**Supplemental appendix:**

For lung cancer, we used the following search terms in PubMed (tobacco OR smok\* OR cig\*) AND (cancer OR carcinoma OR neoplas\*) AND lung AND (odd\* OR risk OR ratio OR hazard\* OR case-control OR cohort OR prospective) on November 22, 2014 and identified 11,789 abstracts. For head and neck cancer, we performed our search on November 22, 2014 and used the following search terms (tobacco OR smok\* OR cig\*) AND (cancer OR carcinoma OR neoplas\*) AND (oral OR larynx OR “head and neck” OR pharynx OR laryngeal OR pharyngeal) AND (odd\* OR risk OR ratio OR hazard\* OR case-control OR cohort OR prospective), identifying 6494 abstracts. We initially reviewed titles and abstracts, excluding reviews, case-series, studies conducted in populations outside of the United States, and studies of cancer survival. We then examined the remaining 323 abstracts from our lung search and 375 abstracts from our head and neck cancer search in more detail, reading the entirety of 98 of the lung cancer and 56 of the head and neck cancer manuscripts.

For lung cancer, we identified 15 unique studies that provided risk estimates for current versus never smoking, pack-years of smoking, or cigarettes per day among current smokers by histologic type. Due to the high lethality of lung cancer, we included studies of both lung cancer incidence and mortality. Searching through the reference lists of these articles identified an additional 6 papers. For incident head and neck cancer, we identified 19 unique studies which provided these risk estimates separately for laryngeal, oral cavity, or pharyngeal cancer. Through the reference lists of these papers we identified an additional 5 studies. In each of the identified articles (21 for lung, 24 for larynx, oral cavity, or pharynx), we extracted maximally adjusted risk estimates. If adjusted risk estimates were unavailable, we present unadjusted risk estimates. Due to the strong and consistent association between smoking and these cancers and our desire to identify as many previous studies as possible, we did not judge studies based on quality. However, we do note whether studies were prospective or case-control and whether risk estimates were multivariate-adjusted or unadjusted in the Supplementary tables.

**Supplemental Table 1: Characteristics of the NIH-AARP Diet and Health Study by smoking status**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Women** | | | **Men** | | |
| **Smoking Status** | **Never smoker** | **Former smoker** | **Current smoker** | **Never smoker** | **Former smoker** | **Current smoker** |
|  | 82,032 (44%) | 72,081 (39%) | 31,944 (17%) | 68,748 (26%) | 161,425 (61%) | 35,901 (13%) |
| **Entry Age, Median** | 62.5 | 62.5 | 61.1 | 61.9 | 63.3 | 61.0 |
| **Education** |  |  |  |  |  |  |
| **High school or less** | 26,677 (34%) | 20,858 (30%) | 11,246 (36%) | 11,052 (16%) | 36,459 (23%) | 10,294 (30%) |
| **Some college** | 27,041 (34%) | 26,713 (38%) | 12,502 (41%) | 17,515 (26%) | 54,294 (35%) | 13,415 (39%) |
| **College or more** | 25,830 (32%) | 22,375 (32%) | 7,091 (23%) | 38,866 (58%) | 66,469 (42%) | 11,045 (32%) |
| **Race/ethnicity** |  |  |  |  |  |  |
| **White** | 72,189 (89%) | 65,578 (92%) | 28,766 (91%) | 62,708 (92%) | 150,598 (94%) | 32,994 (93%) |
| **Other** | 8,703 (11%) | 5,588 (8%) | 2,745 (9%) | 5,378 (8%) | 9,255 (6%) | 2,487 (7%) |
| **Alcohol intake** |  |  |  |  |  |  |
| **None** | 28,921 (35%) | 17,401 (24%) | 7,888 (25%) | 17,820 (26%) | 30,651 (19%) | 6,853 (19%) |
| **>0 to 1** | 46,464 (57%) | 42,931 (60%) | 17,584 (55%) | 37,665 (55%) | 78,159 (49%) | 15,782 (44%) |
| **1 to 3** | 5,313 (7%) | 9,363 (13%) | 4,362 (14%) | 9,686 (14%) | 32,808 (20%) | 6,201 (17%) |
| **>3** | 957 (1%) | 2,191 (3%) | 2,001 (6%) | 3,395 (5%) | 19,323 (12%) | 6,952 (19%) |
| **Age at smoking initiation**\* |  |  |  |  |  |  |
| **<15** |  | 5,032 (13%) | 2,412 (16%) |  | 21,760 (26%) | 4,998 (33%) |
| **15 to 19** |  | 18,258 (47%) | 6,345 (43%) |  | 38,870 (46%) | 6,171 (41%) |
| **20 to 24** |  | 14,302 (36%) | 5,148 (35%) |  | 21,674 (26%) | 3,508 (23%) |
| **≥25** |  | 1,656 (4%) | 862 (6%) |  | 1,298 (2%) | 350 (2%) |
| **Cigarettes per day** |  |  |  |  |  |  |
| **1-10** |  | 27,602 (38%) | 9,784 (31%) |  | 32,166 (20%) | 7,184 (20%) |
| **11-20** |  | 21,848 (30%) | 13,513 (42%) |  | 49,450 (31%) | 13,314 (37%) |
| **20-40** |  | 18,040 (25%) | 8,017 (25%) |  | 57,998 (36%) | 13,421 (37%) |
| **>40** |  | 4,591 (6%) | 630 (2%) |  | 21,810 (14%) | 1,982 (6%) |

\*Available for a subset of 152,644 ever-smokers who completed a later questionnaire in 2004-6.

