

ANFIT log file for primary models

The following is the contents of a log file that contains detailed output from the AMFIT module of Epicure with information on the fits of the primary models for most of the outcomes considered in the paper. It includes information on variable definitions, parameter estimates and Wald-type standard errors. (N.B. Parameter tests and confidence intervals were based on likelihood ratio tests. The Wald test P-values shown in the log file can be different from, and inferior to the results of likelihood ratio tests.)

```

nomodel @
USE lsshempy10-03.BSF

BSF File created by EPICURE on March 26, 2010 3:21:08 pm

INPUT @

Input from n:\leuk2010mar\newdata\lsshempy10-03.BSF

          38578 records read          38578 records used
                                0 records rejected

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

select mar_ad10 >= 0 @

36841 records to be used

tran nic = gdist > 12000;
    over4gy = 1 - un4gy ;
    yob = year-age;

    bcohort = (yob-1915)/10;
    bcsq = bcohort*bcohort;

    e30 = (agex - 30)/10 ;

    tsx = (age -agex) ;
    tsx25 = (tsx-25)/10 ;
    ltsx25 = log(tsx/25) ;  ltsx25sq = ltsx25^2 ;
    tsx40 = (tsx - 40) / 10;
    ltsx40 = log(tsx/40);  ltsx40sq = ltsx40^2;

    lage70 = log(age/70) ;  lage70sq = lage70^2 ;
    lage55 = log(age/55) ;
    lage40 = log(age/40);  lage40sq = lage40^2;
    lage40qsp = lage40sq*(age < 40);
    lage70qsp = lage70sq*(age > 70) ;

    py10k = pyr/10000 ;

    male = sex == 1 ; female = sex == 2;
    msex = 2*sex - 3 ;

    adult = (agex >= 20);
    adultf = adult * female;

    dosegy=mar_ad10/1000;
    dosegysq=dosegy*dosegy*1.12;

    hiro = city == 1 ; naga = city ==2;

@
pyr py10k @

```

```
! Total Leukemia other than CLL and ATL @
cases noncll @
sum noncll @
```

```
Using mar_ad10 >= 0
```

```
Summary for noncll
```

Sum	Count	Minimum	Maximum
312	36841	0	2

```

!ERR model @
rrisk @
logl 0 nic*city female naga bcohort bcsq lage70 lage70sq @
line 1 dosegy dosegysq @
logl 1 lage70 ltsx40 over4gy@
fit @

```

Iter	Step	Deviance
0	0	2801.170
1	0	2469.191
2	0	2429.584
3	0	2406.819
4	0	2403.979
5	0	2403.896
6	0	2403.895
7	0	2403.895

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

Using mar_ad10 >= 0

nonc11 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.....	0.8341	0.1293	6.452	< 0.001
2 female.....	-0.6846	0.1155	-5.93	< 0.001
3 naga.....	-0.4242	0.1522	-2.787	0.00531
4 bcohort.....	0.07655	0.05793	1.321	0.186
5 bcsq.....	-0.08420	0.0243	-3.465	< 0.001
6 lage70.....	3.318	0.3627	9.147	< 0.001
7 lage70sq.....	1.264	0.2251	5.612	< 0.001
8 city_1 * nic.....	-0.3453	0.1934	-1.785	0.0743
9 city_2 * nic.....	0.1759	0.3355	0.5244	> 0.5
Linear term 1				
10 dosegy.....	0.7899	0.4674	1.69	0.091
11 dosegysq.....	0.9501	0.3514	2.704	0.00685
Log-linear term 1				
12 lage70.....	-1.090	0.4441	-2.455	0.0141
13 ltsx40.....	-0.8075	0.2591	-3.117	0.00183
14 over4gy.....	-0.7394	0.411	-1.799	0.072

Records used 36841
Deviance 2403.895
Pearson Chi2 55402.32
Degrees of freedom 36827

```

! EAR model @
add @
logl 0 nic*city female naga bcohort bcsq lage70 lage70sq @
line 1 dosegy dosegysq @
logl 1 e30 lage70 naga female over4gy@
fit @

```

Iter	Step	Deviance
0	0	2801.170
1	0	2478.113
2	0	2410.534
3	0	2401.766
4	0	2401.228
5	0	2401.217
6	0	2401.217

