

**TITLE:** Exposure Misclassification Due to Assignment of Unmatched Address Records in New York State

**KEYWORDS:** Geocoding, misclassification, ozone, asthma

**BACKGROUND:** We improved the completeness of geocoding without a large sacrifice to accuracy by randomly assigning cases within a ZIP code based on the population distribution by census block. While this represents an advantage over exclusion of the unmatched records, the misclassification observed by four-kilometer grid cells represents a “worst case scenario”. Actual misclassification will be less due to spatial autocorrelation between neighboring grid cells. While some cases are placed in incorrect grid cells, they are often placed in a neighboring cell which has similar exposure levels.

**OBJECTIVE:** We attempt to quantify the amount of misclassification caused by randomly assigning cases within a ZIP code while taking spatial autocorrelation of the grid cells into account using modeled ozone and PM<sub>2.5</sub> levels and childhood asthma hospitalizations as an example.

**METHODS:** Childhood asthma hospitalizations were geocoded to the patient’s address. A four-kilometer grid for New York City and a twelve-kilometer grid for the rest of the state were developed to model air pollutants. Daily eight-hour maximum ozone and 24 hour PM<sub>2.5</sub> measures were modeled for each grid cell. The levels of each pollutant were linked to asthma cases by location and date of admission.

**RESULTS:** As expected, misclassification was significantly diminished when taking spatial autocorrelation between neighboring grid cells into account.

**CONCLUSION:** While we did observe a decline in misclassification this varied by pollutant. Because ozone levels are regional there was much spatial autocorrelation between neighboring grid cells while spatial autocorrelation was less for PM<sub>2.5</sub> which varies more widely locally.

**EVALUATION:** This method of assignment of unmatched records worked well when assigning ozone exposure levels, however each pollutant will need to be evaluated individually to determine the effect of this method on exposure misclassification.

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