



Figure 1.10: Figure showing confidence intervals of the sperm counts of Japanese quail (horizontal axis) for 50 different samples (vertical axis).

To calculate the confidence interval, we need to know the limits within which 95% of means will fall. How do we calculate these limits? Remember back in section 1.5.3 that I said that 1.96 was an important value of z (a score from a normal distribution with a mean of 0 and standard deviation of 1) because 95% of z -scores fall between -1.96 and 1.96. This means that if our sample means had a mean of 0 and a standard error of 1, then the limits of our confidence interval would be -1.96 and +1.96. You might also remember that we can convert scores into z -scores using this equation:

$$z = \frac{X - \bar{X}}{s}$$

If we know that our limits would be -1.96 and 1.96 in z -scores, then what are the corresponding scores in our raw data. To find this out, we