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SHIGELLOSIS AT THE FOUNTAIN OF YOUTH

On July 25, 2003, a Woodburn physician contacted the Marion County Health Department to report that over the past 24 hours he had seen 5 unrelated children who presented with acute diarrhea, including 3 with dysentery. Stool cultures had been ordered. All 5 were from the Woodburn area, 3 were Latino, and 4 were from households that shopped at the same grocery store, but initial interviews identified no obvious common exposures. Area physicians and emergency departments were notified of the possible outbreak and encouraged to culture children presenting with diarrhea. Through this active surveillance, additional children with bloody diarrhea — mostly Latino — were soon identified. Lab tests for Shiga toxin were negative, ruling out *Escherichia coli* O157:H7, and the cultures soon yielded *Shigella sonnei*. No common food histories were elicited using a standardized questionnaire, but several children reported attending the annual "Hop Fest" in Hubbard, a small town in Marion County about 20 miles northeast of Salem. This focused the investigation, which implicated as the source an "interactive" water fountain (i.e., one intended for people to play in) in Hubbard's town park.

To confirm the source, we conducted an age- and telephone-prefix-matched case-control study, using the first 7 lab-confirmed cases who were themselves the first in their household or daycare group to become ill. Fountain exposure was strongly associated with illness (7/7 cases vs. 1/15 controls; matched OR undefined, $p = 0.001$). No other plausible confounding exposures (e.g., consumption of free lunches distributed in the park, consumption of drinking water, or eating at nearby food concessions) were associated with illness.

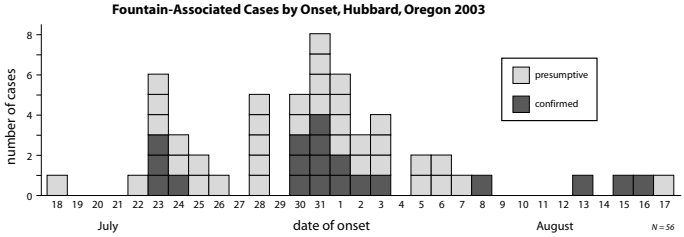
When informed of our initial findings on August 1, Hubbard officials immediately shut off the fountain.* Water samples collected that day yielded moderate to high levels of fecal coliform and *Escherichia coli* indicators, and no detectable chlorine. (Chlorine levels for this kind of fountain should be 1–5 ppm.)

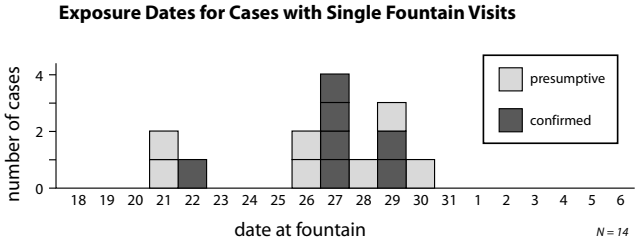
The epidemiology of the outbreak was complicated. Exposures took place over several weeks, many victims reported multiple fountain visits, and it was often impossible to reliably distinguish primary from secondary infections. We identified 19 culture-confirmed cases and another 37 fountain-associated cases who had dysentery or diarrhea with fever and were "epidemiologically linked" (e.g., household or daycare contacts) to confirmed cases. In addition, we heard of many more sick persons about whom data were insufficient to label them as "cases." The majority of cases (77%) were <10 years old; 45% were female. No hospitalizations or deaths were reported. Among the 19 confirmed cases, 10 (53%) reported bloody diarrhea, while surprisingly few (10; still 53%) reported fever. Outbreak-associated isolates matched each other by molecular subtyping.

Based on 14 first-in-household cases who reported only a single fountain visit in the week before onset, incubations ranged from 1–7 days (mean, median = 3), and exposure occurred at least from July 17 (and possibly earlier) to August 1.

As is often the case, the outbreak was clearly larger than the "official" numbers imply. To better estimate the size of the outbreak, we interviewed a random sample of 147 of 809 primary school students (K–5) enrolled in Hubbard schools. Of these, 51 (35%) reported playing in the fountain at least once during the last 2 weeks of July. Those who gamboled in the fountain were much more likely to report subsequent diarrheal illness than were abstainers (39% vs. 3%; RR = 12.6; 95% CI = 3.9–40.2). From this sample we can extrapolate that ~100 children in these grades alone became ill from fountain exposure — not to mention older persons, those from outside the Hubbard school area (e.g., Woodburn), and those who became ill from subsequent person-to-person spread. It's a wonder we didn't all get sick.

