lss07sitemod.log

```
names city, sex, un4gy, distcat, agxcat, agecat, dcat, time, subjects,
      upyr, pyr, gdist, agex, age, year, solid, oralca, lip, tongue,
      saliv, mouth, pharynx, digestca, esoph, stomach, smallint, colon,
      rectum, liver, gallbldr, pancr, othdig, respca, nasal, larynx,
      lung, othres, thymus, skinbone, bone, connect, nmskin, skbasal,
      sksquam, bowens, breast, femgenca, uterus, utrnos, cervix, corpus,
      ovary, othfem, malgenca, prost, testis, othmale, urinca, bladder,
      kidney, renal, othurin, cnsca, thyroid, othsol, msother,
      adeno, squam, othepi, sarcoma, othnonepi, histnos,
      cola02w10, cola02g, cola02n, mara02w10, mara02g, mara02n,
      braa02w10, brea02w10, liva02w10, liva02g, liva02n, luna02w10,
      ovaa02w10, pana02w10, skea02w10, skia02w10, stoa02w10,
      tesa02w10, thya02w10, blaa02w10, utea02w10, trunc02, adjust02
@

! Remove unknown dose records

tran if cola02w10 < 0 then delete endif @
SKIP 1 @

INPUT lssinc07.csv @

Input from lssinc07.csv

       26807 records read       25570 records used
                                 1237 records rejected

97 variables defined  At least 500 additional variables can be created.


! set up categorical variables
leve city sex un4gy distcat agxcat agecat dcat time @

! define dose and age at exposure  categories for case summary tables
city has 2 levels from 1 to 2
sex has 2 levels from 1 to 2
un4gy has 2 levels from 0 to 1
distcat has 3 levels from 1 to 3
agxcat has 15 levels from 1 to 15
agecat has 16 levels from 3 to 18
dcat has 22 levels from 2 to 23
time has 10 levels from 1 to 10

categ cola02w10 < 0.005 0.1 0.2 0.5 1 2 > as tbdcat @
tbdcat has 7 levels from 1 to 7
categ cola02w10 < 0.005 0.5 1 > as d4cat @
d4cat has 4 levels from 1 to 4

categ agex < 10 20 30 40 50 > as agxdec @
agxdec has 6 levels from 1 to 6


! define variables used in fitting models

tran msex = 2*sex - 3 ;
     lage70 = log(age/70) ; lage70sq = lage70^2 ;
     lage70qsp = lage70sq*(age > 70) ;
     lage50sp = log(age/50)*(age >= 50) ;
     e30 = (agex - 30)/10 ; e30sq = e30^2 ;
     py10k = pyr/10000 ;
     hidose = cola02w10 > 2 ;
     lodose = 1 - hidose ;
@

! Define additional variables of interest
tran
     distal = distcat == 2 ;
         nic = distcat == 3 ;
         hiro = city == 1 ; naga = city == 2 ;
     tsx25 = (age - agex - 25) ;
```

lss07sitemod.log

@

```
cases solid @
pyr py10k @
excess @
 *** WARNING: Fit model again to compute statistics
rrisk @
line 1 cola02w10 @

logl 1 e30 lage70 @
pline 1 %con=1 msex @

fit sex:4 naga nic*hiro nic*naga
    sex*lage70:4 sex*lage70sq sex*lage70qsp
    sex*e30 sex*e30sq - %con
@

          Iter  Step      Deviance

             0     0    25630.834
             1     1    18438.147
             2     1    16361.563
             3     0    14821.111
             4     0    14736.139
             5     0    14735.954
             6     0    14735.954

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

    solid is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1.....	5.338	0.02008	265.8	< 0.001
2	sex_2.....	4.547	0.01802	252.3	< 0.001
3	naga.....	-0.04658	0.0194	-2.401	0.0163
4	nic * hiro.....	-0.07415	0.02099	-3.532	< 0.001
5	nic * naga.....	-0.03794	0.03863	-0.9822	0.326
6	sex_1 * lage70.....	5.875	0.1728	33.99	< 0.001
7	sex_2 * lage70.....	3.652	0.1265	28.86	< 0.001
8	sex_1 * lage70sq.....	0.04283	0.2847	0.1504	> 0.5
9	sex_2 * lage70sq.....	0.1152	0.181	0.6364	> 0.5
10	sex_1 * lage70qsp.....	-13.34	1.419	-9.406	< 0.001
11	sex_2 * lage70qsp.....	-3.551	1.041	-3.412	< 0.001
12	sex_1 * e30.....	-0.1721	0.01059	-16.26	< 0.001
13	sex_2 * e30.....	-0.07425	0.01071	-6.936	< 0.001
14	sex_1 * e30sq.....	0.007164	0.004633	1.546	0.122
15	sex_2 * e30sq.....	0.004648	0.004356	1.067	0.286
	Linear term 1				
16	cola02w10.....	0.4666	0.04413	10.57	< 0.001
	Log-linear term 1				
17	e30.....	-0.1850	0.0636	-2.909	0.00363
18	lage70.....	-1.621	0.3058	-5.3	< 0.001
	Linear product term 1				
19	%CON.....	1.000	Aliased		
20	msex.....	0.2465	0.06763	3.645	< 0.001

Records used 25570

Deviance 14735.954

Pearson Chi2 43595.689 Degrees of freedom 25551

add @
fit @

Iter	Step	Deviance
0	0	15145.255
1	2	15131.949
2	2	15116.260
3	1	15097.700
4	1	14855.850
5	0	14772.650
6	0	14746.607
7	0	14739.995
8	0	14739.933
9	0	14739.933

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

solid is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1.....	5.346	0.02014	265.5	< 0.001
2	sex_2.....	4.545	0.01842	246.7	< 0.001
3	naga.....	-0.04565	0.02039	-2.239	0.0252
4	nic * hiro.....	-0.07679	0.02105	-3.648	< 0.001
5	nic * naga.....	-0.04255	0.03886	-1.095	0.274
6	sex_1 * lage70.....	5.713	0.1865	30.64	< 0.001
7	sex_2 * lage70.....	3.671	0.1368	26.84	< 0.001
8	sex_1 * lage70sq.....	-0.4934	0.3428	-1.439	0.15
9	sex_2 * lage70sq.....	0.2283	0.1959	1.165	0.244
10	sex_1 * lage70qsp.....	-12.10	1.511	-8.009	< 0.001
11	sex_2 * lage70qsp.....	-3.818	1.1	-3.472	< 0.001
12	sex_1 * e30.....	-0.1735	0.01072	-16.18	< 0.001
13	sex_2 * e30.....	-0.07292	0.01098	-6.643	< 0.001
14	sex_1 * e30sq.....	0.007825	0.004752	1.647	0.0996
15	sex_2 * e30sq.....	0.003865	0.004536	0.852	0.394
	Linear term 1				
16	cola02w10.....	51.63	4.982	10.36	< 0.001
	Log-linear term 1				
17	e30.....	-0.2806	0.06215	-4.514	< 0.001
18	lage70.....	2.406	0.2731	8.81	< 0.001
	Linear product term 1				
19	%CON.....	1.000	Aliased		
20	msex.....	0.1622	0.06988	2.321	0.0203

Records used 25570

Deviance 14739.933
Pearson Chi2 39853.809 Degrees of freedom 25551

! Cancers of the Oral Cavity (constant ERR only)
cases oralca @

lss07sitemod.log

