Control of hospital-acquired infections in Central Eastern European countries

Control of hospital-acquired infections in Lithuania

Rolanda Valinteliene1, Ieva Kisieliene1,2
1Public Health Technology Centre, Institute of Hygiene, Vilnius
2Infection control division, Republic Vilnius University Hospital, Vilnius
Corresponding author: Rolanda Valinteliene, MD
E-mail: rolanda.valinteliene@hi.lt
Received: 1 September 2018/Accepted: 20 September 2018

Country-specific information

The Republic of Lithuania is a country with over 2.8 million inhabitants, consisting of 10 counties and 60 municipalities. There are 127 hospitals with almost 25,000 beds (8.7 hospital beds per 1,000 inhabitants). Sixty-three hospitals provide general acute care, 15 are specialized (e.g. in infectious disease, oncology, psychiatry), and the rest are long-term care hospitals. There are also 45 nursing homes and 4 rehabilitation centers. In Lithuania there are nursing and rehabilitation hospitals (which are health care institutions) and nursing homes and rehabilitation centres (which are social care institutions). Treatment in nursing hospitals is up to four months, while staying in a nursing home can be for years, for the rest of life. Most of the hospitals are operated by municipalities, some are operated by universities and the Ministry of Health, and 12 are privately owned. National law (Law of healthcare institutions, 1996) regulates principles of establishment, control measures, management and financing requirements for healthcare institutions.

Legal preconditions for the control of healthcare-associated infections

The prevention and control of healthcare-associated infections (HAIs) is regulated by the government. So called Hygiene Norms approved by the Minister of Health (MoH) are the main legal documents which determine hygienic requirements and infection prevention and control measures to be implemented in all healthcare institutions. These include minimum requirements for hand hygiene, cleaning, disinfection and sterilization, isolation, laundry, medical waste, etc. The direct responsibilities for the implementation of all these requirements lay with the hospital, while supervision is carried out routinely by the National Public Health Centre.

The organization of infection control (IC) within healthcare institutions is regulated by an order of the MoH (order no. V-1110, 2008), where main responsibilities, core competencies of IC staff and recommendations on the number of IC staff are given. Infection prevention and control is considered a patient safety prerequisite and implementation of basic requirements (e.g. the presence of a prevention program for HAI, hygienic description of medical procedures) is verified during the licensing procedure.

Other bodies regulating HAIs

Other institutions which are involved in HAI prevention and control at a national level (recommendations, training, consultations, etc.) are the Institute of Hygiene (coordinates the national HAI surveillance system), the Communicable Disease and AIDS Centre, and the National Public Health Surveillance Laboratory.
Position, structure and composition of the infection control team within hospitals

General functions, rights of IC staff within the hospital, as well as recommendations on quantity of staff are detailed in „The description of infection control staff activities”, approved by the MoH (order no. V-1110, 2008). The main functions of IC staff include HAI surveillance, outbreak management, preparation and supervision of IC procedures, education of medical staff, participation in antibiotic stewardship, etc. IC positions are IC doctor (background – medical doctor with at least 80 hours of specific training), IC specialist (background – master of public health with at least 80 hours of specific training), IC doctor’s assistant (background – nurse with at least 160 hours of specific training). Healthcare institutions can establish separate IC divisions. It is stated that the chief of the IC division should be an IC doctor. Due to changes in university programs and a lack of MDs applying for these positions, public health specialists hold that position in most hospitals.

Levels of employment according to size and type of hospital

The above legal act (order no. V-1110, 2008) gives recommendations on the number of IC staff: 1) at least one IC doctor or IC specialist per 400 beds or per 100 beds in the risk areas of hospitals, or for more than 100,000 consultations per year in an outpatient clinic; and 2) at least one IC doctor’s or IC specialist’s assistant per 100 beds or per 50 beds at the infection risk areas of hospitals, or for 50,000–100,000 consultations per year in an outpatient clinic. In reality, these recommended requirements are often not fully met in terms of recommended number and qualification of the staff. All university, national and most regional hospitals have IC divisions. Smaller regional and local hospitals have full-time or part-time IC staff. In some hospitals, responsibility for IC is designated to the deputy director (mainly the head nurse). A newly revised order stipulates that the number of IC staff is considered a hospital quality indicator. Although it is not regulated by law, some hospitals set up IC committees, which usually consist of numerous specialists (e.g. specialists in IC, microbiology, surgery, intensive care).

Surveillance of HAIs in Lithuania

Surveillance of HAIs is regulated at a national level and is compulsory for all healthcare institutions. According to the document „Description of surveillance of healthcare-associated infections” approved by order of the MoH (no. V-1110, 2008), there are four national surveillance protocols: 1) point prevalence survey – mandatory once a year for all hospitals, mandatory data submission to the Institute of Hygiene; 2) surveillance of HAIs in intensive care units – mandatory at least four months per year (mandatory to register pneumonias, blood and urinary tract infections), voluntary data submission to the Institute of Hygiene; 3) surveillance of surgical site infections – mandatory at least four months per year for at least two operation types (mandatory for coronary artery bypass grafting and orthopaedic operations), voluntary data submission to the Institute of Hygiene; and 4) surveillance of Clostridium difficile infections – mandatory at least three months per year, voluntary data submission to the Institute of Hygiene. Participation in the national HAI surveillance system is one of the hospital quality indicators.

Conclusion

Surveillance and control of hospital-acquired infections are in place. Surveillance protocols are comparable with ECDC protocols and data are regularly submitted to the European HAI-Net network. National reports are available online (www.hi.lt/hospitalines) and are presented at annual conferences. An electronic system is under development and will be functional in 2020.

Control of hospital-acquired infections in the Republic of Macedonia

Milena Petrovska1, Angelina Bachanovic2, Biljana Calevska2, Ognen Petrovski3
1Institute of Microbiology and Parasitology, Faculty of Medicine, Ss Cyril and Methodius University, Skopje
2Ministry of Health, Skopje
3Institute of Preclinical and Clinical Pharmacology with Toxicology, Faculty of Medicine, Ss Cyril and Methodius University, Skopje
Corresponding author: Milena Petrovska, MD
E-mail: milena_petrovska@hotmail.com
Received: 31 August 2018/Accepted: 22 September 2018

Country-specific information

The Republic of Macedonia has a population of over 2 million inhabitants. There are 66 hospitals, of which 55 provide acute inpatient care, with a total of 8,879 hospital beds. The control of healthcare-associated infections (HAIs) is regulated by the government, based on a mixed model of financing by the state and the Health Insurance Fund of the Republic of Macedonia.

Legal preconditions for the control of HAIs

National framework legislation for healthcare is defined by the Law on Healthcare (Official Gazette of R. Macedonia no. 43/2012) where the organization of the system, healthcare institutions, healthcare workers, quality of healthcare and accreditation, and the control of the healthcare system are defined. Several rulebooks exist for the specifics and the implementation. The Law on the Protection of the Population against Communicable
Diseases (Official gazette no. 66/2004) and the Law on the Protection of Patient’s Rights (Official gazette no. 82/08) constitute the basis for detailed regulation on the control of HAIs. Regulations are continuously adapted and published as Guidelines for Evidence Based Medicine in the different fields of medicine.

Other bodies regulating HAIs

Competent authorities and other bodies responsible for the quality of healthcare services and patient safety are: The Ministry of Health (MoH), the Agency for Quality and Accreditation of Health Care (governmental institution), e-Health system (popularly „moj termin”), the State Sanitary and Health Inspectorate, and the Commission for Combating Intra-hospital Infections (IHI) (established as an advisory body to the MoH).

Position, structure and composition of the infection control team within hospitals

The Law on the Protection of the Population against Communicable Diseases and the Rulebook on the detailed criteria for prevention and suppression of intra-hospital infections (IHI) (Official gazette no. 25/2008) define the responsibility of the head of the health institution (article 49 of the Law) for establishing the obligatory commission for the monitoring of IHI and for operating a program for the control of HAIs. According to article 25 of the Rulebook, the commission is composed of a doctor authorized by the institution’s head to monitor IHI in the health facility, the chief medical nurse of the facility, a specialist doctor in epidemiology or microbiology or infection disease, a medical nurse (with secondary, high or university education) for IHI, as well as a doctor from a specific specialty dealing with IHI. Health professional organizations, such as the Doctors’ Chamber and the Macedonian Medical Association with its specialist societies conduct accredited training courses for nurses, technicians and doctors for the prevention and suppression of HAIs.

Levels of staffing according to size and type of hospital

The Rulebook (Official Gazette 92/2013) defines parameters for the necessary space, equipment and expert personnel for establishing, starting the work, and performing healthcare activities in a health institution, as well as the number of staff per type of healthcare institution and the number of beds, but not the personnel for the control of HAIs.

Surveillance systems for HAIs

In each healthcare institution, it is the responsibility of the commission for HAIs to report summarized data on HAIs to the Institute of Public Health which, together with the State Sanitary and Health Inspectorate (SSHI), have annual working programs related to HAIs.

Infection control committee in hospitals

In each hospital, an infection control committee provides a multidisciplinary approach, cooperation and information sharing, and is responsible for specific planning of infection control activities and their implementation. The committee is comprised of the staff mentioned previously, and representatives of other departments may be invited if needed (e.g. pharmacy, maintenance, training services etc).

