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Author response to letter from Gomez et al

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Recommended Citation

Zervos M, Maki G, Love NG, and McElmurry SP. Author response to letter from Gomez et al. *Int J Infect Dis* 2019.

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Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijid



Letter to the Editor

Author response to letter from Gomez et al.

The abstract by Maki et al. (2019) contained limited information from a poster presented in a late-breaking session at the Seventh International Meeting on Emerging Diseases and Surveillance. The work had IRB approval (HFHS #12383), and informed consent was obtained prior to collecting samples.

The small sample size ($n = 10$) was clearly not intended to be representative of the Flint community, and only patients with suspected infections from waterborne pathogens were invited to participate. Water samples were collected entering and leaving activated carbon block (ACB) point-of-use (PoU) filters, and from showers. No filter cartridges were tested. In neither the abstract nor the poster did we draw conclusions about deaths; rather, this information only characterized the status of participants. Importantly, species of bacteria known to include pathogens were cultured from many water samples leaving the filters.

There are many unknowns about the microbiology of ACB PoU filters, especially when they are deployed in aged, under-maintained distribution systems (as in Flint, MI). Importantly, these filters have been shown to remove lead, and they effectively reduced lead exposure in Flint (e.g., [U.S. Environmental Protection Agency, 2016](#)). Also, importantly, studies have shown these filters support bacterial growth, including opportunistic pathogens ([Geldreich et al., 1985](#); [Chaidez and Gerba, 2004](#)), although lab studies cast uncertainty about long-term pathogen colonization (e.g., [Reasoner et al., 1987](#)). Prior microbial studies all show that filters change the abundance and composition of bacteria (including opportunistic pathogens) in filtered water relative to distributed water. Furthermore, studies show that multiple variables influence the microbiological quality of filtered water in unpredictable ways (e.g., [Reasoner et al., 1987](#); [Rollinger and Dott, 1987](#)). Consequently, many unknowns about the microbial colonization of ACB PoU filters remain. This helps explain why the U.S. EPA ([Silverstein, 2005](#)), certification organizations ([NSF International, 2015](#)) and manufacturers ([BRITA, 2019](#); [PUR, 2019](#)) caution that filters are not to be used: on water that is microbiologically unsafe or inadequately disinfected; or by people most vulnerable to microbial infections.

In light of this uncertainty, our position is that it is irresponsible to NOT share microbial results such as those in the poster. We concluded in the poster that additional studies about ACB PoU filters are critically needed to ensure their overall (not just lead removal) performance is adequate, especially in aging and oversized systems such as in Flint. We believe that the best, most impactful solutions to these challenges will come when scientists, water utilities, the medical community and

public health officials come together, work constructively, share experiences and coordinate efforts. We owe this to the residents of Flint and communities like theirs.

Conflict of interest

The authors have no conflicts of interest to declare. However, we wish to add the following disclosure. After being served with subpoenas by the Office of Special Counsel appointed by the Attorney General of the State of Michigan, Zervos and McElmurry testified, under oath and without compensation, in court proceedings related to felony cases brought against two former employees of the Michigan Department of Health and Human Services. Zervos grants include Pfizer, Merck, Medimmune, and consultant for Contrafact, none of the listed grants supported the work reported here.

Funding source

Henry Ford Hospital internal support.

Ethical approval

Henry Ford IRB Approval (HFHS #12383).

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<https://doi.org/10.1016/j.ijid.2019.11.030>

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Please cite this article in press as: M. Zervos, et al., Author response to letter from Gomez et al., *Int J Infect Dis* (2019), <https://doi.org/10.1016/j.ijid.2019.11.030>

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Received 26 November 2019