

To the Chairman of the Scientific Jury,  
Appointed with order № P-109-121 / 16.02.2023 of the  
Rector of Medical University - Varna

## **PEER REVIEW**

*From Prof. Dr. Zhasmina Mihaylova Milanova, MD, PhD  
Head of the Clinic of Medical Oncology at  
Department of Hematology, Oncology, Pathology and Radiobiology,  
Military Medical Academy, Sofia*

**Subject:** Dissertation on the topic: "Impact of distance and travel time to cancer center on lung carcinoma treatment outcomes" of the full-time PhD student Dr. Teodorika Vitalinova Panayotova, for awarding the educational and scientific degree "Doctor (PhD)" in professional field: 7. Health and sports, professional field 7.1 Medicine and scientific specialty "Oncology", code 03.01. 46.

**Scientific Supervisor:** Assoc. Prof. Dr. Nikolay Vladimirov Conev, PhD

### **I. Administrative evaluation**

Dr. Teodorika Vitalinova Panayotova, a resident in Clinic of Medical Oncology at the University Hospital St. Marina - Varna, Department of Oncology at Medical University of Varna, is enrolled in full-time doctoral program on 31.01.2020 with the topic "Impact of distance and travel time to cancer center on lung carcinoma treatment outcomes" – scientific supervisor: Assoc. Prof. Nikolay Vladimirov Conev, MD, PhD, with Order № P-109-73 / 31.01.2020 of the Rector of Medical University "Prof. Dr. Paraskev Stoyanov" – Varna.

By a decision of Department meeting of the Department of Oncology – Medical University Varna, Faculty of Medicine – Protocol № 81 / 06.02.2023 the scientific work of Dr. Teodorika

Panayotova "Impact of distance and travel time to cancer center on lung carcinoma treatment outcomes" was approved and proposed for defense. By order № P-109-121 / 16.02.2023 of the Rector of MU – Varna the dissertation thesis was directed for defense and a five-member scientific jury was elected.

## **II. Brief biographical data**

Dr. Teodorika Vitalinova Panayotova graduated from Yoan Ekzarh High School – Varna with degree in German and English. During her medical study, she attended the Clinic of Medical Oncology at the University Hospital St. Marina – Varna as a volunteer. In 2018 she graduated with honors as a doctor at the Medical University – Varna. In October 2018, she started working as a resident in the Clinic of Medical Oncology at the University Hospital St. Marina - Varna and as a part-time assistant at the Department of Propaedeutics of Internal Diseases. In 2019 she was appointed as a regular assistant. In 2020 she was reappointed with the formation of the Department of Oncology. Since January 2020 she is a full-time doctoral student at the Department of Oncology.

Dr. Panayotova is an author of 8 full-text publications, two of which in journals with impact factor. She has four publications with abstracts, published in the Journal of Clinical Oncology and Annals of Oncology.

## **III. Evaluation of the dissertation thesis**

### **1. Relevance of the topic**

The dissertation is focused on an extremely large patient cohort with histologically verified lung cancer. According to GLOBOCAN 2020, newly registered cases of lung cancer for 2020 are 19.3 million, and deaths are almost 10 million. Lung carcinoma is the most commonly diagnosed oncological disease after breast cancer in women. Regarding mortality, lung cancer occupies the leading position. Mathematical analyses show that in 2050 patients with newly diagnosed lung cancer will reach 3.8 million per year.

Large-scale lung cancer morbidity and mortality suggests this is not just a purely medical problem, but one of social importance. Prolonged disability, need for expensive medications and modern technologies confront the health system with need for targeted development of new drug molecules, modern methods of screening and diagnosis, as well as research on factors with predictive and prognostic role that would contribute to better therapy response. The care for

patients with oncological diseases has a very complex nature, which is reflected both in the participation of many specialists in the diagnosis and treatment of the disease itself (surgeons, pathologists, oncologists, etc.) and in the individual characteristics of the patient (social status, comorbidity, concerns to one's own disease, etc.). Faced with challenge of large number of factors when building a therapeutic plan, medical professionals would easily ignore factors of "secondary importance", such as the patient's distance from medical center. This, in turn, would lead to non-adherence to the prescribed regimen, inadequate medical help and, ultimately, non-effectiveness of therapy. In this aspect, the dissertation examines the relationship between travel time and distance to the oncology center and survival of patients with lung cancer. Greater remoteness was found to correlate with worse survival. Recognizing time and distance as factors of prognostic importance is the first step in eliminating their influence and improving care of cancer patients.