**Supplemental Table 2: Cigarette smoking status and cancer in women**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cigarette smoking status** |  | **Never smoker\*** | | **Former smoker** | | | **Current smoker** | | |
| **Number in cohort** |  | 82,032 | | 72,081 | | | 31,944 | | |
| **Cancer type** | **Case (n)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Relative risk‡**  **(95% CI)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Relative risk‡**  **(95% CI)** |
| **Oral cavity and pharynx** | 304 | 69 | 8.7 (6.6-10.7) | 115 | 17.2 (14.0-20.3) | 1.8 (1.3-2.4) | 120 | 44.2 (36.2-52.2) | 4.4 (3.3-6.0) |
| Oral cavity | 153 | 36 | 4.5 (3.0-6.0) | 59 | 8.8 (6.6-11.1) | 1.8 (1.2-2.8) | 58 | 22.0 (16.3-27.7) | 4.3 (2.8-6.6) |
| Oropharynx | 111 | 22 | 2.8 (1.6-4.0) | 39 | 5.8 (4.0-7.6) | 1.8 (1.1-3.0) | 50 | 18.0 (12.9-23) | 5.2 (3.1-8.8) |
| Hypopharynx | 22 | 5 | 0.6 (0.1-1.2) | 8 | 1.2 (0.4-2.0) | 1.8 (0.6-5.7) | 9 | 3.2 (1.1-5.3) | 5.2 (1.7-16) |
| Nasopharynx | 18 | 6 | 0.7 (0.2-1.3) | 9 | 1.4 (0.5-2.2) | 1.7 (0.6-4.9) | 3 | 1.0 (0-2.2) | 1.3 (0.3-5.2) |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Nasal Cavity | 32 | 10 | 1.2 (0.5-2.0) | 12 | 1.8 (0.8-2.8) | 1.2 (0.5-2.9) | 10 | 3.4 (1.3-5.5) | 2.5 (1.0-6.3) |
| Larynx | 100 | 5 | 0.6 (0.1-1.2) | 22 | 3.3 (1.9-4.7) | 4.9 (1.9-13.1) | 73 | 26.8 (20.6-33) | 37.0 (14.9-92.3) |
| Lung | 3475 | 281 | 35.3 (31.1-39.4) | 1301 | 192.9 (182.4-203.4) | 5.4 (4.8-6.2) | 1893 | 718.7 (685.9-751.5) | 19.5 (17.2-22.2) |
| Lung Adenocarcinoma | 1381 | 155 | 19.4 (16.4-22.5) | 579 | 85.9 (78.9-92.9) | 4.2 (3.5-5.0) | 647 | 239.5 (220.8-258.2) | 11.7 (9.8-14.0) |
| Lung small cell | 542 | 15 | 1.9 (0.9-2.8) | 150 | 22.2 (18.7-25.8) | 11.9 (7.0-20.2) | 377 | 142.9 (128.3-157.5) | 73.1 (43.6-122.8) |
| Lung squamous cell | 467 | 7 | 0.9 (0.2-1.6) | 175 | 25.9 (22.1-29.8) | 30.3 (14.2-64.5) | 285 | 110.8 (97.8-123.8) | 121.4 (57.3-257.4) |
| Lung undifferentiated | 165 | 8 | 1.0 (0.3-1.7) | 65 | 9.7 (7.3-12.0) | 9.4 (4.5-19.6) | 92 | 34.1 (27.1-41.2) | 32.0 (15.4-66.2) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 55 | 10 | 1.3 (0.5-2.0) | 17 | 2.5 (1.3-3.7) | 1.9 (0.9-4.2) | 28 | 10.6 (6.6-14.7) | 7.3 (3.5-15.5) |
| Esophageal adenocarcinoma | 38 | 10 | 1.2 (0.5-2.0) | 18 | 2.7 (1.4-3.9) | 1.8 (0.8-4.0) | 10 | 3.7 (1.4-5.9) | 2.4 (1.0-5.9) |
| Stomach | 202 | 86 | 10.7 (8.4-12.9) | 80 | 11.9 (9.3-14.5) | 1.2 (0.9-1.6) | 36 | 13.2 (8.8-17.5) | 1.4 (0.9-2.1) |
| Colon | 1759 | 722 | 90.7 (84.1-97.3) | 716 | 106.2 (98.4-114.0) | 1.2 (1.1-1.3) | 321 | 122.4 (108.8-136.0) | 1.3 (1.2-1.5) |
| Rectum | 582 | 245 | 31.0 (27.1-34.9) | 222 | 33.0 (28.6-37.3) | 1.0 (0.9-1.2) | 115 | 41.6 (33.9-49.3) | 1.3 (1.0-1.6) |
| Liver | 123 | 46 | 5.7 (4.1-7.4) | 55 | 8.1 (6.0-10.3) | 1.5 (1.0-2.3) | 22 | 8.1 (4.7-11.5) | 1.6 (0.9-2.6) |
| Pancreas | 581 | 213 | 26.5 (23.0-30.1) | 216 | 32.0 (27.7-36.2) | 1.2 (1.0-1.5) | 152 | 57.2 (48.0-66.4) | 2.3 (1.8-2.8) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 607 | 131 | 16.6 (13.7-19.4) | 277 | 41.0 (36.2-45.9) | 2.5 (2.0-3.1) | 199 | 75.0 (64.5-85.6) | 4.7 (3.7-5.8) |
| Renal Pelvis | 44 | 10 | 1.2 (0.5-2.0) | 15 | 2.2 (1.1-3.3) | 1.9 (0.8-4.2) | 19 | 7.5 (4.1-10.8) | 7.0 (3.2-15.4) |
| Ureter | 20 | 6 | 0.8 (0.2-1.4) | 5 | 0.7 (0.1-1.4) | 1.1 (0.3-3.8) | 9 | 3.5 (1.2-5.8) | 5.2 (1.8-15.1) |
| Kidney | 467 | 196 | 24.8 (21.3-28.2) | 188 | 28.0 (24.0-32.0) | 1.2 (1.0-1.5) | 83 | 31 (24.3-37.8) | 1.3 (1.0-1.7) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 131 | 48 | 6.0 (4.3-7.7) | 59 | 8.8 (6.5-11) | 1.4 (0.9-2.1) | 24 | 8.9 (5.3-12.5) | 1.4 (0.9-2.3) |
| Cervical | 139 | 56 | 7.2 (5.3-9.1) | 38 | 5.7 (3.9-7.5) | 0.8 (0.5-1.3) | 45 | 15.8 (11.1-20.5) | 2.2 (1.5-3.3) |
| Ovary (Mucinous) | 31 | 12 | 2.2 (0.9-3.4) | 14 | 3.0 (1.4-4.5) | 1.3 (0.6-2.9) | 5 | 2.5 (0.3-4.7) | 1.3 (0.4-3.6) |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Age-standardized to the NIH-AARP population

**‡**Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

**Supplemental Table 3: Cigarette smoking status and cancer in men**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Cigarette smoking status** | | **Never smoker\*** | | **Former smoker** | | | **Current smoker** | | |
| **Number in cohort** | | 68,748 | | 161,425 | | | 35,901 | | |
| **Cancer type** | **Case (n)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Relative risk‡**  **(95% CI)** | **Case (n)** | **Incidence rate†**  **(95% CI)** | **Relative risk‡**  **(95% CI)** |
| **Oral cavity and pharynx** | 814 | 125 | 19.9 (16.4-23.4) | 430 | 29.6 (26.8-32.4) | 1.3 (1.0-1.6) | 259 | 88.9 (77.8-100.0) | 3.8 (3.0-4.7) |
| Oral cavity | 356 | 50 | 8.1 (5.9-10.4) | 191 | 13.0 (11.1-14.8) | 1.4 (1.0-1.9) | 115 | 40.7 (33.0-48.3) | 4.5 (3.1-6.3) |
| Oropharynx | 357 | 64 | 10.1 (7.6-12.5) | 190 | 13.3 (11.4-15.2) | 1.2 (0.9-1.6) | 103 | 34.5 (27.7-41.2) | 2.9 (2.1-4.0) |
| Hypopharynx | 61 | 4 | 0.7 (0-1.3) | 28 | 1.9 (1.2-2.6) | 2.1 (0.7-6.1) | 29 | 9.9 (6.2-13.6) | 9.0 (3.1-26.6) |
| Nasopharynx | 40 | 7 | 1.1 (0.3-1.9) | 21 | 1.4 (0.8-2.1) | 1.2 (0.5-2.9) | 12 | 3.9 (1.7-6.2) | 3.4 (1.3-9.2) |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Nasal Cavity | 65 | 8 | 1.3 (0.4-2.2) | 38 | 2.6 (1.8-3.4) | 2.2 (1.0-5.0) | 19 | 6.6 (3.6-9.7) | 6.2 (2.6-14.7) |
| Larynx | 502 | 31 | 5.0 (3.2-6.8) | 264 | 17.9 (15.8-20.1) | 3.4 (2.4-5.1) | 207 | 72.0 (62.0-82.0) | 13.8 (9.3-20.2) |
| Lung | 5906 | 175 | 28.2 (24.0-32.4) | 3296 | 221.6 (214.0-229.1) | 7.6 (6.6-8.9) | 2435 | 898.6 (862.1-935.1) | 29.4 (25.2-34.3) |
| Lung adenocarcinoma | 2064 | 90 | 14.5 (11.5-17.5) | 1312 | 88.4 (83.6-93.2) | 6.1 (4.9-7.6) | 662 | 240.0 (221.3-258.7) | 15.6 (12.5-19.6) |
| Lung small cell | 803 | 12 | 2 (0.9-3.1) | 346 | 23.3 (20.8-25.7) | 11 (6.2-19.7) | 445 | 161.8 (146.4-177.2) | 73.1 (41.1-130.2) |
| Lung squamous cell | 1245 | 10 | 1.6 (0.6-2.6) | 660 | 44.5 (41.1-47.9) | 25.0 (13.4-46.8) | 575 | 214.6 (196.6-232.5) | 114.6 (61.2-214.4) |
| Lung undifferentiated | 316 | 8 | 1.3 (0.4-2.1) | 169 | 11.5 (9.8-13.2) | 9.2 (4.5-18.9) | 139 | 49.9 (41.4-58.4) | 39.5 (19.2-81.2) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 112 | 8 | 1.3 (0.4-2.2) | 66 | 4.5 (3.4-5.6) | 2.6 (1.2-5.4) | 38 | 12.8 (8.7-17) | 6.2 (2.8-13.7) |
| Esophageal adenocarcinoma | 477 | 65 | 10.5 (8.0-13.1) | 321 | 21.8 (19.4-24.2) | 2.0 (1.5-2.7) | 91 | 32.2 (25.4-38.9) | 2.9 (2.1-4.1) |
| Stomach | 652 | 102 | 16.4 (13.2-19.6) | 439 | 29.7 (26.9-32.5) | 1.7 (1.3-2.1) | 111 | 39.3 (31.8-46.8) | 2.2 (1.7-2.9) |
| Colon | 3373 | 731 | 117.7 (109.1-126.2) | 2202 | 149.5 (143.3-155.8) | 1.2 (1.1-1.3) | 440 | 157.8 (142.8-172.9) | 1.3 (1.1-1.4) |
| Rectum | 1300 | 249 | 39.8 (34.9-44.8) | 863 | 59.1 (55.1-63.0) | 1.3 (1.1-1.5) | 188 | 66.3 (56.6-75.9) | 1.3 (1.1-1.6) |
| Liver | 402 | 70 | 11.3 (8.7-14) | 249 | 16.8 (14.7-18.9) | 1.6 (1.2-2.1) | 83 | 31.4 (24.5-38.3) | 2.7 (1.9-3.8) |
| Pancreas | 981 | 213 | 34.8 (30.1-39.4) | 574 | 38.6 (35.5-41.8) | 1.0 (0.9-1.2) | 194 | 70.3 (60.1-80.4) | 2.0 (1.6-2.4) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 3419 | 411 | 66.7 (60.3-73.2) | 2272 | 152.4 (146.1-158.6) | 2.2 (2.0-2.4) | 736 | 271.7 (251.6-291.8) | 4.0 (3.5-4.5) |
| Renal Pelvis | 119 | 13 | 2.1 (1.0-3.3) | 81 | 5.4 (4.2-6.6) | 2.2 (1.2-4.1) | 25 | 9.6 (5.8-13.5) | 4.2 (2.1-8.4) |
| Ureter | 88 | 8 | 1.3 (0.4-2.2) | 57 | 3.8 (2.8-4.8) | 3.1 (1.5-6.7) | 23 | 8.8 (5.1-12.4) | 6.4 (2.8-14.7) |
| Kidney | 1295 | 291 | 46.9 (41.5-52.3) | 787 | 53.7 (49.9-57.5) | 1.1 (1.0-1.3) | 217 | 77.2 (66.6-87.7) | 1.7 (1.4-2.0) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 334 | 63 | 10.2 (7.7-12.7) | 210 | 14.1 (12.2-16.1) | 1.4 (1.0-1.8) | 61 | 22 (16.4-27.6) | 2.2 (1.5-3.1) |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Age-standardized to the NIH-AARP population

