Figure S1 The flowchart of the qualified study patients.

Initial primary lung cancer patients were involved

$n = 356,840$

Inclusion criterion:
1) Initial diagnosed age between 20 and 79
2) Initial diagnosed year between 1998 and 2011
3) Not reported from death certificate or autopsy
4) Second primary cancers (SPCs) occurred more than 2 months after initial diagnosis

$n = 142,491$

Exclusion criterion:
1) Missing values on important covariates (e.g. tumor size, stage, grade, histology, laterality)
2) Surgery was either missing or the type of surgery was not provided.

Cohort without SPCs
$n = 128,117$

Cohort without SPCs
$n = 14,374$
Table S1: Risk scores of each factor listed in the Nomogram

| Characteristics                       | Score |
|---------------------------------------|-------|
| Sex                                   |       |
| Female                                | 0     |
| Male                                  | 0.5   |
| Age at diagnosis, years               |       |
| 20~54                                 | 0     |
| 55~70                                 | 2.8   |
| 71~79                                 | 1.7   |
| Race                                  |       |
| Black                                 | 1.8   |
| White                                 | 1.6   |
| Other                                 | 0     |
| Tumor size, cm                        |       |
| <=2                                   | 2.3   |
| 2~4                                   | 1.6   |
| 4~6                                   | 0.6   |
| >6                                    | 0     |
| SEER summary stage                    |       |
| Localized                             | 9.9   |
| Regional                              | 6.9   |
| Distant                               | 0     |
| Histology                             |       |
| AD                                    | 0.7   |
| LC                                    | 1.7   |
| SC                                    | 0     |
| SQ                                    | 1.5   |
| Other                                 | 0.5   |
| Surgery                               |       |
| No surgery                            | 0     |
| Lobectomy                             | 10    |
| Pneumonectomy                         | 7.8   |
| Sublobectomy                          | 8.6   |
Figure S2. Calibration plots. The x-axis shows the predicted probability of the cumulative incidence model. The y-axis shows the observed cumulative incidences.