

# The Effects of Air Pollution on Brooklyn Residents

Reena Rahi & Michael W. Magee

Brooklyn College, City University of New York

In conjunction with ITAVA high school and ITAVA chemistry teacher Julius Buh-mbi



## Introduction:

GK-12 fellows have worked in collaboration with teachers at It Takes A Village Academy High School (ITAVA), to take the students on an authentic scientific journey in their community. The students spent several weeks of building a knowledge base about various aspects of air pollution and then designed a research project to assess what the other people in the community knew and felt about air pollution, as well as how air pollution might be directly affecting them. The project comprised two parts: Administering an original knowledge and attitudes towards air pollution survey, and taking FEV1 (Forced Expiratory Volume in the 1st second) measurements. The students managed all aspects of the project including data collection, organization, and analysis. Survey responses were collected from two populations: the student body at ITAVA high school and the student body at Brooklyn College. Upon successful completion of the project, the students learned the role of communication in science by presenting their discoveries to their peers.

## Teaching Strategy (Brophy, 1987):

- Tasks designed around students' interests
- Novelty and variety in the project
- Ownership of the project
- Hands-on tasks
- Group work
- Students analyzed the results

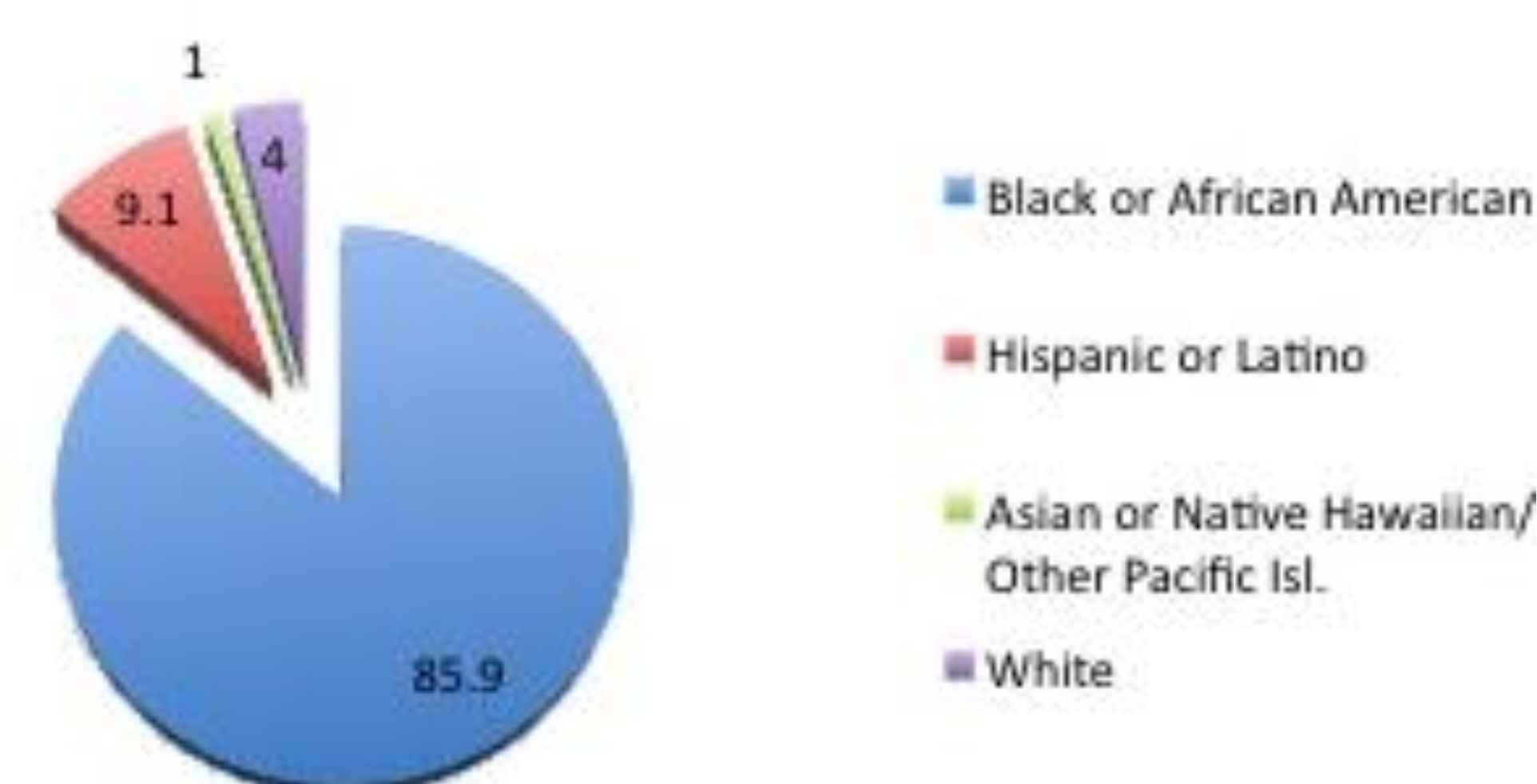
## ITAVA High School:

