

Coal Burning Linked to Fluoride Disease in China

Bones, teeth affected in unventilated homes

Art Chimes | St. Louis, Missouri 21 October 2010



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Fluoride disease is blamed for an outbreak in China that blackened teeth, caused very brittle bones and bone deformation.

A cluster of villages in China's Guizhou province has been plagued by an outbreak of disease that damages teeth and bones. Now, a new study by Chinese and American researchers puts the blame on polluted coal burned in home fireplaces.



In small quantities, fluoride can prevent tooth decay. But too much fluoride can lead to a whole spectrum of symptoms, and that's what Chinese doctors were seeing, explains chemistry professor Joseph Gardella at the State University of New York at Buffalo.

"It runs from everything as simple as blackened teeth to these very brittle bones, bone deformation, so that leads to very debilitating disability," he said in a telephone interview. "And the rates of skeletal fluorosis in some of the villages are as high as 30 percent, although not all of those people who suffer are suffering the most extreme disability."

The most common source of fluoride disease is water pollution. But tests found no problem with the villages' water, so scientists started looking for another environmental source of fluoride.

Coal, which is burned for heating and cooking, was another suspect, but the coal itself wasn't polluted. However, advanced imaging techniques revealed that the culprit was another material burned with the coal.

"These are villagers that will collect what coal is available. And it turns out that they form briquettes, coal briquettes to burn, by mixing it with surface clay. And what we've learned is that the fluorine, as fluoride, is associated with this clay component," Gardella said.

The scientist says it's unclear exactly how the village residents were being poisoned by the fluoride. They might be breathing in the chemical, which is an ion of the element fluorine. Or it might be in tiny particles that settle on food.

"We were able to obtain dried peppers and dried corn samples from the villages and show that the particulate matter on the surfaces of these chili peppers was really high in fluorine content."

Either way, says University at Buffalo scientist Joseph Gardella, the Chinese government has launched a program to install chimneys to vent the harmful fluoride out of villagers' homes.

[Results](#) of the research were presented in Albuquerque, New Mexico, at the International Symposium of the AVS, the scientific group formerly known as the American Vacuum Society.

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