence ratio; IRR=Incidence rate ratio |
| aIRRs were calculated as the ratio of incidence rates between each category of mismatch and the reference mismatch category, and were adjusted for sex, age at transplant, race/ethnicity, year of transplant, transplanted organ, transplant number, panel reactive antibody score, and donor vital status. |

| **Supplementary Table 2. Associations between HLA mismatch and early- and late-onset diffuse large B-cell lymphoma among kidney transplant recipients (only)**  |
| --- |
|  | **Early-onset DLBCL****(≤ 2 years after transplantation)** | **Late-onset DLBCL****(> 2 years after transplantation)** |
| **Antigen** | **Mismatch number** | **IRR\*** | **95%CI** |  | **P for trend** | **IRRa** | **95%CI** |  | **P for trend** |
| **A** | 0 | 1.66 |  (1.16-2.38) |  | 0.0058 | 0.70 |  (0.56-0.87) |  | 0.0304 |
|  | 1 | 1.22 |  (0.88-1.71) |  |  | 0.89 |  (0.75-1.07) |  |  |
|  | 2  | 1.00 | reference |  |  | 1.00 | reference |  |  |
| **B** | 0 | 1.52 |  (1.06-2.17) |  | 0.0228 | 0.66 |  (0.52-0.82) |  | 0.0144 |
|  | 1 | 1.22 |  (0.89-1.69) |  |  | 0.88 |  (0.80-0.98) |  |  |
|  | 2  | 1.00 | reference |  |  | 1.00 | reference |  |  |
| **DR** | 0 | 1.09 |  (0.76-1.56) |  | 0.6336 | -- |  |  | -- |
|  | 1 | 0.86 |  (0.62-1.19) |  |  | -- |  |  |  |
|  | 2  | 1.00 | reference |  |  |  |  |  |  |
| **A+B+DR** | 0 | 1.46 |  (0.84-2.57) |  | 0.0202 | -- |  |  | -- |
|  | 1 | 1.58 |  (0.83-2.99) |  |  | -- |  |  |  |
|  | 2 | 1.07 |  (0.59-1.95) |  |  | -- |  |  |  |
|  | 3 | 0.98 |  (0.58-1.7) |  |  | -- |  |  |  |
|  | 4 | 0.98 |  (0.59-1.7) |  |  | -- |  |  |  |
|  | 5 | 0.87 |  (0.51-1.51) |  |  | -- |  |  |  |
|  | 6  | 1.00 | reference |  |  | -- |  |  |  |
| DLBCL=Diffuse large B-cell lymphoma; IRR=Incidence rate ratioaIRRs were calculated as the ratio of incidence rates between each category of mismatch and the reference mismatch category, and were adjusted for sex, age at transplant, race/ethnicity, year of transplant, transplanted organ, transplant number, panel reactive antibody score, and donor vital status. |

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| --- |
| **Supplementary Table 3. Associations between HLA antigens and diffuse large B-cell lymphoma**  |
| **Antigen** | **Transplant recipients with DLBCL** | **Transplant recipients without DLBCL** | **SIR** | **IRRa** | **95% CI** | **P value** |
| **n (%)** | **n (%)** |
| **HLA-A** |  |  |  |  |  |  |
