Air Pollution and Respiratory-Related Restricted Activity Days in Tunisia

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Abstract : This paper focuses on the assessment of the air pollution and morbidity relationship in Tunisia. Air pollution is measured by ozone air concentration and the morbidity is measured by the number of respiratory-related restricted activity days during the 2-week period prior to the interview. Socioeconomic data are also collected in order to adjust for any confounding covariates. Our sample is composed by 407 Tunisian respondents; 44.7% are women, the average age is 35.2, near 69% are living in a house built after the 1980, and 27.8% have reported at least one day of respiratory-related restricted activity. The model consists on the regression of the number of respiratory-related restricted activity days on the air quality measure and the socioeconomic covariates. In order to correct for zero-inflation and heterogeneity, we estimate several models (Poisson, Negative binomial, Zero inflated Poisson, Poisson hurdle, Negative binomial hurdle and finite mixture Poisson models). Bootstrapping and post-stratification techniques are used in order to correct for any sample bias. According to the Akaike information criteria, the hurdle negative binomial model has the greatest goodness of fit. The main result indicates that, after adjusting for socioeconomic data, the ozone concentration increases the probability of positive number of restricted activity days.

Keywords : bootstrapping, hurdle negbin model, overdispersion, ozone concentration, respiratory-related restricted activity days

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