



CDInfo is a surveillance newsletter intended to promote prevention of morbidity and mortality by providing useful data and practical recommendations for clinicians, laboratorians, and infection control personnel who diagnose, treat or report infectious diseases in Chicago.

Shigellosis in Chicago 2014-2016

Shigellosis is a diarrheal illness caused by *Shigella*, a group of gram-negative bacilli with four main serogroups. The incubation period is 1 to 3 days. Approximately 240 cases of shigellosis are reported to CDPH annually. From 2014 through 2016, 713 cases of shigellosis were reported to the Chicago Department of Public Health (CDPH). *S. sonnei* accounted for 575 (81%) cases, *S. flexneri* for 136 (19%) and *S. boydii* for 2 (1%). There were no *S. dysenteriae* infections reported.

Cases ranged in age from 2 months to 88 years (median: 30 years); 202 (30%) were in the 25-39 year old age group. Thirty-three (7%) cases were hospitalized, and none died. Among 324 cases for whom race/ethnicity was known, 166 (51%) were non-Hispanic Black. Of 302 cases for whom travel information was available, 27 (9%) had traveled outside of Chicago and 16 (5%) had traveled outside of the United States. Among 254 male cases interviewed regarding disease transmission risk factors, 21% reported male-to-male sexual contact (Table 1).

In 2014, CDPH investigated an increase in reported *S. sonnei* infections among adult men who have sex with men (MSM). During July 31-Oct 31, 2014, 23 *S. sonnei* cases reported to CDPH endorsed male-to-male sexual contact within the prior 7 days during routine surveillance interviews (Figure 1). The Centers for Disease Control and Prevention (CDC) laboratory performed antimicrobial susceptibility testing (AST) on selected isolates from this group. Of nine isolates tested, seven had decreased susceptibility to azithromycin (DSA) and one was resistant to ciprofloxacin. In subsequent years, *S. flexneri* cases have also occurred among Chicago MSM.

In order to better understand the prevalence of *Shigella* with DSA in Chicago, CDPH began collecting antibiotic susceptibility profile data from reporting providers. In collaboration with the Illinois Department of Public Health, AST data fields were added to the Illinois National Electronic Surveillance System (INEDSS) *Shigella* module as of August 11, 2015. From August 11, 2015 to December 31, 2016, 8 hospitals and 4 commercial laboratories provided AST profiles on 91/276 (33%) *Shigella* isolates reported via INEDSS. Of these 91 case isolates, 2 (2%) were resistant to azithromycin and 4 were resistant to ciprofloxacin (4%). However, 96% of the AST reports received had missing or unknown susceptibilities for azithromycin and ciprofloxacin (Table 2). Because AST data obtained from clinical laboratories through reporting was incomplete, CDPH collaborated with a regional laboratory to more fully characterize antimicrobial resistance profiles of *S. sonnei* strains

Table 1. Characteristics of reported shigellosis cases, Chicago, 2014-2016

| Patient characteristics | No. (%) of Cases |
|------------------------------|------------------|
| Gender | |
| Male | 434 (61) |
| Female | 279 (39) |
| Age, years [†] | |
| 0-4 | 77 (12) |
| 5-14 | 113 (16) |
| 15-24 | 70 (10) |
| 25-39 | 202 (30) |
| 40-64 | 189 (28) |
| 65+ | 28 (4) |
| Race/Ethnicity | |
| Non-Hispanic White | 144 (20) |
| Non-Hispanic Black | 166 (23) |
| Non-Hispanic Asian | 6 (1) |
| Hispanic | 64 (13) |
| Other | 5 (1) |
| Unknown | 328 (46) |
| Hospitalization [‡] | 33 (7) |
| MSM [¥] | 53 (21) |

circulating within Chicago. AST and pulsed-field gel electrophoresis (PFGE) were performed on isolates from a random sample of *S. sonnei* cases reported to CDPH during January – September 2015. Epidemiologic data were reviewed and cases were cross-referenced with HIV and STI surveillance databases. Among 104 cases included in the analysis, 33 (32%) were adult males, of whom five (15%) self-identified as MSM and four (12%) had received a diagnosis of sexually transmitted infection at least once during the year prior to their illness onset. Nineteen of 104 (19%) case-patients were infected with HIV, with a median CD4 count of 526. DSA was observed for 20/104 (19%) case isolates and ciprofloxacin resistance was observed for 1 (1%) isolate (Figure 2). All isolates with DSA were from adult males, 25% of whom identified as MSM and 65% of whom were HIV-positive.

