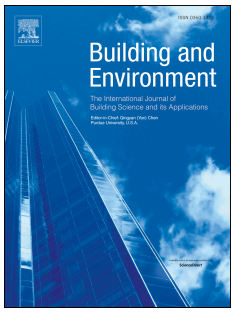
# Accepted Manuscript




An epidemiological approach to daylight discomfort glare

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# An Epidemiological Approach to Daylight Discomfort Glare.

**Abstract**

This paper attempts to extend methodologies of analysis derived from medical disciplines into discomfort glare assessment in office environments. Epidemiology is concerned with the occurrence, prevention and control of health-related events in specific populations. Understanding discomfort glare as an occupational risk factor and glare indexes as its diagnostic tests, allowed us to borrow performance metrics developed in the field of Epidemiology to fully characterize the diagnostic accuracy of some of the accepted, albeit imperfect, discomfort glare diagnostic methods. To demonstrate the applicability of this approach, we compared the results of daylight glare index, daylight glare probability, vertical illuminance at the eye, and degree of eye opening with a reference standard from a random sample (n=45) in three different daylit experimental scenarios. We calculated the sensitivity, specificity, likelihood ratios, Youden´s index, and receiver operating characteristic curves. Our results showed an acceptable diagnostic performance of the evaluated daylight glare indexes. We defined a criterion to assess the goodness of any discomfort glare diagnostic method and presented a method to optimize their performance by selecting the proper cutoff point according to specific diagnostic requirements. Finally, we discussed the benefits and implications of the epidemiological approach and explored future research directions in order to improve our ability to predict and asses the occurrence and magnitude of daylight discomfort glare.

**Keywords**

Discomfort Glare – Daylighting – Epidemiology – Diagnostic Accuracy.