```
      name:  <unnamed>
       log:  C:\Users\fanwa.BC\Downloads\2019-02-28 exercise.txt
  log type:  smcl
 opened on:  28 Feb 2019, 10:44:36

1 . stset time, failure(status)

     failure event:  status != 0 & status < .
obs. time interval:  (0, time]
 exit on or before:  failure

------------------------------------------------------------------------------
         22  total observations
          0  exclusions
------------------------------------------------------------------------------
         22  observations remaining, representing
         18  failures in single-record/single-failure data
        281  total analysis time at risk and under observation
                                        at risk from t =         0
                              earliest observed entry t =         0
                                   last observed exit t =        32

2 . streg i.sex i.married, dist(exponential)

          failure _d:  status
    analysis time _t:  time

Iteration 0:   log likelihood = -28.173087
Iteration 1:   log likelihood = -27.255244
Iteration 2:   log likelihood = -27.229336
Iteration 3:   log likelihood = -27.229316
Iteration 4:   log likelihood = -27.229316

Exponential PH regression

No. of subjects =           22                 Number of obs    =          22
No. of failures =           18
Time at risk    =          281
                                               LR chi2(2)       =        1.89
Log likelihood  =   -27.229316                 Prob > chi2      =      0.3892

------------------------------------------------------------------------------
          _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         sex |
        male |   .5939756   .2903046    -1.07   0.287     .2279005    1.548075
             |
     married |
```

married	.5628904	.2918	-1.11	0.268	.2037814	1.554831
_cons	.1060827	.0434075	-5.48	0.000	.0475714	.2365613

Note: **_cons** estimates baseline hazard.

```
3 . est store exponential

4 . streg i.sex i.married, dist(weibull)

          failure _d:  status
    analysis time _t:  time

Fitting constant-only model:

Iteration 0:   log likelihood = -28.173087
Iteration 1:   log likelihood = -26.654705
Iteration 2:   log likelihood = -26.626377
Iteration 3:   log likelihood = -26.626369
Iteration 4:   log likelihood = -26.626369

Fitting full model:

Iteration 0:   log likelihood = -26.626369
Iteration 1:   log likelihood = -25.445897
Iteration 2:   log likelihood = -25.403305
Iteration 3:   log likelihood = -25.403249
Iteration 4:   log likelihood = -25.403249

Weibull PH regression

No. of subjects =           22                 Number of obs    =          22
No. of failures =           18
Time at risk    =          281
                                               LR chi2(2)       =        2.45
Log likelihood  =   -25.403249                 Prob > chi2      =      0.2943
```

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
male	.5774102	.2847542	-1.11	0.265	.2196382	1.517962
married						
married	.4878313	.2588599	-1.35	0.176	.1724222	1.380213
_cons	.0273861	.0249586	-3.95	0.000	.0045896	.1634117
/ln_p	.4102783	.1976204	2.08	0.038	.0229494	.7976072
p	1.507237	.2978609			1.023215	2.220222

1/p	.6634656	.1311143	.4504054	.9773119

Note: Estimates are transformed only in the first equation.
Note: **_cons** estimates baseline hazard.

5 . lrtest exponential, force

Likelihood-ratio test — LR chi2(**1**) = **3.65**
(Assumption: exponential nested in .) — Prob > chi2 = **0.0560**

6 . streg i.sex i.married, dist(exponential)

failure _d: **status**
analysis time _t: **time**

Iteration 0: log likelihood = **-28.173087**
Iteration 1: log likelihood = **-27.255244**
Iteration 2: log likelihood = **-27.229336**
Iteration 3: log likelihood = **-27.229316**
Iteration 4: log likelihood = **-27.229316**

Exponential PH regression

No. of subjects = **22** — Number of obs = **22**
No. of failures = **18**
Time at risk = **281**
LR chi2(**2**) = **1.89**
Log likelihood = **-27.229316** — Prob > chi2 = **0.3892**

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
male	.5939756	.2903046	-1.07	0.287	.2279005	1.548075
married						
married	.5628904	.2918	-1.11	0.268	.2037814	1.554831
_cons	.1060827	.0434075	-5.48	0.000	.0475714	.2365613

Note: **_cons** estimates baseline hazard.

