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The Cancer Control Challenge:
Better Understanding It to Better Face It

# ARTIFICIAL INTELLIGENCE AS A TOOL TO AID IN THE DIAGNOSIS OF CERVICAL CANCER

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**Introduction**: Cervical cancer is one of the leading causes of female mortality worldwide. Early diagnosis by Pap smear is essential, but it still suffers from limitations in regions with few resources and subjectivity in the interpretation of results. Thus, Artificial Intelligence (AI) has stood out for its ability to analyze data accurately, being an alternative method and aiding in the early identification of precancerous and cancerous lesions. **Objective**: To develop an artificial intelligence capable of performing automated reading and assisted diagnosis of cytopathological slides, with an emphasis on detecting cellular changes associated with cervical cancer in the city of Belém, state of Pará. **Methodology**: Thirty images of Pap smears, labeled as positive or negative diagnoses, extracted from a clinical database were used. The images underwent preprocessing for standardization, and data augmentation was performed dynamically with the ImageDataGenerator tool (Keras). Then, the Convolutional Neural Network model was trained and evaluated with metrics such as accuracy, sensitivity, F1-score, in addition to the analysis of the ROC curve and AUC. **Results**: This section presents the results obtained by applying the two proposed approaches: the simple CNN built from scratch and themodel based on transfer learning with MobileNetV2. The evaluation metrics were calculated based on the testset, which comprises 20% of the total images (6 images in total, 3 positive and 3 negative). The second approach evaluated the application of transfer learning, using the MobileNetV2 architecture pre-trained on theImageNet base. Only the upper layers were adjusted for the binary classification task. This model presented better overall performance, with less variation in themetrics and stability in the training process, which was completed in 22 epochs. **Conclusion**: The AI was successfully assembled to read cytopathology slides to aid in the early diagnosis of cervical cancer. Thus, this approach has the potential to revolutionize the early detection of neoplasms. The expectation is that AI will become an increasingly valuable tool to increase the chances of effective treatment, increasing diagnostic accuracy, reducing analysis time and expanding access to screening.

**Keywords:** Artificial Intelligence (AI); Diagnosis; Cancer; Cervix.