

# LUNG FUNCTION, RESPIRATORY AND MENTAL SYMPTOMS AMONG INHABITANTS EXPOSED TO VOLCANIC ASH FROM THE EYJAFJALLAJÖKULL ERUPTION, ICELAND

**Hanne Krage Carlsen**, *Centre of Public Health Sciences, University of Iceland, Reykjavik, Iceland*

**Thorarinn Gíslason**, *Faculty of Medicine, University of Iceland, Department of Respiratory Medicine and Sleep, Landspítali University Hospital, Reykjavík, Iceland*

**Bryndís Benediktsdóttir**, *Faculty of Medicine, University of Iceland, Department of Respiratory Medicine and Sleep, Landspítali University Hospital, Reykjavík, Iceland*

**Thórir Björn Kolbeinsson**, *Primary Health Care Center of South Iceland, Selfoss, Iceland*

**Arna Hauksdóttir**, *Centre of Public Health Sciences, University of Iceland, Reykjavik, Iceland*

**Throstur Thorsteinsson**, *Institute of Earth Sciences, Reykjavík, Iceland*

**Haraldur Briem**, *Centre for Health Security and Communicable Disease Control, Directorate of Health, Seltjarnarnes, Iceland*

**Background and aims:** The explosive eruption of the Eyjafjallajökull volcano, 14 April to 20 May 2010, produced abundant fine-grained ash, some estimate 8 million tons of particles 2.8-28 µm in diameter. Residents of the rural region near the volcano were heavily exposed to volcanic ash, of which possible health risks are little known. This study aimed to estimate effects of exposure to ash from Eyjafjallajökull to near-by residents' health.

**Methods:** After ashfall ceased, all residents in the most affected areas were invited for a medical examination, spirometry and questionnaires about mental and physical health and use of protective equipment. Parents reported symptoms in their children. The study was conducted in the affected area from 31 May to 11 June 2010.

**Results:** Altogether 167 adults (83 men, 84 women), and 40 children (<18 years) participated. According to local health officials, most residents of the area participated. In questionnaires, 46% of adults reported irritation symptoms from nose and throat, 27% eye irritation, when exposed to ash. Less common were shortness of breath (23%) and nausea (7%). In children, throat irritation was most common (28%). Less than 10% reported symptoms of stress, anxiety or depression in the previous week. Almost all (98%) had used outdoor protective equipment during ash fall. Altogether 18% showed abnormal results when lung function was tested (both pre- and post-bronchodilator testing) according to a standardized protocol ([www.boldstudy.org](http://www.boldstudy.org)). Spirometry results are being compared to an age- and gender matched general population sample. According to physician's reports, those with preexisting conditions, respiratory or mental, were prone to experiencing adverse symptoms following the eruption.

**Conclusions:** No severe immediate health effects (hospitalizations or fatalities) could be attributed to ash exposure. Individuals with history of respiratory or mental disease were more likely to experience adverse symptoms.

**References:** Burden of Lung Disease (BOLD). [www.boldstudy.org](http://www.boldstudy.org). 2011.