7 . estat ic

Akaike's information criterion and Bayesian information criterion

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	22	-28.17309	-27.22932	3	60.45863	63.73176

Note: N=Obs used in calculating BIC; see **[R] BIC note**.

```
8 . streg i.sex i.married, dist(weibull)

         failure _d:  status
   analysis time _t:  time

Fitting constant-only model:

Iteration 0:   log likelihood = -28.173087
Iteration 1:   log likelihood = -26.654705
Iteration 2:   log likelihood = -26.626377
Iteration 3:   log likelihood = -26.626369
Iteration 4:   log likelihood = -26.626369

Fitting full model:

Iteration 0:   log likelihood = -26.626369
Iteration 1:   log likelihood = -25.445897
Iteration 2:   log likelihood = -25.403305
Iteration 3:   log likelihood = -25.403249
Iteration 4:   log likelihood = -25.403249

Weibull PH regression

No. of subjects =           22                 Number of obs    =          22
No. of failures =           18
Time at risk    =          281
                                               LR chi2(2)       =        2.45
Log likelihood  =   -25.403249                 Prob > chi2      =      0.2943
```

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
male	.5774102	.2847542	-1.11	0.265	.2196382	1.517962
married						
married	.4878313	.2588599	-1.35	0.176	.1724222	1.380213
_cons	.0273861	.0249586	-3.95	0.000	.0045896	.1634117
/ln_p	.4102783	.1976204	2.08	0.038	.0229494	.7976072
p	1.507237	.2978609			1.023215	2.220222
1/p	.6634656	.1311143			.4504054	.9773119

Note: Estimates are transformed only in the first equation.
Note: **_cons** estimates baseline hazard.

```
 9 . estat ic

   Akaike's information criterion and Bayesian information criterion

------------------------------------------------------------------------------
       Model |          Obs  ll(null)  ll(model)      df         AIC        BIC
-------------+----------------------------------------------------------------
           . |           22 -26.62637  -25.40325       4     58.8065   63.17067
------------------------------------------------------------------------------
               Note: N=Obs used in calculating BIC; see [R] BIC note.

10 . streg i.sex i.married, dist(loglogicstic)
   unknown distribution: loglogicstic
   r(198);

11 . streg i.sex i.married, dist(loglogistic)

          failure _d:  status
    analysis time _t:  time

   Fitting constant-only model:

   Iteration 0:   log likelihood = -33.099154
   Iteration 1:   log likelihood = -29.457244
   Iteration 2:   log likelihood = -28.810957
   Iteration 3:   log likelihood = -28.789655
   Iteration 4:   log likelihood = -28.789643
   Iteration 5:   log likelihood = -28.789643

   Fitting full model:

   Iteration 0:   log likelihood = -28.789643
   Iteration 1:   log likelihood = -27.937104
   Iteration 2:   log likelihood =   -27.7992
   Iteration 3:   log likelihood = -27.799028
   Iteration 4:   log likelihood = -27.799028

   Loglogistic AFT regression

   No. of subjects =           22                 Number of obs    =           22
   No. of failures =           18
   Time at risk    =          281
                                                  LR chi2(2)       =         1.98
   Log likelihood  =   -27.799028                 Prob > chi2      =       0.3713

------------------------------------------------------------------------------
          _t |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
```

sex						
male	.5892638	.4525152	1.30	0.193	-.2976497	1.476177
married						
married	.3700944	.4658954	0.79	0.427	-.5430439	1.283233
_cons	2.0181	.4099166	4.92	0.000	1.214678	2.821522
/lngamma	-.5912105	.1965372	-3.01	0.003	-.9764165	-.2060046
gamma	.5536567	.1088142			.3766585	.8138293

```
12 . estat ic

   Akaike's information criterion and Bayesian information criterion
```

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
.	22	-28.78964	-27.79903	4	63.59806	67.96223

Note: N=Obs used in calculating BIC; see **[R] BIC note**.

```
13 . streg i.sex i.married, dist(exponential)

          failure _d:  status
    analysis time _t:  time

   Iteration 0:   log likelihood = -28.173087
   Iteration 1:   log likelihood = -27.255244
   Iteration 2:   log likelihood = -27.229336
   Iteration 3:   log likelihood = -27.229316
   Iteration 4:   log likelihood = -27.229316

   Exponential PH regression

   No. of subjects =           22                 Number of obs    =           22
   No. of failures =           18
   Time at risk    =          281
                                                  LR chi2(2)       =         1.89
   Log likelihood  =   -27.229316                 Prob > chi2      =       0.3892
```