```
rrisk @
line 1 skia02w10 @
para 17-18=0 20=0 @
fit @

          Iter  Step      Deviance

             0     0    32306.379
             1     0    12028.374
             2     0     4894.774
             3     0     2561.383
             4     0     1922.880
             5     0     1805.719
             6     0     1796.237
             7     0     1796.089
             8     0     1796.089

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

   oralca is used for cases
    py10k is used for person years


                            Parameter Summary Table

 # Name                          Estimate     Std.Err.  Test Stat.  P value
-- ----------------------------  ----------   ---------  ----------  --------
Log-linear term 0
 1 sex_1.....................        1.298      0.1543       8.41    < 0.001
 2 sex_2.....................      -0.03990      0.1691     -0.236      > 0.5
 3 naga......................      -0.06132      0.1526    -0.4019      > 0.5
 4 nic * hiro................       -0.2491       0.178       -1.4      0.162
 5 nic * naga................        0.2703      0.2653      1.019      0.308
 6 sex_1 * lage70............         4.548       1.113      4.086    < 0.001
 7 sex_2 * lage70............         1.451       1.125       1.29      0.197
 8 sex_1 * lage70sq..........       -0.1114       1.452    -0.07673      > 0.5
 9 sex_2 * lage70sq..........        -1.209       1.478    -0.8182      0.413
10 sex_1 * lage70qsp........        -21.08       11.76      -1.793     0.0729
11 sex_2 * lage70qsp........         4.968       10.02      0.4959      > 0.5
12 sex_1 * e30..............       -0.2397     0.06856      -3.496    < 0.001
13 sex_2 * e30..............      -0.06622     0.08932     -0.7414      0.458
14 sex_1 * e30sq............       0.04259     0.03159       1.348      0.178
15 sex_2 * e30sq............     0.0002359     0.03933    0.005998      > 0.5

Linear term 1
16 skia02w10................        0.4079       0.204       1.999     0.0456

Log-linear term 1
17 e30......................         0.000       Fixed      -1.971     0.0487
18 lage70...................         0.000       Fixed      -2.999    0.00271

Linear product term 1
19 %CON.....................         1.000     Aliased
20 msex.....................         0.000       Fixed       1.315      0.189

            Records used        25570

                Deviance      1796.089
            Pearson Chi2      24336.49      Degrees of freedom    25554



! Cancer of the esophagus(constant ERR only)
rrisk @
cases esoph @
line 1 stoa02w10 @
fit @

          Iter  Step      Deviance
```

Iter	Step	Deviance
0	0	2049.399
1	1	1930.373
2	0	1844.782
3	0	1827.990
4	0	1826.576
5	0	1826.515
6	0	1826.514
7	0	1826.514

Piece-wise exponential regression
Product additive excess model { T0 * (1 + T1 + T2 +...) }

esoph is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	1.884	0.1156	16.3	< 0.001
2	sex_2.....	-0.5021	0.1843	-2.725	0.00643
3	naga.....	0.02122	0.136	0.1561	> 0.5
4	nic * hiro.....	0.08125	0.1415	0.5741	> 0.5
5	nic * naga.....	-0.5647	0.3241	-1.742	0.0814
6	sex_1 * lage70.....	3.848	1.201	3.205	0.00135
7	sex_2 * lage70.....	4.260	1.928	2.21	0.0271
8	sex_1 * lage70sq.....	-9.207	3.323	-2.77	0.0056
9	sex_2 * lage70sq.....	-1.969	4.197	-0.4692	> 0.5
10	sex_1 * lage70qsp.....	-8.835	10.57	-0.8361	0.403
11	sex_2 * lage70qsp.....	4.147	13.17	0.3149	> 0.5
12	sex_1 * e30.....	-0.1329	0.05299	-2.508	0.0121
13	sex_2 * e30.....	-0.06455	0.128	-0.5043	> 0.5
14	sex_1 * e30sq.....	0.08639	0.0228	3.79	< 0.001
15	sex_2 * e30sq.....	0.04990	0.04618	1.08	0.28
Linear term 1					
16	stoa02w10.....	0.5220	0.2742	1.904	0.0569
Log-linear term 1					
17	e30.....	0.000	Fixed	-0.2908	> 0.5
18	lage70.....	0.000	Fixed	-0.7503	0.453
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	0.000	Fixed	0.6504	> 0.5

Records used 25570

Deviance 1826.514
Pearson Chi2 25523.78 Degrees of freedom 25554

! Stomach cancer (ERR and EAR models)
cases stomach @

! ERR model
rrisk @
line 1 stoa02w10 @
para 17-18 free 20 free @
fit @

Iter	Step	Deviance
0	0	27847.424
1	3	27409.046
2	4	27396.320

3	4	27383.597
4	4	27370.876
5	4	27358.156
6	4	27345.437
7	4	27332.721
8	3	26814.223
9	3	26447.287
10	2	21331.199
11	1	9731.208
12	0	9059.880
13	0	8961.504
14	0	8945.397
15	0	8943.610
16	0	8943.586
17	0	8943.586

Piece-wise exponential regression
Product additive excess model { T0 * (1 + T1 + T2 +...) }

stomach is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	4.150	0.03728	111.3	< 0.001
2	sex_2.....	3.041	0.03751	81.1	< 0.001
3	naga.....	-0.1556	0.03871	-4.02	< 0.001
4	nic * hiro.....	-0.05393	0.03924	-1.374	0.169
5	nic * naga.....	0.009240	0.07586	0.1218	> 0.5
6	sex_1 * lage70.....	4.062	0.2921	13.91	< 0.001
7	sex_2 * lage70.....	3.322	0.2656	12.51	< 0.001
8	sex_1 * lage70sq.....	-0.7530	0.4753	-1.584	0.113
9	sex_2 * lage70sq.....	0.3720	0.3826	0.9723	0.331
10	sex_1 * lage70qsp.....	-12.71	2.58	-4.925	< 0.001
11	sex_2 * lage70qsp.....	-7.289	2.167	-3.364	< 0.001
12	sex_1 * e30.....	0.04538	0.01871	2.425	0.0153
13	sex_2 * e30.....	0.1483	0.02392	6.199	< 0.001
14	sex_1 * e30sq.....	-0.01525	0.008169	-1.867	0.0619
15	sex_2 * e30sq.....	-0.002621	0.009054	-0.2895	> 0.5
Linear term 1					
16	stoa02w10.....	0.3364	0.08035	4.187	< 0.001
Log-linear term 1					
17	e30.....	-0.1395	0.1631	-0.8551	0.392
18	lage70.....	-1.488	0.8004	-1.859	0.0631
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	0.3919	0.1627	2.409	0.016

Records used 25570

Deviance 8943.586
Pearson Chi2 50775.95 Degrees of freedom 25551

! EAR model
add @
fit @

Iter	Step	Deviance
0	0	8985.689
1	1	8975.547

2	1	8965.951
3	0	8951.680
4	1	8945.848
5	0	8941.871
6	0	8940.980
7	0	8940.959
8	0	8940.958
9	0	8940.957

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

stomach is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	4.158	0.0374	111.2	< 0.001
2	sex_2.....	3.043	0.03793	80.24	< 0.001
3	naga.....	-0.1669	0.04018	-4.153	< 0.001
4	nic * hiro.....	-0.05692	0.03928	-1.449	0.147
5	nic * naga.....	0.01691	0.07633	0.2215	> 0.5
6	sex_1 * lage70.....	4.044	0.304	13.31	< 0.001
7	sex_2 * lage70.....	3.355	0.2812	11.93	< 0.001
8	sex_1 * lage70sq.....	-0.8750	0.5186	-1.687	0.0915
9	sex_2 * lage70sq.....	0.4873	0.4026	1.211	0.226
10	sex_1 * lage70qsp.....	-12.78	2.677	-4.775	< 0.001
11	sex_2 * lage70qsp.....	-7.608	2.259	-3.368	< 0.001
12	sex_1 * e30.....	0.04381	0.01892	2.316	0.0206
13	sex_2 * e30.....	0.1498	0.0244	6.138	< 0.001
14	sex_1 * e30sq.....	-0.01525	0.00833	-1.831	0.0671
15	sex_2 * e30sq.....	-0.003387	0.009365	-0.3617	> 0.5
Linear term 1					
16	stoa02w10.....	9.520	2.339	4.071	< 0.001
Log-linear term 1					
17	e30.....	-0.01617	0.1556	-0.1039	> 0.5
18	lage70.....	1.931	0.7318	2.639	0.00833
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	0.02266	0.1854	0.1222	> 0.5

Records used 25570

Deviance 8940.957
Pearson Chi2 48102.97 Degrees of freedom 25551

! Colon cancer (ERR and EAR models)
cases colon @

! ERR model
rrisk @
line 1 cola02w10 @
fit @

Iter	Step	Deviance
0	0	8383.089
1	0	5443.659
2	1	5162.877
3	0	4638.240
4	0	4564.922

5	0	4561.241
6	0	4561.163
7	0	4561.157
8	0	4561.157
9	0	4561.157

Piece-wise exponential regression
Product additive excess model { T0 * (1 + T1 + T2 +...) }

colon is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	2.924	0.06922	42.24	< 0.001
2	sex_2.....	2.282	0.05752	39.67	< 0.001
3	naga.....	-0.02711	0.06498	-0.4172	> 0.5
4	nic * hiro.....	-0.06722	0.07125	-0.9434	0.345
5	nic * naga.....	-0.05983	0.1288	-0.4644	> 0.5
6	sex_1 * lage70.....	7.754	0.7434	10.43	< 0.001
7	sex_2 * lage70.....	8.781	0.5689	15.44	< 0.001
8	sex_1 * lage70sq.....	-3.008	1.642	-1.832	0.0669
9	sex_2 * lage70sq.....	1.799	1.058	1.701	0.089
10	sex_1 * lage70qsp.....	-2.051	5.633	-0.3641	> 0.5
11	sex_2 * lage70qsp.....	-12.75	4.008	-3.181	0.00147
12	sex_1 * e30.....	-0.7160	0.0429	-16.69	< 0.001
13	sex_2 * e30.....	-0.5855	0.03897	-15.02	< 0.001
14	sex_1 * e30sq.....	-0.0008955	0.01945	-0.04604	> 0.5
15	sex_2 * e30sq.....	0.03057	0.01724	1.774	0.0761
Linear term 1					
16	cola02w10.....	0.5317	0.1573	3.38	< 0.001
Log-linear term 1					
17	e30.....	0.01168	0.209	0.05589	> 0.5
18	lage70.....	-2.662	1.396	-1.907	0.0565
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	-0.3545	0.2204	-1.608	0.108

Records used 25570

Deviance 4561.157
Pearson Chi2 47724.06 Degrees of freedom 25551

! EAR model
add @
fit @

Iter	Step	Deviance
0	0	4648.350
1	0	4603.985
2	0	4585.600
3	0	4574.458
4	0	4566.824
5	0	4565.462
6	0	4565.293
7	0	4565.263
8	0	4565.257
9	0	4565.256
10	0	4565.256
11	0	4565.256

