

The Human Papillomavirus Vaccine Impact Monitoring Project (HPV-IMPACT)—Connecticut, 2008

In the United States, invasive cervical cancer is diagnosed in nearly 11,000 women annually, resulting in approximately 4,000 deaths per year (1). Virtually all cervical cancers are caused by the human papillomavirus (HPV). Although there are over 30 different strains of HPV that can infect the human genital tract (2), types 16 and 18 are responsible for 70% of all cervical cancer cases and types 6 and 11 are associated with approximately 90% of all cases of genital warts (3). In June 2006, a quadrivalent HPV vaccine (types 6, 11, 16, 18) was licensed by the Food and Drug Administration (FDA) and recommended by the Advisory Committee on Immunization Practices (ACIP) for routine use in females aged 11–12 years, with catch-up vaccination recommended for adolescent girls and women aged 13–26 years (3). A second bivalent HPV vaccine was licensed by the FDA in October 2009.

On January 1, 2008, HPV-related cervical intraepithelial neoplasia grades 2 and 3 (CIN 2/3) and adenocarcinoma in-situ (AIS) were added to the physician reportable diseases and laboratory reportable significant findings lists in Connecticut. Since these are pathological diagnoses, initial reports are made by laboratories and follow-up information is collected from physicians. The goal of this surveillance is to monitor the impact of the HPV vaccine on HPV-related pre-cancerous cervical lesions. In 2008, there were a total of 3,702 reports of CIN 2/3 or AIS received from Connecticut pathology laboratories. These reports represent 2,999 individual women (a woman may have multiple procedures resulting in more than one reportable pathology finding in a given year). The median age of CIN 2/3 & AIS cases was 28 years.

The overall statewide incidence of CIN 2/3 & AIS was 212 cases per 100,000 female population (ages 15 and over). New London County had the highest rate with 292 cases per 100,000 female population, while Windham and Tolland counties had the lowest

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rates with 161 cases and 162 cases per 100,000 female population, respectively (Figure 1).

The 2008 surveillance data show that CIN 2/3 and AIS disproportionately affect young women in Connecticut (Figure 2). The highest incidence was in females aged 18–29 years with a total of 1658 cases and rate of 706 cases per 100,000 female population. The second highest incidence was in women aged 30–39 years with a total of 702 cases and a rate of 255 cases per 100,000 female population. The lowest rates were found among women older than 50 years (36 per 100,000 female population).

Regarding diagnosis type, the majority of cases (55%) had a diagnosis of CIN 2, while only 1% was diagnosed with AIS.

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Figure 1: CIN 2/3 and AIS cases (rates) per 100,000 female population age 15 and over by county—Connecticut, 2008

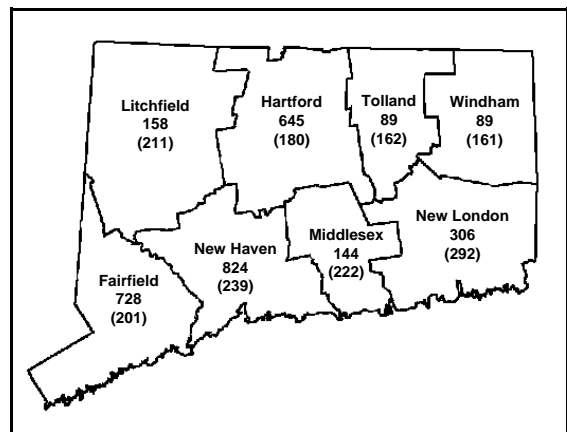
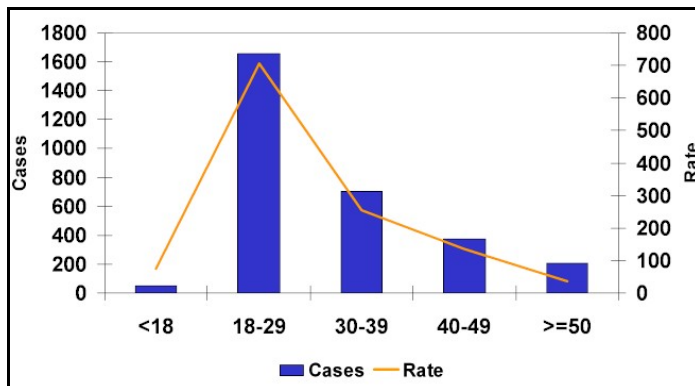


Figure 2: CIN 2/3 and AIS cases and rates per 100,000 female population by age—Connecticut, 2008



Editorial Note:

While the HPV vaccine has proven nearly 100% efficacious in clinical trials (4), it is important to continue to track HPV-associated precancerous lesions in order to determine vaccine effectiveness at the population level (5). Connecticut is among a small group of states monitoring cervical cancer precursors statewide.

