

stir — Report incidence-rate comparison

Description	Quick start	Menu	Syntax
Options	Remarks and examples	Stored results	Methods and formulas
Reference	Also see		

Description

`stir` reports point estimates and confidence intervals for the incidence-rate ratio (IRR) and incidence-rate difference (IRD). Stratified IRRs may be standardized to produce standardized mortality ratios.

`stir` can be used with single- or multiple-record and single- or multiple-failure `st` data.

Quick start

IRR and IRD with confidence intervals for exposure indicator `exposed` using `stset` data

```
stir exposed
```

As above, but display exact p -values calculated without the mid- p adjustment

```
stir exposed, exact
```

Crude and Mantel–Haenszel combined IRRs with test of homogeneity for strata defined by `svar`

```
stir exposed, strata(svar)
```

As above, and standardize the IRRs by weighting variable `wvar`

```
stir exposed, strata(svar) standard(wvar)
```

As above, but standardize using time at risk for the unexposed group as weights

```
stir exposed, strata(svar) estandard
```

Menu

Statistics > Survival analysis > Summary statistics, tests, and tables > Report incidence-rate comparison

Syntax

```
stir exposedvar [if] [in] [, options]
```

<i>options</i>	Description
Options	
<code>strata(<i>varname</i>)</code>	stratify on <i>varname</i>
<code>estandard</code>	combine external weights with within-stratum statistics
<code>istandard</code>	combine internal weights with within-stratum statistics
<code>standard(<i>varname</i>)</code>	combine user-specified weights with within-stratum statistics
<code>pool</code>	display pooled estimate
<code>nocrude</code>	do not display crude estimate
<code>nohom</code>	do not display homogeneity test
<code>ird</code>	calculate standardized IRD
<code>midp</code>	display <i>p</i> -values calculated using mid- <i>p</i> adjustment (unstratified only); the default
<code>exact</code>	display exact <i>p</i> -values without mid- <i>p</i> adjustment (unstratified only)
<code>level(#)</code>	set confidence level; default is level(95)
<code>noshow</code>	do not show st setting information

You must `stset` your data before using `stir`; see [ST] [stset](#).

`by` is allowed; see [D] [by](#).

`fweights` and `iweights` may be specified using `stset`; see [ST] [stset](#). `stir` may not be used with `pweight` data.

Options

Options

`strata(varname)` specifies that the calculation be stratified on *varname*, which may be a numeric or string variable. Within-stratum statistics are shown and then combined with Mantel–Haenszel weights. Also see the `by()` option in [R] [Epitab](#).

`estandard`, `istandard`, `standard(varname)`, `pool`, `nocrude`, `nohom`, and `ird` are relevant only if `strata()` is specified; see [R] [Epitab](#).

`midp` and `exact` are relevant only if `strata()` is not specified; see [R] [Epitab](#).

`level(#)` is relevant in all cases; see [R] [Epitab](#).

`noshow` is relevant in all cases; it prevents `stir` from showing the key `st` variables. This option is seldom used because most people type `stset`, `show` or `stset, noshow` to set whether they want to see these variables mentioned at the top of the output of every `st` command; see [ST] [stset](#).

Remarks and examples

stir examines the incidence rate and time at risk.

```
. use https://www.stata-press.com/data/r16/page2
. stir group
      failure _d: dead
      analysis time _t: time
Incidence-rate comparison
Exposed:  group = 2
Unexposed: group = 1
```

	group		Total
	Exposed	Unexposed	
Failures	19	17	36
Time	5023	4095	9118
Incidence rate	.0037826	.0041514	.0039482
	Point estimate		[95% Conf. Interval]
Inc. rate diff.	-.0003688		-.002974 .0022364
Inc. rate ratio	.9111616		.4484366 1.866047 (exact)
Prev. frac. ex.	.0888384		-.8660469 .5515634 (exact)
Prev. frac. pop	.04894		

Mid *p*-values for tests of incidence-rate difference:

Adj Pr(Exposed failures <= 19) = 0.3900 (lower one-sided)

Adj Pr(Exposed failures >= 19) = 0.6100 (upper one-sided)

