Research indicates urban drinking water sources in Nepal heavily contaminated

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Although access to clean drinking water is crucial to public health, it is a highly neglected issue in Nepal. 80% of all diseases in the world are related to either water or sanitation, according to the World Health Organization. WHO also reports that 30,000 adults and children die everyday due to water-borne diseases across the world. The Nepalese public health department says that 3,500 children die every year due to water-borne diseases.

A recent research article published in the journal *Annals of Clinical Chemistry* and Laboratory Medicine has found a frightening trend in the cleanliness of drinking water in urban centres of Nepal. The research, conducted in the Dharan municipality in eastern Nepal, indicated that urban water sources could be highly contaminated.

Out of five water supply sources investigated, three sources were found to be contaminated with faecal coliform and other bacteria and an additional source was found to be contaminated with heterotrophic bacteria.

The research titled Bacteriological Quality of Drinking Water Sources and Reservoirs Supplying Dharan Municipality of Nepal found high bacteriological contamination in water reservoirs supplying water to the town. The research was conducted by Narayan Dutt Panta with inspiration from Dr. Nimesh Poudyal and Dr. Shyamal Kumar Bhattacharya with water samples from water reservoirs in the Dharan municipality.

"When I was at the BP Koirala Institute of Health Sciences, Dharan, we used to get a lot of people who came to the hospital with some water-borne diseases," said Narayan Dutt Panta, lead author of the journal article. "Tap water was highly contaminated. So, I thought of following the distribution line up to the source. Upon reaching the source, I found an alarming situation. There were open sources and proper disinfection techniques were not followed."

"Children were defecating and butchers were slaughtering animals above source three, an open source without a flocculation and sedimentation plant," he added.

Ironically, even water reservoirs with treatment plants were found to have contamination. Only one of the two reservoirs having treatment plants was found to be effective, according to the research article.

"The treatment plants lacked proper trained technicians. Even the correct doses of water disinfectants were not applied at the treatment plants," added Pant. "If we find contamination in the source, it is easy to decontaminate it if we follow the proper process. But the process is not followed due to carelessness."

The study results have revealed yet another threat to public health. "Rising temperature and upcoming monsoon might provoke an outbreak of cholera and diarrhoea in Nepal unless effective measures are taken on time," said Dr Prabodh Risal, executive editor of the journal. "Public awareness about the current situation and preventive measures could decrease the incidence and prevent death related to the water born disease like cholera, hepatitis and typhoid."

"The research has highlighted the ignorance of the local authority regarding the quality of water supplied to its public," added Dr Risal.

The article recommends regular monitoring of the microbial quality of the water sources and planning of control measures in case of sudden outbreaks due to contaminated water. "The water sources should be protected by fencing or by any other means to control the human and animal activities," recommends the article. "The treatment units should be constructed in [all] sources and proper disinfection of water should be carried out in sources as well as in all the reservoirs."

More information: Narayan Dutt Pant et al. Bacteriological quality of bottled drinking water versus municipal tap water in Dharan municipality, Nepal, *Journal of Health, Population and Nutrition* (2016). DOI: 10.1186/s41043-016-0054-0

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