OutputReport(data = vanDykeData, dataDscrpt = "Van Dyke Data", analysisMethod = "ORH", FOM = "Wilcoxon", covEstMethod = "Jackknife")

RJafroc Version 1.0

Last compilation date: (no need to capitalize; these are not nouns)

Jan 15 2015 10:51:44

Run date:

Mar 23 2015 Mon 12:26:54 EDT

FOM selected : Wilcoxon

Input Data : VanDykeData preloaded datafile

Output Data Filename : /Users/Dev/book/0 temporary/XzPaper/TestXzPackage/VanDykeData\_OR\_ROC.txt

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Significance testing method: : ORH

Number of Readers : 5

Number of Treatments : 2

Number of Normal Cases : 69

Number of Abnormal Cases : 45

Fraction of Normal Cases : 0.605263

Inc. Loc. Frac. : 0.018889 !!dpc

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\*\*\*\*\* Overview \*\*\*\*\*

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Three analyses are presented:

(1) Analysis 1 treats both readers and cases as random samples

--results apply to the reader and case populations;

(2) Analysis 2 treats only cases as a random sample

--results apply to the population of cases but only for the

readers used in this study; and

(3) Analysis 3 treats only readers as a random sample

--results apply to the population of readers but only for the

cases used in this study.

For all three analyses, the null hypothesis of equal treatments is

tested in part (a), treatment difference 95% confidence intervals

are given in part (b), and treatment 95% confidence intervals are

given in part (c). Parts (a) and (b) are based on the treatment x

reader x case ANOVA while part (c) is based on the reader x case

ANOVA for the specified treatment; these ANOVA tables are displayed

before the analyses. Different error terms are used as indicated

for parts (a), (b), and (c) according to whether readers and cases

are treated as fixed or random factors. Note that the treatment

confidence intervals in part (c) are based only on the data for the

specified treatment, rather than the pooled data. Treatment

difference 95% confidence intervals for each reader are presented

in part (d) of Analysis 2; each interval is based on the treatment

x case ANOVA table (not included) for the specified reader.

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\*\*\*\*\* Estimates \*\*\*\*\*

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TREATMENT

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READER 0 1

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0 0.91964573 0.94782609

1 0.85877617 0.90531401

2 0.90386473 0.92173913

3 0.97310789 0.99935588

4 0.82979066 0.92995169

TREATMENT MEANS (averaged across readers)

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0 0.89703704

1 0.94083736

TREATMENT MEAN DIFFERENCES

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0 - 1 -0.04380032

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\*\*\*\*\* Variance Components Estimates \*\*\*\*\*

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Obuchowski-Rockette variance component and covariance estimates

OR Component Estimate

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Var(R) 0.00153500

Var(T\*R) 0.00020040

COV1 0.00034661

COV2 0.00034407

COV3 0.00023903

Var(Error) 0.00080229

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\*\*\*\*\* Analysis 1: Random Readers and Random Cases \*\*\*\*\*

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(Results apply to the population of readers and cases)

a) Test for H0: Treatments have the same ROC figure of merit.

Source DF Mean Square F value Pr > F

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Treatment 1 0.00479617 4.46 0.0517

Error 15.26 0.00056373

Error term: MS(TR) + J \* max[Cov2 - Cov3, 0]

Conclusion: The ROC of treatments are not significantly different,

F(1,15.26) = 4.46, p = 0.0517.

b) 95% confidence intervals for treatment differences

Treatment Estimate StdErr DF t Pr > t 95% CI

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0 - 1 -0.04380 0.02075 15.26 -2.11 0.0517 -0.08796 , 0.00036

H0: the two treatments are equal.

Error term: MS(TR) + J \* max[Cov2 - Cov3, 0]

c) 95% treatment confidence intervals based on reader x case ANOVAs

for each treatment (each analysis is based only on data for the

specified treatment

Treatment Area Std Error DF 95% Confidence Interval

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0 0.89703704 0.03317360 12.74 (0.82522360 , 0.96885048)

1 0.94083736 0.02156637 12.71 (0.89413783 , 0.98753689)

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\*\*\*\*\* Analysis 2: Fixed Readers and Random Cases \*\*\*\*\*

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(Results apply to the population of cases but only for the readers

used in this study)

a) Test for H0: Treatments have the same ROC figure of merit.

Source DF Mean Square F value Pr > F

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Treatment 1 0.00479617 5.48 0.0193

Error Inf 0.00134475

Error term: Var - Cov1 + (J - 1) \* ( Cov2 - Cov3 )

Conclusion: The FOMs of treatments are not equal,

F(1,Inf) = 5.48, p = 0.0193.

b) 95% confidence intervals for treatment differences

Treatment Estimate StdErr DF t Pr > t 95% CI

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0 - 1 -0.04380 0.01872 Inf -2.34 0.0193 -0.08049 , -0.00711

H0: the two treatments are equal.

Error term: Var - Cov1 + (J - 1) \* ( Cov2 - Cov3 )

c) 95% treatment confidence intervals based on reader x case ANOVAs

for each treatment (each analysis is based only on data for the

specified treatment

Treatment Area Std Error DF 95% Confidence Interval

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0 0.89703704 0.02428971 Inf (0.84943008 , 0.94464399)

1 0.94083736 0.01677632 Inf (0.90795637 , 0.97371835)

Error term: Var - Cov1 + (J - 1) \* ( Cov2 - Cov3 )

d) Treatment-by-case ANOVA CIs for each reader

(each analysis is based only on data for the specified reader)

Reader Treatment Estimate StdErr DF t Pr > t 95% CI

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0 0 -1 -0.02818 0.02551 Inf -1.10 0.2693 -0.07818 , 0.02182

1 0 -1 -0.04654 0.02630 Inf -1.77 0.0768 -0.09809 , 0.00501

2 0 -1 -0.01787 0.03121 Inf -0.57 0.5668 -0.07904 , 0.04330

3 0 -1 -0.02625 0.01729 Inf -1.52 0.1290 -0.06014 , 0.00764

4 0 -1 -0.10016 0.04406 Inf -2.27 0.0230 -0.18651 , -0.01381

Reader Var(Error) Cov1

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0 0.000698 0.000373

1 0.001106 0.000760

2 0.000842 0.000355

3 0.000150 1.083399

4 0.001213 0.000243

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\*\*\*\*\* Analysis 3: Random Readers and Fixed Cases \*\*\*\*\*

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(Results apply to the population of readers but only for the cases used in this study)

a) Test for H0: Treatments have the same ROC figure of merit.

Source DF Mean Square F value Pr > F

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Treatment 1 0.00479617 8.70 0.0420

Error 4.00 0.00055103

Error term: MS(TR)

Conclusion: The FOMs of treatments are not equal,

F(1,4.00) = 8.70, p = 0.0420.

b) 95% confidence intervals for treatment differences

Treatment Estimate StdErr DF t Pr > t 95% CI

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0 - 1 -0.04380 0.01485 4.00 -2.95 0.0420 -0.08502 , -0.00258

H0: the two treatments are equal.

c) Reader-by-case ANOVAs for each treatment (each analysis is based only on data for the

specified treatment

Treatment Area Std Error DF 95% Confidence Interval

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0 0.89703704 0.02482994 4.00 (0.82809808 , 0.96597599)

1 0.94083736 0.01615303 4.00 (0.89598936 , 0.98568536)

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