```
Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

    colon is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1.....	2.919	0.07082	41.22	< 0.001
2	sex_2.....	2.284	0.05821	39.23	< 0.001
3	naga.....	-0.01976	0.06851	-0.2885	> 0.5
4	nic * hiro.....	-0.06746	0.07157	-0.9425	0.346
5	nic * naga.....	-0.06692	0.1296	-0.5162	> 0.5
6	sex_1 * lage70.....	7.749	0.7932	9.769	< 0.001
7	sex_2 * lage70.....	8.790	0.5949	14.77	< 0.001
8	sex_1 * lage70sq.....	-2.476	1.769	-1.4	0.162
9	sex_2 * lage70sq.....	1.969	1.107	1.779	0.0752
10	sex_1 * lage70qsp.....	-2.751	5.992	-0.4592	> 0.5
11	sex_2 * lage70qsp.....	-13.17	4.157	-3.167	0.00154
12	sex_1 * e30.....	-0.7090	0.04374	-16.21	< 0.001
13	sex_2 * e30.....	-0.5806	0.03971	-14.62	< 0.001
14	sex_1 * e30sq.....	-0.003255	0.02062	-0.1579	> 0.5
15	sex_2 * e30sq.....	0.03055	0.01763	1.733	0.0831
	Linear term 1				
16	cola02w10.....	7.952	2.151	3.697	< 0.001
	Log-linear term 1				
17	e30.....	-0.8160	0.2217	-3.681	< 0.001
18	lage70.....	6.963	1.398	4.981	< 0.001
	Linear product term 1				
19	%CON.....	1.000	Aliased		
20	msex.....	-0.6237	0.1608	-3.877	< 0.001

```
           Records used        25570

               Deviance     4565.256
           Pearson Chi2     46518.11      Degrees of freedom   25551


! Cancer of the rectum (constant ERR only)
cases rectum @
rrisk @
line 1 blaa02w10 @
para 17-18=0 20=0 @
fit @

          Iter  Step      Deviance

             0     0     3862.577
             1     0     3477.743
             2     0     3445.473
             3     0     3444.956
             4     0     3444.955
             5     0     3444.955

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

   rectum is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	2.428	0.08669	28.01	< 0.001
2	sex_2.....	1.660	0.07826	21.21	< 0.001
3	naga.....	0.002735	0.0866	0.03158	> 0.5
4	nic * hiro.....	-0.1380	0.09617	-1.435	0.151
5	nic * naga.....	-0.1889	0.1768	-1.068	0.285
6	sex_1 * lage70.....	7.603	0.8278	9.184	< 0.001
7	sex_2 * lage70.....	6.684	0.6999	9.549	< 0.001
8	sex_1 * lage70sq.....	0.6437	1.377	0.4674	> 0.5
9	sex_2 * lage70sq.....	1.403	1.103	1.271	0.204
10	sex_1 * lage70qsp.....	-21.22	6.882	-3.083	0.00205
11	sex_2 * lage70qsp.....	-17.18	5.637	-3.048	0.00231
12	sex_1 * e30.....	-0.4237	0.04569	-9.272	< 0.001
13	sex_2 * e30.....	-0.3547	0.04878	-7.273	< 0.001
14	sex_1 * e30sq.....	0.05757	0.0203	2.836	0.00456
15	sex_2 * e30sq.....	0.03148	0.02175	1.447	0.148
Linear term 1					
16	blaa02w10.....	0.1830	0.1524	1.201	0.23
Log-linear term 1					
17	e30.....	0.000	Fixed	-0.3151	> 0.5
18	lage70.....	0.000	Fixed	0.8859	0.376
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	0.000	Fixed	1.111	0.267

Records used 25570

Deviance 3444.955
Pearson Chi2 23428.34 Degrees of freedom 25554

