REVIEW
by
Prof. Tatiana Simeonova Ivanova, MD, PhD

of the doctoral dissertation entitled:
"SURVEILLANCE AND CONTROL OF HEALTHCARE-ASSOCIATED INFECTIONS – CONTEMPORARY CHALLENGES"

submitted for the award of the educational and scientific degree **"Doctor" (PhD)**

Field of Higher Education: 7. Healthcare and Sports
Professional Field: 7.4. Public Health
Doctoral Programme: "Public Health Management"

Author: Deyana Ivanova Ilieva
Full-time doctoral candidate at the Medical University "Prof. Dr. Paraskev Stoyanov" – Varna

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General Information

By Order No. R-109-503 of 10 December 2025 issued by the Rector of the Medical University "Prof. Dr. Paraskev Stoyanov" – Varna, I was appointed as a member of the Scientific Jury. At the first meeting of the Scientific Jury, in accordance with Minutes No. 1/16.12.2025, I was assigned to prepare a review within the procedure for the award of the educational and scientific degree "Doctor" (PhD) to Deyana Ivanova Ilieva.
All procedural requirements concerning enrollment, change of the dissertation topic, implementation of the individual study plan for a full-time doctoral candidate, completion of doctoral studies, and other relevant administrative procedures have been duly fulfilled.
Since 2023 to the present, the doctoral candidate has held the position of Assistant at the Medical College of the Medical University "Prof. Dr. Paraskev Stoyanov" – Varna, Educational Sector of Public Health Inspector.
Deyana Ivanova Ilieva was born on 5 April 1981 in Ruse. Her educational background meets the requirements for participation in the present procedure. In 2002, she graduated from the Medical University – Varna with a degree in "Sanitary Inspector." In 2007, she obtained a Bachelor's degree in Business Management from the University "Prof. Asen Zlatarov" – Burgas, and in 2009 she completed a Master's degree in Business Management at the same university. During the period 2016–2018, she completed a Master's degree in "Public Health Protection and Control" at the Medical University – Varna.
The professional career of Deyana Ilieva is closely related to activities directly associated with public health protection. Since 2007 to the present, she has been working as a Public Health

Inspector at the University Multiprofile Hospital for Active Treatment "St. Marina" – Varna, Department of Sanitary Control.
Her academic development commenced with her enrollment as a full-time PhD candidate (Order No. R-109-509/04.11.2020) at the Medical University "Prof. Dr. Paraskev Stoyanov" – Varna, Department of Social Medicine and Healthcare Organization.
The doctoral candidate has participated in projects directly related to the dissertation topic, including participation during the period 2022–2025 in the project "Surveillance and Control of Healthcare-Associated Infections – Contemporary Challenges and Opportunities for Health Promotion," funded by the Research Fund of the Medical University – Varna.
She has also declared participation in student internship programs under the Ministry of Education and Science.

1. Relevance of the Dissertation

Progress in medicine as a whole is characterized by the introduction of new diagnostic, preventive, therapeutic, and surgical methods involving the use of invasive devices, increased use of a broad spectrum of antibiotics, and other related interventions that contribute to improved clinical outcomes. At the same time, these advanced practices are associated with an increased risk of nosocomial infections (healthcare-associated infections), due to the fact that invasive medical devices create direct pathways for pathogens, the presence of antimicrobial resistance, non-compliance with medical standards, and failure to adhere to established requirements governing routine procedures and services provided in the course of healthcare delivery.
The doctoral candidate's focus on investigating the contemporary challenges in the surveillance and control of healthcare-associated infections is of clear scientific and practical relevance and provides substantial grounds for improving healthcare management in this field.
Moreover, healthcare-associated infections represent a global health problem of high social significance and considerable economic impact. Directing attention toward their surveillance and control is essential for improving the quality of healthcare services. In this regard, the dissertation is *both timely and highly relevant.*

2. Structure of the Dissertation

The dissertation has an appropriate and well-organized structure. It consists of the following sections: Introduction; Chapter One – Literature Review; Chapter Two – Aim, Objectives and Methodology of the Study; Chapter Three – Results and Discussion; Chapter Four – Conclusions, Recommendations and Contributions; Conclusion; Bibliography; and Appendix.
The dissertation comprises 175 pages, illustrated with 15 tables, 47 figures, and 1 appendix. The bibliography includes a sufficient number of sources – 300 references in total, of which 14 are in Cyrillic and 286 in Latin script.

a. Literature Review

The literature review is very well structured and focuses primarily on the contemporary concept of prevention and control of healthcare-associated infections.
The review spans 52 standard typed pages and presents a detailed discussion of the modern conceptual framework, including comparative data on the incidence of nosocomial infections in Bulgaria, Europe, and worldwide, as well as the epidemiological and etiological aspects among hospitalized patients.
Logically, this is followed by a section on the prevention, surveillance, and control of infections, with particular emphasis on opportunities for prophylaxis and infection control. Existing

European models for infection surveillance and control are also presented. Antimicrobial resistance is given special attention, and a comparative analysis is conducted, which may be regarded as one of the notable strengths of the author's work.
The presence of several passages of a more introductory (propedeutic) character slightly disrupts the otherwise coherent and fluent presentation.
A particularly positive impression is made by the concise summary at the end of the literature review, which provides a logical transition to the formulation of the study's aim and objectives.

