REVIEW

by Assoc. Prof. Nevyana Georgieva Feschieva, MD, PhD

of the doctoral dissertation
by **Deyana Ivanova Ilieva**
entitled:

"SURVEILLANCE AND CONTROL OF HEALTHCARE-ASSOCIATED INFECTIONS – CONTEMPORARY CHALLENGES"

Scientific Supervisors:

Prof. Desislava Vankova, MD, DSc
Prof. Tsonko Paunov, MD

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"

By Order No. R-109-503 of 10.12.2025, issued by Prof. Dimitar Raikov, Rector of the Medical University – Varna, I was appointed as an external member of the Scientific Jury. At its first meeting (Minutes No. 1/16.12.2025), I was assigned to prepare a review of the doctoral dissertation entitled "Surveillance and Control of Healthcare-Associated Infections – Contemporary Challenges" for the award of the educational and scientific degree "Doctor" (PhD) in the scientific specialty "Public Health Management", Professional Field 7.4. Public Health.

Biographical Data and Career Development of the Doctoral Candidate

Deyana Ilieva was born in 1981 in the city of Ruse. She obtained her educational degrees as follows: Specialist – Sanitary Inspector at the Medical University – Varna (2002); Bachelor's degree in Business Administration, majoring in Health Management (2007); and Master's degree in Business Administration, majoring in Marketing and Management (2009), both from the University "Prof. Asen Zlatarov" – Burgas. With a second Master's degree in "Public Health Protection and Control" from the Medical University – Varna (2018), she developed a professional profile in the field of public health, specifically in sanitary-epidemiological control.

Complementing her qualifications is her specialization as a supervisor of disinfection, disinsection, and deratization (2018). Her education in business administration contributes to the development of organizational and managerial skills, which are essential for performing control functions—an inherent characteristic of her professional path. Her career began in 2006 at the Regional Health Inspectorate as a sanitary inspector, and since 2007, she has been working at the University Multiprofile Hospital for Active Treatment "St. Marina" – Varna as a public health inspector and member of the infection control team. Since 2023, she has also been an Assistant in the specialty "Public Health Inspector" at the Medical College – Varna. Her academic development started in 2020 when she was enrolled as a PhD student at the Department of Social Medicine and Healthcare Organization at the Medical University – Varna. She has participated in the project "Surveillance and Control of Healthcare-Associated Infections – Contemporary Challenges and Opportunities for Health Promotion" (2022–2025), funded by the Research Fund of the Medical University – Varna.

A clear alignment is observed between the doctoral candidate's education and professional experience and the chosen dissertation topic.

General Characteristics of the Dissertation

The dissertation comprises 175 pages, including 151 pages of main text, 23 pages of bibliography, and one appendix (1 page). It contains 15 tables and 47 figures.

The bibliography includes 300 references, of which 14 are in Cyrillic and 286 in Latin script.

The dissertation is structured into the following well-balanced sections: Introduction (2 pages); Chapter One: Literature Review (42 pages); Chapter Two: Aim, Objectives, and Methodology (6 pages); Chapter Three: Results and Discussion (84 pages); Chapter Four:

Conclusions, Recommendations, and Contributions (7 pages); Conclusion (1 page); Bibliography (23 pages); Appendix.

Relevance of the Dissertation

Modern diagnostic and therapeutic approaches applied in hospital settings have led to improved clinical outcomes but have simultaneously increased the risk of infections, known as hospital-acquired infections. For greater precision, the term "healthcare-associated infections (HAIs)" is widely used in scientific literature and key WHO documents. Their impact on morbidity, work capacity, and mortality, as well as their significant economic consequences, has made them a major public health issue. Reducing these risks—particularly antimicrobial resistance (AMR)—is the focus of intersectoral policies at multiple levels. From a practical perspective, hospitals remain a key setting for HAI surveillance—continuous monitoring of their occurrence and spread. The data obtained can support effective prevention strategies, improve healthcare quality, and contribute to creating a safe environment for patients.

The choice of the topic—focusing on the surveillance and control of healthcare-associated infections in a large university hospital—makes the dissertation highly relevant. At the same time, its analyses offer promising directions for addressing the problem of HAIs.