**‡**Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

**Supplemental Table 4: Pack years of cigarette smoking in current smokers and cancer in women**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Smoking use** | **Never\*** | **>0 to ≤25 pack-years** | | **>25 to ≤40 pack-years** | | **>40 to ≤60 pack years** | | **> 60 pack-years** | |
| **Number in cohort** | 82,032 | 10,660 | | 12,632 | | 4,573 | | 4,079 | |
| **Cancer Type** | **Case (n)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** |
| **Oral cavity and pharynx** | 69 | 23 | 2.7 (1.7-4.4) | 54 | 5.4 (3.7-7.7) | 24 | 7.3 (4.5-11.8) | 19 | 5.1 (3.0-8.6) |
| Oral cavity | 36 | 8 | 2.0 (0.9-4.4) | 29 | 5.8 (3.5-9.6) | 11 | 7.1 (3.5-14.3) | 10 | 5.4 (2.6-11.0) |
| Oropharynx | 22 | 11 | 3.5 (1.7-7.3) | 21 | 5.6 (3.1-10.4) | 11 | 8.3 (3.9-17.8) | 7 | 5.2 (2.2-12.4) |
| Hypopharynx | 5 | 1 | nd | 4 | 6.5 (1.7-25.1) | 2 | nd | 2 | nd |
| Nasopharynx | 6 | 3 | 4.1 (1.0-17.0) | 0 | nd | 0 | nd | 0 | nd |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Nasal Cavity | 10 | 1 | nd | 3 | 1.7 (0.5-6.4) | 4 | 7.3 (2.1-25.2) | 2 | nd |
| Larynx | 5 | 12 | 18.5 (6.5-53.1) | 28 | 37.9 (14.5-98.8) | 11 | 45.6 (15.6-133.7) | 22 | 85.7 (32.0-229.3) |
| Lung | 281 | 384 | 11.6 (9.9-13.5) | 781 | 20.6 (18.0-23.7) | 301 | 25 (21.2-29.6) | 427 | 32.8 (28.1-38.2) |
| Lung Adenocarcinoma | 155 | 134 | 7.0 (5.6-8.9) | 282 | 13.1 (10.7-15.9) | 105 | 14.8 (11.5-19.1) | 126 | 17.6 (13.9-22.4) |
| Lung small cell | 15 | 62 | 35.7 (20.3-63.0) | 146 | 73.8 (43.3-125.9) | 69 | 111.9 (63.6-196.9) | 100 | 146.7 (84.9-253.6) |
| Lung squamous cell | 7 | 59 | 71.7 (32.7-157.5) | 118 | 127.7 (59.4-274.4) | 43 | 156.9 (70.1-350.8) | 65 | 200.7 (91.7-439.4) |
| Lung undifferentiated | 8 | 25 | 25.6 (11.4-57.1) | 42 | 37.9 (17.6-81.4) | 11 | 31.8 (12.6-80.5) | 14 | 34.9 (14.5-84.4) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 10 | 3 | 2.0 (0.5-7.6) | 19 | 13.1 (5.8-29.2) | 4 | 8.6 (2.5-28.9) | 2 | nd |
| Esophageal adenocarcinoma | 10 | 1 | nd | 3 | 1.8 (0.5-6.6) | 3 | 5.0 (1.3-19.9) | 3 | 4.8 (1.2-18.7) |
| Stomach | 86 | 10 | 1.0 (0.5-2.0) | 17 | 1.7 (1.0-2.8) | 0 | nd | 9 | 2.5 (1.2-5.0) |
| Colon | 722 | 105 | 1.3 (1.1-1.6) | 139 | 1.5 (1.3-1.8) | 39 | 1.4 (1.0-1.9) | 38 | 1.2 (0.9-1.7) |
| Rectum | 245 | 35 | 1.2 (0.8-1.7) | 50 | 1.5 (1.1-2.0) | 9 | 0.8 (0.4-1.6) | 21 | 1.9 (1.2-2.9) |
| Liver | 46 | 6 | 1.2 (0.5-2.8) | 11 | 1.9 (1.0-3.7) | 3 | 1.6 (0.5-5.4) | 2 | nd |
| Pancreas | 213 | 59 | 2.5 (1.9-3.4) | 57 | 2.1 (1.6-2.9) | 15 | 1.7 (1.0-3.0) | 21 | 2.3 (1.5-3.6) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 131 | 52 | 3.4 (2.5-4.7) | 77 | 4.5 (3.4-6.0) | 35 | 6.6 (4.5-9.8) | 35 | 5.8 (4.0-8.6) |
| Renal Pelvis | 10 | 3 | 3.2 (0.9-11.7) | 9 | 8.3 (3.3-20.9) | 4 | 13.2 (3.9-44.5) | 3 | 6.9 (1.8-26.0) |
| Ureter | 6 | 2 | nd | 5 | 6.8 (2.0-23.3) | 1 | nd | 1 | nd |
| Kidney | 196 | 25 | 1.1 (0.7-1.6) | 35 | 1.3 (0.9-1.9) | 12 | 1.4 (0.8-2.5) | 11 | 1.4 (0.7-2.5) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 48 | 12 | 2.2 (1.2-4.2) | 8 | 1.2 (0.6-2.6) | 2 | nd | 2 | nd |
| Cervical | 56 | 14 | 1.9 (1.1-3.5) | 16 | 2.0 (1.2-3.6) | 6 | 2.1 (0.9-5.0) | 9 | 4.0 (2.0-8.3) |
| Ovary (Mucinous) | 12 | 2 | nd | 3 | 1.7 (0.5-6.2) | 0 | nd | 0 | nd |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