## **2. General characteristics of the thesis**

The dissertation is designed and built in accordance with the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria, namely - it is developed on 118 pages, of which: Introduction - 2 pages, Literature Review - 58 pages, Aim and objectives - 1 page, Hypotheses - 2 pages, Materials and methods - 1 page, Results - 9 pages, Discussion – 10 pages, Summary – 3 page, Conclusions – 1 page, Contributions – 1 page, Publications and participations in scientific forums related to the dissertation – 3 pages. The dissertation is illustrated with 6 tables and 15 figures. The bibliography includes 259 titles, of which 1 in Cyrillic and 258 in Latin.

## **3. Aim and objectives**

The aim of the dissertation is precisely formulated, concrete and achievable:

*"Impact of distance and travel time to cancer center on lung carcinoma treatment outcomes"*

The set 9 objectives are logically related to the purpose and give grounds to assume that in compliance with the relevant methodological conditions, they will be successfully solved and will serve to formulate conclusions supporting the original hypothesis of the author.

#### **4. Methodology of the research**

- A retrospective non-interventional one-center analysis was carried out among 9240 patients who had undergone treatment for lung cancer in the Department of Medical Oncology - Complex Oncology Center - Plovdiv;
- The survey was conducted in the period 2005 – 2020;
- Strictly defined inclusion and exclusion criteria are used, allowing selection of the required patient cohort;
- Statistical design and analysis are specifically and clearly described.

#### **5. Results**

The obtained results are original and are result of the research work of the doctoral student. The results are presented in two separate subsections:

- Descriptive analysis of the studied patient group;
- Correlative analysis between distance and time to reach the oncology center and overall survival.

The results are illustrated in tables and figures, including an accurate description of the statistical analysis used and the level of statistical significance. Their description fully meets the standard requirements for the dissertation.

#### **6. Evaluation of dissertation thesis and contributions**

The doctoral student Dr. Teodorika Panayotova presented the conclusions and contributions in separate sections, formulating 7 conclusions. The following are of greater importance:

- Overall survival in the studied patient population was significantly lower with increasing distance to the oncology center;
- Overall survival is significantly lower with increasing time required to reach the oncology center;
- Male gender is associated with worse survival;
- Age over  $\geq 64$  years correlates with an increased risk of worse survival.

**More significant contributions:**

- For the first time worldwide, a relationship between distance to the oncology center and survival of lung cancer patients is demonstrated using retrospective analysis based on such large patient cohort;
- For the first time worldwide, a relationship between travel time to the oncology center and survival of patients with lung cancer is proven using retrospective analysis based on such comprehensive patient population;
- For the first time in Bulgaria, such a large-scale analysis of patients with lung cancer is carried out, focused on proving the prognostic role of distance and time;
- For the first time in Bulgaria, correlations are sought between clinical and pathological characteristics of patients with proven lung cancer and the distance to the oncology center;
- For the first time in Bulgaria is studied the relationship between different clinical and pathological characteristics of patients with lung cancer and the time of travel to the oncological center.

**IV. Scientific production**

The scientific production of the candidate, related to the topic of the dissertation, includes 6 publications. One of them is in an international journal with an impact factor. The doctoral student has one participation with presentation of the results of the dissertation at international forum.

**V. Conclusion**

The dissertation thesis of Dr. Teodorika Panayotova is a thorough, comprehensive and significant study of "Impact of distance and travel time to cancer center on lung carcinoma treatment outcomes". The design of the study has relevant scientific justification, in addition, it is clear and well structured. The scientific methods are valid and well presented.

As a member of the Scientific Jury, I consider that the presented scientific work is up-to-date, precisely constructed and with contribution not only of a scientific nature, but also of a practical one to the actual clinical practice. My assessment is based on the content of the dissertation, in which the doctoral student proves mastery of the methodology of scientific research and in-depth knowledge of the problem, as well as readiness for implementation in everyday practice. All this gives me reason with full conviction to suggest to the members of the scientific

jury to vote positively for acquisition of the scientific and educational degree "DOCTOR (PhD)" in the scientific specialty "Oncology" by Dr. Teodorika Panayotova.

With best regards:

/Prof. Zhasmina Mihaylova, MD, PhD/