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# Health effects of exposure to sulfur dioxide from Holuhraun/Barðarbunga eruption in Iceland

**Hanne Krage Carlsen[1,2,3,4], Haraldur Briem[5], Thorsteinn Jóhannsson[6], Unnur Valdimarsdóttir[2,7], Throstur Thorsteinsson[1], Thor Aspelund [2], Thorolfur Gudnason[5],**

[1]Environment & Natural Resources & I Earth Sciences

[2]C of Public Health, U Iceland

[3]Occupational & Environmental Med, Sahlgrenska Academy, Gothenburg

[4]Occupational & Environmental Med, Umeå U, Sweden

[5]Directorate of Health

[6]EPA, Iceland

[7]Dep Epidemiology, Harvard School of Public Health, USA

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During the Holuhraun volcanic eruption in Iceland fall-winter 2014-15 12 million ton sulfur dioxide (SO2) were emitted. The aims of this study were to determine if SO2 exposure from the eruption in Holuhraun was a) a risk to respiratory health in the general population, and b) professionals who worked near the eruption site. Methods SO2 was monitored nation-wide and nationwide data on dispensing of anti-asthma medicines and disease diagnoses during the eruption were obtained. Preliminary analysis focused on the temporal association of anti-asthma medicines dispensing and disease diagnoses with SO2 levels in the Reykjavik capital area using Poisson time series analysis adjusting for time trend and other pollutants. Respiratory health and symptoms experienced during visits to the eruption site were surveyed among professionals by questionnaires and spirometry. Spirometry was performed on 32 who worked regularly at the eruption site(mean age 39 years, 6 females), 16 were followed up upon return. Results In preliminary analysis high SO2 levels during the previous week (lag days 0-6, at least one day >125µg/m3) was associated with increases in asthma drug usage by 14.6%. The increase was highest in children 0-9 years old (53.8%). High SO2 levels during the 3 days (lag days 0-2, corresponding to at least one day >125µg/m3) was statistically significantly ($p<0.05$) associated with increased primary care contacts due to respiratory illnesses (19.1%), circulatory system and heart disease (14.2%) and headaches (28.0%), but not conjunctivitis (-5.0%, ns) or stomach pain (-11.5%, ns). In the professionals lung function was not worsened after visiting the eruption site. Significantly higher rates of eye and nasal irritation was reported at the eruption site than away from it . Conclusions Dispensing of anti-asthma medication and respiratory and circulatory system diseases were increased after SO2 exposure. No persisting effect was found in professionals working near the eruption site.