

```

name: <unnamed>
log: /Users/Chiara/Documents/fileDO 15 Maggio/Kinetics Hematological .smcl
log type: smcl
opened on: 19 May 2020, 16:47:16

1 . do "/Users/Chiara/Documents/fileDO 15 Maggio/analisi_coorte_wide_multilevel_4.do"

2 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDo\coorte_long_emocromo_anemia0.dta", clear

3 . ***** etichette
4 .
5 . replace death=0 if death==99 /* censura dei ricoveray */
   (506 real changes made)

6 . gen death_30=death

7 . gen death_time=a_data_esito-a_data_sintomi if death_30==1
   (9,438 missing values generated)

8 .
9 . replace death_30=0 if death_time>=30
   (286 real changes made)

10 . replace a_data_ricovero=a_data_test if a_data_ricovero<a_data_sintomi
    (242 real changes made)

11 . *gen inizio=mdy(02,29,2020)
12 . *gen giorno_x=a_data_ricovero-inizio
13 . *recode giorno_x -199/0=0 1/7=1 8/14=2 15/21=3 22/28=4 29/2000=99, into(settimana)
14 . tab settimana, mi

      RECODE of
      giorno_x |
      +-----+
      0         | 132      1.24      1.24
      1         | 1,496    14.02     15.26
      2         | 2,024    18.97     34.23
      3         | 3,234    30.31     64.54
      4         | 2,310    21.65     86.19
      99        | 1,474    13.81     100.00
      +-----+
      Total     | 10,670   100.00

15 . drop if a_data_ricovero>=mdy(03,29,2020)
    (1,474 observations deleted)

16 . tab settimana, mi

      RECODE of
      giorno_x |
      +-----+
      0         | 132      1.44      1.44
      1         | 1,496    16.27     17.70
      2         | 2,024    22.01     39.71
      3         | 3,234    35.17     74.88
      4         | 2,310    25.12     100.00
      +-----+
      Total     | 9,196    100.00

17 . keep if dropping==0
    (660 observations deleted)

18 . tab settimana

      RECODE of
      giorno_x |
      +-----+
      0         | 132      1.55      1.55
      1         | 1,364    15.98     17.53
      2         | 1,980    23.20     40.72
      3         | 2,992    35.05     75.77
      4         | 2,068    24.23     100.00
      +-----+
      Total     | 8,536    100.00

19 . recode p_age 0/59=0 60/700=1, into(p_age2)
    (8536 differences between p_age and p_age2)

20 . tab death_30

      death_30 |
      +-----+
      0         | 7,612    89.18     89.18
      1         | 924      10.82     100.00
      +-----+
      Total     | 8,536    100.00

21 .
22 . label define death_30 1 "nonsurvivor" 0 "survivor"

23 . label values death_30 death_30

24 . label variable b_day_malattia "Days since onset"

25 .
26 . save "/Users/Chiara/Documents/fileDO 15 Maggio/fileDo\coorte_long_emocromo_anemia_1.dta", replace
    file /Users/Chiara/Documents/fileDO 15 Maggio/fileDo\coorte_long_emocromo_anemia_1.dta saved

27 .
28 .
29 . *****
30 . *** analisi leucociti *****
31 . *****
32 . **** scatter no model
33 . *use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDo\coorte_long_emocromo_anemia_1.dta", clear
34 . *scatter wbc b_day_malattia if death_30==1, mcolor(red) legend(off) title("WBC variation over time") xtitle("day
    > since onset") ytitle("WBC per mmc X 1000") || scatter wbc b_day_malattia if death_30==0, mcolor(green) legend(off)

```

```

> ) ms(oh)
35 . *keep if wbc!=.
36 . *sort a data_test
37 . *collapse (first) wbc (first) death (first) b_day_malattia, by(progr)
38 .
39 .
40 .
41 . **** modelling
42 . *use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear
43 . *mixed wbc_ln c.b_day_malattia##i.death_30 i.p_age2 i.p_obeso i.p_rene i.p_cardio || progr:b_day_malattia, cov(uns
> tr)
44 . *est store linear
45 . *mixed wbc_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_obeso i.p_rene i.p_cardio || progr:b_da
> y_malattia, cov(unstr)
46 . *est store quadratic
47 . *lrtest linear quadratic
48 . ***** plotting and estimates
49 . *quiet: mixed wbc_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_obeso i.p_rene i.p_cardio || pro
> gr:b_day_malattia, cov(unstr)
50 .
51 . * death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb))) asbal
52 . *marginsplot, title("WBC kinetic day 0 to day 30 after onset") ytitle("Cells per mmc (log-scale)")
53 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb))) asbal
54 . *margins, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb))) contrast
55 . *margins, at(b_day_malattia=(0(1)30) death==0) expression(exp(predict(xb))) contrast
56 .
57 .
58 . *****
59 . *** analisi neutrofili *****
60 . *****
61 . **** scatter no model
62 . use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear

63 . *scatter neu b_day_malattia if death==1, mcolor(red) legend(off) title("Neutrophils variation over time") xtitle(
> "day since onset") ytitle("Neutrophils per mmc X 1000")xlab(0(5)30) || scatter neu b_day_malattia if death==0, mc
> olor(green) legend(off) ms(oh)
64 . *****Graph box
65 . replace neu=neu*1000
(1,805 real changes made)

66 . graph box neu, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitle
> (Cells per mmc) yline(500, lcolor(red)) legend(off)

67 . graph save "Graph" "/Users/Chiara/Documents/fileD0 15 Maggio/BOX neu .gph", replace
(file /Users/Chiara/Documents/fileD0 15 Maggio/BOX neu .gph saved)

68 . **** modelling
69 . use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear

70 . mixed neu_ln c.b_day_malattia##i.death_30 i.p_age2 i.p_obeso i.p_rene|| progr:b_day_malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

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Iteration 0: log likelihood = -1197.7645
Iteration 1: log likelihood = -1197.7498
Iteration 2: log likelihood = -1197.7498

```

Computing standard errors:

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Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups =    379

                                         Obs per group:
                                             min =         1
                                             avg =        4.8
                                             max =        22

                                         Wald chi2(6)    =   120.65
Log likelihood = -1197.7498              Prob > chi2    =    0.0000

```

neu_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	.026355	.0037435	7.04	0.000	.0190179	.0336921
death_30 nonsurvivor	-.0692439	.1417194	-0.49	0.625	-.3470088	.208521
death_30#c.b_day_malattia nonsurvivor	.0442918	.0110632	4.00	0.000	.0226084	.0659752
1.p_age2	.1332044	.0559794	2.38	0.017	.0234869	.2429219
1.p_obeso	.1115497	.1115481	1.00	0.317	-.1070805	.33018
1.p_rene	.0614802	.127466	0.48	0.630	-.1883485	.3113089
_cons	8.035981	.0590407	136.11	0.000	7.920263	8.151698

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0020646	.000305	.0015456	.0027579
var(_cons)	.4650455	.0565429	.3664388	.5901866
cov(b_day_malattia,_cons)	-.0225641	.0038667	-.0301428	-.0149854
var(Residual)	.1239949	.0050842	.1144201	.1343711

LR test vs. linear model: chi2(3) = 1078.06 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

```
71 . est store linear
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```
72 . mixed neu_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day
> _malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-1188.5729**
 Iteration 1: log likelihood = **-1188.5576**
 Iteration 2: log likelihood = **-1188.5576**

Computing standard errors:

Mixed-effects ML regression Number of obs = **1,805**
 Group variable: **progr** Number of groups = **379**

Obs per group:
 min = **1**
 avg = **4.8**
 max = **22**

Wald chi2(9) = **137.27**
 Log likelihood = **-1188.5576** Prob > chi2 = **0.0000**

	neu_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	.0674394	.0106074	6.36	0.000	.0466493	.0882295
	c.b_day_malattia#c.b_day_malattia	-.001686	.0004058	-4.16	0.000	-.0024813	-.0008907
	death_30 nonsurvivor	.2550166	.1800781	1.42	0.157	-.0979301	.6079633
	death_30#c.b_day_malattia nonsurvivor	-.0224537	.0269067	-0.83	0.404	-.0751899	.0302825
	death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0028729	.0011111	2.59	0.010	.0006951	.0050507
	l.p_age2	.1306073	.0591056	2.21	0.027	.0147625	.2464522
	l.p_cardio	.0168001	.0632414	0.27	0.791	-.1071507	.1407509
	l.p_obeso	.107481	.11163	0.96	0.336	-.1113099	.3262718
	l.p_rene	.0578037	.1291291	0.45	0.654	-.1952846	.310892
	_cons	7.814722	.0796682	98.09	0.000	7.658575	7.970868

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0021292	.0003116	.0015983	.0028365
var(_cons)	.4650909	.0567559	.3661542	.5907607
cov(b_day_malattia,_cons)	-.0229141	.0039075	-.0305726	-.0152555
var(Residual)	.1218045	.0050145	.1123623	.1320402

LR test vs. linear model: chi2(3) = **1089.99** Prob > chi2 = **0.0000**

Note: LR test is conservative and provided only for reference.

73 . est store quadratic

74 . lrtest linear quadratic

Likelihood-ratio test LR chi2(3) = **18.38**
 (Assumption: linear nested in quadratic) Prob > chi2 = **0.0004**

75 . **** margins

76 . quiet: mixed neu_ln c.b_day_malattia#i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr
 > r:b_day_malattia, cov(unstr)

77 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions Number of obs = **1,805**

Expression : **exp(predict(xb))**

```

1._at      : b_day_mala-a =      0
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

2._at      : b_day_mala-a =      1
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

3._at      : b_day_mala-a =      2
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

4._at      : b_day_mala-a =      3
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

5._at      : b_day_mala-a =      4
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)

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```

        p_rene                                (asbalanced)

6._at      : b_day_mala-a = 5
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

7._at      : b_day_mala-a = 6
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

8._at      : b_day_mala-a = 7
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

9._at      : b_day_mala-a = 8
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

10._at     : b_day_mala-a = 9
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

11._at     : b_day_mala-a = 10
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

12._at     : b_day_mala-a = 11
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

13._at     : b_day_mala-a = 12
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

14._at     : b_day_mala-a = 13
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

15._at     : b_day_mala-a = 14
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

16._at     : b_day_mala-a = 15
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

17._at     : b_day_mala-a = 16
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

18._at     : b_day_mala-a = 17
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

19._at     : b_day_mala-a = 18
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

20._at     : b_day_mala-a = 19
             death_30      (asbalanced)
             p_age2         (asbalanced)
             p_cardio       (asbalanced)
             p_obeso        (asbalanced)
             p_rene         (asbalanced)

21._at     : b_day_mala-a = 20

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      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at      : b_day_mala-a      =      21
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	2895.947	315.9751	9.17	0.000	2276.648	3515.247
1#nonsurvivor	3737.171	637.8243	5.86	0.000	2487.058	4987.284
2#survivor	3092.766	319.527	9.68	0.000	2466.504	3719.027
2#nonsurvivor	3913.772	599.8806	6.52	0.000	2738.027	5089.516
3#survivor	3291.842	324.3425	10.15	0.000	2656.142	3927.541
3#nonsurvivor	4108.458	569.5686	7.21	0.000	2992.124	5224.792
4#survivor	3491.937	330.6288	10.56	0.000	2843.917	4139.958
4#nonsurvivor	4323.079	547.9801	7.89	0.000	3249.058	5397.101
5#survivor	3691.726	338.4798	10.91	0.000	3028.318	4355.135
5#nonsurvivor	4559.723	536.1051	8.51	0.000	3508.976	5610.469
6#survivor	3889.808	347.8639	11.18	0.000	3208.007	4571.609
6#nonsurvivor	4820.75	534.6489	9.02	0.000	3772.857	5868.642
7#survivor	4084.721	358.6288	11.39	0.000	3381.821	4787.62
7#nonsurvivor	5108.832	543.8963	9.39	0.000	4042.815	6174.849
8#survivor	4274.961	370.5211	11.54	0.000	3548.753	5001.169
8#nonsurvivor	5426.997	563.7055	9.63	0.000	4322.155	6531.84
9#survivor	4459	383.217	11.64	0.000	3707.909	5210.092
9#nonsurvivor	5778.678	593.6558	9.73	0.000	4615.134	6942.222
10#survivor	4635.306	396.359	11.69	0.000	3858.457	5412.156
10#nonsurvivor	6167.771	633.305	9.74	0.000	4926.516	7409.026
11#survivor	4802.363	409.5925	11.72	0.000	3999.576	5605.149
11#nonsurvivor	6598.709	682.4841	9.67	0.000	5261.064	7936.353
12#survivor	4958.691	422.601	11.73	0.000	4130.408	5786.973
12#nonsurvivor	7076.533	741.5821	9.54	0.000	5623.059	8530.007
13#survivor	5102.872	435.1362	11.73	0.000	4250.021	5955.723
13#nonsurvivor	7606.994	811.8171	9.37	0.000	6015.862	9198.126
14#survivor	5233.568	447.0432	11.71	0.000	4357.38	6109.757
14#nonsurvivor	8196.652	895.5072	9.15	0.000	6441.49	9951.814
15#survivor	5349.543	458.2804	11.67	0.000	4451.33	6247.756
15#nonsurvivor	8853.008	996.3517	8.89	0.000	6900.194	10805.82
16#survivor	5449.681	468.9322	11.62	0.000	4530.591	6368.771
16#nonsurvivor	9584.646	1119.711	8.56	0.000	7390.053	11779.24
17#survivor	5533.005	479.2139	11.55	0.000	4593.763	6472.247
17#nonsurvivor	10401.41	1272.861	8.17	0.000	7906.648	12896.17
18#survivor	5598.692	489.4664	11.44	0.000	4639.355	6558.028
18#nonsurvivor	11314.6	1465.197	7.72	0.000	8442.869	14186.34
19#survivor	5646.088	500.1386	11.29	0.000	4665.834	6626.342
19#nonsurvivor	12337.22	1708.388	7.22	0.000	8988.841	15685.6
20#survivor	5674.718	511.7552	11.09	0.000	4671.697	6677.74
20#nonsurvivor	13484.23	2016.536	6.69	0.000	9531.893	17436.57
21#survivor	5684.294	524.8707	10.83	0.000	4655.567	6713.022
21#nonsurvivor	14772.91	2406.426	6.14	0.000	10056.4	19489.42
22#survivor	5674.719	540.0129	10.51	0.000	4616.313	6733.125
22#nonsurvivor	16223.21	2897.934	5.60	0.000	10543.36	21903.05

```

78 . marginsplot, ytitle("Cells per mmc") xlab(0(1)21) yline(500, lcolor(red)) title ("") legend(off)

```

```

      Variables that uniquely identify margins: b_day_malattia death_30

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```

79 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

```

```

Contrasts of adjusted predictions      Number of obs      =      1,805

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```

Expression      : exp(predict(xb))

```

```

1._at      : b_day_mala-a      =      0
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

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```

2._at      : b_day_mala-a      =      1
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

```

3._at      : b_day_mala-a      =      2
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

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4._at      : b_day_mala-a      =      3
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

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```

5._at      : b_day_mala-a      =      4
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

6._at	:	b_day_mala-a	=	5	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
7._at	:	b_day_mala-a	=	6	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
8._at	:	b_day_mala-a	=	7	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
9._at	:	b_day_mala-a	=	8	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
10._at	:	b_day_mala-a	=	9	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
11._at	:	b_day_mala-a	=	10	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
12._at	:	b_day_mala-a	=	11	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
13._at	:	b_day_mala-a	=	12	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
14._at	:	b_day_mala-a	=	13	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
15._at	:	b_day_mala-a	=	14	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
16._at	:	b_day_mala-a	=	15	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
17._at	:	b_day_mala-a	=	16	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
18._at	:	b_day_mala-a	=	17	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
19._at	:	b_day_mala-a	=	18	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
20._at	:	b_day_mala-a	=	19	
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
21._at	:	b_day_mala-a	=	20	
		death_30			(asbalanced)

```

p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

```

```

22._at : b_day_mala-a = 21
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	1.71	0.1908
(nonsurvivor vs survivor) 2	1	1.88	0.1701
(nonsurvivor vs survivor) 3	1	2.13	0.1449
(nonsurvivor vs survivor) 4	1	2.46	0.1167
(nonsurvivor vs survivor) 5	1	2.91	0.0878
(nonsurvivor vs survivor) 6	1	3.50	0.0612
(nonsurvivor vs survivor) 7	1	4.24	0.0394
(nonsurvivor vs survivor) 8	1	5.14	0.0234
(nonsurvivor vs survivor) 9	1	6.19	0.0128
(nonsurvivor vs survivor) 10	1	7.42	0.0065
(nonsurvivor vs survivor) 11	1	8.81	0.0030
(nonsurvivor vs survivor) 12	1	10.36	0.0013
(nonsurvivor vs survivor) 13	1	12.02	0.0005
(nonsurvivor vs survivor) 14	1	13.70	0.0002
(nonsurvivor vs survivor) 15	1	15.25	0.0001
(nonsurvivor vs survivor) 16	1	16.52	0.0000
(nonsurvivor vs survivor) 17	1	17.34	0.0000
(nonsurvivor vs survivor) 18	1	17.61	0.0000
(nonsurvivor vs survivor) 19	1	17.32	0.0000
(nonsurvivor vs survivor) 20	1	16.54	0.0000
(nonsurvivor vs survivor) 21	1	15.40	0.0001
(nonsurvivor vs survivor) 22	1	14.05	0.0002
Joint	6	161.15	0.0000

	Delta-method			
	Contrast	Std. Err.	[95% Conf. Interval]	
death_30@_at				
(nonsurvivor vs survivor) 1	841.2236	643.0631	-419.157	2101.604
(nonsurvivor vs survivor) 2	821.0059	598.3877	-351.8125	1993.824
(nonsurvivor vs survivor) 3	816.6166	560.1934	-281.3422	1914.575
(nonsurvivor vs survivor) 4	831.1421	529.7621	-207.1726	1869.457
(nonsurvivor vs survivor) 5	867.9964	508.4221	-128.4925	1864.485
(nonsurvivor vs survivor) 6	930.9419	497.3304	-43.80777	1905.692
(nonsurvivor vs survivor) 7	1024.112	497.2321	49.55461	1998.668
(nonsurvivor vs survivor) 8	1152.036	508.3174	155.7526	2148.32
(nonsurvivor vs survivor) 9	1319.677	530.289	280.33	2359.025
(nonsurvivor vs survivor) 10	1532.465	562.6437	429.7035	2635.226
(nonsurvivor vs survivor) 11	1796.346	605.0691	610.4325	2982.26
(nonsurvivor vs survivor) 12	2117.843	657.8449	828.4903	3407.195
(nonsurvivor vs survivor) 13	2504.122	722.1985	1088.639	3919.605
(nonsurvivor vs survivor) 14	2963.084	800.6131	1393.911	4532.257
(nonsurvivor vs survivor) 15	3503.464	897.0964	1745.188	5261.741
(nonsurvivor vs survivor) 16	4134.965	1017.401	2140.896	6129.035
(nonsurvivor vs survivor) 17	4868.406	1169.179	2576.857	7159.955
(nonsurvivor vs survivor) 18	5715.911	1362.073	3046.298	8385.524
(nonsurvivor vs survivor) 19	6691.131	1607.788	3539.924	9842.338
(nonsurvivor vs survivor) 20	7809.513	1920.24	4045.912	11573.11
(nonsurvivor vs survivor) 21	9088.613	2315.847	4549.637	13627.59
(nonsurvivor vs survivor) 22	10548.49	2814.037	5033.076	16063.9

```

80 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_NEU.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_NEU.gph saved)

81 . ***combine*****
82 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_NEU.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX n
    > eu .gph", ycomm xsize(8) ysize(4)

83 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_NEU.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_NEU.gph saved)

84 .
85 .
86 . *****
87 . *** analisi Lymphocytes *****
88 . *****
89 . **** scatter no model
90 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

91 . *scatter lym b_day_malattia if death_30==1, mcolor(red) legend(off) title("Lymphocytes variation over time") xtit
    > le("day since onset") ytitle("Cells per mmc X 1000") xlab(0(5)30)|| scatter lym b_day_malattia if death_30==0, mc
    > olor(green) legend(off) ms(oh)
92 . *keep if lym!=.
93 . *****Graph box*****
94 . replace lym=lym*1000
    (1,805 real changes made)

95 . graph box lym, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitle
    > (Cells per mmc) yline(200, lcolor(red)) legend(off)

96 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_LYM.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_LYM.gph saved)

97 .
98 . **** modelling
99 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

100 . mixed lym ln c.b_day_malattia##1.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day_malattia, cov(unst
    > r)

```

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-1068.4684**
 Iteration 1: log likelihood = **-1068.451**
 Iteration 2: log likelihood = **-1068.451**

Computing standard errors:

Mixed-effects ML regression
 Group variable: **progr**

Number of obs = **1,805**
 Number of groups = **379**

Obs per group:
 min = **1**
 avg = **4.8**
 max = **22**

Wald chi2(7) = **103.79**
 Prob > chi2 = **0.0000**

Log likelihood = **-1068.451**

lym_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	.0156949	.0030565	5.13	0.000	.0097043	.0216854
death_30 nonsurvivor	-.1994586	.1093057	-1.82	0.068	-.4136939	.0147766
death_30#c.b_day_malattia nonsurvivor	-.0293182	.0090334	-3.25	0.001	-.0470234	-.011613
1.p_age2	-.2179975	.0536462	-4.06	0.000	-.3231422	-.1128528
1.p_cardio	.0118107	.057423	0.21	0.837	-.1007363	.1243577
1.p_obeso	-.0057988	.1010762	-0.06	0.954	-.2039045	.1923069
1.p_rene	-.2148718	.1154012	-1.86	0.063	-.441054	.0113104
_cons	6.908192	.0489655	141.08	0.000	6.812222	7.004163

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0010352	.0001846	.0007298	.0014684
var(_cons)	.2167147	.0315218	.1629591	.2882027
cov(b_day_malattia,_cons)	-.0071685	.0020917	-.0112683	-.0030688
var(Residual)	.115312	.0046531	.1065433	.1248023

LR test vs. linear model: chi2(3) = **1070.45** Prob > chi2 = **0.0000**

Note: LR test is conservative and provided only for reference.

