

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

Journal of Hospital Infection

journal homepage: [www.elsevier.com/locate/jhin](http://www.elsevier.com/locate/jhin)

# Hospital ownership: a risk factor for nosocomial infection rates?

C. Schröder<sup>a,b,\*</sup>, M. Behnke<sup>a,b</sup>, C. Geffers<sup>a,b</sup>, P. Gastmeier<sup>a,b</sup>

<sup>a</sup>Institute of Hygiene and Environmental Medicine, Charité Berlin, Berlin, Germany

<sup>b</sup>German National Reference Centre for the Surveillance of Nosocomial Infections, Berlin, Germany

## ARTICLE INFO

### Article history:

Received 18 December 2017

Accepted 27 January 2018

Available online xxx

### Keywords:

Ownership

Nosocomial infection

## SUMMARY

**Background:** In some countries, a relationship between hospital ownership and the occurrence of healthcare-associated infection (HCAI) rates has been described.

**Aim:** To investigate the association between hospital ownership and occurrence of HCAI in Germany.

**Methods:** Five different components of the German national nosocomial infection surveillance system were analysed with regard to the influence of hospital ownership in the period 2014–2016. Endpoints included ventilator-associated pneumonia, central-venous-catheter-associated bloodstream infections, urinary-catheter-associated urinary tract infections, surgical site infections (SSI) following hip prosthesis and colon surgery, methicillin-resistant *Staphylococcus aureus* (MRSA), *Clostridium difficile* infections (CDI) and hand rub consumption per 1000 patient-days. Three hospital ownership types (public, non-profit and private) were analysed using univariate and multi-variate methods.

**Findings:** The distribution of hospitals according to the three ownership types was similar in all components. In total, 661 intensive care units (ICUs), 149 departments performing colon procedures, and 349 departments performing hip prosthesis were included. In addition, 568 hospitals provided their MRSA rates and 236 provided their CDI rates, and 1833 ICUs and 12,934 non-ICUs provided their hand rub consumption data. In general, the differences between the hospital types were rather small and not significant for the ICUs. In the multi-variate analysis, public hospitals had a lower SSI rate following hip prosthesis (odds ratio 0.80, 95% confidence interval 0.65–0.99).

**Conclusion:** Hospital ownership was not found to have a major influence on the incidence of HCAI in Germany.

© 2018 The Healthcare Infection Society. Published by Elsevier Ltd. All rights reserved.

## Introduction

Approximately 500,000 healthcare-associated infections (HCAI) can be expected annually in German hospitals, and there is an enormous variation in HCAI rates between hospitals according to the size of the hospital, the status of the hospital (e.g. university hospital), patient risk groups, treatments offered, and quality of infection control measures [1,2]. However, some variation may also be related to the ownership

\* Corresponding author. Address: Institute of Hygiene and Environmental Medicine, Charité – University Medicine Berlin, Hindenburgdamm 27, 12203 Berlin, Germany. Tel.: +49 30 450 577604; fax: +49 30 8445 3682.

E-mail address: [christin.schroeder@charite.de](mailto:christin.schroeder@charite.de) (C. Schröder).

<https://doi.org/10.1016/j.jhin.2018.01.019>

0195-6701/© 2018 The Healthcare Infection Society. Published by Elsevier Ltd. All rights reserved.

of the hospitals. In some countries, a relationship has been reported between hospital ownership and occurrence of HCAI [3–8], yet other studies have found no influence [9]. However, this factor has not been considered in most studies investigating the epidemiology of HCAI.

According to the latest report from 2016, Germany has 1951 hospitals: 29.7% are public hospitals, 35.2% are owned and maintained by non-profit organizations such as the church or the Red Cross, and 35.1% are private hospitals [10]. However, the majority of hospital beds are in public hospitals (48.0%), followed by hospitals owned by non-profit organizations (33.8%) and private hospitals (18.2%).

