STEC (E. coli O157:H7) Outbreak Saginaw Regional Correctional Facility

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Saginaw Regional Correctional Facility

- Forty-three acre facility located in Freeland
  - Three security levels at the facility
    - One Level I (Minimum Security)
    - Three Level II (Medium Security)
    - Three Level IV (Close Security)
  - 2011 Census = 1,449 Inmates (1,488 total capacity)
  - Average age of Inmate = 36 years old
  - Median age of inmate = 34 years old

Saginaw Regional Correctional Facility

http://www.Google Maps.com

Background

- August 30, 2012; MDCH was contacted by MDARD regarding ill inmates at the SRCF. Inmates were reporting cramps and diarrhea (some bloody); stool samples had been collected and submitted to local laboratories.
- Stool samples were positive for Shiga Toxin (STX) 1 and 2 and were sent to MDCH BOL for further characterization.
- Preliminary results with the clinically compatible features of the illnesses indicated that the outbreak was due to STX producing E. coli (STEC).
- STEC Incubation period: 2-7 days, Average = 3 days

Methods

- On August 31, 2012: MDCH provided MDOC staff with a preliminary survey tool for interviewing a sample of ill inmates at the facility.
  - Based on the results from the preliminary tool, a menu specific survey tool was developed for a case control study.
  - Ill inmates and cell mates isolated to cells
  - MDOC Quarantines SRCF
- On September 5, 2012; MDOC Sanitarians visited the SRCF to conduct an environmental assessment.
- On September 6, 2012: Saginaw County Department of Public Health (SCDPH) staff collected and returned 20 menu specific ill inmate surveys.

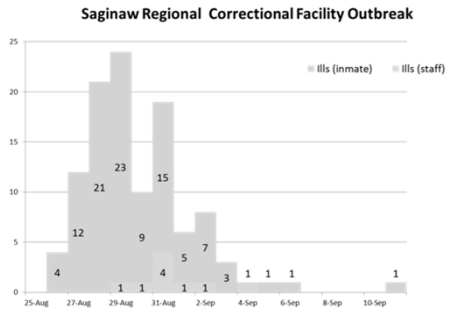
Investigation Key Points

- 102 SRCF inmates and 9 staff (111 total) were ill with gastrointestinal illness between August 26 and September 11, 2012
- Isolates from 30 inmates and 1 staff were indistinguishable by PFGE and matched the outbreak strain of *E coli* O157:H7 1209MIEXH-1
- Of the 80 probable cases, 8 were staff
- 6% of cases were hospitalized (6 inmates, 1 staff)
  - 6% of cases made ED visits (5 inmates, 2 staff)
  - One inmate developed hemolytic uremic syndrome

Key Points - Continued

- All ill inmates were male.
  - Ill inmates ranged in age from 18 to 66 years, with a median age of 36 years (Average = 37 years).
- 3 of the 9 staff were female.
  - The age range of ill staff was 33-58 years with a median age of 48 years (Average = 48 years).
- A full case control study was conducted with the menu specific tool.
  - Completion of the study required an additional 60 well inmate interviews to be conducted by MDOC.

Epicurve of Ill Inmates and Staff by Illness Onset Date



MDOC Environmental Assessment

- MDOC Sanitarians found no critical violations in the cafeteria.
- No ill food handlers/kitchen staff were reported.
- Identified on-site garden and proximity to wastewater treatment ponds as likely vehicle for exposure.
- The on-site garden was tilled under.

Case Control Study Results

- MDCH included data from questionnaires for 19 ill inmates (cases) and 58 well inmates (controls) in the analysis.
- All 204 items on the menu, provided by MDOC, from 8/21/2012 - 8/26/2012 were analyzed for association with illness.
- Additional data were collected on items from vending machines and vegetables from the on-site garden.
- Menu items known to contain vegetables from the on-site garden (taco meat with green peppers served 8/26 and salsa with green peppers served 8/26) were not found to be associated with illness.

Case Control Study Results – Cont.

Meal	Date	Item	Odds Ratio	95% CI (lower – upper)	Chi Square p value
Dinner	8/22/12	Turkey Stir Fry	3.1	1.0 – 9.8	0.05
Dinner	8/22/12	Tossed Salad	3.2	1.0 – 10.2	0.04
Dinner	8/22/12	Low Fat Dressing	3.9	1.2 – 12.3	0.02
Lunch	8/24/12	Skim Milk	3.6	1.2 – 12.7	0.02
Dinner	8/24/12	Italian Sauce	4.0	1.3 – 12.8	0.01
Lunch	8/25/12	Chicken Salad	12.9	2.7 – 61.4	0.00018
Lunch	8/25/12	Carrots	3.0	1.0 – 8.9	0.04
Lunch	8/25/12	Skim Milk	3.1	1.1 – 9.4	0.04
Lunch	8/26/12	Skim Milk	5.2	1.6 – 18.2	0.005

Conclusions

- It's likely that cross contamination in the kitchen contributed to this outbreak.
- Significant secondary transmission occurred from the beginning of this outbreak.
  - Inability to separately cohort ill from well
- The on-site garden was most likely not the vehicle for exposure.

After Action Report

Things that worked well

- Twice daily updates and line lists provided by MDOC SRCF nurse
- SCDPH staff stepped in to assist with interviewing inmates and staff
- Menus received from MDOC on first day of investigation enabled MDCH to get the survey tool out one day after notification.
- The nature of the population setting facilitated the rapid interviewing of cases and controls for the case-control study.

After Action Report – Cont.

Things that need improving

- First notifications would best be handled by a group email notification (High Priority) to avoid delays and minimize multiple calls.
- For the first week at least, daily calls with all investigation partners would have kept all parties informed.
- Set the case definitions for confirmed and probable cases earlier in the investigation.
- LHD follow-up with ill staff within their jurisdictions – 6 counties had ill staff
- Consider holding an after action call with LHD to share "what worked" and "what didn't". (This was held on Dec 21,2012 with SCDPH.)

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