nd: not determined

**Supplemental Table 5: Pack years of cigarette smoking in current smokers and cancer in men**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Smoking use** | **Never\*** | **>0 to ≤25 pack-years** | | **>25 to ≤40 pack-years** | | **>40 to ≤60 pack years** | | **> 60 pack-years** | |
| **Number in cohort** | 68,748 | 7,656 | | 12,667 | | 6,591 | | 8,987 | |
| **Cancer Type** | **Case (n)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case (n)** | **Relative risk †**  **(95% CI)** |
| **Oral cavity and pharynx** | 125 | 35 | 2.5 (1.7-3.7) | 86 | 3.7 (2.7-4.9) | 48 | 3.8 (2.7-5.4) | 90 | 5.1 (3.8-6.9) |
| Oral cavity | 50 | 12 | 2.3 (1.2-4.5) | 44 | 5.2 (3.3-8.0) | 19 | 4.5 (2.6-7.9) | 40 | 5.9 (3.7-9.3) |
| Oropharynx | 64 | 21 | 2.9 (1.7-4.9) | 30 | 2.4 (1.5-3.9) | 19 | 2.7 (1.5-4.6) | 33 | 3.7 (2.4-5.9) |
| Hypopharynx | 4 | 1 | nd | 7 | 7.2 (2.0-25.8) | 9 | 17.3 (4.9-60.9) | 12 | 15.2 (4.5-50.6) |
| Nasopharynx | 7 | 1 | nd | 5 | 2.9 (0.8-10.6) | 1 | nd | 5 | 5.3 (1.4-19.6) |
| Nasal Cavity | 8 | 2 | nd | 10 | 9.0 (3.3-24.5) | 1 | nd | 6 | 6.8 (2.2-21.4) |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Larynx | 31 | 30 | 9.5 (5.6-15.9) | 68 | 13.1 (8.4-20.3) | 34 | 13.1 (7.9-21.7) | 75 | 19.8 (12.7-30.7) |
| Lung | 175 | 302 | 16.7 (13.8-20.2) | 825 | 28.8 (24.4-34.1) | 415 | 32.0 (26.7-38.4) | 893 | 42.7 (36.1-50.4) |
| Lung adenocarcinoma | 90 | 101 | 11.1 (8.3-14.9) | 241 | 16.7 (13.0-21.5) | 102 | 15.3 (11.4-20.6) | 218 | 21.3 (16.5-27.5) |
| Lung small cell | 12 | 52 | 39.6 (21.0-74.7) | 147 | 69.2 (38.2-125.5) | 84 | 83.7 (45.3-154.7) | 162 | 103.8 (57.3-188.1) |
| Lung squamous cell | 10 | 68 | 61.8 (31.6-120.6) | 181 | 106.4 (56.0-202.1) | 103 | 138.0 (71.6-266.1) | 223 | 176.3 (93.0-334.3) |
| Lung undifferentiated | 8 | 18 | 23.6 (10.1-55.2) | 35 | 29.0 (13.2-63.5) | 23 | 44.1 (19.3-100.8) | 63 | 70.6 (33.1-150.3) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 8 | 4 | 3.0 (0.9-10.4) | 12 | 6.3 (2.4-16.2) | 8 | 8.7 (3.0-24.8) | 14 | 10.0 (3.9-25.5) |
| Esophageal adenocarcinoma | 65 | 11 | 1.7 (0.9-3.3) | 35 | 3.2 (2.1-5.0) | 14 | 2.6 (1.4-4.7) | 31 | 4.0 (2.5-6.4) |
| Stomach | 102 | 27 | 2.4 (1.5-3.7) | 39 | 2.3 (1.5-3.4) | 18 | 2.3 (1.3-3.9) | 27 | 2.2 (1.4-3.5) |
| Colon | 731 | 96 | 1.3 (1.0-1.6) | 156 | 1.3 (1.1-1.6) | 69 | 1.2 (0.9-1.6) | 119 | 1.3 (1.1-1.6) |
| Rectum | 249 | 39 | 1.2 (0.8-1.7) | 70 | 1.4 (1.0-1.8) | 26 | 1.0 (0.7-1.6) | 53 | 1.4 (1.0-1.9) |
| Liver | 70 | 22 | 3.0 (1.8-5.0) | 31 | 2.8 (1.8-4.4) | 14 | 2.7 (1.4-4.9) | 16 | 2.1 (1.2-3.7) |
| Pancreas | 213 | 39 | 1.6 (1.1-2.3) | 63 | 1.7 (1.3-2.3) | 31 | 1.8 (1.2-2.7) | 61 | 2.3 (1.7-3.1) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 411 | 126 | 3.2 (2.6-3.9) | 266 | 4.2 (3.5-4.9) | 137 | 4.7 (3.8-5.8) | 207 | 4.4 (3.6-5.2) |
| Renal Pelvis | 13 | 4 | 3.9 (1.2-12.8) | 12 | 7.4 (3.1-17.4) | 3 | 4.2 (1.1-15.7) | 6 | 5.0 (1.8-14.1) |
| Ureter | 8 | 3 | 4.5 (1.2-17.6) | 13 | 11.3 (4.5-28.6) | 1 | nd | 6 | 6.3 (2.0-19.1) |
| Kidney | 291 | 54 | 1.8 (1.3-2.5) | 63 | 1.3 (1.0-1.8) | 53 | 2.3 (1.7-3.2) | 47 | 1.4 (1.0-2.0) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 63 | 14 | 2.1 (1.1-4.0) | 23 | 2.3 (1.4-3.8) | 7 | 1.5 (0.7-3.5) | 17 | 2.4 (1.3-4.2) |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

nd: not determined

**Supplemental Table 6: Cigarette smoking status and cancer by strata of education in women**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **High school or less** | | | **Some college** | | | **College or more** | | |
| **Smoking use** | **Never smoker** | **Current smoker** | | **Never smoker** | **Current smoker** | | **Never smoker** | **Current smoker** | |
| **Number in cohort** | 26,677 | 11,246 | | 27,041 | 12,502 | | 25,830 | 7,091 | |
| **Cancer Type** | **Case**  **(n)** | **Case**  **(n)** | **Relative risk †**  **(95% CI)** | **Case**  **(n)** | **Case**  **(n)** | **Relative risk †**  **(95% CI)** | **Case**  **(n)** | **Case**  **(n)** | **Relative risk †**  **(95% CI)** |
| **Oral cavity and pharynx** | 35 | 33 | 2.5 (1.5-4.1) | 15 | 33 | 7.2 (4.0-13.0) | 17 | 30 | 6.1 (3.3-11.2) |
| Oral cavity | 22 | 20 | 2.7 (1.4-5.0) | 6 | 24 | 8.8 (3.6-21.8) | 6 | 11 | 6.1 (2.2-16.9) |
| Oropharynx | 8 | 11 | 3.1 (1.2-7.9) | 6 | 24 | 7.6 (3.1-19.1) | 8 | 14 | 5.7 (2.3-14.1) |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Larynx | 0 | 30 | nd | 3 | 29 | 21.1 (6.4-70.3) | 2 | 12 | nd |
| Lung | 88 | 743 | 24.1 (19.3-30.1) | 90 | 725 | 20.3 (16.3-25.3) | 90 | 337 | 14.3 (11.2-18.1) |
| Lung Adenocarcinoma | 48 | 225 | 12.6 (9.2-17.3) | 43 | 268 | 15.4 (11.1-21.3) | 58 | 127 | 7.9 (5.7-10.8) |
| Lung small cell | 5 | 160 | 89.0 (36.5-217.4) | 6 | 138 | 59.5 (26.2-135.1) | 3 | 63 | 87.7 (27.3-281.7) |
| Lung squamous cell | 2 | 128 | nd | 4 | 102 | 67.6 (24.8-184.2) | 1 | 34 | nd |
| Lung undifferentiated | 2 | 33 | nd | 2 | 41 | nd | 3 | 16 | 16.9 (4.8-59.1) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 3 | 8 | 6.6 (1.7-25.9) | 3 | 11 | 8.2 (2.2-30.5) | 4 | 7 | 6.0 (1.7-21.4) |
| Esophageal adenocarcinoma | 2 | 4 | nd | 6 | 5 | 1.7 (0.5-5.8) | 2 | 1 | nd |
| Stomach | 41 | 14 | 1.2 (0.6-2.2) | 19 | 18 | 2.5 (1.3-4.8) | 23 | 4 | 0.8 (0.3-2.3) |
| Colon | 250 | 133 | 1.6 (1.3-1.9) | 261 | 111 | 1.1 (0.9-1.4) | 178 | 66 | 1.6 (1.2-2.1) |
| Rectum | 92 | 43 | 1.2 (0.9-1.8) | 78 | 44 | 1.4 (0.9-2.0) | 66 | 24 | 1.4 (0.9-2.2) |
| Liver | 20 | 13 | 2.1 (1.1-4.4) | 12 | 7 | 1.5 (0.6-3.9) | 14 | 2 | nd |
| Pancreas | 80 | 57 | 2.2 (1.5-3.1) | 72 | 56 | 2.1 (1.4-3.0) | 53 | 36 | 3.0 (1.9-4.6) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 36 | 72 | 6.2 (4.1-9.2) | 38 | 72 | 4.9 (3.3-7.3) | 52 | 50 | 3.8 (2.5-5.6) |
| Kidney | 75 | 45 | 1.7 (1.2-2.5) | 64 | 21 | 0.9 (0.5-1.5) | 43 | 14 | 1.4 (0.8-2.7) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 15 | 11 | 2.0 (0.9-4.4) | 18 | 8 | 1.1 (0.5-2.5) | 12 | 4 | 1.4 (0.4-4.4) |
| Cervical | 20 | 24 | 3.2 (1.7-5.9) | 21 | 14 | 1.5 (0.8-3.0) | 14 | 6 | 1.8 (0.7-4.8) |
| Ovary (Mucinous) |  |  |  |  |  |  |  |  |  |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

