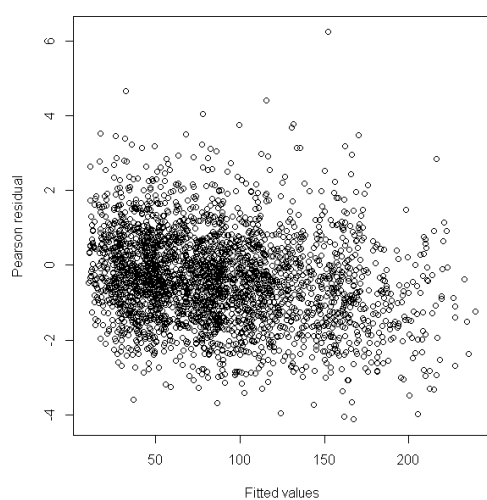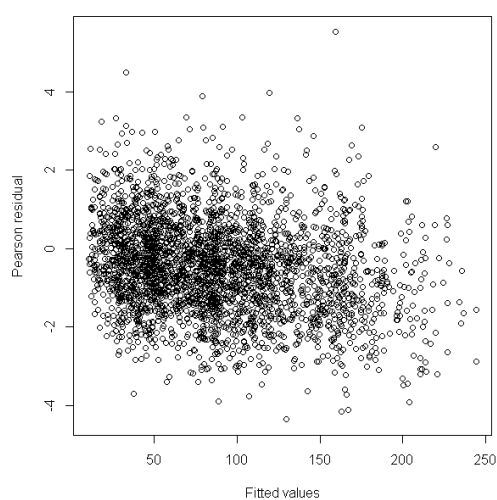# Supplementary material

Pearson residual plot of total mortality and PM2.5
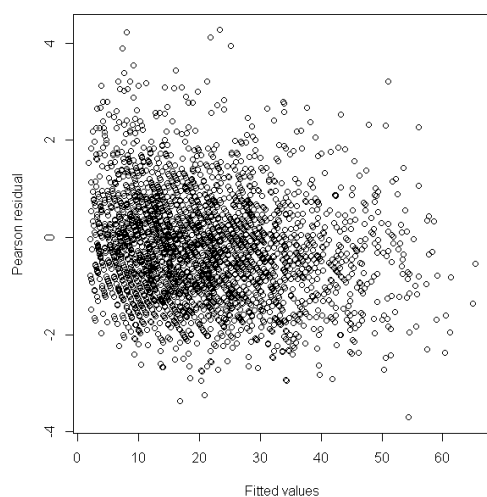

(a) total mortality and PM$_{2.5}$
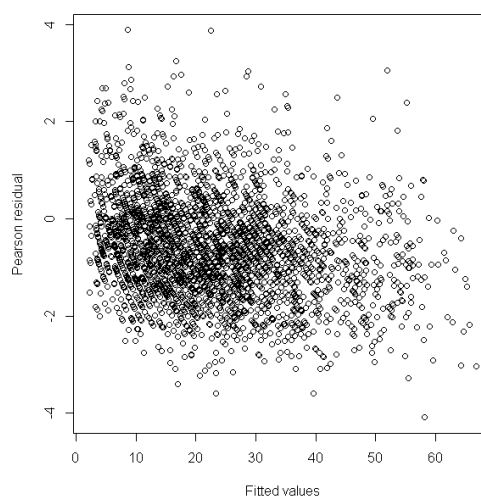
Pearson residual plot of total mortality and PM10

(b) total mortality and PM$_{10}$

Pearson residual plot of cardiovascular mortality and PM2.5

(c) cardiovascular mortality and PM$_{2.5}$

Pearson residual plot of cardiovascular mortality and PM10

(d) cardiovascular mortality and PM$_{10}$

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Pearson residual plot of respiratory mortality and PM2.5   **Pearson residual plot of respiratory mortality and PM10**

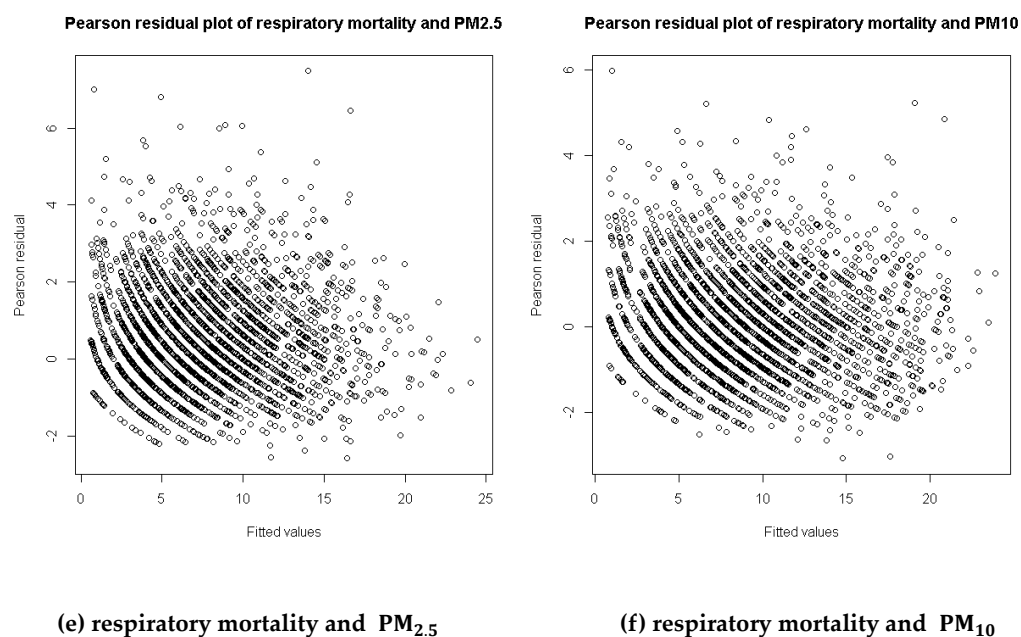**(e) respiratory mortality and PM$_{2.5}$**   **(f) respiratory mortality and PM$_{10}$**

Figure S1. Plots of Pearson residuals versus the forecasted values for different types of mortality and air pollutants.

Figure S1 shows the plots of Pearson residuals. The x-axis indicates the forecasted death counts for 2015 and y-axis indicates the Pearson residuals of the observed death counts and forecasted death counts. Pearson residuals r_i are calculated using the following formula:

$$r_i = \frac{y_i - \widehat{y_i}}{\sqrt{\widehat{y_i}}}$$ where y_i *is the observed death count and* $\widehat{y_i}$ *is the forecasted death count.*