**SUPPLEMENTAL TABLES**

**Supplemental Table 1:** Lymphoid malignancies diagnosed among HIV–infected people (N=6,513)

|  |  |
| --- | --- |
| **Lymphoid Malignancies** | **Number (%)** |
|  |  |
| **AIDS–defining lymphoid malignancies** | **4,542 (69.7)** |
| Diffuse large B–cell lymphoma | 2,461 (37.8) |
| Burkitt lymphoma | 572 (8.8) |
| Central nervous system lymphoma | 620 (9.5) |
| B–cell non–Hodgkin lymphoma, NOS | 527 (8.1) |
| Unclassified non–Hodgkin lymphomas | 362 (5.6) |
|  |  |
| **Non–AIDS–defining lymphoid malignancies** | **1,971 (30.3)** |
| ***B–cell non–Hodgkin lymphomas*** | **321 (4.9)** |
| Follicular lymphoma | 112 (1.7) |
| Marginal zone lymphoma | 78 (1.2) |
| CLL/SLL | 46 (0.7) |
| Precursor lymphoblastic leukemia | 39 (0.6) |
| Lymphoplasmacytic lymphoma | 36 (0.6) |
| Mantle cell lymphoma | 10 (0.2) |
| ***T–cell non–Hodgkin lymphomas*** | **255 (3.9)** |
| Peripheral T–cell lymphoma | 102 (1.6) |
| Anaplastic large cell lymphoma | 96 (1.5) |
| Mycosis fungoides/Sezary syndrome | 25 (0.4) |
| T–cell leukemia/lymphoma | 15 (0.2) |
| NK/T–cell lymphoma | 5 (<0.1) |
| T–cell non–Hodgkin lymphoma, NOS | 12 (0.2) |
| ***Hodgkin lymphomas*** | **1,130 (17.3)** |
| ***Plasma cell neoplasms*** | **265 (4.1)** |
|  |  |

**Abbreviations:** AIDS, acquired immunodeficiency syndrome; CLL/SLL, chronic lymphocytic leukemia/small lymphocytic lymphoma; HIV, human immunodeficiency virus; NOS, not otherwise specified.