Conclusion

The process of control of HAIs in the Republic of Macedonia has the necessary basic legislation, which needs further improvement with continuing accreditation, continuing education of personnel, control of implementation in practice, preparation of a revised national strategy on HAIs, with defined goals, budget and action plan, as well as the standardized monitoring of HAIs.

Control of hospital-acquired infections in Montenegro

Zoran Vratnica1, Božidarka Rakоčević2, Sanja Medenica2, Željka Zeković1, Ljubica Terić1, Miro Knežević2, Boban Mugoša4
1Centre for Medical Microbiology – CMM, Institute of Public Health of Montenegro, Podgorica
2Centre for Control and Prevention of Infectious Diseases, Institute of Public Health of Montenegro, Podgorica
3Ministry of Health, Podgorica
4Institute of Public Health of Montenegro, Podgorica

Corresponding author: Zoran Vratnica, MD, PhD
E-mail: zoran.vratnica@ijzcg.me

Received: 27 July 2018/Accepted: 22 September 2018

Country specific information

Montenegro is a country in South-eastern Europe with approx. 620,000 inhabitants. It covers an area of 13,812 km² and consists of 23 municipalities. In Montenegro, there are eight (7 public + 1 private, acting as public) general hospitals, one tertiary clinical centre and three specialty hospitals (pulmonary diseases, psychiatry and orthopedics and neurosurgery). In total there are 3.98 hospital beds per 1000 inhabitants.

Legal preconditions on the control of health care-acquired infections (HAIs)

In Montenegro, the control of HAIs is regulated by the Ministry of Health. For hospitals, framework legislation is defined at the country level by The Law on the Protection of the Population against Infectious Diseases (2018) as follows: Article 4: „Epidemiological surveillance is car-
ried out of health-related infections (hospital infections)”; Article 7: “... Everyone has the right to protection against infectious diseases and hospital infections, ...”; Article 18: „Health institutions and other legal entities that provide health care services are obliged, in a case of infectious disease or nosocomial infection, to immediately inform the competent medical institution, as well as the Institute (IPH), the body of the administration responsible for inspection activities ...”; Article 36: „... Epidemiological surveillance involves the continuous systematic collection of data on infectious diseases, hospital infections ...”;

Article 41: „The mandatory reporting, for the purpose of epidemiological surveillance, in accordance with this law, refers to: .... 6) hospital infection ...”; Article 56 defines the obligation of healthcare institutions to provide hygienic-technical conditions and to carry out professional, organizational and other mandatory measures to prevent the occurrence of hospital infections and to secure their early detection and control. Here it is defined that „... hospitals and other types of stationary healthcare institutions are obliged to establish a team for the prevention and control of hospital infections for every 200 beds, consisting of a medical doctor, a specialist in epidemiology, specialized in supervision, prevention and control of hospital infections, and one sanitary/medical technician with a higher or high level of education, specifically trained in the prevention and control of hospital infections. Health facilities that have less than 200 beds are obliged to establish a qualified team for the control and prevention of hospital infections.” The infection control team in the hospital is responsible for monitoring and analysing the current situation, for reporting, suggesting quality improvements and implementing infection control measures with regard to HAIs. In the same article (56) it is defined that „Health institutions are obliged to establish a commission for the prevention of hospital infections. The Commission shall conduct an analysis of the condition of hospital infections and sanitary and hygienic conditions and shall propose appropriate measures for their prevention and control.” The Rulebook on the Reporting of Contagious Diseases, Nosocomial Infections, Conditions and Deaths from Contagious Diseases (2015) defines the obligation of reporting as well as how and to whom to report on HAIs. A new Rulebook on Prevention and Control of Nosocomial Infections is in the adoption phase.

Surveillance system for HAIs in Montenegro

The Ministry of Health established the National Commission for the Control of Hospital Infections, which consists of specialists in epidemiology, microbiology, infectious diseases, hygiene and other specialties of importance for the prevention of hospital infections. The tasks of the Commission are defined by the law mentioned above.

Conclusion

In recent years, Montenegro has made considerable improvements in the field of prevention and control of HAIs. The Law on the Protection of the Population against Infectious Diseases (2018) defines competent bodies, competences and activities crucial for successfully combatting HAIs.

Creation of the infection control teams and completion of specializations of medical doctors in epidemiology (with particular competences in HAIs) needed for the control teams, has started in almost all hospitals of Montenegro. The new Rulebook on the Prevention and Control of Nosocomial Infections is to be adopted very soon. The incorporation of the infection control structures mandated by the legal requirements described above into everyday routines is the present challenge.

Control of hospital-acquired infections in Poland

Tomasz Wolkowicz, Rafał Halik, Rafał Gierczyński
National Institute of Public Health – National Institute of Health, Warsaw

Corresponding author: Tomasz Wolkowicz, PhD
E-mail: twolkowicz@pzh.gov.pl

Received: 1 September 2018/Accepted: 22 September 2018

Country-specific information

Poland is a republic with nearly 38.5 million inhabitants, and consists of 16 administrative regions (voivodships). In Poland, there are around 936 hospitals, which provide 182,924 inpatient acute beds (4.76 hospital beds per 1,000 inhabitants). Control of healthcare-associated infections (HAIs) is the responsibility of the Ministry of Health and National Sanitary Inspection. Operationally, this system relies mainly on sanitary epidemiological stations at county and voivodship (regional) levels.

Legal preconditions for the control of healthcare-associated infections (HAIs)

For hospitals, framework legislation is defined at a national level by the Act of 5 December 2008 „on the prevention and control of infections and infectious diseases in humans“ (Dz. U. of 2008, item 1570), and a regulation of the Minister of Health „on the list of alarm agents, records of nosocomial infections and alarm agents and reports on the current epidemiological situation of the hospital“ (Dz. U. of 2011, item. 1741). The regulation specifies infectious agents which are reported mandatorily and defines the procedures for the recording of healthcare-associated infections (HAIs). Internal control of activities conducted must be carried out by each hospital, whereas external control is carried out by the competent authorities. Heads of medical entities are obliged to implement a system of monitoring, prevention and control of HAIs.
by appointing a team and a committee for the control of HAI s, risk assessment and monitoring of the occurrence of hospital-acquired infections and alert factors, including resistant strains. They also have to regularly prepare reports on the current epidemiological situation, and an annual report must be sent to the local authority, the Sanitary Epidemiological Station. Heads of medical institutions are also obligated to maintain a registry of HAI s.

**Other bodies regulating HAI s**

In the process of hospitals accreditation, the Center for Quality Monitoring in Health Care (agenda of Ministry of Health) issues standards for HAI control measures. The National Health Fund is the main public payer in the Polish health-care system; the fund may control hospital entities which have a contract with this institution to check the effectiveness of the control of HAI s.

**Position, structure and composition of the infection control team and committee within hospitals**

Heads of the medical entities are obliged to set up a team and a committee for the control of HAI s. The team is composed of a medical doctor as head of the team, an epidemiology nurse and a laboratory diagnostician (as a microbiology specialist if the medical doctor does not have a specialty degree for microbiology). The infection control team (ICT) is mainly responsible for introducing measures to control nosocomial infections, for internal investigations, and for the reporting of results and conclusions of inspections to the head of hospital and the hospital infection control committee (HIICC). The committee is composed of the head of the medical institution, members of the HAI control teams, the head of hospital nurses and a local occupational health physician. The main goals of the committee include the preparation of recommendations and guidelines for the hospital in the field of elimination of HAI s, and evaluation of activities of the ICT.

**Levels of staffing**

According to the results of controls performed by the Supreme Audit Office (pol. NIK) in Poland in 2017 (information about control results, KZD.430.001.2018, registry number 13/2018/P/17/060/KZD) there were 110 medical doctors with a specialization in medical microbiology, 219 with a specialization in epidemiology and 227 with a specialization in hygiene and epidemiology. Some 39 %, 47 % and 46 %, respectively, of them are over 64 years of age. There were 1,250 nurses and midwives with a specialization in epidemiological nursing, epidemiology or hygiene and epidemiology. This means that in many hospitals there is no proper doctor or epidemiological nurse employed. According to the Act of 5 December 2008 „on the prevention and control of infectious diseases” there should be at least one epidemiology nurse per 200 beds.

**Surveillance systems for HAI s in Poland**

The Polish surveillance system includes reports on hospital outbreaks (initial report, final report and periodic reports if needed) by hospital infection control teams. The reports are forwarded to the regional office of the Sanitary Inspectorate. The heads of the medical entities and the committees have to keep accurate records of HAI s and infectious agents (according to the Regulation of the Minister of Health) detected in hospitals.

**Conclusion**

An investigation recently carried out by the Supreme Audit Office in Poland showed that there are still not enough microbial laboratory tests performed in HAI investigations. Most HAI surveillance systems are still paper-based. Expertise in the field of HAI s and dissemination of the respective knowledge to medical professionals, which is essential to control nosocomial infections, are in large part provided by variety of medical societies such as the Polish Society of Hospital Infection. Government funded programs such as „National Programme for Protection of Antibiotics“ (NPPA) also support control of HAI s.

