

# Outbreak of gastroenteritis among participants of a survival run in The Netherlands in September 2016

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## Gastroenteritis outbreak survival run

A two-day survival run with **1,000 participants** took place in **Udenhout**, in the south of the Netherlands, **September 2016**.

An outbreak investigation was initiated after the municipal health service was notified that several participants had developed acute gastroenteritis in the days following the event.

## Objectives outbreak investigation

- To determine the **size**, causing **pathogen** and **source** of the outbreak
- To identify **risk factors** for developing gastroenteritis among participants of the survival run

## Methods: retrospective cohort study

Study design: retrospective cohort study

**Case definition:** a participant of this survival run with symptoms of diarrhea and/or vomiting starting within 3 days after the run

We sent an **online questionnaire** via email and shared a link on Facebook and website of the run.

Data collection:

- Demographic characteristics
- Symptoms of gastroenteritis
- Several exposures during the run and at event area

Data analysis:

- Attack rates
- Relative risks (binomial regression analyses)

**Microbiology:** 6 stool samples were tested for common gastrointestinal pathogens.

**Table 1: Risk factors for developing gastroenteritis among participants of the survival run in Udenhout 2016 (N=444)**

Exposure		Total	Cases	AR%	Univariate			Multivariate**		
					RR	95% CI	p-value	aRR	95% CI	p-value
Day of participation	17 Sept only	43	5	12	ref					
	18 Sept only	400	157	39	3.4	1.46-7.76	0.004	2.4	1.12-5.34	0.024
	Both	1	1	100	-					
Water ingested	No	191	49	26	ref					
	Yes	211	108	51	2.0	1.52-2.63	0.000	1.7	1.30-2.29	0.000
Mud ingested	No	342	120	35	ref					
	Yes	60	37	62	1.8	1.37-2.25	0.000	1.3	1.10-1.59	0.003
Food consumed other*	No	11	22	33	ref					
	Yes	45	24	53	1.5	1.08-1.99	0.027	1.7	1.46-2.07	0.000

\* Food consumed other than fruit

\*\*Included in multivariate analyses, but not showed in Table 1: toilet used and consumed beverages (both non-significant)

## Discussion: survival run track probably contaminated with norovirus

Norovirus was the causing agent of this outbreak. - Based on symptom duration and test microbiological results The epi-curve suggests a **point source**. - Indicates infection occurred during the event.

### Track probably contaminated

- Risk factors: water and mud ingestion
- Participants reported symptoms of gastroenteritis before or during the run.
- Unfortunately no environmental samples

Limitations

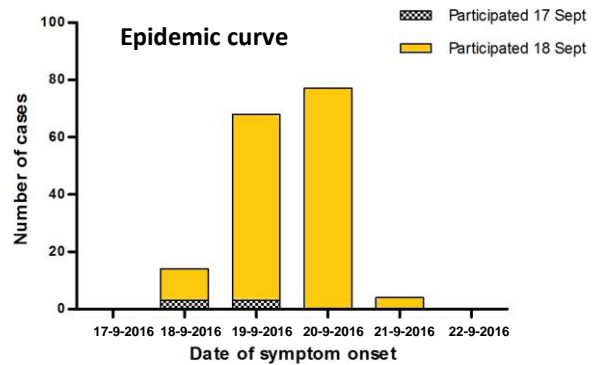
- Attack rate potentially overestimated, higher response among persons with AGI
- Potential recall bias among non-cases
- Did not specifically ask for food consumption other than fruit at the event

## Recommendation: inform participants and organizers

Municipal health services can inform organizers & organizers can inform participants of such events about:

- Possible health risks**, such as acute gastroenteritis
- Prevention measures**, such as not participating with gastroenteritis and avoiding ingestion of water and mud
- Notify the public health services** in case of a potential outbreak

## Results: 37% gastroenteritis (163 cases)



**Response rate: 44%** (444/1,000)

- 14 volunteers, 84% male, mean age: 33 years
- 163 respondents met the case definition (see epi curve).
- Attack rate: 37%
- Symptoms: **diarrhea** (88%), stomach ache (76%), nausea (75%) and vomiting (58%)
- Median duration of illness: 2 days
- No hospital admissions
- 8 participants reported symptoms of gastroenteritis before or during the run.

Microbiology

- Norovirus** in 4/6 stool samples
- Genotypes differed: GI-1, GI-2, GI-3 and GII
- No other pathogens were found.

Risk factors (see table)

- Participation on the second day**
- Ingesting water or mud**
- Consuming food other than fruit at the event area



Final obstacle of survival run Udenhout 2016  
source: <https://www.youtube.com/watch?v=rg:LGiac2sY>