122. Cox regression with observed (all-cause) mortality as the outcome

```
. /* Data set used */
. use melanoma11 if stage == 1, clear
(Skin melanoma, diagnosed 1975-94, follow-up to 1995)
.
. /* All-cause survival */
. stset surv_mm, failure(status==1,2) exit(time 120)
     failure event:  status == 1 2
obs. time interval:  (0, surv_mm]
 exit on or before:  time 120
------------------------------------------------------------------------------
      5,318  total observations
          0  exclusions
------------------------------------------------------------------------------
      5,318  observations remaining, representing
      1,580  failures in single-record/single-failure data
    388,520  total analysis time at risk and under observation
                                            at risk from t =         0
                                 earliest observed entry t =         0
                                      last observed exit t =       120
.
. /* Cox regression */
. stcox i.sex i.year8594 i.agegrp
         failure _d:  status == 1 2
   analysis time _t:  surv_mm
  exit on or before:  time 120
Iteration 0:   log likelihood = -12951.328
Iteration 1:   log likelihood = -12680.429
Iteration 2:   log likelihood = -12507.064
Iteration 3:   log likelihood = -12506.146
Iteration 4:   log likelihood = -12506.145
Refining estimates:
Iteration 0:   log likelihood = -12506.145
Cox regression -- Breslow method for ties
No. of subjects =        5,318                 Number of obs    =       5,318
No. of failures =        1,580
Time at risk    =       388520
                                               LR chi2(5)       =      890.37
Log likelihood  =   -12506.145                 Prob > chi2      =      0.0000
------------------------------------------------------------------------------
          _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
```

sex						
Female	.6101738	.0311091	-9.69	0.000	.5521485	.674297
year8594						
Diagnosed 85-94	.753006	.0390759	-5.47	0.000	.6801847	.8336238
agegrp						
45-59	1.502939	.1307488	4.68	0.000	1.267333	1.782346
60-74	2.937808	.234755	13.49	0.000	2.511917	3.435907
75+	8.427357	.6966317	25.79	0.000	7.166851	9.90956

```
.
. /* Now cause-specific survival */
. stset surv_mm, failure(status==1)

     failure event:  status == 1
obs. time interval:  (0, surv_mm]
 exit on or before:  failure
```

```
      5,318  total observations
          0  exclusions
```

```
      5,318  observations remaining, representing
      1,013  failures in single-record/single-failure data
    463,519  total analysis time at risk and under observation
                                            at risk from t =         0
                                 earliest observed entry t =         0
                                      last observed exit t =     251.5

.
. /* Cox regression */
. stcox i.sex i.year8594 i.agegrp

         failure _d:  status == 1
   analysis time _t:  surv_mm

Iteration 0:   log likelihood = -8262.7792
Iteration 1:   log likelihood = -8163.4913
Iteration 2:   log likelihood = -8158.3831
Iteration 3:   log likelihood =  -8158.363
Refining estimates:
Iteration 0:   log likelihood =  -8158.363

Cox regression -- Breslow method for ties

No. of subjects =        5,318                 Number of obs    =       5,318
No. of failures =        1,013
Time at risk    =       463519
                                               LR chi2(5)       =      208.83
Log likelihood  =    -8158.363                 Prob > chi2      =      0.0000
```

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
Female	.6060685	.0385507	-7.87	0.000	.5350306	.6865384
year8594						
Diagnosed 85-94	.7154353	.0472398	-5.07	0.000	.6285878	.8142818
agegrp						
45-59	1.297032	.1173508	2.87	0.004	1.086268	1.54869
60-74	1.830303	.1601515	6.91	0.000	1.541852	2.172716
75+	3.282573	.3360783	11.61	0.000	2.685753	4.012015

(a) For patients of the same sex diagnosed in the same period, those aged 60–74 at diagnosis have a 2.9 times higher risk of death due to any causes than those aged 0–44 at diagnosis. This difference is statistically significant.
(b) Note that the previous model estimated cause-specific hazard ratios whereas the current model estimates all-cause hazard ratios. The estimated hazard ratios for sex and period are similar, whereas the estimated hazard ratios for age are markedly different. This is because non-cancer mortality is heavily dependent on age, but only lightly dependent on sex and calendar period.