**Control of hospital-acquired infections in Romania**

Gabriel Ionescu, Irina Codită, Alexandra-Maria Născuțiu
“Carol Davila” University of Medicine and Pharmacy, Bucharest
Corresponding author: Gabriel Ionescu, MD
E-mail: gionescu2@yahoo.com
Received: 3 August 2018/Accepted: 17 September 2018

**Country-specific information**

Romania, a south-east central European country with 20 million inhabitants, is organized into 41 counties and the capital Bucharest. In 2014, there were 527 hospitals (6.6 hospital beds/1,000 inhabitants). The Ministry of Health (MoH) is responsible for the policy, regulations and financing of the surveillance of healthcare infections, antimicrobial resistance and antibiotic consumption.

**Legal preconditions on the control of hospital-acquired infections**

According to Law 95/2006 on reform in the health domain, every hospital provides sanitary conditions and is responsible for HAI s prevention. The National Strategy of Health 2014–2020 and the Implementation Plan approved by the 1028/2014 Governmental Decision include objectives such as conducting studies, surveys and assessments, and developing a national strategic plan on HAI s and staff training programmes. The 1101/2016 MoH order provides the norms for organising surveillance,
prevention, reporting and limitation of HAIs, the methodology for monitoring the accidental exposure of medical staff to biological products, and standard precautions to prevent HAIs. Norms for cleaning, disinfection and sterilization in healthcare settings, plus other technical recommendations are stipulated in MoH order 961/2016. Other bodies regulating HAIs are the National Authority of Quality Management in Health (NAQM) and the National Institute of Public Health (NIPH). NAQM has issued *The accreditation standards for hospitals*, which includes requirements/criteria for good practices in the management of HAIs and antibiotic therapy. MoH experts have issued guidelines to control HAIs caused by *Clostridium difficile*, rubella, MERS-CoV, CPE and MRSA.

**Position, structure and composition of the infection control team within hospitals**

Hospitals are responsible through their management to assure the organisation and functionality of a dedicated unit for surveillance to prevent HAIs. This unit is headed by an epidemiologist who is member of the Director’s Committee. The unit has at least three positions. In hospitals under 50 beds, there is at least one epidemiologist/infectious diseases specialist. The antimicrobial stewardship programme coordinator must be an infectious disease physician or a clinician who has successfully completed an appropriate training course.

**Levels of employment according to size and type of hospital**

At least one epidemiologist and one infectious disease physician, respectively, have to be employed per 400 beds and at least one nurse with post-secondary education or a general nurse who has completed a professional training course in the field of HAIs per 250 beds.

**HAI surveillance systems in Romania**

The National Programme for Surveillance and Control of HAIs and Monitoring of Antimicrobials Use and Antimicrobial Resistance includes a sentinel surveillance system of HAIs in high-risk settings (ICU, surgery) and of antimicrobial resistance in strains involved in invasive infections, training of healthcare professionals, and point prevalence surveys of HAIs and antimicrobial use in hospitals. A dedicated national system for the surveillance of *Clostridium difficile* infections was implemented in 2014.

**The data**

The most recent data regarding HAIs in Romania have been published in 2018 by the National Centre for Surveillance and Control of Communicable Diseases in *Antibiotics Consumption, Antimicrobial Resistance and Nosocomial Infections in Romania – 2016 Report*.

**Infection control committee in hospitals**

Each hospital has a committee to support the surveillance activity. This Hospital Acquired Infection Prevention Committee (HAIPC) includes the head of the HAIs prevention service, the antibiotic use policy doctor, the medical director, the healthcare director, the pharmacist, the microbiologist, and all heads of departments. The HAIPC develops the annual plan for control of HAIs, and organizes point prevalence studies and training programmes.

**Conclusion**

A comprehensive legal framework has been established to control HAIs in Romania. Specific HAIs programmes and guidelines are implemented in each healthcare unit. HAIs are monitored via a national sentinel surveillance system and point prevalence surveys, the quality of activities being assessed by the NAQM.

**Control of hospital-acquired infections in Serbia**

Ljiljana Markovic-Denic  
Faculty of Medicine, University of Belgrade, Institute of Epidemiology, Belgrade  
Corresponding author: Prof. Ljiljana Markovic-Denic, MD, PhD  
E-mail: markovic.denic@gmail.com  
Received: 26 August 2018/Accepted: 22 September 2018

**Country specific information**

There are 306 healthcare institutions (HCIs) in Serbia (7.2 million inhabitants in 2016), operated by the Ministry of Health (MoH), and classified into four levels of healthcare: a) 151 healthcare centres b) 42 general hospitals c) six clinical hospital centres d) four university medical centres; and specialized institutions – 41 hospitals devoted to particular diseases and 61 institutes (of which 25 are specialized in public health). Ten private hospitals and 12 private primary health centres are also included in the healthcare system.

**Legal preconditions for the control of healthcare-acquired infections (HAIs)**

The Law on Protection of Population from Infectious Diseases (Official Gazette of Republic of Serbia, 15/2016) regulates the obligation of all HCIs to take measures for the prevention and control of HAIs, including mandatory public reporting of HAIs, and defines the role of the HAI Commission. All of this is described in more detail in the Rulebook on Prevention, Early Detection and Control of HAI (Official Gazette of Republic of Serbia, 77/2015) and in the Rulebook on Indicators of Quality of Healthcare (Official Gazette of Republic of Serbia, 49/2010).
Other bodies regulating HAIs

The MoH has established the Republic (National) Expert Commission (REC) as a multidisciplinary body that defines the national HAI surveillance system, participates in the drafting of HAI legislative regulations, evaluates the success of the applied measures for HAI prevention and control, and prepares HAI guidelines and recommendations. The REC works closely with the Institute of Public Health of Serbia (IPHS) and with the Centre for Disease Prevention and Control in the network of 25 Regional Institutes of Public Health (RIPH).

Position, structure and composition of the infection control team within hospitals

There is at least one infection control (IC) nurse in HCIs at the primary level, whereas hospitals at the secondary and tertiary level have an IC team. This team consists of at least one epidemiologist and at least one IC nurse, depending on the size of the hospital. The role of the IC team is to ensure that the risk of HAIs is minimised through a set of measures, to monitor HAI rates, practices and standards of care, and to educate healthcare personnel.

Levels of staffing according to size and type of hospital

No rulebook has yet stipulated the number of IC doctors and IC nurses per number of patient beds. A rulebook is being drafted that will ask for one IC doctor (an epidemiologist) per 500 beds and in addition – in secondary and tertiary care hospitals – for at least one IC nurse per 200 beds.

Surveillance systems for HAIs

Active surveillance of HAIs in Serbia is currently based on incidence- and prevalence surveys. Monitoring of incidence is obligatory for high-risk departments (ICU, surgical, neonatal and obstetric units) and is conducted throughout the year. The current law requires hospitals to monitor and report cases of HAI on an annual basis. In addition, each hospital prepares an annual report on HAIs, which is sent to the RIPH. The Republic Institute of Public Health compiles the results and publishes an annual report. The synchronization of the Serbian national surveillance system with EU regulations is underway. So far, four national prevalence surveys have been conducted. The last one was part of a European Union-wide survey, performed in November 2017.

Infection control committee in hospitals

The director of a HCI is responsible for IC, patient safety, and the implementation of all HAI prevention and control measures. Usually, he/she is the president of the Infection Control Committee (ICC). The ICC, with at least one epidemiologist from the RIPH as a member, was first introduced as a legal obligation in 1997. Nowadays, the members of the hospital ICC are epidemiologists, infectious disease specialists, microbiologists, nurses, etc. The ICC sets general IC policy, defines the IC programme and approves the IC plan for every calendar year.

Conclusion

Despite many limitations, and limited funding, the hospital epidemiology system and infection control system are rapidly improving in Serbia.

Control of hospital acquired infections in Slovakia

Mária Štefkovičová1,2, Slavka Litvová2, Jana Kerlik3
1 Alexander Dubček University of Trenčín, Trenčín
2 Regional Public Health Authority in Trenčín, Trenčín
3 Regional Public Health Authority in Banska Bystrica, Banska Bystrica
Corresponding author: Mária Štefkovičová, PhD, MPH
E-mail: tn.stefkovicova@uvzsr.sk
Received: 28 July 2018/Accepted: 22 September 2018

Country specific information

Slovakia has 5.5 million inhabitants and is divided administratively into eight counties and 79 districts. There are 106 hospitals in Slovakia, of which 99 provide acute healthcare (4.87 inhabitants per 1,000 beds). The control and prevention of healthcare associated infections (HAIs) are laid down by national legislation. Hospitals in Slovakia are owned by the state (mainly teaching hospitals and tertiary hospitals – there is usually one tertiary hospital in each county), higher territorial units, private companies (14 hospitals serving a catchment area of 1 million inhabitants) and non-profit organizations. Clinical microbiology laboratories are in most cases privately operated and are not part of hospitals. Most hospitals are funded by health insurance companies, while state-funded hospitals receive contributions from the Ministry of Health for investment items.

