# Health Effects of Short-term Volcanic SO₂ Exposure and Recommended Actions

## Quantity of SO₂*  
<table>
<thead>
<tr>
<th>µg/m³</th>
<th>ppm</th>
<th>Air quality description</th>
<th>Recommended actions</th>
</tr>
</thead>
</table>
| 0-300 | 0-0,1 | Good  
Poses little or no health risk. | Sensitive Groups ** | Can experience mild respiratory symptoms. | Healthy individuals | No health effects expected. |
| 300-600 | 0,1-0,2 | Moderate  
May cause respiratory symptoms in individuals with underlying diseases. | Caution advised. Follow SO₂ measurements closely. | Healthy individuals | Health effects unlikely. |
| 600-2.000 | 0,2-0,7 | Unhealthy for sensitive individuals  
Individuals with underlying diseases likely to experience respiratory symptoms. Health effects unlikely in healthy individuals. | Avoid outdoor activities. | Healthy individuals | Health effects not expected. Heavy outdoor activities not advised. |
| 2.000-9.000 | 0,7-3,0 | Unhealthy  
Everyone may experience respiratory symptoms especially individuals with underlying diseases. | Remain indoors and close the windows. Shut down air conditioning. | Healthy individuals | Avoid outdoor activities. Remaining indoors advised. Close the windows and shut down air conditioning. |
| 9.000-14.000 | 3,0-5,0 | Very unhealthy  
Everyone may experience more severe respiratory symptoms. | Remain indoors and close the windows. Shut down air conditioning. Follow closely official advises. | Healthy individuals | Remain indoors and close the windows. Shut down air conditioning. Follow closely official advises. |
| > 14.000 | >5,0 | Hazardous  
Serious respiratory symptoms expected. | Remain indoors and close the windows. Shut down air conditioning. Follow closely official advises. | Healthy individuals | Remain indoors and close the windows. Shut down air conditioning. Follow closely official advises. |

*Based on 15-minute average  
**Children and adults with pre-existing bronchial asthma, bronchitis, emphysema and/or heart diseases. These recommendations also apply to pregnant women.

## General recommendations:

1. Individuals with pre-existing pulmonary- and heart diseases are encouraged to have their medications readily available.
2. Recommendations to reduce SO₂ in inhaled air:
   - Breathe with your nose as much as possible and avoid physical exercise.
   - Remain indoors and close the windows. Shut down the air conditioning if visible haze.
   - If you are staying inside and experiencing respiratory difficulties due to high SO₂, take a cloth and saturate it with a thin paste of baking soda and water (5 gram per liter of
Drape the cloth over the face of a fan and turn the fan on at a low or medium speed. The baking soda will neutralize the sulfur compounds and the moisture will help remove particles from the air. You’ll need to keep the cloth damp at all times to ensure for this method to be as effective as possible. The use of a face mask or a cloth soaked in water mixed with baking soda (5 grams per liter) can also reduce the SO$_2$ in inhaled air. However, breathing through a soaked face mask/cloth can be difficult for fragile individuals.

- The use of a gas mask is the most effective way in reducing the SO$_2$ in inhaled air. Gas masks are however, not widely available and their use is not advised unless in circumstances where the SO$_2$ concentration is very high and also according to official recommendations.

**The Chief Epidemiologist for Iceland, the Environmental Agency and the Civil Protection**

September 2014