**Waterborne Infectious Disease Burden and Recreational Water-Associated Illness in the United States – Webinar Q&A**

1. Was there any subcategorization of drinking water for public sources vs. Private or well water sources?

For Burden 2 analysis, drinking water could come from a public water system, private well, or commercially bottled sources. But we did not separate private vs. public in the analysis. Hopefully Burden 3!?

1. Surprised that otitis externa is considered drinking water? Not recreational water?

We were also surpised to see OE in drinking water as well as rec water, but it was also a difficult estimation. We used ICD-9-CM codes 380.10 (infective otitis externa, unspecified), 380.12 (acute swimmers' ear), and 380.14 (malignant otitis externa). Because distinguishing otitis externa from otitis media is difficult and a conservative estimate was desired, all visits with a concurrent diagnosis of ICD-9-CM code 381 (nonsuppurative otitis media and eustachian tube disorders) or 382 (suppurative and unspecified otitis media) were excluded. We found that drinking water (bathing and showering) could also result in the disruption of the ear pH.

1. Is M. abscessus the primary pathogen in the group of NTM described as cousing death?

It is included in the NTM of our analysis. <https://www.cdc.gov/hai/organisms/nontuberculous-mycobacteria.html>

1. Swimmer's ear as cause of death?

Rare cases and those with weakened immune systems where it can turn into malignant or necrotizing OE.

1. Otitis externa is also caused by Vibrio, mostly Vibrio alginolyticus. / Is swimmers ear diagnosed as a typical ear infection usually? What is the difference between the two?

OE was defined as OE without concurrent otitis media. No national case surveillance system for OE exists; therefore, we used administrative data and case definitions from (ICD-9-CM codes. We used ICD-9-CM codes 380.10 (infective otitis externa, unspecified), 380.12 (acute swimmers' ear), and 380.14 (malignant otitis externa). Because distinguishing otitis externa from otitis media is difficult and a conservative estimate was desired, all visits with a concurrent diagnosis of ICD-9-CM code 381 (nonsuppurative otitis media and eustachian tube disorders) or 382 (suppurative and unspecified otitis media) were excluded. Acute otitis externa can be caused by many pathogens, which makes calculating the burden more complicated. We conducted a literature search to estimate the proportion of acute otitis externa caused by each causative agent. The literature in this area was sparse, but 1 study estimated 50% of otitis externa was caused by Pseudomonas sp., 25% by staphylococci, and the remainder by other pathogens.

1. If a Biofilm is suspected, how do you remove/kill/flush it out of a system? Ex. hot tub

<https://www.cdc.gov/legionella/wmp/control-toolkit/hot-tubs.html>

1. Can you speak to the other deaths attributed to the waterborne recreational exposures? infections with pseudomonas and NTM infection seem more important for hospitalizations and deaths data.

Recreational water exposure was linked to ≈1,290 (95% CrI 591–2,520) deaths, drinking water to 3,300 (95% CrI 1,630–5,180) deaths, and NRND water exposure to 2,040 (95% CrI 909–3,690) deaths. NTM infections caused most deaths for each water exposure type; 37% of NTM-related deaths were associated with recreational water, 78% with drinking water, and 37% with NRND water. Table 4 in the paper that is linked in the follow up email can give you more specific numbers!

1. Does pseudomonas have a baseline for non-treated natural water bodies used for swimming, similar to ecoli?

Pseudomonas aeruginosa is commonly found in the environment, particularly in freshwater. Refer to timestamp 54:00 for more information.

1. For the public drinking water sources did you stratify by disinfectant for the system? I'm thinking of an older EPA webinar describing monochloramine as a good controller of Legionella but not so for Mycobacterium.

Not for this analysis, but working on a paper on low-pressure events and gastro and respiratory outcomes, with some stratification by disinfectant type.

1. Health hazards associated with inhaling chlorine(--e.g. higher concentrations in hot tubs)?

The data presented in this webinar focuses on infectious diseases rather than chemical exposures. However, yes, there are hazards associated with inhaling chlorine. Refer to timestamp 52:24 in the presentation for more details.

1. Are there any changes to water treatment standards in light of these findings?

There haven’t been any changes to pool standards. However, EPA is taking a lot of this information under advisement as they continually meet and update what is included on their list of drinking water regulations. There are a few changes in the works. Refer to timestamp 54:59 for more information.

1. With regard to Crypto, did the analysis consider the spread from a swimming pool into child care facilities as related to the recreational water use? Several large outbreaks in the past had dozens of cases directly from the pool, but hundreds of cases associated with spread into child care settings.

Pseudomonas isn’t something we really see spread from person to person – it is transmitted by water. Therefore, the difference between cryptosporidium and pseudomonas is that cryptosporidium is extremely tolerant to chlorine, so we can easily see it go pool to pool where chlorines is the primary barrier. It is not surprising that crypto goes pool to pool and then into daycares, based on who uses the pool. In terms of pseudomonas, you can bring it from one pool to another, but if the pool is well maintained, it won’t spread to the next pool or a daycare. Refer to timestamp 57:31 for more information.

1. What is the trick to get bathers to shower --properly--before entering pools, etc?

Refer to timestamp 59:47 for information.