| A3 | 232 (25.72) | 35,116 (20.50) | 14.10 | 1.22 | (1.05-1.42) | 0.0099 |
| A28 + A68 + A69 | 115 (12.75) | 20,160 (11.77) | 14.11 | 1.30 | (1.06-1.58) | 0.0099 |
| A32 | 36 (3.99) | 8,876 (5.18) | 8.43 | 0.68 | (0.48-0.94) | 0.0255 |
| A25 | 18 (2.00) | 4,491 (2.62) | 7.91 | 0.67 | (0.40-1.03) | 0.0911 |
| A33 | 32 (3.55) | 10,340 (6.04) | 8.52 | 0.74 | (0.51-1.04) | 0.1016 |
| A66 | 3 (0.33) | 1,857 (1.08) | 4.91 | 0.50 | (0.12-1.31) | 0.2324 |
| A2 | 417 (46.23) | 78,722 (45.95) | 11.75 | 0.93 | (0.82-1.06) | 0.2945 |
| A1 | 235 (26.05) | 37,938 (22.14) | 13.13 | 1.07 | (0.92-1.25) | 0.3652 |
| A23 | 46 (5.10) | 12,952 (7.56) | 9.60 | 0.87 | (0.63-1.16) | 0.3664 |
| A11 | 94 (10.42) | 17,906 (10.45) | 11.74 | 0.91 | (0.73-1.12) | 0.3859 |
| A36 | 4 (0.44) | 2,056 (1.20) | 6.21 | 0.66 | (0.20-1.56) | 0.4146 |
| A30 | 77 (8.54) | 17,258 (10.07) | 11.78 | 1.10 | (0.86-1.39) | 0.4385 |
| A74 | 8 (0.89) | 3,452 (2.01) | 7.77 | 0.82 | (0.37-1.56) | 0.5831 |
| A31 | 51 (5.65) | 9,155 (5.34) | 12.86 | 1.07 | (0.79-1.40) | 0.6567 |
| A29 | 65 (7.21) | 11,711 (6.84) | 12.73 | 1.05 | (0.81-1.34) | 0.7255 |
| A34 | 14 (1.55) | 4,133 (2.41) | 11.10 | 0.92 | (0.51-1.52) | 0.7609 |
| A24 | 162 (17.96) | 30,396 (17.74) | 12.31 | 0.98 | (0.82-1.16) | 0.7889 |
| A26 | 58 (6.43) | 10,140 (5.92) | 11.93 | 1.03 | (0.78-1.33) | 0.8152 |
|   |   |   |   |   |   |   |
| **HLA-B** |   |   |   |   |   |   |
| B38 | 53 (5.88) | 6,680 (3.90) | 16.67 | 1.48 | (1.10-1.93) | 0.0061 |
| B58 | 13 (1.44) | 7,405 (4.32) | 5.13 | 0.47 | (0.26-0.78) | 0.0071 |
| B18 | 100 (11.09) | 14,613 (8.53) | 14.87 | 1.28 | (1.03-1.57) | 0.021 |
| B48 | 2 (0.22) | 2,000 (1.17) | 2.79 | 0.23 | (0.04-0.72) | 0.0388 |
| B55 | 15 (1.66) | 4,177 (2.44) | 7.56 | 0.58 | (0.34-0.94) | 0.0396 |
| B41 | 10 (1.11) | 3,642 (2.13) | 5.99 | 0.53 | (0.27-0.94) | 0.0482 |
| B70 + B71 + B72 | 37 (4.10) | 8,343 (4.87) | 13.45 | 1.40 | (0.97-1.95) | 0.0584 |
| B63 | 7 (0.78) | 3,109 (1.81) | 5.45 | 0.52 | (0.22-1.01) | 0.087 |
| B7 | 195 (21.62) | 31,070 (18.13) | 13.54 | 1.15 | (0.97-1.34) | 0.0954 |
| B47 | 1 (0.11) | 744 (0.43) | 2.81 | 0.21 | (0.01-0.94) | 0.1214 |
| B46 | 8 (0.89) | 946 (0.55) | 26.42 | 1.79 | (0.79-3.56) | 0.1247 |
| B57 | 43 (4.77) | 10,685 (6.24) | 9.00 | 0.79 | (0.57-1.05) | 0.1251 |
| B42 | 8 (0.89) | 4,603 (2.69) | 5.72 | 0.58 | (0.26-1.10) | 0.1318 |
| B51 | 93 (10.31) | 15,441 (9.01) | 13.32 | 1.14 | (0.92-1.41) | 0.2238 |
| B75 | 3 (0.33) | 1,380 (0.81) | 6.88 | 0.50 | (0.12-1.33) | 0.2383 |
