Title

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stir — Report incidence-rate comparison

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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
```

Same 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)
```

Same as above, and standardize the IRRs by weighting variable `wvar`

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

Same 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]
```

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

You must `stset` your data before using `stir`; see [ST] **stset**.

`by` and `collect` are allowed; see [U] **11.1.10 Prefix commands**.

`fweights` and `iweights` may be specified using `stset`; see [ST] **stset**. `stir` may not be used with `pweighted` 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

stata.com

stir examines the incidence rate and time at risk.

```
. use https://www.stata-press.com/data/r18/page2
. stir group
        Failure _d: dead
  Analysis time _t: time
Incidence-rate comparison
Exposed:   group = 2
Unexposed: group = 1
```

	group		
	Exposed	Unexposed	Total
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		
	Exposed	Unexposed	Total
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

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

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

Scalars

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

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