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

Using mar_ad10 >= 0

nonc11 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.....	0.9657	0.1416	6.819	< 0.001
2 female.....	-0.8118	0.1463	-5.55	< 0.001
3 naga.....	-0.3026	0.1923	-1.574	0.116
4 bcohort.....	0.09914	0.06279	1.579	0.114
5 bcsq.....	-0.1232	0.03321	-3.711	< 0.001
6 lage70.....	3.580	0.4392	8.151	< 0.001
7 lage70sq.....	1.463	0.3267	4.477	< 0.001
8 city_1 * nic.....	-0.3293	0.1956	-1.683	0.0923
9 city_2 * nic.....	0.06326	0.345	0.1834	> 0.5
Linear term 1				
10 dosegy.....	1.059	0.5494	1.927	0.0539
11 dosegysq.....	1.086	0.4181	2.598	0.00939
Log-linear term 1				
12 e30.....	0.4118	0.1077	3.823	< 0.001
13 lage70.....	-1.447	0.3343	-4.329	< 0.001
14 naga.....	-0.6470	0.3187	-2.03	0.0424
15 female.....	-0.4210	0.2347	-1.794	0.0729
16 over4gy.....	-0.7913	0.4293	-1.843	0.0653

Records used	36841
Deviance	2401.217
Pearson Chi2	53655.53
Degrees of freedom	36825

```
! AML @  
nomodel @
```

```
cases amltot @  
sum amltot @
```

```
Using mar_ad10 >= 0
```

```
Summary for amltot
```

Sum	Count	Minimum	Maximum
176	36841	0	1

```

!ERR model @
rrisk @
logl 0 nic*city female bcohort bcsq lage70 lage70sq female*lage70
female*lage70sq @
line 1 dosegysq @
logl 1 e30 e30sq lage70 over4gy@
fit @

```

Iter	Step	Deviance
0	0	1866.658
1	0	1604.470
2	1	1572.797
3	0	1528.272
4	0	1522.562
5	0	1522.156
6	0	1522.145
7	0	1522.145
8	0	1522.144

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

Using mar_ad10 >= 0

amltot 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.....	0.6216	0.1597	3.893	< 0.001
2 female.....	-0.9146	0.1701	-5.376	< 0.001
3 bcohort.....	0.1727	0.08006	2.157	0.031
4 bcsq.....	-0.1801	0.04617	-3.901	< 0.001
5 lage70.....	4.214	0.6134	6.871	< 0.001
6 lage70sq.....	1.581	0.4229	3.739	< 0.001
7 female * lage70.....	-1.009	0.7645	-1.319	0.187
8 female * lage70sq.....	-0.1699	0.5144	-0.3303	> 0.5
9 city_1 * nic.....	-0.3341	0.2402	-1.391	0.164
10 city_2 * nic.....	-0.2016	0.3916	-0.5149	> 0.5
Linear term 1				
11 dosegysq.....	1.109	0.3873	2.864	0.00418
Log-linear term 1				
12 e30.....	0.1651	0.1664	0.9919	0.321
13 e30sq.....	0.2509	0.07601	3.301	< 0.001
14 lage70.....	-0.8938	0.6886	-1.298	0.194
15 over4gy.....	-1.618	0.7975	-2.029	0.0424

Records used 36841
Deviance 1522.144

```

                Pearson Chi2      49217.68
                Degrees of freedom  36826
! EAR model @
add @
logl 0 nic*city female bcohort bcsq lage70 lage70sq female*lage70
female*lage70sq @
line 1 dosegysq @
logl 1 lage70 lage70sq over4gy@
fit @

```

Iter	Step	Deviance
0	0	1866.658
1	0	1605.826
2	0	1536.983
3	0	1523.573
4	0	1522.014
5	0	1521.945
6	0	1521.945
7	0	1521.945

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

Using mar_ad10 >= 0

amltot 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.....	0.6780	0.1637	4.141	< 0.001
2 female.....	-1.057	0.1924	-5.492	< 0.001
3 bcohort.....	0.1660	0.07942	2.09	0.0366
4 bcsq.....	-0.1742	0.04541	-3.837	< 0.001
5 lage70.....	3.975	0.7602	5.229	< 0.001
6 lage70sq.....	1.243	0.7517	1.653	0.0983
7 female * lage70.....	-0.3141	0.9561	-0.3285	> 0.5
8 female * lage70sq.....	0.5880	0.8702	0.6757	0.499
9 city_1 * nic.....	-0.3293	0.2403	-1.37	0.171
10 city_2 * nic.....	-0.2008	0.3916	-0.5126	> 0.5
Linear term 1				
11 dosegysq.....	1.587	0.3846	4.127	< 0.001
Log-linear term 1				
12 lage70.....	2.585	0.8568	3.017	0.00255
13 lage70sq.....	1.426	0.4765	2.993	0.00276
14 over4gy.....	-1.450	0.7418	-1.955	0.0505
Records used	36841			
Deviance	1521.945			

