

Kualitas udara ambien dan kejadian ISPA di Prop. DKI Jakarta: analisis time trend, correlate dan multiple regression linear berbasis data hasil pengukuran meteorologi, ISPU dan surveilans aktif rumah sakit di Prop. DKI Jakarta

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Abstrak

DKI Jakarta menunjukkan sebanyak 46% dari kasus-kasus penyakit adalah penyakit gangguan pernapasan (ISPA 43%, iritasi mata 1,7% dan asma 1,3%) yang terkait dengan kualitas udara ambien yang tidak memenuhi baku umum dimana polusi udara di DKI Jakarta mengalami fluktuasi dengan beberapa parameter telah melewati nilai ambang batas seperti Ozon, NO₂ dan nilai ISPU menunjukkan bahwa selama setahun hanya terhitung 22 hari udara Jakarta berkualitas baik, 95 hari dinyatakan tidak sehat, dan selebihnya 233 hari berkualitas sedang. Studi ekologi ini bertujuan untuk mengidentifikasi kualitas udara ambien, kondisi meteorologi, dan kejadian ISPA, mempelajari kecenderungan perubahan kualitas udara ambien, kondisi meteorologi dan mempelajari hubungan antara kondisi meteorologi dengan kualitas udara ambien serta mempelajari hubungan antara kualitas udara ambien, kondisi meteorologi dengan kejadian ISPA. Alat ukur yang digunakan untuk mengukur kualitas udara ambien menggunakan : FH6-I (5-ray absorbtion), APSA-360 (Fluorescence UV), APOA-360 (Chelminescence) dan NDR sedangkan untuk kondisi meteorologi adalah Tennometer; Hygrometrig Cup anemometer dan Global Star Pymnrometer. Populasi yang dilibatkan sebanyak 820 data rata-rata harian kualitas udara ambien, kondisi meteorologi dan ISPA dengan sampel sebesar 118 data rata-rata mingguan kualitas udara ambien, kondisi meteorologi dan ISPA. Dalam kurun waktu 2006 - Maret 2008 diperoleh konsentrasi rata-rata PM₁₀; 65,9 µg/m³, SO₂; 31,1 µg/m³, CO 1,1 µg/m³, NO; 51,4 µg/m³, NO₂; 31,6 µg/m³ dan nilai ISPU 72,3. Sedangkan rata-rata suhu 27,6°C, kelembaban 75,6 %, arah angin 154,5°, kecepatan angin 0,7 m/s, radiasi matahari 112,0 W/m² Serta rata-rata angka ISPA sebanyak 54 kejadian. Hubungan kualitas udara ambien dengan ISPA didapatkan bahwa SO₂ mempunyai korelasi positif terhadap angka ISPA. PM₁₀, ISPU mempunyai korelasi negatif terhadap angka ISPA. Hubungan kondisi meteorologi dengan ISPA didapatkan bahwa kelembaban, arah angin mempunyai korelasi positif terhadap angka ISPA. Suhu, radiasi matahari mempunyai korelasi negatif terhadap angka ISPA. Hubungan kondisi meteorologi dengan kualitas udara ambien didapatkan bahwa suhu mempunyai korelasi positif dengan PM₁₀, SO₂, NO₁ dan ISPU. Kelembaban mempunyai korelasi negatif dengan PM₁₀, SO₂, NO₂ dan ISPU, arah angin mempunyai korelasi PM₁₀, CO, SO₂, NO₂, ISPU, kecepatan angin mempunyai korelasi negatif dengan PM₁₀, CO, NO₂, ISPU, radiasi matahari mempunyai korelasi negatif dengan CO, radiasi matahari mempunyai korelasi positif dengan ISPU. Disimpulkan bahwa dalam kurun waktu 2006 - Maret 2008 didapatkan pola angka ISPA mengikuti pola konsentrasi kualitas udara ambien dan kondisi meteorologi hal ini dibuktikan dengan adanya hubungan SO₂, dan SO₂*O₃ Serta SO₂*Suhu secara bersamaan mempunyai pengaruh yang besar terhadap ISPA dengan nilai koefisien korelasi sebesar 0,616 dan nilai koefisien determinasi sebesar 0,379 (kuat). Dengan demikian SO₂, SO₂*O₃, dan SO₂*Suhu secara bersama-sama berpengaruh signifikan terhadap ISPA Namun konsentrasi CO, NO₂, kecepatan angin tidak berhubungan dengan kejadian ISPA di DKI Jakarta.

DKI Jakarta indicated 46% of disease cases were respirations problems (ISPA 43%, eye irritation of

1,7% and asthma of 1,3%) related to ambient air quality which did not fulfill standard quality where air pollution in DKI Jakarta experienced fluctuation with a few parameter have passed boundary threshold value like Ozone, NO₂ and ISPA value indicated that Jakarta air had a good quality for 22 days each year, it was not health for 95 days, and it was a medium quality for 233 days. This purpose of ecology study to identity an outdoor air quality, meteorology condition, and ISPA occurrence, studying a change tendency of outdoor air quality, meteorology condition and studying related between meteorology condition of outdoor air quality and also studying related between meteorology condition of outdoor air quality and ISPA occurrence. Measurement instruments which are used for measuring outdoor air quality such as FI-I6-l (B-ray absorption), APSA-360 (Fluorescence UV), APOA-360 (Cheluminescence) and NIDR while the instruments which are used for measuring meteorology condition such as Thermometer, Hygrometer Cup Anemometer and Global Star Pyranometer. Populations which are participated amount of 820 data on daily average of outdoor air quality, meteorology condition and ISPA by samples amount of 118 data on weekly average of outdoor air quality, meteorology condition and ISPA. At period of 2006 - March 2008 obtained average concentrations were PM₁₀ 65,9p g/m³, SO₁ 31,1p g/m³, CO up g/ms, O₃ 51,4u6§/ma, NO; 31,6p g/m³ and ISPU value '2,3. While temperature average was 27, C, dampness was 7S,6%, wind direction is 154,5°, wind velocity was 0,7 mls, sun radiation was 112,0 Wim! and also mean number of ISPA was amount 54 occurrences. Related between outdoor air quality and ISPA indicated that SO₂ has a positive correlation of ISPA number. PMN, O₃, ISPU have negative correlations of ISPA number. Related between meteorology condition and ISPA indicated that dampness, wind direction have positive correlations of ISPA number. Temperature and sun radiation have negative correlations of ISPA number. Related between meteorology condition and outdoor air quality indicated that temperature has positive correlations of PM₁₀, O₃, NO; and ISPU. Dampness has negative correlation with PM₁₀, O₃, NO; and ISPU, wind direction has correlation PM₁₀, CO, O₃, NO₂, ISPU, wind velocity has negative correlation of PMN, CO, O₃, NO₂, ISPU, sun radiation has negative correlation of cobalt, sun radiation has positive correlation of ISPU. It was concluded that at period of 2006 - March 2008 indicated ISPA number pattern follow pattern concentration of outdoor air quality and this meteorology condition was proved by the existence of related between SO; SO₁* SO; and SO₂* temperature, at the same time, it has a big effect of [SPA by correlation coefficient value was 0,616 and determination coefficient value was 0,379 (strong). Therefore SO;, SO₁=, and SO# temperature, at the same time, it has an effect of ISPA significantly. But concentration of CO, NOQ, wind velocity does not relate to ISPA occurrence in DKI Jakarta.