The Connecticut Emerging Infections Program, which is a joint project between the Connecticut Department of Public Health (DPH) and the Yale University School of Public Health, is conducting enhanced surveillance for CIN 2/3 & AIS in women aged 18–39 years residing in New Haven County. Vaccination history (including barriers to vaccination) and cervical cancer screening history is collected through medical chart reviews and telephone interview. A sample of the biopsy specimens from patients will also be collected and sent to the Centers for Disease Control and Prevention to determine which HPV type is present in the lesion.

This surveillance effort is expected to continue over the next 10 years, allowing public health professionals to monitor the impact of the HPV vaccine on population rates of cervical cancer precursors and the prevalence of HPV types responsible for these lesions. Surveillance findings will also help inform clinicians of any possible changes in the rates of cervical cancer screening as a result of the introduction of the HPV vaccine. Questions regarding HPV-IMPACT can be directed to Dr. Lynn Sosa, Deputy State Epidemiologist, DPH at 860-509-7722, or Dr. Linda Niccolai, Yale University School of Public Health at 203-785-7834.

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Multiple-Serotype Outbreak of *Salmonella* Gastroenteritis at a Reception, Connecticut, 2009

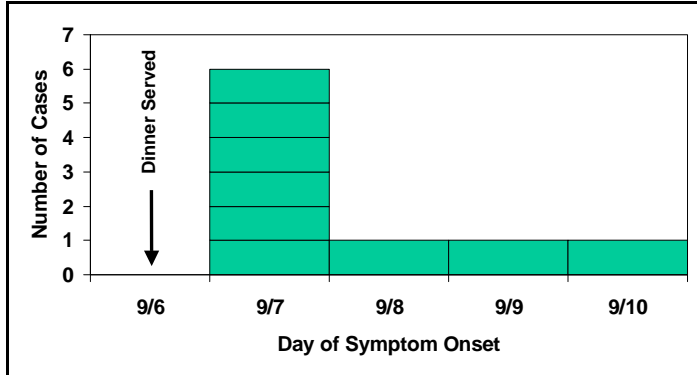
On September 18, 2009, the Connecticut Department of Public Health (DPH) Epidemiology and Emerging Infections Program was notified of a laboratory-confirmed *Salmonella* infection in a person who attended a reception on September 6, 2009. Preliminary information indicated that several other attendees became ill following the reception. The reception was held at a banquet hall and catered by an off-site food establishment. Approximately 150 guests attended the reception. Staff from the DPH and local health department conducted an epidemiologic and environmental investigation to determine the source and extent of the outbreak, and to recommend control measures. This report summarizes findings from the investigation.

Epidemiologic Investigation.

Contact information was available for approximately 17% of attendees. Telephone interviews were conducted by DPH staff and included questions about demographics, illness history, and food consumption at the reception. A case was defined as an individual who attended the reception and developed diarrhea (3 or more stools per day) within 5 days after the reception. Of the 25 interviewed attendees, 9 (36%) met the case definition.

Of the 9 case-patients, all reported diarrhea, 8 (89%) abdominal cramping, 7 (78%) fever, 6 (67%) muscle aches, and 4 (44%) bloody stools. The median age was 31 years (range 25-51 years); 5 (56%) were male. The median incubation period was 13.5 hours (range 9.5-95.5 hours) (Figure 1);

Figure 1: Number of cases of gastrointestinal illness among reception guests, Connecticut, September 6 – September 10, 2009.



the median duration of illness was 8.5 days (range 0.5 to 14 days). Of the 9 case-patients, 2 (22%) sought outpatient medical care; none were hospitalized.

Food items served at the reception were prepared at the catering facility and delivered to the banquet hall by the caterer. Catering staff set up the food items buffet-style for self service by the guests. Items available included appetizers, salads (green, macaroni, and potato), rice (yellow and white), chicken, pork, baked beans, pastries, and cake. Ill persons were significantly more likely than non-ill persons to have consumed the potato salad (odds ratio=84.0; 95% confidence limits=4.5,1564; p-value<0.0001). Additionally, analysis indicated that roasted pork consumption was potentially associated with illness (odds ratio=14.5; 95% confidence limits=0.7,298; p-value=0.048), but was of borderline statistical significance.

Environmental Investigation.

