

# The effects of the PM2.5 air pollution on labor supply in Japan

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## **Abstract**

In this paper, we empirically examine how PM2.5 pollution affects labor supply in Japan. While the air pollution by PM2.5 can cause severe illness which raises mortality, that pollution also causes relatively mild illness which may not be fatal but can bare other forms of social costs. The loss of labor supply is one of such social costs. Individuals feeling sick due to the increased PM2.5 pollution can decide not to attend the workplace by taking sick or paid leaves or shorten their work hours, and this can reduce the total labor supply. The adverse effects of the PM2.5 pollution on labor activities have been recently discussed in various countries but have not been examined in the context of Japan. We use the combined monthly panel datasets covering from 2012 to 2017 obtained from the Monthly Labor Survey collected by the Ministry of Labor, Health and Welfare and the PM2.5 pollution data collected by the National Institute for Environmental Studies, and examine the effects of the PM2.5 pollution mainly under the fixed effects model. The results show that the increased PM2.5 pollution reduces the total labor supply per worker, and the reduction of labor supply is apparently caused by the reduced attendance to workplace. The results also suggest the possibility that workers try to compensate the lost labor in a day with high PM2.5 pollution levels by extending the working hours in other days, although that behavior is not sufficient to fully compensate the loss.

**Keywords:** particulate matters; air pollution; labor supply; social costs; Japan.