Assessment of the Literature Review

Healthcare-associated infections (HAIs) are the main focus of the literature review. Comparative data on HAI incidence worldwide, in Europe, and in Bulgaria, as well as the epidemiological aspects of HAIs among hospitalized patients, serve as an introduction to the most substantial part of the review: "Prevention, Surveillance, and Control of HAIs." This section is

logically structured into three main groups: indicator infections (associated with invasive and surgical procedures), opportunities for the prevention and control of HAIs (including programmes, as well as standard and specific precautionary measures), and European models for the organization of HAI surveillance and control. The systematization of prevention and control approaches is directly relevant to the issues addressed in the dissertation. This also applies to the section on "Antimicrobial Resistance (AMR)." Certain parts of the literature review are also of informative value to a broader segment of the medical community.

The doctoral candidate demonstrates a high level of familiarity with the literature on the selected dissertation topic, both in terms of scientific sources and in her knowledge of international guidelines and reports issued by the World Health Organization and the European Centre for Disease Prevention and Control, as well as national regulatory documents related to the prevention and control of HAIs and the containment of antimicrobial resistance (AMR). Evidence of her ability to navigate the literature and systematize the available evidence is provided by her commentary within the review and its final synthesis, which serves as a basis for the formulation of the study's aim and methodology.

Assessment of Aim, Objectives, Methods, and Organization of the Study

The aim is clearly defined in two directions:

a) analysis and evaluation of the system for prevention, surveillance, and control of HAIs at UMHAT "St. Marina" – Varna;

b) investigation of HAI incidence, etiological and clinical structure (2013–2022), with the ultimate goal of developing an integrated model for HAI management in a modern hospital environment.

Two main objectives with well-structured sub-objectives have been formulated. Five working hypotheses are based on the literature review and the researcher's professional experience.

The selected design—a retrospective epidemiological study—is fully appropriate. Diagnostic criteria of the European Centre for Disease Prevention and Control and the national medical standards have been applied.

The methods applied include documentary, theoretical, and epidemiological approaches, complemented by comparative analyses (pre-COVID vs. pandemic period) and analyses of hospital outbreaks. The statistical methods are appropriate and ensure the reliability of the results.

Assessment of Results, Conclusions, and Contributions

The results are presented in accordance with the objectives, each section followed by a discussion that enhances clarity.

A comprehensive 10-year analysis of the HAI prevention and control system has been conducted, including disinfection, disinsection, and deratization activities. Antibiotic policy and outbreak dynamics are also analyzed. Positive effects of modernization (equipment, information systems, organization, staff qualification) are noted, alongside challenges such as staff shortages and the lack of integrated electronic surveillance systems.

Epidemiological analysis reveals dominance of Gram-negative microorganisms (80%), respiratory infections, and increased pneumonia cases during COVID-19. Surgical site infections remain above international levels. Surgical site infections remain elevated, exceeding international benchmarks. The relationships between localization, clinical characteristics, and key causative agents are thoroughly analysed, with the main problems clearly identified and appropriate recommendations put forward.

Based on the results of the multifaceted study, the doctoral candidate has formulated ten conclusions, in which the identification of the key problems is grounded in comparisons with international benchmarks. The high proportion of patients receiving antibiotic treatment, exceeding European average levels, once again highlights the importance of antibiotic policy at the hospital level. The doctoral candidate proposes well-founded recommendations addressing all aspects of the problem examined in the dissertation. The contributions presented are 4 scientific and 5 practical, with which I fully agree.

Abstract and Publications

The abstract (91 pages) adequately reflects the dissertation. The candidate has two full-text publications related to the dissertation, both as first author, fully meeting national requirements.

Personal Impressions

Although I do not have direct personal impressions of the candidate, her professional trajectory and the quality of the dissertation indicate strong potential for continued development in this important field.

Conclusion

The dissertation “Surveillance and Control of Healthcare-Associated Infections – Contemporary Challenges” addresses a highly relevant topic directly related to patient safety and public health. It is developed at a high scientific level, in accordance with contemporary best practices. The doctoral candidate demonstrates strong preparation and the ability to independently conduct scientific research. The dissertation has both theoretical and practical contributions and

fully meets the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria and the regulations of the Medical University – Varna.

In view of the above, I give a positive evaluation and recommend that the esteemed Scientific Jury award the educational and scientific degree “Doctor” (PhD) in the scientific specialty “Public Health Management”, Professional Field 7.4. Public Health to Deyana Ivanova Ilieva.

11 March 2026

Reviewer:

Заличено на основание чл. 5, §1, б. „В“ от Регламент (ЕС) 2016/679

/Assoc. Prof. Nevyana Feschieva, MD, PhD/