101 . est store linear

102 . mixed lym_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day
 > _malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **-1002.984**
 Iteration 1: log likelihood = **-1002.959**
 Iteration 2: log likelihood = **-1002.959**

Computing standard errors:

Mixed-effects ML regression
 Group variable: **progr**

Number of obs = **1,805**
 Number of groups = **379**

Obs per group:
 min = **1**
 avg = **4.8**
 max = **22**

Wald chi2(9) = **246.54**
 Prob > chi2 = **0.0000**

Log likelihood = **-1002.959**

lym_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0774067	.0091223	-8.49	0.000	-.095286	-.0595274
c.b_day_malattia#c.b_day_malattia	.0038736	.0003553	10.90	0.000	.0031772	.00457
death_30 nonsurvivor	-.2860727	.1407578	-2.03	0.042	-.5619529	-.0101925
death_30#c.b_day_malattia nonsurvivor	-.0281842	.0233644	-1.21	0.228	-.0739777	.0176093
death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0002729	.0009716	0.28	0.779	-.0016315	.0021773
1.p_age2	-.2218182	.0523814	-4.23	0.000	-.3244839	-.1191526
1.p_cardio	.0097151	.0560636	0.17	0.862	-.1001675	.1195977
1.p_obeso	.0367953	.0987614	0.37	0.709	-.1567735	.2303642
1.p_rene	-.2177771	.1119601	-1.95	0.052	-.4372149	.0016607
_cons	7.387266	.0647979	114.00	0.000	7.260265	7.514268

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0011768	.0001991	.0008446	.0016397

var(_cons)	.1916417	.0284008	.1433323	.2562335
cov(b_day_malattia,_cons)	-.006868	.0020182	-.0108237	-.0029123
var(Residual)	.104534	.0042586	.0965119	.1132229

LR test vs. linear model: chi2(3) = **1160.20** Prob > chi2 = **0.0000**

Note: LR test is conservative and provided only for reference.

103 . est store quadratic

104 . lrtest linear quadratic

Likelihood-ratio test LR chi2(2) = **130.98**
 (Assumption: linear nested in quadratic) Prob > chi2 = **0.0000**

105 . ****margins****

106 . quiet: mixed lym ln c.b_day_malattia#c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || prog
 > r:b_day_malattia, cov(unstr)

107 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions Number of obs = **1,805**

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = **0**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

2._at : b_day_mala-a = **1**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

3._at : b_day_mala-a = **2**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

4._at : b_day_mala-a = **3**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

5._at : b_day_mala-a = **4**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

6._at : b_day_mala-a = **5**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

7._at : b_day_mala-a = **6**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

8._at : b_day_mala-a = **7**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

9._at : b_day_mala-a = **8**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

10._at : b_day_mala-a = **9**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

11._at : b_day_mala-a = **10**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

12._at : b_day_mala-a = **11**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)

```

      p_rene                                (asbalanced)

13._at   : b_day_mala-a = 12
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

14._at   : b_day_mala-a = 13
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

15._at   : b_day_mala-a = 14
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

16._at   : b_day_mala-a = 15
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

17._at   : b_day_mala-a = 16
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

18._at   : b_day_mala-a = 17
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

19._at   : b_day_mala-a = 18
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

20._at   : b_day_mala-a = 19
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

21._at   : b_day_mala-a = 20
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

22._at   : b_day_mala-a = 21
          death_30                (asbalanced)
          p_age2                  (asbalanced)
          p_cardio                (asbalanced)
          p_obeso                 (asbalanced)
          p_rene                  (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	1327.064	121.8415	10.89	0.000	1088.259	1565.869
1#nonsurvivor	996.9008	134.1	7.43	0.000	734.0696	1259.732
2#survivor	1232.982	107.4015	11.48	0.000	1022.479	1443.485
2#nonsurvivor	900.7312	107.7332	8.36	0.000	689.578	1111.884
3#survivor	1154.48	96.18505	12.00	0.000	965.9605	1342.999
3#nonsurvivor	820.6163	88.17468	9.31	0.000	647.7971	993.4355
4#survivor	1089.383	87.54858	12.44	0.000	917.7906	1260.975
4#nonsurvivor	753.853	73.97559	10.19	0.000	608.8635	898.8425
5#survivor	1035.951	80.97907	12.79	0.000	877.2349	1194.667
5#nonsurvivor	698.2884	63.97407	10.92	0.000	572.9015	823.6753
6#survivor	992.8017	76.0687	13.05	0.000	843.7098	1141.894
6#nonsurvivor	652.2057	57.2013	11.40	0.000	540.0932	764.3182
7#survivor	958.8494	72.49614	13.23	0.000	816.7595	1100.939
7#nonsurvivor	614.2371	52.83886	11.62	0.000	510.6748	717.7993
8#survivor	933.2604	70.01245	13.33	0.000	796.0385	1070.482
8#nonsurvivor	583.2961	50.21647	11.62	0.000	484.8736	681.7186
9#survivor	915.4189	68.4298	13.38	0.000	781.299	1049.539
9#nonsurvivor	558.5264	48.82146	11.44	0.000	462.8381	654.2147
10#survivor	904.9019	67.61215	13.38	0.000	772.3845	1037.419
10#nonsurvivor	539.2623	48.29581	11.17	0.000	444.6042	633.9203
11#survivor	901.4625	67.46781	13.36	0.000	769.228	1033.697
11#nonsurvivor	524.9984	48.41708	10.84	0.000	430.1027	619.8941
12#survivor	905.0206	67.94383	13.32	0.000	771.8531	1038.188
12#nonsurvivor	515.3681	49.07239	10.50	0.000	419.188	611.5482
13#survivor	915.659	69.0224	13.27	0.000	780.3776	1050.94
13#nonsurvivor	510.1275	50.2349	10.15	0.000	411.6689	608.5861
14#survivor	933.6277	70.71949	13.20	0.000	795.02	1072.235
14#nonsurvivor	509.1451	51.94742	9.80	0.000	407.33	610.9602
15#survivor	959.3525	73.08598	13.13	0.000	816.1066	1102.598
15#nonsurvivor	512.3963	54.31339	9.43	0.000	405.944	618.8486
16#survivor	993.4529	76.21138	13.04	0.000	844.0813	1142.824

16#nonsurvivor	519.9626	57.49391	9.04	0.000	407.2766	632.6486
17#survivor	1036.766	80.23053	12.92	0.000	879.5175	1194.015
17#nonsurvivor	532.0345	61.70902	8.62	0.000	411.0871	652.982
18#survivor	1090.383	85.33365	12.78	0.000	923.1324	1257.634
18#nonsurvivor	548.9201	67.24221	8.16	0.000	417.1278	680.7124
19#survivor	1155.692	91.7802	12.59	0.000	975.8058	1335.578
19#nonsurvivor	571.0579	74.44802	7.67	0.000	425.1424	716.9733
20#survivor	1234.438	99.9172	12.35	0.000	1038.604	1430.272
20#nonsurvivor	599.0357	83.76392	7.15	0.000	434.8615	763.21
21#survivor	1328.805	110.203	12.06	0.000	1112.811	1544.799
21#nonsurvivor	633.6172	95.72881	6.62	0.000	445.9922	821.2422
22#survivor	1441.511	123.2375	11.70	0.000	1199.97	1683.052
22#nonsurvivor	675.7761	111.0108	6.09	0.000	458.1989	893.3532

```
108 . marginsplot, ytitle("Cells per mmc") xlab(0(1)21) ylab(0(1000)3000) yline(200, lcolor(red)) title("") legend(off)
```

```
Variables that uniquely identify margins: b_day_malattia death_30
```

```
109 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal
```

```
Contrasts of adjusted predictions          Number of obs      =      1,805
```

```
Expression   : exp(predict(xb))
```

```
1._at        : b_day_mala-a =      0
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
2._at        : b_day_mala-a =      1
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
3._at        : b_day_mala-a =      2
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
4._at        : b_day_mala-a =      3
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
5._at        : b_day_mala-a =      4
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
6._at        : b_day_mala-a =      5
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
7._at        : b_day_mala-a =      6
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
8._at        : b_day_mala-a =      7
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
9._at        : b_day_mala-a =      8
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
10._at       : b_day_mala-a =      9
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
11._at       : b_day_mala-a =     10
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```
12._at       : b_day_mala-a =     11
               death_30      (asbalanced)
               p_age2         (asbalanced)
               p_cardio       (asbalanced)
               p_obeso        (asbalanced)
               p_rene         (asbalanced)
```

```

13._at      : b_day_mala-a =      12
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

14._at      : b_day_mala-a =      13
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

15._at      : b_day_mala-a =      14
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

16._at      : b_day_mala-a =      15
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

17._at      : b_day_mala-a =      16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =      17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =      18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =      19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =      20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =      21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

		df	chi2	P>chi2
death_30@_at				
(nonsurvivor vs survivor)	1	1	4.55	0.0329
(nonsurvivor vs survivor)	2	1	7.02	0.0081
(nonsurvivor vs survivor)	3	1	10.38	0.0013
(nonsurvivor vs survivor)	4	1	14.61	0.0001
(nonsurvivor vs survivor)	5	1	19.37	0.0000
(nonsurvivor vs survivor)	6	1	24.13	0.0000
(nonsurvivor vs survivor)	7	1	28.33	0.0000
(nonsurvivor vs survivor)	8	1	31.67	0.0000
(nonsurvivor vs survivor)	9	1	34.12	0.0000
(nonsurvivor vs survivor)	10	1	35.88	0.0000
(nonsurvivor vs survivor)	11	1	37.13	0.0000
(nonsurvivor vs survivor)	12	1	38.04	0.0000
(nonsurvivor vs survivor)	13	1	38.70	0.0000
(nonsurvivor vs survivor)	14	1	39.11	0.0000
(nonsurvivor vs survivor)	15	1	39.25	0.0000
(nonsurvivor vs survivor)	16	1	39.03	0.0000
(nonsurvivor vs survivor)	17	1	38.36	0.0000
(nonsurvivor vs survivor)	18	1	37.19	0.0000
(nonsurvivor vs survivor)	19	1	35.49	0.0000
(nonsurvivor vs survivor)	20	1	33.29	0.0000
(nonsurvivor vs survivor)	21	1	30.70	0.0000
(nonsurvivor vs survivor)	22	1	27.87	0.0000
Joint		5	40.30	0.0000

		Delta-method		
		Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at				
(nonsurvivor vs survivor)	1	-330.1628	154.7546	-633.4764 -26.84931
(nonsurvivor vs survivor)	2	-332.2508	125.4147	-578.0591 -86.4425
(nonsurvivor vs survivor)	3	-333.8635	103.6061	-536.9277 -130.7993

```
(nonsurvivor vs survivor) 4      -335.5297    87.78817      -507.5914      -163.4681
(nonsurvivor vs survivor) 5      -337.6626    76.71533      -488.0219      -187.3033
(nonsurvivor vs survivor) 6      -340.596     69.33495       -476.49       -204.7019
(nonsurvivor vs survivor) 7      -344.6123    64.74366       -471.5075       -217.717
(nonsurvivor vs survivor) 8      -349.9643    62.19066       -471.8558       -228.0729
(nonsurvivor vs survivor) 9      -356.8925    61.09448       -476.6354       -237.1495
(nonsurvivor vs survivor) 10     -365.6396    61.0446       -485.2848       -245.9944
(nonsurvivor vs survivor) 11     -376.4641    61.78297       -497.5565       -255.3717
(nonsurvivor vs survivor) 12     -389.6524    63.17631       -513.4757       -265.8292
(nonsurvivor vs survivor) 13     -405.5315    65.19049       -533.3026       -277.7605
(nonsurvivor vs survivor) 14     -424.4826    67.87286       -557.5109       -291.4542
(nonsurvivor vs survivor) 15     -446.9562    71.34326       -586.7864       -307.1259
(nonsurvivor vs survivor) 16     -473.4903    75.79296       -622.0418       -324.9388
(nonsurvivor vs survivor) 17     -504.7319    81.48962       -664.4487       -345.0152
(nonsurvivor vs survivor) 18     -541.4631    88.78721       -715.4829       -367.4434
(nonsurvivor vs survivor) 19     -584.6338    98.14034       -776.9853       -392.2822
(nonsurvivor vs survivor) 20     -635.4025   110.1238       -851.2412       -419.5638
(nonsurvivor vs survivor) 21     -695.188    125.4596       -941.0843       -449.2917
(nonsurvivor vs survivor) 22     -765.7346   145.0545      -1050.036       -481.433

110 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_LYM.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_LYM.gph saved)

111 .
112 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
113 . *marginsplot, title("Lymphocytes kinetic day 0 to day 30 after onset") ytitle("Cells per mmc (log-scale)") xlab(0(
    > 5)30) ylab(0(250)2500, angle(horizontal)) yline(800, lcolor(green)) yline(500, lcolor(orange)) yline(200, lcolor(r
    > ed)) legend(off)
114 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
115 .
116 . ***combine****
117 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_LYM.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_L
    > YM.gph", ycomm xsize(8) ysize(4)

118 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_LYM.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_LYM.gph saved)

119 .
120 .
121 . *****
122 . *** analisi Monocytes *****
123 . *****
124 . **** scatter no model
125 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

126 . *scatter mono b_day_malattia if death_30==1, mcolor(red) legend(off) title("Monocytes variation over time") xtitl
    > e("day since onset") ytitle("Cells per mmc X 1000") xlab(0(5)30)|| scatter mono b_day_malattia if death_30==0, mc
    > olor(green) legend(off) ms(oh)
127 .
128 . *****Graph box*****
129 . replace mono=mono*1000
    (1,805 real changes made)

130 . graph box mono, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitl
    > e("Cells per mmc") yline(100, lcolor(red)) legend(off)

131 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_MONO.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_MONO.gph saved)

132 .
133 . **** modelling
134 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

135 . mixed mono ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -1234.8149
Iteration 1: log likelihood = -1234.808
Iteration 2: log likelihood = -1234.808

Computing standard errors:

Mixed-effects ML regression                                Number of obs   =    1,805
Group variable: progr                                Number of groups =     379

Obs per group:
    min =         1
    avg =         4.8
    max =        22

Wald chi2(3) = 131.44
Prob > chi2 = 0.0000

Log likelihood = -1234.808
```

mono_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	.0338711	.003426	9.89	0.000	.0271563	.040586
death_30 nonsurvivor	-.2782923	.1340952	-2.08	0.038	-.5411141	-.0154705
death_30#c.b_day_malattia nonsurvivor	-.0015475	.0097598	-0.16	0.874	-.0206764	.0175815
_cons	5.782126	.0502506	115.07	0.000	5.683637	5.880616

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0014032	.0002267	.0010224	.0019259
var(_cons)	.4201148	.0537424	.3269487	.5398291
cov(b_day_malattia,_cons)	-.0196816	.0032793	-.0261089	-.0132542

var(Residual)	.1478748	.005912	.1367298	.1599283
LR test vs. linear model: chi2(3) = 695.19	Prob > chi2 = 0.0000			

Note: LR test is conservative and provided only for reference.