**Supplemental Table 2:** Cancer risk following lymphoid malignancies among HIV–infected people

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cancers** | **No. of cancers**  **N** | **No. with first primary lymphoid malignancies N (row %)** | **aHR (95% CI)**  **Model 1\*** | **aHR (95% CI)**  **Model 2\*** |
| Any first non–lymphoid cancer | 18,944 | 226 (1.2) | **2.7 (2.3–3.2)** | **1.7 (1.5–2.0)** |
|  |  |  |  |  |
| Oral cavity | 511 | 7 (1.4) | **2.6 (1.2–5.5)** | 1.9 (0.9–4.0) |
| Oropharynx | 254 | 1 (0.4) | … | … |
| Esophagus | 240 | 2 (0.8) | … | … |
| Stomach | 244 | 1 (0.4) | … | … |
| Colon | 601 | 7 (1.2) | **2.4 (1.1–5.0)** | 2.0 (1.0–4.3) |
| Rectum | 549 | 10 (1.8) | **3.6 (1.9–6.7)** | **2.7 (1.5–5.1)** |
| Rectal SCC | 163 | 5 (3.1) | **5.5 (2.3–13.5)** | **4.1 (1.7–10.1)** |
| Rectal Non–SCC | 386 | 5 (1.3) | **2.7 (1.1–6.4)** | 2.0 (0.8–4.9) |
| Anus | 1,744 | 32 (1.8) | **3.6 (2.5–5.1)** | **2.6 (1.8–3.6)** |
| Liver | 1,377 | 13 (0.9) | **2.0 (1.2–3.5)** | 1.7 (1.0–3.0) |
| Gall bladder/Biliary tract | 115 | 2 (1.7) | … | … |
| Pancreas | 385 | 2 (0.5) | … | … |
| Larynx | 389 | 4 (1.0) | 2.2 (0.8–5.9) | 1.6 (0.6–4.4) |
| Lung | 3,111 | 24 (0.8) | **1.6 (1.1–2.4)** | 1.2 (0.8–1.8) |
| Melanoma | 275 | 3 (1.1) | 2.1 (0.7–6.4) | 1.6 (0.5–4.9) |
| Kaposi sarcoma | 2,379 | 44 (1.9) | **4.6 (3.4–6.2)** | **2.0 (1.5–2.7)** |
| Soft tissue/Heart | 336 | 2 (0.6) | … | … |
| Female breast | 873 | 5 (0.6) | 1.7 (0.7–4.1) | 1.4 (0.6–3.4) |
| Cervix | 523 | 3 (0.6) | 1.9 (0.6–5.8) | 0.9 (0.3–2.8) |
| Uterus | 114 | 1 (0.9) | … | … |
| Vagina/Vulva | 201 | 4 (2.0) | **6.1 (2.3–16.3)** | **4.1 (1.5–11.1)** |
| Prostate | 1,803 | 7 (0.4) | 0.7 (0.3–1.4) | 0.6 (0.3–1.3) |
| Testis | 122 | 0 (0) | … | … |
| Penis | 132 | 2 (1.5) | … | … |
| Urinary bladder | 200 | 3 (1.5) | 2.8 (0.9–8.8) | 2.3 (0.7–7.1) |
| Kidney | 441 | 5 (1.1) | 2.4 (1.0–5.7) | 2.0 (0.8–4.9) |
| Central nervous system | 143 | 3 (2.1) | **5.0 (1.6–15.6)** | 3.2 (1.0–10.2) |
| Thyroid | 198 | 1 (0.5) | … | … |
| Myeloid malignancies† | 447 | 19 (4.3) | **9.7 (6.1–15.4)** | **7.1 (4.5–11.3)** |
| Miscellaneous‡ | 1,237 | 19 (1.5) | **3.4 (2.1–5.3)** | **2.5 (1.6–3.9)** |
|  |  |  |  |  |

**Abbreviations**: aHR, adjusted hazard ratio; CI, confidence interval; SCC, squamous cell carcinoma.

\***Model 1**: Models adjusted for sex/risk group, race/ethnicity, and calendar year of cohort entry.

**Model 2**: Models adjusted for sex/risk group, race/ethnicity, calendar year of cohort entry, and prior AIDS diagnosis and time since HIV diagnosis as time–varying covariates.

Models 1 and 2 had age as the time scale.

†Myeloid malignancies include myelodysplasia, myeloproliferative neoplasms, and other myeloid malignancies.

‡ Miscellaneous cancers include cancers of the following sites: salivary glands (N=32), other oral cavity/pharynx (N=85), small intestine (N=70), other gastrointestinal tract (N=33), other respiratory tract (N=49), Bone and cartilage (N=77), male breast (N=32), other female genital tract (N=88), other male genital tract (N=25), eye and orbit (N=39), other urinary tract (N=21), other endocrine glands (N=26), and unknown primary site (N=660).

Note: Highlighted aHRs and 95%CIs indicate estimates that were statistically significant with p<0.05.

… hazard ratios were suppressed for comparisons when there were ≤2 non-lymphoid cancers with prior lymphoid malignancies

**Supplemental Table 3:** Cancer risk following first non–Hodgkin lymphoma, Hodgkin lymphoma, or plasma cell neoplasms among HIV–infected people