Two-sided *p*-value = 0.7799

Specifying the exact option displays *p*-values for the tests of IRD calculated without using the mid-*p* adjustment. The noshow option suppresses the display of st variables.

```
. stir group, exact noshow
Incidence-rate comparison
Exposed:  group = 2
Unexposed: group = 1
```

	group		Total
	Exposed	Unexposed	
Failures	19	17	36
Time	5023	4095	9118
Incidence rate	.0037826	.0041514	.0039482
	Point estimate		[95% Conf. Interval]
Inc. rate diff.	-.0003688		-.002974 .0022364
Inc. rate ratio	.9111616		.4484366 1.866047 (exact)
Prev. frac. ex.	.0888384		-.8660469 .5515634 (exact)
Prev. frac. pop	.04894		

Exact *p*-values for tests of incidence-rate difference:

Pr(Exposed failures <= 19) = 0.4536 (lower one-sided)

Pr(Exposed failures >= 19) = 0.6737 (upper one-sided)

Two-sided *p*-value = 0.9071

See [R] [EpiTab](#) for details about the exact option and other stir options.

Video example

How to calculate incidence rates and incidence-rate ratios

Stored results

`stir` (without `strata()`) stores the following in `r()`:

Scalars

<code>r(ird)</code>	IRD
<code>r(lb_ird)</code>	lower CI bound for IRD
<code>r(ub_ird)</code>	upper CI bound for IRD
<code>r(irr)</code>	IRR
<code>r(lb_irr)</code>	lower CI bound for IRR
<code>r(ub_irr)</code>	upper CI bound for IRR
<code>r(afe)</code>	attributable fraction among the exposed
<code>r(lb_afe)</code>	lower CI bound for attributable fraction among the exposed
<code>r(ub_afe)</code>	upper CI bound for attributable fraction among the exposed
<code>r(afp)</code>	attributable fraction for the population
<code>r(p_lower_midp)</code>	lower one-sided p -value with mid- p adjustment
<code>r(p_upper_midp)</code>	upper one-sided p -value with mid- p adjustment
<code>r(p_twosided_midp)</code>	two-sided p -value with mid- p adjustment
<code>r(p_lower_exact)</code>	lower one-sided exact p -value
<code>r(p_upper_exact)</code>	upper one-sided exact p -value
<code>r(p_twosided_exact)</code>	two-sided exact p -value

`stir`, `strata()` stores the following in `r()`:

Scalars

<code>r(irr)</code>	Mantel–Haenszel IRR, if option <code>ird</code> is not specified
<code>r(lb_irr)</code>	lower CI bound for Mantel–Haenszel IRR
<code>r(ub_irr)</code>	upper CI bound for Mantel–Haenszel IRR
<code>r(ird)</code>	Mantel–Haenszel IRD, if option <code>ird</code> is specified
<code>r(lb_ird)</code>	lower CI bound for Mantel–Haenszel IRD
<code>r(ub_ird)</code>	upper CI bound for Mantel–Haenszel IRD
<code>r(crude)</code>	crude IRR or, if option <code>ird</code> is specified, crude IRD
<code>r(lb_crude)</code>	lower CI bound for the crude IRR or IRD
<code>r(ub_crude)</code>	upper CI bound for the crude IRR or IRD
<code>r(pooled)</code>	pooled IRR or, if option <code>ird</code> is specified, pooled IRD
<code>r(lb_pooled)</code>	lower CI bound for pooled IRR or IRD
<code>r(ub_pooled)</code>	upper CI bound for pooled IRR or IRD
<code>r(df)</code>	degrees of freedom for homogeneity χ^2 test
<code>r(chi2_mh)</code>	Mantel–Haenszel homogeneity χ^2
<code>r(chi2_p)</code>	pooled homogeneity χ^2 , if option <code>pool</code> is specified

Methods and formulas

`stir` simply accumulates numbers of failures and time at risk by exposed and unexposed (by `strata`, if necessary) and passes the calculation to `ir`; see [R] [Eptab](#).

Reference

Dupont, W. D. 2009. *Statistical Modeling for Biomedical Researchers: A Simple Introduction to the Analysis of Complex Data*. 2nd ed. Cambridge: Cambridge University Press.

Also see

[ST] [stset](#) — Declare data to be survival-time data

[ST] [stsum](#) — Summarize survival-time data

[R] [Epitab](#) — Tables for epidemiologists