136 . est store linear

137 . mixed mono_ln c.b_day_malattia#c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day
> _malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = -1214.9499
Iteration 1: log likelihood = -1214.9415
Iteration 2: log likelihood = -1214.9415

Computing standard errors:

Mixed-effects ML regression
Group variable: **progr**

Number of obs = 1,805
Number of groups = 379

Obs per group:
min = 1
avg = 4.8
max = 22

Wald chi2(9) = 181.99
Prob > chi2 = 0.0000

Log likelihood = -1214.9415

	mono_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	-.0175094	.0108672	-1.61	0.107	-.0388086	.0037899
	c.b_day_malattia#c.b_day_malattia	.0021106	.0004208	5.02	0.000	.0012857	.0029354
	death_30 nonsurvivor	-.1891192	.1752773	-1.08	0.281	-.5326564	.1544181
	death_30#c.b_day_malattia nonsurvivor	-.016233	.0275329	-0.59	0.555	-.0701965	.0377305
	death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0008249	.0011461	0.72	0.472	-.0014214	.0030712
	1.p_age2	-.1042496	.0501716	-2.08	0.038	-.2025841	-.005915
	1.p_cardio	-.0082546	.0533906	-0.15	0.877	-.1128982	.096389
	1.p_obeso	-.0116325	.0938326	-0.12	0.901	-.195541	.1722761
	1.p_rene	-.1855588	.1085617	-1.71	0.087	-.3983357	.0272182
	_cons	6.11702	.07747	78.96	0.000	5.965181	6.268858

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr : Unstructured				
var(b_day_malattia)	.0012124	.0002085	.0008654	.0016984
var(_cons)	.3662504	.0493641	.2812233	.4769853
cov(b_day_malattia,_cons)	-.0165163	.0030029	-.0224018	-.0106308
var(Residual)	.1466274	.0058517	.1355953	.158557

LR test vs. linear model: chi2(3) = 691.78 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

138 . est store quadratic

139 . lrtest linear quadratic

Likelihood-ratio test LR chi2(6) = 39.73
(Assumption: linear nested in quadratic) Prob > chi2 = 0.0000

140 . ****margins****

141 . quiet: mixed mono_ln c.b_day_malattia#c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day_malattia, cov(unstr)

142 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions Number of obs = 1,805

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = 0 (asbalanced)
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

2._at : b_day_mala-a = 1 (asbalanced)
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

3._at : b_day_mala-a = 2 (asbalanced)
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

```

4._at      : b_day_mala-a =      3
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

5._at      : b_day_mala-a =      4
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

6._at      : b_day_mala-a =      5
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

7._at      : b_day_mala-a =      6
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

8._at      : b_day_mala-a =      7
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

9._at      : b_day_mala-a =      8
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

10._at     : b_day_mala-a =      9
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

11._at     : b_day_mala-a =     10
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

12._at     : b_day_mala-a =     11
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

13._at     : b_day_mala-a =     12
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

14._at     : b_day_mala-a =     13
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

15._at     : b_day_mala-a =     14
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

16._at     : b_day_mala-a =     15
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

17._at     : b_day_mala-a =     16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at     : b_day_mala-a =     17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at     : b_day_mala-a =     18
              death_30      (asbalanced)
              p_age2         (asbalanced)

```

```

      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

20._at      : b_day_mala-a      =      19
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

21._at      : b_day_mala-a      =      20
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at      : b_day_mala-a      =      21
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

	Delta-method					
	Margin	Std. Err.	z	P> z	[95% Conf. Interval]	
_at#death_30						
1#survivor	388.4529	38.65304	10.05	0.000	312.6944	464.2115
1#nonsurvivor	321.5178	52.81145	6.09	0.000	218.0092	425.0263
2#survivor	382.517	35.56431	10.76	0.000	312.8123	452.2218
2#nonsurvivor	311.7638	45.42954	6.86	0.000	222.7236	400.8041
3#survivor	378.2652	33.1177	11.42	0.000	313.3557	443.1747
3#nonsurvivor	304.0858	39.55271	7.69	0.000	226.5639	381.6077
4#survivor	375.6429	31.24492	12.02	0.000	314.404	436.8818
4#nonsurvivor	298.3433	35.01192	8.52	0.000	229.7212	366.9655
5#survivor	374.6168	29.88053	12.54	0.000	316.052	433.1815
5#nonsurvivor	294.4328	31.65583	9.30	0.000	232.3886	356.4771
6#survivor	375.1737	28.96117	12.95	0.000	318.4109	431.9366
6#nonsurvivor	292.2845	29.33417	9.96	0.000	234.7906	349.7785
7#survivor	377.3209	28.42626	13.27	0.000	321.6064	433.0353
7#nonsurvivor	291.8604	27.88858	10.47	0.000	237.1998	346.521
8#survivor	381.0855	28.21969	13.50	0.000	325.776	436.3951
8#nonsurvivor	293.1529	27.15522	10.80	0.000	239.9297	346.3762
9#survivor	386.5159	28.29181	13.66	0.000	331.0649	441.9668
9#nonsurvivor	296.1849	26.97756	10.98	0.000	243.3099	349.06
10#survivor	393.6818	28.60128	13.76	0.000	337.6243	449.7393
10#nonsurvivor	301.0104	27.22211	11.06	0.000	247.656	354.3647
11#survivor	402.6768	29.11654	13.83	0.000	345.6095	459.7442
11#nonsurvivor	307.7157	27.79056	11.07	0.000	253.2472	362.1842
12#survivor	413.6196	29.81685	13.87	0.000	355.1796	472.0595
12#nonsurvivor	316.4226	28.62718	11.05	0.000	260.3144	372.5309
13#survivor	426.6569	30.69338	13.90	0.000	366.499	486.8148
13#nonsurvivor	327.2918	29.72381	11.01	0.000	269.0342	385.5494
14#survivor	441.9668	31.75056	13.92	0.000	379.7369	504.1968
14#nonsurvivor	340.5277	31.1259	10.94	0.000	279.5221	401.5334
15#survivor	459.7627	33.00811	13.93	0.000	395.068	524.4574
15#nonsurvivor	356.3851	32.94153	10.82	0.000	291.8209	420.9493
16#survivor	480.2983	34.50394	13.92	0.000	412.6718	547.9248
16#nonsurvivor	375.1771	35.35299	10.61	0.000	305.8865	444.4677
17#survivor	503.8736	36.29824	13.88	0.000	432.7303	575.0168
17#nonsurvivor	397.2855	38.6281	10.28	0.000	321.5759	472.9952
18#survivor	530.842	38.4786	13.80	0.000	455.4253	606.2587
18#nonsurvivor	423.174	43.12683	9.81	0.000	338.647	507.701
19#survivor	561.6196	41.16598	13.64	0.000	480.9357	642.3034
19#nonsurvivor	453.4035	49.30136	9.20	0.000	356.7746	550.0324
20#survivor	596.6949	44.52116	13.40	0.000	509.4351	683.9548
20#nonsurvivor	488.6529	57.69343	8.47	0.000	375.5759	601.73
21#survivor	636.6426	48.75099	13.06	0.000	541.0924	732.1928
21#nonsurvivor	529.7438	68.93937	7.68	0.000	394.6251	664.8624
22#survivor	682.138	54.11422	12.61	0.000	576.0761	788.1999
22#nonsurvivor	577.6715	83.79256	6.89	0.000	413.4411	741.9019

```

143 . marginsplot, ytitle("Cells per mmc") xlab(0(1)21) ylab(0(500)2000) yline(100,lcolor(red)) legend(off)

```

```

      Variables that uniquely identify margins: b_day_malattia death_30

```

```

144 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

```

```

Contrasts of adjusted predictions      Number of obs      =      1,805

```

```

Expression      : exp(predict(xb))

```

```

1._at      : b_day_mala-a      =      0
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

2._at      : b_day_mala-a      =      1
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

3._at      : b_day_mala-a      =      2
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

4._at      : b_day_mala-a      =      3

```



```

      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

5._at      : b_day_mala-a =      4      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

6._at      : b_day_mala-a =      5      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

7._at      : b_day_mala-a =      6      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

8._at      : b_day_mala-a =      7      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

9._at      : b_day_mala-a =      8      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

10._at     : b_day_mala-a =      9      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

11._at     : b_day_mala-a =     10      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

12._at     : b_day_mala-a =     11      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

13._at     : b_day_mala-a =     12      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

14._at     : b_day_mala-a =     13      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

15._at     : b_day_mala-a =     14      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

16._at     : b_day_mala-a =     15      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

17._at     : b_day_mala-a =     16      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

18._at     : b_day_mala-a =     17      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

19._at     : b_day_mala-a =     18      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)

```

```

      p_obeso      (asbalanced)
      p_rene      (asbalanced)

20._at      : b_day_mala-a =      19
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

21._at      : b_day_mala-a =      20
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at      : b_day_mala-a =      21
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

		df	chi2	P>chi2
death_30@_at				
(nonsurvivor vs survivor)	1	1	1.28	0.2588
(nonsurvivor vs survivor)	2	1	1.93	0.1651
(nonsurvivor vs survivor)	3	1	2.81	0.0938
(nonsurvivor vs survivor)	4	1	3.92	0.0476
(nonsurvivor vs survivor)	5	1	5.23	0.0222
(nonsurvivor vs survivor)	6	1	6.60	0.0102
(nonsurvivor vs survivor)	7	1	7.88	0.0050
(nonsurvivor vs survivor)	8	1	8.91	0.0028
(nonsurvivor vs survivor)	9	1	9.61	0.0019
(nonsurvivor vs survivor)	10	1	10.00	0.0016
(nonsurvivor vs survivor)	11	1	10.13	0.0015
(nonsurvivor vs survivor)	12	1	10.05	0.0015
(nonsurvivor vs survivor)	13	1	9.79	0.0018
(nonsurvivor vs survivor)	14	1	9.36	0.0022
(nonsurvivor vs survivor)	15	1	8.75	0.0031
(nonsurvivor vs survivor)	16	1	7.92	0.0049
(nonsurvivor vs survivor)	17	1	6.88	0.0087
(nonsurvivor vs survivor)	18	1	5.67	0.0173
(nonsurvivor vs survivor)	19	1	4.40	0.0359
(nonsurvivor vs survivor)	20	1	3.21	0.0732
(nonsurvivor vs survivor)	21	1	2.20	0.1381
(nonsurvivor vs survivor)	22	1	1.42	0.2338
Joint		5	10.70	0.0577

		Delta-method		
		Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at				
(nonsurvivor vs survivor)	1	-66.93515	59.27759	-183.1171 49.2468
(nonsurvivor vs survivor)	2	-70.7532	50.97133	-170.6552 29.14877
(nonsurvivor vs survivor)	3	-74.17936	44.27377	-160.9543 12.59563
(nonsurvivor vs survivor)	4	-77.29955	39.01844	-153.7743 -8.8248194
(nonsurvivor vs survivor)	5	-80.18391	35.06014	-148.9005 -11.4673
(nonsurvivor vs survivor)	6	-82.88918	32.25529	-146.1084 -19.66996
(nonsurvivor vs survivor)	7	-85.46048	30.44761	-145.1367 -25.78426
(nonsurvivor vs survivor)	8	-87.93264	29.46608	-145.6851 -30.18017
(nonsurvivor vs survivor)	9	-90.33093	29.13683	-147.4381 -33.2238
(nonsurvivor vs survivor)	10	-92.67148	29.30219	-150.1027 -35.24024
(nonsurvivor vs survivor)	11	-94.96115	29.83817	-153.4429 -36.47941
(nonsurvivor vs survivor)	12	-97.19698	30.66603	-157.3013 -37.09267
(nonsurvivor vs survivor)	13	-99.3651	31.75998	-161.6135 -37.11669
(nonsurvivor vs survivor)	14	-101.4391	33.1549	-166.4215 -36.4567
(nonsurvivor vs survivor)	15	-103.3776	34.95704	-171.8922 -34.8631
(nonsurvivor vs survivor)	16	-105.1212	37.35783	-178.3412 -31.90126
(nonsurvivor vs survivor)	17	-106.588	40.64727	-186.2552 -26.92084
(nonsurvivor vs survivor)	18	-107.668	45.22107	-196.2997 -19.03637
(nonsurvivor vs survivor)	19	-108.216	51.57736	-209.3058 -7.126278
(nonsurvivor vs survivor)	20	-108.042	60.30757	-226.2427 10.15865
(nonsurvivor vs survivor)	21	-106.8988	72.095	-248.2024 34.40476
(nonsurvivor vs survivor)	22	-104.4665	87.73475	-276.4235 67.49041

```

145 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_MONO.gph", replace
      (file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_MONO.gph saved)

146 .
147 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
148 . *marginsplot, title("Monocytes kinetic day 0 to day 30 after onset") ytitle("Cells per mmc (log-scale)") xlab(0(5)
      > 30) ylab(0(100)800) yline(100, lcolor(red)) legend(off)
149 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
150 .
151 . ***combine****
152 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_MONO.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_
      > MONO.gph", ycomm xsize(8) ysize(4)

153 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_MONO.gph", replace
      (file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_MONO.gph saved)

154 .
155 .
156 . *****
157 . *** analisi Eosinophils (senza trasfomazione ci sono tanti ZERI) *****
158 . *****
159 . **** scatter no model
160 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

161 . scatter eos b_day_malattia if death_30==1, mcolor(red) legend(off) title("Eosinophils variation over time") xtitl
      > e("day since onset") ytitle("Cells per mmc X 1000") || scatter eos b_day_malattia if death_30==0, mcolor(green) 1

```

```

> elegend(off) ms(oh)

162 .
163 . **** modelling
164 . use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear

165 . replace eos=eos*1000
      (961 real changes made)

166 . mixed eos c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0:  log likelihood = -10062.085
Iteration 1:  log likelihood = -10062.036
Iteration 2:  log likelihood = -10062.036

```

Computing standard errors:

```

Mixed-effects ML regression      Number of obs   =    1,805
Group variable: progr           Number of groups =     379

```

```

Obs per group:
      min =      1
      avg =     4.8
      max =     22

```

```

Wald chi2(3)      =    121.64
Prob > chi2       =    0.0000

Log likelihood = -10062.036

```

eos	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	5.120101	.4880917	10.49	0.000	4.163459	6.076743
death_30 nonsurvivor	6.918299	12.25559	0.56	0.572	-17.10221	30.93881
death_30#c.b_day_malattia nonsurvivor	-3.48303	1.480325	-2.35	0.019	-6.384414	-.5816457
_cons	-5.791112	4.845078	-1.20	0.232	-15.28729	3.705066

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	35.1686	5.270418	26.21759	47.1756
var(_cons)	1709.433	495.5068	968.54	3017.078
cov(b_day_malattia,_cons)	-169.9506	46.90627	-261.8852	-78.01596
var(Residual)	2751.337	112.6649	2539.146	2981.259

```

LR test vs. linear model: chi2(3) = 783.15      Prob > chi2 = 0.0000

```

Note: LR test is conservative and provided only for reference.

```
167 . est store linear
```

```
168 . mixed eos c.b_day_malattia#c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)
```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0:  log likelihood = -10057.824
Iteration 1:  log likelihood = -10057.642
Iteration 2:  log likelihood = -10057.642

```

Computing standard errors:

```

Mixed-effects ML regression      Number of obs   =    1,805
Group variable: progr           Number of groups =     379

```

```

Obs per group:
      min =      1
      avg =     4.8
      max =     22

```

```

Wald chi2(5)      =    133.34
Prob > chi2       =    0.0000

Log likelihood = -10057.642

```

eos	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	1.786876	1.338072	1.34	0.182	-.8356974	4.409449
c.b_day_malattia#c.b_day_malattia	.1433959	.0536253	2.67	0.007	.0382922	.2484996
death_30 nonsurvivor	8.559288	17.49322	0.49	0.625	-25.7268	42.84537
death_30#c.b_day_malattia nonsurvivor	-4.44837	3.378566	-1.32	0.188	-11.07024	2.173497
death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0621388	.1446084	0.43	0.667	-.2212885	.3455661
_cons	10.58238	7.69387	1.38	0.169	-4.497329	25.66209

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				

var(b_day_malattia)	34.48418	5.193817	25.66946	46.32583
var(_cons)	1377.686	461.892	714.1199	2657.845
cov(b_day_malattia,_cons)	-150.8955	44.79085	-238.6839	-63.10701
var(Residual)	2763.249	112.9161	2550.569	2993.665

LR test vs. linear model: $\chi^2(3) = 786.76$ Prob > $\chi^2 = 0.0000$

Note: LR test is conservative and provided only for reference.

169 . est store quadratic

170 . lrtest linear quadratic

Likelihood-ratio test LR $\chi^2(2) = 8.79$
 (Assumption: linear nested in quadratic) Prob > $\chi^2 = 0.0124$

171 .

172 . margins death_30, at(b_day_malattia={0(1)30})

Adjusted predictions Number of obs = 1,805

Expression : Linear prediction, fixed portion, predict()

1._at : b_day_mala-a = 0
 2._at : b_day_mala-a = 1
 3._at : b_day_mala-a = 2
 4._at : b_day_mala-a = 3
 5._at : b_day_mala-a = 4
 6._at : b_day_mala-a = 5
 7._at : b_day_mala-a = 6
 8._at : b_day_mala-a = 7
 9._at : b_day_mala-a = 8
 10._at : b_day_mala-a = 9
 11._at : b_day_mala-a = 10
 12._at : b_day_mala-a = 11
 13._at : b_day_mala-a = 12
 14._at : b_day_mala-a = 13
 15._at : b_day_mala-a = 14
 16._at : b_day_mala-a = 15
 17._at : b_day_mala-a = 16
 18._at : b_day_mala-a = 17
 19._at : b_day_mala-a = 18
 20._at : b_day_mala-a = 19
 21._at : b_day_mala-a = 20
 22._at : b_day_mala-a = 21
 23._at : b_day_mala-a = 22
 24._at : b_day_mala-a = 23
 25._at : b_day_mala-a = 24
 26._at : b_day_mala-a = 25
 27._at : b_day_mala-a = 26
 28._at : b_day_mala-a = 27
 29._at : b_day_mala-a = 28
 30._at : b_day_mala-a = 29
 31._at : b_day_mala-a = 30

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	10.58238	7.69387	1.38	0.169	-4.497329	25.66209
1#nonsurvivor	19.14167	15.71042	1.22	0.223	-11.65018	49.93352
2#survivor	12.51265	6.527092	1.92	0.055	-.2802154	25.30552
2#nonsurvivor	16.68571	13.12093	1.27	0.203	-9.030837	42.40225
3#survivor	14.72971	5.48991	2.68	0.007	3.969687	25.48974
3#nonsurvivor	14.64082	10.89322	1.34	0.179	-6.709501	35.99113
4#survivor	17.23357	4.593984	3.75	0.000	8.229525	26.23761
4#nonsurvivor	13.007	9.083217	1.43	0.152	-4.795783	30.80977
5#survivor	20.02422	3.856058	5.19	0.000	12.46648	27.58195
5#nonsurvivor	11.78424	7.765083	1.52	0.129	-3.435039	27.00353
6#survivor	23.10165	3.29714	7.01	0.000	16.63938	29.56393
6#nonsurvivor	10.97256	7.005717	1.57	0.117	-2.758394	24.70351
7#survivor	26.46588	2.93566	9.02	0.000	20.7121	32.21967
7#nonsurvivor	10.57195	6.806705	1.55	0.120	-2.76895	23.91284
8#survivor	30.11691	2.772483	10.86	0.000	24.68294	35.55087
8#nonsurvivor	10.5824	7.068136	1.50	0.134	-3.270889	24.43569
9#survivor	34.05472	2.778922	12.25	0.000	28.60813	39.50131

9#nonsurvivor	11.00393	7.635667	1.44	0.150	-3.961704	25.96956
10#survivor	38.27933	2.905158	13.18	0.000	32.58532	43.97333
10#nonsurvivor	11.83652	8.37497	1.41	0.158	-4.578117	28.25116
11#survivor	42.79072	3.102079	13.79	0.000	36.71076	48.87069
11#nonsurvivor	13.08019	9.201946	1.42	0.155	-4.955297	31.11567
12#survivor	47.58891	3.335251	14.27	0.000	41.05194	54.12589
12#nonsurvivor	14.73492	10.07723	1.46	0.144	-5.016082	34.48592
13#survivor	52.67389	3.586728	14.69	0.000	45.64404	59.70375
13#nonsurvivor	16.80072	10.99259	1.53	0.126	-4.744359	38.3458
14#survivor	58.04567	3.851715	15.07	0.000	50.49644	65.59489
14#nonsurvivor	19.27759	11.95998	1.61	0.107	-4.16354	42.71873
15#survivor	63.70423	4.134837	15.41	0.000	55.6001	71.80836
15#nonsurvivor	22.16553	13.0039	1.70	0.088	-3.321644	47.65271
16#survivor	69.64959	4.447113	15.66	0.000	60.93341	78.36577
16#nonsurvivor	25.46455	14.1559	1.80	0.072	-2.2805	53.20959
17#survivor	75.88174	4.803461	15.80	0.000	66.46712	85.29635
17#nonsurvivor	29.17462	15.45022	1.89	0.059	-1.107245	59.45649
18#survivor	82.40068	5.220431	15.78	0.000	72.16882	92.63253
18#nonsurvivor	33.29577	16.92035	1.97	0.049	.1325	66.45905
19#survivor	89.20641	5.714153	15.61	0.000	78.00687	100.4059
19#nonsurvivor	37.82799	18.59641	2.03	0.042	1.379706	74.27628
20#survivor	96.29893	6.298725	15.29	0.000	83.95366	108.6442
20#nonsurvivor	42.77128	20.50357	2.09	0.037	2.585015	82.95754
21#survivor	103.6782	6.985261	14.84	0.000	89.98739	117.3691
21#nonsurvivor	48.12564	22.66152	2.12	0.034	3.709873	92.5414
22#survivor	111.3444	7.781654	14.31	0.000	96.09259	126.5961
22#nonsurvivor	53.89106	25.08464	2.15	0.032	4.726081	103.056
23#survivor	119.2973	8.692903	13.72	0.000	102.2595	136.335
23#nonsurvivor	60.06756	27.78275	2.16	0.031	5.614365	114.5208
24#survivor	127.5369	9.721727	13.12	0.000	108.4827	146.5912
24#nonsurvivor	66.65512	30.76209	2.17	0.030	6.362542	126.9477
25#survivor	136.0634	10.86923	12.52	0.000	114.7601	157.3667
25#nonsurvivor	73.65376	34.02617	2.16	0.030	6.963694	140.3438
26#survivor	144.8767	12.13549	11.94	0.000	121.0916	168.6618
26#nonsurvivor	81.06346	37.57664	2.16	0.031	7.414602	154.7123
27#survivor	153.9768	13.51997	11.39	0.000	127.4781	180.4754
27#nonsurvivor	88.88424	41.41389	2.15	0.032	7.714508	170.054
28#survivor	163.3636	15.02184	10.88	0.000	133.9214	192.8059
28#nonsurvivor	97.11608	45.53751	2.13	0.033	7.864204	186.368
29#survivor	173.0373	16.64014	10.40	0.000	140.4232	205.6513
29#nonsurvivor	105.759	49.94663	2.12	0.034	7.86539	203.6526
30#survivor	182.9977	18.37389	9.96	0.000	146.9855	219.0099
30#nonsurvivor	114.813	54.64015	2.10	0.036	7.720245	221.9057
31#survivor	193.2449	20.22219	9.56	0.000	153.6102	232.8797
31#nonsurvivor	124.278	59.61685	2.08	0.037	7.431142	241.1249