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cancers** | **No. of cancers**  **N** | **Non–Hodgkin lymphoma** | | **Hodgkin lymphoma** | |
| **No. with first primary lymphoid malignancies N (row %)** | **aHR**  **(95% CI)\*** | **No. with first primary lymphoid malignancies N (row %)** | **aHR**  **(95% CI)\*** |
|  |  |  |  |  |  |
| Any first non–lymphoid cancer | 18,944 | 169 (0.9) | **1.8 (1.6–2.1)** | 43 (0.2) | **1.9 (1.4–2.5)** |
| Oral Cavity | 511 | 7 (1.4) | **2.5 (1.2–5.2)** | 0 (0) | … |
| Colon | 601 | 6 (1.0) | **2.4 (1.1–5.5)** | 1 (0.2) | … |
| Rectum | 549 | 4 (0.7) | 1.4 (0.5–3.8) | 4 (0.7) | **5.4 (2.0–14.3)** |
| Anus | 1,744 | 19 (1.1) | **2.0 (1.3–3.1)** | 11 (0.6) | **4.2 (2.3–7.6)** |
| Liver | 1,377 | 10 (0.7) | 1.8 (1.0–3.4) | 3 (0.2) | 2.0 (0.7–6.3) |
| Lung | 3,111 | 18 (0.6) | 1.3 (0.8–2.0) | 4 (0.1) | 1.1 (0.4–3.0) |
| Kaposi Sarcoma | 2,379 | 41 (1.7) | **2.3 (1.7–3.2)** | 1 (0.1) | … |
| Female Breast | 873 | 2 (0.2) | … | 1 (0.1) | … |
| Prostate | 1,803 | 2 (1.1) | … | 5 (0.3) | 2.2 (0.9–5.2) |
| Kidney | 441 | 5 (1.1) | **2.8 (1.2–6.8)** | 0 (0) | … |
| Myeloid malignancies† | 447 | 12 (2.7) | **5.8 (3.3–10.4)** | 7 (1.6) | **13.5 (6.4–28.5)** |
| Miscellaneous‡ | 1,237 | 18 (1.5) | **3.1 (2.0–5.0)** | 0 (0) | … |
|  |  |  |  |  |  |

**Abbreviations:** aHR, adjusted hazard ratio; AIDS, acquired immunodeficiency syndrome; CI, confidence interval.

\* Models adjusted for sex/risk group, race/ethnicity, calendar year of cohort entry, and prior AIDS diagnosis and time since HIV diagnosis as time–varying covariates. Cox regression model had age as the time scale.

†Myeloid malignancies include myelodysplasia, myeloproliferative neoplasms, and other myeloid malignancies.

‡ Miscellaneous cancers include cancers of the following sites: salivary glands (N=32), other oral cavity/pharynx (N=85), small intestine (N=70), other gastrointestinal tract (N=33), other respiratory tract (N=49), Bone and cartilage (N=77), male breast (N=32), other female genital tract (N=88), other male genital tract (N=25), eye and orbit (N=39), other urinary tract (N=21), other endocrine glands (N=26), and unknown primary site (N=660).

Note: Highlighted aHRs and 95%CIs indicate estimates that were statistically significant with p<0.05.

… hazard ratios were suppressed for comparisons when there were ≤2 non-lymphoid cancers with prior lymphoid malignancies

**Supplemental Table 4:** Cancer risk following any first lymphoid malignancy according to stage at cancer diagnosis among HIV–infected people