Legal preconditions for the control of healthcare acquired infections (HAIs)

Legislation applies at a national level. It is made up of laws, so-called implementing decrees, government regulations, and expert guidelines. Act No. 355/2007 Coll. on Protection, Support and Development of Public Health (§ 52) obliges hospitals and health workers (a) to report the occurrence of nosocomial infections and carriers of pathogenic micro-organisms to the regional public health authority, (b) to prevent HAIs, to record HAIs in health documentation, to analyze the occurrence of HAIs.
and to take measures to reduce the incidence and spread of HAIs, to provide continuous training in the area of HAI prevention of hospital diseases, and to establish operating instructions that include the sanitary instructions and disinfection plan of the hospital. These obligations are further elaborated in implementing decree no. 553/2007 Coll. on Details of the Operation of Healthcare Facilities in terms of health protection. Several expert guidelines have also been adopted. They include the performance of endoscopic decontamination, checking the effectiveness of the sterilization process for medical devices, diagnosis and anti-epidemic measures in the presence of infectious disease bacterial agents with clinically and epidemiologically significant resistance mechanisms. In the field of personnel, a legislative regulation obliges hospitals to employ an epidemiologist to monitor, analyze and prevent nosocomial infections. However, it does not specify the hospital epidemiologist’s training or the number of epidemiologists per number of beds.

Other bodies regulating HAIs

In 2018, the Action Plan on the Prevention and Control of Infectious Diseases and the Action Plan for ATB Resistance were adopted, laying down the establishment of an NRC for HAI control and prevention.

Position, structure and composition of the infection control team within hospitals

In the past, outpatient, hospital and sanitary-epidemiological services were a combined unit at district level. Epidemiologists took control and methodological action to combat HAIs. After the Velvet Revolution in 1989, the system collapsed and the sanitary-epidemiological service became an independent state-controlled body (Regional Authority of Public Health, RAPH). Across the whole country, there are 36 RAPHs with regional competencies, which, in addition to community epidemiology, carry out control and methodological activity to prevent HAI in the relevant hospitals. Hospital epidemiologists and hygiene officers are missing in many hospitals. If they are present, their incorporation in the structure of the hospital is not systematized. Therefore, a legislative process is underway, in which a proposal for the employment of experts for HAI prevention and control is presented. According to this proposal, each hospital would employ one doctor (epidemiologist, physician hygienist, infectiologist or microbiologist) for every 500 beds and one public health professional (with specialization in infectious disease epidemiology) for every 250 beds.

Surveillance systems for HAIs

A base of surveillance is set up to perform point prevalence surveys (PPS). PPS was performed according to the ECDC protocol in one-third of Slovak hospitals in 2012 and in nearly one-half of Slovak hospitals in 2017. In 2016, the private healthcare company Health World introduced a PPS in its network of 14 hospitals. It performs the PPS annually with about 3,000 patients, separately from the national PPS. Since 2005, incidence survey of catheter-related bloodstream infections and of ventilator-associated pneumonia in ICUs and of surgical site infections after cholecystectomy has been carried out in 8 hospitals. The continuous surveillance of Clostridium difficile infections in 25 hospitals began in 2016. The performance of point prevalence and incidence surveys is voluntary.

Infection control committee in hospitals

Infection control committees do exist in hospitals, but in practice many of them have proven to be „paper tigers“. In some hospitals, these committees are part of antibiotics commissions. The implementation of a National Reference Centre for HAI control and prevention is planned for the near future as a part of the execution of the Action Plan on the Prevention and Control of Communicable Diseases. However, a Society of Hospital Epidemiology and Hygiene has been established and this gives a realistic chance to further improve the situation in Slovak Republic in terms of hospital associated infections.

Control of hospital-acquired infections in Slovenia

Viktorija Tomic1,2
1University Clinic of Respiratory and Allergic Diseases, Golnik
2National Committee for Infection Control and Prevention, Ministry of Health, Ljubljana
Corresponding author: Viktorija Tomic, MD, PhD
E-mail: viktorija.tomic@klinika-golnik.si
Received: 7 August 2018/Accepted: 22 September 2018

Country specific information

Slovenia is a democratic republic in Central Europe with 2.05 million inhabitants, divided into 58 administrative units and 212 municipalities. In Slovenia, there are 26 public hospitals with a total of 9,384 beds (4.6 hospital beds per 1,000 inhabitants) of which 10 are general hospitals, 2 university clinical centres and 14 specialised hospitals (pulmonology, orthopaedics, gynaecology and obstetrics, oncology, psychiatry). The control of healthcare-associated infections (HAIs) in Slovenia is regulated by the government through the Ministry of Health. There is no funding specifically allocated for infection control.

Legal preconditions for the control of healthcare-associated infections (HAIs)

All healthcare legislation is defined at the state level. There are several laws governing the organisation and function of healthcare institutions (Law on Institu-

Extended Abstracts
tions, Law on Healthcare, Law on Health Protection and Health Insurance, Law on Medical Doctors). Tasks and obligations in the area of HAI are governed by the Law on Communicable Diseases, Rules on Infection Control and Prevention (RICP) and Rules on Professional Audits of Infection Control and Prevention Practices. The RICP regulate core competences to control HAI: §3 and §4 define responsibilities and quality assurance; §5 and §6 define the responsibility and required number of infection control physicians and nurses, while §8 defines the composition, tasks and responsibilities of infection control teams (ICT). According to these rules and regulations on HAI, infection control physicians and infection control nurses have to complete a one-semester postgraduate course (with a minimum of 90 hours) on infection control and hospital hygiene, which is currently organized by the Faculty of Medicine at the University of Ljubljana.

Other bodies regulating HAI

In 2003, the National Committee for Infection Control and Prevention (NAKOBO) was established as a professional advisory body to the Ministry of Health (Department for Quality and Patient Safety). NAKOBO prepares and updates infection control standards and recommendations, performs infection control audits in hospitals, proposes appropriate quality indicators, and advises and assists the Ministry of Health in infection control and prevention issues. Two quality indicators have been introduced to ensure quality and patient safety: control of MRSA in 2005 and hand hygiene compliance in 2015. Reporting of quality indicators to the Ministry of Health is mandatory for all hospitals.

Position, structure and composition of the infection control team within hospitals

The medical director or hospital director is ultimately responsible for the safety and quality of infection control. According to the RICP, the ICT should consist of the medical director, the hospital head nurse, an infection control physician (ICP), infection control nurse (ICN), pharmacist, clinical microbiologist, epidemiologist, infectious disease specialist and surgeon or other medical specialist. Sanitary engineers, when available, work in close cooperation with the ICT. The ICT is responsible for the planning, implementation, prioritisation and resource allocation of infection control policy.

Levels of employment according to size of hospital

The level of employment of each ICP and ICN is determined by the size of the hospital. The RICP decrees that one ICP should be employed per 600 beds. Another ICP should be employed for each additional 800 beds. In hospitals with fewer than 600 beds, one ICP should work in infection control part-time, but not less than 20 hours per week. One ICN per 250 beds should be employed with an additional ICN for every additional 400 beds. If a hospital has fewer than 250 beds, one ICN should work in infection control part-time, but not less than 20 hours per week.

Surveillance systems for HAI

No HAI surveillance system has been implemented in Slovenia as yet. However, all hospitals (except psychiatric clinics) participated in the European point-prevalence surveys of HAI in 2011 and 2017.

Conclusion

Since 2003, much effort has been put into building a comprehensive HAI control and prevention system in Slovenia. Further support and additional financial input from state sources is needed to fulfil the mission of control of hospital-acquired infections.

Control of hospital acquired infections in Turkey

Nuran Esen, Arzu Sayiner
Department of Medical Microbiology, Faculty of Medicine, Dokuz Eylul University, Izmir
Corresponding author: Nuran Esen, MD
E-mail: nuran.esen@deu.edu.tr
Received: 30 August 2018/Accepted: 22 September 2018

Country-specific information

Turkey is a transcontinental country in Eurasia, with nearly 80 million inhabitants. The country has a unitary administrative structure, divided into 81 provinces and 923 districts. According to 2016 statistics, there are 1,510 hospitals (2.73 hospital beds per 1,000 inhabitants) with a total of 33,063 intensive care beds. The control of healthcare-associated infections (HAIs) is regulated by the Ministry of Health (MoH).

Legal preconditions on the control of health care acquired infections (HAIs)

Turkish MoH is the major government body responsible for policy-making and provision of health services while provincial health directorates coordinate and manage the health services in the provinces. „Infection Control Regulation of Inpatient Treatment Institutions“ was published in 2005 by the MoH in order to regulate the establishment of infection control committees and the procedures and principles concerning its activities, duties, authorities, and responsibilities. The training and certification of infection control nurses and the qualifications of the training centers are also regulated by MoH. The training lasts at least four weeks and covers 37 hours of theoretical and 90 hours of practical courses. At least 1 infection control nurse per 150 beds is required accord-
ing to the 2011-update of the regulation. MoH and the Turkish Public Health Institution started an „Infection Control Remote Training Program“ (www.ekuzep.org) for infection control doctors and nurses in 2017. The MoH’s Office of Health Quality and Accreditation, aims to ensure and promote quality of health, patient and employee safety by „Health Quality Standards“ (HQS) and related guidelines. One of the chapters of the HQS (v5) is related to the prevention of HAIs, where goals, objectives, standards and assessment criteria are described.

The infection control teams in hospitals

The infection control team consists of the representative of the infectious disease department, the director of the clinical microbiology laboratory, an infection control physician and infection control nurses. The team is mainly responsible for planning, implementation, prioritisation, monitoring, and resource allocation of infection control policies. The team informs the infection control committee (ICC) regarding problems and proposes solutions.

