

Arsenic contamination and its health outcomes in the Mekong River basin of Cambodia

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Abstract

To measure the magnitude of arsenic exposure through oral ingestion, laboratory and field investigation were conducted in four different provinces within the Mekong River basin of Cambodia. As a result, groundwater arsenic in Kandal, Prey Veng and Kratie provinces were greater than the regulation limit of the World Health Organization and Cambodian drinking water quality standard. Likewise, rice arsenic in Kandal and Prey Veng could be considered as an additional source of arsenic intake of the study populations. Health risk assessment revealed that 98.7 % of respondents from the Kandal province study area were at risk for the potential non-cancer effect and an average cancer risk was found to be 5 in 1000 exposure. The calculations also indicated that, in the Kratie province study area, 13.5% of respondents were affected by non-cancer health risks and 33.7% were threatened by cancer, whereas none of respondents in the Kampong Cham province study area appeared to have non-carcinogenic effect. Concurrently, in-depth interview was particularly conducted in Tuol Svay village (formerly known as Preak Russey village) in Kandal province by a questionnaire for demographic and socioeconomic information and the behaviors of water consumption of the residents. A survey found that females and adults were more likely to be diagnosed with arsenicosis symptoms than males and children, respectively. Among all respondents (n = 246), 42.3 % were illiterate, 64.6% were farmers and 84.6% could earn less than 8,000 Riels (USD 2.0) per day. The majority (72% in dry season and 91.9% in raining season) drank water from various alternative sources (i.e. rainwater, piped water and open well/pond). The discrimination and behavior toward arsenicosis patients were negligible. However, health care and the follow-up on severe patients and appropriate medication were requested.

Keywords: Arsenic; groundwater; rice, the Mekong River basin, Cambodia