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cancers** | **No. of cancers**  **N** | **No. with first primary lymphoid malignancies N (row %)** | **aHR (95% CI)**  **Model 1\*** | **aHR (95% CI)**  **Model 2\*** |
|  |  |  |  |  |
| **Any non-lymphoid malignancy** |  |  |  |  |
| Localized/Stage I | 7,466 | 93 (1.3) | **2.6 (2.1-3.2)** | **1.9 (1.6-2.4)** |
| Regional/Distant/Stage II-IV | 8,325 | 95 (1.1) | **2.5 (2.0-3.0)** | **1.8 (1.5-2.3)** |
| Unstaged | 3,153 | 38 (0.6) | **2.6 (1.9-3.5)** | **1.6 (1.2-2.2)** |
|  |  |  |  |  |
| **Oral cavity** |  |  |  |  |
| Localized/Stage I | 188 | 2 (1.1) | … | … |
| Regional/Distant/Stage II-IV | 272 | 4 (1.5) | **2.8 (1.1-7.6)** | 2.1 (0.8-5.6) |
| Unstaged/Missing | 51 | 1 (2.0) | … | … |
|  |  |  |  |  |
| **Colon** |  |  |  |  |
| Localized/Stage I | 187 | 2 (1.1) | … | … |
| Regional/Distant/Stage II-IV | 336 | 3 (0.9) | 1.8 (0.6-5.7) | 1.5 (0.5-4.8) |
| Unstaged/Missing | 78 | 2 (2.6) | … | … |
|  |  |  |  |  |
| **Rectum** |  |  |  |  |
| Localized/Stage I | 209 | 6 (2.9) | **5.8 (2.6-13.2)** | **4.4 (1.9-9.9)** |
| Regional/Distant/Stage II-IV | 244 | 3 (1.2) | 2.4 (0.8-7.6) | 1.9 (0.6-5.9) |
| Unstaged/Missing | 96 | 1 (1.0) | … | … |
|  |  |  |  |  |
| **Anus** |  |  |  |  |
| Localized/Stage I | 930 | 12 (1.3) | **2.5 (1.4-4.4)** | **1.8 (1.0-3.2)** |
| Regional/Distant/Stage II-IV | 610 | 13 (2.1) | **4.4 (2.6-7.7)** | **3.1 (1.8-5.4)** |
| Unstaged/Missing | 204 | 7 (3.4) | **6.2 (2.9-13.2)** | **4.1 (1.9-8.7)** |
|  |  |  |  |  |
| **Liver** |  |  |  |  |
| Localized/Stage I | 532 | 10 (1.9) | **4.1 (2.2-7.6)** | **3.6 (1.9-6.7)** |
| Regional/Distant/Stage II-IV | 564 | 3 (0.5) | 1.1 (0.4-3.5) | 1.0 (0.3-3.0) |
| Unstaged/Missing | 281 | 0 (0) | … | … |
|  |  |  |  |  |
| **Lung** |  |  |  |  |
| Localized/Stage I | 431 | 8 (1.9) | **4.0 (2.0-8.1)** | **3.0 (1.5-6.0)** |
| Regional/Distant/Stage II-IV | 2,372 | 15 (0.6) | 1.3 (0.8-2.2) | 1.0 (0.6-1.7) |
| Unstaged/Missing | 308 | 1 (0.3) | … | … |
|  |  |  |  |  |
| **Kaposi sarcoma** |  |  |  |  |
| Localized/Stage I | 1,067 | 18 (1.7) | **4.2 (2.6-6.6)** | **1.9 (1.2-3.0)** |
| Regional/Distant/Stage II-IV | 599 | 11 (1.8) | **5.1 (2.8-9.3)** | **2.1 (1.2-3.8)** |
| Unstaged/Missing | 713 | 15 (2.1) | **4.9 (2.9-8.2)** | **2.1 (1.3-3.6)** |
|  |  |  |  |  |
| **Female breast** |  |  |  |  |
| Localized/Stage I | 423 | 3 (0.7) | 2.1 (0.7-6.4) | 1.7 (0.6-5.4) |
| Regional/Distant/Stage II-IV | 404 | 2 (0.5) | … | … |
| Unstaged/Missing | 46 | 0 (0) | … | … |
|  |  |  |  |  |
| **Prostate** |  |  |  |  |
| Localized/Stage I | 1,435 | 6 (0.4) | 0.7 (0.3-1.6) | 0.7 (0.3-1.5) |
| Regional/Distant/Stage II-IV | 251 | 0 (0) | … | … |
| Unstaged/Missing | 117 | 1 (0.9) | … | … |
|  |  |  |  |  |
| **Kidney** |  |  |  |  |
| Localized/Stage I | 306 | 4 (1.3) | **2.8 (1.0-7.4)** | 2.5 (0.9-6.7) |
| Regional/Distant/Stage II-IV | 113 | 1 (0.9) | … | … |
| Unstaged/Missing | 22 | 0 (0) | … | … |
|  |  |  |  |  |

**Abbreviations**: aHR, adjusted hazard ratio; CI, confidence interval

\***Model 1**: Models adjusted for sex/risk group, race/ethnicity, and calendar year of cohort entry.