```
173 . marginsplot, title("Eosinophils kinetic day 0 to day 28 after onset") ytitle("Cells per mmc (log-scale)")
```

```
Variables that uniquely identify margins: b_day_malattia death_30
```

```
174 . margins ar.death_30, at(b_day_malattia=(0(1)30))
```

```
Contrasts of adjusted predictions          Number of obs      =      1,805
```

```
Expression   : Linear prediction, fixed portion, predict()
```

```
1._at       : b_day_mala-a      =      0
2._at       : b_day_mala-a      =      1
3._at       : b_day_mala-a      =      2
4._at       : b_day_mala-a      =      3
5._at       : b_day_mala-a      =      4
6._at       : b_day_mala-a      =      5
7._at       : b_day_mala-a      =      6
8._at       : b_day_mala-a      =      7
9._at       : b_day_mala-a      =      8
10._at      : b_day_mala-a      =      9
11._at      : b_day_mala-a      =     10
12._at      : b_day_mala-a      =     11
13._at      : b_day_mala-a      =     12
14._at      : b_day_mala-a      =     13
15._at      : b_day_mala-a      =     14
16._at      : b_day_mala-a      =     15
17._at      : b_day_mala-a      =     16
18._at      : b_day_mala-a      =     17
19._at      : b_day_mala-a      =     18
20._at      : b_day_mala-a      =     19
21._at      : b_day_mala-a      =     20
22._at      : b_day_mala-a      =     21
23._at      : b_day_mala-a      =     22
24._at      : b_day_mala-a      =     23
25._at      : b_day_mala-a      =     24
26._at      : b_day_mala-a      =     25
```

27._at : b_day_mala-a = 26
28._at : b_day_mala-a = 27
29._at : b_day_mala-a = 28
30._at : b_day_mala-a = 29
31._at : b_day_mala-a = 30

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	0.24	0.6246
(nonsurvivor vs survivor) 2	1	0.08	0.7758
(nonsurvivor vs survivor) 3	1	0.00	0.9942
(nonsurvivor vs survivor) 4	1	0.17	0.6780
(nonsurvivor vs survivor) 5	1	0.90	0.3419
(nonsurvivor vs survivor) 6	1	2.45	0.1172
(nonsurvivor vs survivor) 7	1	4.60	0.0320
(nonsurvivor vs survivor) 8	1	6.62	0.0101
(nonsurvivor vs survivor) 9	1	8.05	0.0046
(nonsurvivor vs survivor) 10	1	8.90	0.0029
(nonsurvivor vs survivor) 11	1	9.36	0.0022
(nonsurvivor vs survivor) 12	1	9.58	0.0020
(nonsurvivor vs survivor) 13	1	9.63	0.0019
(nonsurvivor vs survivor) 14	1	9.52	0.0020
(nonsurvivor vs survivor) 15	1	9.27	0.0023
(nonsurvivor vs survivor) 16	1	8.87	0.0029
(nonsurvivor vs survivor) 17	1	8.33	0.0039
(nonsurvivor vs survivor) 18	1	7.69	0.0056
(nonsurvivor vs survivor) 19	1	6.97	0.0083
(nonsurvivor vs survivor) 20	1	6.23	0.0126
(nonsurvivor vs survivor) 21	1	5.49	0.0191
(nonsurvivor vs survivor) 22	1	4.79	0.0287
(nonsurvivor vs survivor) 23	1	4.14	0.0419
(nonsurvivor vs survivor) 24	1	3.56	0.0591
(nonsurvivor vs survivor) 25	1	3.05	0.0806
(nonsurvivor vs survivor) 26	1	2.61	0.1061
(nonsurvivor vs survivor) 27	1	2.23	0.1351
(nonsurvivor vs survivor) 28	1	1.91	0.1671
(nonsurvivor vs survivor) 29	1	1.63	0.2013
(nonsurvivor vs survivor) 30	1	1.40	0.2369
(nonsurvivor vs survivor) 31	1	1.20	0.2733
Joint	3	9.82	0.0202

	Delta-method		
	Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at			
(nonsurvivor vs survivor) 1	8.559288	17.49322	-25.7268 42.84537
(nonsurvivor vs survivor) 2	4.173057	14.65475	-24.54972 32.89584
(nonsurvivor vs survivor) 3	-.0888971	12.19842	-23.99735 23.81956
(nonsurvivor vs survivor) 4	-4.226574	10.17888	-24.1768 15.72366
(nonsurvivor vs survivor) 5	-8.239972	8.669815	-25.2325 8.752552
(nonsurvivor vs survivor) 6	-12.12909	7.742817	-27.30474 3.046548
(nonsurvivor vs survivor) 7	-15.89394	7.412782	-30.42272 -1.365152
(nonsurvivor vs survivor) 8	-19.5345	7.592444	-34.41542 -4.653587
(nonsurvivor vs survivor) 9	-23.05079	8.125627	-38.97673 -7.124856
(nonsurvivor vs survivor) 10	-26.4428	8.86454	-43.81698 -9.068625
(nonsurvivor vs survivor) 11	-29.71054	9.710752	-48.74326 -10.67781
(nonsurvivor vs survivor) 12	-32.85399	10.61482	-53.65866 -12.04933
(nonsurvivor vs survivor) 13	-35.87317	11.56294	-58.53612 -13.21022
(nonsurvivor vs survivor) 14	-38.76807	12.56491	-63.39484 -14.14131
(nonsurvivor vs survivor) 15	-41.5387	13.64545	-68.28329 -14.7941
(nonsurvivor vs survivor) 16	-44.18504	14.838	-73.26698 -15.1031
(nonsurvivor vs survivor) 17	-46.70711	16.17969	-78.41873 -14.9955
(nonsurvivor vs survivor) 18	-49.1049	17.70737	-83.81072 -14.39909
(nonsurvivor vs survivor) 19	-51.37842	19.45451	-89.50855 -13.24828
(nonsurvivor vs survivor) 20	-53.52765	21.44925	-95.56741 -11.48789
(nonsurvivor vs survivor) 21	-55.55261	23.71367	-102.0306 -9.074661
(nonsurvivor vs survivor) 22	-57.45329	26.26391	-108.9296 -5.976968
(nonsurvivor vs survivor) 23	-59.22969	29.11096	-116.2861 -2.173264
(nonsurvivor vs survivor) 24	-60.88182	32.26171	-124.1136 2.349971
(nonsurvivor vs survivor) 25	-62.40967	35.72003	-132.4196 7.600299
(nonsurvivor vs survivor) 26	-63.81324	39.48764	-141.2076 13.58112
(nonsurvivor vs survivor) 27	-65.09253	43.56489	-150.4781 20.29309
(nonsurvivor vs survivor) 28	-66.24755	47.95123	-160.2302 27.73513
(nonsurvivor vs survivor) 29	-67.27828	52.64561	-170.4618 35.90521
(nonsurvivor vs survivor) 30	-68.18475	57.64673	-181.1703 44.80078
(nonsurvivor vs survivor) 31	-68.96693	62.9532	-192.3529 54.41908

```
175 .  
176 .  
177 . *****  
178 . *** analisi PLTS *****  
179 . *****  
180 . **** scatter no model  
181 . use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear  
  
182 . *scatter plt b_day_malattia if death_30==1, mcolor(red) legend(off) title("Platelets variation over time") xtitle  
> ("day since onset") ytitle("Cells per mmc X 1000") xlab(0(5)30)|| scatter plt b_day_malattia if death_30==0, mcol  
> or(green) legend(off) ms(oh)  
183 . *****Graph box*****  
184 . replace plt=plt*1000  
(1,805 real changes made)  
  
185 . graph box plt, over(death_30, label(nolabel)) over(b_day_malattia asyvars box(1, fcolor(navy)) nooutsides ytitle  
> (Cells per mmc) yline(150000, lcolor(red)) legend(off)  
  
186 . graph save "Graph" "/Users/Chiara/Documents/fileD0 15 Maggio/BOX_PLT.gph", replace  
(file /Users/Chiara/Documents/fileD0 15 Maggio/BOX_PLT.gph saved)
```

```

187 . **** modelling
188 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear
189 . mixed plt_ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0:   log likelihood = -488.15169
Iteration 1:   log likelihood = -488.15166

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =         4.8
      max =         22

Wald chi2(3)    =    170.93
Prob > chi2     =     0.0000

Log likelihood = -488.15166

```

	plt_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	.040182	.0032144	12.50	0.000	.033882	.046482
	death_30 nonsurvivor	.3307512	.117088	2.82	0.005	.1012631	.5602394
	death_30#c.b_day_malattia nonsurvivor	-.0509723	.0096373	-5.29	0.000	-.069861	-.0320836
	_cons	11.96795	.0419482	285.30	0.000	11.88573	12.05017

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr : Unstructured				
var(b_day_malattia)	.0021197	.0002226	.0017254	.0026041
var(_cons)	.3864737	.0394638	.3163746	.4721047
cov(b_day_malattia,_cons)	-.0240338	.0027549	-.0294332	-.0186343
var(Residual)	.0483518	.002008	.0445721	.052452

LR test vs. linear model: chi2(3) = 1364.85 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

```

190 . est store linear

```

```

191 . mixed plt_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day_
> malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0:   log likelihood = -382.02189
Iteration 1:   log likelihood = -382.02185

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =         4.8
      max =         22

Wald chi2(9)    =    413.99
Prob > chi2     =     0.0000

Log likelihood = -382.02185

```

	plt_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	.1209497	.0070774	17.09	0.000	.1070783	.1348211
	c.b_day_malattia#c.b_day_malattia	-.0032354	.0002557	-12.65	0.000	-.0037367	-.0027342
	death_30 nonsurvivor	.3947662	.1463285	2.70	0.007	.1079676	.6815648
	death_30#c.b_day_malattia nonsurvivor	-.0276821	.0179166	-1.55	0.122	-.062798	.0074338
	death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	-.001778	.000696	-2.55	0.011	-.0031422	-.0004138
	1.p_age2	-.1391985	.0420066	-3.31	0.001	-.22153	-.0568671
	1.p_cardio	-.0182412	.0448995	-0.41	0.685	-.1062426	.0697603
	1.p_obeso	.0614358	.0794493	0.77	0.439	-.094282	.2171537
	1.p_rene	-.1097104	.0927053	-1.18	0.237	-.2914094	.0719886
	_cons	11.5935	.0604623	191.75	0.000	11.47499	11.712

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr : Unstructured				
var(b_day_malattia)	.0024137	.0002437	.0019804	.0029418
var(_cons)	.4782215	.0476246	.3934237	.5812963
cov(b_day_malattia,_cons)	-.0297081	.0032096	-.0359988	-.0234174

```

var(Residual)      .0398844   .0016814   .0367214   .0433198
LR test vs. linear model: chi2(3) = 1477.93          Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

192 . est store quadratic

193 . lrtest linear quadratic

Likelihood-ratio test          LR chi2(6) =    212.26
(Assumption: linear nested in quadratic)   Prob > chi2 =    0.0000

194 . *margins*****
195 . quiet: mixed plt_ln c.b_day_malattia#c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr
> :b_day_malattia, cov(unstr)

196 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions          Number of obs    =    1,805

Expression   : exp(predict(xb))

1._at       : b_day_mala-a =    0
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

2._at       : b_day_mala-a =    1
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

3._at       : b_day_mala-a =    2
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

4._at       : b_day_mala-a =    3
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

5._at       : b_day_mala-a =    4
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

6._at       : b_day_mala-a =    5
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

7._at       : b_day_mala-a =    6
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

8._at       : b_day_mala-a =    7
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

9._at       : b_day_mala-a =    8
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

10._at      : b_day_mala-a =    9
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

11._at      : b_day_mala-a =   10
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

12._at      : b_day_mala-a =   11
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```



```

13._at      : b_day_mala-a =      12
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

14._at      : b_day_mala-a =      13
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

15._at      : b_day_mala-a =      14
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

16._at      : b_day_mala-a =      15
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

17._at      : b_day_mala-a =      16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =      17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =      18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =      19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =      20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =      21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

	Delta-method					
	Margin	Std. Err.	z	P> z	[95% Conf. Interval]	
_at#death_30						
1#survivor	97796.27	7888.64	12.40	0.000	82334.82	113257.7
1#nonsurvivor	145133.3	20108.02	7.22	0.000	105722.3	184544.3
2#survivor	110013.2	8428.929	13.05	0.000	93492.84	126533.6
2#nonsurvivor	158524.1	20066.9	7.90	0.000	119193.7	197854.5
3#survivor	122958.1	8994.522	13.67	0.000	105329.2	140587.1
3#nonsurvivor	171423	19879.56	8.62	0.000	132459.8	210386.2
4#survivor	136539.8	9589.321	14.24	0.000	117745.1	155334.6
4#nonsurvivor	183522	19576.81	9.37	0.000	145152.2	221891.9
5#survivor	150643.8	10215.87	14.75	0.000	130621	170666.5
5#nonsurvivor	194514.8	19192.27	10.14	0.000	156898.6	232131
6#survivor	165132.6	10874.62	15.19	0.000	143818.7	186446.5
6#nonsurvivor	204109.2	18758.93	10.88	0.000	167342.4	240876
7#survivor	179847.4	11563.37	15.55	0.000	157183.6	202511.2
7#nonsurvivor	212040	18306.1	11.58	0.000	176160.7	247919.3
8#survivor	194610	12277.05	15.85	0.000	170547.4	218672.6
8#nonsurvivor	218081.4	17857.47	12.21	0.000	183081.4	253081.4
9#survivor	209226.1	13007.93	16.08	0.000	183731	234721.2
9#nonsurvivor	222057.1	17430.51	12.74	0.000	187893.9	256220.3
10#survivor	223489.1	13746.11	16.26	0.000	196547.2	250431
10#nonsurvivor	223849.6	17037.45	13.14	0.000	190456.8	257242.3
11#survivor	237184.6	14480.38	16.38	0.000	208803.6	265565.6
11#nonsurvivor	223405.1	16686.9	13.39	0.000	190699.4	256110.9
12#survivor	250095.8	15199.22	16.45	0.000	220305.9	279885.8
12#nonsurvivor	220737.2	16385.54	13.47	0.000	188622.1	252852.3
13#survivor	262009	15891.95	16.49	0.000	230861.3	293156.6
13#nonsurvivor	215925.1	16138.79	13.38	0.000	184293.7	247556.6
14#survivor	272719.1	16549.79	16.48	0.000	240282.1	305156.1
14#nonsurvivor	209110.7	15949.96	13.11	0.000	177849.4	240372.1
15#survivor	282036.1	17166.72	16.43	0.000	248389.9	315682.2
15#nonsurvivor	200491	15818.33	12.67	0.000	169487.7	231494.4
16#survivor	289790.1	17740.12	16.34	0.000	255020.1	324560.1
16#nonsurvivor	190308.8	15736.7	12.09	0.000	159465.4	221152.1
17#survivor	295836.7	18270.98	16.19	0.000	260026.3	331647.2

19/05/20, 17:13

```

13._at      : b_day_mala-a =      12
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

14._at      : b_day_mala-a =      13
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

15._at      : b_day_mala-a =      14
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

16._at      : b_day_mala-a =      15
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

17._at      : b_day_mala-a =      16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =      17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =      18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =      19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =      20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =      21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	5.52	0.0188
(nonsurvivor vs survivor) 2	1	5.90	0.0151
(nonsurvivor vs survivor) 3	1	6.09	0.0136
(nonsurvivor vs survivor) 4	1	6.01	0.0142
(nonsurvivor vs survivor) 5	1	5.55	0.0184
(nonsurvivor vs survivor) 6	1	4.67	0.0306
(nonsurvivor vs survivor) 7	1	3.40	0.0650
(nonsurvivor vs survivor) 8	1	1.92	0.1657
(nonsurvivor vs survivor) 9	1	0.60	0.4372
(nonsurvivor vs survivor) 10	1	0.00	0.9823
(nonsurvivor vs survivor) 11	1	0.73	0.3925
(nonsurvivor vs survivor) 12	1	3.29	0.0695
(nonsurvivor vs survivor) 13	1	7.88	0.0050
(nonsurvivor vs survivor) 14	1	14.31	0.0002
(nonsurvivor vs survivor) 15	1	22.04	0.0000
(nonsurvivor vs survivor) 16	1	30.41	0.0000
(nonsurvivor vs survivor) 17	1	38.78	0.0000
(nonsurvivor vs survivor) 18	1	46.63	0.0000
(nonsurvivor vs survivor) 19	1	53.62	0.0000
(nonsurvivor vs survivor) 20	1	59.54	0.0000
(nonsurvivor vs survivor) 21	1	64.30	0.0000
(nonsurvivor vs survivor) 22	1	67.86	0.0000
Joint	6	314.32	0.0000

