عنوان مقاله:

Correlation between meteorological variables, air quality, and the Coronavirus-۱۹ pandemic events

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خلاصه مقاله:

BACKGROUND AND OBJECTIVES: The study explores the complex relationship between meteorological variables, air quality, and Coronavirus-۱۹ pandemic events in Jakarta, emphasizing the global concern over air pollution's detrimental effects on both health and the economy. It emphasizes the correlation between climate change and exacerbating air pollution by changing weather patterns and meteorological conditions, leading to elevated levels of pollution. Additionally, the study underscores the impact of the Coronavirus-۱۹ pandemic on air quality, with lockdowns temporarily reducing emissions but also revealing the complex interplay between climate change, agricultural practices, and air pollution spikes. The ongoing challenges in improving air quality persist despite the government's efforts, highlighting the need for a thorough understanding of the situation to inform effective policy interventions and strategies for reducing emissions. METHODS: The study analyzed key pollutants from five monitoring stations in Jakarta including particulate matter ۲.۵ from a Swiss air quality technology company. Meteorological data (temperature, rainfall, wind speed, humidity, and sunshine hours) were sourced from the Indonesian Agency for Meteorology, Climatology, and Geophysics for the period ۲۰۱۸-۲۰۲۱. The restriction measures and case data pertaining to the Coronavirus disease-۱۹ were acquired from Health Office in Jakarta. Data analysis utilized Microsoft excel and statistical package for the social sciences software, with spearman correlation tests due to non-normal distribution. This empirical approach investigated the associations among air pollutants, meteorological factors, and occurrences of Coronavirus disease-۱۹ in Jakarta, Indonesia. FINDINGS: Positive linear elationships were identified between the concentrations of particulate matter ۱۰, particulate matter ۲.۵, carbon monoxide, and nitrogen dioxide. Conversely, a negative linear correlation was observed between carbon monoxide and ozone levels. Nonlinear correlations also existed between various pollutants. During the pandemic, carbon monoxide, nitrogen monoxide and sulphur dioxide concentrations increased, whereas particulate matter ۲.۵ and ozone levels decreased. Air quality parameters were generally higher in the dry season. Throughout the pandemic, the temperature and wind speed exhibited a consistent pattern, remaining stable. However, it is noteworthy that the levels of humidity and intensity of rainfall experienced a noticeable increase during this period. Particulate matter exhibited a negative correlat ...

کلمات کلیدی:

Air pollution, Air Quality, Coronavirus disease-۱۹ (COVID-۱۹) pandemic, meteorological variables

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