The infection control committees in hospitals

The regulation requires all healthcare institutions to establish an ICC. The chairman of the committee is the representative of the infectious disease department. The committee meets at least three times a year. An ICC consists of the infection control team, the medical director of the hospital, representatives of internal and surgical medicine departments, the director of nursing services and a pharmacist.

The main responsibilities of the infection control committee are: a) To prepare and implement an infection control program, control the activities, make decisions about the problems; b) To set targets and assess the results; c) If an infectious risk is identified, to determine and monitor isolation measures; d) To identify, implement and monitor antibiotic usage policies; and e) To prepare a HAI surveillance report.

Surveillance-systems for HAIs

All hospitals are required to collect and record the HAI surveillance data on a daily basis. Notification is made through „National Hospital Infections Surveillance Network“ (UHESA). This network was initiated by MoH in 2006 and initially used standardized forms to collect data. This was replaced by a web-based notification system in 2008. UHESA currently contains pooled data for 14 topics collected from hospitals.

Conclusion

The Turkish MoH has strengthened the regulatory framework of HAI control in the last decade. It is expected that these actions will lead to a decline in the incidence of HAIs and of antibiotic resistance.

Control of hospital-acquired infections in Albania

Andi Koraqi1,2, Vjollca Durro1,2, Silva Novi3, Denada Lacej1,2
1 Medical University of Tirana, Faculty of Medicine, Tirana
2 Laboratory of Clinical Microbiology at University Hospital, „Mother Theresa” Center, Tirana.
3 Ministry of Health, Labour and Social Affairs, Tirana
Corresponding author: Andi Koraqi, MD
E-mail: a_koraqi_70@hotmail.com
Received: 1 August 2018/Accepted: 22 September 2018

Country information

Albania is situated in Southeast Europe, in the western part of the Balkans, and has 2,831,741 inhabitants. From an administrative point of view, the territory of Albania is divided into 12 counties and 61 municipalities. The health system in Albania is both public and private. The private sector provides most pharmaceutical services and dentistry, as well as some diagnostic clinics and hospital services, concentrated mainly in Tirana. The public service includes public primary health services and hospitals. Albania has 44 hospitals with a ratio of 2.82 hospital beds for 1,000 inhabitants. The majority of them are acute beds. In the public and private sector, the leading role is played by the Ministry of Health, Labour and Social Affairs (MoHLSA), which is responsible for policy-making, strategy and regulation of the health system, as well as for the coordination of all actors inside and outside the system. In Albania the control of hospital infection is regulated by the government and funded by the state budget and insurance health funds.

Legal framework and bodies regulating control of hospital-acquired infections (CHAs)

Based on European Commission and WHO recommendations, laws for „Hospital service in Albania (1998)“ and „State Sanitary Inspectorate (1992)“ with an amendment from 2006, and the law „For the prevention of and fight against contagious diseases (2015)“ define the responsible bodies and their competences in CHAs at a national and regional level, their administrative structure, and the role of committees for CHAs at a national and hospital level. Based on these laws, bylaw acts define the administrative structure and responsibility of national and hospital committees for CHAs, the composition of the infection control units in hospitals, their aims and tasks, mandatory requirements regarding quality assurance, and regulate periodic inspections of hospitals by the health state inspectorate body. At national level, MoHLSA as a policy-making body is responsible for preparing and approving national policy on CHAs, necessary legislation, collection and evaluation of data.
on CHAIs and for forwarding these data to the European surveillance system (TESSY). The national committee on CHAIs, established by MoHLSA Act no. 415/2009, functions as an advisory body for the MoHLSA. The National Public Health Institute is the body responsible for surveillance programme implementation for CHAIs at a national level, for training staff on CHAIs and for informing the MoHLSA. The Health State Inspectorate is the body responsible for the periodic inspection of the implementation status of legislation related to CHAIs in hospitals. At a local level, the hospital committee established according to MoHLSA Act no. 568/2010, is the advising body for the hospital director. In the hospital, a unit for CHAIs controls hospital-acquired infections. The national legislation on the accreditation of health institutions and quality control of health services aims to promote and ensure quality of care, patient safety, and protection of health care staff in a sustainable way. To improve the structure, process and quality of results for the control of hospital-acquired infections, respective standards and guidelines have been approved by the Ministry of Health. In 2009, the MoHLSA approved a national programme for prevention and CHAIs, a national training programme for CHAI unit staff in hospitals, and for medical staff involved in CHAI programmes. In 2011, the MoHLSA approved the first edition of the „National guidelines and clinical protocol on controlling hospital-acquired infections“ as a standard reference for the organisation of hospital structures and strategies on CHAIs. Technical infection control guidelines provide recommendations regarding air, water, environmental services (disinfection and sterilisation), laundry and bedding, and medical waste disposal. In 2012, a national task force was implemented for „Clinical used antibiotics and reduction of antibiotic resistance“. With Act no. 798/2012, the MoHLSA approved „National Guidelines and National Regulation on Hospital Waste Management“ to set up a structure for the monitoring and implementation of safe waste-treatment measures for each of their healthcare providers and for determining the special budget for the pre-treatment of hospital waste.

Administrative structure and composition of infection control units in hospitals

The MoHLSA mandates healthcare providers to perform comprehensive infection control surveillance. The medical director and the head of the unit of infection control (ICU) is ultimately responsible for safety and for the quality of infection control measures, including planning, and for daily implementation and resource allocation. In university hospitals, the staff of these units consist of specialists in epidemiology, public health and infectious diseases, and of infection-control nurses. The staff are full-time practitioners within the ICU and therefore play a key role in day-to-day infection control activities. In other hospitals, the staff of ICU are not full-time and consist of an epidemiologist, a microbiology/infection disease specialist and a nurse (the latter full time).

National surveillance systems for CHAIs

In 2017, MoHLSA updated the regulatory framework of infection surveillance according to EC directives. Various surveillance tools are in use: nosocomial infection surveillance system, antibiotic-resistance surveillance system, infectious diseases transmitted by transfusion surveillance. Usually, these surveillance programmes concentrate on high-risk areas within hospitals. Hospitals can choose to participate in one or more components, depending on their individual needs, but reporting is not mandatory, except in the case of infectious diseases transmitted by transfusion.

Hospital-acquired infections control committee

This committee is responsible for the planning, implementation and resource allocation of all matters related to infection control policies. It provides multidisciplinary input, and cooperation and information sharing for all hospital staff. The national legislation on CHAIs mandates each health care provider to have a hospital-specific infection control plan, according to national and county epidemiological data. Infection control staff have access to all microbiological data and work in close cooperation with microbiological laboratories. The infection control plan regulates the surveillance, prevention and control of infections throughout the organisation, implements the best available techniques to minimise adverse reactions, monitors the results and takes corrective action as needed in order to ensure a proper and safe hospital environment.

Conclusion

The MoHLSA has made the problem of hospital infections the focus of its priority policy. In recent years, national legislation on CHAIs has been updated, and the structures necessary for the national programme on CHAIs successfully implemented.
Country-specific information

Bosnia and Herzegovina (BiH) is a country with 3.5 million inhabitants, consisting of two entities (Federation of Bosnia and Herzegovina and Republic of Srpska) and one district region (Brčko District). In Bosnia and Herzegovina, there are around 30 hospitals, of which 19 are in the Federation of Bosnia and Herzegovina, 10 in the Republic of Srpska, and 1 in Brčko District. The majority of hospitals provide acute inpatient care, including secondary-level care, while 6 hospitals additionally provide tertiary-level care. In BiH, healthcare is regulated at an entity, canton and district level. The state has only a coordination role in the healthcare system. Control of healthcare-associated infections (HAIs) is regulated by the Ministry of Health of entities and the Office for Health in BiH.

Legal preconditions for the control of healthcare-acquired infections (HAIs)

Legislation related to HAIs is defined at an individual entity and district level. Key documents are the Law for the Protection of the Population from Infectious Diseases and the Rulebook of Conditions and Methods of Establishing Measures for Preventing and Combating Hospital Infections. They regulate the responsibilities of institutions and staff involved in HAIs in terms of the monitoring and surveillance of HAIs, and define the authorities for official inspection.

Levels of staffing according to size and type of hospital

Hospital staff responsible for hospital infection control vary according to the level of care and the size of the hospital. It is recommended to have one infection-control nurse (full-time) per 250 beds. The nurse requires additional education in the field of hospital infection control. The doctor for hospital infection control is usually a microbiologist, epidemiologist or infectious diseases specialist, with at least 2 hours per working day allocated of hospital infection control.

Surveillance systems for HAIs in Bosnia and Herzegovina

According to the law, reporting of HAIs is mandatory for all hospitals and for all types of infections. The reports are directed to the Public Health Institute at an entity, district and regional level. However, there is no any specific implemented surveillance program. More reliable data can be found in hospital surveillance systems for specific types of HAIs and are comparable with international data.

Infection control committee in hospitals

Implementation of measures to prevent and control HAIs is organized by a committee for the prevention and control of hospital infections, an infection control team, the epidemiological service in the hospital, the Institute of Public Health and the Ministry of Health. An infection control committee is required by law for every hospital. This committee consists of a multidisciplinary team, including representatives of management (medical director and hospital head nurse), a doctor for infection control (microbiologist, epidemiologist or infectious diseases specialist), nurses for infection control, and doctors of various clinical specialties (intensive care, surgery, etc). This committee closely collaborates with the hospital’s drug committee, hygiene department and epidemiological service. The committee is responsible for planning and implementing the program for hospital infection control and for the monitoring and surveillance of hospital infections. The committee has to deliver annual reports on HAIs to the hospital board. Besides the hospital’s infections committee, some hospitals have established teams for hospital infection control, which are the operative body for everyday activities.

