

The magnitude of arsenic contamination in groundwater and its health effects to the inhabitants of the Jalangi-one of the 85 arsenic affected blocks in West Bengal, India

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Abstract

To better understand the magnitude of arsenic contamination in groundwater and its effects on human beings, a detailed study was carried out in Jalangi, one of the 85 arsenic affected blocks in West Bengal, India. Jalangi block is approximately 122 km² in size and has a population of 215 538. Of the 1916 water samples analyzed (about 31% of the total hand tubewells) from the Jalangi block, 77.8% were found to have arsenic above 10 µg l⁻¹ [the World Health Organization (WHO) recommended level of arsenic in drinking water], 51% had arsenic above 50 µg l⁻¹ (the Indian standard of permissible limit of arsenic in drinking water) and 17% had arsenic at above 300 µg l⁻¹ (the concentration predicting overt arsenical skin lesions). From our preliminary medical screening 1488 of the 7221 people examined in the 44 villages of Jalangi block exhibit definite arsenical skin lesions. An estimation of probable population that may suffer from arsenical skin lesions and cancer in the Jalangi block has been evaluated comparing along with international data. A total of 1600 biologic samples including hair, nail and urine have been analyzed from the affected villages of Jalangi block and on an average 88% of the biologic samples contain arsenic above the normal level. Thus, a vast population of the block may have arsenic body burden. Cases of Bowen's disease and cancer have been identified among adults who also show arsenical skin lesions and children in this block are also seriously affected. Obstetric examinations were also carried out in this block.