Pearson Chi2 60818.3
Degrees of freedom 36827

```
! ALL @  
nomodel @  
cases alltot @  
sum alltot @
```

Using mar_ad10 >= 0

Summary for alltot

Sum	Count	Minimum	Maximum
43	36841	0	1

```
!ERR model @
rrisk @
logl 0 nic*city lage70 @
line 1 dosegy @
logl 1 female lage70 over4gy@
fit @
```

Iter	Step	Deviance
0	0	1025.721
1	0	648.989
2	1	589.801
3	0	502.814
4	0	483.809
5	0	480.646
6	0	480.428
7	0	480.427
8	0	480.427

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

Using mar_ad10 >= 0

alltot 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.....	-2.334	0.2982	-7.827	< 0.001
2 lage70.....	1.700	0.8163	2.083	0.0372
3 city_1 * nic.....	-0.01965	0.5708	-0.03443	> 0.5
4 city_2 * nic.....	-0.1337	1.039	-0.1287	> 0.5
Linear term 1				
5 dosegy.....	2.398	1.552	1.546	0.122
Log-linear term 1				
6 female.....	-0.9221	0.491	-1.878	0.0604
7 lage70.....	-3.511	0.8948	-3.923	< 0.001
8 over4gy.....	0.9380	0.5749	1.632	0.103

Records used	36841
Deviance	480.427
Pearson Chi2	22258.2
Degrees of freedom	36833

```

! EAR model @
add @
logl 0 nic*city lage70 @
line 1 dosegy @
logl 1 female lage70 over4gy@
fit @

```

Iter	Step	Deviance
0	0	1025.721
1	0	662.694
2	0	515.210
3	0	485.972
4	0	480.927
5	0	480.431
6	0	480.427
7	0	480.427

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

Using mar_ad10 >= 0

alltot 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.....	-2.334	0.2982	-7.827	< 0.001
2 lage70.....	1.700	0.8162	2.083	0.0373
3 city_1 * nic.....	-0.01973	0.5708	-0.03457	> 0.5
4 city_2 * nic.....	-0.1338	1.039	-0.1288	> 0.5
Linear term 1				
5 dosegy.....	0.2323	0.1224	1.898	0.0577
Log-linear term 1				
6 female.....	-0.9221	0.491	-1.878	0.0604
7 lage70.....	-1.810	0.3775	-4.795	< 0.001
8 over4gy.....	0.9381	0.5749	1.632	0.103

Records used	36841			
Deviance	480.427			
Pearson Chi2	22258.6			
Degrees of freedom	36833			

```
! CML @
nomodel @
cases cml @
sum cml @
```

Using mar_ad10 >= 0

Summary for cml

Sum	Count	Minimum	Maximum
75	36841	0	1

```
!ERR model @
rrisk @
logl 0 nic*city female lage70 female*lage70 @
line 1 dosegy @
logl 1 naga ltsx25 lage55 over4gy@
fit @
```

Iter	Step	Deviance
0	0	1222.097
1	0	906.334
2	1	849.426
3	0	775.289
4	0	757.396
5	0	754.536
6	0	754.454
7	0	754.454

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

Using mar_ad10 >= 0

cml 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.....	-1.512	0.2952	-5.121	< 0.001
2 female.....	-0.05945	0.2994	-0.1985	> 0.5
3 lage70.....	1.383	0.6999	1.976	0.0482
4 female * lage70.....	1.753	0.6741	2.601	0.0093
5 city_1 * nic.....	-0.1898	0.4256	-0.446	> 0.5
6 city_2 * nic.....	-0.8395	1.02	-0.8232	0.41
Linear term 1				
7 dosegy.....	5.240	2.404	2.18	0.0293
Log-linear term 1				
8 naga.....	-1.499	0.7872	-1.905	0.0568
9 ltsx25.....	-1.592	0.3629	-4.388	< 0.001
10 lage55.....	-1.416	0.7779	-1.82	0.0687
11 over4gy.....	-0.3006	0.7508	-0.4003	> 0.5

