

## Human Immunodeficiency Virus Testing Practices of Tuberculosis Patients by Connecticut Health Care Providers

Coinfection with the human immunodeficiency virus (HIV) and *Mycobacterium tuberculosis* may amplify the persistence of tuberculosis (TB) in a population (1). Identification of coinfecting persons is therefore central to effective TB control (2–4). The Centers for Disease Control and Prevention (CDC) recommends routine HIV screening for all patients initiating treatment for TB following patients' consent citing the inability of selective HIV testing based on health care provider risk assessment to substantially identify HIV-infected individuals (2). Moreover, the CDC emphasizes the identification of persons with latent tuberculosis infection (LTBI) who are at increased risk for TB disease, especially those who are HIV infected, as an integral component of the national TB elimination strategy (3,4).

During December 2010–January 2011, the Connecticut Department of Public Health TB Control Program surveyed health care providers who reported TB case-patients to the DPH during 2008–2009 to: 1) assess the extent that providers offer HIV testing to TB patients, 2) identify potential challenges to TB patients being routinely offered HIV testing, and 3) assess the extent that TB patients refuse HIV testing and identify barriers to accepting testing.

The TB Control Program identified 84 health care providers as providing TB patient care services during 2008–2009 and were sent a survey. Survey responses were anonymous. Analysis was conducted using frequencies, Pearson's chi-square, and Fisher's exact tests. Data analyzed included demographics and selected variables. TB patients' refusal of HIV testing was defined categorically as never (0% of the time), infrequently (1–35% of the time), often (36–69% of the time), most of the time (70–99% of the time), and always (100% of the time).

Among the providers surveyed, 6/84 (7.1%) reported not providing health care services to

### In this issue...

Human Immunodeficiency Virus Testing Practices of Tuberculosis Patients by Connecticut Health Care Providers	39
<i>Salmonella Enteritidis</i> Outbreak: Long Term Care Facility as Sentinel for a Community Outbreak	40

persons with TB and were excluded from further analysis. One provider returned the survey but did not answer most of the questions and was also excluded from analysis. The questionnaire was completed by 48/78 (61.5%) providers.

Of the providers who completed the survey, 42 (87.5%) reported routinely offering HIV testing to patients with TB disease and 26 (54.2%) reported routinely offering HIV testing to patients with LTBI (odds ratio: 5.7, 95% confidence interval: 2.0, 15.9,  $P < .001$ ). Initial bivariate analysis indicated that providers with subspecialty training in infectious diseases and providers who reported providing health care services to >20 HIV-infected patients during a recent 5 year period were more likely to report routinely offering HIV testing to patients with LTBI. There was no association found when stratified analysis was performed. There was no difference in HIV testing practices of patients with TB disease.

Of the 48 completed surveys, 11 (22.9%) providers reported TB patients never refuse HIV testing, 34 (70.8%) reported TB patients infrequently refuse HIV testing, and 3 (6.3%) reported TB patients often refuse HIV testing. The most common reasons cited by providers for why patients refuse HIV testing included stigma associated with HIV diagnosis, perception of not being at risk for HIV, and lack of understanding about the disease (Table, page 40).

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**Editorial**

Among a group of health care providers experienced in providing TB disease and LTBI patient care services, most test for HIV in TB disease patients, but are less likely to do the same for patients with LTBI. These practices exist despite recommendations by the CDC that all persons in health care settings be offered HIV testing, regardless of risk, and that persons with HIV are among the highest risk for progression from LTBI to TB disease (2,4).

As TB disease cases continue to decline, treating LTBI patients will become increasingly important in reaching the goal of TB elimination. Given the interaction of TB and HIV, knowing a patient's HIV status will be vital to prioritizing those patients at highest risk for eventually developing TB disease. Although a small proportion of patients refuse HIV testing, the reasons for refusal will be helpful in shaping appropriate educational efforts for TB patients that emphasize the potential for improved health outcomes if one's HIV status is known. In this way, reducing HIV-related stigma and improving TB patients' understanding of HIV might facilitate their acceptance of HIV testing.

There were at least 3 limitations to this analysis. First, while the survey response rate was 61.5%, the small overall sample size limits the ability to detect significant differences in the data. Second, the respondents were primarily infectious disease or pulmonary specialists. Many other providers treat patients with LTBI, and their HIV testing practices may be different. Finally, it is not possible to correlate actual testing practices with survey

responses given the nature of the anonymous self-reported data in the survey.

