

World first study shows water supply does not contribute to gastrointestinal disease

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A world first research study published today suggests that major metropolitan water supplies do not contribute to gastrointestinal illness.

The \$3 million study compared the health of people drinking sterilised water with people drinking ordinary tap water in Melbourne. There was no difference in the incidence of gastroenteritis between the two groups over a 16 month period. The researchers said they found no evidence of waterborne disease.

The Water Services Association of Australia said spending hundreds of millions of dollars on higher water treatment standards would have no effect on human health.

"Some people believe we should sterilise water to remove every last trace of bacteria and other organisms," the association's Executive Director, Dr John Langford, said. "We could do that if Australians were willing to pay far more for drinking water, but this new research shows it would not improve public health."

Dr Langford said the research demonstrated how to measure any health benefit from stricter treatment standards. "We should be focussed on improving public health, not producing sterilised water," he said.

The research was carried out by a team from the Department of Epidemiology and Preventive Medicine at Monash University in Melbourne, as a partner in the CRC for Water Quality and Treatment

It is the first rigorous study anywhere in the world that a major research project has studied the impact of drinking water on people's health. Previous water quality studies have focussed on measuring bacteria levels rather than health effects.

The WSAA, which co funded the research, described the report as a major contribution to debate on the future management of water supplies. The WSAA is made up of 21 urban water businesses and authorities serving approximately 13 million Australians.

"The water industry contributed to this research because we wanted to know if major additional investment in water treatment could be justified on public health grounds," Dr Langford said.

"The Monash University research answers that question and the answer is NO. Melbourne's water is unfiltered because the water supply catchments are highly protected. In most other Australian cities filtration is provided in recognition of the fact that catchments are often less protected. Additional treatment of city water supplies would cost hundreds of millions of dollars. If we have that much extra to spend on public health, we would get a better result putting the dollars into the hospital system.

"In the past three years the cost of building and running water treatment plants in Australia increased by 47 per cent. Water treatment now costs every household \$60 of the \$365 they spend on average on water supplies each year.

"Higher standards of water treatment would push that figure even higher. It is unlikely that the community would be well served diverting community funds into additional water treatment for no benefit to public health."

Some 600 families in Melbourne's eastern and south eastern suburbs took part in the Monash University study. Each family had a water treatment unit installed in the kitchen. Only half of the units worked -the other half were dummy units delivering normal tap water. The families and the research workers did not know who had the real treatment units and who had the dummies.

Each family kept detailed health diaries recording any cases of gastroenteritis. The research team found 2,669 cases of the disease over 16 months. There was virtually no difference in the level of gastroenteritis between families with the real and dummy units.

In its conclusions, the research team headed by Associate Professor Kit Fairley wrote: "We found no evidence of waterborne disease in a city with a chlorinated unfiltered water supply drawn from a protected catchment".

Dr Langford said the Melbourne research would be closely studied throughout the world because it switched the emphasis from measuring bacteria to measuring health..

"Many cities are looking at their water quality as new testing techniques detect ever smaller numbers of micro-organisms in urban water supplies," he said.

"What Dr Fairley and his researchers have established is that we should be looking at the health benefits of new water treatment technologies, not just what they remove from the water."

The Melbourne study was supported by: The Cooperative Research Centre for Water Quality and Treatment, Water Services Association of Australia, Department of Human Services Victoria, Melbourne Water Corporation, South East Water Limited, Yarra Valley Water Limited and City West Water Limited.

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NO HEALTH BENEFIT TO FILTERING MELBOURNE'S WATER

No city in the world can be more sure that its water supply does not cause health problems than Melbourne, according to medical doctor and infectious diseases expert Kit Fairley. Associate Professor Fairley was commenting on the outcome of a 'world first' scientific study on Melbourne's water quality conducted by the Cooperative Research Centre for Water Quality and Treatment and Monash University.

The \$3 million, three year project was designed to examine the relationship between human health and water quality. Some 600 families in the eastern and south-eastern suburbs took part in the study. Each family had a water treatment unit installed in the kitchen, half of which were real filter units and half of which were dummy units. The real units filtered and disinfected the water, whilst the dummy units delivered normal tap water. Neither the families nor the research workers knew who had the real or dummy units until after the study was completed.

Families recorded their health over a 16 month period, monitoring symptoms of gastroenteritis. The study showed no difference in the level of gastroenteritis between families with real water treatment units and families with dummy units.

"This study represents an unprecedented shift from a reliance on measuring bacteria to test water quality - to measuring the health effects on people," says Associate Professor Fairley. "Worldwide trends would indicate that water supplies sourced from surface waters are increasingly being filtered. In contrast, 90% of Melbourne's water is sourced from one of the best protected catchment systems in the world. The study was prompted by questions about the value of installing filtration systems."

The Water Quality Study results indicate that it is unlikely that Melbourne would derive a health benefit **from** filtering drinking water taken from highly protected **catchments**. Associate Professor Fairley points out that this result is consistent with data **from** other sources, indicating Australian capital cities are free from waterborne disease.

"Health implications can't always be determined from the ever more sophisticated testing methods available., Therefore, this study is a valuable tool in deciding whether we should contribute significant amounts of money to increase the degree of water treatment, when at the end of the day, we would not be able to measure any benefit to human health."

Melbourne's drinking water is considered one of the best in the world as almost all of it is harvested from wilderness **catchments**, which are protected from any public access - all forms of tourism and agriculture are banned. As a result, the water requires minimal treatment.

The study was directed by Associate Professor Kit Fairley, **from** the Department of Epidemiology and Preventive Medicine at Monash University.

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**ABSTRACT for Australasian Society of Infectious Diseases Annual Scientific Meeting,
Leura NSW, 15 -19 April 2000**

**A RANDOMISED CONTROLLED TRIAL INVESTIGATING THE
GASTROINTESTINAL HEALTH EFFECTS OF DRINKING WATER.**

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Background. A number of investigative studies and highly publicized outbreaks of waterborne disease have raised concerns about the safety of water supplies in developed nations, and suggested that waterborne pathogens may be responsible for a significant fraction of endemic gastroenteritis.

We undertook an epidemiological study to determine the contribution of drinking water to gastroenteritis in a major city with minimal water treatment.

Methods. This was a double blind randomized controlled trial carried out in Melbourne, Australia. This city of 3.3 million draws its drinking water from a protected forest catchment, and the water is chlorinated but not filtered before distribution to consumers. Six hundred families were randomly allocated to receive either real or sham water treatment units (WTUs) installed in their kitchen. Real units were designed to remove viruses, bacteria and protozoa. Study participants completed a weekly Health Diary reporting gastrointestinal symptoms during the 68-week observation period.

Results. There were 2,669 cases of highly credible gastroenteritis (I-KG) during the study (0.80 cases /person/year). The ratio of HCG episode rates for the real WTU group compared the sham WTU group was 0.99 (95% CI 0.85 to 1.15, $p=0.850$). Seven hundred and ninety-five fecal specimens were collected from participants with gastroenteritis, and pathogens were not more significantly common in the sham WTU group.

Conclusions. We found no evidence of waterborne disease in a city with an unfiltered supply drawn from a protected catchment.