



**Air Pollution, Climate and Health in Hampden County
February 1, 2019**

Air pollution contributes to climate change and has clear Impact on Health

Air pollution is a major health danger for children and adults. Hampden County struggles with high levels of outdoor air pollution. This is likely due to several factors, including the I-91 interstate that runs along the city and over some neighborhoods, several point sources, including factories and power plants, and the fact that the city is in a valley and that pollution travels from other sources and settles. Ozone, PM_{2.5} and outdoor air pollution have been shown to lead to morbidity for several chronic diseases including asthma, chronic obstructive pulmonary disease (COPD), cardiovascular disease, with recent studies also suggesting an association with diabetes (Anderson 2012, Brook 2004, Ko 2009, Rajagopalan 2012).

In addition, air pollution affects the development of lungs and is linked to low birth weight and pre-term birth and susceptibility to infections. According to the EPA, fine particle pollution causes early death (both short-term and long-term exposure) and may cause reproductive and developmental harm (U.S. Environmental Protection Agency, *Integrated Science Assessment for Particulate Matter*, December 2009 EPA 600/R-08/139F). In 2013 the World Health Organization concluded that outdoor air pollution is [carcinogenic](http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/news/news/2013/10/outdoor-air-pollution-a-leading-environmental-cause-of-cancer-deaths) to humans (http://www.euro.who.int/en/health-topics/environment-and-health/urban-health/news/news/2013/10/outdoor-air-pollution-a-leading-environmental-cause-of-cancer-deaths).

Asthma – pediatric prevalence:

- Holyoke: 19.9%
- Chicopee 17.9%
- Springfield 16.6%
- Hampden County 15%
- Statewide: 12.1%
- Nationwide: 8.6%

The impacts of climate change are expected to increase the health disparities in Hampden County. Increases in temperature, increased precipitation and flooding may create even greater disparities and negatively impact individuals with pre-existing conditions and other vulnerable populations as follows:



- Increases in temperature and heat waves– Individuals with diabetes, obese individuals, children, elderly, hypertension, stroke, and depression are all at risk for negative effects of increases in temperature (Kovatz 2008). In some cases, such as children and older adults, bodies have a difficult time adjusting to the increased temperature, particularly in the absence of air conditioning. Elderly adults in assisted living institutions have been found to be at particular risk. Heat stress can also increase strain on the cardiovascular system which would negatively impact those with existing cardiac disease (e.g. stroke). The increase in temperature may also increase ozone pollution levels which would potentially adversely affect all residents but particularly vulnerable populations which include the elderly, children, and individuals with asthma, COPD, stroke, and diabetes. Hampden County already has D rating for the number of days with ozone.
- Flooding or extreme weather conditions would have the potential to destroy or cause damage to houses – Damage sustained from these conditions would lead to exposure to hazards in the home, including lead, asbestos and mold. Disrepair could also create opportunity for pest infestation, which is a trigger for asthma morbidity, in addition to mold exposure. It is estimated that 21% of asthma cases can be attributable to mold and moisture exposure in housing and buildings (Mudarri & Fisk 2007).
- Extreme weather events Such events may negatively impact mental health due to the stress and strain of homelessness, loss of property, etc.
- Rising temperatures, increased precipitation and flooding, and extreme weather events that will likely occur as a result of climate change may negatively affect the health of a large number of at-risk Springfield residents, including those with asthma, COPD, stroke, hypertension, diabetes, obesity, depression.
- ***These negative effects may exacerbate large existing health disparities if measures are not taken to increase resiliency of our cities and its residents.***