Some specificities in hospital infection control

In some university hospitals, in order to improve hospital infection control, a laboratory and a department for hospital infection control have been established with the mission to create procedures for the prevention of HAIs, by compiling recommended instructions and practices for patient care, hospital hygiene, patient isolation and screening of patients and staff.

Conclusions

Future plans in the field of control of nosocomial infections in BiH should include improvement of education and development of a surveillance program at a national level as essential steps to identify problems and set priori-
Control of healthcare-associated infections in Bulgaria

Nadezhda Vladimirova
Department of Epidemiology, National Centre of Infectious and Parasitic Diseases, Sofia
Corresponding author: Nadezhda Vladimirova, MD
E-mail: nvladimirova@ncipd.org
Received: 8 August 2018/Accepted: 22 September 2018

Country specific information
The Republic of Bulgaria has a population of 7 million. The country is divided into 28 administrative regions. There are 322 acute care hospitals with 50,000 beds (7.1 hospital beds per 1,000 inhabitants).

Legal preconditions for the control of health-care associated infections (HCAI)
The „Law on Health” regulates all areas of healthcare in the country. A number of regulations under this law were issued by the Ministry of Health (MoH). These regulations organise prevention, control and surveillance of healthcare-associated infections (HCAI) and determine the prevention standards for occupational hazards among healthcare workers, their vaccinations etc. The medical standard on the prevention and control of healthcare associated infections (HAIs), endorsed by the Minister of Health, through Regulation № 3/08.05.2013 specifies basic measures for the prevention and control of HCAI, as well as requirements for core competences, responsibility and required number of infection control doctors/nurses, the composition of the infection control team (ICT), the annual plan for surveillance, prevention and control of HCAI and antimicrobial resistance (AMR). and its implementation.

Other bodies regulating HCAI
The control of HCAI is regulated by the MoH and its regional structures, regional health inspectorates, responsible for supervising all medical activities locally. Their work is supported by the National Centre of Infectious and Parasitic Diseases (NCIPD), which is responsible for analyses of HCAI at a national level, for reference lab confirmation of some hospital pathogens, postgraduate education of medical specialists dealing with the prevention and control of HCAI, surveillance, analyses of antimicrobial consumption (AMC) and AMR, and for collaboration with the European Centre for Disease Prevention and Control in Stockholm. The Bulgarian Association for Prevention and Infection Control (BulNoso), an academic society, supports training and education of medical specialists dealing with HCAI.

Infection control commissions in hospitals
The hospital policy on the prevention and control of HCAI is led by the medical director and the hospital commission on HCAI, which includes heads of clinics/wards, of the microbiological laboratory, and of the ICT.

Position, structure and composition of the infection control team within hospitals
The ICT is the key structure responsible for planning and implementing all activities regarding HCAI control, and usually includes an infection control doctor (epidemiologist or microbiologist), and either an infection control nurse (qualified nurse with training in infection control, full-time practitioner) or a healthcare specialist (bachelor in hospital hygiene).

Levels of employment according to size and type of hospital
For general acute care hospitals with a minimum of 120 beds, it is recommended that the hospital ICT should be composed of at least one doctor and one nurse.

Surveillance systems for HCAI in Bulgaria
HCAI surveillance is compulsory. Hospitals and other healthcare institutions collect and summarise data on the number of hospitalised patients and documented HCAI. Data are processed by ward type and type of HCAI. Aggregated data are sent to the regional health inspectorates (RHI), where information is collected at regional level and directed to the National Centre of Public Health and Analyses (NCPHA) for further processing. NCPHA ensures feedback to the RHI and information to the MoH and the National Centre of Infectious and Parasitic Diseases (NCIPD). The latter is the leading national health institution in Bulgaria specialised in research and practical activities in the field of communicable disease surveillance, prevention and control. Since 1997, AMR surveillance is performed through the Bulgarian Surveillance Tracking of Antimicrobial Resistance system. This system collects information about isolated organisms for further processing and analysis, and supports national policy in this area.

Conclusion
Since the country joined the EU in 2007, much effort has been undertaken in Bulgaria in order to implement surveillance systems for HCAI, AMC and AMR, according to the standards recommended by the EU and ECDC. The process is challenging, takes time, and relies on on-going political support for this important public health issue.
Control of hospital-acquired infections in Croatia

Nenad Andrić¹, Ivana Bešlić¹, Nikica Kuzmičić³, Zrinka Bošnjak², Ana Budimir³
¹Croatian Institute of Public Health, Zagreb
²University Hospital Centre Split, University of Split
³School of Medicine, Split

The control of healthcare-associated infections (HAIs) is regulated by the Ordinance on the Conditions and Methods of Performing Measures for the Prevention and Suppression of Healthcare-Acquired infections (NN 85/2012), formulated pursuant to Article 67, paragraph 1 of the Act on the Protection of the Population from Infectious Diseases. The aforementioned rules define hospital infections and regulate all bodies within the health system required to carry out the work on the prevention and suppression of health-related infections. Every hospital must have an infection control committee, appointed by the hospital’s governing council at the proposal of the hospital director, and an infection control team, appointed by the committee at the proposal of the chairperson of the committee. The same rules regulate the composition and responsibilities of the healthcare institution’s infection control committee and infection control team.

Legal preconditions for the control of healthcare-acquired infections

The control of healthcare-associated infections (HAIs) is regulated by the Ordinance on the Conditions and Methods of Performing Measures for the Prevention and Suppression of Healthcare-Acquired infections (NN 85/2012), formulated pursuant to Article 67, paragraph 1 of the Act on the Protection of the Population from Infectious Diseases. The aforementioned rules define hospital infections and regulate all bodies within the health system required to carry out the work on the prevention and suppression of health-related infections. Every hospital must have an infection control committee, appointed by the hospital’s governing council at the proposal of the hospital director, and an infection control team, appointed by the committee at the proposal of the chairperson of the committee. The same rules regulate the composition and responsibilities of the healthcare institution’s infection control committee and infection control team.

Country-specific information

The Republic of Croatia is a country of about 4.2 million inhabitants, and consists of 21 counties (županije). In Croatia, there are 61 hospitals: 5 university hospital centres, 3 clinical hospitals, 5 clinics, 21 general hospitals, 24 special hospitals and 3 spas. The total number of beds is 5.39 per 1,000 inhabitants; for acute patients it is 3.49 per 1,000 inhabitants.

Levels of staffing according to size and type of hospital

A state ordinance mandates a defined number of full-time nurses for healthcare institutions – one nurse per 250 beds. Each physician for infection control is required to work at least two hours a day on hospital infection control tasks, depending on the size of the hospital, and if a hospital has 1,000 or more beds, it is obligatory to employ one full-time physician.

Surveillance systems for HAIs

Each hospital is required to report annually to the Reference Centre for Hospital Infections. The annual report comprises structure, process and outcome indicators. Structural indicators include general hospital information (number of beds, patients, etc.), infection control team structure, infection control committee structure, alcoholic hand-rub consumption, infection rates in ICUs, number of MRSA infections, Klebsiella pneumoniae carbapenemase (KPC)-producing K. pneumoniae infections, other resistant organisms (A. baumannii, P. aeruginosa, etc.) infections, C. difficile infections, staff vaccination against HBV and influenza, sharp-object injuries, outbreaks, urinary catheter-related infections (point prevalence survey data) and 200 hand hygiene opportunities survey. The hospital director is obliged to report every outbreak to the Ministry of Health and, depending on the type of outbreak, to the epidemiological reference centre.

Other bodies regulating HAIs

The infection control committee for HAIs of the Ministry of Health and the Reference Centre for Hospital Infections of the Ministry of Health operate programmes and control their implementation at national level.

Position, structure and composition of the infection control team within hospitals

The director of a hospital is responsible for the safety of patients and employees and for the functioning of the hospital’s infection control team. The team of each hospital consists of 1) a medical doctor for hospital infection control (specialist in clinical microbiology, infectious diseases, epidemiology or some of the clinical specialties like paediatrics, surgery or internal medicine, who has completed a course (300 hours) of basic competencies in HAI s (17 ECTS) at a medical school and passed the exam; 2) nurse for hospital infection control (bachelor or graduate nurse, who has completed a course (300 hours) of basic competencies in HAI s (17 ECTS) at a medical school and passed the exam; 3) a clinical microbiology specialist.

The team’s daily tasks are to monitor the implementation of recommendations, procedures and measures for prevention and control of healthcare-associated infections, to perform surveillance of infections (by priority) and specific culture-isolates (multi-resistant, with specific virulence, etc.), to provide counselling and professional assistance in daily work, as well as during outbreaks, to manage and to secure prevention of needle and other sharp-object injuries, as well as other occupational exposure to infectious disease agents, to perform epidemiological surveys in case of outbreaks, including data collection and data analysis, outbreak control management, and introduction and reinforcement of infection control measures; organization of continuous education of all employees, trainees and visitors and securing data protection are other tasks assigned to this team.
Infection control committee in hospitals

The committee consists of the director or assistant director for medical issues, the head nurse, the infections control physician, a clinical microbiology specialist, an infectious diseases specialist, an epidemiology specialist, an infection control nurse, and optionally, the chairman of the quality control committee, chairman of the drug commission, chairman of the antibiotic commission, and other representatives of departments, such as doctors from ICUs and other major departments (surgery, internal medicine, etc.).

