

# **Evaluating and Communicating the Health Impacts of Climate-Related Changes to Heat and Air Quality**

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Climate change is expected to increase the concentration of greenhouse gases leading to an increase in temperature and level of outdoor air pollutants. The health effects from excessive heat include heat stroke, heat exhaustion, cramps, edema, and, premature mortality. Extreme temperatures can also worsen chronic conditions such as respiratory, cardiovascular and kidney diseases, as well as diabetes-related conditions. Poor air quality can adversely impact the cardiovascular system leading to an increase in asthma and heart attacks. We have evaluated these impacts in Massachusetts where climate models estimate that there will be as many as 40 days per year over 90 degrees by 2030, and as many as 90 days by 2070. This is compared to approximately 11 days per year for the past 40 years. These models also predict an increase of up to 7 ppb in daily 8-hour maximum ozone levels by 2050 if there are no substantial reductions in GHG over the next decade. In evaluating these impacts we have developed a “heat-map” approach of ranking geographic areas of concern based on an evaluation of downscaled data on vulnerability to climate hazards, exposure to poor air quality, and a calculation of relative health risks. This approach integrates meteorological data, physiological factors (e.g. preexisting disease), and socioeconomic conditions (e.g., poverty). Examples of adaptive approaches that communities, institutions or individuals may implement to prepare for climate change will be presented. Our approach is to provide local, regional and state planners with technical information in an accurate and user friendly format.

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