

Chapter 1

Appendix D

- **Blood (JSR) data:**
- **PEFR Data:** ARoy20092009
- **Oximetry data:** BXC2004
- **Fat data:** BXC2004
- **Trig Gerber Data:** BXC2008
- **Nadler Hurley:**
- **Hamlett:**

1.1 Roy's PEFR Examples

To complete the study, the relevant values are provided for the $RvsS$ comparison also.

The second data set, a comparison of two peak expiratory flow rate measurements, is referenced by Bland and Altman (1986).

The last case study is also based on a data set from Bland and Altman (1999). It contains the measurements of left ventricular cardiac eject fraction, measured by impedance cartography and radionuclide ventriculography, on twelve patients. The number of replicated differs for each patient.

The bias is shown to be 0.7040, with a p-value of 0.0204. The MLEa of the between-method and within-method variance-covariance matrices of methods RV and IC are given by

$$\hat{D} = \begin{pmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{pmatrix}, \quad (1.1)$$

$$\hat{\Sigma} = \begin{pmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{pmatrix}. \quad (1.2)$$

Roy (2009) notes that these are the same estimate for variance as given by Bland and Altman (1999).

The repeatability coefficients are determined to be 0.9080 for the RV method and 1.0293 for the IC method.

From the estimated $\mathbf{\Omega}_i$ correlation matrix, the overall correlation coefficient is 0.7100. The overall correlation coefficients between two methods RV and IC are 0.9384 and 0.9131 respectively.

Roy (2009) concludes that is appropriate to switch between the two methods if needed.

Roy (2009) recommends to not switch between the two method.

Chapter 2

Other Data Sets

2.1 IC/RV comparison

For the the RV-IC comparison, \hat{D} is given by

$$\hat{D} = \begin{bmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{bmatrix} \quad (2.1)$$

The estimate for the within-subject variance covariance matrix is given by

$$\hat{\Sigma} = \begin{bmatrix} 0.1072 & 0.0372 \\ 0.0372 & 0.1379 \end{bmatrix} \quad (2.2)$$

The estimated overall variance covariance matrix for the the 'RV vs IC' comparison is given by

$$Block\Omega_i = \begin{bmatrix} 1.7396 & 1.1799 \\ 1.1799 & 1.5877 \end{bmatrix}. \quad (2.3)$$

The power of the likelihood ratio test may depends on specific sample size and the specific number of replications, and the author proposes simulation studies to examine this further.

- **Blood (JSR) data:**
- **PEFR Data:** ARoy20092009
- **Oximetry data:** BXC2004
- **Fat data:** BXC2004
- **Trig Gerber Data:** BXC2008
- **Nadler Hurley:**
- **Hamlett:**

2.2 Roy's PEFR Examples

To complete the study, the relevant values are provided for the $RvsS$ comparison also.

The second data set, a comparison of two peak expiratory flow rate measurements, is referenced by Bland and Altman (1986).

The last case study is also based on a data set from Bland and Altman (1999). It contains the measurements of left ventricular cardiac eject fraction, measured by impedance cartography and radionuclide ventriculography, on twelve patients. The number of replicated differs for each patient.

The bias is shown to be 0.7040, with a p-value of 0.0204. The MLEa of the between-method and within-method variance-covariance matrices of methods RV and IC are given by

$$\hat{D} = \begin{pmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{pmatrix}, \quad (2.4)$$

$$\hat{\Sigma} = \begin{pmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{pmatrix}. \quad (2.5)$$

- Roy (2009) notes that these are the same estimate for variance as given by Bland and Altman (1999).

- The repeatability coefficients are determined to be 0.9080 for the RV method and 1.0293 for the IC method.
- From the estimated $\mathbf{\Omega}_i$ correlation matrix, the overall correlation coefficient is 0.7100.
- The overall correlation coefficients between two methods RV and IC are 0.9384 and 0.9131 respectively.
- Roy (2009) concludes that is appropriate to switch between the two methods if needed.
- Roy (2009) recommends to not switch between the two method.

Chapter 3

Other Data Sets

3.1 IC/RV comparison

For the the RV-IC comparison, \hat{D} is given by

$$\hat{D} = \begin{bmatrix} 1.6323 & 1.1427 \\ 1.1427 & 1.4498 \end{bmatrix} \quad (3.1)$$

The estimate for the within-subject variance covariance matrix is given by

$$\hat{\Sigma} = \begin{bmatrix} 0.1072 & 0.0372 \\ 0.0372 & 0.1379 \end{bmatrix} \quad (3.2)$$

The estimated overall variance covariance matrix for the the 'RV vs IC' comparison is given by

$$Block\Omega_i = \begin{bmatrix} 1.7396 & 1.1799 \\ 1.1799 & 1.5877 \end{bmatrix}. \quad (3.3)$$

The power of the likelihood ratio test may depends on specific sample size and the specific number of replications, and the author proposes simulation studies to examine this further.

Bibliography

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