According to the 2008 report:

- Males: 45.4 %
- Females: 54.6 %
- ~ 50% students are ELL and 20% former ELL



## ITAVA Demographics



## Experimental Method

### I. ITAVA Air Pollution Knowledge and Survey:

- ITAVA students designed and administered a survey
- Participants: ITAVA and Brooklyn College students
- Students interpreted the data by comparing the results of both groups



### II. FEV1 measurements: To assess how air pollution might already be affecting the community, FEV1 measurements were taken. FEV1 is a measurement of how much air can be expelled from the lungs in the first second of exhalation and is the most frequently used index to assess lung functioning. FEV1 levels lower than the norms could indicate compromised lung functioning which could be caused or exacerbated by air pollution.

- ITAVA students measured their FEV1 values
- The experimental values were compared with the normal values



## Results

232 people in total completed the survey.  
 181 from ITAVA (M = 93 or 52.4% , F = 86 or 47.5%; 2 missing)  
 Median age= 16  
 Mode age= 16  
 Age Range = 13 – 20

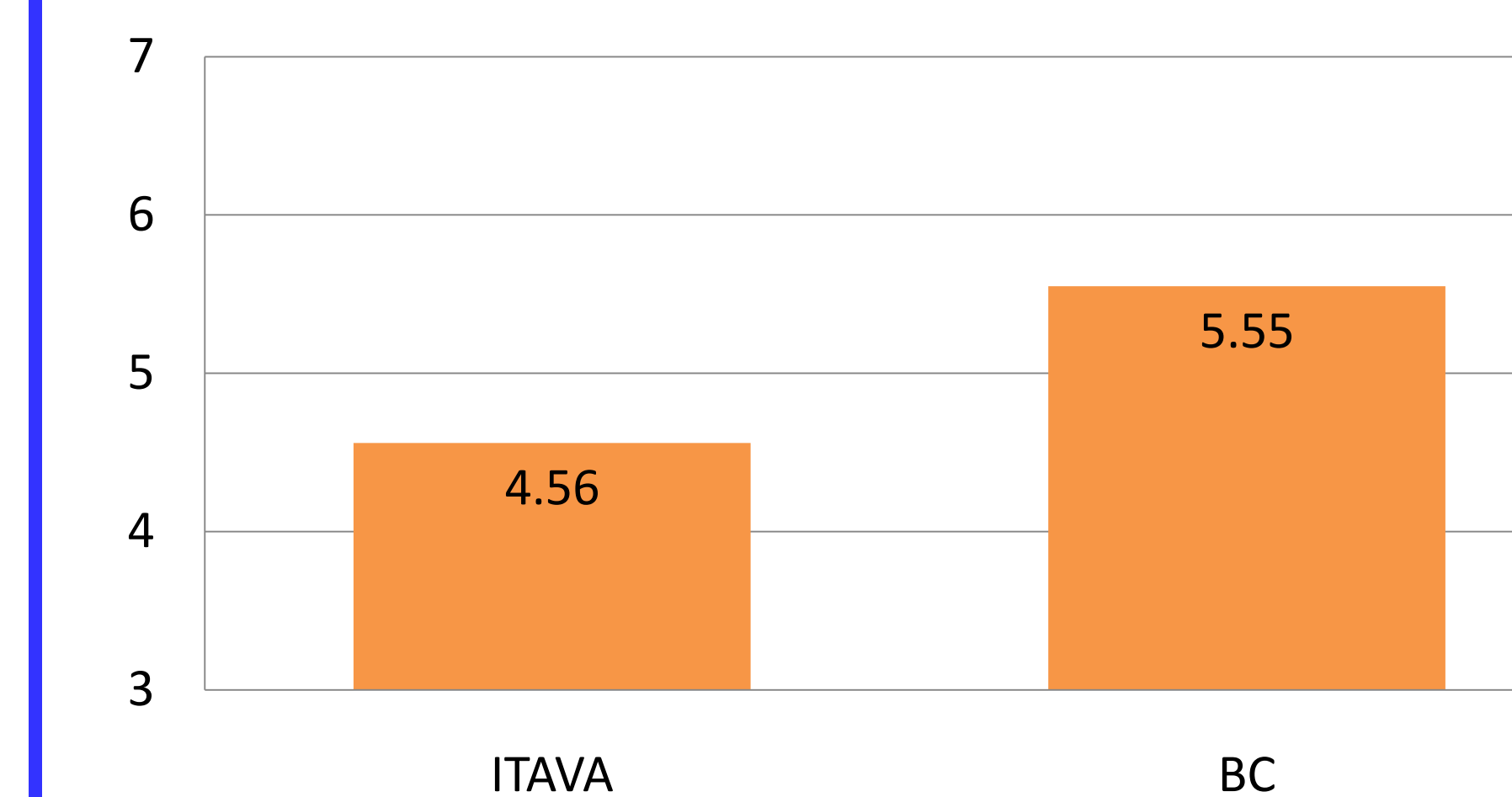
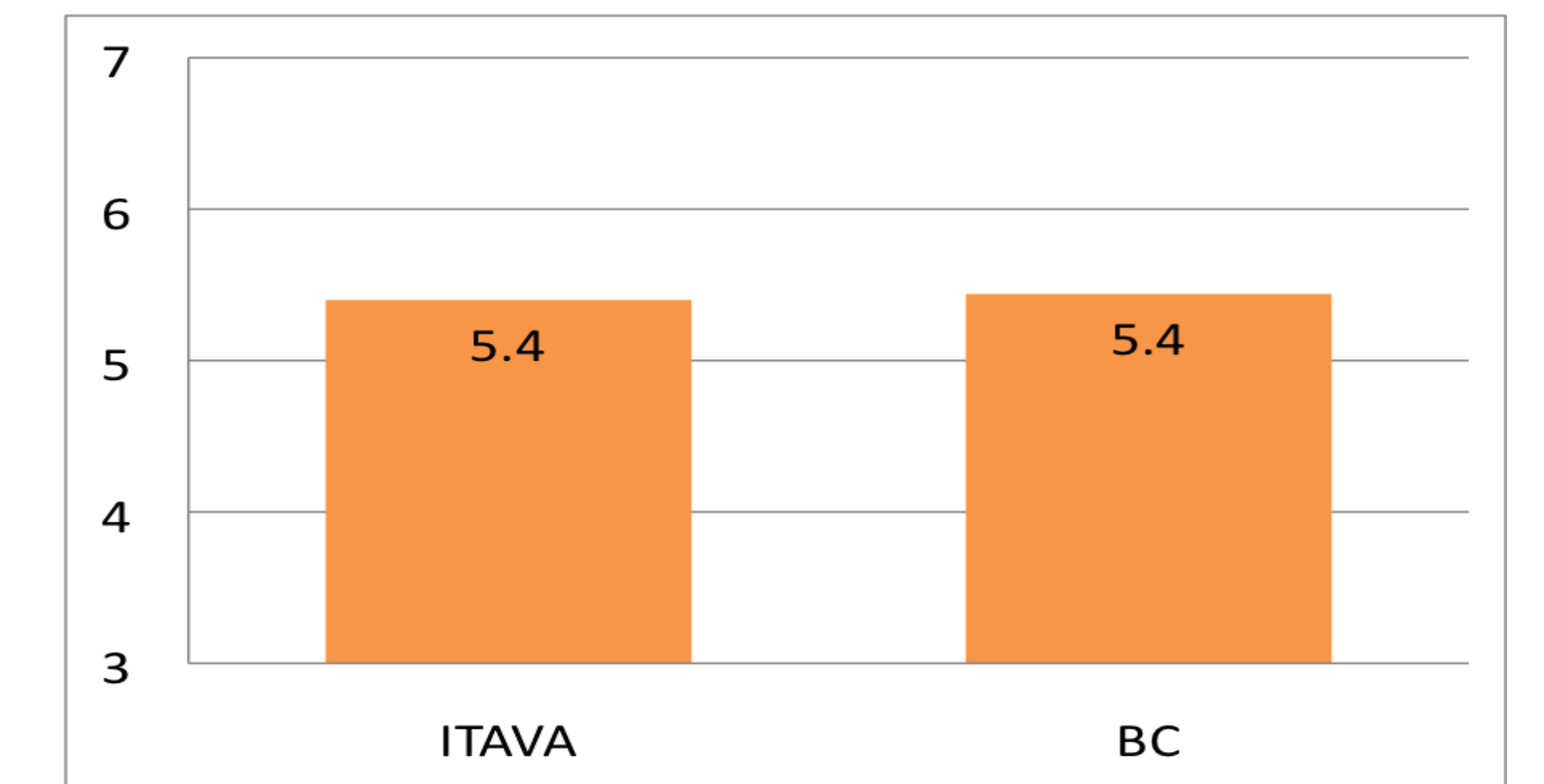
51 from Brooklyn College (M = 6, F = 25; 20 not reported)  
 Median = 21  
 Mode = 19  
 Age range = 18 – 40

## Data Analysis

A sample item from the Air Pollution survey:

***I think that air pollution is a problem in my community.***

(ITAVA & BC mean responses; higher bars indicate greater levels of agreement)



