Burden of disease from joint household and ambient air pollution for 2016

V3.0 April 2018

Description of method
The burden of disease attributable to the joint effects of household and ambient air pollution for the year 2016 was estimated based on the calculation of the joint population attributable fractions assuming independently distributed exposures and independent hazards as described in (1). The joint population attributable fractions (PAF) were calculated using the following formula:

$$ PAF = 1 - \prod_{i=1}^{n}(1 - PAF_i) $$

where PAF_i is PAF of individual risk factors.

Note of caution
An approximation of the combined effects of risk factors is possible if independence and little correlation between risk factors with impacts on the same diseases can be assumed (1). In the case of air pollution, however, there are some limitations to estimate the joint effects: limited knowledge on the distribution of the population exposed to both household and ambient air pollution, correlation of exposures at individual level as household air pollution is a contributor to ambient air pollution, and non-linear interactions (4, 5, 6). In several regions, however, household air pollution remains mainly a rural issue, while ambient air pollution is predominantly an urban problem. Also, in some continents, many countries are relatively unaffected by household air pollution, while ambient air pollution is a major concern. If assuming independence and little correlation, a rough estimate of the total impact can be calculated, which is less than the sum of the impact of the two risk factors. The joint effects of both ambient and household air pollution would result in the impacts shown the document “Burden of disease from the joint effects of Household and Ambient Air Pollution for 2016”.

References
Contributes to Ambient PM2.5 Air Pollution and the Burden of Disease. Environ Health Perspect. 2014; 122:12. doi:10.1289/ehp.1206340.

For further information, please contact:
Public Health, Social and Environmental Determinants of Health Department,
World Health Organization, 1211 Geneva 27, Switzerland
Website: www.who.int/phe; email: ambientair@who.int

© World Health Organization 2018

All rights reserved.