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Organization of infection control in European hospitals☆

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SUMMARY

Background: The Prevention of Hospital Infections by Intervention and Training (PROHIBIT) survey was initiated to investigate the status of healthcare-associated infection (HCAI) prevention across Europe.
Aim: This paper presents the methodology of the quantitative PROHIBIT survey and outlines the findings on infection control (IC) structure and organization including management's support at the hospital level.
Methods: Hospitals in 34 countries were invited to participate between September 2011 and March 2012. Respondents included IC personnel and hospital management.
Findings: Data from 309 hospitals in 24 countries were analysed. Hospitals had a median (interquartile range) of four IC nurses (2–6) and one IC doctor (0–2) per 1000 beds. Almost all hospitals (96%) had defined IC objectives, which mainly addressed hand hygiene (87%), healthcare-associated infection reduction (84%), and antibiotic stewardship (66%). Senior management provided leadership walk rounds in about half of hospitals, most often in Eastern and Northern Europe, 65% and 64%, respectively. In the majority of hospitals (71%), sanctions were not employed for repeated violations of IC practices. Use of sanctions varied significantly by region ($P < 0.001$), but not by countries' healthcare expenditure.
Conclusion: There is great variance in IC staffing and policies across Europe. Some areas of practice, such as hand hygiene, seem to receive considerably more attention than others that are equally important, such as antibiotic stewardship. Programmes in IC suffer from deficiencies in human resources and local policies, ubiquitous factors that negatively impact on IC effectiveness. Strengthening of IC policies in European hospitals should be a public health priority.

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Introduction

Healthcare-associated infections (HCAIs) are the most frequent adverse events in healthcare delivery and result in increased morbidity and mortality.[1] According to the recent European point prevalence survey (PPS), the number of patients with an HCAI on any given day in European acute care hospitals is about 81,000.[2]

Various studies have shown that HCAIs are partly preventable.[3] In the Study on the Efficacy of Nosocomial Infection Control (SENIC) project, infection control (IC) programmes that included surveillance, control activities and IC personnel were strongly associated with HCAI reduction.[4] Later, a consensus panel report by the Society for Healthcare Epidemiology of America defined key IC functions as follows: targeted surveillance, detection and control of outbreaks, implementing and auditing written policies, and education and training.[5]

More recently, leadership, organizational mechanisms, and communication strategies have been identified as important determinants of effective practice.[6–8] The Systematic Review and Evidence-based Guidance on Organization of Hospital Infection Control Programmes (SIGHT) project has identified components for effective IC programmes; besides factors such as staffing, surveillance, audits, education, and training, the authors recommended fostering working relationships and communication across units and staff groups.[9]

However, variations in key IC functions have been reported in multiple sources.[10,11] In 2001, the Antimicrobial Resistance Prevention and Control (ARPAC) project showed that the intensity of IC programmes scored higher in Northern and Western Europe than in other European regions. Variations in IC throughout Europe can be explained by differences in social and legal perspectives, and also by cultural norms.[12] The extent to which national and hospital factors influence best practice is one objective of the Prevention of Hospital Infections by Intervention and Training (PROHIBIT) study, a European Union-funded project that was launched in 2010. A quantitative survey was implemented across Europe in order to obtain a broad understanding of what is actually being done to prevent HCAI in European hospitals. The PROHIBIT survey comprised four questionnaires (Q1–4) that explored IC organization and activities at the hospital level (Q1), the intensive care unit level (Q2), and the non-intensive care unit level (Q3, Q4). Here we report on the methodology of the survey and summarize the findings of IC structure and organization including management's support at the hospital level (Q1).

Methods

The PROHIBIT survey was developed by an interdisciplinary group of IC specialists (S.H., W.Z., P.G., H.S.), infectious diseases specialists (W.Z., H.S.), experts in public health (S.H., B.C.) and health management (R.A., Y.K.).

During a PROHIBIT expert meeting in December 2010 a first draft of the questionnaire was discussed with European surveillance representatives who were identified in close cooperation with the European Centre for Disease Prevention and Control (ECDC) and invited to act as national contact points (NCPs). An advanced version was piloted in three countries (Finland, Hungary, Germany) in April 2011 and the final version was translated into 15 languages.

The NCPs were asked to invite 30 hospitals per country to participate in the survey between September 2011 and March 2012. Hospitals' leading IC personnel were asked to act as hospital contact points (HCPs). Various professional groups were invited to answer different parts of the questionnaire. Hospitals were offered access to the PROHIBIT results later to benchmark their IC practices with other hospitals.

The HCPs received individualized web-based questionnaires (Limesurvey version 1.92), distributed the questionnaires within their hospitals, and organized data transfer to their NCPs. Completed anonymized paper forms were entered into the online database either by NCPs or by the study centre at Charité–University Medicine Berlin (CUB). Data plausibility was checked by the NCPs in collaboration with the study team at CUB.

A preliminary data set was created by CUB and presented at a second PROHIBIT expert meeting in April 2012. The NCPs performed further plausibility analyses and sent feedback until March 2013.

In countries with more than 30 participating hospitals, 30 were selected at random for a European reference in order to not over-represent hospitals in a country.

Table I
Distribution of participating hospitals and national healthcare expenditure by country – The Prevention of Hospital Infection by Intervention and Training (PROHIBIT) survey

UN geographic region[a]	Country	Total HCE as % of GDP[b]	No. of participating hospitals
Eastern Europe ($N = 88$)	Bulgaria	7.2	19
	Hungary	7.8	30
	Poland	7	9
	Slovakia	9	30
Northern Europe ($N = 73$)	Finland	8.9	11
	Ireland	9.2	12
	Latvia	6.8	8
	Lithuania	7	13
	Sweden	9.6	8
	UK, England	9.6	5
	UK, Scotland		3
	UK, Wales		13
Southern Europe ($N = 83$)	Croatia	7.8	6
	Italy	9.3	18
	Malta	8.6	1
	Portugal	10.7	27
	Slovenia	9	8
	Spain	9.6	23
Western Europe ($N = 65$)	Austria	11	8
	Belgium	10.5	5
	France	11.6	8
	Germany	11.6	30
	Switzerland	11.4	6
	The Netherlands	12	8
All			309

UN, United Nations; HCE, healthcare expenditure; GDP, gross domestic product.
[a] Regional grouping used by the UN Statistics Department.[15]
[b] HCE as the share of GDP.[16]