nd: not determined

**Supplemental Table 7: Cigarette smoking status and cancer by strata of education in men**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **High school or less** | | | **Some college** | | | **College or more** | | |
| **Smoking use** | **Never smoker** | **Current smoker** | | **Never smoker** | **Current smoker** | | **Never smoker** | **Current smoker** | |
| **Number in cohort** | 11,052 | 10,294 | | 17,515 | 13,415 | | 38,866 | 11,045 | |
| **Cancer Type** | **Case**  **(n)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case**  **(n)** | **Case (n)** | **Relative risk †**  **(95% CI)** | **Case**  **(n)** | **Case (n)** | **Relative risk †**  **(95% CI)** |
| **Oral cavity and pharynx** | 20 | 76 | 3.9 (2.4-6.5) | 38 | 97 | 3.3 (2.2-4.8) | 65 | 82 | 4.3 (3.0-6.0) |
| Oral cavity | 4 | 36 | 10.4 (3.7-29.6) | 14 | 42 | 3.7 (2.0-7.0) | 32 | 35 | 3.9 (2.3-6.5) |
| Oropharynx | 13 | 29 | 2.3 (1.2-4.5) | 23 | 36 | 2.1 (1.2-3.6) | 27 | 36 | 4.4 (2.6-7.5) |
| **Respiratory tract** |  |  |  |  |  |  |  |  |  |
| Larynx | 6 | 72 | 15.1 (6.5-35.0) | 10 | 73 | 10.8 (5.5-21.1) | 14 | 59 | 16.3 (9.0-29.7) |
| Lung | 28 | 811 | 38.6 (26.5-56.4) | 44 | 895 | 33.4 (24.7-45.3) | 95 | 638 | 26.5 (21.3-33) |
| Lung Adenocarcinoma | 12 | 212 | 23.5 (13.1-42.1) | 27 | 253 | 14.9 (10.0-22.2) | 45 | 172 | 15.7 (11.3-22.0) |
| Lung small cell | 5 | 143 | 36.2 (14.8-88.7) | 2 | 175 | nd | 4 | 112 | 102.3 (37.5-279.4) |
| Lung squamous cell | 1 | 204 | nd | 2 | 201 | nd | 6 | 147 | 91.5 (40.2-208.1) |
| Lung undifferentiated | 0 | 45 | nd | 3 | 43 | 25.8 (8.0-83.7) | 5 | 48 | 39.1 (15.3-99.6) |
| **Alimentary tract** |  |  |  |  |  |  |  |  |  |
| Esophageal squamous cell | 2 | 12 | nd | 2 | 11 | nd | 3 | 14 | 8.8 (2.4-32.5) |
| Esophageal adenocarcinoma | 17 | 30 | 2.3 (1.2-4.2) | 13 | 40 | 5.0 (2.7-9.5) | 32 | 18 | 2.3 (1.3-4.2) |
| Stomach | 16 | 38 | 3.0 (1.7-5.5) | 26 | 36 | 2.0 (1.2-3.4) | 55 | 34 | 2.2 (1.4-3.5) |
| Colon | 137 | 135 | 1.3 (1.0-1.6) | 200 | 158 | 1.2 (1.0-1.5) | 383 | 135 | 1.3 (1.1-1.6) |
| Rectum | 56 | 66 | 1.3 (0.9-1.9) | 70 | 63 | 1.2 (0.8-1.7) | 118 | 52 | 1.6 (1.1-2.2) |
| Liver | 16 | 27 | 2.5 (1.3-4.7) | 16 | 29 | 3.0 (1.6-5.6) | 36 | 25 | 2.7 (1.6-4.5) |
| Pancreas | 33 | 53 | 2.1 (1.3-3.2) | 58 | 71 | 1.8 (1.2-2.6) | 117 | 61 | 2.0 (1.4-2.8) |
| **Urinary tract** |  |  |  |  |  |  |  |  |  |
| Bladder | 61 | 243 | 5.4 (4.1-7.2) | 100 | 250 | 4.0 (3.2-5.1) | 236 | 224 | 3.7 (3.1-4.5) |
| Kidney | 48 | 61 | 1.3 (0.4-4.4) | 87 | 78 | 1.7 (1.2-2.5) | 151 | 72 | 1.4 (1.0-1.9) |
| **Other** |  |  |  |  |  |  |  |  |  |
| AML | 18 | 19 | 1.3 (0.7-2.5) | 14 | 14 | 1.5 (0.7-3.3) | 30 | 24 | 3.6 (2.1-6.3) |

\*Referent group: Never smokers are participants who did not smoke cigarettes, pipes, or cigars.

†Adjusted for age, education, alcohol intake, self-reported ethnicity, and smoking pipes or cigars.

nd: not determined

**Supplemental Table 8: Historical comparison of associations of current versus never smoking with lung cancer in US studies, by sex and histologic type**

1. **Lung Adenocarcinoma**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** |
|  |  |  |  |  |  |  |
| **Women** | Wynder[[1](#_ENREF_1)] | 1949 | case-control | MO | 15 | 0.6, 0.1-2.7\* |
|  | Wynder[[2](#_ENREF_2)] | 1953-5 | case-control | NY | 41 | 0.8, 0.4-1.6\* |
|  | Haenszel[[3](#_ENREF_3)] | 1955-7 | case-control | US | 56 | 1.2, 0.6-2.4\* |
|  | Thun[[4](#_ENREF_4)] | 1959-61 | cohort | US | 17 | 1.5, 0.3-7.7 |
|  | Wynder[[5](#_ENREF_5)] | 1970-2 | case-control | US | 44 | 3.3, 1.6-7.3\* |
|  | Osann[[6](#_ENREF_6)] | 1969-77 | Cohort | CA | 83 | 3.2, 1.5-6.6 |
|  | Wu[[7](#_ENREF_7)] | 1981-2 | case-control | CA | 149 | 4.1, 2.3-7.5 |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 58 | 8.1, 4.5-14.6 |
|  | Wu[[8](#_ENREF_8)] | 1983-1986 | case-control | CA | 336 | 4.5, 3.0-6.9 |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 290 | 11.6, 8.2-16.4 |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 384 | 13.8, 10.0-19.1\* |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1648 | 7.2, 6.2-8.3 |
|  | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 234 | 9.1, 6.7-12.4\* |
|  | Current study | 1995-2006 | cohort | US | 1381 | 11.7, 9.8-14.0 |
|  | Wang[[13](#_ENREF_13)] | 1993-2009 | cohort | US | 441 | 6.8, 4.9-9.3 |
|  |  |  |  |  |  |  |
| **Men** | Wynder[[1](#_ENREF_1)] | 1949 | case-control | MO | 39 | 1.5, 0.5-5.9\* |
|  | Hammond[[14](#_ENREF_14)] | 1952-5 | cohort | US | 32 | 3.9, 0.9-16.5\* |
|  | Thun[[4](#_ENREF_4)] | 1959-61 | cohort | US | 28 | 4.6, 1.7-12.6 |
|  | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 54 | 4.1, 1.8-10.8\* |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 85 | 19.0, 8.3-47.7 |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 333 | 21.7, 12.5-39.7 |
|  | Khuder[[16](#_ENREF_16)] | 1985-7 | case-control | PA | 162 | 8.2, 3.6-18.4 |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 418 | 7.2, 5.0-10.6\* |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 2131 | 9.1, 7.6-10.8 |
|  | Current study | 1995-2006 | cohort | US | 2064 | 15.6, 12.5-19.6 |
|  |  |  |  |  |  |  |
| **Both** | Fontham[[17](#_ENREF_17)] | 1979-82 | case-control | LA | 239 | 6.7, 4.3-10.6 |

