

# Economic burden of air pollution in Colombia

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## Abstract

To estimate indirect costs related to the loss of productivity due to premature mortality associated with air quality risk factors in Colombia, 2016. We estimated potential productivity years of life lost (PPYLL) related to indoor (biomass fuels) and outdoor pollution (PM<sub>2.5</sub> and ozone). We analyzed deaths records of the Departamento Administrativo Nacional de Estadística, 2016, with the following basic causes of death related to air quality risk factors: ischemic heart disease (IHD), cardiovascular disease (CD), lower respiratory tract infections (LRTI), lung cancer (LC) and chronic obstructive pulmonary disease (COPD), according to ICD-10. PPYLL were valued considering the productive age in Colombia, which ranges from 18-57 years for women and up to 62 for men. Three scenarios were built: lower loss (minimum legal wage), average loss [one per capita gross domestic product (GDP<sub>pc</sub>)] and higher loss (three GDP<sub>pc</sub>). PPYLL for the mentioned causes were multiplied by the fraction attributable to each air risk factor. The latest were estimated from IDEAM (outdoor) and the survey of Quality of Life 2016 and systematic reviews (indoor pollution). Costs were reported in American dollars, using the December 31 (2016) exchange rate: 1USD=3,000.7 Colombian Pesos. The economic burden due to premature deaths caused by the analyzed diseases was US\$845,967,999 (\$444,320,058-\$2,537,903,997). From this burden, 17.8% was attributable to air risk quality factors, corresponding to US\$150,585,143 (\$79,090,461-451,755,428). Regarding to the studied diseases, IHD deaths caused by air quality risk factors accounted US\$83,007,582. The second with the highest economic burden attributable to air quality risk factors was CD (US\$32,750,315), followed by LRTI (US\$22,077,091), LC (US\$6,909,659) and COPD (US\$5,840,495). The exposure to PM<sub>2.5</sub> particulate matter represented the largest share of the economic burden attributable to air quality risk factors. Our estimations suggest that premature deaths caused by exposure to air quality risk factors represented 0.052% of GDP for 2016.