The Use of Artificial Intelligence in Improving the Cost - Effectiveness of Cervical Cancer Treatment in the Western Region of Romania

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Abstract:

Background and Aim: Romania has the most significant cervical cancer incidence and mortality rates in Europe, and there is an acute need for improvement. According to the guidelines set by the International Federation of Gynaecology and Obstetrics, different treatments can lead to similar rates of progression-free survival and overall survival in different stages of cervical cancer. The aim was to compare the main treatment plans' cost-effectiveness (CE) regarding survival rate and CE using artificial intelligence (AI) in the western region of Romania and to offer insight re-garding how to improve the statistics. *Materials and Methods:* Descriptive statistics and a correlation model have been used to investigate costs. Artificial intelligence (AI) models were elaborated to predict CE of different types of treatment using the published studies regarding overall survival rates and treatment-related toxicity rates for five years. The costs involving cervical cancer treatment were obtained from the public health department, the oncological clinic in the West Region of Romania, and the County Hospital, specifically for each stage. *Results:* The mean cost was €8,349.60 for stages IIA (surgery, chemotherapy, radiotherapy), IIIA, IIIB, and IIIC (surgery, chemotherapy, radiotherapy, brachy- therapy), followed by €3,705.20 for IIB (surgery, chemotherapy, brachytherapy), and IVA (chemo-therapy, radiotherapy). *Conclusions:* The costs that would increase as a result of cervical cancer if further steps are not taken to stop the disease's aggressive and quick spread among women of all ages. It has been noted that these costs are growing linearly, resulting in patients' quality of life being negatively impacted.

Keywords: Cost-effectiveness; Cervical Cancer; Treatment; Artificial Intelligence (AI); Surgery.