	Delta-method			
	Contrast	Std. Err.	[95% Conf. Interval]	
death_30@_at				
(nonsurvivor vs survivor) 1	47337.03	20141.19	7861.019	86813.05
(nonsurvivor vs survivor) 2	48510.89	19970.61	9369.225	87652.56
(nonsurvivor vs survivor) 3	48464.84	19633.79	9983.324	86946.37
(nonsurvivor vs survivor) 4	46982.17	19167.56	9414.436	84549.9

```
(nonsurvivor vs survivor) 5 | 43871.02 18615.81 7384.695 80357.34
(nonsurvivor vs survivor) 6 | 38976.6 18026.66 3645 74308.21
(nonsurvivor vs survivor) 7 | 32192.67 17449.34 -2007.41 66392.76
(nonsurvivor vs survivor) 8 | 23471.41 16931.11 -9712.962 56655.77
(nonsurvivor vs survivor) 9 | 12831.03 16514.36 -19536.53 45198.58
(nonsurvivor vs survivor) 10 | 360.4604 16234.15 -31457.88 32178.8
(nonsurvivor vs survivor) 11 | -13779.49 16116.06 -45366.39 17807.41
(nonsurvivor vs survivor) 12 | -29358.67 16174.56 -61060.23 2342.896
(nonsurvivor vs survivor) 13 | -46083.82 16411.85 -78250.46 -13917.18
(nonsurvivor vs survivor) 14 | -63608.35 16817.68 -96570.4 -30646.29
(nonsurvivor vs survivor) 15 | -81545.08 17370.36 -115590.4 -47499.8
(nonsurvivor vs survivor) 16 | -99481.31 18039.02 -134837.1 -64125.49
(nonsurvivor vs survivor) 17 | -116995.3 18786.84 -153816.8 -80173.76
(nonsurvivor vs survivor) 18 | -133673.3 19574.76 -172039.1 -95307.43
(nonsurvivor vs survivor) 19 | -149125.8 20364.96 -189040.4 -109211.2
(nonsurvivor vs survivor) 20 | -163003 21123.87 -204405 -121601
(nonsurvivor vs survivor) 21 | -175007.3 21824.18 -217781.9 -132232.7
(nonsurvivor vs survivor) 22 | -184903.4 22445.91 -228896.6 -140910.3

199 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_PLT.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_PLT.gph saved)

200 .
201 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
202 . *marginsplot, title("Platelets kinetic day 0 to day 30 after onset") ytitle("Cells per mmc x 1000") xlab(0(5)30) y
> lab(0(50000)400000, angle(horizontal)) yline(150000,lcolor(red)) legend(off)
203 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
204 .
205 . ***combine*****
206 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_PLT.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_P
> LT.gph", ycomm xsize(8) ysize(4)

207 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_PLT.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_PLT.gph saved)

208 .
209 . *****
210 . *** analisi MPV *****
211 . *****
212 . **** scatter no model
213 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

214 . *scatter mpv b_day_malattia if death_30==1, mcolor(red) legend(off) title("MPV variation over time") xttitle("day
> since onset") ytitle("Cell volume (fl)") xlab(0(5)30)|| scatter mpv b_day_malattia if death_30==0, mcolor(green)
> legend(off) ms(oh)
215 .
216 . *****Graph box*****
217 . graph box mpv, over(death_30, label(nolabel)) over(b_day_malattia, gap(5)) asyvars box(1, fcolor(navy)) nooutsides
> ytitle(Cells volume (fl)) legend(off)

218 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_MPV.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_MPV.gph saved)

219 .
220 . *****modelling*****
221 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

222 . mixed mpv ln c.b_day_malattia##1.death_30 || progr:b_day_malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = 2703.4127
Iteration 1: log likelihood = 2703.4129

Computing standard errors:

Mixed-effects ML regression              Number of obs   =    1,773
Group variable: progr                   Number of groups  =     376

Obs per group:
      min =         1
      avg =         4.7
      max =         22

Wald chi2(3)      =     98.30
Prob > chi2       =     0.0000

Log likelihood = 2703.4129
```

mpv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0029786	.0004825	-6.17	0.000	-.0039243	-.0020328
death_30 nonsurvivor	-.066807	.0203881	-3.28	0.001	-.1067669	-.0268471
death_30#c.b_day_malattia nonsurvivor	.0122826	.0014827	8.28	0.000	.0093766	.0151886
_cons	2.402822	.0072018	333.64	0.000	2.388707	2.416938

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000422	4.78e-06	.0000338	.0000527
var(_cons)	.0120543	.0011994	.0099185	.0146499
cov(b_day_malattia,_cons)	-.0004925	.0000673	-.0006244	-.0003606
var(Residual)	.0011794	.0000494	.0010863	.0012804

LR test vs. linear model: chi2(3) = 1847.24 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

223 . est store linear

224 . mixed mpv_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day_malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = **2721.9498**
Iteration 1: log likelihood = **2721.9499**

Computing standard errors:

Mixed-effects ML regression
Group variable: **progr**

Number of obs = **1,773**
Number of groups = **376**

Obs per group:
min = **1**
avg = **4.7**
max = **22**

Wald chi2(9) = **137.32**
Prob > chi2 = **0.0000**

Log likelihood = **2721.9499**

mpv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0077241	.0011545	-6.69	0.000	-.0099869	-.0054612
c.b_day_malattia#c.b_day_malattia	.0001913	.0000427	4.48	0.000	.0001075	.0002751
death_30 nonsurvivor	-.0830919	.0241874	-3.44	0.001	-.1304983	-.0356854
death_30#c.b_day_malattia nonsurvivor	.0115817	.002954	3.92	0.000	.0057919	.0173714
death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0000729	.0001181	0.62	0.537	-.0001586	.0003044
1.p_age2	.0148626	.009325	1.59	0.111	-.003414	.0331392
1.p_cardio	.0047159	.0099999	0.47	0.637	-.0148836	.0243154
1.p_obeso	-.014846	.017699	-0.84	0.402	-.0495354	.0198434
1.p_rene	.0475706	.0207101	2.30	0.022	.0069795	.0881618
_cons	2.418874	.010416	232.23	0.000	2.398459	2.439289

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000431	4.86e-06	.0000346	.0000538
var(_cons)	.0122388	.0012204	.0100661	.0148804
cov(b_day_malattia,_cons)	-.0005139	.0000687	-.0006485	-.0003794
var(Residual)	.0011489	.0000484	.0010578	.0012477

LR test vs. linear model: chi2(3) = **1816.08** Prob > chi2 = **0.0000**

Note: LR test is conservative and provided only for reference.

225 . est store quadratic

226 . lrtest linear quadratic

Likelihood-ratio test
(Assumption: linear nested in quadratic)

LR chi2(6) = **37.07**
Prob > chi2 = **0.0000**

227 . ****margins****

228 . quiet: mixed mpv_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day_malattia, cov(unstr)

229 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions

Number of obs = **1,773**

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = **0**
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

2._at : b_day_mala-a = **1**
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

3._at : b_day_mala-a = **2**
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

4._at : b_day_mala-a = **3**
death_30 (asbalanced)
p_age2 (asbalanced)
p_cardio (asbalanced)
p_obeso (asbalanced)
p_rene (asbalanced)

5._at : b_day_mala-a = **4**

	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
6._at	: b_day_mala-a	=	5
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
7._at	: b_day_mala-a	=	6
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
8._at	: b_day_mala-a	=	7
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
9._at	: b_day_mala-a	=	8
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
10._at	: b_day_mala-a	=	9
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
11._at	: b_day_mala-a	=	10
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
12._at	: b_day_mala-a	=	11
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
13._at	: b_day_mala-a	=	12
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
14._at	: b_day_mala-a	=	13
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
15._at	: b_day_mala-a	=	14
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
16._at	: b_day_mala-a	=	15
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
17._at	: b_day_mala-a	=	16
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
18._at	: b_day_mala-a	=	17
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
19._at	: b_day_mala-a	=	18
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
20._at	: b_day_mala-a	=	19
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)

```

                p_obeso                (asbalanced)
                p_rene                  (asbalanced)

21._at      : b_day_mala-a =          20
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

22._at      : b_day_mala-a =          21
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	11.53085	.1826359	63.14	0.000	11.17289	11.88881
1#nonsurvivor	10.61145	.2487169	42.66	0.000	10.12398	11.09893
2#survivor	11.44432	.1754135	65.24	0.000	11.10051	11.78812
2#nonsurvivor	10.65528	.2318052	45.97	0.000	10.20095	11.10961
3#survivor	11.36278	.1693532	67.10	0.000	11.03085	11.69471
3#nonsurvivor	10.70495	.2176766	49.18	0.000	10.27831	11.13159
4#survivor	11.28614	.1643296	68.68	0.000	10.96406	11.60822
4#nonsurvivor	10.76053	.2062348	52.18	0.000	10.35631	11.16474
5#survivor	11.21431	.1602145	70.00	0.000	10.90003	11.52833
5#nonsurvivor	10.82211	.1973311	54.84	0.000	10.43535	11.20887
6#survivor	11.1472	.156881	71.06	0.000	10.83972	11.45468
6#nonsurvivor	10.8898	.1907661	57.08	0.000	10.51591	11.2637
7#survivor	11.08474	.1542083	71.88	0.000	10.78249	11.38698
7#nonsurvivor	10.96371	.1863015	58.85	0.000	10.59856	11.32885
8#survivor	11.02684	.1520849	72.50	0.000	10.72876	11.32492
8#nonsurvivor	11.04395	.1836821	60.13	0.000	10.68394	11.40396
9#survivor	10.97344	.150412	72.96	0.000	10.67864	11.26824
9#nonsurvivor	11.13065	.1826624	60.94	0.000	10.77264	11.48866
10#survivor	10.92448	.1491056	73.27	0.000	10.63224	11.21672
10#nonsurvivor	11.22397	.1830332	61.32	0.000	10.86523	11.58271
11#survivor	10.8799	.1480981	73.46	0.000	10.58963	11.17017
11#nonsurvivor	11.32405	.1846444	61.33	0.000	10.96215	11.68595
12#survivor	10.83965	.1473391	73.57	0.000	10.55087	11.12843
12#nonsurvivor	11.43106	.1874212	60.99	0.000	11.06372	11.7984
13#survivor	10.80368	.1467958	73.60	0.000	10.51597	11.0914
13#nonsurvivor	11.54518	.1913738	60.33	0.000	11.1701	11.92027
14#survivor	10.77195	.146453	73.55	0.000	10.48491	11.059
14#nonsurvivor	11.66661	.1966	59.34	0.000	11.28128	12.05193
15#survivor	10.74443	.1463129	73.43	0.000	10.45766	11.0312
15#nonsurvivor	11.79554	.2032828	58.03	0.000	11.39711	12.19396
16#survivor	10.72108	.146395	73.23	0.000	10.43415	11.00801
16#nonsurvivor	11.93219	.2116806	56.37	0.000	11.51731	12.34708
17#survivor	10.70187	.1467354	72.93	0.000	10.41427	10.98947
17#nonsurvivor	12.07682	.2221124	54.37	0.000	11.64148	12.51215
18#survivor	10.68678	.1473858	72.51	0.000	10.39791	10.97566
18#nonsurvivor	12.22965	.2349381	52.05	0.000	11.76918	12.69012
19#survivor	10.67581	.1484131	71.93	0.000	10.38492	10.96669
19#nonsurvivor	12.39096	.2505369	49.46	0.000	11.89992	12.88201
20#survivor	10.66892	.1498972	71.17	0.000	10.37513	10.96271
20#nonsurvivor	12.56104	.2692868	46.65	0.000	12.03325	13.08883
21#survivor	10.66612	.1519289	70.20	0.000	10.36834	10.96389
21#nonsurvivor	12.74018	.2915489	43.70	0.000	12.16876	13.31161
22#survivor	10.6674	.1546074	69.00	0.000	10.36437	10.97042
22#nonsurvivor	12.92871	.317658	40.70	0.000	12.30611	13.55131

```
230 . marginsplot, ytitle("Cell volume (fL)")xlab(0(1)21) ylab(8(2)14) legend(off)
```

```
Variables that uniquely identify margins: b_day_malattia death_30
```

```
231 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal
```

```
Contrasts of adjusted predictions          Number of obs      =      1,773
```

```
Expression   : exp(predict(xb))
```

```
1._at      : b_day_mala-a =          0
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

```
2._at      : b_day_mala-a =          1
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

```
3._at      : b_day_mala-a =          2
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

```
4._at      : b_day_mala-a =          3
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

```
5._at      : b_day_mala-a =          4
              death_30          (asbalanced)

```

				p_age2	(asbalanced)
				p_cardio	(asbalanced)
				p_obeso	(asbalanced)
				p_rene	(asbalanced)
6._at	:	b_day_mala-a	=	5	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
7._at	:	b_day_mala-a	=	6	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
8._at	:	b_day_mala-a	=	7	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
9._at	:	b_day_mala-a	=	8	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
10._at	:	b_day_mala-a	=	9	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
11._at	:	b_day_mala-a	=	10	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
12._at	:	b_day_mala-a	=	11	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
13._at	:	b_day_mala-a	=	12	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
14._at	:	b_day_mala-a	=	13	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
15._at	:	b_day_mala-a	=	14	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
16._at	:	b_day_mala-a	=	15	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
17._at	:	b_day_mala-a	=	16	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
18._at	:	b_day_mala-a	=	17	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
19._at	:	b_day_mala-a	=	18	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)
		p_rene			(asbalanced)
20._at	:	b_day_mala-a	=	19	(asbalanced)
		death_30			(asbalanced)
		p_age2			(asbalanced)
		p_cardio			(asbalanced)
		p_obeso			(asbalanced)


```

                p_rene                (asbalanced)

21._at      : b_day_mala-a =          20
                death_30                (asbalanced)
                p_age2                  (asbalanced)
                p_cardio                (asbalanced)
                p_obeso                 (asbalanced)
                p_rene                  (asbalanced)

22._at      : b_day_mala-a =          21
                death_30                (asbalanced)
                p_age2                  (asbalanced)
                p_cardio                (asbalanced)
                p_obeso                 (asbalanced)
                p_rene                  (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	12.27	0.0005
(nonsurvivor vs survivor) 2	1	10.69	0.0011
(nonsurvivor vs survivor) 3	1	8.68	0.0032
(nonsurvivor vs survivor) 4	1	6.37	0.0116
(nonsurvivor vs survivor) 5	1	4.01	0.0453
(nonsurvivor vs survivor) 6	1	1.91	0.1674
(nonsurvivor vs survivor) 7	1	0.46	0.4998
(nonsurvivor vs survivor) 8	1	0.01	0.9219
(nonsurvivor vs survivor) 9	1	0.84	0.3597
(nonsurvivor vs survivor) 10	1	3.09	0.0789
(nonsurvivor vs survivor) 11	1	6.76	0.0093
(nonsurvivor vs survivor) 12	1	11.75	0.0006
(nonsurvivor vs survivor) 13	1	17.81	0.0000
(nonsurvivor vs survivor) 14	1	24.60	0.0000
(nonsurvivor vs survivor) 15	1	31.68	0.0000
(nonsurvivor vs survivor) 16	1	38.54	0.0000
(nonsurvivor vs survivor) 17	1	44.67	0.0000
(nonsurvivor vs survivor) 18	1	49.62	0.0000
(nonsurvivor vs survivor) 19	1	53.08	0.0000
(nonsurvivor vs survivor) 20	1	54.96	0.0000
(nonsurvivor vs survivor) 21	1	55.34	0.0000
(nonsurvivor vs survivor) 22	1	54.45	0.0000
Joint	5	100.00	0.0000

	Delta-method		
	Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at			
(nonsurvivor vs survivor) 1	-.9193936	.2624571	-1.4338 -.404987
(nonsurvivor vs survivor) 2	-.7890325	.2413354	-1.262041 -.3160238
(nonsurvivor vs survivor) 3	-.657832	.2232637	-1.095421 -.2202431
(nonsurvivor vs survivor) 4	-.5256145	.2081744	-.9336287 -.1176002
(nonsurvivor vs survivor) 5	-.3921989	.1959516	-.776257 -.0081408
(nonsurvivor vs survivor) 6	-.2574002	.1864246	-.6227857 .1079853
(nonsurvivor vs survivor) 7	-.1210289	.1793709	-.4725895 .2305317
(nonsurvivor vs survivor) 8	.0171092	.1745328	-.3249688 .3591872
(nonsurvivor vs survivor) 9	.1572137	.171644	-.1792024 .4936297
(nonsurvivor vs survivor) 10	.2994899	.1704628	-.034611 .6335908
(nonsurvivor vs survivor) 11	.4441495	.1708031	.1093817 .7789173
(nonsurvivor vs survivor) 12	.591411	.1725596	.2532004 .9296216
(nonsurvivor vs survivor) 13	.7415003	.1757239	.3970878 1.085913
(nonsurvivor vs survivor) 14	.8946513	.1803898	.5410939 1.248209
(nonsurvivor vs survivor) 15	1.051107	.1867492	.6850849 1.417128
(nonsurvivor vs survivor) 16	1.211118	.1950784	.8287711 1.593464
(nonsurvivor vs survivor) 17	1.374947	.2057162	.9717504 1.778143
(nonsurvivor vs survivor) 18	1.542866	.2190364	1.113562 1.972169
(nonsurvivor vs survivor) 19	1.715159	.2354206	1.253743 2.176575
(nonsurvivor vs survivor) 20	1.892122	.2552347	1.391872 2.392373
(nonsurvivor vs survivor) 21	2.074065	.2788147	1.527598 2.620532
(nonsurvivor vs survivor) 22	2.26131	.3064621	1.660656 2.861965

```

232 . graph save "Graph" "/Users/Chiara/Documents/fileD0 15 Maggio/Marg_MPV.gph", replace
      (file /Users/Chiara/Documents/fileD0 15 Maggio/Marg_MPV.gph saved)

233 .
234 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
235 . *marginsplot, title("MPV kinetic day 0 to day 30 after onset") ytitle("Cell volume (fl)") xlab(0(5)30) ylab(5(2)15,
      > angle(horizontal)) yline(7, lcolor(red)) yline(11, lcolor(green)) legend(off)
236 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
237 .
238 . ***combine****
239 . gr combine "/Users/Chiara/Documents/fileD0 15 Maggio/Marg_MPV.gph" "/Users/Chiara/Documents/fileD0 15 Maggio/BOX_M
      > PV.gph", ycomm xsize(8) ysize(4)

240 . graph save "Graph" "/Users/Chiara/Documents/fileD0 15 Maggio/Graph_MPV.gph", replace
      (file /Users/Chiara/Documents/fileD0 15 Maggio/Graph_MPV.gph saved)

241 .
242 .
243 . *****
244 . *** analisi HCT *****
245 . *****
246 . **** scatter no model
247 . *use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear
248 . *scatter hct b_day_malattia if death_30==1, mcolor(red) legend(off) title("HCT %") xtitle("day since onset") ytit
      > le("HCT %") || scatter hct b_day_malattia if death_30==0, mcolor(green) legend(off) ms(oh)
249 .
250 . **** modelling
251 . *use "/Users/Chiara/Documents/fileD0 15 Maggio/fileD0\coorte_long_emocromo_anemia_1.dta", clear
252 . *mixed hct ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)
253 . *est store linear
254 . *mixed hct ln c.b_day_malattia##c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)
255 . *est store quadratic
256 . *lrtest linear quadratic
257 .