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
male	.5939756	.2903046	-1.07	0.287	.2279005	1.548075
married						

```
    married |   .5628904      .2918    -1.11   0.268     .2037814    1.554831
      _cons |   .1060827   .0434075    -5.48   0.000     .0475714    .2365613
------------------------------------------------------------------------------

Note: _cons estimates baseline hazard.

14 . predict cs, csnell

15 . scatter cs _t

16 . streg i.sex i.married if cs > 1.5 & cs < ., dist(exponential)

         failure _d:  status
   analysis time _t:  time
note: 0.sex omitted because of collinearity

Iteration 0:   log likelihood =  -2.081644
Iteration 1:   log likelihood = -2.0022592
Iteration 2:   log likelihood = -2.0000017
Iteration 3:   log likelihood =         -2
Iteration 4:   log likelihood =         -2

Exponential PH regression

No. of subjects =            2                 Number of obs    =            2
No. of failures =            2
Time at risk    =           50
                                               LR chi2(1)       =         0.16
Log likelihood  =           -2                 Prob > chi2      =       0.6861

------------------------------------------------------------------------------
          _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         sex |
      female |          1  (omitted)
             |
     married |
     married |      .5625   .7954951    -0.41   0.684     .0351837    8.992973
       _cons |   .0555556   .0555556    -2.89   0.004     .0078257    .3943929
------------------------------------------------------------------------------

Note: _cons estimates baseline hazard.

17 . streg i.sex i.married if cs < 1.5, dist(exponential)

         failure _d:  status
   analysis time _t:  time

Iteration 0:   log likelihood = -25.782766
Iteration 1:   log likelihood = -24.505804
Iteration 2:   log likelihood = -24.413007
```

```
Iteration 3:   log likelihood = -24.412727
Iteration 4:   log likelihood = -24.412727

Exponential PH regression

No. of subjects =           20                 Number of obs    =          20
No. of failures =           16
Time at risk    =          231
                                               LR chi2(2)       =        2.74
Log likelihood  =   -24.412727                 Prob > chi2      =      0.2541
```

_t	Haz. Ratio	Std. Err.	z	P>|z|	[95% Conf.	Interval]
sex						
male	.443554	.2300541	-1.57	0.117	.160495	1.225833
married						
married	.5868581	.3257658	-0.96	0.337	.1977105	1.741952
_cons	.1408061	.0632283	-4.37	0.000	.0583974	.3395075

```
Note: _cons estimates baseline hazard.

18 . use "C:\Users\fanwa.BC\Downloads\hrs.dta"
no; data in memory would be lost
r(4);

19 . use "C:\Users\fanwa.BC\Downloads\hrs.dta", clear

20 . do "C:\Users\fanwa.BC\AppData\Local\Temp\STDb78_000000.tmp"

21 . drop if deathyr >= .
(3,577 observations deleted)

22 . stset deathyr, failure(deathw12) id(hhidpn) origin(time byear) enter(time firstinyr)

                id:  hhidpn
     failure event:  deathw12 != 0 & deathw12 < .
obs. time interval:  (deathyr[_n-1], deathyr]
 enter on or after:  time firstinyr
 exit on or before:  failure
    t for analysis:  (time-origin)
            origin:  time byear

------------------------------------------------------------------------------
     33,918  total observations
          0  exclusions
------------------------------------------------------------------------------

     33,918  observations remaining, representing
```

```
        33,918  subjects
        10,716  failures in single-failure-per-subject data
       441,292  total analysis time at risk and under observation
                                                at risk from t =         0
                                     earliest observed entry t =        18
                                          last observed exit t =       115

23 . drop if _t0 < 50
   (3,207 observations deleted)

24 .
   end of do-file

25 . stcox female

           failure _d:  deathw12
     analysis time _t:  (deathyr-origin)
               origin:  time byear
    enter on or after:  time firstinyr
                   id:  hhidpn

   Iteration 0:   log likelihood = -91385.841
   Iteration 1:   log likelihood = -91229.334
   Iteration 2:   log likelihood = -91229.223
   Refining estimates:
   Iteration 0:   log likelihood = -91229.223

   Cox regression -- Breslow method for ties

   No. of subjects =       30,711                 Number of obs    =      30,711
   No. of failures =       10,557
   Time at risk    =       395444
                                                  LR chi2(1)       =      313.24
   Log likelihood  =   -91229.223                 Prob > chi2      =      0.0000

   ------------------------------------------------------------------------------
             _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
   -------------+----------------------------------------------------------------
         female |   .7046838   .0138707   -17.78   0.000     .6780155     .732401
   ------------------------------------------------------------------------------

26 . stcox female, nohr

           failure _d:  deathw12
     analysis time _t:  (deathyr-origin)
               origin:  time byear
    enter on or after:  time firstinyr
                   id:  hhidpn
```

```
Iteration 0:   log likelihood = -91385.841
Iteration 1:   log likelihood = -91229.334
Iteration 2:   log likelihood = -91229.223
Refining estimates:
Iteration 0:   log likelihood = -91229.223

Cox regression -- Breslow method for ties

No. of subjects =       30,711                 Number of obs    =      30,711
No. of failures =       10,557
Time at risk    =       395444
                                               LR chi2(1)       =      313.24
Log likelihood  =   -91229.223                 Prob > chi2      =      0.0000

------------------------------------------------------------------------------
          _t |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |  -.3500061   .0196835   -17.78   0.000    -.3885851   -.3114271
------------------------------------------------------------------------------
```

```
27 . stcox female, exactm

          failure _d:  deathw12
    analysis time _t:  (deathyr-origin)
              origin:  time byear
  enter on or after:  time firstinyr
                  id:  hhidpn

Iteration 0:   log likelihood = -6089.0234
Iteration 1:   log likelihood = -6070.2624
Iteration 2:   log likelihood = -6070.2232
Refining estimates:
Iteration 0:   log likelihood = -6070.2232

Cox regression -- exact marginal likelihood

No. of subjects =       30,711                 Number of obs    =      30,711
No. of failures =       10,557
Time at risk    =       395444
                                               LR chi2(1)       =       37.60
Log likelihood  =   -6070.2232                 Prob > chi2      =      0.0000

------------------------------------------------------------------------------
          _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |   .7086788   .0393472    -6.20   0.000     .6356076    .7901503
------------------------------------------------------------------------------
```

```
28 . do "C:\Users\fanwa.BC\AppData\Local\Temp\STDb78_000000.tmp"
```

```
29 . stcox female, efron noshow nolog        // Efron

   Cox regression -- Efron method for ties

   No. of subjects =       30,711                 Number of obs    =       30,711
   No. of failures =       10,557
   Time at risk    =       395444
                                                  LR chi2(1)       =       331.26
   Log likelihood  =   -90861.988                 Prob > chi2      =       0.0000

------------------------------------------------------------------------------
          _t | Haz. Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      female |   .6975645   .0137365   -18.29   0.000     .6711544    .7250138
------------------------------------------------------------------------------

30 .
   end of do-file

31 . stcox female, exactp

           failure _d:  deathw12
     analysis time _t:  (deathyr-origin)
               origin:  time byear
    enter on or after:  time firstinyr
                   id:  hhidpn

   Iteration 0:   log likelihood = -8.99e+307
   flat region resulting in a missing likelihood
   r(430);

32 . tab _t

   analysis |
     time when |
record ends |      Freq.     Percent        Cum.
------------+-----------------------------------
         51 |          5        0.02        0.02
         52 |         10        0.03        0.05
         53 |         28        0.09        0.14
         54 |         56        0.18        0.32
         55 |        253        0.82        1.15
         56 |        804        2.62        3.76
         57 |        841        2.74        6.50
         58 |        808        2.63        9.13
         59 |        780        2.54       11.67
         60 |        763        2.48       14.16
         61 |        854        2.78       16.94
```

