Air Pollution and Lung Function in East Flatbush

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Abstract

The purpose of this experiment was to find out if air pollution is affecting the respiratory rates of people in East Flatbush. Air pollution can cause asthma, Chronic Obstructive Pulmonary Disease and high occurrences of bronchitis. In our study we measured the forced expiratory volume (FEV) and peak expiratory flow (PEF) of high school students attending Tilden High school in Brooklyn New York. Our findings are mixed but suggest that students living in and around East Flatbush, Brooklyn may have lower than normal rates on both scales.

Introduction

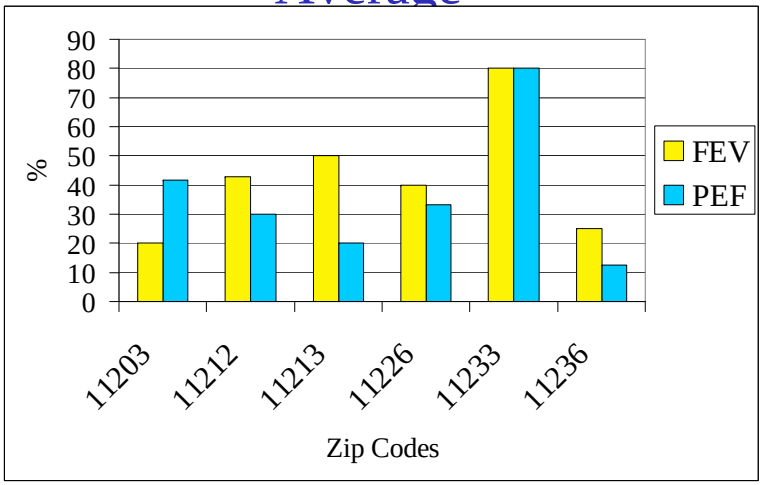
Air pollution can cause asthma, Chronic Obstructive Pulmonary Disease and high occurrences of bronchitis. Air pollution has a harmful effect on health, especially on the lungs (Medscape, 2009). New York City is ranked 18th for most particle pollution and 13th for ozone pollution year round (American Lung Association, 2004). In this research experiment we studied the respiratory functions of high school students. We hypothesize that the Flatbush community will have decreased lung functioning compared to normal healthy rates.

Methods

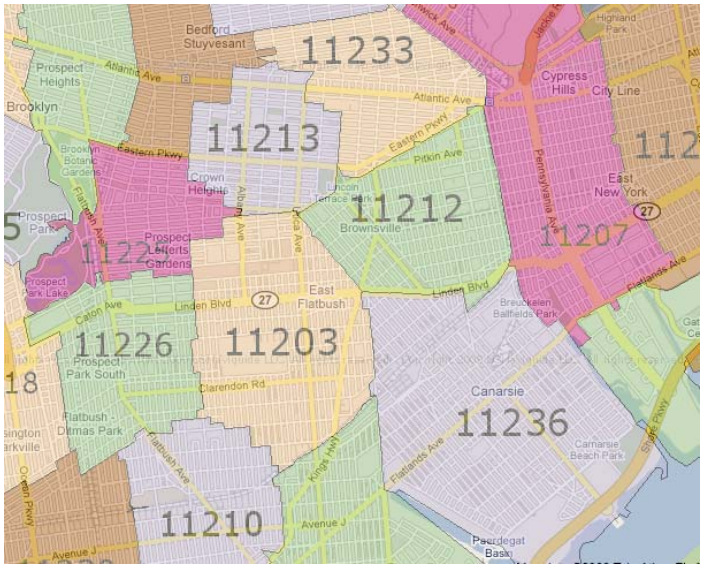
We measured students' peak expiratory flow (PEF) and forced expiratory volume (FEV) using a Digital Peak Flow Meter. Students were asked to blow twice using a disposable mouthpiece to get their accurate respiratory rates. We collected different types of information such as their age, height, zip code, cross streets and gender. We also asked them a series of questions such as:

- Do you have asthma?
- Do any of your family members have asthma or respiratory illness?
- Do you smoke cigarettes?

Percentage of Students below Average



Map of Areas Sampled



Results

Our results displayed that the people in the community of Flatbush may be affected by air pollution. Overall we found that 18 out of 89 students (20.2%) were below the normal rate for FEV, and 20 out of 70 (28.5%) were below the number for PEF. We then broke the data up by zip code. What we found was that zip code 11233 had the worst FEV and PEF rates. We also found that people living in 11203 had the best FEV, and 11236 had the best PEF readings.

Discussion

We concluded that 20% of the people surveyed in our community have low respiratory rates. This could be caused by air pollution in New York. It could also be caused by pollution in other cities our participants may have lived. Although we controlled for smoking and asthma with our sample we do not know about smoking within the household. To make our study better we could have surveyed more people, ideally everyone in East Flatbush. Genetics, diets and lifestyles can also contribute to respiratory illness and have not been completely ruled out in this study.

References

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