b. Aim and Objectives

The aim of the dissertation is appropriately formulated and directed toward utilizing the data derived from the analysis and evaluation of the existing system for prevention, surveillance, and control to develop an integrated model for infection management in the contemporary hospital environment, specifically that of the University Multiprofile Hospital for Active Treatment "St. Marina" – Varna.
The doctoral candidate has formulated two comprehensive and logically structured main objectives with corresponding sub-objectives and has selected an appropriate research design for their achievement.
The working hypotheses concerning the level of incidence, the etiological structure of infections, the increase in cases during the COVID-19 epidemic, the higher frequency of epidemiological outbreaks in units treating immunocompromised patients, as well as the requirement for a well-structured infection control team with clearly defined responsibilities and coordinated management at all levels, are well chosen and clearly articulated.

c. Methods

A retrospective epidemiological study covering the period 2013–2022 was conducted. The study included patients hospitalized at the University Multiprofile Hospital for Active Treatment "St. Marina" – Varna who were identified as cases of nosocomial infections in accordance with international standards and the requirements of the Medical Standard for Prevention and Control of Healthcare-Associated Infections in the Republic of Bulgaria.
Documentary and epidemiological methods were applied for data collection, and appropriate statistical methods, described in detail in the respective section, were used for data processing.

d. Results and Discussion

The study reflects an in-depth analysis of the system for prevention, surveillance, and control of infections in the selected hospital. A multi-layered analysis of the organization of surveillance and control was conducted. The activities related to disinfection, disinsection, and deratization were examined; a specific analysis of disinfection control was performed; epidemiological outbreaks were analyzed; as well as incidence rates, frequency of healthcare-associated infections, antibiotic use across clinical units, and the etiological structure of infections.
The distribution of healthcare-associated infections by clinical form was also examined, along with the impact of the COVID-19 pandemic on incidence rates and infection structure.
The assessment of the existing situation covers a sufficiently long period of 10 years and is carried out in considerable detail, followed by proposals for optimizing activities at all stages of implementation.
The well-designed study, the obtained and analyzed results, and the appropriate conclusions demonstrate the doctoral candidate's ability to conduct a comprehensive and in-depth independent study using suitable methods and instruments, and on this basis to outline the specific profile of activities and propose the necessary steps for their improvement and management.

e. Conclusions

The doctoral candidate has formulated 10 conclusions in the dissertation, which adequately reflect the results obtained.

Particularly noteworthy are the findings regarding staff shortages and the lack of effective electronic surveillance, which is standard practice in most European countries. The identified increase in incidence rates and antibiotic use during the COVID-19 epidemic, with only partial normalization after the pandemic and persistently relatively high levels, necessitates the implementation of sustainable measures for rational antibiotic use and enhancement of epidemiological surveillance quality.

Special attention is also required for the established high relative proportion (34–47%) of hospitalized patients receiving antibiotic treatment, which exceeds the European average.

It is noted that the level of healthcare-associated infections (0.5–1.9%) is significantly below the European average, which corresponds with international data indicating compromised infection control during periods of system overload.

Disinfection measures are assessed as very good and consistent with European standards. The identified clinical structure of infections shows a predominance of respiratory infections, particularly during the pandemic period. Surgical site infections remain a persistent epidemiological problem, significantly exceeding international levels.

f. Recommendations

Based on the findings and the doctoral candidate's professional experience, appropriate recommendations have been made, which could be partially or fully adopted by relevant institutions and institutional levels.

The recommendations are grounded in the established findings and are directed toward improving reporting efficiency and control through the implementation of an integrated electronic system, drawing on the experience of certain European countries; strengthening antibiotic policy; and introducing modern methods for hospital environment control. They are practically oriented and could be implemented in any hospital setting.

g. Contributions

The contributions are grouped into nine points, of which four are scientific contributions and five are practical contributions.

The principal contributions lie in the substantial body of collected data and particularly in the comparative analysis with European and global data, which provides an appropriate benchmark for improving the existing system. I fully accept the contributions as presented.

3. Abstract and Publications Related to the Dissertation

The abstract comprises 91 pages and adequately and comprehensively reflects the content of the dissertation. The doctoral candidate has presented two full-text publications: one in the journal "Social Medicine," in which she is the first author, and one published paper from a prestigious international scientific forum.

The presented publications fully meet the minimum national requirements.

4. Conclusion

The doctoral dissertation of Deyana Ivanova Ilieva represents a thoroughly developed scientific work addressing in detail the issues of prevention, surveillance, and control of infections.

It demonstrates in-depth theoretical knowledge in healthcare management, as well as the capacity to conduct independent scientific research on a relevant topic, with appropriately formulated aim and objectives, adequately applied research methods, presentation of results in the required academic format, and logically derived scientific conclusions and realistic proposals.

The doctoral candidate shows strong command of documentary, epidemiological, and statistical methods applied in the study.

It should also be noted that the dissertation is presented in a structure fully compliant with the requirements for a doctoral thesis. The style is academic, and the text is written in correct Bulgarian. The numerical data are presented in an exceptionally clear graphical and tabular format.

The plagiarism detection software used for similarity verification (iThenticate) establishes the absence of unacceptable similarity.

In view of the above, I consider that the dissertation possesses all the necessary qualities for the award of the educational and scientific degree "Doctor" (PhD).

I firmly give a **positive evaluation** for awarding the educational and scientific degree "Doctor" (PhD) to Deyana Ivanova Ilieva in the Field of Higher Education: 7. Healthcare and Sports, Professional Field 7.4. Public Health, Doctoral Programme "Healthcare Management."

26 February 2026

REVIEWE

/Prof. Tatiana Ivanova, MD, PhD/