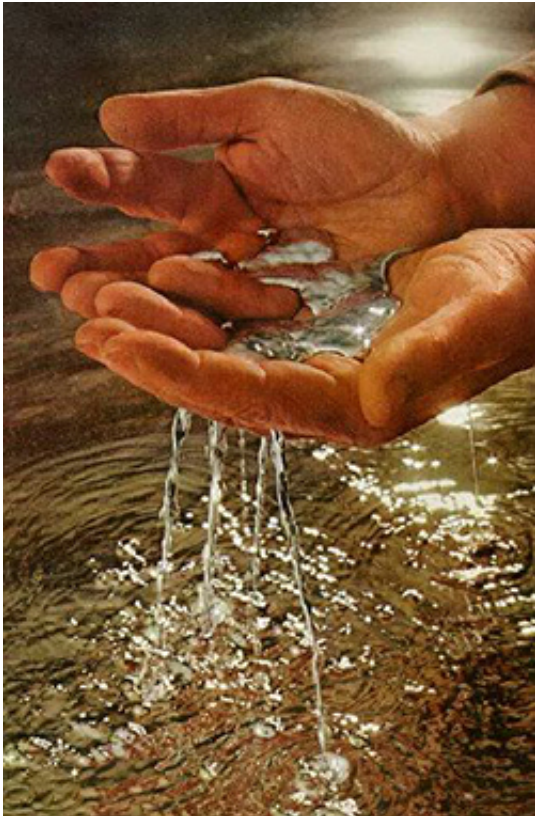


Artisanal gold mining and its health risks

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Mercury is a toxic element that can cause neurological disorders when is continuously in contact with the organism.

Researchers from the UPM have characterized the health risks derived from the usage of mercury in artisanal gold mining in Colombia through probabilistic models.

The tools developed by researchers from the Environmental

Geochemistry Research and Engineering Laboratory (LI2GA) of the Universidad Politécnica de Madrid (UPM) have given evidence of their quantitative efficiency to problems about occupational and environmental exposures to pollutants. These tools will allow researchers to categorize risk situations and to give priority to the intervention performances, especially in regions with limited financial resources where is more complex to conduct rigorous clinical studies.

Artisanal gold mining is common in Latin-American regions, Africa and Southeast Asia where there are large socio-economic inequalities and active or abandoned goldfields. This activity is performed outside of the workplace health and safety regulations. Therefore, miners can be at risk due to possible accidents during the exploitation of deposits and due to chronic exposure to [mercury](#). This risk of [mercury poisoning](#) is not just limited to workers but also the entire population of the mining communities.

Mercury is a toxic element that can cause neurological disorders when is continuously in contact with the organism, either through [elemental mercury](#) by inhalation or consumption of fish contaminated with mercury. Mercury from artisanal gold mining is used to concentrate gold in an amalgam of both elements. Later, it is burned in order to rid of the mercury and to recover the gold. During this amalgamation process, accidental and intentional discharges of mercury can occur.

Mercury eventually ends up in nearby rivers and, consequently, in the fish tissues. The problem is that fish constitutes an essential part of the diet for the mining communities included in this research. Likewise, amalgam burning is made in small workshops, sometimes in houses. All this can cause [mercury pollution](#) in the air of workplaces, houses and outer areas of these communities.

Researchers from LI2GA of UPM collected data about biometrics,

lifestyle and consumption of 12 [gold mining](#) departments in Colombia. They also collected mercury concentration air data of in the amalgamation workshops, air data of the roads of these mining communities and also data of the diverse fish species of the area.

All this data along with the quantitative data of potential toxicity of mercury were conducted by probabilistic risk assessment. The results unveiled the mercury exposure dose in these mining communities exceeded the admissible values, even reaching 200 times higher of the reference values in certain maximum exposure situations.

The general population is also exposed to unacceptable risk to health (up to 50 times higher than the recommended values) due to consumption of contaminated fish and breathing mercury vapor in the air.

The probabilistic risk assessment cannot replace the clinical research to control public health and intervention. However, it can be a useful tool to characterize and to highlight these problems in order to give priority to corrective performances.

More information: De Miguel E., Clavijo D., Ortega M.F., Gómez A. (2014). Probabilistic meta-analysis of risk from the exposure to Hg in artisanal gold mining communities in Colombia. *Chemosphere* 108: 183–189.

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