Records used 36841
Deviance 754.454
Pearson Chi2 86984.5
Degrees of freedom 36830

```

! EAR model @
add @
logl 0 nic*city female lage70 female*lage70 @
line 1 dosegy @
logl 1 female naga ltsx25 lage55 female*lage55 over4gy@
fit @

```

Iter	Step	Deviance
0	0	1222.097
1	0	912.306
2	0	903.391
3	0	777.453
4	0	757.322
5	0	753.905
6	0	753.704
7	0	753.703
8	0	753.703

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

Using mar_ad10 >= 0

cml 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.....	-1.367	0.3138	-4.356	< 0.001
2 female.....	-0.2774	0.3816	-0.7269	0.467
3 lage70.....	1.595	0.8054	1.98	0.0477
4 female * lage70.....	1.375	1.273	1.08	0.28
5 city_1 * nic.....	-0.1963	0.4253	-0.4616	> 0.5
6 city_2 * nic.....	-0.8590	1.02	-0.8425	0.4
Linear term 1				
7 dosegy.....	0.6804	0.3108	2.189	0.0286
Log-linear term 1				
8 female.....	-0.1786	0.4633	-0.3856	> 0.5
9 naga.....	-1.487	0.7921	-1.878	0.0604
10 ltsx25.....	-1.626	0.3668	-4.432	< 0.001
11 lage55.....	-0.2000	0.4183	-0.4781	> 0.5
12 over4gy.....	-0.2632	0.7525	-0.3497	> 0.5
13 female * lage55.....	2.297	1	2.296	0.0217

Records used	36841
Deviance	753.703
Pearson Chi2	78213.4
Degrees of freedom	36828

```
! ATL @
nomodel @
select dosegy >=0 and city == 2 @
```

16906 records to be used

```
cases atl @
sum atl @
```

Using dosegy >=0 and city == 2

Summary for atl

Sum	Count	Minimum	Maximum
42	16906	0	2

```
!Baseline rate
rrisk @
logl 0 nic bcohort lage70 @
fit @
```

Iter	Step	Deviance
0	0	469.948
1	0	407.733
2	0	384.990
3	0	377.236
4	0	376.132
5	0	376.105
6	0	376.105

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

Using dosegy >=0 and city == 2

atl 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.....	-0.03068	0.179	-0.1714	> 0.5
2 nic.....	-0.5829	0.4766	-1.223	0.221
3 bcohort.....	0.2938	0.12	2.448	0.0144
4 lage70.....	4.065	0.8025	5.065	< 0.001

Records used	16906
Deviance	376.105
Pearson Chi2	7952.64
Degrees of freedom	16902

Adult T-cell Leukemia (ATL) (Nagasaki baseline only)


```
! NHL @  
nomodel @  
noselect @
```

38578 records to be used

```
select dosegy >=0 @
```

36841 records to be used

```
cases nhl @  
sum nhl @
```

Using dosegy >=0

Summary for nhl

Sum	Count	Minimum	Maximum
402	36841	0	4

```

!ERR model @
rrisk @
logl 0 nic*city female bcohort bcsq lage70 lage70sq lage40qsp lage70qsp@
line 1 dosegy*sex @
para 12=0 @
logl 1 lage40 @
fit @

```

Iter	Step	Deviance
0	0	2806.176
1	1	2563.613
2	0	2399.351
3	0	2360.281
4	0	2354.957
5	0	2353.135
<i><omitted lines></i>		
12	0	2351.236
13	0	2351.236

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

Using dosegy >=0

nhl 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.....	1.433	0.1044	13.73	< 0.001
2	female.....	-0.5427	0.1032	-5.258	< 0.001
3	bcohort.....	0.3090	0.04251	7.27	< 0.001
4	bcsq.....	-0.05382	0.02155	-2.497	0.0125
5	lage70.....	6.848	0.7623	8.983	< 0.001
6	lage70sq.....	4.698	1.404	3.347	< 0.001
7	lage40qsp.....	-10.55	4.892	-2.157	0.031
8	lage70qsp.....	-18.51	6.274	-2.95	0.00318
9	city_1 * nic.....	-0.1060	0.1304	-0.8133	0.416
10	city_2 * nic.....	-0.2400	0.2429	-0.9879	0.323
Linear term 1					
11	sex_1 * dosegy.....	0.09953	0.2411	0.4128	> 0.5
12	sex_2 * dosegy.....	0.000	Fixed	-0.02045	> 0.5
Log-linear term 1					
13	lage40.....	-10.69	5.467	-1.955	0.0506
	Records used	36841			
	Deviance	2351.236			
	Pearson Chi2	44194.16			
	Degrees of freedom	36829			

```

! EAR model @
add @
logl 0 nic*city female bcohort bcsq lage70 lage70sq lage40qsp lage70qsp@
line 1 dosegy*sex @
para 12=0 @
logl 1 @
fit @

