



## TFOS Lifestyle Report: Impact of environmental conditions on the ocular surface

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### ABSTRACT

Environmental risk factors that have an impact on the ocular surface were reviewed and associations with age and sex, race/ethnicity, geographical area, seasonality, prevalence and possible interactions between risk factors are reviewed.

Environmental factors can be (a) climate-related: temperature, humidity, wind speed, altitude, dew point, ultraviolet light, and allergen or (b) outdoor and indoor pollution: gases, particulate matter, and other sources of airborne pollutants. Temperature affects ocular surface homeostasis directly and indirectly, precipitating ocular surface diseases and/or symptoms, including trachoma. Humidity is negatively associated with dry eye disease. There is little data on wind speed and dewpoint. High altitude and ultraviolet light exposure are associated with pterygium, ocular surface degenerations and neoplastic disease. Pollution is associated with dry eye disease and conjunctivitis. Primary Sjögren syndrome is associated with exposure to chemical solvents. Living within a potential zone of active volcanic eruption is associated with eye irritation. Indoor pollution, “sick” building or house can also be associated with eye irritation. Most ocular surface conditions are multifactorial, and several environmental factors may contribute to specific diseases.

A systematic review was conducted to answer the following research question: “What are the associations between outdoor environment pollution and signs or symptoms of dry eye disease in humans?” Dry eye disease is associated with air pollution (from NO<sub>2</sub>) and soil pollution (from chromium), but not from air pollution from CO or PM<sub>10</sub>.

Future research should adequately account for confounders, follow up over time, and report results separately for ocular surface findings, including signs and symptoms.

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