Reviewer's report

Title: Longitudinal study of respiratory function and symptoms in a non-smoking group of long-term officially-acknowledged victims of pollution-related illness

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Reviewer: Bjorgulf Claussen

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Review of the article Oslo 6.5.2013
Longitudinal study of respiratory function and symptoms in a non-smoking group of long-term officially-acknowledged victims of pollution-related illness

This study follows 563 officially-acknowledged victims of air pollution related illness in the city of Kurashiki in Japan who were above 64 years of age in 2009, the survivors of the original sample of 3,838 persons in 1988. A small number of smokers were excluded. The victims were examined annually and treated for their medical conditions.

A range of lung function tests declined in the observation years 2000-09 but not more than among a reference population of healthy persons of same age who were not exposed to heavy air pollution. The victims had much respiratory symptoms when they got the compensation, and dyspnoa increased in the observation years but not wheezing, cough and sputum.

The strength of this study is a long follow up period with very good data, among them grading of lung symptoms. The selected population had been exposed to the high mean of 40-50 ppm of SO2 for seven years in 1968-1974, according to figure 2. Statistics are very well done. The main weakness is no control group which would be nearly impossible to establish with so comprehensible data. Comparison with a reference population is a good alternative.

The main conclusion of the authors is, first, that the lung symptoms of these victims are caused by the high level of air pollution, and second, that the normal increase in dyspnoea and decrease in lung function in the observation period are caused by only common aging. The second part of this conclusion is well documented in the article and is obviously true. Because the levels of SO2 and NO2 fell rapidly after 1974 to around 5-10 and 20 ppm, respectively, this result supports the first part of the conclusion. Still, I think it is too far fetched to conclude that the lung disorders at the start was caused by the high air pollution level at that time. That the victims are legally acknowledged is not a strong point, as far as I can see, because these persons are probably not selected only because they have been extraordinarily exposed to air pollution. They are only 0.9% of scarcely half a million inhabitants in the city, and they may have applied for the compensation because of many different reasons for their lung disorder. In reality, the authors may absolutely be right, the legal acknowledgement may have been very strictly conducted, and they may have been exposed also in their
work. In addition, their conclusion are supported by many other research results. But it is hard to establish causal relationships in epidemiology, and the authors should be more careful on the pages 13 - 17.

Minor points:

I think that the columns with total numbers should be skipped in all tables because in most of them the two sexes are compared, and that is enough. Then, only one point will be missed, on page 13 para 1 is stated one important result in the total population which are not statistically significant for men and women separately, but that result can be placed in the text.

On page 11 para 2 is stated that SO2 were above the accepted level in 1965 to 1974 but on figure 2, I find this level in the years 1968 to 1974.

On page 12 para 3, I wonder if the results in table 4 are statistically significant?