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Prevalence of healthcare-associated infections in Dutch nursing homes

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Introduction:

Elderly residents of nursing homes are at higher risk of contracting a healthcare associated infection (HAI) due to underlying chronic illnesses, dependence on care, sharing of facilities and living in a closed setting. Systematic surveillance on prevalence of HAI in this vulnerable population is scarce but essential to target and evaluate interventions.

Objectives:

The aim of this study was to determine the prevalence of healthcare-associated infections (HAIs) and risk factors for infection in nursing homes in the Netherlands.

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Methods:

- After a pilot phase in 2009 and 2010, the Dutch national surveillance network for HAIs in nursing homes (SNIV) performs biannual cross-sectional prevalence surveys in April and November since 2011.
- For all residents in participating nursing homes baseline characteristics and the presence of gastroenteritis (GI), lower respiratory tract infection (LTI), urinary tract infection (UTI), bacterial conjunctivitis, bloodstream infection, and antibiotic use are registered.
- Infections are determined based on predefined clinical definitions, and additional information on diagnostic testing is collected.
- For this study data collected by a flexible group of nursing homes participating between 2011 and 2015 is included.

Results:

- In each survey on average 25 of around 450 nursing homes participated. Two nursing homes participated all 5 years.
- In 5 years, 23,306 residents were included and 686 HAIs were registered. Mean annual prevalence of HAI was 2.9% (95%CI: 2.7-3.2) and varied between years from 4.3% (95%CI: 3.5-5.2) in 2011 to 2.8% (95%CI: 2.4-3.2) in 2015 (Figure 1).
- Residents of rehabilitation units (4.4%, 95%CI: 3.5-5.4) had a higher risk of HAI than residents of other (somatic and psychogeriatric) units (Table1).
- The most commonly reported infections were UTIs (1.9%, 95%CI: 1.8-2.1) and LTIs (0.6%, 95%CI: 0.5-0.7) (Figure 2).
- Prevalence of HAI varied between nursing homes although numbers were small (Figure 3).
- In the study period, the number of single bedrooms in nursing homes increased from 53% in 2011 to 80% in 2015. Among residents with a single bedroom, the overall HAI prevalence was lower (2.7%, 95%CI: 2.5-3.0) compared to residents sharing a bedroom with other residents (3.3%, 95%CI: 2.9-3.8).

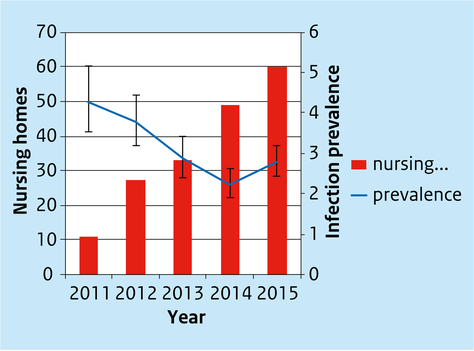

Figure 1. Participated nursing homes and prevalence of infections including 95%CI per year.

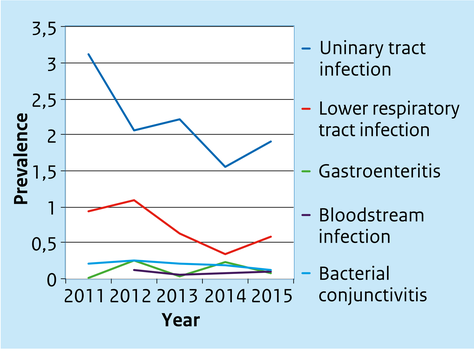

Figure 2. Prevalence of infections per period.

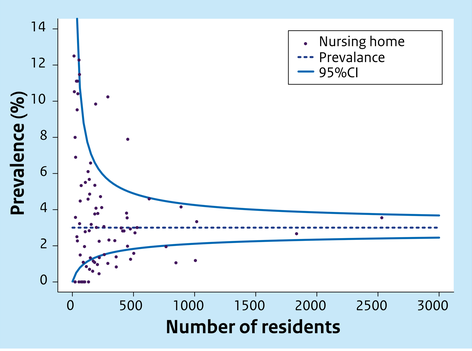

Figure 3. Variation between nursing homes.

Table 1. Infections between the ward specialties and different types of rooms

Resident demographics	Residents	Infections	Percentage %	95% CI
Gender				
Male	7163	198	2,8	2.4-3.2
Female	16143	476	2,9	2.7-3.2
Room type				
Single resident room	16893	462	2,7	2.5-3.0
Resident rooms	6373	212	3,3	2.9-3.8
Ward specialty				
Rehabilitation	1768	77	4,4	3.5-5.4
Somatic	8322	231	2,8	2.4-3.2
Psychogeriatric	13176	366	2,8	2.5-3.1

- For 230 (34%) of 686 HAIs a causative agent was detected and reported. For 194 (43%) of 454 UTIs laboratory conformation was reported, for 16% of all UTIs E. coli was reported as causative organism. Diagnostic testing is most commonly performed for gastrointestinal infections, i.e. for 26 (90%) of 29 GIs, and norovirus is the most detected microorganism (66%).

Conclusion

- Nursing homes mainly rely on clinical symptoms when diagnosing HAIs. In more than 50% of registered HAIs, the causative agent remains unknown due to the absence of diagnostic testing. Diagnostic testing in nursing homes is difficult and sometimes even impossible.
- A trend towards single rooms for nursing home residents is visible in the SNIV data over the past 5 years, and single rooms were found to be associated with lower prevalence of HAIs.
- Repeated, systematic point prevalence surveys enable guidance of national policy making and provide insight into risk factors that may serve local infection control policies. Further in-depth analysis is needed to investigate the found effects for the different types of infection in the course of time.