

Linking human and environmental specimens following a gastrointestinal outbreak in a restaurant

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Background: a large outbreak of gastrointestinal illness

- In September 2018, the public health office of Rotterdam-Rijnmond was notified of an outbreak of gastrointestinal illness among 92 persons who had attended a business event
- The first notification was of 35 persons with symptoms of diarrhoea and vomiting
- The business event included a dinner at a restaurant
- A multidisciplinary outbreak investigation was initiated

- **Aim: to identify the mode and the vehicle of transmission and to initiate appropriate control measures**

Methods: Steps of an outbreak investigation

Case finding

- We defined a case as a person who had symptoms of diarrhoea and/or vomiting prior to, or within a week after the business event
- We sent questionnaires to all participants (n=92) of this business event and to the staff (n=7) of the restaurant
- The questionnaire included questions on exposure to food items in a retrospective cohort study design

Verification of the diagnosis

- We tested 12 (12/99; 12%) stool specimens of eight symptomatic (8/37; 22%) and four (4/62; 6%) non-symptomatic persons

Environmental investigations

- We tested 11 swab samples taken from various surfaces in the restaurant

Results: Point source outbreak

Extent of the outbreak

- Of 79 (80%) persons who participated in the study, 30 (38%) met the case definition
- The epidemic curve reflected a point source outbreak

Attack rates of food items

- There was a higher attack rate for ketchup (RR: 3.4; 95%CI: 2.3-5.0) and mayonnaise (RR: 2.3; 95%CI: 1.1-5.0) for exposed compared to unexposed persons

Verification of the diagnosis (including environmental investigation)

- All stool specimens (n=8) of symptomatic individuals were positive for norovirus genogroup I (GI)
- The stool specimens for asymptomatic individuals were negative
- Four environmental specimens (36%) were positive for norovirus GI
- The environmental specimens included kitchen surfaces
- No food items were available for testing

Linking stool specimens to environmental specimens

- Based on the comparison of the sequences of the human and environmental specimens the norovirus GI RNA detected in the environmental specimen matched 100% (204 nucleotides) with the GI.3 capsid fragment in the human specimens

Conclusion: comparing sequences in environmental and stool specimens

- We recommended hygiene measures for all participants who were still symptomatic and a stringent cleaning protocol for the kitchen of the restaurant.
- Through comparison of sequences identified in human and environmental specimens, we could elucidate that food was likely contaminated by an infectious human source via the kitchen.
- This work highlights the importance of comparing sequences in environmental and stool specimens.