Hubungan Kualitas Udara Ambien dan Faktor Meteorologis dengan Kejadian ISPA di Kota Bogor Tahun 2019-2022 = Association between Ambient Air Quality and Meteorological Factors with Occurrence of Acute Respiratory Infections (ARI) in Bogor City in 2019-2022

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Abstrak

Pencemaran udara dan faktor meteorologis dapat mempengaruhi kualitas udara dan meningkatkan risiko penyakit pernapasan seperti Infeksi Saluran Pernapasan Akut (ISPA). Penelitian ini menganalisis hubungan antara kualitas udara ambien (PM₁₀, SO₂, NO₂, O₃) dan faktor meteorologis (suhu, kelembaban, curah hujan, kecepatan angin) dengan kejadian ISPA di Kota Bogor tahun 2019-2022. Menggunakan desain studi ekologi time trend, hasil bahwa terdapat hubungan antara konsentrasi SO₂ dengan kejadian ISPA (p = 0,002). Sedangkan tidak terdapat hubungan antara konsentrasi PM₁₀dengan kejadian ISPA (p = 0,093), konsentrasi NO₂ dengan kejadian ISPA (p = 0,283), konsentrasi O₃ dengan kejadian ISPA (p = 0,439), suhu dengan kejadian ISPA (p = 0,571), kelembaban dengan kejadian ISPA (p = 1,000), curah hujan dengan kejadian ISPA (p = 0,732) dan kecepatan angin dengan kejadian ISPA (p = 0,334). Analisis regresi linear berganda menghasilkan persamaan: Kejadian ISPA = -41413,496 + 399,0079 (PM₁₀) + 891,919 (SO₂). Analisis spasial menunjukkan Kecamatan Tanah Sareal memiliki kejadian ISPA tertinggi. Dapat disimpulkan, hanya SO₂ yang secara signifikan berhubungan dengan kejadian ISPA di Kota Bogor selama periode penelitian.

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Air pollution and meteorological factors can affect air quality and increase the risk of respiratory diseases such as Acute Respiratory Infection (ARI). This study aimed to analyze the relationship between ambient air quality (PM₁₀, SO₂, NO₂, and O₃) and meteorological factors (temperature, humidity, rainfall, and wind speed) with the incidence of ARI in Bogor City from 2019 to 2022. A time-trend ecological study design was employed. Correlation test results indicated a significant relationship between SO₂ concentration and ARI incidence (p = 0.002). However, no significant relationships were found between PM₁₀ concentration and ARI incidence (p = 0.093), NO₂ concentration and ARI incidence (p = 0.283), O₃ concentration and ARI incidence (p = 0.439), temperature and ARI incidence (p = 0.571), humidity and ARI incidence (p = 1.000), rainfall and ARI incidence (p = 0.732), and wind speed and ARI incidence (p = 0.334). A multiple linear regression analysis between PM₁₀ and SO₂ with ARI incidence yielded the equation: ARI Incidence = -41413.496 + 399.0079 (PM₁₀) + 891.919 (SO₂). Spatial analysis results showed that during the study period, Tanah Sareal district had the highest ARI incidence in Bogor City. In conclusion, only SO₂ concentration was significantly associated with ARI incidence in Bogor City from 2019 to 2022.