

## **Health risk assessment of fine suspended particulate in rural and urbanizing areas of Taiwan**

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### **Abstract**

There is an improving trend of air quality in Taiwan, but the particles (particulate matter, PM) concentration compared with the standard value is still high. The impact of fine suspended particles (PM<sub>2.5</sub>) and related air pollution on the environment and human health are more widely concerned recently.

Although the health effects of suspended particles have been studied in Taiwan, fine suspended particulate (PM<sub>2.5</sub>) is not well assessed. Nevertheless, PM<sub>2.5</sub> may also interact with traffic pollutants and ozone and cause further harm to health. There is highly traffic density in Taiwan. In the meantime, the ozone episode day also continues to increase. The issues of fine suspended particulate (PM<sub>2.5</sub>) on health hazards, especially for respiratory and cardiovascular, have recently been raised. There is a need to conduct a systematic comprehensiveness survey network for assessing the health effects of fine suspended particles (PM<sub>2.5</sub>) on the respiratory and cardiovascular diseases, including short-term and long-term morbidity and mortality, especially area-specific consideration in the analyses. Urbanizing and rural area may have potentially increased traffic air pollution and ozone exposure respectively. We used Poisson regression for analyzing the long-term health effects (including mortality, emergency care, hospitalization and other medical utilization) of fine suspended particles (PM<sub>2.5</sub>) exposure. Furthermore, we used case-crossover for short-term health effect. The results showed that acute effects of PM<sub>2.5</sub> exposure related to cardiovascular diseases and respiratory diseases were more likely found in rural area of Taiwan. However, the results showed potentially more chronic health effects of cardiovascular diseases and respiratory diseases related PM<sub>2.5</sub> exposure in urbanizing area of Taiwan. Area-specific PM<sub>2.5</sub> may have different effects on health. The composition of PM<sub>2.5</sub> can be playing a key role related to acute and chronic health effects in area-specific way.

Keywords: air pollution, fine suspended particles, morbidity, mortality, rural, urbanizing