

Abstract of Master's Dissertation

Course	International Health Development	Name	Shingo Tamaki
Thesis Title	Fine particulate matter and daily health facility-based mortality: a time-stratified case-crossover study in Jakarta, Indonesia		
<p>Objective:</p> <p>We examined the short-term association between daily health facility-based mortality and exposure to fine particulate matter (PM_{2.5}) concentration in Jakarta, Indonesia.</p> <p>Method:</p> <p>(Study Area) The research location was Jakarta, the capital city of Indonesia.</p> <p>(Mortality Data) Daily mortality information was obtained from the DKI (Daerah Khusus Ibukota) Jakarta Provincial Health Office between January 1, 2016 and December 31, 2017. The data include only death cases reported by government hospitals and public health centers.</p> <p>(PM_{2.5} Data) Daily mean PM_{2.5} data was retrieved from two monitoring sources, operated by the U.S. Embassy in Jakarta via OpenAQ.</p> <p>(Weather Data) Meteorological data was collected from the Jakarta/Observatory station and a World Meteorological Organization (WMO) station located at Kemayoran.</p> <p>(Study Design and Statistical Analysis) We employed a time-stratified case-crossover study design to estimate the relative risk (RR) of mortality associated with PM_{2.5}. We applied conditional quasi-Poisson regression model with year-month-day-of-the-week strata and temperature adjustment. Excess risk was computed as $(RR - 1) \times 100\%$.</p>			

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<p data-bbox="253 427 347 456">Result:</p> <p data-bbox="253 477 1331 813">There were 59,113 non-accidental deaths, 5,992 respiratory-related deaths and 16,833 cardiovascular-related deaths. The average PM_{2.5} level was 36.0 with inter-quantile range (IQR) 19.9 µg/m³, while average temperature was 28.6 C°. An IQR increase in PM_{2.5} was associated with a delayed effect on respiratory mortality at lag 1 (5.50%, 95%CI: 0.16-11.12) and lag 2 (7.12%, 95%CI: 1.76-12.76). The cumulative effects from lag 0 to lag 2 was 7.85% (95%CI: 1.54-14.56). We did not observe significant associations for non-accidental and circulatory mortality.</p> <p data-bbox="253 882 408 911">Conclusion:</p> <p data-bbox="253 931 1331 1317">Findings suggest that short-term exposure to PM_{2.5} might adversely affect respiratory related mortality in Jakarta, Indonesia. The association is short and appears to be delayed for up to two days preceding death due to respiratory diseases. Although no evidence was observed for non-accidental and cardiovascular deaths, more research with longer study period and multiple locations is needed to confirm our findings. Local evidence is important to increase awareness and help local government priority prevention measures to reduce burden associated with daily PM_{2.5}.</p> <p data-bbox="1182 1337 1342 1366">(323 words)</p>			