

Letter to the Editor

Household Water Treatment in China

Dear Sir:

We read with interest the article by Rosa and Clasen¹ about the prevalence of household water treatment in low-income and middle-income countries. They discussed the geographic limitations of their global estimation, especially the lack of data for the largest national population in China. Several surveys covering water and sanitation have been undertaken in China in recent decades, such as the World Health Survey, the Global Water Supply and Sanitation Assessment 2000, and the Multiple Indicator Cluster Survey. These survey results have already been included in the World Health Organization/United Nations Children's Fund Joint Monitoring Program report.² However, none of these survey questionnaires covered household water treatment. Despite the lack of data on home water treatment accessible in the English language, it is possible that other surveys exist that have been conducted by the Chinese government rather than through international systems, such as the Multiple Indicator Cluster Survey, with results published in Chinese only.

We searched the bibliographic database Chinese National Knowledge Infrastructure by using the Chinese key words for "household" and "water" and "treatment/disinfection". We found 417 Chinese language references. After screening the titles and abstracts of all references and the content of an additional 197 references, we found one paper reporting the national summary results of the Investigation of Drinking Water and Sanitation in the Rural Areas conducted jointly by the Ministry of Health and the National Committee for Patriotic Public Health Campaign, People's Republic of China, during August 2006–November 2007.³ In this nationally representative multi-stage cluster survey of rural areas, 6,948 sites were surveyed in 6,590 villages across all 31 provinces, autonomous regions, and municipalities in mainland China. A total of 65,839 households were interviewed and 6,948 supply system, groundwater and surface water samples were tested for physicochemical parameters and total coliforms. The interviews included two questions on home water treatment:

- "What is your usual drinking practice? 1) Drink raw water, 2) Drink boiled water" and
- "Do you treat (other than boiling) the household's water? Yes or No".

Although the raw data are still not publicly available, the summary of the official report indicated that 85.23% of rural households boiled their water before drinking and 5.11% treated their water (excluding boiling).³ Given that the mainland Chinese rural population was estimated to be 712.88 million in 2009,⁴ this finding suggests that the population boiling household water is 607.59 million and the population using other

forms of home water treatment is 36.3 million in rural China. Household water filters are increasingly used in urban areas of China. Although there are no reported household survey data for urban areas, one report estimated that 3–5% of the urban population used household water filters.⁵ If this 4% prevalence estimate for household water filtration is applied to the total mainland Chinese urban population of 621.86 million,⁴ this suggests a population of 24.9 million filtering their water. Including these estimates for China, the global population from low-income and middle-income countries boiling household water doubles from 0.60¹ to 1.21 billion, and the population using treated household water increases to at least 1.78 billion.

A small-scale survey in Anhui Province in central China that collected 35 household storage water samples from randomly selected households in three counties reported that the compliance rate for total coliforms (< 1 colony-forming unit/100 mL) of water stored in the home was only 39%.⁶ This limited evidence on microbial contamination of stored water implies that there may be a need for household water treatment in rural China. Other treatment methods, e.g., filters, are increasingly used in more economically developed parts of rural China.⁷ However, boiling is still the most widely used water treatment method in rural China. The Investigation of Drinking Water and Sanitation in the Rural Areas survey figures illustrate the need for more data on the world's most populous nation in understanding global patterns of household water treatment. It further underscores the need articulated by Rosa and Clasen to understand the effectiveness and use of boiling in non-intervention settings.

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This study was supported by the Bill & Melinda Gates Foundation, under grant reference 48599 (Aquatest 2: Delivery a low cost water test for developing countries).

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