The German national nosocomial infection surveillance system (KISS) has a large number of participating hospitals and high variation of hospitals by ownership, and represents an opportunity to investigate the association between hospital ownership and the occurrence of HCAI.

## Methods

Analysis focused on data from five different surveillance components of KISS. Surveillance protocols of the individual surveillance components are described elsewhere, and can also be found on the website in German and English ([www.nrz-hygiene.de](http://www.nrz-hygiene.de)) [11–14].

**Table 1**

Description of included intensive care units (ICUs) by hospital ownership

Ownership	Public	Non-profit	Private	P-value
Number of ICUs	266	246	149	
Interdisciplinary	121 (45.49%)	188 (76.11%)	95 (63.33%)	<0.01
Medical	47 (17.67%)	21 (8.5%)	12 (8.00%)	<0.01
Surgical	56 (21.05%)	23 (9.3%)	15 (10.00%)	<0.01
Other	41 (15.41%)	14 (5.7%)	27 (18.0%)	<0.01
Number of beds per ICU, mean (interquartile range)	13.7 (9–16)	11.8 (8–14)	13.1 (9–16)	0.01
Number of hospitals	195 (37%)	215 (40%)	121 (23%)	
University hospitals	34 (17%)	3 (1%)	3 (2%)	<0.01
Non-university hospitals	161 (83%)	212 (99%)	118 (98%)	<0.01
Months of surveillance	2771	1536	1735	
Patients	724,575	682,421	381,651	
Patient-days	2,825,832	2,245,872	1,460,682	
Length of stay, mean (days)	5.0	4.4	5.2	<0.01
Bed occupancy, mean (%)	82.72	79.73	78.36	0.01
Ventilator utilization rate (per 100 patients)	41.1	32.5	39.7	<0.01
Urinary catheter utilization rate (per 100 patients)	82.6	80.1	82.9	<0.01
CVC utilization rate (per 100 patients)	70.5	59.8	63.0	<0.01
Number of HCAI	10,723	7229	5570	
Incidence density of HCAI (per 1000 patient-days)	3.79	3.22	3.81	<0.01
Ventilator-associated lower respiratory infection rate (per 1000 ventilator-days)	4.40	4.14	4.33	0.03
Catheter-associated urinary tract infection rate (per 1000 catheter-days)	0.85	0.86	0.93	0.04
CVC-associated primary bloodstream infection rate (per 1000 CVC-days)	1.02	0.95	1.30	<0.01

HCAI, healthcare-associated infections; CVC, central venous catheter.

Two of the components included were not hospital based: the intensive care unit (ICU-KISS) component and the component for surgical site infections (SSI) (OP-KISS). ICU-KISS is unit based and OP-KISS is patient based. ICUs were included in the analysis if they reported at least 18 months between 2014 and 2016. Surgical departments had to report at least 30 surgeries between 2014 and 2016. The endpoints of the study were three different types of device-associated HCAI per 1000 device-days, the sum of all three types of device-associated HCAI per 1000 patient-days in ICUs (ICU-KISS), and SSI per 100 operated patients (OP-KISS). Only colon procedures and hip prosthesis following arthrosis were selected as procedures because a large number of hospitals used them.

In addition, the hospitalwide components for the surveillance of methicillin-resistant *Staphylococcus aureus* (MRSA-KISS), *Clostridium-difficile*-associated diarrhoea (CDAD-KISS) and alcohol hand rub consumption, stratified according to ICUs and non-ICU wards (HAND-KISS), were investigated for the period 2014–2016. Healthcare-associated MRSA rates and healthcare-associated *C. difficile* infection (not identified before day 4 in the hospital) were the selected endpoints of MRSA-KISS and CDAD-KISS, respectively. Alcohol hand rub consumption per patient-day was the outcome of interest in HAND-KISS.

Download English Version:

<https://daneshyari.com/en/article/8957914>

Download Persian Version:

<https://daneshyari.com/article/8957914>

[Daneshyari.com](https://daneshyari.com)