\* Crude recalculated risk estimate

1. **Lung Squamous Cell Carcinoma**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** |
|  |  |  |  |  |  |  |
| **Women** | Wynder[[2](#_ENREF_2)] | 1953-5 | case-control | NY | 41 | 3.0, 1.5-6.1\* |
|  | Thun[[4](#_ENREF_4)] | 1959-61 | cohort | US | 10 | 2.6, 0.6-11.2\* |
|  | Wu[[7](#_ENREF_7)] | 1981-2 | case-control | CA | 71 | 35.3, 4.7-267.3 |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 38 | 50.5, 13.0-432.9\* |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 171 | 35.2, 19.1-65.1 |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 165 | 31.2, 16.9-62.6\* |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1157 | 20.6, 16.6-25.6 |
|  | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 115 | 38.5, 19.3-76.6\* |
|  | Current study | 1995-2006 | cohort | US | 467 | 121.4, 57.3-257.4 |
|  | Wang[[13](#_ENREF_13)] | 1993-2009 | cohort | US | 119 | 86.8, 30.7-245.7 |
|  |  |  |  |  |  |  |
| **Men** | Thun[[4](#_ENREF_4)] | 1959-61 | cohort | US | 36 | 22.9, 3.9-932.0\* |
|  | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 321 | 8.3, 5.3-13.6\* |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 91 | 27.3, 10.3-102.5\* |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 360 | 49.3, 24.1-101 |
|  | Khuder[[16](#_ENREF_16)] | 1985-7 | case-control | PA | 185 | 8.6, 4.2-17.6 |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 397 | 35.1, 17.4-82.6\* |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 3334 | 13.7, 11.7-16.1 |
|  | Current study | 1995-2006 | cohort | US | 1245 | 114.6, 61.2-214.4 |

\* Crude recalculated risk estimate

1. **Lung Small Cell Carcinoma**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** |
|  |  |  |  |  |  |  |
| **Women** | Thun[[4](#_ENREF_4)] | 1959-61 | cohort | US | 6 | 1.3, 0.1-9.0\* |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 24 | 14.0, 4.7-56.4\* |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 169 | 119.1, 43.4-327 |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1152 | 42.5, 32.1-56.6 |
|  | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 123 | 87.0, 35.4-213.5\* |
|  | Current study | 1995-2006 | cohort | US | 542 | 73.1, 43.6-122.8 |
|  | Wang[[13](#_ENREF_13)] | 1993-2009 | cohort | US | 79 | 100.8, 30.1-337.5 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| **Men** | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 89 | 13.0, 4.8-49.0\* |
|  | Thun[[4](#_ENREF_4)] | 1982-4 | cohort | US | 51 | 62.8, 10.8-2529.2\* |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 195 | 62.0, 22.8-169.0 |
|  | Khuder[[16](#_ENREF_16)] | 1985-7 | case-control | PA | 75 | 23.1, 3.1-174.2 |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1612 | 15.1, 12.0-19.0 |
|  | Current study | 1995-2006 | cohort | US | 803 | 73.1, 41.1-130.2 |

\* Crude recalculated risk estimate

**Supplemental Table 9: Historical comparison for the association of cigarettes per day among current smokers, versus never-smoking, in US studies, with lung cancer by sex and histologic type**

1. **Lung Adenocarcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** | **Comparison category** |
|  |  |  |  |  |  |  |  |
| **Women** | Wynder[[2](#_ENREF_2)] | 1953-5 | case-control | NY | 41 | 0.7, 0.02-4.3\* | ≥21 cig/day |
|  | Haenszel[[3](#_ENREF_3)] | 1955-7 | case-control | US | 56 | 2.5, 0.6-7.9 | ≥21 cig/day |
|  | Osann[[6](#_ENREF_6)] | 1969-77 | cohort | CA | 83 | 3.8, 1.6-8.8 | ≥20 cig/day |
|  | Wynder[[5](#_ENREF_5)] | 1970-2 | case-control | US | 44 | 6.2, 2.3-16.6\* | ≥21 cig/day |
|  | Wu[[7](#_ENREF_7)] | 1981-2 | case-control | CA | 149 | 6.5, 3.1-13.9 | ≥21 cig/day |
|  | Schoenberg[[18](#_ENREF_18)] | 1982-3 | case-control | NJ | 290 | 6.4, 4.2-9.7 | ≥20cig/day ≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 290 | 24.2, 15.8-37.2 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1648 | 8.6, 7.3-10.1 | ≥20 cig/day |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 384 | 34.3, 16.2-72.5 | ≥41 cig/day |
|  | Current study | 1995-2006 | cohort | US | 1381 | 25.7, 16.8-39.4 | >40 cig/day |
|  |  |  |  |  |  |  |  |
| **Men** | Wynder[[1](#_ENREF_1)] | 1949 | case-control | MO | 39 | 3.3, 0.8-16.3\* | ≥35 cig/day/≥20 years |
|  | Hammond[[14](#_ENREF_14)] | 1952-5 | cohort | US | 32 | 6.5, 1.4-31.4\* | ≥21 cig/day |
|  | Schoenberg[[18](#_ENREF_18)] | 1980-1 | case-control | NJ | 122 | 7.4, 2.9-18.9 | ≥20cig/day/≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 333 | 37.5, 21.3-66.0 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 2131 | 10.7, 8.9-13.0 | ≥20 cig/day |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 418 | 19.3, 12.0-30.3 | ≥41 cig/day |
|  | Stellman[[19](#_ENREF_19)] | 1992-7 | case-control | NY, DC | NA | 54.6, 18.8-158.4 | ≥30 cig/day |
|  | Current study | 1995-2006 | cohort | US | 2064 | 20.9, 14.3-30.6 | >40 cig/day |
|  |  |  |  |  |  |  |  |
| **Both** | Fontham[[17](#_ENREF_17)] | 1979-82 | case-control | LA | 239 | 12.0, 7.3-19.7 | ≥21 cig/day |

\* Crude recalculated risk estimate

NA: not available

1. **Lung Squamous Cell Carcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** | **Comparison category** |
|  |  |  |  |  |  |  |  |
| **Women** | Wynder[[2](#_ENREF_2)] | 1953-5 | case-control | NY | 41 | 14.7, 5.9-35.2\* | ≥21 cig/day |
|  | Wu[[7](#_ENREF_7)] | 1981-2 | case-control | CA | 71 | 94.4, 9.9-904.6 | ≥21 cig/day |
|  | Schoenberg[[18](#_ENREF_18)] | 1982-3 | case-control | NJ | 269 | 21.1, 12.8-34.9 | ≥20 cig/day/≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 171 | 72.3, 36.8-142 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1157 | 26.1, 20.7-32.8 | ≥20 cig/day |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 165 | 85.3, 29.5-247.1 | ≥41 cig/day |
|  | Current study | 1995-2006 | cohort | US | 467 | 233.7, 86.6-630.6 | >40 cig/day |
|  |  |  |  |  |  |  |  |
| **Men** | Schoenberg[[18](#_ENREF_18)] | 1980-1 | case-control | NJ | 373 | 29.0, 10.6-79.3 | ≥20 cig/day/≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 360 | 76.0, 36.8-157 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 3334 | 17.2, 14.6-20.3 | ≥20 cig/day |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 397 | 66.8, 36.8-121.3 | ≥41 cig/day |
|  | Current study | 1995-2006 | cohort | US | 1245 | 222.5, 112.3-440.9 | >40 cig/day |

**C. Lung Small Cell Carcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Women** | Schoenberg[[18](#_ENREF_18)] | 1982-3 | case-control | NJ | 220 | 132.0, 47.1-372 | ≥20 cig/day/≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 169 | 316.1, 111-900 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1152 | 53.1, 39.5-71.3 | ≥20 cig/day |
|  | Current study | 1995-2006 | cohort | US | 542 | 185.8, 91.4-377.7 | >40 cig/day |
|  |  |  |  |  |  |  |  |
| **Men** | Schoenberg[[18](#_ENREF_18)] | 1980-1 | case-control | NJ | 114 | 35.8, 4.9-260 | ≥20 cig/day ≥35 years |
|  | Osann[[9](#_ENREF_9)] | 1984-6 | case-control | CA | 195 | 95.3, 34.7-262 | ≥40 cig/day |
|  | Brownson[[11](#_ENREF_11)] | 1984-90 | case-control | MO | 1612 | 19.2, 15.2-24.4 | ≥20 cig/day |
|  | Current study | 1995-2006 | cohort | US | 803 | 125.5, 65.0-242.3 | >40 cig/day |