[†] Age data was missing for 34 cases (N=679)

[‡] Hospitalization data was missing for 250 cases (N=457)

[¥] Number and percentage of male cases interviewed about disease transmission risk factors (N=254) who reported same-sex sexual relations in the prior 7 days

Although *Shigella* infections are generally self-limited, resistant organisms can lead to complications among individuals who are not adequately treated. Given increasing antimicrobial resistance observed among *Shigella* strains circulating in Chicago, clinicians should refrain from prescribing antibiotics for shigellosis unless clinically indicated and should perform routine stool culture and antimicrobial susceptibility testing of *Shigella* isolates to inform selection of appropriate antibiotics when necessary. Clinicians should be aware that Chicago MSM and HIV-infected individuals may be at increased risk for DSA.

All *Shigella* cases should be reported to the CDPH Communicable Disease (CD) Program within 7 days via the Illinois National Electronic Surveillance System (INEDSS). CDPH urges providers and laboratories to include AST results, when available, in all *Shigella* reports. Clusters and cases occurring in persons with an exposure history thought to represent a potentially ongoing risk of transmission to others should be reported immediately to the CD Program at 312-746-5925 or 312-746-5377.

Figure 1. Number of shigellosis cases by sex, sexual orientation, and month of onset, Chicago 2014-2016

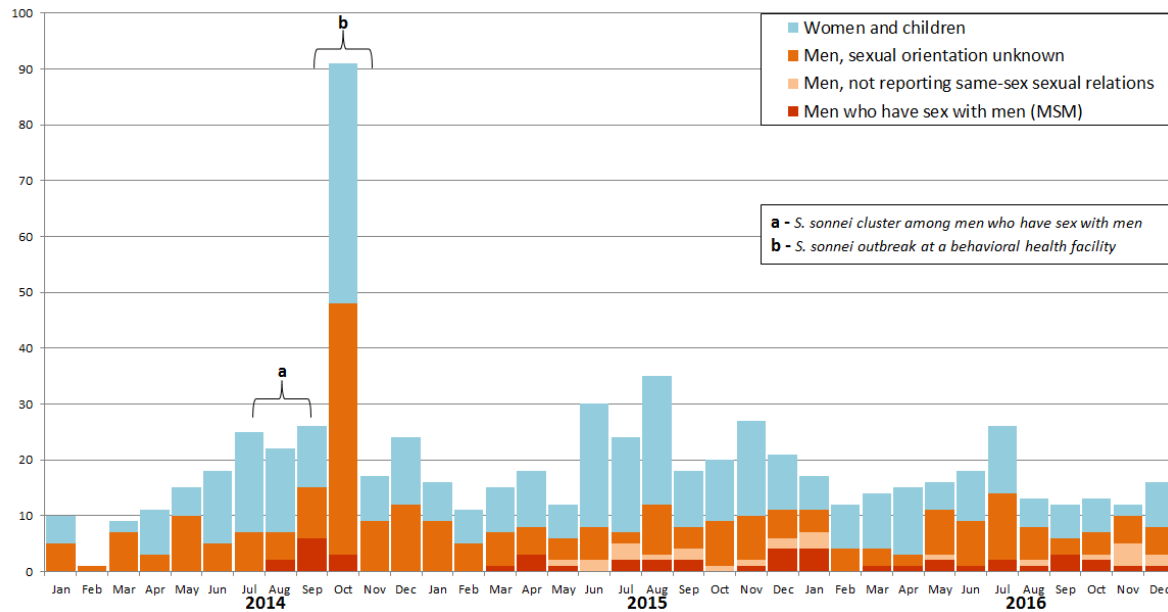


Table 2. Number of antimicrobial susceptibility testing reports received from clinical laboratories, Chicago 2015-2016

| | Reports Received | Susceptible (%) | Intermediate (%) | Resistant (%) | Not Reported (%) |
|------------------|------------------|-----------------|------------------|---------------|------------------|
| 2015 | | | | | |
| Ampicilin | 38 | 26 (68%) | 1 (2%) | 9 (24%) | 2 (5%) |
| Azithromycin | | 4 (11%) | 0 | 0 | 34 (89%) |
| Ciprofloxacin | | 31 (82%) | 0 | 1 (2%) | 6 (16%) |
| Sulfamethoxazole | | 14 (37%) | 0 | 18(47%) | 6 (16%) |
| 2016 | | | | | |
| Ampicilin | 51 | 21 (39%) | 0 | 18 (35%) | 14(26%) |
| Azithromycin | | 2 (2%) | 0 | 2 (2%) | 49 (96%) |
| Ciprofloxacin | | 39 (74%) | 0 | 4 (8%) | 10 (18%) |
| Sulfamethoxazole | | 15 (29%) | 1 (1%) | 36 (68%) | 1(1%) |

Figure 2. Antimicrobial resistance among 104 randomly selected *S. sonnei* isolates, Chicago 2015