| B52 | 17 (1.88) | 4,743 (2.77) | 8.32 | 0.78 | (0.46-1.22) | 0.3135 |
| B39 | 38 (4.21) | 9,166 (5.35) | 10.54 | 0.85 | (0.60-1.17) | 0.3392 |
| B44 | 190 (21.06) | 34,926 (20.39) | 11.65 | 0.93 | (0.79-1.10) | 0.4111 |
| B8 | 184 (20.40) | 29,753 (17.37) | 13.82 | 1.06 | (0.90-1.25) | 0.4601 |
| B49 | 35 (3.88) | 6,678 (3.90) | 12.39 | 1.12 | (0.79-1.55) | 0.5011 |
| B13 | 33 (3.66) | 6,396 (3.73) | 11.10 | 0.89 | (0.62-1.24) | 0.519 |
| B78 | 1 (0.11) | 632 (0.37) | 5.68 | 0.57 | (0.03-2.53) | 0.5749 |
| B27 | 64 (7.10) | 10,104 (5.90) | 13.49 | 1.07 | (0.82-1.37) | 0.5955 |
| B56 | 11 (1.22) | 1,754 (1.02) | 14.30 | 1.16 | (0.60-1.99) | 0.6285 |
| B14 + B64 + B65 | 67 (7.43) | 11,692 (6.82) | 12.42 | 1.06 | (0.82-1.35) | 0.6314 |
| B45 | 24 (2.66) | 5,880 (3.43) | 11.76 | 1.08 | (0.70-1.59) | 0.7168 |
| B50 | 19 (2.11) | 4,090 (2.39) | 10.71 | 0.93 | (0.57-1.43) | 0.7704 |
| B35 | 160 (17.74) | 31,201 (18.21) | 11.16 | 0.98 | (0.82-1.16) | 0.8318 |
| B53 | 31 (3.44) | 9,941 (5.80) | 9.71 | 0.96 | (0.65-1.39) | 0.8538 |
| B61 | 28 (3.10) | 6,387 (3.73) | 11.59 | 0.97 | (0.65-1.39) | 0.8715 |
| B37 | 20 (2.22) | 3,364 (1.96) | 12.62 | 1.04 | (0.64-1.57) | 0.8729 |
| B60 | 86 (9.53) | 14,180 (8.28) | 13.16 | 0.99 | (0.79-1.23) | 0.9275 |
| B62 | 100 (11.09) | 16,903 (9.87) | 13.32 | 1.00 | (0.81-1.23) | 0.9939 |
| B81 | -- | 983 (0.57) | -- | -- | -- | -- |
|   |   |   |   |   |   |   |
| **HLA-C** |   |   |   |   |   |   |
| C8 | 21 (2.33) | 8,035 (4.69) | 6.49 | 0.56 | (0.35-0.85) | 0.0098 |
| C12 | 11 (1.22) | 2,245 (1.31) | 20.16 | 1.94 | (0.99-3.40) | 0.0337 |
| C3 + C9 + C10 | 125 (13.86) | 27,215 (15.88) | 10.60 | 0.81 | (0.66-0.98) | 0.034 |
| C7 | 251 (27.83) | 46,553 (27.17) | 12.42 | 1.15 | (0.97-1.36) | 0.1007 |
| C5 | 84 (9.31) | 13,196 (7.70) | 13.78 | 1.17 | (0.92-1.47) | 0.1884 |
| C6 | 70 (7.76) | 16,335 (9.53) | 9.96 | 0.88 | (0.68-1.13) | 0.3304 |
| C15 | 5 (0.55) | 1,396 (0.81) | 16.95 | 1.48 | (0.53-3.25) | 0.3837 |
| C4 | 146 (16.19) | 29,767 (17.37) | 11.34 | 1.06 | (0.87-1.28) | 0.5373 |
| C100 | 3 (0.33) | 1,627 (0.95) | 6.80 | 0.82 | (0.20-2.16) | 0.7293 |
| C2 | 58 (6.43) | 11,739 (6.85) | 11.48 | 1.03 | (0.78-1.35) | 0.8124 |
| C16 | 6 (0.67) | 2,476 (1.45) | 12.19 | 1.09 | (0.43-2.26) | 0.8298 |
| C1 | 41 (4.55) | 7,805 (4.56) | 11.76 | 0.98 | (0.70-1.33) | 0.9035 |
| C14 | -- | 785 (0.46) | -- | -- | -- | -- |
| C17 | -- | 1,656 (0.97) | -- | -- | -- | -- |
|   |   |   |   |   |   |   |
| **HLA-DQ** |   |   |   |   |   |   |