The committee creates the programme for prevention and control of hospital infections, provides standard operating protocols for individual procedures, determines priorities in control and surveillance of hospital-associated infections, organizes an annual meeting with employees, submits an annual report on hospital-associated infections to the hospital’s governing council and the Reference Centre for Hospital Infections of the Ministry of Health. It has to convene at least twice a year.

Conclusion

The Implementation of infection control, especially surveillance, is not standardized, and there is a lack of electronic surveillance systems allowing continuous reporting of infection control rates. Croatia is participating in point prevalence surveys coordinated by ECDC. Croatian healthcare institutions are continuously striving to improve their infection control practice.

Prevention and control of healthcare-associated infections in the Czech Republic

Vlastimil Jindrák, Dana Hedlová
National Reference Center on Healthcare-associated Infections, National Institute of Public Health, Prague
Corresponding author: Vlastimil Jindrák, MD
E-mail: vlastimil.jindrak@gmail.com
Received: 31 August 2018/Accepted: 8 September 2018

Country-specific information

A fundamental healthcare system transition took place 20 years ago. Healthcare management and financing were changed from a strictly centralized, state-managed system, to a decentralized, general health insurance-based system. University hospitals and specialized centers operating nationally are still managed directly by the Ministry of Health (MoH). The largest group of hospitals is managed by regional governments (14 regions) or municipalities. A smaller group of primary- and secondary-care hospitals are private.

Legal and organizational aspects

Legislation related to the prevention and control of healthcare-associated infections (HAI) was implemented after the country entered the EU, in close cooperation with the European Center of Disease Prevention and Control. At a national level, two core legislative regulations are in place. General rules on infection prevention are defined in the „Public Health Protection Act“. The „Health Services Act“ mandates the establishment of programs for the prevention and control of infections in acute-care hospitals. To assist hospitals, the Ministry of Health (MoH) published a guidance-document „Program on prevention and control of infections in acute care hospitals“, which describes its organization and operation. The National Reference Center on HAIs (NRC-HAI) was established in 2012 to co-ordinate relevant activities at a national level. Most hospitals decided to implement national or international hospital accreditation, where standards on prevention and control of infections are integrated.

National strategy on prevention and control of HAI’s

The WHO „Health 2020 strategy“ was implemented at a national level in 2015, when the Czech government adopted the Health 2020 National Action Plan, which includes a specific focus on the prevention and control of HAIs to „improve quality of care, patient safety and to maintain the financial sustainability of healthcare system“. The MoH created the role of a national coordinator to the NRC-HAI for all professional activities in the field of prevention and control of HAIs. Its mission covers six key components: to organize local and national surveillance of HAIs in co-operation with the ECDC, to define and implement good practice standards for clinically-oriented and surveillance-based infection control interventions, to assist hospitals in the capacity building of local programs for the prevention and control of infections, to support hospitals with antimicrobial stewardship activities, to assist with investigation and control of major outbreaks, and to organize education and training of infection control specialists (to meet personnel capacity needs in hospitals).

Organization of prevention and control of infections in hospitals

The core organizational unit is the Infection Prevention and Control Team (ICT), which is the daily acting structure, focused on routine infection control practice. It consists of fulltime infection control specialists (doctors and nurses), and co-operating team members (e.g. specialist in clinical microbiology, antimicrobial stewardship, epidemiology, clinical medicine, nursing, healthcare quality, etc.). Additional infection control personnel are available at individual clinical departments („contact“ doctors and nurses). The ICT is responsible for risk assessment plus surveillance, and for implementing ur-
gent and systematic interventions to decrease the occurrence and spread of HAIs and threatening micro-organisms (risk management). The Infection Prevention and Control Committee (ICC) has mainly a „political“ role. The ICC acts as an advisory board to the hospital director, and is responsible for communication between the ICT and top management, and assisting in decision-making related to infection control.

Education and training

A specific training course was developed to increase numbers of competent infection control specialists. This one-year course was originally dedicated to infection control nurses at a time when this profession was not recognized in the Czech healthcare system. Extension for training of infection control doctors and other healthcare workers was implemented in 2014. The course was evaluated by the ECDC as fully compatible with requirements listed as „Core competencies for infection control and hospital hygiene professionals in the EU“.

Conflict of interest

V. Jindrák, and D. Hedlová declare that they have no competing interests.

Control of hospital-acquired infections in Estonia

Pille Märtin
Estonian Health Board, Tallinn
Corresponding author: Pille Märtin, MD
E-mail: pille.martin@terviseamet.ee
Received: 27 August 2018/Accepted: 22 September 2018

Country-specific information

Since 2003, prevention and control in healthcare facilities is regulated by the Communicable Diseases Prevention and Control Act and a regulation titled „Surveillance and Prevention of Healthcare-associated Infections (HAIs) in Healthcare Settings“. Standards for infection prevention and control in hospitals have been in place since 2000. The Estonian Health Board, a governmental agency, is the main responsible body. There are also two professional societies with more than 60 members involved in the prevention and control of HAIs, the Estonian Society for Infectious Diseases and the Estonian Society for Infection Control.

Infection control at hospital level

Under the aforementioned law, every hospital has to establish a team or nominate a person responsible for infection control (IC) in their setting. At least one IC doctor and a nurse should be in place per 250 beds. If the facility has fewer beds, a contract with other hospitals should be made to use part-time professionals. Every hospital has its own IC guidelines, approved by the Health Board. Every hospital has also isolation rooms. A national guideline for the isolation of patients was published in 2016. In Estonia, there is an electronic registration system (NAKIS) for communicable diseases, including outbreaks and occurrences of multi-drug-resistant microbes. If there is a suspicion of an outbreak in a hospital, it has to be reported through this system. Surveillance is possible in several ways. Point prevalence surveys (PPS) are one of the easiest ways to get an overview of the prevalence of HAIs. Since 2010, Estonia has participated in Europe-wide PPS, starting with a pilot survey in 2011, and followed by surveys in 2015 and 2016. In 2011, the prevalence of HAIs in Estonia was 5.7 % (CI 4.5–7.1 %). This survey did not include long-term care facilities and geriatric wards. In the 2016 survey, participation was over 80 % of all acute care hospitals and this survey included some long-term care wards. The prevalence of HAIs found was 4.2 % (CI 3.6–4.9 %). Urinary tract infection was the most frequently documented HAI in the last survey, followed by lower respiratory tract infections and surgical site infections. Hospitals participate in the ECDC surveillance projects on a voluntary basis. Several departments follow ECDC ICU protocols for ICU-related infection surveillance. The ventilator-associated pneumonia rate per 1,000 device days is also used as a quality indicator by the Estonian Health Insurance Fund. Clostridium difficile surveillance started in 2016, when ECDC launched a pilot protocol; Estonian hospitals have participated since then. HAIs are often caused by multi-drug-resistant (MDR) microorganisms. It is crucial that microbiology laboratories have consistent systems for quality in place, so they can identify MDRs in a timely manner. In the field of clinical microbiology, almost all laboratories hold accreditation according to ISO 15189:2012. All microbiology labs are capable of doing susceptibility testing for all clinically important bacteria (according to the EUCAST scheme since 2011) and participate in EARS-Net. For example, in 2017, the prevalence of MRSA (among blood culture isolates) was 2.1 %; the ratio of resistance to third-generation cephalosporins in E. coli was 8.5 % and in Klebsiella pneumoniae 26.1 %. Occurrence of carbapenem resistance in Enterobacteriaceae is still a very rare event in Estonia.

Conclusion

In Estonia, the surveillance of HAIs has been regulated by law since 2003. Every hospital has a team for infection control and surveillance in place. The establishment of an electronic reporting system has fostered the reporting of outbreaks and occurrence of MDR in microbes. The prevalence of HAIs and MDR is still low and every effort is being made to maintain this level.
Control of healthcare-associated infections in Hungary

Ágnes Hajdu, Andrea Kurcz, Ágnes Dánielisz
Department of Hospital Hygiene and Communicable Disease Control, Ministry of Human Capacities, Budapest
Corresponding author: Ágnes Dánielisz, MD
E-mail: agnes.danielisz@emmi.gov.hu
Received: 21 August 2018/Accepted: 3 September 2018

Country-specific information

Hungary is a republic of 9.7 million inhabitants, consisting of 19 counties and the capital city, Budapest. In Hungary, there are around 160 hospitals (7.1 hospital beds per 1,000 inhabitants), of which 89 facilities provide acute inpatient care. The control of healthcare-associated infections (HAIs) is regulated by the government.

Legal preconditions for the control of HAIs

Ministry of Health Decree No. 20/2009 (VI.18.) on the prevention of healthcare-associated infections, minimum professional requirements and supervision of these activities (20/2009. (VI. 18.) EüM rendelet az egészségügyi ellátással összefüggő fertőzések megelőzéséről, e tevékenységek szakmai minimumfeltételeiről és felügyeletéről) defines a general framework for infection control (IC). It also regulates related tasks, responsibilities, human resources and infrastructure for all types of healthcare providers, including primary, secondary and tertiary care institutions. In addition, it defines the roles of the public health authority and the Chief Medical Officer in infection control.

