E-mail survey as a rapid tool to confirm frozen strawberries as the vehicle of the largest foodborne Norovirus outbreak ever reported in Germany, 2012

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BACKGROUND: Alert for the largest foodborne outbreak in Germany

The alert:
- On 09/27/2012 federal state Brandenburg informed the Robert Koch Institute (RKI) about gastroenteritis clusters
- 500 cases in Brandenburg (symptom onset until 09/27/2012)
- Investigations by the RKI revealed 1,067 cases as of 11/14, same state by same source

The outbreak:
- Altogether 10,950 reported cases (09/19/2012 – 10/19/2012), see Figure 1
- Population: Majority (865) children, <18 years
- 390 institutions affected (see Figure 2)
- Symptoms: Diarrhea, nausea, vomiting and abdominal pain
- Setting: Schools and kindergartens
- Epidemiological link: catering nationwide providing lunch at all institutions affected
- Epidemiological studies: Two case control studies, two surveys, one interview based investigation conducted by RKI

Presented here:
- E-mail survey among students of school X in Brandenburg

Obstacles for investigation:
- Beginning of school holidays in two federal states
- School X reported 40 cases, but closed on 09/28/2012 and remained closed for school holidays
- Families leaving for fall vacation
- Face-to-face interviews not feasible

OBJECTIVE:
- To identify the vehicle transmitting the disease and to stop a further spread of disease

METHODS: E-mail survey to reach study population on vacation

Definition of cases and non-cases:
- Case: School child with self-reported diarrhea or vomiting
- Non case: School children without diarrhea or vomiting
- Study period: 09/27/2012 – 10/19/2012

Variables:
- Nutritional data (age, sex, symptoms (diarrhea, vomiting, ...), onset of symptoms, date or exposure (lunch at school, meal on caterer, sibling, disease, symptoms, ...)

Circulating questions:
- Sent to parent representative forwarded to parent representative of ≤ 30 classes
- Fax "test button" on questionnaire directly e-mail account
- Responses automatically transferred into database

RESULTS: Frozen strawberries the likely vehicle of Norovirus outbreak

In total:
- 87 replies (1 empty questionnaire excluded)
- 14 of 40 participants met case definition
- Median age 10 years (range 9-17 years)

Timeline of questionnaires received:
- After 24 hours:
  - 26 questionnaires
  - association with ambering school lunch significant (OR 15.9; 95% CI 1.5-257.9)
- After 48 hours:
  - 61 questionnaires
  - association with strawberry compote significant (OR 15.9; 95% CI 1.5-481.2)

Further results of outbreak investigation team:
- All five studies conducted by the RKI found association with dishes containing frozen strawberries
- Lab confirmation: Norovirus detected in human specimens and in strawberries (with identical strain)

LIMITATIONS:
- During school holidays unclear number of faecal-quantifying questionnaires and unclear response rate ≥ selection bias?
- Affected individuals may have recalled better what they ate or recalled less?
- Study population must have e-mail account, current mailing list is essential (At school X communication with parents mainly via e-mail)

CONCLUSION: E-mail survey - a valuable tool

- E-mail survey generated evidence within 24 hours implicating frozen strawberries as vehicle
- Results concordant with evidence from other epidemiological investigations
- Timely recall of more than 30 tons of frozen strawberries

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