

## **Murshidabad-one of the nine groundwater arsenic affected districts of West Bengal, India. Part I: Magnitude of contamination and population at risk**

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### **ABSTRACT**

**Introduction.** To understand the severity of the arsenic crisis in West Bengal, India, a detailed, three-year study was undertaken in Murshidabad, one of the nine arsenic affected districts in West Bengal. The district covers an area of 5324 km<sup>2</sup> with a population of 5.3 million. **Methods.** Description of the study area, mode of sample collection and instrumentation for analysis and quality assurance program were highlighted. **Results.** During our survey we analyzed 29612 hand tubewell water samples for arsenic and 26% of the tubewells were found to have arsenic above 50 µg/L while 53.8% had arsenic above 10 µg/L. Of the 26 blocks in Murshidabad, 24 were found to have arsenic above 50 µg/L. Based on our generated data we estimated that approximately 0.2 million hand tubewells are installed in all 26 blocks of Murshidabad and 1.8 million in West Bengal. It was estimated on the basis of our data that about 2.5 million and 1.2 million people were drinking arsenic contaminated water with concentrations above 10 µg/L and 50 µg/L levels respectively in this district. The analysis of total 3800 biologic (nail, urine and hair) samples from arsenic affected villages revealed that 95% of the nail and 94% of the urine samples contained arsenic above the normal levels and 75% of the hair samples were found to have arsenic above the toxic level. Thus, many villagers in the affected areas of Murshidabad might be sub-clinically affected. **Discussion and conclusion:** Comparing our extrapolated data with international dose response results we estimated how many people may suffer from arsenical skin lesions and cancer. Finally if the exposed population is provided safe water, better nutrition and proper awareness about arsenic problem, lives can be saved and countless suffering of the affected population can be avoided.