Other bodies regulating HAIs

The Minister of State for Healthcare and the Chief Medical Officer have mandates to issue professional guidelines and methodological guidance, and to support infection prevention and control in healthcare facilities.

Infection control within healthcare facilities

According to Decree No. 20/2009, infection control is part of the institutions’ internal quality assurance system. Independent outpatient clinics must employ one nurse and one public health inspector (PHI) to support infection control. Hospitals with fewer than 400 beds, chronic care hospitals and rehabilitation centres must employ one hospital epidemiologist, one infectious disease specialist, one PHI and two IC nurses. In addition to these requirements, hospitals with 400 or more beds should have one additional IC nurse per additional 300 beds, and have an independent infection control unit within the hospital.

Depending on the level of care, healthcare facilities are mandated to implement surveillance of HAIs, of antimicrobial resistance and antimicrobial use, to perform infection risk assessment, provide written policies on preventive measures (including isolation precautions), cleaning, disinfection, sterilisation, sterile material supply, waste management, investigation of HAIs and outbreaks, IC training of healthcare workers, and to deliver data to the National Nosocomial Surveillance System (Nemzeti Nosocomialis Surveillance Rendszer, NNSR). Hospitals must have an annually renewed infection control plan.

Surveillance systems for HAIs in Hungary

The NNSR was implemented in 2004. Currently, there are four mandatory modules of continuous surveillance: nosocomial outbreaks, HAIs due to selected multidrug-resistant organisms, healthcare-associated Clostridium difficile infections, and healthcare-associated bloodstream infections. Hospitals with a surgical or an intensive care unit (ICU) can choose to participate in periodic surveillance of either surgical site infections or ICU-acquired infections. Since 2017, participation of Hungarian hospitals in the European point-prevalence survey of HAIs and antimicrobial use has been mandatory. In each surveillance module, standard European case definitions of HAIs are applied. Infection control staff report hospital surveillance data through an online platform (Országos Szakmai Információs Rendszer, OSZIR). Data are analysed at a national level and an annual report is published each year. Relevant data are further reported to the European Centre for Disease Prevention and Control.

Infection control committee in hospitals

Decree No. 20/2009 places emphasis on the functioning of infection control and antibiotic committees (ICACs) at hospital, county and national level. Hospital ICACs are a multidisciplinary advisory forum reporting to the hospital management and chaired by the hospital director. Members include the medical director, hospital epidemiologist, infectious disease specialist, microbiologist, pharmacist and representatives of clinical specialities.

Conclusion

There is a strong legal basis, including a set of facility-level requirements, to support infection control and surveillance of HAI in Hungary.
Control of hospital-acquired infections in Kosovo

Lul Raka1,2, Arsim Kurti1
1National Institute of Public Health of Kosovo, Pristina
2Faculty of Medicine, University of Prishtina „Hasan Prishtina”, Pristina
Corresponding author: Arsim Kurti, MD
E-mail: arsimpz@hotmail.com
Received: 3 September 2018/Accepted: 22 September 2018

Country -specific information

Kosovo, with a population of 1.7 million inhabitants, has the youngest population in Europe (mean age of 26.5 years). In Kosovo there are 8 hospitals, of which seven are general hospitals and one a tertiary teaching hospital with 2,034 beds. The annual per capita government expenditure in healthcare is 65 €. No health insurance system has been established yet. Common problems in the field of infection control are lack of financial support, lack of political commitment, inadequate numbers of trained personnel and insufficient equipment and supplies. There is no dedicated budget by the government for infection prevention and control (IPC). In Kosovo, the control of healthcare-associated infections (HAIs) is regulated by the government. Infection prevention and control does not exist as a medical or nursing specialty. Infection control is a mandatory subject for students at undergraduate level within the medical schools of universities.

Legal preconditions for the control of HAIs

The framework for prevention and control of HAIs in Kosovo is set by Administrative Instruction No. 05/2011. This legal document defines the conditions and methods of prevention and control of HAI in acute healthcare facilities. According to this document, IPC in Kosovo is structured on two levels: (1) an executive level at the Ministry of Health, through the Kosovo Council for Prevention and Control of Hospital Infections and (2) an operative level, through so called councils for hospital infections, established in all hospitals. Article 7 defines the following measures for the prevention of HAIs: triage of patients at admission; early identification, isolation and treatment; surveillance of HAIs, antibiotic consumption and resistance; reporting; continuing education; hand hygiene; cleaning, disinfection and sterilization; management of infectious waste; safe dialysis and sanitary control. Article 8 defines the tasks of the National Council for infection prevention and control (IPC), including preparation of a national strategy and action plan for HAIs, and coordination with the councils at hospital level. Article 9 defines the responsibilities of the councils at hospital level, including daily activities to prevent and control HAIs. Administrative violations and their sanctions are mentioned in articles 16 and 17.

Position, structure and composition of the infection control team within the hospital

The minimum requirement is one infection control nurse per 500 beds. The head of the infection control team is nominated by the executive director and he/she is usually a doctor who spends 50% of their working hours on infection control. At the tertiary-care center, the core group consists of one infectious disease specialist and four infection control nurses, whereas in general hospitals one doctor and one nurse are responsible for IPC. The infection control team is responsible for the implementation of infection control policies, surveillance and training. The infection control nurses of the infection control team are full-time practitioners and they act in close cooperation with the microbiology laboratory.

Surveillance systems for HAIs

Hospitals are obliged to conduct mandatory prevalence studies of HAIs every three years. In high risk areas such as intensive care units, incidence studies are mandatory every year, with at least 1–3 months of surveillance. The main HAIs under surveillance are surgical site infection, urinary tract infection, ventilator-associated pneumonia and bloodstream infection.

Infection control councils in hospitals

The deputy director of the hospital is the leader of the council for hospital infections. This body has to provide multidisciplinary collaboration and is comprised of 13 members from all medical and technical services.

Conclusion

Several initiatives have been conducted during the last two decades to empower IPC in Kosovo. Focusing on infection control, Kosovo strives to improve patient safety and the quality of healthcare.

Control of hospital acquired infections in Latvia

Kate Vulāne, Elina Dimina
Centre for Disease Prevention and Control of Latvia, Riga
Corresponding author: Kate Vulāne, Mg. sc. sal.
E-mail: kate.vulane@spkc.gov.lv
Received: 31 August 2018/Accepted: 22 September 2018

Country specific information

Latvia is a parliamentary republic with 1,950,116 inhabitants. There are 63 hospitals in Latvia, 45 of which are public hospitals. Public hospitals are divided into four levels. First level hospitals provide basic health care services for general medicine and chronically ill patients;
second level hospitals provide services in at least seven main profiles as well as emergency medicine; third level hospitals (regional hospitals) provide care in at least 13 specialties and forth level hospitals in at least 22 specialties or one specialized tertiary level profile according to each hospitals specialization. Acute inpatient care is provided by 35 of these hospitals (3.41 curative care hospital beds per 1000 inhabitants).

Legal preconditions on the control of healthcare acquired infections (HAIs) and barriers for successful implementation

The control of HAIs is regulated by Cabinet of Ministers „Regulations Regarding the Basic Requirements for a Hygienic and Counter-epidemic Regimen in a Medical Treatment Institution” (Nr. 104, adopted 2016.). First of all the legalisation defines the responsibilities of the head of the healthcare facility and duty to develop action plan covering all infection control areas defined in the regulation must be developed. According to the regulation a infection control team must be established and the minimal required number of infection control specialists per hospital is defined (one doctor per 500 beds and one nurse per 250 beds, but at least one doctor and one nurse). It is also requested to have an antimicrobial stewardship programme in all hospitals. To encourage hospital level surveillance of multiresistant microorganisms and to characterize the burden, an aggregated data set on health care associated infections must be reported to authorities. Other standard infection control activities included in the regulation are requirements for hand hygiene, use of gloves, reprocessing of medical devices etc. The Centre for Disease Prevention and Control of Latvia (CDPC) in collaboration with Health Inspectorate have developed recommendations for healthcare institutions on the development of their hygienic and anti-epidemic plans.

Despite these described requirements, the implementation process is insufficient due to several reasons. There is lack of qualified specialists with relevant core competences in infection control. The curriculum of doctors and nurses doesn’t include enough information regarding surveillance, infection control and antimicrobial stewardship. There is also a general lack of human and time resources in healthcare settings. There are no designated financial resources for infection control activities and methodological support to medical institutions has to be to be improved. A National Action Plan on Antimicrobial Resistance is under active development and it will solve some problems regarding infection control in hospitals. The incidence surveillance, accordingly to the European Centre for Disease Prevention and Control (ECDC) surveillance protocols, is not implemented in Latvia. Therefore, Latvia only participated in ECDC Point prevalence surveys of healthcare-associated infections and antimicrobial use in European acute care hospitals. In 2011, 15 hospitals participated in the survey, in 2016. 14 hospitals participated. Surgical site infection surveys have been done sporadically, but the number of patients included was too low to allow valid conclusions.

Conclusions

Despite a well-developed regulatory basis, more efforts must be put on implementation of requirements and on the training and education of healthcare workers.