Nuclear Lab Report

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date

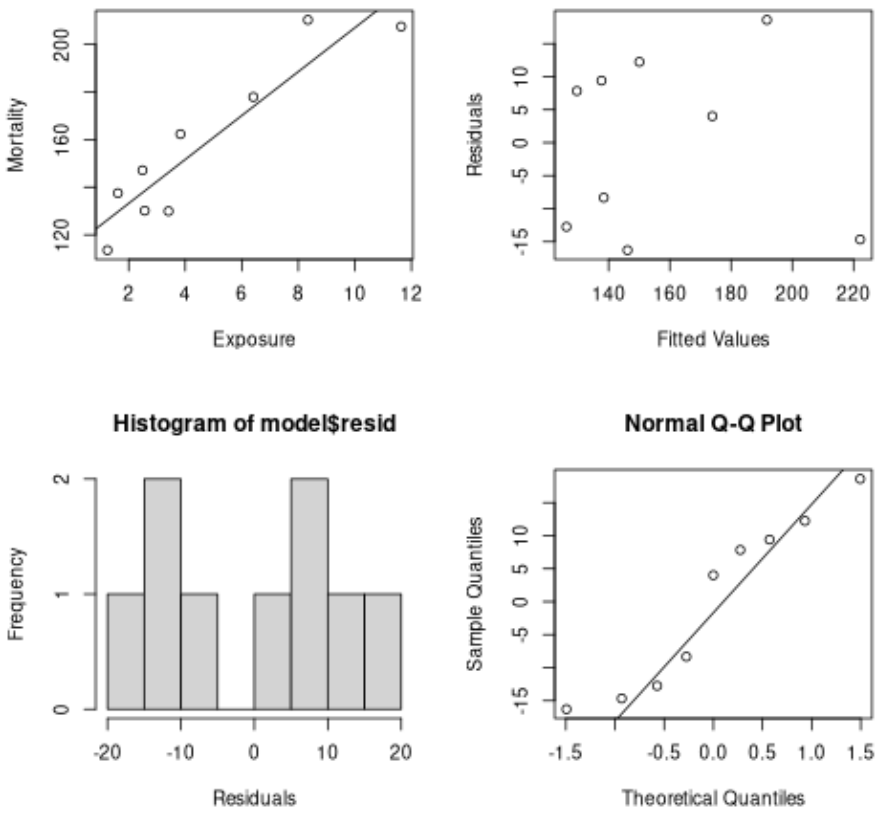

Figure 1: Linear fit on non-transformed data

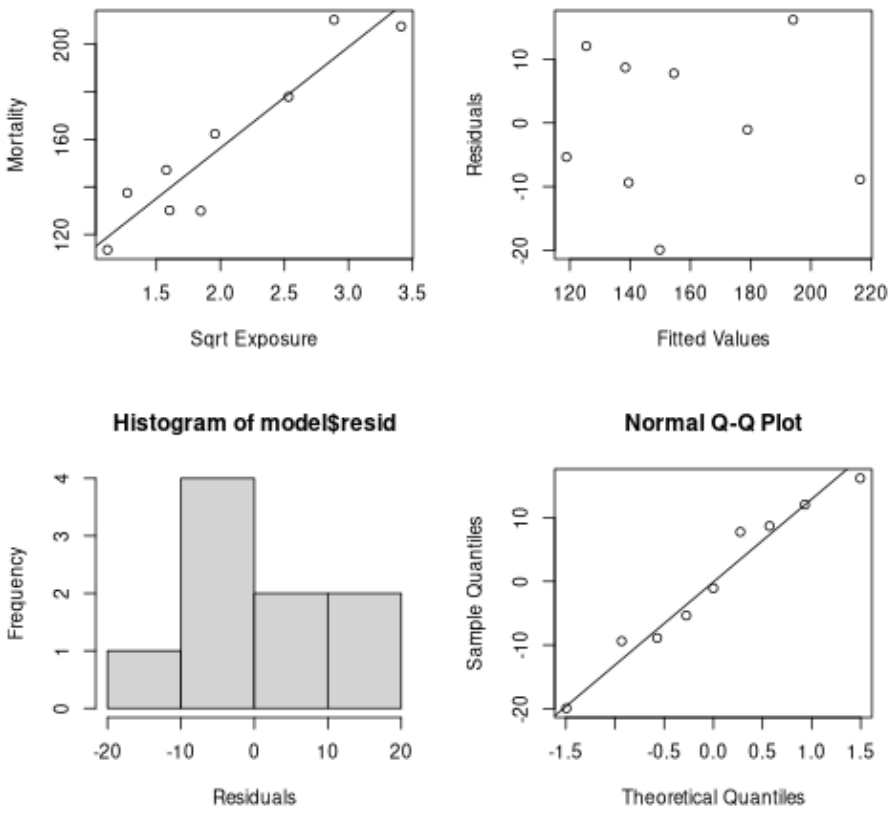

Figure 2: Linear fit on transformed data

1 Model

In examining the data, a linear model was fit to the original data, as seen in Figure 1. The basic fit showed that the data linear, though after experimentation, an even better fit was found using a square root transform on the Exposure data, seen in Figure 2. The fitted model is written as

$$M = -1.242 + 0.02 \cdot \sqrt{E}, \tag{1}$$

where M is the cancer mortality per 100000 man-years, and E is the index of exposure. Performing a t-test with this model gave a p-value for the slope of 0.00017, showing strong statistical significance of the model. We see an R^2 of 0.88, confirming that Exposure and square-root Mortality are strongly correlated. However, this is not to say that there is no correlation between Exposure and Mortality, the fitted model without transforming Mortality had a p-value for the slope of 0.00033, and an R^2 of 0.85. The linear model is written as

$$M = 114.716 + 9.231 \cdot E. \tag{2}$$

The positive slope tells