



Shigella outbreak among students from a student society in the Netherlands

Mare de Boer, Mariska Petrignani
GGD Haaglanden, Den Haag, The Netherlands

INTRODUCTION

On the 30th of March 2017 a cluster of *shigella flexneri* infections was identified among students from a student society, starting with three microbiologically confirmed cases. Initial investigation suggested that more students were affected, and an association with food consumed at the society was suspected. An outbreak investigation was initiated to determine the extent of the outbreak, and to look for possible sources.

METHODS

An electronic questionnaire-based cohort study was conducted among the 1971 members (63% male, 37% female) of the student society. Cases were defined as members of the student society who visited the student society between the 10th and 17th of March 2017, and suffered gastrointestinal complaints starting within a week after the visit. Controls visited the society in the same period, though did not develop gastrointestinal complaints. Statistical analyses was performed with SAS.

RESULTS

The response rate was 26%. 32% (n=162) of the respondents had suffered gastrointestinal complaints between the 10th of March and the 26th of April, showing a peak around the 17th and 18th of March (including seven microbiologically confirmed cases) and a smaller peak around the 4th and 5th of April. Of the students who consumed food or drinks on the student society on the 15th of March (n=43), a large percentage (70%) developed gastrointestinal complaints. Though, cases had occurred beforehand. Other analyses on use of toilets, food handling, and bar tendering showed significant associations. Only food consumption on the 15th remained significant in the multivariate analysis (p=0,000). The investigations showed insight in practices that impose transmission risks: students and staff attending the society while having gastrointestinal complaints; using the toilet of kitchen staff, bar tenders serving used glasses without washing; students helping with food serving.

Epidemic curve

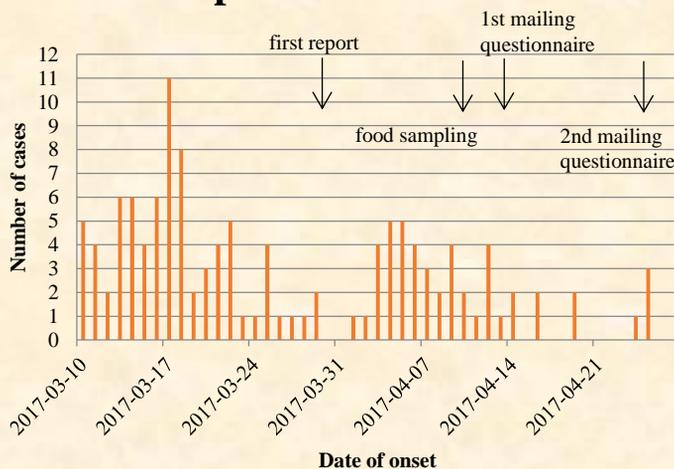


Table 1. Univariate analysis of risk factors for developing gastrointestinal complaints

	Gastrointestinal complaints (%)
Visiting the society	
Yes	35,4*
Consumption of food/drinks	
No	23,3*
Yes	38,2*
Not certain	22,8*
Use of toilets	
Yes	37,3*
Not certain	24,8*
Food consumption 10 March	
Yes	44,6*
Food consumption 14 March	
Yes	38,7*
Food consumption 15 March	
No	28,4*
Yes	69,8*
Bar tendering	
No	34,7*
Not certain	22,7*
Food handling lunch	
No	34,8*
Not certain	22,7*

*Only significant results are shown

Norovirus can be ruled out as a cause. 14 % of the respondents reported vomiting. In case of norovirus this is known to be 70%.¹ The Dutch food and consumer product safety authority (NVWA) has taken food samples the 10th of April. No pathogens were found. Limitations were: delay in conducting the questionnaire, which could cause recall bias. Anonymity was ensured, though double entries could not entirely be ruled out. Questions were not mandatory; not structured by risks per day; and the time frame (10th – 17th of March) was too limited in hindsight.

CONCLUSIONS

This has been an unusually large outbreak. The outcome of the questionnaire indicates attending the society, and consumption of food on 15th of March were risk factors. However, several cases had already occurred beforehand. The initial source of introduction could therefore not be traced. Most likely, multiple transmission routes have been involved, through use of toilets, food handling, and bar tendering. Exposure may have been increased through food handling, explaining the first peak.

REFERENCES

¹ Kirby A.E. et al. (2016). Vomiting as a Symptom and Transmission Risk in Norovirus illness: Evidence from Human Challenge Studies. PLoS ONE 11(4): e0143759. doi:10.1371/journal.pone.0143759