

Bland-Altman Plot

- ▶ Method Comparison: Commonly encountered issue in medical statistics
- ▶ “Do two methods of measurement agree statistically?”.
- ▶ “Can the two methods be used interchangeably?”
- ▶ Sources of disagreement can arise from differing population means (i.e. inter-method bias), differing between-subject and with-in subject variances (*Anuradha Roy 2009*).

The Bland-Altman Plot

- ▶ The Bland-Altman plot is a very simple graphical method to compare two measurements techniques.
- ▶ In this approach the case-wise differences between the two methods are plotted against the corresponding case-wise averages of the two methods.
- ▶ A horizontal lines is drawn at the mean difference(the inter-method bias) , and at the limits of agreement, which are defined as the inter-method bias plus and minus 2 times the standard deviation of the differences.

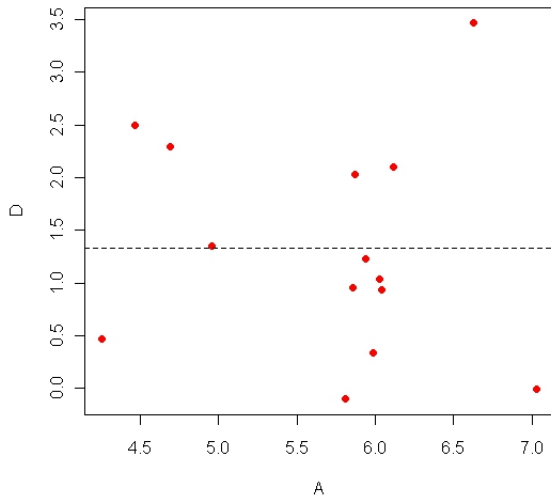
Bland-Altman Plot

```
>X = rnorm(14,6,1);Y = rnorm(14,5.3,1.1)
>
>A=(X+Y)/2 #case-wise averages
>D=X-Y #case-wise differences
>
>Dbar=mean(D) #inter-method bias
>SdD=sd(D) #standard deviation of the differences
>
>plot(A,D,pch=16,col="red", ylim=c(-3,3))
>
>abline(h=Dbar,lty=2)
>abline(h=(Dbar-2*SdD),lty=2)
>abline(h=(Dbar+2*SdD),lty=2)
```

Simple Bland-Altman Plot

Inter-method Bias : 0.45

Limits of Agreement: [-1.32, 2.23]



The Bland-Altman Plot: Prevalence

- ▶ Limits of Agreement are used extensively in medical literature for assessing agreement between two methods.
- ▶ According to Google Scholar, Bland and Altman's 1986 paper has 22,456 citations.
(“The Pricing of Options and Corporate Liabilities” by Black and Scholes has 19,019 citations.)