

## The role of dust due to soil erosion in causing allergies in population groups in Iran

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### Abstract:

An allergy occurs when the body's immune system reacts to a particular substance while that substance does not react in other people. The immune system makes proteins called antibodies against external agents (allergens). Antibodies produced by the immune system release other chemicals, such as histamines, and histamine causes symptoms of inflammation. A study by the Asthma and Allergy Foundation of America found that anaphylaxis is an allergic reaction threatening people's health, affecting about one in 50 Americans. However, there is a one in 20 chance. Studies by the WHO show that about a quarter of the world's population suffers from allergy complications. Urbanization and the industrialization of human societies are increasing the number of people with seasonal allergies. Dust particles are allergens in different age groups that enter the respiratory tract through respiration and stimulate the immune system to react. A study on the impacts of fine dust on health and the environment showed that fine dust climbs to a height of six kilometres and is transported up to six thousand kilometres. This condition is dangerous for the age group of adults, children, and patients with respiratory diseases, so governments and doctors recommend that people stay at home and travel less outside the home. In addition to endangering people's health, this situation can severely undermine the economy and livelihoods as offices, shops, and workshops are closed, similar to what happened during the Lockdown period of Coronavirus; there is an economic crisis.

There is also damage, such as damage to cars, power, and water outages. A study on the social harms of dust in Sistan and Baluchestan province (eastern Iran) showed a correlation between the occurrence of dust and the increase in migration and unemployment. The phenomenon of fine dust has been observed for years in some parts of Iran, especially in the western and semi-western regions. It has created problems for the inhabitants of cities. Iran ranks first in soil erosion in the world. The wind erosion in Iran is significant due to the vastness of arid regions and winds that enter the country from the west. In Iran, about 20 million hectares of land are exposed to wind erosion. According to the National Center

for Climate Change in the Environment Organization of Iran in 2012, 22 provinces of Iran were affected by the phenomenon of dust. In 2015, four provinces of Lorestan, Kermanshah, Ilam, and Khuzestan were in the worst situation. The phenomenon of fine dust in Khuzestan province depicts one of the worst forms of polluted air, and Ahwaz hospitals are always ready. The most important factor in creating dust centers is the loss of vegetation and soil erosion.

The wind carries the loose particles with its kinetic energy and transports them to different areas. It is at this point that the importance of protecting the soil and human health are aligned. In Iran, due to the lack of proper implementation of soil protection programs, new centers of dust production in the country, especially in the western and central desert regions have been formed. They are expanding. It can be said that in Khuzestan, hundreds of people go to the hospital every year due to respiratory disorders. Adverse effects of fine dust include burning of the nose and throat, inflammation of the nose and throat, the possibility of sinusitis and upper respiratory infections. Besides, hoarseness, allergies, asthma, and bronchitis will not be unexpected. Lung cancer and respiratory failure are long-term complications of particulate matter. Asthma is a chronic allergic disease that affects one in ten children and one in twenty adults. There is a 25% chance that the number of people with asthma will increase in the future.

Since the end of the 20th century, the incidence of asthma has doubled due to increased air pollution, global warming, and lifestyle changes. According to the latest figures from the WHO, more than 334 million people worldwide have asthma. Studies by the Iranian Ministry of Health show that about 15% of Iranians have asthma, and the disease has become more prevalent in children under the age of six in recent years. The phenomenon of fine dust has been occurring in some cities of Iran for more than a decade, so it is considered a long-term phenomenon, and if not addressed, it will have severe adverse consequences in the future. In recent years, the number of dust days in the west of the country has been announced to be more than 100 days and 16 times the world standard. A statistical study in one of the hospitals in Khorramabad (Lorestan) showed a correlation of more than 80% between the two dust variables with the number of

patients with asthma and lung diseases. A study in the city of Kermanshah also showed that with a 1% increase in air pollution caused by fine dust, about half of the hospitalization of respiratory patients, about 1% of heart patients, and about 0.3% The death rate of heart patients would increase. One study found that inhaling high concentrations of calcium bicarbonate, silt, and clay in dust particles led to sneezing and prolonged coughing. The physical and chemical study of the particles showed that the fine dust contained a complex combination of chemical elements and harmful microorganisms. The results of research in Khuzestan showed that the fine dust imported to this province had excessive concentrations of heavy metals lead, zinc, and cadmium. It is recommended to use ventilation systems and wash the mouth, nose regularly when the dust phenomenon occurs. Of course, this is only temporary relief and does not solve the main problem.

This condition will only improve if you follow vegetation management and soil conservation programs. It is necessary to use methods such as creating and maintaining pastures, using natural mulch, etc. to prevent the development and aggravation of allergies in the population of urban residents. It should not be forgotten that oil mulches should be discarded due to their harmful properties for the environment and carcinogenicity to humans. Sandblasting and enriching sands with plant growth-promoting microorganisms (PGPR) is an effective and environmentally friendly method that can effectively combat wind erosion and dispersion of soil particles. It is suggested that immunologists and physicians play an effective role in preventing allergic diseases and maintaining human health by pursuing environmental protection plans.