



Outdoor Exposure to Secondhand Smoke: What's the Danger?

The dangers of secondhand smoke have been well established for decades and numerous studies document that secondhand smoke contains the same deadly chemicals as the smoke coming directly from a cigarette.

The research completed on outdoor air and secondhand smoke does not have nearly the volume that indoor air research does, but the research findings are unsurprisingly similar.

Studies on outdoor exposure to secondhand smoke have found:

- Secondhand smoke concentrations in a variety of outdoor locations can reach levels comparable to indoor concentrations where smoking is permitted.
- Outdoor locations with the greatest number of smokers resulted in average exposure levels that are considered unhealthy for sensitive groups and peak exposure levels that are considered very hazardous for everyone.
- Secondhand smoke odor is detectable at 23 feet from the source and irritation levels began 13 feet from the source. Furthermore, anyone positioned downwind from an outdoor source of secondhand smoke will be exposed, even at significant distances from the source.

These studies dispel the common misperception that outdoor secondhand smoke immediately dissipates into the air and does not pose a health risk. The dangerous composition of chemicals in smoke is the same – indoors or outdoors.



Action Steps

Communities across Minnesota have enacted policies to protect people from secondhand smoke exposure in outdoor settings. Restrictions have been placed on tobacco use in such places as:

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| • Parks | • Building Entrances | • Amusement Parks |
| • Trails | • Worksite Grounds | • Fair Grounds |
| • Playgrounds | • Ball Fields | • Water Parks |
| • Beaches | • Skate Parks | • Stadiums |
| • Zoos | • Bus Stops | • Rodeo Arenas |
| • Patios | • Festivals | • Picnic Shelters |

By eliminating smoking at these types of outdoor settings, people are receiving protection from the health consequences of secondhand smoke exposure, just as they have come to expect to receive this type of protection indoors.

Visit us at www.tobaccofreeparks.org to find out how to make your community's outdoor areas tobacco free!



Outdoor Exposure to Secondhand Smoke: The Research

The volume of scientific evidence showing that secondhand smoke causes serious illness and death in adults and children has grown to a level where in 2006, the U.S. Surgeon General called it *massive, conclusive, and indisputable*. As a result, health professionals in the United States and across the globe are taking action to eliminate people's exposure to secondhand smoke. Most of these actions have been through the elimination of indoor smoking in homes, cars, worksites, and to a lesser degree outdoor areas.

The California Air Resources Board(1) measured secondhand smoke concentrations in a variety of outdoor locations at *airports, colleges, government centers, office complexes and amusement parks*. They found that when smoking occurs in these settings, people could be exposed to levels of secondhand smoke that is comparable to indoor concentrations where smoking is permitted. In another study(2), where measurements were conducted when active smoking was taking place at outdoor *patios, sidewalks and parks*, similar results were observed.

Measuring Secondhand Smoke

A common measure of air quality in detecting secondhand smoke pollution is *particulate matter (PM)*. **PM 2.5** is air particles that have a diameter of smaller than 2.5 microns and the U.S. Environmental Protection Agency (EPA) has set air quality index levels and corresponding health advisory descriptors based upon these size measurements.

A Canadian study (3) measured secondhand smoke levels on outdoor *hospitality patios (restaurants/bars)*. Measurements were taken at three different locations, with some variation in dimensions and structure. The most significant difference was the number of smoking customers. The location with the greatest number of smokers resulted in average PM 2.5 levels of 102 (unhealthy for sensitive groups) and peak levels of 660 (very hazardous+).

A study conducted at one of the University of Maryland campuses (4) measured the distance from the source of secondhand smoke in which PM 2.5 can be detected. Previous studies found that odor *detection* can occur at 1 micron/cubic meter and *irritation* begins at 4 microns/cubic meter. In this study, odor was detectable at 23 feet from the source and irritation levels began at 13 feet. The study also found that anyone positioned downwind from an outdoor source of secondhand smoke is going to be exposed, even at significant distances from the source.

PM 2.5 AQI Break Points (microns/cubic meter)	Air Quality Index (AQI)	Health Advisory Descriptor
0.0 – 15.4	0-50	Good
15.5 – 40.4	51-100	Moderate
40.5 – 65.4	101-150	Unhealthy for Sensitive Groups
65.5 – 150.4	151-200	Unhealthy for Everyone
150.5 – 250.4	201-300	Very Unhealthy
250.5 – 350.4	301-400	Hazardous
350.5 – 500.4	401-500	Very Hazardous

References

- (1) CARB. (2003). "Technical Support Document for the Proposed Identification of Environmental Tobacco Smoke as a Toxic Air Contaminant: Part A," Technical Report. California Environmental Protection Agency, California Air Resources Board, Office of Environmental Health Hazard Assessment, Chapter 5, pp. V6-V19.
- (2) Klepeis NE, Ott WR, Switzer P. (May 2007). "Real-Time Measurements of Outdoor Tobacco Smoke Particles." Journal of Air & Waste Management Association. Vol. 57.
- (3) Kennedy RD, Sendzik T., Elton-Marshall T., Hammond D., Fong G. (2006). "Tobacco Smoke Pollution in Outdoor Hospitality Settings." University of Waterloo, Canada. Presented at the 13th World Conference on Tobacco OR Health 2006.
- (4) Repace, J. (2005). "Measurements of Outdoor Air Pollution from Secondhand Smoke on the UMBC Campus." www.repace.com