



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

Monica Alves^{a,*}, Penny Asbell^b, Murat Dogru^c, Giuseppe Giannaccare^d, Arturo Grau^e, Darren Gregory^f, Dong Hyun Kim^g, Maria Cecilia Marini^h, William Ngoⁱ, Anna Nowinska^j, Ian J. Saldanha^k, Edoardo Villani^l, Tais Hitomi Wakamatsu^m, Mitasha Yuⁿ, Fiona Stapleton^c

^a Department of Ophthalmology and Otorhinolaryngology, University of Campinas Campinas, Brazil

^b Department of Bioengineering, University of Memphis, Memphis, USA

^c School of Optometry and Vision Science, UNSW, Sydney, NSW, Australia

^d Department of Ophthalmology, University Magna Graecia of Catanzaro, Catanzaro, Italy

^e Department of Ophthalmology, Pontifical Catholic University of Chile, Santiago, Chile

^f Department of Ophthalmology, University of Colorado School of Medicine, Aurora, USA

^g Department of Ophthalmology, Korea University College of Medicine, Seoul, South Korea

^h Department of Ophthalmology, Hospital El Cruce, Buenos Aires, Argentina

ⁱ School of Optometry & Vision Science, University of Waterloo, Waterloo, Canada

^j Clinical Department of Ophthalmology, Faculty of Medical Sciences in Zabrze, Medical University of Silesia, Katowice, Poland

^k Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

^l Department of Clinical Sciences and Community Health, University of Milan, Eye Clinic, San Giuseppe Hospital, IRCCS Multimedica, Milan, Italy

^m Department of Ophthalmology and Visual Sciences, Paulista School of Medicine, São Paulo Hospital, Federal University of São Paulo, Brazil

ⁿ Sensory Functions, Disability and Rehabilitation Unit, World Health Organization, Geneva, Switzerland

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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 NO₂) and soil pollution (from chromium), but not from air pollution from CO or PM₁₀.

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

* Corresponding author.

E-mail address: monicalves@me.com (M. Alves).