```

```

258 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
259 . *marginsplot, title("HCT kinetic day 0 to day 28 after onset") ytitle("Cell volume (fl; log-scale)")
260 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
261 .
262 .
263 . *****
264 . *** analisi mcv *****
265 . *****
266 . **** scatter no model
267 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

268 . *scatter mcv b_day_malattia if death_30==1, mcolor(red) legend(off) title("MCV variation over time") xtitle("day
> since onset") ytitle("Cell volume (fl)") xlab(0(5)30)|| scatter mcv b_day_malattia if death_30==0, mcolor(green)
> legend(off) ms(oh)
269 .
270 . *****Graph box*****
271 . graph box mcv, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitle
> (Cells volume (fl)) yline(80, lcolor(red)) legend(off)

272 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_MCV.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_MCV.gph saved)

273 . **** modelling
274 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

275 . mixed mcv ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 3881.4055
Iteration 1: log likelihood = 3881.4181
Iteration 2: log likelihood = 3881.4181

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =        4.8
      max =        22

Wald chi2(3)      =    42.56
Prob > chi2       =    0.0000

Log likelihood = 3881.4181

```

mcv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	.0010319	.0002037	5.07	0.000	.0006326	.0014312
death_30 nonsurvivor	.0508694	.0124139	4.10	0.000	.0265387	.0752001
death_30#c.b_day_malattia nonsurvivor	-.0004992	.0006146	-0.81	0.417	-.0017039	.0007054
_cons	4.46217	.004274	1044.02	0.000	4.453793	4.470547

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	5.95e-06	8.62e-07	4.48e-06	7.90e-06
var(_cons)	.0049492	.0004213	.0041887	.0058477
cov(b_day_malattia,_cons)	-.000066	.0000146	-.0000946	-.0000373
var(Residual)	.0002965	.0000122	.0002735	.0003213

LR test vs. linear model: chi2(3) = 3647.86 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

```
276 . est store linear
```

```

277 . mixed mcv ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene|| progr:b_day_
> malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 3895.8695
Iteration 1: log likelihood = 3895.8837
Iteration 2: log likelihood = 3895.8837

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =        4.8
      max =        22

Wald chi2(9)      =    71.94
Prob > chi2       =    0.0000

Log likelihood = 3895.8837

```

mcv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0001139	.0005479	-0.21	0.835	-.0011878	.00096
c.b_day_malattia#c.b_day_malattia	.0000462	.0000206	2.25	0.025	5.93e-06	.0000865

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```
9._at      : b_day_mala~a      =      8
            death_30           (asbalanced)
            p_age2              (asbalanced)
            p_cardio            (asbalanced)
```

```

      p_obeso      (asbalanced)
      p_rene      (asbalanced)

10._at      : b_day_mala-a =      9
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

11._at      : b_day_mala-a =     10
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

12._at      : b_day_mala-a =     11
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

13._at      : b_day_mala-a =     12
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

14._at      : b_day_mala-a =     13
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

15._at      : b_day_mala-a =     14
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

16._at      : b_day_mala-a =     15
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

17._at      : b_day_mala-a =     16
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

18._at      : b_day_mala-a =     17
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

19._at      : b_day_mala-a =     18
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

20._at      : b_day_mala-a =     19
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

21._at      : b_day_mala-a =     20
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at      : b_day_mala-a =     21
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	87.63465	.9886045	88.64	0.000	85.69702	89.57228
1#nonsurvivor	89.97241	1.302937	69.05	0.000	87.4187	92.52612
2#survivor	87.62872	.9752644	89.85	0.000	85.71723	89.5402
2#nonsurvivor	90.36644	1.259146	71.77	0.000	87.89856	92.83432
3#survivor	87.63088	.9646516	90.84	0.000	85.7402	89.52156
3#nonsurvivor	90.72909	1.224892	74.07	0.000	88.32834	93.12983
4#survivor	87.64115	.9564088	91.64	0.000	85.76662	89.51567
4#nonsurvivor	91.05995	1.199193	75.93	0.000	88.70957	93.41032
5#survivor	87.65952	.9501902	92.25	0.000	85.79718	89.52185

5#nonsurvivor	91.35867	1.18091	77.36	0.000	89.04413	93.67321
6#survivor	87.68599	.9456694	92.72	0.000	85.83252	89.53947
6#nonsurvivor	91.62493	1.168824	78.39	0.000	89.33408	93.91578
7#survivor	87.72059	.9425454	93.07	0.000	85.87323	89.56794
7#nonsurvivor	91.85844	1.161722	79.07	0.000	89.5815	94.13537
8#survivor	87.7633	.9405486	93.31	0.000	85.91986	89.60674
8#nonsurvivor	92.05894	1.158473	79.47	0.000	89.78837	94.3295
9#survivor	87.81416	.9394438	93.47	0.000	85.97288	89.65543
9#nonsurvivor	92.22622	1.158087	79.64	0.000	89.95641	94.49603
10#survivor	87.87316	.9390334	93.58	0.000	86.03269	89.71363
10#nonsurvivor	92.36009	1.15976	79.64	0.000	90.087	94.63318
11#survivor	87.94033	.9391591	93.64	0.000	86.09961	89.78105
11#nonsurvivor	92.4604	1.162902	79.51	0.000	90.18116	94.73965
12#survivor	88.01569	.9397027	93.66	0.000	86.17391	89.85747
12#nonsurvivor	92.52706	1.167151	79.28	0.000	90.23949	94.81463
13#survivor	88.09925	.9405874	93.66	0.000	86.25574	89.94277
13#nonsurvivor	92.55998	1.172382	78.95	0.000	90.26215	94.8578
14#survivor	88.19105	.9417777	93.64	0.000	86.3452	90.0369
14#nonsurvivor	92.55913	1.178705	78.53	0.000	90.24891	94.86934
15#survivor	88.2911	.94328	93.60	0.000	86.4423	90.13989
15#nonsurvivor	92.5245	1.186459	77.98	0.000	90.19909	94.84992
16#survivor	88.39943	.9451424	93.53	0.000	86.54699	90.25188
16#nonsurvivor	92.45615	1.196199	77.29	0.000	90.11164	94.80065
17#survivor	88.51608	.9474552	93.43	0.000	86.6591	90.37306
17#nonsurvivor	92.35413	1.208677	76.41	0.000	89.98517	94.72309
18#survivor	88.64107	.9503504	93.27	0.000	86.77842	90.50373
18#nonsurvivor	92.21857	1.224809	75.29	0.000	89.81799	94.61915
19#survivor	88.77445	.9540015	93.05	0.000	86.90464	90.64426
19#nonsurvivor	92.04961	1.245635	73.90	0.000	89.60821	94.49101
20#survivor	88.91624	.9586224	92.75	0.000	87.03738	90.79511
20#nonsurvivor	91.84743	1.272264	72.19	0.000	89.35384	94.34103
21#survivor	89.06649	.9644658	92.35	0.000	87.17618	90.95681
21#nonsurvivor	91.61227	1.30581	70.16	0.000	89.05292	94.17161
22#survivor	89.22525	.9718204	91.81	0.000	87.32051	91.12998
22#nonsurvivor	91.34436	1.347326	67.80	0.000	88.70365	93.98507

```
283 . marginsplot, ytitle("Cells volume (fl)") xlab(0(1)21) ylab(70(10)110) yline(80, lcolor(red)) legend(off)
```

```
Variables that uniquely identify margins: b_day_malattia death_30
```

```
284 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal
```

```
Contrasts of adjusted predictions          Number of obs      =      1,805
```

```
Expression   : exp(predict(xb))
```

```
1._at      : b_day_mala-a =      0
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
2._at      : b_day_mala-a =      1
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
3._at      : b_day_mala-a =      2
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
4._at      : b_day_mala-a =      3
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
5._at      : b_day_mala-a =      4
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
6._at      : b_day_mala-a =      5
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
7._at      : b_day_mala-a =      6
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
8._at      : b_day_mala-a =      7
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
9._at      : b_day_mala-a =      8
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
```

```

      p_rene                                (asbalanced)

10._at   : b_day_mala-a = 9
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

11._at   : b_day_mala-a = 10
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

12._at   : b_day_mala-a = 11
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

13._at   : b_day_mala-a = 12
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

14._at   : b_day_mala-a = 13
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

15._at   : b_day_mala-a = 14
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

16._at   : b_day_mala-a = 15
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

17._at   : b_day_mala-a = 16
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

18._at   : b_day_mala-a = 17
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

19._at   : b_day_mala-a = 18
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

20._at   : b_day_mala-a = 19
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

21._at   : b_day_mala-a = 20
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

22._at   : b_day_mala-a = 21
          death_30 (asbalanced)
          p_age2   (asbalanced)
          p_cardio (asbalanced)
          p_obeso  (asbalanced)
          p_rene   (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	3.38	0.0660
(nonsurvivor vs survivor) 2	1	5.08	0.0241
(nonsurvivor vs survivor) 3	1	7.04	0.0080
(nonsurvivor vs survivor) 4	1	9.12	0.0025
(nonsurvivor vs survivor) 5	1	11.20	0.0008
(nonsurvivor vs survivor) 6	1	13.13	0.0003
(nonsurvivor vs survivor) 7	1	14.82	0.0001
(nonsurvivor vs survivor) 8	1	16.17	0.0001
(nonsurvivor vs survivor) 9	1	17.15	0.0000
(nonsurvivor vs survivor) 10	1	17.73	0.0000
(nonsurvivor vs survivor) 11	1	17.91	0.0000

(nonsurvivor vs survivor) 12	1	17.70	0.0000
(nonsurvivor vs survivor) 13	1	17.13	0.0000
(nonsurvivor vs survivor) 14	1	16.21	0.0001
(nonsurvivor vs survivor) 15	1	14.97	0.0001
(nonsurvivor vs survivor) 16	1	13.45	0.0002
(nonsurvivor vs survivor) 17	1	11.72	0.0006
(nonsurvivor vs survivor) 18	1	9.83	0.0017
(nonsurvivor vs survivor) 19	1	7.89	0.0050
(nonsurvivor vs survivor) 20	1	5.98	0.0144
(nonsurvivor vs survivor) 21	1	4.22	0.0399
(nonsurvivor vs survivor) 22	1	2.71	0.1000
Joint	5	56.45	0.0000

	Delta-method			
	Contrast	Std. Err.	[95% Conf. Interval]	
death_30@_at				
(nonsurvivor vs survivor) 1	2.337763	1.271823	-.1549639	4.83049
(nonsurvivor vs survivor) 2	2.737729	1.214203	.3579347	5.117522
(nonsurvivor vs survivor) 3	3.098205	1.167916	.8091323	5.387277
(nonsurvivor vs survivor) 4	3.4188	1.132068	1.199986	5.637613
(nonsurvivor vs survivor) 5	3.699153	1.105514	1.532385	5.865921
(nonsurvivor vs survivor) 6	3.938936	1.086933	1.808587	6.069285
(nonsurvivor vs survivor) 7	4.137852	1.074934	2.03102	6.244684
(nonsurvivor vs survivor) 8	4.295637	1.068166	2.202071	6.389203
(nonsurvivor vs survivor) 9	4.412061	1.065404	2.323909	6.500214
(nonsurvivor vs survivor) 10	4.486927	1.065625	2.398341	6.575513
(nonsurvivor vs survivor) 11	4.520073	1.068056	2.426722	6.613424
(nonsurvivor vs survivor) 12	4.51137	1.072199	2.409899	6.612841
(nonsurvivor vs survivor) 13	4.460724	1.077846	2.348186	6.573263
(nonsurvivor vs survivor) 14	4.368077	1.085077	2.241365	6.494789
(nonsurvivor vs survivor) 15	4.233403	1.094256	2.088701	6.378104
(nonsurvivor vs survivor) 16	4.056712	1.106006	1.888981	6.224443
(nonsurvivor vs survivor) 17	3.83805	1.121187	1.640565	6.035535
(nonsurvivor vs survivor) 18	3.577494	1.140848	1.341473	5.813516
(nonsurvivor vs survivor) 19	3.275159	1.166173	.9895012	5.560817
(nonsurvivor vs survivor) 20	2.931191	1.198403	.5823646	5.280018
(nonsurvivor vs survivor) 21	2.545771	1.238755	.1178566	4.973686
(nonsurvivor vs survivor) 22	2.119113	1.28834	-.4059876	4.644214

```
285 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_MCV.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_MCV.gph saved)

286 .
287 . *margins death_30, at(b_day_malattia=(0|1)30)) expression(exp(predict(xb)))
288 . *marginsplot, title("MCV kinetic day 0 to day 30 after onset") ytitle("Cell volume (fL)" xlab(0(5)30) ylab(75(5)10
> 0, angle(horizontal)) ylabel(80, lcolor(red)) legend(off)
289 . *margins ar.death_30, at(b_day_malattia=(0|1)30)) expression(exp(predict(xb)))
290 .
291 . ***combine****
292 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_MCV.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_M
> CV.gph", ycomm xsize(8) ysize(4)

293 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_MCV.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_MCV.gph saved)

294 .
295 . *****
296 . *** analisi RDW-CV *****
297 . *****
298 . **** scatter no model
299 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

300 . *scatter rdwcv b_day_malattia if death_30==1, mcolor(red) legend(off) title("RDW-CV% variation over time") xtitle
> ("day since onset") ytitle("RDW-CV (%)") xlab(0(5)30)|| scatter rdwcv b_day_malattia if death_30==0, mcolor(green
> ) legend(off) ms(oh)
301 . *keep if rdwcv!=.
302 .
303 . *****Graph box*****
304 . graph box rdwcv, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytit
> le(Cells volume (fL)) ylabel(14, lcolor(red)) legend(off)

305 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_RDW.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_RDW.gph saved)

306 .
307 . **** modelling
308 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

309 . mixed rdwcv ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)
```

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = 3194.0524
Iteration 1: log likelihood = 3194.0531
Iteration 2: log likelihood = 3194.0531

Computing standard errors:

Mixed-effects ML regression
Group variable: **progr**

Number of obs = 1,805
Number of groups = 379

Obs per group:
min = 1
avg = 4.8
max = 22

Wald chi2(3) = 83.89
Prob > chi2 = 0.0000

Log likelihood = 3194.0531

rdwcv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
----------	-------	-----------	---	------	----------------------

b_day_malattia	.0006332	.0003203	1.98	0.048	5.45e-06	.001261
death_30 nonsurvivor	.067003	.016913	3.96	0.000	.0338541	.1001518
death_30#c.b_day_malattia nonsurvivor	.0053289	.0009825	5.42	0.000	.0034032	.0072546
_cons	2.56952	.0058591	438.55	0.000	2.558037	2.581004

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000165	1.99e-06	.000013	.0000209
var(_cons)	.0089686	.0007812	.007561	.0106382
cov(b_day_malattia,_cons)	-.0000786	.00003	-.0001375	-.0000198
var(Residual)	.0006158	.000025	.0005686	.0006668

LR test vs. linear model: $\chi^2(3) = 3387.52$ Prob > $\chi^2 = 0.0000$

Note: LR test is conservative and provided only for reference.

310 . est store linear

311 . mixed rdwcv_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_d
> ay_malattia, cov(unstr)

Performing EM optimization:

Performing gradient-based optimization:

Iteration 0: log likelihood = 3237.8802
Iteration 1: log likelihood = 3237.8807
Iteration 2: log likelihood = 3237.8807

Computing standard errors:

Mixed-effects ML regression Number of obs = 1,805
Group variable: **progr** Number of groups = 379

Obs per group:
min = 1
avg = 4.8
max = 22

Wald $\chi^2(9)$ = 186.47
Log likelihood = 3237.8807 Prob > χ^2 = 0.0000

rdwcv_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0006197	.0008029	-0.77	0.440	-.0021933	.000954
c.b_day_malattia#c.b_day_malattia	.0000504	.0000299	1.69	0.092	-8.22e-06	.000109
death_30 nonsurvivor	.0548367	.0188874	2.90	0.004	.017818	.0918554
death_30#c.b_day_malattia nonsurvivor	-.0017401	.0020595	-0.84	0.398	-.0057767	.0022964
death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0003325	.0000822	4.05	0.000	.0001714	.0004935
1.p_age2	.0355318	.0099427	3.57	0.000	.0160444	.0550192
1.p_cardio	.039348	.0106709	3.69	0.000	.0184334	.0602626
1.p_obeso	-.0000827	.0189147	-0.00	0.997	-.0371548	.0369894
1.p_rene	.0855343	.0219689	3.89	0.000	.0424761	.1285925
_cons	2.542967	.0086469	294.09	0.000	2.526019	2.559915

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000167	2.00e-06	.0000132	.0000212
var(_cons)	.0079089	.000708	.0066361	.0094259
cov(b_day_malattia,_cons)	-.0001011	.0000294	-.0001588	-.0000434
var(Residual)	.0006023	.0000245	.0005561	.0006523

LR test vs. linear model: $\chi^2(3) = 3166.07$ Prob > $\chi^2 = 0.0000$

Note: LR test is conservative and provided only for reference.

312 . est store quadratic

313 . lrtest linear quadratic

Likelihood-ratio test LR $\chi^2(6)$ = 87.66
(Assumption: linear nested in quadratic) Prob > χ^2 = 0.0000

314 . *****margins*****

315 . quiet:mixed rdwcv_ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || pro
> gr:b_day_malattia, cov(unstr)

316 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions Number of obs = 1,805

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = 0
 death_30 (asbalanced)
 p_age2 (asbalanced)


```

      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

2._at      : b_day_mala-a =      1
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

3._at      : b_day_mala-a =      2
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

4._at      : b_day_mala-a =      3
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

5._at      : b_day_mala-a =      4
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

6._at      : b_day_mala-a =      5
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

7._at      : b_day_mala-a =      6
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

8._at      : b_day_mala-a =      7
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

9._at      : b_day_mala-a =      8
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

10._at     : b_day_mala-a =      9
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

11._at     : b_day_mala-a =     10
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

12._at     : b_day_mala-a =     11
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

13._at     : b_day_mala-a =     12
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

14._at     : b_day_mala-a =     13
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

15._at     : b_day_mala-a =     14
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

16._at     : b_day_mala-a =     15
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

```

17._at      : b_day_mala-a =      16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =      17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =      18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =      19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =      20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =      21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	13.77882	.2107385	65.38	0.000	13.36578	14.19186
1#nonsurvivor	14.55551	.280021	51.98	0.000	14.00668	15.10434
2#survivor	13.77098	.2074847	66.37	0.000	13.36432	14.17764
2#nonsurvivor	14.52676	.2676984	54.27	0.000	14.00208	15.05144
3#survivor	13.76453	.2049122	67.17	0.000	13.36291	14.16615
3#nonsurvivor	14.50917	.2583346	56.16	0.000	14.00285	15.0155
4#survivor	13.75947	.2029351	67.80	0.000	13.36172	14.15721
4#nonsurvivor	14.50271	.251644	57.63	0.000	14.0095	14.99592
5#survivor	13.7558	.2014696	68.28	0.000	13.36092	14.15067
5#nonsurvivor	14.50735	.2473073	58.66	0.000	14.02264	14.99207
6#survivor	13.75351	.2004359	68.62	0.000	13.36066	14.14636
6#nonsurvivor	14.52312	.2449919	59.28	0.000	14.04294	15.00329
7#survivor	13.75261	.1997604	68.85	0.000	13.36109	14.14414
7#nonsurvivor	14.55003	.2443731	59.54	0.000	14.07107	15.02899
8#survivor	13.7531	.1993769	68.98	0.000	13.36233	14.14387
8#nonsurvivor	14.58816	.2451543	59.51	0.000	14.10767	15.06866
9#survivor	13.75497	.1992277	69.04	0.000	13.36449	14.14545
9#nonsurvivor	14.6376	.2470825	59.24	0.000	14.15332	15.12187
10#survivor	13.75823	.1992644	69.05	0.000	13.36768	14.14878
10#nonsurvivor	14.69845	.2499585	58.80	0.000	14.20854	15.18836
11#survivor	13.76288	.1994482	69.00	0.000	13.37197	14.15379
11#nonsurvivor	14.77086	.2536426	58.23	0.000	14.27373	15.26799
12#survivor	13.76892	.1997507	68.93	0.000	13.37741	14.16042
12#nonsurvivor	14.855	.2580565	57.56	0.000	14.34922	15.36078
13#survivor	13.77634	.2001531	68.83	0.000	13.38405	14.16864
13#nonsurvivor	14.95106	.2631841	56.81	0.000	14.43523	15.46689
14#survivor	13.78516	.2006473	68.70	0.000	13.3919	14.17843
14#nonsurvivor	15.05927	.2690695	55.97	0.000	14.5319	15.58663
15#survivor	13.79538	.201235	68.55	0.000	13.40097	14.18979
15#nonsurvivor	15.17988	.2758156	55.04	0.000	14.63929	15.72046
16#survivor	13.807	.2019282	68.38	0.000	13.41123	14.20277
16#nonsurvivor	15.31317	.283581	54.00	0.000	14.75736	15.86898
17#survivor	13.82002	.2027487	68.16	0.000	13.42264	14.2174
17#nonsurvivor	15.45947	.2925762	52.84	0.000	14.88603	16.03291
18#survivor	13.83444	.2037284	67.91	0.000	13.43514	14.23374
18#nonsurvivor	15.61913	.3030585	51.54	0.000	15.02514	16.21311
19#survivor	13.85028	.2049083	67.59	0.000	13.44866	14.25189
19#nonsurvivor	15.79251	.3153252	50.08	0.000	15.17449	16.41054
20#survivor	13.86753	.2063391	67.21	0.000	13.46311	14.27194
20#nonsurvivor	15.98006	.3297051	48.47	0.000	15.33385	16.62627
21#survivor	13.8862	.2080796	66.74	0.000	13.47837	14.29403
21#nonsurvivor	16.18222	.3465489	46.70	0.000	15.503	16.86144
22#survivor	13.9063	.2101966	66.16	0.000	13.49432	14.31827
22#nonsurvivor	16.39949	.3662199	44.78	0.000	15.68171	17.11726

