

THREE WATERBORNE OUTBREAKS IN DETROIT (2016 & 2017)

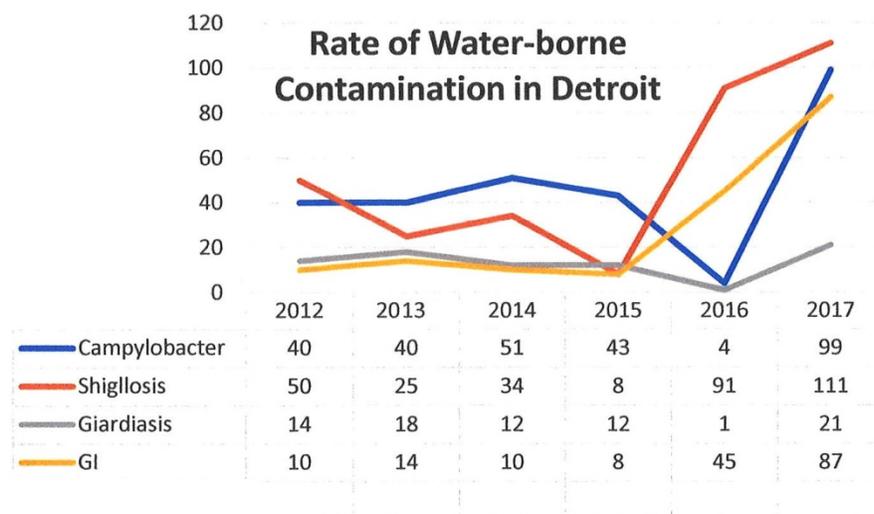
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The morbidity data from Michigan Community Health and the Detroit Department of Health show several disease outbreaks during the last two years. This paper will describe the increases and offer a view at the etiological factors that were involved.

A theory and hypothesis are given supporting this concept's validity. (The hypothesis is derived from) data from the study by Ford Hospital¹ & The Morbidity Data from the City Health Department 2012 thru 2017. The supporting theory is the lack of household water will affect household sanitation increasing the risk for disease.

Given the fact of thousands of water-service shut offs, sanitation is compromised increasing risk of disease. The hypothesis is outbreaks of waterborne disease in Detroit are caustically related to the massive number of shut offs in 2016-2017. The three waterborne diseases are proof of outbreaks: First, *shigellosis* an acute dysentery. Second, *giardiasis* is a protozoan infection. Third, *campylobacter* an acute enteric that attacks the intestines. Children are infected more by water contaminated water sources than adults. For shigellosis "most of the deaths, are in children under 10 years of age."²ⁱ

GI outbreaks annually averaged 10.2 from 2012 thru 2015 years. However, 2016 had 45 & 2017 had 87 outbreaks of group clusters. Individual cases are not required reportable.



¹ Plum, Alexander, MPH < CHHES, Kyle Moxley, ABD, Marcus Zervos, MD. "The Impact of Geographical Water Shut-offs on the Diagnosis of Potentially Water Associated Illness, with the Role of Social Vulnerability Examined 8 Apr. 2017

² *Control of Communicable Disease in Man*, APHA, Official Report
Chart, Douglas & Karl Gaines

Data are arranged in two sections: the usual number of waterborne cases for years 2012-2015 and secondly, the two outbreak years 2016 & 2017 where the morbidity cases were compared to the previous usual annually number of cases. For example, **shigellosis**, the yearly rates were as follows: 2012 was (50), 2013 was (25), 2014 and 2015, (41) then in 2016 the rate jumped from an average rate of 35 from 2012 to 2015 to a rate of (93). Then in 2017 the rate increased again to (111).

An average for the four prior years that is the endemic rate as a mean was 35, that suggests there were three times more (cases) in 2017.

Campylobacter had a four-year average or mean of 43. The rate of disease in 2016 to 57 & in 2017 it went to 99. What is clear from the data here is an outbreak of epidemics that is, ‘more than the usual expected number of cases of a specific disease’.

Giardiasis, also fits the pattern of a low mean number of yearly infections, then a quantum jump in the years of massive water shut offs. This infection showed small annual rates: 14, 18, 12 but only one case in 2016 with an average of only 14 for the prior four years. In 2017, a increase to 21. Can it be concluded that the increases to outbreak rates is water shut offs?

No, not by the increases per se. However, when combined with findings of the Ford Hospital Study the case is made for a specific type of epidemic, one that has a “continuing source.” Water shut off city policy is ultimately setting up for compromised sanitation that feeds the disease agents. All named above require an environment with poor sanitation to thrive. Hypothesizing that water shut off has a causal relationship on disease requires connecting shut off with disease.

That connection was made in the Study “*to measure whether City of Detroit government-imposed water offs shut had effect on illness experienced by a sample of Henry Ford Hospital patients*”, Ford’s study found:

1. The overall ranking of a patient’s social vulnerability significantly increased the likelihood of being diagnosed with a water shut off as associated illness by 1.48 times.
2. Patients who came from blocks with water shut off were 1.55 times more likely to be diagnosed with a water associated illness. Also, if the patient had waterborne disease they more likely lived on a block with a shut off. Ford Study Examined (*The impact of Geographical Water Shut Offs on Diagnosis of Potentially Waterborne illness, with the Role of Social Vulnerability*).
3. The disease outbreaks (3) and possibly (4) coincide with the massive water service cancellations. Without running water to clean and to wash hands, the sanitation of a residency is set-up for disease existing and growing.

When water service is terminated in a residency, sanitation becomes an ongoing risk. A “Community Hygiene Glossary” from the Detroit Department of Health described sanitation as *the process of effecting clean hygienic conditions the absence of dirt and agents of disease. Control of Communicable Diseases in Man* discusses the ‘removal of infectious agents with hot water, especially those that may find as favorable; conditions for surviving or multiplying’.

Summary & Conclusion

There exists a positive causal relationship in shut off water and waterborne disease and the proposition is plausible. The case is based on three inter related facts: 1) Epidemic rates at the time of as many as 80,000 shut-offs, 2) A study that showed that a patient with waterborne disease 'was 1.48 times more likely to be living on a block with water shut offs' and 3) Without running wear to clean and to wash hands the sanitation of a residency is set-up for diseases existing and growing.

Recommendation:

Stop the water shut-offs.