This report identifies an area where provider and patient education can be improved and will be necessary to attain TB elimination. In addition, increasing routine screening for HIV in persons with TB disease or LTBI may improve patients' health outcomes and protect the public's health.

**References**

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**Salmonella Enteritidis Outbreak: Long Term Care Facility as Sentinel for a Community Outbreak**

In September 2010, the Connecticut Department of Public Health (DPH) Epidemiology and Emerging Infections Program was notified by a hospital infection preventionist (IP) of laboratory-confirmed *Salmonella* in a resident of a long term care facility (LTFC) located in Fairfield County, Connecticut.

**Table. Reasons tuberculosis (TB) patients refuse human immunodeficiency virus (HIV) testing as cited by health care providers, Connecticut.**

Reasons TB patients refuse HIV testing	Health care provider citations* n = 40	
	No.	(%)
Stigma associated with HIV diagnosis	29	(72.5)
Perception of not being at risk for HIV	27	(67.5)
Lack of understanding about HIV	21	(52.5)
Inability to mentally deal with HIV diagnosis	17	(42.5)
Financial difficulties	1	(2.5)

\*40/48 health care providers responded to this question; multiple reasons for why TB patients refuse HIV testing could be cited.

Preliminary case-finding indicated that several other LTCF residents had recently experienced diarrhea. The DPH and local health department (LHD) staff conducted an outbreak investigation to determine the source and extent of the outbreak, and to recommend control measures.

The same Connecticut hospital also reported a cluster of *Salmonella* cases involving Westchester County, New York (NY) residents. Because one of the LTCF residents with diarrhea had an epidemiologic link to the NY cluster, concern was raised that the NY *Salmonella* cluster might be related to the LTCF outbreak. Public health staff from Westchester County, NY initiated an investigation of their cluster.

### Epidemiologic Investigation

The DPH and LHD staff conducted on-site visits at the LTCF. A possible case was defined as a LTCF resident with onset of loose stools during September 1–30, 2010; a confirmed case required culture-confirmed *Salmonella* in the stool. To verify demographic and clinical history, medical chart review was conducted for residents who met the case definition. If signs or symptoms were not specifically noted in the medical record or by the nursing director, they were assumed to be absent. Interviews were conducted with residents who had confirmed *Salmonella* infection.

Of the 72 total residents at the LTCF, 17 (24%) met the case definition (14 possible and 3 confirmed cases). The median age was 74 years (range 55–95 years); 14 (82%) were female. Fever was reported in 4 (24%) cases, none reported bloody stools or vomiting, 3 were hospitalized, and none died.

Information obtained from the LTCF epidemiologic investigation and the NY *Salmonella* cluster investigation were compared. Illness onset dates of confirmed LTCF and NY cluster cases overlapped (Figure 1). A common item (cannoli) from a common bakery in Westchester County was suggested. Cannoli were brought into the facility by a visitor who was known to frequent the NY bakery; this food item was shared with several LTCF residents. Of the 3 confirmed cases from the LTCF, 2 consumed cannoli and a third might have consumed cannoli. A total of 5 confirmed NY cluster cases were identified, of which 3 consumed cannoli.

### Environmental Investigation

Connecticut LHD staff conducted on-site visits to the LTCF kitchen. All 16 food workers were

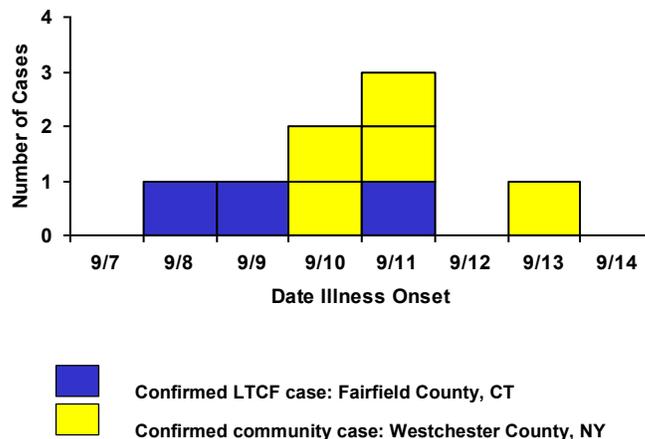
interviewed; none reported recent gastrointestinal illness. Stool specimens were obtained from all food workers. Food handling practices were assessed and complied with the Public Health Code.