\* Crude recalculated risk estimate

**Supplemental Table 10: Historical comparison for the association of cigarette pack-years versus never-smoking with lung cancer in US studies, by sex and histologic type**

1. **Lung Adenocarcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** | **Comparison category** |
|  |  |  |  |  |  |  |  |
| **Women** | Brownson[[20](#_ENREF_20)] | 1979-1982 | case-control | CO | 118 | 9.58, 8.31-10.86 | ≥40 pack-years |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 384 | 32.7, 19.0-56.2 | ≥50 pack-years‡ |
|  | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 234 | 13.9, 8.6-22.6 | ≥60 pack-years |
|  | Current study | 1995-2006 | cohort | US | 1381 | 17.6, 13.9-22.4 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |
| **Men** | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 54 | 7.4, 3.2-19.7\* | ≥40 pack-years |
|  | Stayner[[21](#_ENREF_21)] | 1969-71 | case-control | US | 50 | 3.4, 1.7-7.1 | ≥56 pack-years |
|  | Brownson[[20](#_ENREF_20)] | 1979-1982 | case-control | CO | 115 | 5.42, 4.13-6.71 | ≥40 pack-years |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 418 | 13.8, 9.2-20.9 | ≥50 pack-years‡ |
|  | Current study | 1995-2006 | cohort | US | 2064 | 21.3, 16.5-27.5 | >60 pack-years‡ |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |

1. **Lung Squamous Cell Carcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Women** | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 165 | 95.2, 43.4-209.0 | ≥50 pack-years‡ |
|  | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 115 | 54.6, 23.2-128.3 | ≥60 pack-years |
|  | Current study | 1995-2006 | cohort | US | 467 | 200.7, 91.7-439.4 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |
| **Men** | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 321 | 13.6, 8.5-22.7\* | ≥40 pack-years |
|  | Stayner[[21](#_ENREF_21)] | 1969-71 | case-control | US | 152 | 4.0,2.7-6.0 | ≥56 pack-years |
|  | Zang[[10](#_ENREF_10)] | 1981-94 | case-control | US | 397 | 82.1, 39.5-170.9 | ≥50 pack-years‡ |
|  | Current study | 1995-2006 | cohort | US | 1245 | 176.3, 93.0-334.3 | >60 pack-years‡ |

**C. Lung Small Cell Carcinoma**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Women** | Yang[[12](#_ENREF_12)] | 1986-98 | cohort | IA | 123 | 86.4, 31.4-237.3 | ≥60 pack-years |
|  | Current study | 1995-2006 | cohort | US | 542 | 146.7, 84.9-253.6 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |
| **Men** | Vena[[15](#_ENREF_15)] | 1957-65 | case-control | NY | 89 | 18.4, 6.7-70.2\* | ≥40 pack-years |
|  | Stayner[[21](#_ENREF_21)] | 1969-71 | case-control | US | 45 | 7.1, 3.3-15.2 | ≥56 pack-years |
|  | Current study | 1995-2006 | cohort | US | 803 | 103.8, 57.3-188.1 | >60 pack-years‡ |

\* Crude recalculated risk estimate

‡Restricted to lifetime pack-years in current smokers vs never smokers.

**Supplemental Table 11: Historical comparison of associations of cigarette smoking with laryngeal cancer in US studies**

1. **Current versus never smoking**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** |
|  |  |  |  |  |  |  |
| **Women** | CPS-I[[22](#_ENREF_22)] | 1959-65 | cohort | US | NA | 3.8, 0.8-18.5 |
|  | Wynder[[23](#_ENREF_23)] | 1969-1975 | case-control | US | 80 | 12.8, 6.3-28.5\* |
|  | CPS-II[[22](#_ENREF_22)] | 1982-6 | cohort | US | NA | 17.8, 3.5-91.7 |
|  | Zang[[24](#_ENREF_24)] | 1981-1994 | case-control | US | 159 | 18.4, 10.6-34.0\* |
|  | Current study | 1995-2006 | cohort | US | 100 | 37.0, 14.9-92.3 |
|  |  |  |  |  |  |  |
| **Men** | Wynder[[25](#_ENREF_25)] | 1952-4 | case-control | NY | 200 | 23.4, 3.7-970.8\* |
|  | Graham[[26](#_ENREF_26)] | 1957-65 | case-control | NY | 374 | 5.8, 3.9-8.6\* |
|  | CPS-I[[22](#_ENREF_22)] | 1959-65 | cohort | US | NA | 10.0, 3.5-28.5 |
|  | McLaughlin[[27](#_ENREF_27)] | 1954-1980 | cohort | US | 167 | 13.7, 7.0-27.1 |
|  | Wynder[[23](#_ENREF_23)] | 1969-1975 | case-control | US | 387 | 12.9, 6.8-27.4\* |
|  | Falk[[28](#_ENREF_28)] | 1980-2 | case-control | TX | 209 | 10.7, 4.7-27.2\* |
|  | CPS-II[[22](#_ENREF_22)] | 1982-6 | cohort | US | NA | 10.5, 3.6-30.4\* |
|  | Zang[[24](#_ENREF_24)] | 1981-1994 | case-control | US | 521 | 21.5, 12.6-39.9\* |
|  | Current study | 1995-2006 | cohort | US | 502 | 13.8, 9.3-20.2 |
|  |  |  |  |  |  |  |
| **Both** | Stingone[[29](#_ENREF_29)] | 2002-2006 | case-control | NC | 473 | 19.5, 11.1-34.5 |

\* Crude recalculated risk estimate

NA: not available

1. **Cigarettes per day among current smokers, versus never-smoking**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** | **Comparison category** |
|  |  |  |  |  |  |  |  |
| **Women** | Zang[[24](#_ENREF_24)] | 1981-1994 | case-control | US | 159 | 67.8, 36.4-132.1\* | ≥40 cig/day |
|  | Current study | 1995-2006 | cohort | US | 100 | 118.8, 31.4-449.4 | ≥40 cig/day |
|  |  |  |  |  |  |  |  |
| **Men** |  |  |  |  |  |  |  |
|  | Wynder[[25](#_ENREF_25)] | 1952-4 | case-control | NY | 200 | 42.1, 6.1-1762.9\* | ≥35 cig/day |
|  | Graham[[26](#_ENREF_26)] | 1957-65 | case-control | NY | 374 | 9.9, 5.2-19.1\* | ≥40 cig/day |
|  | McLaughlin[[27](#_ENREF_27)] | 1954-1980 | cohort | US | 167 | 45.1, 20.6-99.0 | ≥40 cig/day |
|  | Falk[[28](#_ENREF_28)] | 1980-2 | case-control | TX | 209 | 19.2, 5.0-73.4 | >40 cig/day |
|  | Zang[[24](#_ENREF_24)] | 1981-1994 | case-control | US | 521 | 36.6, 21.0-68.7\* | ≥40 cig/day |
|  | Current study | 1995-2006 | cohort | US | 502 | 26.2, 14.6-46.8 | ≥40 cig/day |
|  |  |  |  |  |  |  |  |
| **Both** |  |  |  |  |  |  |  |
|  | Stockwell[[30](#_ENREF_30)] | 1982 | case-control | FL | 797 | 21.1, 15.5-28.7 | >40 cig/day |
|  | Hedberg[[31](#_ENREF_31)] | 1983-1987 | case-control | WA | 235 | 23.1, 9.4-52.6 | ≥40 cig/day |

1. **Cigarette pack-years, versus never-smoking**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Women** | Current study | 1995-2006 | cohort | US | 100 | 85.7, 32.0-229.3 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |
| **Men** | Freudenheim[[32](#_ENREF_32)] | 1975-85 | case-control | NY | 250 | 12.6, 5.0-31.5 | ≥46 pack-years |
|  | Spitz[[33](#_ENREF_33)] | 1985-7 | case-control | TX | 47 | 15.1, 5.0-45.3 | ≥50 pack-years |
|  | Current study | 1995-2006 | cohort | US | 502 | 19.8, 12.7-30.7 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |
| **Both** | Peters[[34](#_ENREF_34)] | 1999-2003 | case-control | MA | 135 | 13.3, 6.7-26. 5 | ≥45 pack-years |

\* Crude recalculated risk estimate

‡Restricted to lifetime pack-years in current smokers vs never smokers.