62	807	2.63	19.57
63	875	2.85	22.42
64	765	2.49	24.91
65	809	2.63	27.54
66	714	2.32	29.87
67	812	2.64	32.51
68	638	2.08	34.59
69	613	2.00	36.58
70	497	1.62	38.20
71	543	1.77	39.97
72	563	1.83	41.80
73	859	2.80	44.60
74	1,078	3.51	48.11
75	1,061	3.45	51.56
76	1,011	3.29	54.86
77	1,047	3.41	58.27
78	1,027	3.34	61.61
79	966	3.15	64.76
80	964	3.14	67.89
81	907	2.95	70.85
82	868	2.83	73.67
83	833	2.71	76.39
84	846	2.75	79.14
85	750	2.44	81.58
86	656	2.14	83.72
87	681	2.22	85.94
88	633	2.06	88.00
89	595	1.94	89.94
90	530	1.73	91.66
91	471	1.53	93.19
92	398	1.30	94.49
93	398	1.30	95.79
94	267	0.87	96.66
95	258	0.84	97.50
96	222	0.72	98.22
97	141	0.46	98.68
98	124	0.40	99.08
99	93	0.30	99.38
100	63	0.21	99.59
101	39	0.13	99.72
102	36	0.12	99.83
103	23	0.07	99.91
104	13	0.04	99.95
105	6	0.02	99.97
106	2	0.01	99.98
107	2	0.01	99.98
108	1	0.00	99.99
109	1	0.00	99.99
112	1	0.00	99.99

```
        115 |          2        0.01      100.00
------------+-----------------------------------
      Total |     30,711      100.00
```

```
33 . log close
      name:  <unnamed>
       log:  C:\Users\fanwa.BC\Downloads\2019-02-28 exercise.txt
  log type:  smcl
 closed on:  28 Feb 2019, 11:46:43
-------------------------------------------------------------------------------
```