

# Package ‘MImix’

July 2, 2014

**Title** Mixture summary method for multiple imputation

**Version** 1.0

**Author** Russell Steele, Naisyin Wang, and Adrian Raftery

**Description** Tools to combine results for multiply-imputed data using mixture approximations

**Maintainer** Russell Steele <steele@math.mcgill.ca>

**Suggests** mitools

**License** GPL-2

**Repository** CRAN

**Date/Publication** 2012-01-05 21:43:05

**NeedsCompilation** no

## R topics documented:

diaph.data . . . . .	1
MImix . . . . .	3

<b>Index</b>	<b>5</b>
--------------	----------

---

diaph.data	<i>Diaphanography Partial Verification Bias Example</i>
------------	---

---

## Description

This dataset consists of a list of imputed datasets for an example of multiple imputation for the correction of partial verification bias, as originally reported in Harel and Zhou (2006) and discussed by deGroot, et al. (2008).

**Usage**

diaph.data

**Format**

A list containing three elements:

imputed.tables: A list of 100 imputed tables using the saturated categorical model of Schafer (1997).

sens.samples: A vector of 1000 draws of the sensitivity of the test from the posterior distribution using the saturated categorical model of Schafer (1997).

original.data: The original dataset from Marshall, et al. (1981), including the observations with missing gold standard values.

**Details**

For the imputed tables and the original table, D refers to the gold standard test and T refers to the diagnostic test of interest.

**Source**

Marshall, V., Williams, D.C., and Smith, K. D. (1981). Diaphanography as a means of detecting breast cancer. *Radiology* 150:339-343.

**References**

Schafer, J. L. (1997). *Analysis of Incomplete Multivariate Data by Simulation*. Chapman & Hall Ltd.

Harel O., Zhou X.H. (2006) Multiple imputation for correcting verification bias. *Statistics in Medicine* 25:3769-3786.

de Groot, J.A.H. and Janssen, K.J.M. and Zwinderman, A.H. and Moons, K.G.M. and Reitsma, J.B. (2008) Multiple imputation to correct for partial verification bias revisited. *Statistics in Medicine* 27:5880-5899.

**Examples**

```
data(diaph.data)
attach(diaph.data)
## Calculate sensitivity for each imputed table

sensimps<-lapply(imputed.tables,function(x){ x[2,2]/(x[2,1]+x[2,2]) })
sensimps.vars<-lapply(imputed.tables,function(x){ x[2,2]*x[2,1]/(x[2,1]+x[2,2])^3 })

### Calculate mixture summary

MImix(sensimps,sensimps.vars)

### Compare to usual t-summary using MCombine: requires(mitools)

library(mitools)
summary(MCombine(sensimps,sensimps.vars))
```

```
### Compare both to the Bayesian posterior estimate
quantile(sens.samples,c(0.025,0.5,0.975))
```

---

MImix

*Multiple imputation summaries via mixture of normals*


---

### Description

Combines results of analyses on multiply imputed data sets using a mixture of normal distributions.

### Usage

```
MImix(results, ...)
## Default S3 method:
MImix(results,variances,weights = 1/length(results), percentiles = c(0.025, 0.5, 0.975), ...)
```

### Arguments

results	A list of results from inference on separate imputed datasets
variances	If results is a list of parameter vectors, variances should be the corresponding variance-covariance matrices
weights	A vector of weights for each imputed dataset. The default is to use equal weights.
percentiles	A vector of percentiles to be returned from the mixture summary distribution. The default is to return the 2.5th, 50th, and 97.5th percentiles.
...	Other arguments, not used

### Details

This function combines results of analyses on multiply imputed data sets using a mixture of normal distributions according to the approach described in Steele, R.J., Wang, N., and Raftery A.E. (2009). This package contains a generic function default method, although other methods may be available in future releases. The results argument in the default method may be either a list of parameter vectors or a list of objects that have coef and vcov methods. In the former case a list of variance-covariance matrices must be supplied as the second argument. This corresponds to the same structure that is used by MIcombine in the mi tools package.

### Value

An list containing the desired percentiles from the mixture summary distribution.

### Author(s)

Russell Steele, <steele@math.mcgill.ca>

**References**

Steele, R.J., Wang N., and Raftery, A.E. (2009) Inference from Multiple Imputation for Missing Data Using Mixtures of Normals *Sociological Methodology* Accepted.

**Examples**

```
### See help(diaph.data) for example
```

# Index

- \*Topic **htest**
  - MImix, 3
- \*Topic **manip**
  - MImix, 3
- \*Topic **surveys**
  - MImix, 3
- diaph.data, 1
- MImix, 3