```
! Liver cancer (ERR and EAR models)
cases liver @

! ERR model
rrisk @
line 1 liva02w10  @
para 17-18 free 20 free @
fit @
```

Iter	Step	Deviance
0	0	5444.923
1	0	5408.457
2	0	4856.946
3	0	4796.948
4	0	4795.214
5	0	4795.209
6	0	4795.209

```
Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

    liver is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value

lss07sitemod.log

```
Log-linear term 0
 1 sex_1.....................          3.137     0.06511      48.18    < 0.001
 2 sex_2.....................          2.077     0.06458      32.16    < 0.001
 3 naga......................       -0.02534     0.06556    -0.3866      > 0.5
 4 nic * hiro................        -0.1208     0.07255     -1.665     0.0959
 5 nic * naga................        0.04765      0.1221     0.3903      > 0.5
 6 sex_1 * lage70............          3.244      0.6034      5.376    < 0.001
 7 sex_2 * lage70............          5.906      0.7319      8.069    < 0.001
 8 sex_1 * lage70sq..........         -6.371       1.277     -4.991    < 0.001
 9 sex_2 * lage70sq..........         -3.290       1.958      -1.68     0.0929
10 sex_1 * lage70qsp.........          4.193       5.332     0.7863      0.432
11 sex_2 * lage70qsp.........         -4.970       5.685    -0.8742      0.382
12 sex_1 * e30...............        -0.3999     0.03256     -12.28    < 0.001
13 sex_2 * e30...............        -0.3048     0.04382     -6.955    < 0.001
14 sex_1 * e30sq.............       -0.01652     0.01567     -1.054      0.292
15 sex_2 * e30sq.............       -0.01101     0.02027    -0.5433      > 0.5

Linear term 1
16 liva02w10................          0.3034       0.132      2.299     0.0215

Log-linear term 1
17 e30......................       -0.006380      0.2678   -0.02383      > 0.5
18 lage70...................          -2.419       1.922     -1.259      0.208

Linear product term 1
19 %CON.....................          1.000     Aliased
20 msex.....................       -0.04237      0.3357    -0.1262      > 0.5

            Records used        25570

                Deviance     4795.209
            Pearson Chi2     56210.29      Degrees of freedom   25551



! EAR model
add @
fit @

          Iter  Step      Deviance

             0     0     4834.080
             1     0     4811.629
             2     0     4802.478
             3     0     4799.111
             4     0     4798.168
             5     0     4797.842
             6     0     4797.624
             7     0     4797.501
             8     0     4797.442
             9     0     4797.417
            10     0     4797.407
            11     0     4797.403
            12     0     4797.402
            13     0     4797.402
            14     0     4797.401

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

    liver is used for cases
    py10k is used for person years


                            Parameter Summary Table

 # Name                          Estimate     Std.Err.  Test Stat.  P value
-- ---------------------------   ----------   ---------  ----------  --------
Log-linear term 0
 1 sex_1.....................          3.149     0.06558      48.01    < 0.001
```

2 sex_2.....	2.089	0.06503	32.13	< 0.001
3 naga.....	-0.02802	0.06798	-0.4121	> 0.5
4 nic * hiro.....	-0.1263	0.07269	-1.738	0.0823
5 nic * naga.....	0.04242	0.1227	0.3457	> 0.5
6 sex_1 * lage70.....	3.258	0.627	5.196	< 0.001
7 sex_2 * lage70.....	5.240	0.8002	6.549	< 0.001
8 sex_1 * lage70sq.....	-6.250	1.342	-4.656	< 0.001
9 sex_2 * lage70sq.....	-6.040	2.488	-2.428	0.0152
10 sex_1 * lage70qsp.....	3.913	5.554	0.7046	0.481
11 sex_2 * lage70qsp.....	0.5792	6.356	0.09113	> 0.5
12 sex_1 * e30.....	-0.4066	0.03271	-12.43	< 0.001
13 sex_2 * e30.....	-0.3041	0.04508	-6.746	< 0.001
14 sex_1 * e30sq.....	-0.01882	0.0162	-1.162	0.245
15 sex_2 * e30sq.....	-0.01361	0.02116	-0.6435	> 0.5
Linear term 1				
16 liva02w10.....	4.231	1.659	2.55	0.0108
Log-linear term 1				
17 e30.....	-0.2546	0.2676	-0.9515	0.341
18 lage70.....	3.683	1.386	2.657	0.00789
Linear product term 1				
19 %CON.....	1.000	Aliased		
20 msex.....	-0.4784	0.2329	-2.054	0.04

Records used 25570

Deviance 4797.401
Pearson Chi2 59607.85 Degrees of freedom 25551

```
! Gallbladder cancer (constant ERR only)
cases gallbldr@
rrisk @
line 1 pana02w10  @
para 17-18=0 20=0 @
fit @
```

Iter	Step	Deviance
0	0	3567.912
1	0	2738.049
2	0	2556.072
3	0	2532.114
4	0	2530.950
5	0	2530.942
6	0	2530.942

```
Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

 gallbldr is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	1.414	0.1292	10.95	< 0.001
2	sex_2.....	1.323	0.08848	14.95	< 0.001
3	naga.....	0.4485	0.1018	4.407	< 0.001
4	nic * hiro.....	0.02872	0.1197	0.2398	> 0.5
5	nic * naga.....	-0.02575	0.1882	-0.1368	> 0.5
6	sex_1 * lage70.....	5.586	1.414	3.951	< 0.001
7	sex_2 * lage70.....	6.369	0.8017	7.944	< 0.001

```
 8 sex_1 * lage70sq.........          -4.365       3.595     -1.214      0.225
 9 sex_2 * lage70sq.........           1.278       1.656     0.7718       0.44
10 sex_1 * lage70qsp........          -8.035        11.4    -0.7049      0.481
11 sex_2 * lage70qsp........          -7.763       5.635     -1.378      0.168
12 sex_1 * e30..............         -0.1612     0.07065     -2.282     0.0225
13 sex_2 * e30..............       -0.001159     0.06187   -0.01874      > 0.5
14 sex_1 * e30sq............         0.02901     0.03083      0.941      0.347
15 sex_2 * e30sq............        -0.04922     0.02574     -1.913     0.0558