An environmental investigation was conducted at the catering facility, which included interviews of all food workers, a general evaluation of food-handling procedures, a targeted review of reception food preparation procedures, and collection of stool specimens, environmental swabs, and food samples. None of the workers reported experiencing gastrointestinal illness. Bare-hand contact by food workers with ready-to-eat food and inadequate hand washing were observed. Review of potato salad preparation revealed that ingredients consisted of potatoes, hard boiled eggs, commercial mayonnaise, onions, green and red peppers, and salt. Potatoes were peeled, cut, boiled in salted water, drained, and cooled. Chopped vegetables and eggs, along with mayonnaise, were added to the potatoes. All ingredients were then mixed with a potato masher,

placed in a large tin tray, and stored in the refrigerator. Of note, the kitchen was a small size relative to the large quantities of food being prepared. Environmental samples of 8 food contact surfaces (including a preparation table, potato masher, cutting board, and sink) and 3 spices used in preparation of the reception food were collected for testing. The environmental samples were obtained approximately 4 weeks after the outbreak event, and after facility cleaning had taken place. No leftover potato salad was available for testing.

Of the 4 food worker stool samples tested, 1 tested positive for *Salmonella* spp. This food worker reported travel to Guatemala with return to the United States approximately one month prior to the outbreak event. This food worker also reported not preparing any food for the reception, and having the responsibility of transporting the food to the banquet hall and ensuring that the food was maintained at the correct temperature prior to serving.

Laboratory Investigation.

The index case-patient with confirmed *Salmonella* infection was initially identified by a clinical laboratory; the isolate was subsequently submitted to the DPH Laboratory. Stool samples from 5 additional case-patients and all 4 food workers were collected and tested at the DPH Laboratory for *Campylobacter*, *Escherichia coli* O157:H7, *Salmonella*, and *Shigella*. *Salmonella* isolates were serotyped and further sub-typed genetically by pulsed-field gel electrophoresis (PFGE). The isolate from the index case-patient was serotyped as *S. Typhimurium* variant (var.) O 5-. Of the 5 additional case-patient stool samples tested, 4 were positive for *Salmonella* spp. Of these 4 specimens, 2 yielded *S. Schwarzengrund*; 1 yielded *S. Typhimurium* var. O 5-; 1 yielded both *S. Schwarzengrund* and *S. Typhimurium* var. O 5-. Of the 4 food workers, 1 tested positive for *Salmonella* spp., yielding both *S. Schwarzengrund* and *S. Typhimurium* var. O 5- serotypes. All *S. Schwarzengrund* and *S. Typhimurium* var. O 5- isolates, respectively, had indistinguishable PFGE patterns. These PFGE patterns are uncommon in the national PulseNet database. All environmental and food samples tested negative for *Salmonella*.

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Editorial Note:

Salmonella is the most common bacterial cause of foodborne disease outbreaks in the United States (US) (1). Outbreaks of *Salmonella* have been attributed to a variety of sources, including the following food commodities: poultry, beef, pork, dairy products, eggs, fruits/nuts, and various vegetables types (2).

S. Schwarzengrund is a relatively uncommon cause of salmonellosis, however, the incidence of this serotype appears to have increased in recent years (3). Evidence suggests that poultry could be a common reservoir (4). Data from the Food Safety and Inspection Service show that *S. Typhimurium* var. O 5- has been consistently isolated from poultry, hogs, and cattle (5).

Outbreaks of *Salmonella* infection with multiple serotypes are uncommonly reported in the literature. It is possible that multiple-serotype infections are, in fact, common, but not detected because testing all colonies on an isolation plate is unfeasible, and such a strategy is not part of routine protocol. This report raises awareness of the possibility of multiple-serotype *Salmonella* outbreaks.

Epidemiologic and laboratory data suggest an outbreak of *Salmonella* infection with multiple serotypes occurred among guests who attended the reception; potato salad was the likely source but the contamination mechanism is unclear.

It remains unknown if the *Salmonella*-positive food worker contaminated a food item, or, rather, if he was simply another victim of the outbreak. The food worker's recent foreign travel raises the possibility of the food worker being the source of food contamination. An alternative hypothesis is that raw chicken or pork cooked for this same event could have cross-contaminated the already-made potato salad or could have contaminated the countertop area on which the ingredients for the potato salad were prepared. The latter possibility is less likely because the same vegetable ingredients which were prepared in bulk were used in both the potato

salad and a macaroni salad and no illness was associated with the macaroni salad. Similarly, it is unlikely that the commercial mayonnaise used in the potato salad was the source of contamination given that the same mayonnaise was used in the macaroni salad.

Control measures included proper food-handling instruction and exclusion of the *Salmonella* – positive food worker until 2 consecutive negative stools at least 24 hours apart were obtained. Since the close of the investigation, November 2009, no additional *S. Typhimurium* var. O 5- or *S. Schwarzengrund* isolates with the outbreak PFGE strains have been reported in Connecticut.

It should be noted that this outbreak likely would not have come to the attention of DPH staff had the physician of the index patient not contacted the Epidemiology and Emerging Infections Program. DPH staff rely on astute healthcare providers to notify the department of issues that may require public health action.

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