Swimming and playing in recreational water has long been recognized as a source of enteric and other infections,[1,2] but until recently, fountains have attracted little attention.[3,4] Unlike public swimming and wading pools, interactive fountains in Oregon and elsewhere are often unlicensed and unregulated. Paradoxically, however, the risk of infection at fountains may exceed that at pools. In contrast to pools, for example, fountains typically offer unrestricted access to children and other animals, utilize small volumes of recycled water, and often feature water jets that, in our observation, are popular to squat over. In other words, fecal contamination is the rule, not the exception; thus, inadequately maintained and disinfected fountains are





* Well, *almost* immediately; first we took some photos.

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"accidents" waiting to happen. This outbreak underscores the need to consider public health standards in the design, operation, and maintenance of public fountains, especially because many new fountains are specifically designed for intimate interaction between the public and the water.

In Oregon, recent statutory changes give counties the authority to regulate public fountains, with the implied authority to set minimum standards, compel inspection, and impose licensing fees. (Funding for public health inspections and regulation is typically fee-based in Oregon.) Rule development is in progress, but standards for fountains have not been officially adopted.

The Hubbard fountain was re-designed to modify the gratings, sump pit and water source. The recirculation system was revamped and rebuilt with new filters, pumps and an automated metering and chemical feed system. Maintenance staff attended a pool maintenance seminar, and the fountain has been licensed as a public wading pool and opened for the 2004 season.

The take-home message for physicians: disease reporting is a good thing. We like getting early calls about possible problems, including clusters of illness. Don't wait for lab confirmation; pick up the phone and call your local health department. Operators are standing by.

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3. CDC. Outbreak of gastroenteritis associated with an interactive water fountain at a beachside park—Florida, 1999. MMWR 2000; 49:565–68.
4. Hoebe CJ, Vennema H, De Roda Husman AM, Van Duynhoven YT. Norovirus outbreak among primary schoolchildren who had played in a recreational water fountain. J Infect Dis 2004; 189:699–705.

Updated Recommendations for Use of Pneumococcal Conjugate Vaccine: Reinstatement of the Third Dose

In February 2004, production of the 7-valent pneumococcal conjugate vaccine (PCV7) failed to meet demand, resulting in shortages. To conserve the limited supply, CDC recommended that the fourth dose of PCV7 be temporarily withheld from healthy children.[1] Effective immediately, CDC, in consultation with the Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians, and the American Academy of Pediatrics, recommends that providers reinstate administration of 3 doses of PCV7 at 2, 4, and 6 months of age. The fourth dose should still be deferred for healthy children until further production and supply data demonstrate that a 4-dose schedule can be sustained. The full 4-dose series should continue to be administered to children at increased risk for pneumococcal disease because of certain immunocompromising or chronic conditions (e.g., sickle cell disease, anatomic asplenia, chronic heart or lung disease, diabetes, cerebrospinal fluid leak, and cochlear implant).

An interim catch-up schedule is available for children who are incompletely vaccinated (*http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5326a7.htm#tab*). The highest priority for catch-up vaccination is to ensure that children aged <5 years at high risk for invasive pneumococcal disease are fully vaccinated. Secondary priorities include vaccination of healthy children aged <24 months who have not received any doses of PCV7; and vaccination of healthy children aged <12 months who have not yet received 3 doses.

Because of the frequency of health-care visits by children during their first 18 months, catch-up vaccination might occur at regularly scheduled visits for children who receive vaccines from their primary-care providers. If you provide vaccinations but do not see children routinely for other reasons, consider a notification process to contact undervaccinated children.

REFERENCES

1. CDC. MMWR 2004; 53:589–90. Available at *www.cdc.gov/mmwr/pdf/wk/mm5326.pdf.*

Erratum: The numbers of 2003 cases by county for hepatitis B and C cited in the charts in issue #5312 and our annual CD report were misaligned, and thus incorrect. Corrections are online at *www.oshd.org/cdsummary/2004/ohd5312.pdf* or *www.oshd.org/arpt03/03county.pdf*. Special apologies to Umatilla and Wallowa counties, which did not earn the whopping case counts that belonged to more populous counties.