Linear term 1
16 pana02w10................        -0.06367      0.1698     -0.375      > 0.5

Log-linear term 1
17 e30......................           0.000       Fixed     -1.134      0.257
18 lage70...................           0.000       Fixed     0.02105      > 0.5

Linear product term 1
19 %CON.....................           1.000     Aliased
20 msex.....................           0.000       Fixed      0.1742      > 0.5

            Records used        25570

                Deviance     2530.942
            Pearson Chi2     24401.36      Degrees of freedom   25554



! Pancreatic cancer (constant ERR only)
cases pancr @
rrisk @
line 1 pana02w10 @
para 17-18=0 20=0 @
fit @

          Iter  Step      Deviance

             0     0     2565.474
             1     0     2505.060
             2     0     2502.608
             3     0     2502.601
             4     0     2502.601

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

    pancr is used for cases
    py10k is used for person years


                          Parameter Summary Table

 # Name                        Estimate     Std.Err.  Test Stat.  P value
-- --------------------------  ----------  ---------  ----------  --------
Log-linear term 0
 1 sex_1.....................       1.805      0.1176       15.34    < 0.001
 2 sex_2.....................       1.243     0.09445       13.16    < 0.001
 3 naga......................     -0.06906      0.1155     -0.5981      > 0.5
 4 nic * hiro................      -0.1214      0.1223     -0.9932      0.321
 5 nic * naga................       0.1824      0.2118      0.8614      0.389
 6 sex_1 * lage70............        4.661       1.227       3.799    < 0.001
 7 sex_2 * lage70............        7.354      0.8751       8.403    < 0.001
 8 sex_1 * lage70sq.........        -4.887       3.207      -1.524      0.128
 9 sex_2 * lage70sq.........         2.593       1.538       1.686     0.0918
10 sex_1 * lage70qsp........        -6.605       10.18     -0.6487      > 0.5
11 sex_2 * lage70qsp........        -15.22       6.147      -2.475     0.0133
12 sex_1 * e30..............      -0.04431      0.0637     -0.6956      0.487
13 sex_2 * e30..............      -0.04449     0.07019     -0.6339      > 0.5
14 sex_1 * e30sq............     -0.003206     0.02833     -0.1132      > 0.5
15 sex_2 * e30sq............      -0.03364       0.029      -1.16      0.246
```

lss07sitemod.log

```
Linear term 1
16 pana02w10.............          0.2600       0.2192       1.186       0.236

Log-linear term 1
17 e30...................           0.000        Fixed       -1.49       0.136
18 lage70................           0.000        Fixed      -1.081        0.28

Linear product term 1
19 %CON..................           1.000     Aliased
20 msex..................           0.000        Fixed       1.075       0.282

            Records used        25570

                Deviance      2502.601
            Pearson Chi2      47452.14      Degrees of freedom    25554



! Lung cancer (ERR and EAR models)
cases lung @
! ERR
rrisk @
line 1 luna02w10 @
para 17-18 free 20 free @
fit @

          Iter  Step      Deviance

             0     0     7524.610
             1     1     5837.774
             2     1     5558.351
             3     0     5342.225
             4     0     5326.705
             5     0     5326.642
             6     0     5326.642

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

     lung is used for cases
    py10k is used for person years


                          Parameter Summary Table

 # Name                          Estimate     Std.Err.  Test Stat.  P value
-- ----------------------------  ----------  ---------  ----------  --------
Log-linear term 0
 1 sex_1..................          3.399     0.05536       61.4    < 0.001
 2 sex_2..................          2.000     0.06246      32.03    < 0.001
 3 naga...................         0.1109     0.06018      1.843     0.0653
 4 nic * hiro.............       -0.02533     0.06692     -0.3785     > 0.5
 5 nic * naga.............       0.007271      0.1139     0.06385     > 0.5
 6 sex_1 * lage70.........          6.606      0.5745       11.5    < 0.001
 7 sex_2 * lage70.........          6.280      0.6198      10.13    < 0.001
 8 sex_1 * lage70sq.......         -2.542       1.519     -1.673     0.0943
 9 sex_2 * lage70sq.......         -0.3517       1.385     -0.2539     > 0.5
10 sex_1 * lage70qsp......         -11.43       4.597     -2.485     0.0129
11 sex_2 * lage70qsp......         -7.191       4.424     -1.626      0.104
12 sex_1 * e30............         -0.1182     0.03145      -3.76    < 0.001
13 sex_2 * e30............         -0.1353     0.04545     -2.978     0.0029
14 sex_1 * e30sq..........        -0.03358     0.01416     -2.371     0.0177
15 sex_2 * e30sq..........       -0.009822     0.01745    -0.5629     > 0.5

Linear term 1
16 luna02w10.............          0.8090      0.1617      5.001    < 0.001

Log-linear term 1
17 e30...................          0.1771      0.1514       1.17      0.242
```

```
18 lage70..................          -1.916       1.133      -1.692      0.0907

Linear product term 1
19 %CON.....................           1.000     Aliased
20 msex.....................          0.6573      0.1236       5.317     < 0.001

            Records used        25570

                Deviance      5326.642
            Pearson Chi2      30936.75      Degrees of freedom    25551



! EAR
add @
fit @

          Iter  Step      Deviance

             0     0      5409.289
             1     0      5358.879
             2     0      5334.834
             3     0      5329.666
             4     0      5329.506
             5     0      5329.502
             6     0      5329.502
             7     0      5329.502

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

     lung is used for cases
    py10k is used for person years


                            Parameter Summary Table

 # Name                          Estimate     Std.Err.   Test Stat.  P value
-- ----------------------------  ----------  ---------  ----------  --------
Log-linear term 0
 1 sex_1.....................          3.405     0.05583       60.99     < 0.001
 2 sex_2.....................          1.998     0.06452       30.97     < 0.001
 3 naga......................         0.1223     0.06385       1.916      0.0554
 4 nic * hiro................       -0.02615     0.06731     -0.3885       > 0.5
 5 nic * naga................      -0.005008      0.1146    -0.04372       > 0.5
 6 sex_1 * lage70............          6.549      0.5978       10.95     < 0.001
 7 sex_2 * lage70............          6.253       0.686       9.115     < 0.001
 8 sex_1 * lage70sq..........         -2.803        1.65      -1.698      0.0894
 9 sex_2 * lage70sq..........         -0.1571       1.601    -0.09816       > 0.5
10 sex_1 * lage70qsp........          -10.92       4.815      -2.267      0.0234
11 sex_2 * lage70qsp........          -7.209       4.946      -1.458       0.145
12 sex_1 * e30..............         -0.1159     0.03209       -3.61     < 0.001
13 sex_2 * e30..............         -0.1290     0.04706      -2.742     0.00611
14 sex_1 * e30sq............       -0.03564     0.01463      -2.436      0.0149
15 sex_2 * e30sq............       -0.01303      0.0193     -0.6751         0.5

Linear term 1
16 luna02w10................          7.550       1.677       4.502     < 0.001

