

# Outdoor Air and Health in Central Harlem - Morningside Heights

Air pollution is one of the most important environmental threats to urban populations and while all people are exposed, pollutant emissions, levels of exposure, and population vulnerability vary across neighborhoods. Exposures to common air pollutants have been linked to respiratory and cardiovascular diseases, cancers, and premature deaths.

## Outdoor Air Pollutants

Estimated annual average concentrations calculated from a model that used NYC Community Air Survey measurements, 2009-2010.

	Central Harlem - Morningside Heights			Compared with other NYC neighborhoods*	Trend over time
	Central Harlem - Morningside Heights	Manhattan	NYC		
Nitric oxide (NO) (ppb) Annual Average 2009-2010	27.2	40.3	27.1	Middle	Not Available
Nitrogen dioxide (NO2) (ppb) Annual Average 2009-2010	27.8	32.2	24.8	Worse	Not Available
Fine particulate matter (PM2.5) (µg/m3) Annual Average 2009-2010	10.8	12.4	10.6	Middle	Not Available
Ozone (O3) (ppb) Annual Average 2009-2010	25.4	23.5	27	Better	Not Available
Sulfur dioxide (SO2) (ppb) 2-Year Winter Average 2009-2010	6.7	7.1	4.7	Worse	Not Available
Elemental carbon (ppb) Annual Average 2009-2010	1.3	1.5	1.2	Middle	Not Available

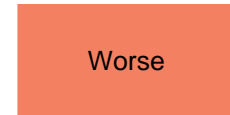
## Health Burden: Fine Particles (PM2.5)

Estimated health events attributable to PM2.5 exposures, (average annual rate per 100,000 residents), 2009-2011.

	Central Harlem - Morningside Heights			Compared with other NYC neighborhoods*	Trend over time
	Central Harlem - Morningside Heights	Manhattan	NYC		
Asthma emergency department visits among children under 18 years of age 2009-2011	291.1	144.3	106.8	Worse	2005-2007-2009-2011
Asthma emergency department visits in adults 2009-2011	137	45.7	45.1	Worse	2005-2007-2009-2011
Cardiovascular hospitalizations among adults aged 40 years and older 2009-2011	19.7	15	17.8	Worse	2005-2007-2009-2011
Respiratory hospitalizations in adults aged 20 years and older 2009-2011	18.8	12.6	14.1	Worse	2005-2007-2009-2011

Deaths due to all causes among adults aged 30 years and older 2009-2011

63.6 50 48.2



## Health Burden: Ozone (O3)

Estimated health events attributable to ozone (O3) exposures, (average annual rate per 100,000 residents), April through September, 2009-2011.

Central Harlem - Morningside Heights

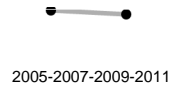
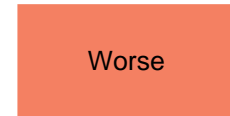
Central Harlem - Morningside Heights

Compared with other NYC neighborhoods\*

Trend over time

Asthma emergency department visits among children under 18 years of age 2009-2011

269.9 135.7 108.6



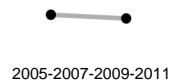
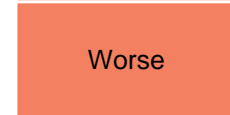
Asthma emergency department visits among adults 2009-2011

130.4 43.2 47.4



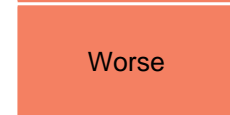
Asthma hospitalizations among children under 18 years of age 2009-2011

38.1 19.9 22.7



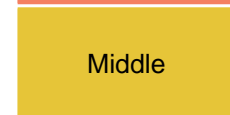
Asthma hospitalizations among adults 2009-2011

10.3 4.9 7



Deaths due to cardiac and respiratory causes among all residents 2009-2011

4.3 3.8 4.7



## Outdoor Air Toxics

Estimated annual average concentrations of known carcinogens that are part of a class of pollutants also known as hazardous air pollutants, 2005