Staff of the Westchester County Department of Health and New York State (NYS) Department of Health Bureau of Community Environmental Health and Food Protection coordinated an on-site visit to the bakery. The 3 food workers responsible for cannoli preparation all denied recent gastrointestinal illness; stool specimens were obtained approximately one month after the outbreak. Cannoli preparation procedures were reviewed. The display case where the filled cannoli were stored was not maintained at a proper temperature. The bakery was instructed not to use this display case and to relocate food items to another display case maintained at a proper temperature.

### Laboratory Investigation

Stool specimens from 16 LTCF residents who met the case definition, all 16 LTCF food workers, and the 3 NY food workers involved in cannoli preparation were tested for enteric pathogens at a clinical laboratory, the Connecticut DPH State Laboratory, or the Westchester County Department of Labs and Research. All PFGE testing was performed at the Connecticut DPH State Laboratory. All MLVA testing was performed at the New York State Department of Health Wadsworth Center Laboratories.

**Figure 1. Epidemic Curve: Community Outbreak of *Salmonella Enteritidis*—Connecticut and New York, September, 2010\***



\*For one case, date of illness onset is unknown and estimated to be 3 days prior to specimen collection date.

A total of 3 LTCF resident specimens tested positive for *Salmonella*. All specimens from LTCF food workers and NY food workers tested negative for enteric pathogens. The isolates from the 3 LTCF *Salmonella* cases and the 5 NY *Salmonella* cluster cases were all serotyped as *Salmonella enterica* serotype Enteritidis (SE). Isolates from 2 LTCF SE cases and all 5 NY SE cases had indistinguishable Xba and Bln pulsed-field gel electrophoresis (PFGE) patterns; the third LTCF SE case isolate had a Bln PFGE pattern that only differed by one band.

Multiple-locus variable-number tandem repeat analysis (MLVA) testing was conducted. Isolates from all 3 LTCF SE cases and 4 NY SE cases had an indistinguishable MLVA pattern. The fifth NY SE case isolate had an MLVA pattern that was different from the outbreak pattern; this case was not associated with cannoli consumption.

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**Editorial**

Epidemiologic and laboratory data suggest that an SE outbreak occurred among residents of a LTCF in Fairfield County, Connecticut and among residents of Westchester County, New York. Overlapping illness onset dates, indistinguishable PFGE and MLVA patterns, and a common food exposure suggest that the LTCF SE outbreak was part of a larger community outbreak of SE in NY.

The finding that food purchased in the community was the likely source of the LTCF outbreak was unexpected. Early during the outbreak, investigators first aimed to exclude the possibility of

an ongoing public health threat at the LTCF. Knowledge of the NY *Salmonella* cluster prompted investigators to look outside the LTCF for the outbreak source. Public health staff investigating LTCF gastrointestinal outbreaks should consider the possibility that LTCFs might act as sentinels for larger community outbreaks.

Use of MLVA helped investigators conclude that the LTCF and NY SE outbreaks were related. MLVA is a molecular subtyping technique that involves amplification and fragment size analysis of DNA containing tandemly repeated sequences. Although MLVA is not considered the gold standard for subtyping SE, this technique is considered a potentially useful tool in SE outbreak investigations. Because SE is a genetically homogenous serotype, commonly used subtyping methods, such as PFGE and phage typing, have poor discriminatory capacity. However, MLVA has been shown to better differentiate isolates between different outbreaks than either PFGE or phage typing (1). In this outbreak, LTCF and NY cluster cases that were epidemiologically linked to each other by cannoli consumption had indistinguishable MLVA patterns. These results strengthened the hypothesis that the LTCF SE outbreak was part of a community SE outbreak in NY related to contaminated cannoli.

DPH staff members rely on astute members of the healthcare community to notify the department of issues that might require public health action. Gastrointestinal illness outbreaks in LTCFs and other settings should be reported immediately to the DPH Epidemiology and Emerging Infections Program by calling (860) 509-7994.

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