

Volcanic ashes: short- and long-term body problems

What is it?

Ashes are particles produced because of rock fragmentation during eruptions, and have a size under 2 mm. Problems can be unnoticed and last a long time, even after the eruption has terminated

Problems in the respiratory system

Extra-thoracic area

Nose
Mouth
Larynx

Inhalable fraction
Particles under 15 microns

Trachea-bronchial area

Trachea
Bronchus

Thoracic fraction
Particles under 10 microns

Alveolar region

Lungs
Alveoli

Breathable fraction
Particles under 4 microns

One micron (μ) is one-thousandth part of a millimeter

Frequent imposition problems:

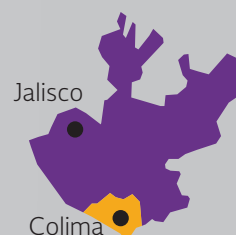
What happens in your alveoli?

- 1 Particles under 4 microns lodge in pulmonary alveoli
- 2 Your body encapsulates particles a lung-defense mechanism
- 3 As a result of inflammation, a scar is produced and breathing capacity is reduced

Did you know that...

Along various eruptive episodes, from 1991 on, some towns

for 20 years, some towns



have received ashes from the Colima volcano, exposing around...

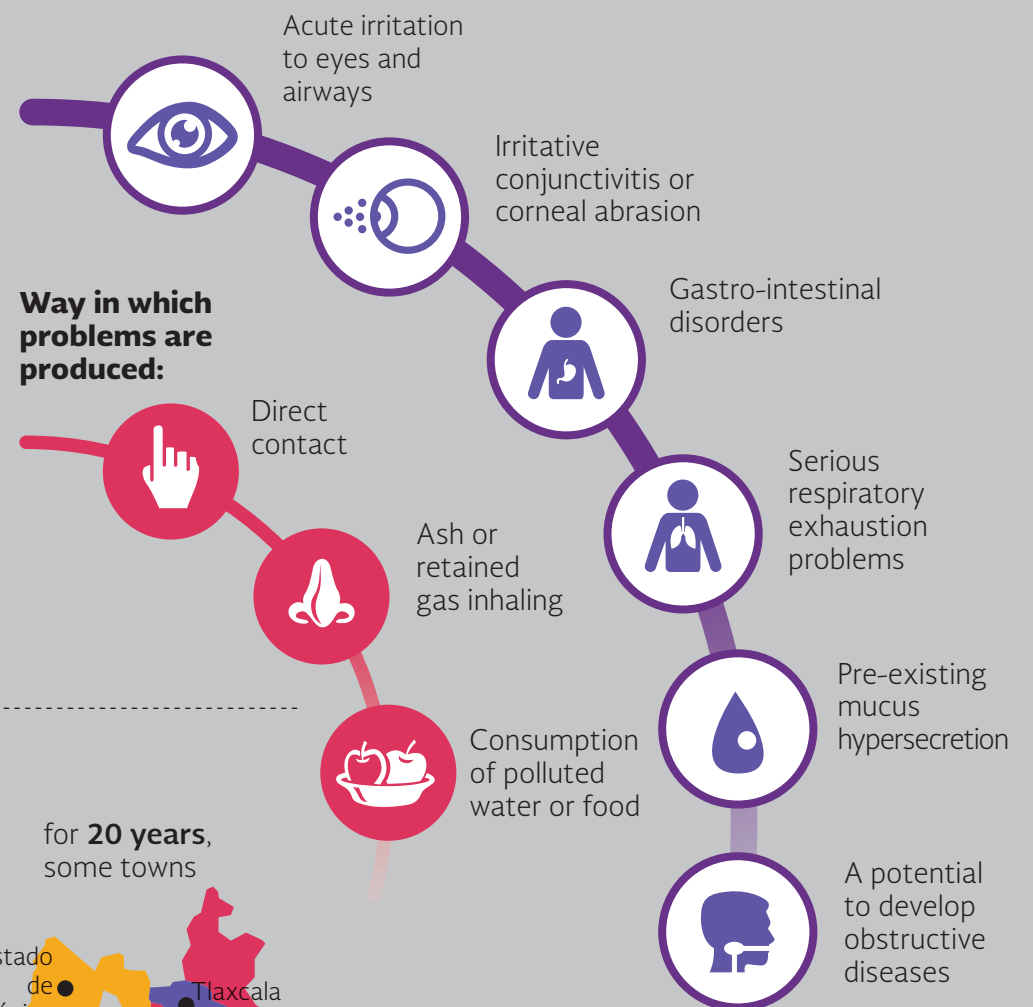


have received ashes from the Popocatepetl volcano, exposing around ...

400 thousand persons to problems



4.5 million persons to problems



Be informed

Secretaría de Salud
www.gob.mx/salud

Centro Nacional de Prevención de Desastres
www.gob.mx/cenapred

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Volcanic ashes scattered

Affect human activity and health

On ashes

The mechanism by which an eruption may affect human health, depends on four factors:



Eruption variables:
the amount of material expelled depends on the type of eruption



Toxic properties of components:
gas concentration, pH, and water solubility



Scattering and permanence patterns:
proximity to eruption site is important to determine risk



Physical properties of ashes:

- Size under 15 microns can be inhaled
- Size under 4 microns are breathable, and by far more toxic

In case of ashes distribution

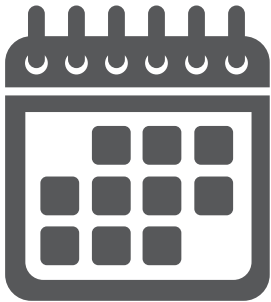
- Cover nose and mouth with a face mask or handkerchief, wash eyes and throat with pure water
- If possible, stay indoors
- Try to avoid children and the elderly to be in contact with ashes
- Cover water deposits or tanks to avoid contamination

At the Popocatepetl...



35 individuals working

outdoors (1994-1995) at a distance under 25 km from the volcano, suffered a decreased respiratory capability because of ash inhalation



7 months later,

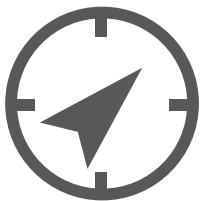
effects could be reversed once ash emissions were reduced

Ashes can remain active for 100 years after and eruption



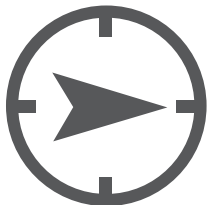
700 ash emissions

were reported 1994 to 2014



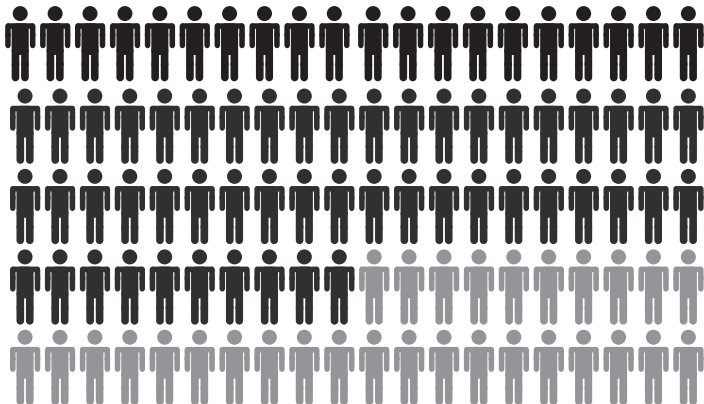
30% of ashes

have been scattered over the northeast



20% of ashes

have been scattered over the east



In Mexico,

70% of persons

having respiratory problems do not visit health services