**Model 2**: Models adjusted for sex/risk group, race/ethnicity, calendar year of cohort entry, and prior AIDS diagnosis and time since HIV diagnosis as time–varying covariates.

Models 1 and 2 had age as the time scale.

Note: Highlighted aHRs and 95%CIs indicate estimates that were statistically significant with p<0.05.

Stage variable was created by assigning cancer stage according to the date of cancer diagnosis as follows: SEER summary stage 1977 (cancers diagnosed between 1996-2000), SEER summary stage 2000 (2001-2004), AJCC 6th edition (2004-2010), and AJCC 7th edition (2010+). SEER summary stages were either localized, regional, distant, or unstaged. AJCC stages were stage I, II, III, or IV.

… hazard ratios were suppressed for comparisons when there were ≤2 non-lymphoid malignancies with prior lymphoid malignancies.

**Supplemental Table 5:** CD4 count data at the time of lymphoid malignancy diagnosis (N=6,513)

|  |  |
| --- | --- |
| **Characteristics** | **Statistics** |
|  |  |
| CD4 count closest to lymphoid malignancy diagnosis (0-6 months **before** diagnosis) |  |
| Median (IQR) | 150 (50-350) |
| CD4 counts available | 3,782 (58.1%) |
| Missing, number (%) | 2,731 (41.9%) |
|  |  |
| CD4 count closest to lymphoid malignancy diagnosis (1-6 months **after** diagnosis) |  |
| Median (IQR) | 150 (50-350) |
| CD4 counts available | 2,914 (44.7%) |
| Missing, number (%) | 3,599 (55.3%) |
|  |  |
| Lowest CD4 count closest to lymphoid malignancy diagnosis (0-6 months before or 1-6 months after lymphoid malignancy) |  |
| Median (IQR) | 116 (50 - 262) |
| Missing, number (%) | 2,117 (32.5%) |
| CD4 count 0-200 cells/µL | 3,142 (48.2%) |
| CD4 count > 200 cells/µL | 1,254 (19.3%) |
|  |  |

