

Air Pollution and Asthma

HIGHLIGHTS

- In 2001 in Peel, an estimated 58 hospitalizations for asthma were attributed to air pollution. This is equivalent to nearly 5% of all asthma hospitalizations.
- Additionally, an estimated 172,000 “asthma symptom days” were attributed to air pollution in Peel in 2001.
- In 2001 in Peel, annual health care costs for hospital admissions and minor illnesses related to asthma were estimated to be over \$2.5 million.



INTRODUCTION

Outdoor air quality is affected by smog, which is composed of ground level ozone and fine particulate matter. Ozone is a respiratory irritant, formed when nitrogen oxides, volatile organic compounds and oxygen react with sunlight.^{15,16} The formation of ozone is dependent upon weather conditions and levels of air pollutants.¹⁶ As a result, the Ontario smog season usually extends from May to September, with ozone levels being highest between noon and early evening on hot, sunny days.¹⁶ Hot, dry weather can also result in increases in fine particulate matter that is inhalable, such as sulphur particles.

A number of studies provide strong evidence that air pollutants such as ground level ozone, airborne particles and acid aerosols are linked to reduced lung function in children, increased hospitalization due to respiratory and cardiac diseases, and increased mortality. Some studies have specifically examined the relationship between air pollution and asthma:

- A 1997 study found that “air pollution was significantly and consistently correlated with acute asthma exacerbations, chest symptoms and lung function decrements in asthmatic individuals”.¹⁷
- There is strong North American evidence of an increased number of emergency room visits for asthma and respiratory illness related to ground level ozone.¹⁸
- Finally, there is evidence that PM_{2.5} (particulate matter less than 2.5 micrometres in average diameter), PM₁₀ (particulate matter less than 10 micrometres in average diameter) and particulate sulphates are related to increased respiratory symptoms, lost school and work days, restricted activity, asthma attacks, emergency room visits, hospital admissions and death.¹⁹

THE IMPACT OF AIR POLLUTION AND ASTHMA IN PEEL

In 2000, the Ontario Medical Association created a model for estimating the level of health problems and associated health care costs that could be attributed to air pollution using available scientific evidence on the relationship between air pollution and illness. Using the Ontario Medical Association software tool called Illness Costs of Air Pollution (ICAP) and Peel-specific air pollution data for both ozone and particulate matter (PM₁₀) for 1999, estimates of asthma illness and health care costs attributable to air pollution were made.

In 2001 in Peel, it is estimated that 58 hospital admissions for asthma were attributable to air pollution. This number represents approximately 4.7% of all asthma hospital admissions, a proportion that is similar to that for Ontario (5.6%, based on a total of 610 asthma-related hospital admissions attributed to air pollution).²⁰

There were also over 172,000 “asthma symptom days” estimated as attributable to air pollutants in Peel in 2001. An asthma symptom day is counted when a person diagnosed with asthma has increased symptoms (wheezing, chest tightness and/or difficulty breathing) on a given day. Every asthma symptom day due to air pollution experienced by every asthmatic individual in Peel is then added together to obtain the overall annual total.

In 2001 in Peel, health care costs for asthma related hospital admissions and minor illnesses, attributable to air pollution, were estimated to be over \$2.5 million.