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help for {competout}

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## Generate Outputs, Graphics and Tests in presence of competing risks

### Syntax

```
competout timevar eventvar [if exp] [in range] , event(integer) [group(varname)] test(
> s | r | sr) msave]
```

### Description

**competout** displays outputs, graphics and tests for CI (Cumulative Incidence) using several Stata's commands and **cmprsk** package from R. It is not useful to declare data as survival-time data with **stset** instruction.

### Options

- **event(integer)** is the event of interest of **eventvar**. It is not an option. The right-censoring level has to be coded 0. The maximum number of competing events is fixed at 6 by **stcompet**. So, the maximum number of levels for **eventvar** is 7 plus the censoring(0).
- **group(varname)** is the categorical variable to make comparison between groups.
- **test(s | r | sr)** shows results of several tests in order to compare estimates for different levels defined by the use of **by(varname)**.
  - (1) **s** display Stata's available tests: **log-rank** for cause specific hazard and (but not for difference(s) between survival curves), and **Pepe-Mori** for weighted areas **between 2 cumulative incidences only**.
  - (2) **r** display **Gray's test**. This test is based on subdistribution hazard and compares Cumulative incidences between 2 or more groups.
  - (3) **sr** display all the tests.
- **msave** saves results in a matrix. The name of the matrix is given by **eventvar#** or **eventvar#group#**, where # are levels of **eventvar** and **group**. See example (3) below

>

### Remark

**competout** uses 3 commands from SSC: **stcompet**(Coviello, Bogess), **stpepemori**(Covellio) and **rsource** (Newson). Only **rsource** needs to be installed by the user, **competout** installs automatically **stpepemori** if the command is needed. R coding is not required, **cmprsk** and **foreign** package can be downloaded directly via dialog boxes of R's console. If you want to install **foreign** and **cmprsk** packages in Stata, see below ("How to display Gray's test", (4) (5)).

### How too display Gray's test from R

- (1) **ssc install rsource**
- (2) Install R: <https://www.r-project.org/>
- (3) Find R path\*, copy & paste in your profile.do\*:
 

```
global Rterm_path `"path to R\R.exe"'
global Rterm_options `"--slave --vanilla --args "`tf1'" "`tf2'" ""
```
- (4) Install **foreign** package from Stata.:
 

```
rsource, terminator(END_OF_R)
install.packages("foreign", repos="http://cran.uk.r-project.org")
END_OF_R
```
- (5) Install **cmprsk** package from Stata.:
 

```
rsource, terminator(END_OF_R)
install.packages("cmprsk", repos="http://cran.uk.r-project.org")
END_OF_R
```
- (6) File **competout\_gray\_test.do** must be in the same directory than **competout.ado**

\* For example: path to R => C:\Program Files\R\R-3.3.1\bin\i386

\*\* Help for [profile](#). You can create a profile.do and save it in the user directory of C:

### Examples

- (1) Display all results comparing 2 levels of a categorical variable  
 . use [http://www.stata-press.com/data/cggm3/bc\\_compete](http://www.stata-press.com/data/cggm3/bc_compete), clear  
 . competout time status, event(1) group(drug) test(sr)
- (2) Display all results comparing 2 levels of 3 levels categorical variable. The event of interest is status=2  
 . The competout time status if race==1 | race==3, event(2) group(race) test(sr)

#### Output for example(2)

Cumulative incidence for race=1

_t	IC	SE	95% LB	95% UB
3	0.0308	0.0107	0.0145	0.0572
9	0.1115	0.0195	0.0769	0.1532
12	0.1346	0.0212	0.0965	0.1791
15	0.1385	0.0214	0.0998	0.1834
18	0.1500	0.0221	0.1097	0.1962
21	0.1538	0.0224	0.1131	0.2004
24	0.1577	0.0226	0.1164	0.2046
27	0.1731	0.0235	0.1299	0.2215
33	0.1769	0.0237	0.1333	0.2257
36	0.1846	0.0241	0.1401	0.2340
54	0.1885	0.0243	0.1435	0.2382

Cumulative incidence for race=3

_t	IC	SE	95% LB	95% UB
3	0.0250	0.0175	0.0048	0.0784
6	0.0875	0.0316	0.0385	0.1617
9	0.1000	0.0335	0.0467	0.1772
12	0.1375	0.0385	0.0731	0.2221
15	0.1500	0.0399	0.0823	0.2367
18	0.1750	0.0425	0.1013	0.2654
21	0.1875	0.0436	0.1110	0.2795
27	0.2000	0.0447	0.1209	0.2935
33	0.2125	0.0457	0.1309	0.3074
45	0.2375	0.0476	0.1512	0.3349
60	0.2500	0.0484	0.1616	0.3484

[Graph not displayed]

#### Log-rank test (Cause specific hazards)

Main event failure: status == 2  
 Chi2(1) = 1.2385  
 Prob>Chi2 = 0.2658

#### Pepe and Mori test comparing the cumulative incidence of two groups of race

Main event failure: status == 2  
 Chi2(1) = .35604 - p = 0.55071  
 Competing event failure: status == 1  
 Chi2(1) = .12298 - p = 0.72583

#### Gray's test

using Rsource (Newson) & cmprsk (Gray)

Line 1 - Test for main event failure: status == 2  
 Line 2 - Test for competing event(s) failure: status == 1

```
1 . rsource, terminator(END_OF_R)
Assumed R program path: "C:\Program Files\R\R-3.3.1\bin\i386\R.exe"
Beginning of R output
```

```
      Chi2 df    Pr>Chi2
1 1.2464305  1 0.2642353
2 0.2942562  1 0.5875059
```

```
End of R output
```

```
Runtime: r; t=2.20 15:58:30
```

```
(3) Display matrix of results & save it as variables
. qui competout time status, event(1) group(drug) msave
```

```
.matrix dir
statusldrug1[7,5]
statusldrug0[13,5]
```

```
. matrix list statusldrug0
```

```
statusldrug0[13,5]
      t_10    ic_10    se_10    lb_10    ub_10
r1      3 .09677419 .0187738 .06403645 .13745086
r2      6 .19354839 .02508754 .14705034 .2449125
r3      9 .25403226 .02764258 .20168248 .30950267
r4     12 .31451613 .02948453 .25772676 .37275583
r5     15 .31854839 .02958553 .26150619 .37693165
r6     18 .3266129 .0297799 .26908012 .38526888
r7     21 .33467742 .02996426 .27667385 .39358721
r8     27 .33870968 .03005274 .28047802 .39773938
r9     30 .34274194 .03013879 .28428701 .40188696
r10    36 .34677419 .03022242 .28810076 .40602996
r11    39 .35080645 .03030366 .29191924 .41016844
r12    45 .35483871 .03038252 .29574242 .41430243
r13    48 .36290323 .0305332 .3034027 .42255705
```

```
. svmat statusldrug0, names(col)
```

```
Comment: with names(col) option, variables generated are t_10, ic_10, se_10, lb_10, ub
> _10
```

## References

Coviello, V. and Bogess, M. *Cumulative incidence estimation in the presence of competing risks*. The Stata Journal, 2004, Number2, pp 103-112.

Pintilie, M. *Competing Risks. A practical perspective*. 2006, Wiley and Sons. Chichester, England.

## Authors

```
competout:      Marc Thevenin, Ined-Sms, (marc.thevenin@ined.fr)
>
```

## Others packages:

```
stcompet  (Stata): Coviello and Bogess
stpepemori (Stata): Coviello
Rsource   (Stata): Newson
cmprsk     (R): Gray
```

## Also see

Stata's help files: help for [rsource](#), [stcompet](#), [stpepemori](#)