Central Harlem - Morningside Heights

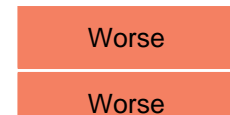
Central Harlem - Morningside Heights

Compared with other NYC neighborhoods\*

Trend over time

Benzene (µg/m3) 2005

3.9 4.7 2.9



Not Available

Formaldehyde (µg/m3) 2005

4.2 4.3 3.2



Not Available

## Traffic Density

Estimated millions of annual vehicle miles traveled per km2 in 2005. Vehicle miles traveled is an indicator of emissions from automobile exhaust, brake wear and tire wear.

Central Harlem - Morningside Heights

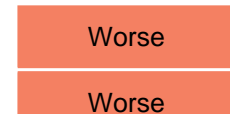
Central Harlem - Morningside Heights

Compared with other NYC neighborhoods\*

Trend over time

All vehicles 2005

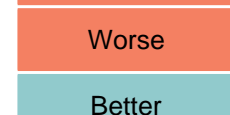
36.9 24.9 24



Not Available

Cars 2005

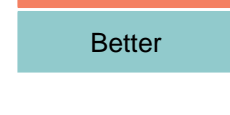
35.7 23.5 22.6



Not Available

Trucks 2005

0.9 1.2 1.3



Not Available

## Heating Fuel

Estimated annual boiler emissions per km<sup>2</sup> as of September 2013. Calculated using heating fuel type on NYC boiler permits and estimates of boiler activity.

	Central Harlem - Morningside Heights			Central Harlem - Morningside Heights	
	Central Harlem - Morningside Heights	Manhattan	NYC	Compared with other NYC neighborhoods*	Trend over time
Sulfur dioxide (SO <sub>2</sub> ) tons 2013	15.7	50.6	6.1	Worse	Not Available
Fine particulate matter (PM <sub>2.5</sub> ) tons 2013	2	5.9	0.7	Worse	Not Available
Nitrogen oxides (NO <sub>x</sub> ) tons 2013	82.1	161.1	29.4	Worse	Not Available

\* Categories based on whether the most recent neighborhood value falls among the best, middle or worse performing third of all NYC neighborhoods. NYC is divided into 42 neighborhoods based on the United Hospital Fund (UHF) approach of aggregating zip code areas to approximate Community Planning Districts.

### Data Sources:

1. United States Environmental Protection Agency (EPA) Air Quality System (AQS) Data
2. New York City Community Air Survey
3. New York City Department of Transportation
4. USEPA Air Quality System; Krewski D, et al. (2009) HEI Research Report 140. Health Effects Institute, Boston, MA
5. USEPA Air Quality System; Ito K et al. (2007) J Expo Sci Environ Epidemiol 17:S45-S60
6. USEPA Air Quality System; Moolgavkar SH (2000) Inhal Toxicol 12(Supp 4):75-90; Zanobetti et al. (2009) Environ Health 8:58. doi:10.1186/1476-069X-8-58
7. US EPA Air Quality System; Ito K et al (2011) Environ Health Persp, 119(4):467-473
8. USEPA Air Quality System; Huang Y et al. (2005) Environmetrics 16:547-562
9. US EPA Air Quality System; Silverman RA, Ito K (2010) J Allergy Clin Immun 125(2):367-373
10. New York City Bureau of Vital Statistics; United States Census
11. New York State Statewide Planning and Research Cooperative System (SPARCS); US Census

More data and information on Outdoor Air and Health can be found on the NYC Tracking Portal ([www.nyc.gov/health/tracking](http://www.nyc.gov/health/tracking)) and on EpiQuery ([www.nyc.gov/health/epiquery](http://www.nyc.gov/health/epiquery)). The tracking program is part of the National Environmental Public Health Tracking Network ([www.cdc.gov/EPHTracking](http://www.cdc.gov/EPHTracking)).