```

Iter	Step	Deviance
0	0	2806.176
1	1	2564.500
2	0	2400.881
3	0	2361.281
4	0	2357.075
5	0	2356.021
6	0	2355.667
7	0	2355.591
8	0	2355.580
9	0	2355.579
10	0	2355.579

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

Using dosegy >=0

nhl 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.....	1.410	0.1072	13.15	< 0.001
2 female.....	-0.5191	0.1053	-4.928	< 0.001
3 bcohort.....	0.3077	0.04318	7.126	< 0.001
4 bcsq.....	-0.05398	0.022	-2.453	0.0142
5 lage70.....	6.669	0.7704	8.657	< 0.001
6 lage70sq.....	4.051	1.396	2.902	0.00371
7 lage40qsp.....	-6.017	3.913	-1.538	0.124
8 lage70qsp.....	-17.04	6.292	-2.709	0.00675
9 city_1 * nic.....	-0.09261	0.1309	-0.7073	0.479
10 city_2 * nic.....	-0.2253	0.2433	-0.9261	0.354
Linear term 1				
11 sex_1 * dosegy.....	0.5432	0.3052	1.78	0.0751
12 sex_2 * dosegy.....	0.000	Fixed	-0.05316	> 0.5

Records used	36841
Deviance	2355.579
Pearson Chi2	45115.94
Degrees of freedom	36830

```
! HL @
nomodel @
cases hl @
sum hl @
```

Using dosegy >=0

Summary for hl

Sum	Count	Minimum	Maximum
35	36841	0	2

```
!ERR & EAR model @
risk @
```

```
No reference vector specified risk not computed
logl 0 nic*city female bcohort lage70 @
fit @
```

Iter	Step	Deviance
0	0	889.816
1	0	518.060
2	0	405.000
3	0	375.221
4	0	369.785
5	0	369.413
6	0	369.409
7	0	369.409

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

Using dosegy >=0

```
hl 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.....	-1.811	0.3277	-5.527	< 0.001
2 female.....	-0.8477	0.3431	-2.471	0.0135
3 bcohort.....	-0.3840	0.1313	-2.924	0.00346
4 lage70.....	0.6598	0.7086	0.9312	0.352
5 city_1 * nic.....	0.3365	0.409	0.8227	0.411
6 city_2 * nic.....	0.6225	0.614	1.014	0.311

```
Records used      36841
Deviance          369.409
Pearson Chi2      17667.6
Degrees of freedom 36835
```

```
!Multiple Myeloma @
nomodel @
cases mye @
pyr py10k @
```

```
sum mye @
```

```
Using dosegy >=0
```

```
Summary for mye
```

Sum	Count	Minimum	Maximum
136	36841	0	3

!ERR & EAR model @

logl 0 nic*city bcohort bcsq lage70 lage70sq lage70qsp@
fit @

Iter	Step	Deviance
0	0	1450.509
1	0	1171.428
2	0	1073.112
3	0	1042.953
4	0	1037.182
5	0	1036.385
6	0	1036.178
7	0	1036.137
8	0	1036.135
9	0	1036.135

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

Using dosegy >=0

mye 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.....	0.2871	0.1336	2.149	0.0316
2 bcohort.....	0.1620	0.08051	2.012	0.0442
3 bcsq.....	-0.1201	0.04392	-2.734	0.00625
4 lage70.....	7.751	1.042	7.438	< 0.001
5 lage70sq.....	2.540	1.417	1.793	0.073
6 lage70qsp.....	-25.58	8.898	-2.874	0.00405
7 city_1 * nic.....	-0.1149	0.2227	-0.5158	> 0.5
8 city_2 * nic.....	-0.1928	0.4203	-0.4587	> 0.5

Records used 36841
Deviance 1036.135
Pearson Chi2 60414.47
Degrees of freedom 36833