| DQ7b | 98 (15.86) | 29,725 (20.88) | 7.97 | 0.77 | (0.59-0.99) | 0.0481 |
| DQ8b | 64 (10.36) | 15,031 (10.56) | 12.78 | 1.33 | (0.97-1.78) | 0.0678 |
| DQ5b | 92 (14.89) | 22,526 (15.82) | 11.52 | 1.25 | (0.95-1.63) | 0.0968 |
| DQ2 | 281 (31.15) | 56,657 (33.07) | 11.51 | 0.92 | (0.79-1.07) | 0.3016 |
| DQ6b | 116 (18.77) | 32,607 (22.91) | 9.09 | 0.93 | (0.72-1.19) | 0.5784 |
| DQ9b | 19 (3.07) | 3,896 (2.74) | 13.35 | 1.15 | (0.59-2.00) | 0.656 |
| DQ4 | 51 (5.65) | 13,461 (7.86) | 10.02 | 0.96 | (0.71-1.26) | 0.7586 |
|   |   |   |   |   |   |   |
| **HLA-DR** |   |   |   |   |   |   |
| DR13b | 96 (15.53) | 29,321 (20.60) | 8.76 | 0.74 | (0.57-0.93) | 0.0144 |
| DR17b | 112 (18.12) | 22,562 (15.85) | 13.76 | 1.23 | (0.96-1.56) | 0.0947 |
| DR9 | 20 (2.22) | 6,208 (3.62) | 9.06 | 0.70 | (0.43-1.06) | 0.1158 |
| DR7 | 163 (18.07) | 33,210 (19.38) | 10.62 | 0.87 | (0.73-1.03) | 0.1206 |
| DR4 | 294 (32.59) | 54,989 (32.10) | 12.50 | 0.92 | (0.8-1.06) | 0.2599 |
| DR10 | 23 (2.55) | 4,170 (2.43) | 13.98 | 1.24 | (0.8-1.84) | 0.3047 |
| DR1 | 159 (17.63) | 26,250 (15.32) | 12.86 | 1.09 | (0.91-1.29) | 0.3332 |
| DR16b | 13 (2.10) | 4,327 (3.04) | 7.53 | 0.77 | (0.37-1.40) | 0.4354 |
| DR15b | 131 (21.20) | 29,482 (20.71) | 11.01 | 1.09 | (0.86-1.37) | 0.4778 |
| DR18b | 4 (0.65) | 3,093 (2.17) | 4.71 | 0.72 | (0.22-1.73) | 0.5243 |
| DR12b | 33 (3.89) | 8,098 (4.89) | 10.27 | 0.89 | (0.57-1.31) | 0.5712 |
| DR11b | 141 (16.63) | 29,680 (17.92) | 10.32 | 0.95 | (0.76-1.18) | 0.6443 |
| DR8 | 73 (8.09) | 16,037 (9.36) | 11.79 | 1.03 | (0.80-1.31) | 0.7973 |
| DR103 | 7 (0.78) | 1,492 (0.87) | 11.57 | 1.10 | (0.47-2.13) | 0.8079 |
| DR14b | 41 (6.63) | 9,048 (6.36) | 12.11 | 1.02 | (0.70-1.44) | 0.9032 |
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| DLBCL=Diffuse large B-cell lymphoma; SIR=Standardized incidence ratio; IRR=Incidence rate ratio |

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| aIRRs were calculated as the ratio of incidence rates between each antigen category and all other antigens combined, and were adjusted for sex, age at transplant, race/ethnicity, year of transplant, transplanted organ, and transplant number. |
| bThis category includes restricted transplant years reflecting when the split antigen category was in common use (described in supplementary materials). |

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| **Supplementary Table 4. Associations between HLA antigens and diffuse large B-cell lymphoma among kidney transplant recipients (only)** |