```

317 . marginsplot, ytitle("RDW %") xlab(0(1)21) ylab(10(2)18) yline(14, lcolor(red)) legend(off)

```

```

Variables that uniquely identify margins: b_day_malattia death_30

```

```

318 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

```

```

Contrasts of adjusted predictions          Number of obs      =      1,805

```

```

Expression   : exp(predict(xb))

```

```

1._at      : b_day_mala-a =      0
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)

```

	p_obeso		(asbalanced)
	p_rene		(asbalanced)
2._at	: b_day_mala-a	=	1
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
3._at	: b_day_mala-a	=	2
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
4._at	: b_day_mala-a	=	3
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
5._at	: b_day_mala-a	=	4
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
6._at	: b_day_mala-a	=	5
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
7._at	: b_day_mala-a	=	6
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
8._at	: b_day_mala-a	=	7
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
9._at	: b_day_mala-a	=	8
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
10._at	: b_day_mala-a	=	9
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
11._at	: b_day_mala-a	=	10
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
12._at	: b_day_mala-a	=	11
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
13._at	: b_day_mala-a	=	12
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
14._at	: b_day_mala-a	=	13
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
15._at	: b_day_mala-a	=	14
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)
16._at	: b_day_mala-a	=	15
	death_30		(asbalanced)
	p_age2		(asbalanced)
	p_cardio		(asbalanced)
	p_obeso		(asbalanced)
	p_rene		(asbalanced)

```

17._at      : b_day_mala-a =      16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =      17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =      18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =      19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =      20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =      21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	8.24	0.0041
(nonsurvivor vs survivor) 2	1	8.75	0.0031
(nonsurvivor vs survivor) 3	1	9.33	0.0022
(nonsurvivor vs survivor) 4	1	10.00	0.0016
(nonsurvivor vs survivor) 5	1	10.76	0.0010
(nonsurvivor vs survivor) 6	1	11.64	0.0006
(nonsurvivor vs survivor) 7	1	12.66	0.0004
(nonsurvivor vs survivor) 8	1	13.85	0.0002
(nonsurvivor vs survivor) 9	1	15.26	0.0001
(nonsurvivor vs survivor) 10	1	16.92	0.0000
(nonsurvivor vs survivor) 11	1	18.85	0.0000
(nonsurvivor vs survivor) 12	1	21.09	0.0000
(nonsurvivor vs survivor) 13	1	23.64	0.0000
(nonsurvivor vs survivor) 14	1	26.50	0.0000
(nonsurvivor vs survivor) 15	1	29.64	0.0000
(nonsurvivor vs survivor) 16	1	33.01	0.0000
(nonsurvivor vs survivor) 17	1	36.51	0.0000
(nonsurvivor vs survivor) 18	1	40.02	0.0000
(nonsurvivor vs survivor) 19	1	43.40	0.0000
(nonsurvivor vs survivor) 20	1	46.50	0.0000
(nonsurvivor vs survivor) 21	1	49.17	0.0000
(nonsurvivor vs survivor) 22	1	51.30	0.0000
Joint	5	165.28	0.0000

	Delta-method		
	Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at			
(nonsurvivor vs survivor) 1	.7766853	.2706044	.2463104 1.30706
(nonsurvivor vs survivor) 2	.7557797	.2554936	.2550216 1.256538
(nonsurvivor vs survivor) 3	.7446448	.2437229	.2669567 1.222333
(nonsurvivor vs survivor) 4	.7432419	.2350389	.2825741 1.20391
(nonsurvivor vs survivor) 5	.7515579	.2291253	.3024805 1.200635
(nonsurvivor vs survivor) 6	.7696045	.2256223	.3273928 1.211816
(nonsurvivor vs survivor) 7	.7974185	.2241547	.3580834 1.236754
(nonsurvivor vs survivor) 8	.8350623	.2243618	.3953213 1.274803
(nonsurvivor vs survivor) 9	.8826236	.2259236	.4398215 1.325426
(nonsurvivor vs survivor) 10	.9402159	.2285798	.4922077 1.388224
(nonsurvivor vs survivor) 11	1.007979	.2321408	.5529915 1.462967
(nonsurvivor vs survivor) 12	1.08608	.2364927	.6225631 1.549597
(nonsurvivor vs survivor) 13	1.174713	.2415978	.70119 1.648236
(nonsurvivor vs survivor) 14	1.274101	.2474936	.789022 1.759179
(nonsurvivor vs survivor) 15	1.384494	.2542883	.8860979 1.88289
(nonsurvivor vs survivor) 16	1.506175	.2621571	.9923567 2.019994
(nonsurvivor vs survivor) 17	1.639457	.271335	1.10765 2.171264
(nonsurvivor vs survivor) 18	1.784685	.2821089	1.231762 2.337609
(nonsurvivor vs survivor) 19	1.942239	.2948071	1.364428 2.520051
(nonsurvivor vs survivor) 20	2.112534	.309787	1.505362 2.719705
(nonsurvivor vs survivor) 21	2.29602	.327422	1.654285 2.937756
(nonsurvivor vs survivor) 22	2.49319	.3480892	1.810948 3.175433

```

319 . graph save "Graph" "/Users/Chiara/Documents/fileD0 15 Maggio/Marg_RDW.gph", replace
      (file /Users/Chiara/Documents/fileD0 15 Maggio/Marg_RDW.gph saved)

320 .
321 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
322 . *marginsplot, title("RDW-CV% kinetic day 0 to day 30 after onset") ytitle("RDW (%)") xlab(0(5)30) ylab(10(2)20, an
      > gle(horizontal)) yline(14, lcolor(red)) legend(off)
323 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))

```

```

324 .
325 . ***combine****
326 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_RDW.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_R
> DW.gph", ycomm xsize(8) ysize(4)

327 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_RDW.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_RDW.gph saved)

328 .
329 . *****
330 . *** analisi RBC*****
331 . *****
332 . **** scatter no model
333 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

334 . *scatter rbc b_day_malattia if death_30==1, mcolor(red) legend(off) title("RBC variation over time") xtitle("day
> since onset") ytitle("RBC per mmc X 1000000") xlab(0(5)30)|| scatter rbc b_day_malattia if death_30==0, mcolor(gr
> een) legend(off) ms(oh)
335 . *keep if rdwcv!=.
336 . *****Graph box*****
337 . replace rbc=rbc*1000000
(1,805 real changes made)

338 . graph box rbc, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitle
> (Cells per mmc x 1000000) yline(3000000, lcolor(red)) legend(off)

339 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_RBC.gph", replace
(file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_RBC.gph saved)

340 . **** modelling
341 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

342 . mixed rbc ln c.b_day_malattia##i.death_30 || progr:b_day_malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 1661.5037
Iteration 1: log likelihood = 1661.5103
Iteration 2: log likelihood = 1661.5103

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =         4.8
      max =        22

Wald chi2(3)    =    129.70
Prob > chi2     =     0.0000

Log likelihood = 1661.5103

```

	rbc_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	-.0059862	.0007063	-8.48	0.000	-.0073706	-.0046018
	death_30 nonsurvivor	-.1346529	.0307841	-4.37	0.000	-.1949886	-.0743173
	death_30#c.b_day_malattia nonsurvivor	-.0034302	.0021124	-1.62	0.104	-.0075704	.0007099
	_cons	15.38927	.0110902	1387.65	0.000	15.36753	15.411

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr : Unstructured				
var(b_day_malattia)	.0000655	9.52e-06	.0000493	.0000871
var(_cons)	.0259037	.0026059	.0212682	.0315496
cov(b_day_malattia,_cons)	-.0005826	.0001341	-.0008455	-.0003197
var(Residual)	.0044198	.0001783	.0040837	.0047836

LR test vs. linear model: chi2(3) = 2292.52 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

```

343 . est store linear

```

```

344 . mixed rbc ln c.b_day_malattia##c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day
> _malattia, cov(unstr)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 1694.3095
Iteration 1: log likelihood = 1694.3168
Iteration 2: log likelihood = 1694.3168

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

Obs per group:
      min =         1
      avg =         4.8
      max =        22

Wald chi2(9)    =    207.08
Prob > chi2     =     0.0000

Log likelihood = 1694.3168

```

	rbc_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
	b_day_malattia	-.0073368	.002025	-3.62	0.000	-.0113056	-.0033679
	c.b_day_malattia#c.b_day_malattia	.0000585	.0000771	0.76	0.448	-.0000926	.0002096
	death_30 nonsurvivor	-.0426858	.0380358	-1.12	0.262	-.1172345	.0318629
	death_30#c.b_day_malattia nonsurvivor	-.0130316	.0051749	-2.52	0.012	-.0231742	-.002889
	death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0004259	.0002116	2.01	0.044	.0000111	.0008407
	1.p_age2	-.0644802	.0157717	-4.09	0.000	-.095392	-.0335683
	1.p_cardio	.0093844	.0169037	0.56	0.579	-.0237463	.0425151
	1.p_obeso	.0368329	.0299484	1.23	0.219	-.0218649	.0955307
	1.p_rene	-.2186919	.0348034	-6.28	0.000	-.2869053	-.1504786
	_cons	15.43243	.0170308	906.15	0.000	15.39905	15.46581

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000694	.00001	.0000523	.000092
var(_cons)	.0245928	.0025468	.0200752	.030127
cov(b_day_malattia,_cons)	-.0006992	.0001403	-.0009741	-.0004242
var(Residual)	.0043675	.0001767	.0040346	.004728

LR test vs. linear model: chi2(3) = 2164.87 Prob > chi2 = 0.0000

Note: LR test is conservative and provided only for reference.

345 . est store quadratic

346 . lrtest linear quadratic

Likelihood-ratio test LR chi2(6) = 65.61
(Assumption: linear nested in quadratic) Prob > chi2 = 0.0000

347 . ***margins*****

348 . quiet: mixed rbc_ln c.b_day_malattia#c.b_day_malattia#i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || prog
> r:b_day_malattia, cov(unstr)

349 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

Adjusted predictions Number of obs = 1,805

Expression : exp(predict(xb))

1._at : b_day_mala-a = 0
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

2._at : b_day_mala-a = 1
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

3._at : b_day_mala-a = 2
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

4._at : b_day_mala-a = 3
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

5._at : b_day_mala-a = 4
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

6._at : b_day_mala-a = 5
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

7._at : b_day_mala-a = 6
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

8._at : b_day_mala-a = 7
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)

```

      p_obeso      (asbalanced)
      p_rene      (asbalanced)

9._at      : b_day_mala-a =      8      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

10._at     : b_day_mala-a =      9      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

11._at     : b_day_mala-a =     10      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

12._at     : b_day_mala-a =     11      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

13._at     : b_day_mala-a =     12      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

14._at     : b_day_mala-a =     13      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

15._at     : b_day_mala-a =     14      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

16._at     : b_day_mala-a =     15      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

17._at     : b_day_mala-a =     16      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

18._at     : b_day_mala-a =     17      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

19._at     : b_day_mala-a =     18      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

20._at     : b_day_mala-a =     19      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

21._at     : b_day_mala-a =     20      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at     : b_day_mala-a =     21      (asbalanced)
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

	Delta-method				
	Margin	Std. Err.	z	P> z	[95% Conf. Interval]
._at#death_30					
1#survivor	4474709	117652.2	38.03	0.000	4244115 4705303
1#nonsurvivor	4287722	158954.8	26.97	0.000	3976176 4599267

2#survivor	4442259	112971.6	39.32	0.000	4220839	4663679
2#nonsurvivor	4203306	143880.2	29.21	0.000	3921306	4485307
3#survivor	4410560	109097.2	40.43	0.000	4196733	4624386
3#nonsurvivor	4124547	131690.1	31.32	0.000	3866439	4382655
4#survivor	4379599	105934.8	41.34	0.000	4171970	4587227
4#nonsurvivor	4051186	122118.6	33.17	0.000	3811838	4290534
5#survivor	4349364	103385.9	42.07	0.000	4146731	4551997
5#nonsurvivor	3982987	114853.8	34.68	0.000	3757877	4208096
6#survivor	4319843	101352.1	42.62	0.000	4121196	4518489
6#nonsurvivor	3919731	109546.7	35.78	0.000	3705023	4134438
7#survivor	4291024	99738.81	43.02	0.000	4095539	4486508
7#nonsurvivor	3861218	105832.5	36.48	0.000	3653790	4068646
8#survivor	4262895	98459.08	43.30	0.000	4069919	4455872
8#nonsurvivor	3807265	103359.7	36.84	0.000	3604684	4009847
9#survivor	4235447	97436.08	43.47	0.000	4044475	4426418
9#nonsurvivor	3757705	101817.4	36.91	0.000	3558147	3957263
10#survivor	4208667	96604.98	43.57	0.000	4019324	4398009
10#nonsurvivor	3712385	100954.1	36.77	0.000	3514518	3910251
11#survivor	4182545	95914.01	43.61	0.000	3994557	4370533
11#nonsurvivor	3671165	100587.2	36.50	0.000	3474018	3868313
12#survivor	4157072	95324.86	43.61	0.000	3970238	4343905
12#nonsurvivor	3633922	100604.6	36.12	0.000	3436741	3831104
13#survivor	4132237	94812.71	43.58	0.000	3946407	4318066
13#nonsurvivor	3600544	100961.1	35.66	0.000	3402664	3798424
14#survivor	4108030	94366.07	43.53	0.000	3923076	4292984
14#nonsurvivor	3570929	101673	35.12	0.000	3371654	3770205
15#survivor	4084443	93986.31	43.46	0.000	3900233	4268653
15#nonsurvivor	3544991	102811.6	34.48	0.000	3343484	3746498
16#survivor	4061467	93687.26	43.35	0.000	3877843	4245090
16#nonsurvivor	3522652	104495	33.71	0.000	3317845	3727458
17#survivor	4039091	93494.67	43.20	0.000	3855845	4222338
17#nonsurvivor	3503846	106878.9	32.78	0.000	3294367	3713325
18#survivor	4017309	93445.45	42.99	0.000	3834159	4200459
18#nonsurvivor	3488519	110144.9	31.67	0.000	3272639	3704399
19#survivor	3996112	93586.77	42.70	0.000	3812685	4179538
19#nonsurvivor	3476625	114486.6	30.37	0.000	3252236	3701015
20#survivor	3975491	93974.68	42.30	0.000	3791304	4159678
20#nonsurvivor	3468130	120095.1	28.88	0.000	3232748	3703512
21#survivor	3955439	94672.3	41.78	0.000	3769885	4140993
21#nonsurvivor	3463009	127145.9	27.24	0.000	3213807	3712210
22#survivor	3935948	95747.44	41.11	0.000	3748287	4123610
22#nonsurvivor	3461246	135789.6	25.49	0.000	3195104	3727389

```
350 . marginsplot, ytitle("Cells per mmc") xlab(0(1)21) ylab(2000000(1000000)6000000) yline(3000000, lcolor(red)) legend
> (off)
```

Variables that uniquely identify margins: b_day_malattia death_30

```
351 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal
```

Contrasts of adjusted predictions Number of obs = **1,805**

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = **0**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

2._at : b_day_mala-a = **1**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

3._at : b_day_mala-a = **2**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

4._at : b_day_mala-a = **3**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

5._at : b_day_mala-a = **4**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

6._at : b_day_mala-a = **5**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

7._at : b_day_mala-a = **6**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

8._at : b_day_mala-a = **7**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)


```

      p_obeso      (asbalanced)
      p_rene      (asbalanced)

9._at      : b_day_mala-a =      8
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

10._at     : b_day_mala-a =      9
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

11._at     : b_day_mala-a =     10
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

12._at     : b_day_mala-a =     11
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

13._at     : b_day_mala-a =     12
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

14._at     : b_day_mala-a =     13
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

15._at     : b_day_mala-a =     14
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

16._at     : b_day_mala-a =     15
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

17._at     : b_day_mala-a =     16
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

18._at     : b_day_mala-a =     17
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

19._at     : b_day_mala-a =     18
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

20._at     : b_day_mala-a =     19
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

21._at     : b_day_mala-a =     20
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

22._at     : b_day_mala-a =     21
      death_30      (asbalanced)
      p_age2      (asbalanced)
      p_cardio      (asbalanced)
      p_obeso      (asbalanced)
      p_rene      (asbalanced)

```

	df	chi2	P>chi2
death_30#_at			
(nonsurvivor vs survivor) 1	1	1.28	0.2572
(nonsurvivor vs survivor) 2	1	2.61	0.1065
(nonsurvivor vs survivor) 3	1	4.54	0.0330

(nonsurvivor vs survivor) 4	1	7.11	0.0077
(nonsurvivor vs survivor) 5	1	10.18	0.0014
(nonsurvivor vs survivor) 6	1	13.54	0.0002
(nonsurvivor vs survivor) 7	1	16.90	0.0000
(nonsurvivor vs survivor) 8	1	20.02	0.0000
(nonsurvivor vs survivor) 9	1	22.71	0.0000
(nonsurvivor vs survivor) 10	1	24.89	0.0000
(nonsurvivor vs survivor) 11	1	26.54	0.0000
(nonsurvivor vs survivor) 12	1	27.65	0.0000
(nonsurvivor vs survivor) 13	1	28.24	0.0000
(nonsurvivor vs survivor) 14	1	28.29	0.0000
(nonsurvivor vs survivor) 15	1	27.78	0.0000
(nonsurvivor vs survivor) 16	1	26.71	0.0000
(nonsurvivor vs survivor) 17	1	25.07	0.0000
(nonsurvivor vs survivor) 18	1	22.90	0.0000
(nonsurvivor vs survivor) 19	1	20.32	0.0000
(nonsurvivor vs survivor) 20	1	17.48	0.0000
(nonsurvivor vs survivor) 21	1	14.56	0.0001
(nonsurvivor vs survivor) 22	1	11.76	0.0006
Joint	5	36.28	0.0000

	Delta-method		
	Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at			
(nonsurvivor vs survivor) 1	-186987.3	165026.5	-510433.4 136458.7
(nonsurvivor vs survivor) 2	-238952.2	148043.8	-529112.8 51208.26
(nonsurvivor vs survivor) 3	-286012.5	134174.5	-548989.8 -23035.31
(nonsurvivor vs survivor) 4	-328412.7	123198.5	-569877.3 -86948.04
(nonsurvivor vs survivor) 5	-366377.2	114836.6	-591452.7 -141301.6
(nonsurvivor vs survivor) 6	-400112	108747.9	-613254 -186970.1
(nonsurvivor vs survivor) 7	-429805.6	104546.9	-634713.9 -224897.4
(nonsurvivor vs survivor) 8	-455630	101837	-655226.8 -256033.1
(nonsurvivor vs survivor) 9	-477741.5	100248.3	-674224.5 -281258.4
(nonsurvivor vs survivor) 10	-496282.1	99469.25	-691238.2 -301325.9
(nonsurvivor vs survivor) 11	-511379.7	99265	-705935.6 -316823.9
(nonsurvivor vs survivor) 12	-523149.3	99483.78	-718133.9 -328164.6
(nonsurvivor vs survivor) 13	-531692.9	100055.1	-727797.3 -335588.5
(nonsurvivor vs survivor) 14	-537101	100983.7	-735025.4 -339176.6
(nonsurvivor vs survivor) 15	-539452.3	102341.5	-740038 -338866.6
(nonsurvivor vs survivor) 16	-538814.6	104257.9	-743156.4 -334472.9
(nonsurvivor vs survivor) 17	-535245	106907.9	-744780.5 -325709.5
(nonsurvivor vs survivor) 18	-528790.1	110497.1	-745360.3 -312219.8
(nonsurvivor vs survivor) 19	-519486.5	115244.5	-745361.6 -293611.4
(nonsurvivor vs survivor) 20	-507360.9	121364	-745229.9 -269491.8
(nonsurvivor vs survivor) 21	-492430.2	129047.6	-745358.9 -239501.5
(nonsurvivor vs survivor) 22	-474701.9	138455.3	-746069.3 -203334.5