Log-linear term 1
17 e30......................         0.01109      0.1413     0.07847       > 0.5
18 lage70...................          4.257      0.9382       4.537     < 0.001

Linear product term 1
19 %CON.....................          1.000     Aliased
20 msex.....................         0.2102       0.212      0.9912       0.322

            Records used        25570

                Deviance      5329.502
```

Pearson Chi2 30259.6 Degrees of freedom 25551

! Renal cell tumors (constant ERR only)
cases kidney @
rrisk @
line 1 blaa02w10 @
para 17-18=0 20=0 @
fit @

Iter	Step	Deviance
0	0	3435.865
1	0	1776.474
2	0	1306.432
3	0	1214.037
4	0	1205.429
5	0	1205.186
6	0	1205.185
7	0	1205.185

Piece-wise exponential regression
Product additive excess model { T0 * (1 + T1 + T2 +...) }

kidney is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	1.086	0.1841	5.902	< 0.001
2	sex_2.....	-0.1582	0.1886	-0.8389	0.402
3	naga.....	-0.1604	0.2021	-0.7937	0.427
4	nic * hiro.....	-0.2070	0.2154	-0.9611	0.337
5	nic * naga.....	-0.05322	0.3961	-0.1344	> 0.5
6	sex_1 * lage70.....	8.413	1.702	4.942	< 0.001
7	sex_2 * lage70.....	3.581	1.664	2.152	0.0314
8	sex_1 * lage70sq.....	2.274	2.643	0.8606	0.389
9	sex_2 * lage70sq.....	-1.775	2.939	-0.6039	> 0.5
10	sex_1 * lage70qsp.....	-44.96	16.24	-2.769	0.00562
11	sex_2 * lage70qsp.....	-1.891	13.46	-0.1405	> 0.5
12	sex_1 * e30.....	-0.2123	0.09776	-2.172	0.0299
13	sex_2 * e30.....	-0.2292	0.1084	-2.116	0.0344
14	sex_1 * e30sq.....	0.04634	0.04368	1.061	0.289
15	sex_2 * e30sq.....	0.03724	0.0468	0.7957	0.426
Linear term 1					
16	blaa02w10.....	0.1499	0.331	0.4529	> 0.5
Log-linear term 1					
17	e30.....	0.000	Fixed	-2.652	0.00801
18	lage70.....	0.000	Fixed	-4.555	< 0.001
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	0.000	Fixed	1.817	0.0692

Records used 25570

Deviance 1205.185
Pearson Chi2 39333.61 Degrees of freedom 25554

! Bladder cancer (ERR and EAR models)
cases bladder @

```
! ERR
rrisk @
line 1 blaa02w10 @
para 17-18 free 20 free @
fit @

          Iter  Step      Deviance

             0     0     2920.136
             1     1     2545.097
             2     1     2477.215
             3     0     2421.334
             4     0     2418.088
             5     0     2418.063
             6     0     2418.062
             7     0     2418.062

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

  bladder is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1.....	2.048	0.1036	19.76	< 0.001
2	sex_2.....	0.4725	0.1317	3.587	< 0.001
3	naga.....	-0.04614	0.121	-0.3812	> 0.5
4	nic * hiro.....	0.1287	0.1229	1.048	0.295
5	nic * naga.....	-0.2290	0.2592	-0.8833	0.377
6	sex_1 * lage70.....	8.358	0.9555	8.747	< 0.001
7	sex_2 * lage70.....	8.459	1.169	7.235	< 0.001
8	sex_1 * lage70sq.....	1.715	1.598	1.073	0.283
9	sex_2 * lage70sq.....	3.946	1.401	2.817	0.00484
10	sex_1 * lage70qsp.....	-18.42	6.971	-2.642	0.00825
11	sex_2 * lage70qsp.....	-26.00	8.056	-3.228	0.00125
12	sex_1 * e30.....	-0.3249	0.0568	-5.72	< 0.001
13	sex_2 * e30.....	-0.1028	0.09838	-1.044	0.296
14	sex_1 * e30sq.....	0.04895	0.02296	2.132	0.033
15	sex_2 * e30sq.....	0.02050	0.03629	0.5649	> 0.5
	Linear term 1				
16	blaa02w10.....	1.235	0.4131	2.991	0.00278
	Log-linear term 1				
17	e30.....	-0.04311	0.2744	-0.1571	> 0.5
18	lage70.....	0.3597	2.284	0.1575	> 0.5
	Linear product term 1				
19	%CON.....	1.000	Aliased		
20	msex.....	0.5044	0.2354	2.142	0.0322

```
           Records used        25570

               Deviance     2418.062
           Pearson Chi2     43098.02      Degrees of freedom   25551



! EAR
add @
fit @

          Iter  Step      Deviance
```

0	0	2444.900
1	0	2429.225
2	0	2421.737
3	0	2420.675
4	0	2420.637
5	0	2420.633
6	0	2420.633
7	0	2420.632

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

bladder is used for cases
py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
Log-linear term 0					
1	sex_1.....	2.053	0.1051	19.53	< 0.001
2	sex_2.....	0.4894	0.1351	3.624	< 0.001
3	naga.....	-0.05523	0.1302	-0.4243	> 0.5
4	nic * hiro.....	0.1193	0.1234	0.9675	0.333
5	nic * naga.....	-0.2293	0.2614	-0.8772	0.38
6	sex_1 * lage70.....	8.450	0.9945	8.496	< 0.001
7	sex_2 * lage70.....	8.439	1.243	6.787	< 0.001
8	sex_1 * lage70sq.....	1.777	1.659	1.071	0.284
9	sex_2 * lage70sq.....	4.020	1.425	2.822	0.00478
10	sex_1 * lage70qsp.....	-18.38	7.237	-2.54	0.0111
11	sex_2 * lage70qsp.....	-26.94	8.891	-3.03	0.00244
12	sex_1 * e30.....	-0.3303	0.05845	-5.651	< 0.001
13	sex_2 * e30.....	-0.1014	0.1035	-0.9791	0.328
14	sex_1 * e30sq.....	0.05079	0.02382	2.132	0.033
15	sex_2 * e30sq.....	0.02137	0.03963	0.5393	> 0.5
Linear term 1					
16	blaa02w10.....	3.229	1.161	2.781	0.00541
Log-linear term 1					
17	e30.....	-0.2133	0.2803	-0.7609	0.447
18	lage70.....	6.348	2.087	3.041	0.00236
Linear product term 1					
19	%CON.....	1.000	Aliased		
20	msex.....	-0.2052	0.3003	-0.6831	0.495

Records used 25570

Deviance 2420.632
Pearson Chi2 43306.14 Degrees of freedom 25551

! CNS tumors (constant ERR only)
cases cnsca @
rrisk @
line 1 braa02w10 @
para 17-18=0 20=0 @
fit @