| **Antigen** | **Transplant recipients with DLBCL** | **Transplant recipients without DLBCL** | **SIR** | **IRRa** | **95% CI** | **P value** |
| **n (%)** | **n (%)** |
| **HLA-A** |  |  |  |  |  |  |
| A28 + A68 + A69 | 79 (14.34) | 16,283 (12.27) | 12.53 | 1.42 | (1.10-1.80) | 0.0050 |
| A32 | 19 (3.45) | 6,625 (4.99) | 6.38 | 0.62 | (0.37-0.96) | 0.0454 |
| A25 | 10 (1.81) | 3,330 (2.51) | 6.37 | 0.59 | (0.28-1.06) | 0.1117 |
| A33 | 22 (3.99) | 8,658 (6.53) | 7.11 | 0.72 | (0.46-1.09) | 0.1459 |
| A3 | 125 (22.69) | 26,337 (19.85) | 10.63 | 1.10 | (0.89-1.34) | 0.3649 |
| A36 | 4 (0.73) | 1,806 (1.36) | 7.10 | 0.65 | (0.16-1.73) | 0.4657 |
| A2 | 252 (45.74) | 60,242 (45.40) | 9.73 | 0.95 | (0.80-1.12) | 0.5368 |
| A29 | 40 (7.26) | 8,858 (6.68) | 10.66 | 1.09 | (0.77-1.48) | 0.6174 |
| A34 | 12 (2.18) | 3,593 (2.71) | 11.18 | 0.86 | (0.42-1.54) | 0.6394 |
| A23 | 32 (5.81) | 10,694 (8.06) | 8.46 | 0.92 | (0.62-1.31) | 0.6512 |
| A66 | 3 (0.54) | 1,528 (1.15) | 6.12 | 0.77 | (0.19-2.03) | 0.6595 |
| A26 | 36 (6.53) | 7,890 (5.95) | 10.08 | 1.06 | (0.74-1.46) | 0.7436 |
| A11 | 68 (12.34) | 14,104 (10.63) | 11.42 | 1.04 | (0.79-1.34) | 0.7699 |
| A1 | 131 (23.77) | 27,743 (20.91) | 10.21 | 1.02 | (0.83-1.25) | 0.8273 |
| A74 | 7 (1.27) | 2,953 (2.23) | 7.86 | 0.95 | (0.40-1.90) | 0.9024 |
| A24 | 101 (18.33) | 23,647 (17.82) | 10.32 | 1.01 | (0.80-1.25) | 0.9439 |
| A31 | 30 (5.44) | 7,304 (5.50) | 9.95 | 1.01 | (0.68-1.43) | 0.9656 |
| A30 | 46 (8.35) | 14,054 (10.59) | 8.92 | 1.01 | (0.73-1.36) | 0.9730 |
| **HLA-B** |  |  |  |  |  |  |
| B38 | 36 (6.53) | 5,300 (3.99) | 15.04 | 1.60 | (1.12-2.22) | 0.0072 |
| B58 | 8 (1.45) | 6,209 (4.68) | 3.83 | 0.41 | (0.18-0.77) | 0.0124 |
| B46 | 8 (1.45) | 852 (0.64) | 29.23 | 2.16 | (0.94-4.36) | 0.0473 |
| B41 | 5 (0.91) | 2,854 (2.15) | 4.10 | 0.43 | (0.15-0.93) | 0.0614 |
| B63 | 3 (0.54) | 2,558 (1.93) | 2.94 | 0.34 | (0.08-0.89) | 0.0635 |
| B57 | 24 (4.36) | 8,368 (6.31) | 6.74 | 0.68 | (0.44-1.01) | 0.0725 |
| B55 | 8 (1.45) | 3,191 (2.41) | 5.80 | 0.54 | (0.25-1.01) | 0.0831 |
| B18 | 60 (10.89) | 10,954 (8.26) | 12.29 | 1.27 | (0.95-1.65) | 0.0905 |
| B48 | 2 (0.36) | 1,795 (1.35) | 3.18 | 0.30 | (0.05-0.95) | 0.0934 |
| B7 | 117 (21.23) | 23,659 (17.83) | 11.16 | 1.18 | (0.95-1.44) | 0.1206 |
| B70 + B71 + B72 | 26 (4.72) | 7,024 (5.29) | 11.39 | 1.39 | (0.89-2.07) | 0.1228 |
| B75 | 2 (0.36) | 1,272 (0.96) | 4.95 | 0.37 | (0.06-1.17) | 0.1619 |
