

## ABSTRACT

People living and working in artisanal and small-scale gold mining (ASGM) areas are frequently exposed to elemental mercury (Hg), which is used for gold extraction. However, additional exposure to other toxic metals such as arsenic (As), cadmium (Cd) and lead (Pb) may result from mining-related activities and could be ingested via dust, water or food. In these areas, only limited biomonitoring data is available for toxic metals other than Hg. In particular, data about the exposure to As, Cd and Pb is unavailable for the Zimbabwean population. Therefore, we conducted a cross-sectional study in two ASGM areas in Zimbabwe to evaluate the internal exposure to these metals. In total, urine and blood samples from 207 people that identified themselves as miners were collected and analysed for As and Cd in urine as well as Pb in blood by GF-AAS. Median levels (interquartile ranges in  $\mu\text{g/l}$ ) of As and Pb were 9.7  $\mu\text{g/l}$  (4.0, 18.5) and 19.7  $\mu\text{g/l}$  (12.5, 34.5), respectively. The 25th percentile and the median for Cd were below the limit of detection (0.5  $\mu\text{g/l}$ ); the 75th percentile was at 0.9  $\mu\text{g/l}$ . The results were compared to reference values found for the general population in the USA and Germany, and a significant number of participants exceeded these values (As, 33 %; Cd, 27 %; Pb, 32 %), indicating a relevant exposure to toxic metals. Although not representative for the Zimbabwean population, our results demonstrate that the exposure to toxic metals is relevant for the public health in Zimbabwe and requires further investigation.