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Mercury Contamination in Huancavelica, Peru: Community Engagement to Assessment and Remediation

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Huancavelica, Peru is among the world's most mercury-contaminated cities due to 400 years of cinnabar mining and refining associated with the nearby Santa Bárbara mine. Located southeast of Lima at 12,000 ft. in the Andes, Huancavelica is the capitol of its namesake department, which is the poorest in Peru. Several assessments using community-based participatory research have identified mercury two orders of magnitude above risk-based screening levels in earthen walls and floors in 75% of the homes studied. This extrapolates to about 3,800 homes that could be contaminated above risk-based screening levels. The contamination is likely due to historic emissions of both vapor and dust from refining cinnabar in the city. Local surface soil is contaminated with mercury and other heavy metals, and such soil has been used as construction material for over half the homes in the city. Mercury concentrations in wall and floor material, as well as indoor vapor, are above USEPA and World Health Organization standards for chronic exposure and in many cases above USEPA interim removal action levels. Since 2009, community members have been engaged in research design and conduct, educational initiatives, and a remedial action pilot study. The pilot study consisted of encapsulating contaminated walls and floors to reduce both vapor and contaminated dust in the homes. Vapor concentrations decreased on average approximately 60% after completing the remedial action. In addition, encapsulation of heavy metal-contaminated earthen materials significantly decreased the risk of exposure through incidental ingestion of contaminated dust, which also contains arsenic and lead above screening levels. Stucco walls and concrete floors are moderately inexpensive and are a culturally relevant remedy.

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