Time series data are frequently used to study the acute effects of particulate matter air pollution on mortality. Distributed lag models, models that relate the current mortality to a mixture of pollution levels over several time units prior, are often desirable over models that only consider a specific lag. Estimation for distributed lag models is difficult at many locations because the air pollution monitoring stations are calibrated so that pollution levels are collected at a cruder time scale than the daily mortality counts. This talk presents an exploratory technique for estimating the distributed lag total effect of pollution on daily mortality when the pollutant data is systematically missing. The estimator for is motivated by a practical solution for Gaussian data which is used as motivation. We evaluate the estimator via simulation studies and data where the pollution process is completely observed.