Iter	Step	Deviance
0	0	2280.898
1	1	2091.661
2	0	1898.413
3	0	1857.006
4	0	1853.975

```
            5     0     1853.942
            6     0     1853.942

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

    cnsca is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1.....	0.3190	0.2043	1.561	0.118
2	sex_2.....	0.6138	0.1313	4.675	< 0.001
3	naga.....	-0.2231	0.1496	-1.491	0.136
4	nic * hiro.....	-0.6373	0.1954	-3.261	0.00111
5	nic * naga.....	-0.4845	0.3778	-1.283	0.2
6	sex_1 * lage70.....	3.661	1.204	3.041	0.00236
7	sex_2 * lage70.....	3.203	0.916	3.496	< 0.001
8	sex_1 * lage70sq.....	0.9203	1.033	0.8909	0.373
9	sex_2 * lage70sq.....	-0.2900	1.147	-0.2529	> 0.5
10	sex_1 * lage70qsp.....	1.034	10.72	0.09637	> 0.5
11	sex_2 * lage70qsp.....	-13.09	8.721	-1.501	0.133
12	sex_1 * e30.....	-0.2701	0.09322	-2.897	0.00376
13	sex_2 * e30.....	-0.1591	0.06556	-2.427	0.0152
14	sex_1 * e30sq.....	0.1020	0.03654	2.792	0.00523
15	sex_2 * e30sq.....	0.09293	0.02662	3.491	< 0.001
	Linear term 1				
16	braa02w10.....	0.6192	0.2806	2.207	0.0273
	Log-linear term 1				
17	e30.....	0.000	Fixed	-1.662	0.0965
18	lage70.....	0.000	Fixed	-2.755	0.00587
	Linear product term 1				
19	%CON.....	1.000	Aliased		
20	msex.....	0.000	Fixed	-2.387	0.017

```
           Records used        25570

               Deviance     1853.942
           Pearson Chi2     26840.85      Degrees of freedom   25554



! Other sites (ERR and EAR models)
cases msother @
! ERR
rrisk @
line 1 cola02w10 @
para 17-18 free 20 free @
fit @

         Iter  Step      Deviance

            0     0     5092.035
            1     1     4025.414
            2     0     3915.430
            3     0     3858.022
            4     0     3852.605
            5     0     3852.139
            6     0     3852.131
            7     0     3852.131

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }
```

```
  msother is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	sex_1	2.146	0.09424	22.77	< 0.001
2	sex_2	1.441	0.08511	16.93	< 0.001
3	naga	0.1801	0.08387	2.148	0.0317
4	nic * hiro	-0.08642	0.09978	-0.866	0.386
5	nic * naga	-0.3513	0.1888	-1.861	0.0628
6	sex_1 * lage70	4.559	0.6307	7.229	< 0.001
7	sex_2 * lage70	4.862	0.6191	7.853	< 0.001
8	sex_1 * lage70sq	1.030	0.7565	1.361	0.173
9	sex_2 * lage70sq	1.387	0.8841	1.568	0.117
10	sex_1 * lage70qsp	-7.544	5.215	-1.446	0.148
11	sex_2 * lage70qsp	-11.82	4.942	-2.393	0.0167
12	sex_1 * e30	0.02184	0.04872	0.4483	> 0.5
13	sex_2 * e30	0.07316	0.05628	1.3	0.194
14	sex_1 * e30sq	-0.01855	0.02008	-0.9237	0.356
15	sex_2 * e30sq	-0.02897	0.02251	-1.287	0.198
	Linear term 1				
16	cola02w10	0.9120	0.2556	3.567	< 0.001
	Log-linear term 1				
17	e30	-0.3021	0.2106	-1.434	0.152
18	lage70	-0.7693	1.056	-0.7282	0.466
	Linear product term 1				
19	%CON	1.000	Aliased		
20	msex	0.1799	0.2146	0.8381	0.402

```
           Records used        25570

               Deviance     3852.131
           Pearson Chi2     26974.77      Degrees of freedom   25551



! EAR
add @
fit @

         Iter  Step      Deviance

            0     0     3882.867
            1     0     3861.711
            2     0     3854.935
            3     0     3852.898
            4     0     3852.768
            5     0     3852.764
            6     0     3852.764

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

  msother is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				

```
 1 sex_1.....................          2.124      0.09741       21.81     < 0.001
 2 sex_2.....................          1.448      0.08722        16.6     < 0.001
 3 naga......................         0.2040      0.09048       2.255      0.0241
 4 nic * hiro................        -0.07886       0.1008     -0.7824       0.434
 5 nic * naga................         -0.3664       0.1898      -1.931      0.0535
 6 sex_1 * lage70............          4.374       0.6887       6.352     < 0.001
 7 sex_2 * lage70............          4.741       0.7096       6.681     < 0.001
 8 sex_1 * lage70sq..........         0.8215       0.8715      0.9426       0.346
 9 sex_2 * lage70sq..........          1.024        1.179      0.8685       0.385
10 sex_1 * lage70qsp........         -6.169        5.533      -1.115       0.265
11 sex_2 * lage70qsp........         -11.05        5.541      -1.993      0.0462
12 sex_1 * e30..............        0.02316      0.05039      0.4597       > 0.5
13 sex_2 * e30..............        0.08366      0.05935        1.41       0.159
14 sex_1 * e30sq............        -0.01824      0.02108     -0.8652       0.387
15 sex_2 * e30sq............        -0.03658      0.02446      -1.496       0.135

Linear term 1
16 cola02w10................          5.043        1.39       3.628     < 0.001

Log-linear term 1
17 e30......................         -0.2195      0.1865      -1.177       0.239
18 lage70...................          2.858      0.9794       2.918     0.00352

Linear product term 1
19 %CON.....................          1.000     Aliased
20 msex.....................         -0.2082      0.1913      -1.088       0.277

            Records used        25570

                Deviance     3852.764
            Pearson Chi2     28251.37      Degrees of freedom   25551



! Gender-specific cancers
select sex == 2 @

13212 records to be used


tran lage50preqsp = log(age/50)^2*(age<50) @

pline 1 @
logl 0 %con naga nic*hiro nic*naga
         lage50preqsp lage70:4 lage70sq lage70qsp
       e30 e30sq
@

! Breast cancer (ERR and EAR models)
cases breast @
! ERR
rrisk @
line 1 brea02w10 @
para 11-13 free @
fit @

          Iter  Step      Deviance

             0     0     7420.326
             1     2     6077.227
             2     2     5285.075
             3     1     3529.146
             4     0     3324.773
             5     0     3295.462
             6     0     3295.243
             7     0     3295.243