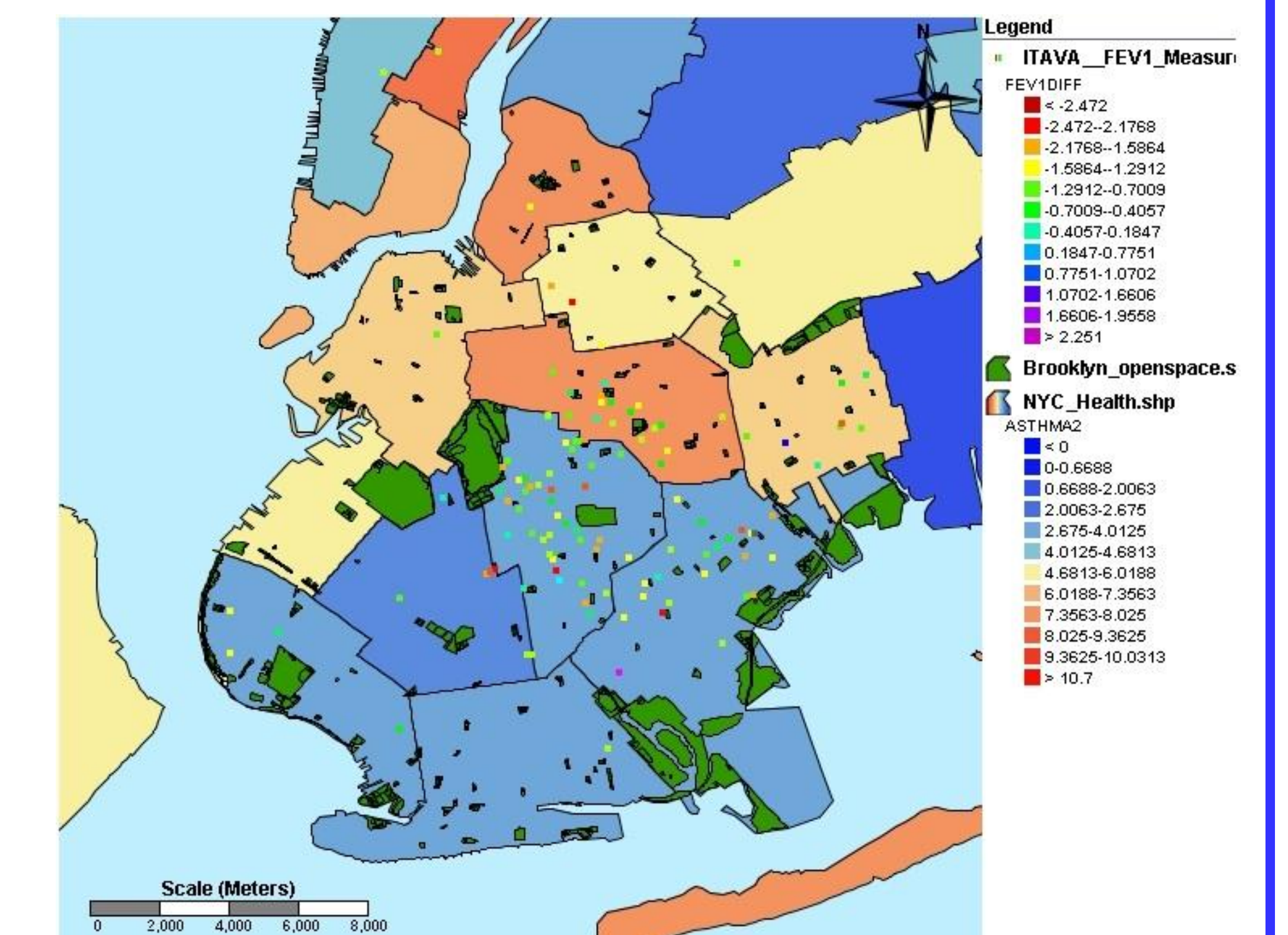
A sample item from the Air Pollution survey:

***There are many things that I can do to help solve the air pollution problem in my community.***

(ITAVA & BC mean responses; higher bars indicate greater levels of agreement)

## My World GIS:

The students learned to analyze and interpret data using GIS (geographic information systems) via My World GIS software.



## General Discussion:

By participating in this program, students have learned the role of science in their everyday lives. Their project has taught them about their role and responsibilities as the citizens of the world. Moreover, the students are now able to analyze and interpret data using technology, e.g. Excel, Google Earth, and My World GIS, and communicate their findings using PowerPoint.

GK-12 fellows have been provided with the opportunity to design and create novel science projects. Fellows are training in science education, and honing their science communication skills.

## Reference:

*Educational Leadership*, 1987, 45(2), 40-48

[http://schools.nyc.gov/documents/oaosi/cep/2008-09/cep\\_K563.pdf](http://schools.nyc.gov/documents/oaosi/cep/2008-09/cep_K563.pdf)