```

352 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_RBC.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_RBC.gph saved)

353 .
354 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
355 . *marginsplot, title("RBC kinetic day 0 to day 30 after onset") ytitle("RBC(log-scale)") xlab(0(5)30) ylab(2000000(5
    > 00000)6000000, angle(horizontal)) yline(3000000, lcolor(red)) legend(off)
356 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
357 .
358 . ***combine****
359 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_RBC.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_R
    > BC.gph", ycomm xsize(8) ysize(4)

360 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_RBC.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_RBC.gph saved)

361 .
362 .
363 . *****
364 . *** analisi HGB *****
365 . *****
366 . **** scatter no model
367 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

368 . *scatter hgb b_day_malattia if death_30==1, mcolor(red) legend(off) title("HGb variation over time") xtitle("day
    > since onset") ytitle("HGb (g/dL)") xlab(0(5)30)|| scatter hgb b_day_malattia if death_30==0, mcolor(green) legend
    > (off) ms(oh)
369 . *keep if hgb!=.
370 .
371 . *****Graph box*****
372 . graph box hgb, over(death_30, label(nolabel)) over(b_day_malattia) asyvars box(1, fcolor(navy)) nooutsides ytitle
    > (Hb (gr/dL)) yline(8, lcolor(red)) legend(off)

373 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_Hb.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/BOX_Hb.gph saved)

374 .
375 . **** modelling
376 . use "/Users/Chiara/Documents/fileDO 15 Maggio/fileDO\coorte_long_emocromo_anemia_1.dta", clear

377 . mixed hgb ln c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day_malattia, cov(unst
    > r)

```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 1759.0037
Iteration 1: log likelihood = 1759.0077
Iteration 2: log likelihood = 1759.0077

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                   Number of groups  =     379

```

Obs per group:

```

min =      1
avg  =     4.8
max  =     22

```

```

Wald chi2(7)      =    207.52
Prob > chi2       =    0.0000
Log likelihood = 1759.0077

```

hgb_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0061723	.0006761	-9.13	0.000	-.0074975	-.0048471
death_30 nonsurvivor	-.0544592	.0296128	-1.84	0.066	-.1124992	.0035809
death_30#c.b_day_malattia nonsurvivor	-.0032463	.0020197	-1.61	0.108	-.0072049	.0007122
1.p_age2	-.0602628	.0152214	-3.96	0.000	-.0900962	-.0304294
1.p_cardio	-.0184339	.0163211	-1.13	0.259	-.0504227	.0135549
1.p_obeso	.0064551	.0288868	0.22	0.823	-.050162	.0630721
1.p_rene	-.1946001	.0335085	-5.81	0.000	-.2602756	-.1289246
_cons	2.690466	.0129946	207.04	0.000	2.664997	2.715935

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000603	8.54e-06	.0000457	.0000796
var(_cons)	.021043	.0021668	.0171972	.0257487
cov(b_day_malattia,_cons)	-.0005393	.0001172	-.0007689	-.0003097
var(Residual)	.0040964	.0001641	.003787	.0044311

```

LR test vs. linear model: chi2(3) = 2144.88      Prob > chi2 = 0.0000

```

Note: LR test is conservative and provided only for reference.

```
378 . est store linear
```

```
379 . mixed hgb_ln c.b_day_malattia#c.b_day_malattia##i.death_30 i.p_age2 i.p_obeso i.p_rene i.p_cardio || progr:b_day
> _malattia, cov(unstr)
```

Performing EM optimization:

Performing gradient-based optimization:

```

Iteration 0: log likelihood = 1760.7311
Iteration 1: log likelihood = 1760.7359
Iteration 2: log likelihood = 1760.7359

```

Computing standard errors:

```

Mixed-effects ML regression              Number of obs   =    1,805
Group variable: progr                  Number of groups  =     379

Obs per group:
min =      1
avg  =     4.8
max  =     22

```

```

Wald chi2(9)      =    209.82
Prob > chi2       =    0.0000
Log likelihood = 1760.7359

```

hgb_ln	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
b_day_malattia	-.0089773	.0019427	-4.62	0.000	-.0127849	-.0051697
c.b_day_malattia#c.b_day_malattia	.0001142	.0000741	1.54	0.123	-.000031	.0002593
death_30 nonsurvivor	-.0496867	.0361198	-1.38	0.169	-.1204801	.0211067
death_30#c.b_day_malattia nonsurvivor	-.0049944	.004972	-1.00	0.315	-.0147393	.0047506
death_30#c.b_day_malattia#c.b_day_malattia nonsurvivor	.0000927	.0002034	0.46	0.648	-.0003059	.0004914
1.p_age2	-.0607034	.0152433	-3.98	0.000	-.0905797	-.0308271
1.p_obeso	.0075202	.0289389	0.26	0.795	-.0491989	.0642393
1.p_rene	-.1956897	.0335835	-5.83	0.000	-.2615123	-.1298672
1.p_cardio	-.0181757	.0163432	-1.11	0.266	-.0502078	.0138564
_cons	2.705509	.0162643	166.35	0.000	2.673632	2.737387

Random-effects Parameters	Estimate	Std. Err.	[95% Conf. Interval]	
progr: Unstructured				
var(b_day_malattia)	.0000622	8.79e-06	.0000471	.000082
var(_cons)	.0216148	.002242	.0176385	.0264875
cov(b_day_malattia,_cons)	-.0005742	.0001218	-.000813	-.0003355
var(Residual)	.0040683	.0001636	.00376	.0044018

```

LR test vs. linear model: chi2(3) = 2144.62      Prob > chi2 = 0.0000

```

Note: LR test is conservative and provided only for reference.

```
380 . est store quadratic
```

```
381 . lrtest linear quadratic
```

```

Likelihood-ratio test              LR chi2(2) =    3.46
(Assumption: linear nested in quadratic)  Prob > chi2 =    0.1776

```

```

382 .
383 . *margins*****
384 . quiet: mixed hgb ln c.b_day_malattia##i.death_30 i.p_age2 i.p_cardio i.p_obeso i.p_rene || progr:b_day_malattia, c
> ov(unstr)

```

```

385 . margins death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal

```

Adjusted predictions Number of obs = **1,805**

Expression : **exp(predict(xb))**

1._at : b_day_mala-a = **0**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

2._at : b_day_mala-a = **1**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

3._at : b_day_mala-a = **2**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

4._at : b_day_mala-a = **3**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

5._at : b_day_mala-a = **4**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

6._at : b_day_mala-a = **5**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

7._at : b_day_mala-a = **6**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

8._at : b_day_mala-a = **7**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

9._at : b_day_mala-a = **8**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

10._at : b_day_mala-a = **9**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

11._at : b_day_mala-a = **10**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

12._at : b_day_mala-a = **11**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

13._at : b_day_mala-a = **12**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)
 p_rene (asbalanced)

14._at : b_day_mala-a = **13**
 death_30 (asbalanced)
 p_age2 (asbalanced)
 p_cardio (asbalanced)
 p_obeso (asbalanced)

```

                p_rene                (asbalanced)

15._at      : b_day_mala-a =          14
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

16._at      : b_day_mala-a =          15
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

17._at      : b_day_mala-a =          16
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

18._at      : b_day_mala-a =          17
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

19._at      : b_day_mala-a =          18
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

20._at      : b_day_mala-a =          19
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

21._at      : b_day_mala-a =          20
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

22._at      : b_day_mala-a =          21
              death_30          (asbalanced)
              p_age2             (asbalanced)
              p_cardio           (asbalanced)
              p_obeso            (asbalanced)
              p_rene             (asbalanced)

```

	Delta-method					[95% Conf. Interval]
	Margin	Std. Err.	z	P> z		
_at#death_30						
1#survivor	12.89765	.299634	43.04	0.000	12.31038	13.48493
1#nonsurvivor	12.21404	.3683134	33.16	0.000	11.49216	12.93592
2#survivor	12.81829	.2952045	43.42	0.000	12.2397	13.39688
2#nonsurvivor	12.09954	.3534449	34.23	0.000	11.4068	12.79228
3#survivor	12.73942	.2910505	43.77	0.000	12.16897	13.30987
3#nonsurvivor	11.98612	.3399792	35.26	0.000	11.31977	12.65246
4#survivor	12.66103	.2871729	44.09	0.000	12.09818	13.22388
4#nonsurvivor	11.87375	.3279857	36.20	0.000	11.23091	12.51659
5#survivor	12.58312	.2835722	44.37	0.000	12.02733	13.13891
5#nonsurvivor	11.76245	.3175285	37.04	0.000	11.1401	12.38479
6#survivor	12.50569	.2802483	44.62	0.000	11.95642	13.05497
6#nonsurvivor	11.65218	.3086617	37.75	0.000	11.04721	12.25715
7#survivor	12.42874	.2772006	44.84	0.000	11.88544	12.97205
7#nonsurvivor	11.54295	.3014249	38.29	0.000	10.95217	12.13373
8#survivor	12.35226	.2744277	45.01	0.000	11.8144	12.89013
8#nonsurvivor	11.43474	.2958389	38.65	0.000	10.85491	12.01457
9#survivor	12.27626	.2719278	45.15	0.000	11.74329	12.80923
9#nonsurvivor	11.32755	.2919019	38.81	0.000	10.75543	11.89966
10#survivor	12.20072	.2696983	45.24	0.000	11.67212	12.72932
10#nonsurvivor	11.22136	.2895872	38.75	0.000	10.65378	11.78894
11#survivor	12.12564	.2677359	45.29	0.000	11.60089	12.6504
11#nonsurvivor	11.11616	.2888433	38.49	0.000	10.55004	11.68229
12#survivor	12.05103	.2660369	45.30	0.000	11.52961	12.57245
12#nonsurvivor	11.01196	.2895953	38.03	0.000	10.44436	11.57955
13#survivor	11.97688	.2645965	45.26	0.000	11.45828	12.49548
13#nonsurvivor	10.90872	.2917483	37.39	0.000	10.33691	11.48054
14#survivor	11.90318	.2634096	45.19	0.000	11.38691	12.41945
14#nonsurvivor	10.80646	.2951927	36.61	0.000	10.2279	11.38503
15#survivor	11.82994	.2624705	45.07	0.000	11.3155	12.34437
15#nonsurvivor	10.70516	.2998091	35.71	0.000	10.11754	11.29277
16#survivor	11.75714	.2617727	44.91	0.000	11.24408	12.27021
16#nonsurvivor	10.6048	.3054733	34.72	0.000	10.00609	11.20352
17#survivor	11.6848	.2613094	44.72	0.000	11.17264	12.19696
17#nonsurvivor	10.50539	.3120619	33.66	0.000	9.89376	11.11702
18#survivor	11.6129	.2610731	44.48	0.000	11.10121	12.12459
18#nonsurvivor	10.40691	.319455	32.58	0.000	9.780788	11.03303
19#survivor	11.54144	.261056	44.21	0.000	11.02978	12.0531
19#nonsurvivor	10.30935	.3275394	31.48	0.000	9.667384	10.95132
20#survivor	11.47042	.2612501	43.91	0.000	10.95838	11.98247
20#nonsurvivor	10.21271	.3362104	30.38	0.000	9.553746	10.87167
21#survivor	11.39984	.2616468	43.57	0.000	10.88703	11.91266
21#nonsurvivor	10.11697	.3453723	29.29	0.000	9.440051	10.79389
22#survivor	11.3297	.2622374	43.20	0.000	10.81572	11.84367
22#nonsurvivor	10.02213	.3549391	28.24	0.000	9.32646	10.7178

```
386 . marginsplot, ytitle("HGb (g/dL)") xlab(0(1)21) ylab(5(5)20) yline(8, lcolor(red)) legend(off)
```

```
Variables that uniquely identify margins: b_day_malattia death_30
```

```
387 . margins ar.death_30, at(b_day_malattia=(0(1)21)) expression(exp(predict(xb))) asbal
```

```
Contrasts of adjusted predictions          Number of obs      =      1,805
```

```
Expression   : exp(predict(xb))
```

```
1._at      : b_day_mala-a =      0
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
2._at      : b_day_mala-a =      1
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
3._at      : b_day_mala-a =      2
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
4._at      : b_day_mala-a =      3
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
5._at      : b_day_mala-a =      4
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
6._at      : b_day_mala-a =      5
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
7._at      : b_day_mala-a =      6
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
8._at      : b_day_mala-a =      7
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
9._at      : b_day_mala-a =      8
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
10._at     : b_day_mala-a =      9
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
11._at     : b_day_mala-a =     10
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
12._at     : b_day_mala-a =     11
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
13._at     : b_day_mala-a =     12
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```
14._at     : b_day_mala-a =     13
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)
```

```

15._at      : b_day_mala-a =          14
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

16._at      : b_day_mala-a =          15
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

17._at      : b_day_mala-a =          16
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

18._at      : b_day_mala-a =          17
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

19._at      : b_day_mala-a =          18
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

20._at      : b_day_mala-a =          19
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

21._at      : b_day_mala-a =          20
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

22._at      : b_day_mala-a =          21
              death_30      (asbalanced)
              p_age2         (asbalanced)
              p_cardio       (asbalanced)
              p_obeso        (asbalanced)
              p_rene         (asbalanced)

```

	df	chi2	P>chi2
death_30@_at			
(nonsurvivor vs survivor) 1	1	3.45	0.0631
(nonsurvivor vs survivor) 2	1	4.19	0.0407
(nonsurvivor vs survivor) 3	1	5.03	0.0250
(nonsurvivor vs survivor) 4	1	5.96	0.0146
(nonsurvivor vs survivor) 5	1	6.98	0.0082
(nonsurvivor vs survivor) 6	1	8.06	0.0045
(nonsurvivor vs survivor) 7	1	9.18	0.0025
(nonsurvivor vs survivor) 8	1	10.28	0.0013
(nonsurvivor vs survivor) 9	1	11.33	0.0008
(nonsurvivor vs survivor) 10	1	12.28	0.0005
(nonsurvivor vs survivor) 11	1	13.10	0.0003
(nonsurvivor vs survivor) 12	1	13.75	0.0002
(nonsurvivor vs survivor) 13	1	14.23	0.0002
(nonsurvivor vs survivor) 14	1	14.55	0.0001
(nonsurvivor vs survivor) 15	1	14.70	0.0001
(nonsurvivor vs survivor) 16	1	14.72	0.0001
(nonsurvivor vs survivor) 17	1	14.62	0.0001
(nonsurvivor vs survivor) 18	1	14.43	0.0001
(nonsurvivor vs survivor) 19	1	14.18	0.0002
(nonsurvivor vs survivor) 20	1	13.88	0.0002
(nonsurvivor vs survivor) 21	1	13.55	0.0002
(nonsurvivor vs survivor) 22	1	13.21	0.0003
Joint	3	19.01	0.0003

	Delta-method		
	Contrast	Std. Err.	[95% Conf. Interval]
death_30@_at			
(nonsurvivor vs survivor) 1	-.6836119	.3678441	-1.404573 .0373493
(nonsurvivor vs survivor) 2	-.7187483	.3511618	-1.407013 -.0304838
(nonsurvivor vs survivor) 3	-.7532997	.335995	-1.411838 -.0947616
(nonsurvivor vs survivor) 4	-.7872732	.3224432	-1.41925 -.1552961
(nonsurvivor vs survivor) 5	-.8206756	.3106033	-1.429447 -.2119043
(nonsurvivor vs survivor) 6	-.853514	.3005633	-1.442607 -.2644206
(nonsurvivor vs survivor) 7	-.8857951	.2923953	-1.458879 -.3127107
(nonsurvivor vs survivor) 8	-.9175257	.2861479	-1.478365 -.3566863
(nonsurvivor vs survivor) 9	-.9487126	.2818391	-1.501107 -.3963181
(nonsurvivor vs survivor) 10	-.9793623	.2794522	-1.527079 -.431646
(nonsurvivor vs survivor) 11	-1.009481	.2789336	-1.556181 -.4627814
(nonsurvivor vs survivor) 12	-1.039076	.280195	-1.588248 -.4899039
(nonsurvivor vs survivor) 13	-1.068153	.2831184	-1.623055 -.5132514
(nonsurvivor vs survivor) 14	-1.096719	.2875636	-1.660333 -.5331046
(nonsurvivor vs survivor) 15	-1.124779	.2933771	-1.699788 -.5497708
(nonsurvivor vs survivor) 16	-1.152341	.3004001	-1.741114 -.5635674
(nonsurvivor vs survivor) 17	-1.179409	.3084755	-1.78401 -.5748086

(nonsurvivor vs survivor) 18	-1.205991	.3174533	-1.828188	-.5837943
(nonsurvivor vs survivor) 19	-1.232092	.3271942	-1.873381	-.5908036
(nonsurvivor vs survivor) 20	-1.257719	.3375714	-1.919346	-.5960909
(nonsurvivor vs survivor) 21	-1.282876	.3484714	-1.965867	-.5998843
(nonsurvivor vs survivor) 22	-1.30757	.3597942	-2.012753	-.6023863

```

388 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_Hb.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Marg_Hb.gph saved)

389 .
390 . *margins death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
391 . *marginsplot, title("HGb kinetic day 0 to day 30 after onset") ytitle("HGb (g/dL; log-scale)") xlab(0(5)30) ylab(4
    > (2)16, angle(horizontal)) yline(10, lcolor(green)) yline(8, lcolor(orange)) yline(5, lcolor(red)) legend(off)
392 . *margins ar.death_30, at(b_day_malattia=(0(1)30)) expression(exp(predict(xb)))
393 .
394 . **combine****
395 . gr combine "/Users/Chiara/Documents/fileDO 15 Maggio/Marg_Hb.gph" "/Users/Chiara/Documents/fileDO 15 Maggio/BOX_Hb
    > .gph", ycomm xsize(8) ysize(4)

396 . graph save "Graph" "/Users/Chiara/Documents/fileDO 15 Maggio/Graph_Hb.gph", replace
    (file /Users/Chiara/Documents/fileDO 15 Maggio/Graph_Hb.gph saved)

397 .
    end of do-file

398 . log close
    name: <unnamed>
    log: /Users/Chiara/Documents/fileDO 15 Maggio/Kinetics Hematological .smcl
    log type: smcl
    closed on: 19 May 2020, 17:05:04

```