**Supplemental Table 12: Historical comparison of associations of cigarette smoking with oral cavity and pharyngeal cancer in US studies**

1. **Current versus never smoking**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Site** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** |
| **Women** | Oral-pharyngeal | Wynder[[35](#_ENREF_35)] | 1952-4 | case-control | NY | 116 | 2.6, 1.6-4.2\* |
|  | Oral-pharyngeal | CPS-I[[22](#_ENREF_22)] | 1959-65 | cohort | US | NA | 2.0, 1.1-3.4 |
|  | Oral cavity | Wynder[[23](#_ENREF_23)] | 1969-1975 | case-control | US | 280 | 3.9, 2.8-5.4\* |
|  | Oral-pharyngeal | Kabat[[36](#_ENREF_36)] | 1977-90 | case-control | US | 463 | 4.3, 3.2-5.9 |
|  | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 322 | 6.5, 4.4-9.8 |
|  | Oral-pharyngeal | CPS-II[[38](#_ENREF_38)] | 1982-96 | cohort | US | 178 | 4.9, 3.5-6.8 |
|  | Oral-pharyngeal | Blot[[39](#_ENREF_39)] | 1984-5 | case-control | CA, NJ | 352 | 4.7, 3.0-7.3 |
|  | Oral-pharyngeal | Hayes[[40](#_ENREF_40)] | 1992-5 | case-control | PR | 69 | 14.1, 4.2-47.2 |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 304 | 4.4, 3.3-6.0 |
|  |  |  |  |  |  |  |  |
| **Men** | Oral-pharyngeal | Wynder[[35](#_ENREF_35)] | 1952-4 | case-control | NY | 543 | 3.1, 1.5-6.6\* |
|  | Oral cavity | McLaughlin[[27](#_ENREF_27)] | 1954-1980 | cohort | US | 189 | 3.4, 2.3-5.0 |
|  | Oral-pharyngeal | CPS-I[[22](#_ENREF_22)] | 1959-65 | cohort | US | NA | 6.3, 3.6-11.1 |
|  | Oral cavity | Wynder[[23](#_ENREF_23)] | 1969-1975 | case-control | US | 593 | 8.3, 5.3-13.5\* |
|  | Oral-pharyngeal | Kabat[[36](#_ENREF_36)] | 1977-90 | case-control | US | 1097 | 3.3, 2.4-4.3 |
|  | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 687 | 4.1, 2.9-5.8 |
|  | Oral-pharyngeal | Blot[[39](#_ENREF_39)] | 1984-5 | case-control | CA, NJ | 762 | 3.4, 2.3-5.1 |
|  | Oral-pharyngeal | CPS-II[[38](#_ENREF_38)] | 1982-96 | cohort | US | 297 | 9.3, 6.4-13.5 |
|  | Oral-pharyngeal | Hayes[[40](#_ENREF_40)] | 1992-5 | case-control | PR | 298 | 7.5, 3.9-14.4 |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 814 | 3.8, 3.0-4.7 |
|  |  |  |  |  |  |  |  |
|  | Pharynx | McLaughlin[[27](#_ENREF_27)] | 1954-1980 | cohort | US | 143 | 14.1, 6.9-28.9 |
|  |  |  |  |  |  |  |  |
| **Both** | Oral-pharyngeal | Chen[[41](#_ENREF_41)] | 1985-95 | case-control | WA | 341 | 4.5, 3.0-6.8 |
|  | Oral-pharyngeal | Wang[[42](#_ENREF_42)] | 1994-2002 | case-control | IA | 348 | 2.4, 1.5-3.9 |
|  | Oral-pharyngeal | Buch[[43](#_ENREF_43)] | 2000-2004 | case-control | PA | 197 | 2.1, 1.3-3.4\* |
|  | Oral cavity | Stingone[[29](#_ENREF_29)] | 2002-2006 | case-control | NC | 192 | 7.1, 3.8-13.0 |
|  | Oropharynx | Stingone[[29](#_ENREF_29)] | 2002-2006 | case-control | NC | 361 | 1.6, 1.1-2.5 |

\* Crude recalculated risk estimate

NA: not available

1. **Cigarettes per day among current smokers, versus never-smoking**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Site** | **Author** | **Year** | **Design** | **Location** | **No.** | **Relative Risk** | **Comparison category** |
| **Women** | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 322 | 12.3, 5.6-29.6 | ≥40 cig/day |
|  | Oral-pharyngeal | Kabat[[36](#_ENREF_36)] | 1977-90 | case-control | US | 463 | 9.6, 5.9-15.8\* | >30 cig/day |
|  | Oral-pharyngeal | Blot[[39](#_ENREF_39)] | 1984-5 | case-control | CA, NJ | 352 | 10.2, 5.2-20.4 | ≥40 cig/day/≥20years |
|  | Oral-pharyngeal | CPS-II[[38](#_ENREF_38)] | 1982-96 | cohort | US | 178 | 12.3, 7.2-21.1 | ≥40 cig/day |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 304 | 8.0, 2.9-22.0 | >40 cig/day |
|  |  |  |  |  |  |  |  |  |
| **Men** | Oral cavity | McLaughlin[[27](#_ENREF_27)] | 1954-80 | cohort | US | 189 | 8.6, 4.7-15.7 | ≥40 cig/day |
|  | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 687 | 6.3, 4.1-9.7 | ≥40 cig/day |
|  | Oral-pharyngeal | Kabat[[36](#_ENREF_36)] | 1977-90 | case-control | US | 1097 | 8.2, 6.0-11.3\* | >30 cig/day |
|  | Oral-pharyngeal | Blot[[39](#_ENREF_39)] | 1984-5 | case-control | CA, NJ | 762 | 4.4, 2.7-7.2 | ≥40 cig/day/≥20years |
|  | Oral-pharyngeal | CPS-II[[38](#_ENREF_38)] | 1982-96 | cohort | US | 297 | 12.9, 8.3-20.1 | ≥40 cig/day |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 814 | 5.4, 3.3-8.7 | >40 cig/day |
|  |  |  |  |  |  |  |  |  |
|  | Pharyngeal | McLaughlin[[27](#_ENREF_27)] | 1954-80 | cohort | US | 143 | 37.3, 15.9-87.5 | ≥40 cig/day |
|  |  |  |  |  |  |  |  |  |
| **Both** | Pharyngeal | Stockwell[[30](#_ENREF_30)] | 1982 | case-control | FL | 450 | 24.0, 16.1-35.6 | >40 cig/day |

1. **Cigarette pack-years, versus never-smoking**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Women** | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 322 | 5.3, 2.5-11.3 | >60 pack-years |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 304 | 5.1, 3.0-8.6 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |  |
| **Men** | Oral-pharyngeal | Muscat[[37](#_ENREF_37)] | 1981-90 | case-control | US | 687 | 2.2, 1.4-3.3 | >60 pack-years |
|  | Oral-pharyngeal | Current study | 1995-2006 | cohort | US | 814 | 5.1, 3.8-6.9 | >60 pack-years‡ |
|  |  |  |  |  |  |  |  |  |
| **Both** | Oral cancer | Marshall[[44](#_ENREF_44)] | 1975-83 | case-control | NY | 290 | 5.7, 2.7-12.1 | ≥70 pack-years |
|  | Oral-pharyngeal | Rogers[[45](#_ENREF_45)] | 1983-7 | case-control | WA | 379 | 3.6, 2.6-5.0\* | ≥20 pack-years |
|  | Oral-pharyngeal | Chen[[41](#_ENREF_41)] | 1985-95 | case-control | WA | 341 | 7.5, 4.0-14.2 | ≥60 pack-years‡ |
|  | Oral cavity | Peters[[34](#_ENREF_34)] | 1999-2003 | case-control | MA | 352 | 2.0, 1.4-3.1 | ≥45 pack-years |
|  |  |  |  |  |  |  |  |  |
|  | Pharyngeal | Peters[[34](#_ENREF_34)] | 1999-2003 | case-control | MA | 196 | 3.5, 2.1-5.6 | ≥45 pack-years |

\* Crude recalculated risk estimate

**\*** Restricted to lifetime pack-years in current smokers vs never smokers

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