| B49 | 25 (4.54) | 5,300 (3.99) | 11.59 | 1.29 | (0.84-1.88) | 0.2201 |
| B52 | 10 (1.81) | 3,957 (2.98) | 5.95 | 0.68 | (0.34-1.20) | 0.2225 |
| B56 | 9 (1.63) | 1,368 (1.03) | 15.78 | 1.50 | (0.72-2.72) | 0.2307 |
| B14 + B64 + B65 | 43 (7.80) | 9,037 (6.81) | 10.89 | 1.20 | (0.87-1.62) | 0.2485 |
| B42 | 7 (1.27) | 4,027 (3.04) | 5.72 | 0.66 | (0.28-1.32) | 0.2887 |
| B47 | 1 (0.18) | 514 (0.39) | 4.08 | 0.40 | (0.02-1.76) | 0.3567 |
| B8 | 107 (19.42) | 21,284 (16.04) | 11.27 | 1.10 | (0.88-1.37) | 0.3839 |
| B62 | 53 (9.62) | 12,366 (9.32) | 9.88 | 0.88 | (0.65-1.17) | 0.4088 |
| B60 | 46 (8.35) | 10,565 (7.96) | 10.06 | 0.88 | (0.64-1.19) | 0.4235 |
| B50 | 10 (1.81) | 3,141 (2.37) | 7.66 | 0.80 | (0.40-1.42) | 0.4887 |
| B27 | 37 (6.72) | 7,535 (5.68) | 11.22 | 1.11 | (0.78-1.53) | 0.5505 |
| B39 | 24 (4.36) | 7,288 (5.49) | 8.61 | 0.88 | (0.57-1.31) | 0.5583 |
| B35 | 107 (19.42) | 24,820 (18.71) | 9.95 | 1.06 | (0.85-1.31) | 0.5894 |
| B45 | 13 (2.36) | 4,855 (3.66) | 7.93 | 0.87 | (0.48-1.47) | 0.6393 |
| B44 | 116 (21.05) | 26,247 (19.78) | 10.05 | 0.97 | (0.78-1.19) | 0.7738 |
| B37 | 12 (2.18) | 2,524 (1.90) | 10.60 | 1.05 | (0.56-1.78) | 0.8638 |
| B61 | 19 (3.45) | 5,313 (4.00) | 9.81 | 0.97 | (0.59-1.50) | 0.8889 |
| B51 | 52 (9.44) | 12,043 (9.08) | 10.10 | 0.99 | (0.73-1.31) | 0.9239 |
| B13 | 22 (3.99) | 4,861 (3.66) | 10.21 | 0.98 | (0.62-1.47) | 0.9351 |
| B53 | 24 (4.36) | 8,563 (6.45) | 8.85 | 0.99 | (0.62-1.51) | 0.9532 |
| B78 | -- | 561 (0.42) | -- | -- | -- | -- |
| B81 | -- | 847 (0.64) | -- | -- | -- | -- |
| **HLA-C** |  |  |  |  |  |  |
| C12 | 8 (1.45) | 1,650 (1.24) | 19.41 | 2.67 | (1.19-5.16) | 0.0077 |
| C7 | 155 (28.13) | 35,420 (26.70) | 10.47 | 1.22 | (0.98-1.51) | 0.0745 |
| C3 + C9 + C10 | 74 (13.43) | 20,654 (15.57) | 8.67 | 0.80 | (0.61-1.03) | 0.0920 |
| C8 | 18 (3.27) | 6,463 (4.87) | 7.21 | 0.73 | (0.43-1.14) | 0.1979 |
| C16 | 1 (0.18) | 1,859 (1.40) | 2.71 | 0.33 | (0.02-1.46) | 0.2658 |
| C100 | 1 (0.18) | 1,430 (1.08) | 2.55 | 0.36 | (0.02-1.64) | 0.3162 |
| C15 | 1 (0.18) | 1,064 (0.80) | 4.53 | 0.50 | (0.03-2.22) | 0.4860 |
| C2 | 39 (7.08) | 9,251 (6.97) | 10.46 | 1.10 | (0.77-1.52) | 0.5830 |
| C6 | 45 (8.17) | 12,595 (9.49) | 8.58 | 0.92 | (0.67-1.25) | 0.6250 |
| C5 | 44 (7.99) | 9,614 (7.25) | 10.26 | 1.06 | (0.76-1.44) | 0.7220 |
| C4 | 91 (16.52) | 24,159 (18.21) | 9.27 | 0.97 | (0.75-1.23) | 0.7868 |
| C1 | 29 (5.26) | 6,206 (4.68) | 11.20 | 1.01 | (0.67-1.48) | 0.9421 |
