



# Intestinal carriage of resistant bacteria and *Clostridium difficile* in nursing homes in the Netherlands - a point prevalence study

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## Introduction

The vulnerable population of elderly combined with frequent use of antibiotics, provide the potential for nursing homes to become a reservoir of resistant bacteria.

## Purpose

We performed a baseline study to determine the level of intestinal carriage of HRMO and toxin producing *Clostridium difficile* with the aim to relate the findings to possible indicators, at both the patient and nursing home level.

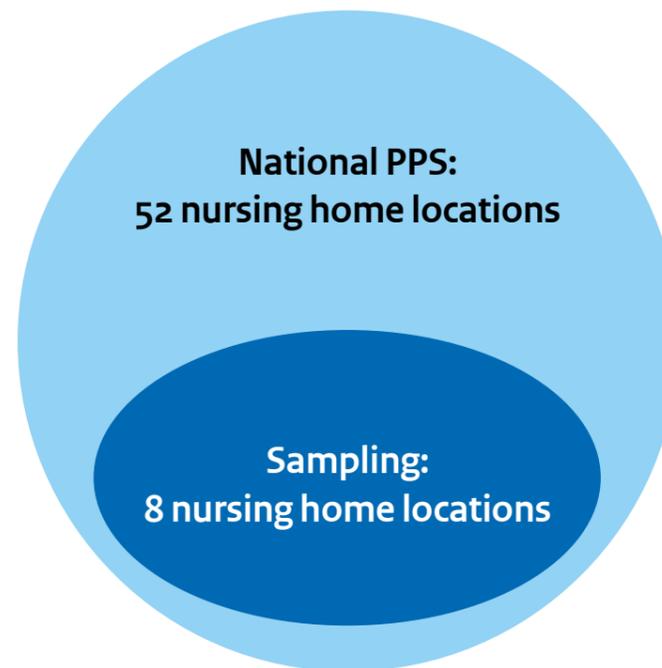
## Methods

Nursing homes participating in the national surveillance program, aimed to measure the point-prevalence of health-care associated infections, were asked to additionally collect residents' feces. Data were collected on age, gender, indication for admission, current infections and use of antibiotics. Feces was cultured for the presence of Extended-Spectrum beta-lactamases (ESBL) producing *Klebsiella pneumoniae* and *Escherichia coli*, using nationally developed protocols. In addition, validated PCRs were applied for the detection of colistine-resistance (*mcr-1*gene) and for toxin B gene of *Clostridium difficile*.

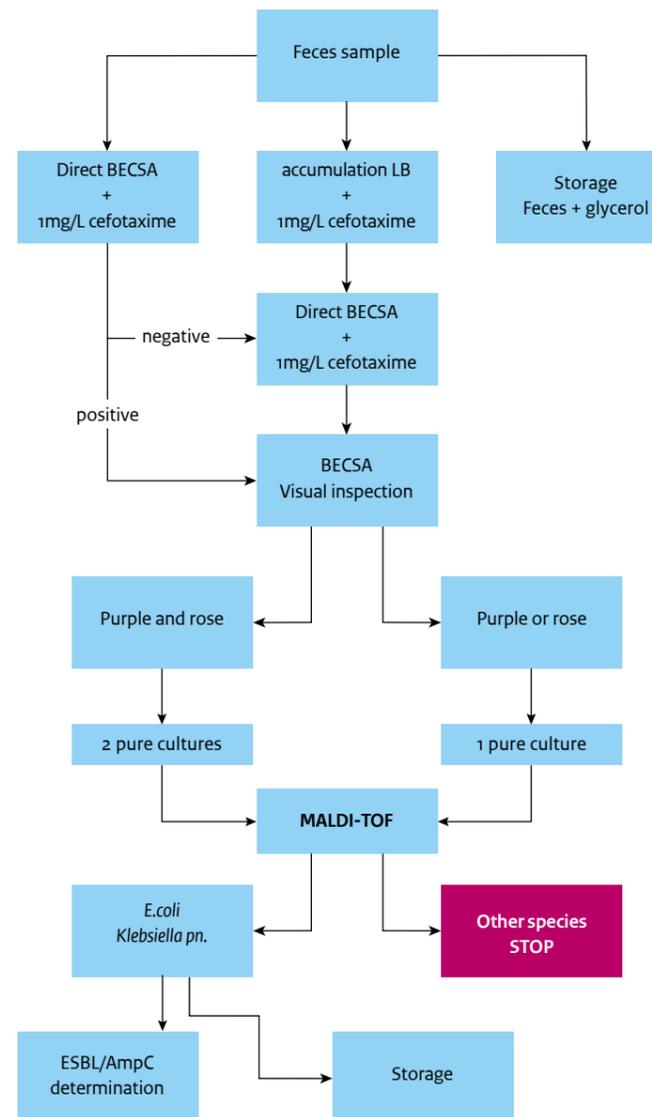
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**Figure 1:** Material that was provided to the participants for collection of stool samples.



**Figure 2:** Participation of nursing homes in the National Point Prevalence study, and the part of these nursing homes that participated in the sampling study.



**Figure 3:** Laboratory analyses of fecal samples for ESBL detection.

## Results

Eight (15%) of 52 nursing homes in the national surveillance point-prevalence study collected feces from 337 (75%) of 448 residents. Reasons for non-response were mainly the expected workload for sampling. Table 1 shows results for pathogen detection, resulting in 9.5% ESBL (range 0-22%) and 3.2%(range 0-17%) toxigenic *C. difficile* carriership. Nine different PCR ribotypes of *C. difficile* were found. Colistine-resistance was not detected. Despite low numbers, having a private room (more than a private bathroom) was found to be a statistically significantly associated with a lower risk on ESBL carriage.

**Table 1:** Results of ESBL carriage, *C. difficile* presence and colistine resistance in nursing home residents.

	n/N	%	Range
ESBL-producing <i>E. coli</i>	14/337	4.2%	0-22%
ESBL-producing <i>K. pneumoniae</i>	18/337	5.3%	0-20%
<i>C. difficile</i>	11/337	3.2%	0-17%
Colistine-resistance	0/337	0%	0%



**Figure 4:** Incentive for participation.

## Conclusions

Carriage of resistant bacteria and *C. difficile* is commonly found in nursing home residents and comparable to the level of carriage in the community. High variation is seen between nursing home locations. Indicators of carriership as well as a national trend are difficult to identify due high non-response of nursing homes in this study, resulting in low numbers and lack of power.