Abbreviations: IQR, interquartile range

**Supplemental Table 6:** Cancer risk following any first lymphoid malignancy according to CD4 count within 6 months before or after lymphoid malignancy diagnosis.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cancers** | **No. of cancers** | **CD4 count ≤ 200 cells/**µ**L at the time of lymphoid malignancy diagnosis vs. no lymphoid malignancy** | | **CD4 count > 200 cells/**µ**L at the time of lymphoid malignancy diagnosis vs. no lymphoid malignancy** | | **CD4 count missing at the time of lymphoid malignancy diagnosis vs. no lymphoid malignancy** | | **CD4 count** **≤ 200 vs. > 200 cells/**µ**L at the time of lymphoid malignancy diagnosis** |
| **No. with first primary lymphoid malignancies N (row %)** | **aHR**  **(95% CI)\*** | **No. with first primary lymphoid malignancies N (row %)** | **aHR**  **(95% CI)\*** | **No. with first primary lymphoid malignancies N (row %)** | **aHR**  **(95% CI)\*** | **aHR**  **(95% CI)\*** |
|  |  |  |  |  |  |  |  |  |
| Any non-lymphoid malignancy | 18,944 | 93 (0.5) | **2.7 (2.2- 3.4)** | 38 (0.2) | **2.0 (1.5-2.7)** | 95 (0.5) | **2.6 (2.1-3.2)** | 1.4 (1.0-2.0) |
| Oral Cavity | 511 | 4 (0.8) | **3.9 (1.5-10.5)** | 1 (0.2) | … | 2 (0.4) | … | … |
| Colon | 601 | 3 (0.5) | 2.8 (0.9-8.6) | 0 (0) | … | 4 (0.7) | **3.3 (1.2-8.8)** | … |
| Rectum | 549 | 3 (0.5) | 2.9 (0.9-8.9) | 2 (0.4) | … | 5 (0.9) | **4.3 (1.8-10.3)** | … |
| Rectal SCC | 163 | 3 (1.8) | **9.0 (2.9-28.3)** | 0 (0) | … | 2 (1.2) | **…** | … |
| Rectal Non-SCC | 386 | 0 (0) | … | 2 (0.5) | … | 3 (0.8) | **3.8 (1.2-12.0)** | … |
| Anus | 1,744 | 11 (0.6) | **3.4 (1.9-6.1)** | 5 (0.3) | **2.8 (1.2-6.8)** | 16 (0.9) | **4.2 (2.6-6.8)** | 1.2 (0.4-3.5) |
| Liver | 1,377 | 3 (0.2) | 1.2 (0.4-3.7) | 3 (0.2) | 2.1 (0.7 -6.4) | 7 (0.5) | **2.9 (1.4-6.1)** | 0.6 (0.1-2.8) |
| Lung | 3,111 | 5 (0.2) | 0.9 (0.38-2.2) | 7 (0.2) | **2.3 (1.1-4.7)** | 12 (0.4) | **1.9 (1.1-3.4)** | 0.4 (0.1-1.3) |
| Kaposi sarcoma | 2,379 | 29 (1.2) | **7.9 (5.5 -11.4)** | 5 (0.2) | **2.5 (1.0-6.0** | 10 (0.4) | **2.6 (1.4-4.8)** | **3.2 (1.2-8.2)** |
| Female breast | 873 | 2 (0.2) | … | 1 (0.1) | … | 2 (0.2) | … | … |
| Prostate | 1,803 | 3 (0.2) | 0.8 (0.2-2.3) | 0 (0) | … | 4 (0.2) | 1.0 (0.4-2.7) | … |
| Kidney | 441 | 1 (0.2) | … | 0 (0) | … | 4 (0.9) | **4.8 (1.8-12.8)** | … |
| Myeloid malignancies† | 447 | 8 (1.8) | **10.7 (5.3-21.6)** | 3 (0.7) | **6.82 (2.2-21.3)** | 8 (1.8) | **10.3 (5.1-20.8)** | 1.5 (0.4-5.9) |
| Miscellaneous‡ | 1,237 | 8 (0.6) | **3.7 (1.8-7.4)** | 2 (0.2) | … | 9 (0.7) | **3.8 (2.0-7.3)** | … |
|  |  |  |  |  |  |  |  |  |

**Abbreviations:** aHR, adjusted hazard ratio; CI, confidence interval.

\* Models adjusted for sex/risk group, race/ethnicity, and calendar year of cohort entry. Cox regression model had age as the time scale.

†Myeloid malignancies include myelodysplasia, myeloproliferative neoplasms, and other myeloid malignancies.

‡ Miscellaneous cancers include cancers of the following sites: salivary glands (N=32), other oral cavity/pharynx (N=85), small intestine (N=70), other gastrointestinal tract (N=33), other respiratory tract (N=49), Bone and cartilage (N=77), male breast (N=32), other female genital tract (N=88), other male genital tract (N=25), eye and orbit (N=39), other urinary tract (N=21), other endocrine glands (N=26), and unknown primary site (N=660).

Note: Highlighted aHRs and 95%CIs indicate estimates that were statistically significant with p<0.05.

… hazard ratios were suppressed for comparisons when there were ≤2 non-lymphoid malignancies with prior lymphoid malignancies.