| C14 | -- | 594 (0.45) | -- | -- | -- | -- |
| C17 | -- | 1,348 (1.02) | -- | -- | -- | -- |
| **HLA-DQ** |  |  |  |  |  |  |
| DQ7b | 63 (16.41) | 23,989 (21.69) | 6.57 | 0.77 | (0.58-1.01) | 0.0648 |
| DQ5b | 60 (15.63) | 17,705 (16.01) | 9.85 | 1.25 | (0.93-1.65) | 0.1294 |
| DQ8b | 38 (9.90) | 11,047 (9.99) | 10.22 | 1.28 | (0.89-1.78) | 0.1621 |
| DQ9b | 11 (2.86) | 2,969 (2.68) | 10.26 | 1.26 | (0.65-2.20) | 0.4560 |
| DQ2 | 169 (30.67) | 42,501 (32.03) | 9.46 | 0.94 | (0.78-1.14) | 0.5599 |
| DQ4 | 34 (6.17) | 11,184 (8.43) | 8.34 | 0.91 | (0.63-1.29) | 0.6191 |
| DQ6b | 78 (20.31) | 26,114 (23.61) | 7.92 | 0.97 | (0.74-1.25) | 0.8209 |
| **HLA-DR** |  |  |  |  |   |  |
| DR13b | 58 (15.10) | 23,247 (21.02) | 6.87 | 0.74 | (0.57-0.95) | 0.0225 |
| DR15b | 91 (23.70) | 23,720 (21.45) | 10.02 | 1.17 | (0.92-1.48) | 0.1862 |
| DR7 | 99 (17.97) | 25,509 (19.23) | 8.93 | 0.87 | (0.69-1.08) | 0.2128 |
| DR17b | 61 (15.89) | 16,262 (14.71) | 10.15 | 1.18 | (0.88-1.54) | 0.2487 |
| DR1 | 94 (17.06) | 19,828 (14.94) | 10.57 | 1.11 | (0.88-1.38) | 0.3663 |
| DR10 | 15 (2.72) | 3,441 (2.59) | 11.69 | 1.20 | (0.69-1.93) | 0.4875 |
| DR18 | 4 (1.04) | 2,695 (2.44) | 5.35 | 0.76 | (0.23-1.81) | 0.5850 |
| DR12b | 24 (4.58) | 6,809 (5.31) | 9.40 | 0.90 | (0.57-1.34) | 0.6130 |
| DR16b | 9 (2.34) | 3,428 (3.10) | 6.81 | 0.85 | (0.41-1.55) | 0.6353 |
| DR4 | 172 (31.22) | 40,623 (30.62) | 10.15 | 0.96 | (0.79-1.15) | 0.6532 |
| DR14b | 26 (6.77) | 7,525 (6.80) | 9.90 | 1.08 | (0.74-1.52) | 0.6732 |
| DR9 | 17 (3.09) | 4,931 (3.72) | 9.98 | 0.92 | (0.54-1.45) | 0.7366 |
| DR11 | 90 (17.18) | 23,815 (18.57) | 8.72 | 0.98 | (0.77-1.22) | 0.8302 |
| DR8 | 46 (8.35) | 13,176 (9.93) | 9.41 | 0.99 | (0.72-1.33) | 0.9622 |
| DR103 | 4 (0.73) | 1,153 (0.87) | 8.66 | 0.99 | (0.31-2.32) | 0.9857 |
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| DLBCL=Diffuse large B-cell lymphoma; SIR=Standardized incidence ratio; IRR=Incidence rate ratio |
| aIRRs were calculated as the ratio of incidence rates between each antigen category and all other antigens combined, and were adjusted for sex, age at transplant, race/ethnicity, year of transplant, transplanted organ, transplant number, panel reactive antibody score, and donor vital status. |
| bThis category includes restricted transplant years reflecting when the split antigen category was in common use (described in supplementary materials). |

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