**Supplemental Material 1. Distribution of number of visits with immunological data for subjects in the**

**study cohort (n=532).**

**Histogram_num_subs_with_immune data_FINAL.tif**

**Supplemental Material 2.** Frequency of incident virus-associated cancers.

|  |  |
| --- | --- |
| **Cancer** | **Count** |
| Anal cancer | 9 |
| Hodgkin lymphoma | 3 |
| Kaposi sarcoma | 2 |
| Liver cancer | 6 |
| Non-Hodgkin lymphoma | 9 |
| Head and neck squamous cell carcinoma | 3 |

**Supplemental Material 3**. Subjects with multiple cancer diagnoses

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Subject | Virus-associated cancer | |  | Non-virus-associated cancer | |  | Time interval between diagnoses |
|  | First diagnosis | Second diagnosis |  | First diagnosis | Second diagnosis |  |
| 1 |  | Hodgkin lymphoma |  | Thyroid cancer |  |  | 17 years |
| 2 |  | Anal cancer |  | Prostate cancer |  |  | 2 years |
| 3 | Non Hodgkin lymphoma |  |  |  | Prostate cancer |  | 9 years |
| 4 | Kaposi sarcoma |  |  |  | Prostate cancer |  | 14 years |

**Supplemental Material 4**. Longitudinal trends of CD4 and white blood cell counts proximal to virus-associated

cancer diagnosis from mixed-effects models.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **CD4 cell count (cells/μl)** | | | **White blood cell count (cells/μl) (log2)** | | |
|  | **Estimate** | **SE** | **p-value** | **Estimate** | **SE** | **p-value** |
| Virus-associated cancer | -233.667 | 71.748 | **0.001** | -0.185 | 0.086 | **0.032** |
| Heavy smokinga | 179.515 | 28.533 | **<0.001** | 0.245 | 0.035 | **<0.001** |
| Age proximal to diagnosisb | 1.590 | 1.138 | 0.163 | 0.000 | 0.000 | **0.041** |
| Black race | -7.809 | 28.443 | 0.784 | 0.002 | 0.001 | 0.201 |
| FIB-4 > 1.45c | -122.874 | 29.688 | **<0.001** | -0.145 | 0.035 | **<0.001** |
| Time to diagnosisd | -0.084 | 0.164 | 0.608 | -0.196 | 0.037 | **<0.001** |

Heterogeneity was assumed between groups by cancer diagnosis; therefore, group by time interaction was included in

the models despite non-significant estimates. Given discordant patterns for CD4 and WBC counts in NHL cases compared to other

virus-associated cancers (see Figure 3), NHL cases were excluded from these models.

aSmoking 0.5 packs per day or more on average during follow-up

bAge 6 years prior to endpoint.

cTime-updated.

dFrom 6 years prior to endpoint