

There are a large number of small-scale artisan gold miners who use mercury in the extraction of gold in Ghana. The extraction process releases arsenic and mercury into the environment with its associated risk to human health. Human exposure to arsenic and mercury was assessed in artisanal miners involved in illegal mining activities in five communities at Obuasi municipality, a historic mining area in Ghana. Subjects completed an exposure assessment questionnaire and also provided the first urine voided upon waking up in the morning. Total urine-As and urine-Hg were simultaneously determined using neutron activation analysis. The highest mean urine-As value recorded at the high risk level ($> 35 \mu\text{g/L}$) was $53.57 \pm 5.58 \mu\text{g/L}$. Seventeen percent of the miners recorded urinary-As levels above the biological exposure index of $35 \mu\text{g/L}$; 38% were found in the moderate risk level ($20\text{-}35 \mu\text{g/L}$) while 45% were in the low risk bracket ($< 20 \mu\text{g/L}$). The highest mean urine-Hg concentration at the high risk level was $38.55 \pm 3.83 \mu\text{g/L}$, recorded by 2% of the miners. Five percent of the miners had urine-Hg concentrations in the moderate risk bracket while 93% were at the low risk level. Fifty five percent of the artisanal miners recorded values above the WHO recommended range of 5 to $20 \mu\text{g/L}$ for urine-As. Key words: Mercury, arsenic, urine, neutron activation analysis.