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }
```

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Using sex == 2

   breast is used for cases
    py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	%CON.....	2.087	0.06667	31.3	< 0.001
2	naga.....	-0.1667	0.07833	-2.129	0.0333
3	lage50preqsp.....	-10.85	2.938	-3.694	< 0.001
4	lage70.....	2.492	0.6405	3.891	< 0.001
5	lage70sq.....	2.045	1.543	1.325	0.185
6	lage70qsp.....	-0.9628	5.628	-0.1711	> 0.5
7	e30.....	-0.3883	0.03647	-10.65	< 0.001
8	e30sq.....	-0.01374	0.01482	-0.9268	0.354
9	nic * hiro.....	-0.05127	0.08855	-0.5791	> 0.5
10	nic * naga.....	0.05893	0.162	0.3638	> 0.5
	Linear term 1				
11	brea02w10.....	0.8781	0.2073	4.236	< 0.001
	Log-linear term 1				
12	e30.....	0.004822	0.1364	0.03534	> 0.5
13	lage70.....	-2.222	0.7031	-3.161	0.00157

Records used 13212

Deviance 3295.243
Pearson Chi2 12441.13 Degrees of freedom 13199

! EAR
add @
fit @

Iter	Step	Deviance
0	0	3404.605
1	0	3357.559
2	1	3325.954
3	0	3308.966
4	0	3307.142
5	0	3307.120
6	0	3307.119
7	0	3307.119

Piece-wise exponential regression
Additive model { T0 + T1 + T2 +... }

Using sex == 2

   breast is used for cases
    py10k is used for person years

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	%CON.....	2.076	0.06996	29.67	< 0.001
2	naga.....	-0.2033	0.09014	-2.255	0.0241
3	lage50preqsp.....	-13.29	3.825	-3.474	< 0.001
4	lage70.....	2.504	0.7129	3.512	< 0.001
5	lage70sq.....	2.658	1.785	1.489	0.137

```
 6 lage70qsp.............          -2.292        6.24     -0.3672      > 0.5
 7 e30...................         -0.3796     0.03722       -10.2    < 0.001
 8 e30sq.................        -0.01266     0.01604     -0.7894       0.43
 9 nic * hiro............        -0.05912     0.08923     -0.6626      > 0.5
10 nic * naga............         0.08586      0.1654      0.5191      > 0.5

Linear term 1
11 brea02w10.............          9.257       1.578       5.865    < 0.001

Log-linear term 1
12 e30...................         -0.4543      0.1209      -3.758    < 0.001
13 lage70................          1.725       0.4526       3.811    < 0.001

           Records used        13212

               Deviance     3307.119
           Pearson Chi2     12054.35      Degrees of freedom   13199



! Cancer of the uterus (constant ERR only)
cases uterus @
rrisk @
logl 0 %con naga nic*hiro nic*naga
        lage70:4 lage70sq lage70qsp
      e30 e30sq
@
line 1 utea02w10 @
para 11-12=0 @
fit @

          Iter  Step      Deviance

             0     0     7434.810
             1     2     6143.080
             2     1     3325.354
             3     0     3168.407
             4     0     3156.145
             5     0     3156.062
             6     0     3156.062

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

Using sex == 2

   uterus is used for cases
    py10k is used for person years


                          Parameter Summary Table

 # Name                          Estimate     Std.Err.  Test Stat.  P value
-- ----------------------------  ----------  ---------  ----------  --------
Log-linear term 0
 1 %CON...................          2.071     0.06487       31.93    < 0.001
 2 naga...................         -0.1369     0.07701      -1.778     0.0754
 3 lage70.................         -1.700      0.3696        -4.6    < 0.001
 4 lage70sq...............         -3.462      0.5012      -6.907    < 0.001
 5 lage70qsp..............          4.490       3.908       1.149      0.251
 6 e30....................         0.2214     0.02815       7.867    < 0.001
 7 e30sq..................        -0.01480     0.01275      -1.161      0.246
 8 nic * hiro.............        0.008768     0.07804      0.1123      > 0.5
 9 nic * naga.............         0.08998      0.1507      0.5971      > 0.5

Linear term 1
10 utea02w10.............          0.1013      0.1335      0.7591      0.448

Log-linear term 1
11 e30...................           0.000       Fixed      -1.291      0.197
```

```
12 lage70..................          0.000       Fixed      0.6636      > 0.5

           Records used        13212

               Deviance     3156.062
           Pearson Chi2     13472.48      Degrees of freedom   13202



! Ovarian cancer (constant ERR only)
cases ovary @
rrisk @
line 1 ovaa02w10 @
para 11-12=0 @
fit @

          Iter  Step      Deviance

             0     0     2410.104
             1     0     1524.688
             2     0     1332.740
             3     0     1310.197
             4     0     1309.464
             5     0     1309.463
             6     0     1309.463

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

Using sex == 2

    ovary is used for cases
    py10k is used for person years


                            Parameter Summary Table

 # Name                          Estimate     Std.Err.   Test Stat.  P value
-- ----------------------------  ----------  ---------  ----------  --------
Log-linear term 0
 1 %CON.....................        0.6641      0.1297       5.121    < 0.001
 2 naga.....................        0.1296      0.1567      0.8273      0.408
 3 lage70...................        0.9092      0.8349       1.089      0.276
 4 lage70sq.................        -2.604       1.255      -2.075      0.038
 5 lage70qsp................         4.515       7.442      0.6068      > 0.5
 6 e30......................      -0.04018     0.05896     -0.6815      0.496
 7 e30sq....................       0.02052     0.02572      0.7979      0.425
 8 nic * hiro...............      -0.02539      0.1805     -0.1407      > 0.5
 9 nic * naga...............      -0.04452      0.3181     -0.1399      > 0.5

Linear term 1
10 ovaa02w10................        0.6137      0.3868       1.587      0.113

Log-linear term 1
11 e30......................          0.000       Fixed      0.1086      > 0.5
12 lage70...................          0.000       Fixed     -0.3702      > 0.5

           Records used        13212

               Deviance     1309.463
           Pearson Chi2     8661.708      Degrees of freedom   13202



! Prostate cancer (onstant ERR only)
select sex == 1 @

12358 records to be used

cases prost @
```

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```
rrisk @
line 1 blaa02w10 @
para 11-12=0 @
fit @

          Iter  Step      Deviance

             0     0     2410.007
             1     1     1670.051
             2     0     1521.784
             3     0     1469.844
             4     0     1460.328
             5     0     1456.950
             6     0     1454.851
             7     0     1454.579
             8     0     1454.575
             9     0     1454.575

Piece-wise exponential regression
Product additive excess model { T0 * ( 1 + T1 + T2 +...) }

Using sex == 1

    prost is used for cases
    py10k is used for person years
```

Parameter Summary Table

#	Name	Estimate	Std.Err.	Test Stat.	P value
	Log-linear term 0				
1	%CON.....	2.347	0.09773	24.02	< 0.001
2	naga.....	-0.2213	0.1433	-1.544	0.123
3	lage70.....	12.37	1.319	9.38	< 0.001
4	lage70sq.....	-8.314	6.889	-1.207	0.227
5	lage70qsp.....	-12.40	11.29	-1.098	0.272
6	e30.....	-0.3604	0.06586	-5.473	< 0.001
7	e30sq.....	0.05387	0.02408	2.237	0.0253
8	nic * hiro.....	0.008704	0.1312	0.06634	> 0.5
9	nic * naga.....	0.1552	0.249	0.6231	> 0.5
	Linear term 1				
10	blaa02w10.....	0.1216	0.2168	0.5609	> 0.5
	Log-linear term 1				
11	e30.....	0.000	Fixed	-0.9974	0.319
12	lage70.....	0.000	Fixed	-1.055	0.291

```
           Records used        12358

               Deviance     1454.575
           Pearson Chi2     12955.34      Degrees of freedom   12348
```