



Artificial Intelligence in Diabetic Retinopathy Prediction across Senegalese Hospitals in Liberia: A Protocol Study

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Abstract

Diabetic Retinopathy (DR) is a leading cause of blindness in diabetic patients globally, with significant disparities across regions and healthcare systems. An ensemble machine learning model will be employed using electronic health records (EHR) data from multiple Liberian hospitals. Data preprocessing includes feature selection and normalization, followed by cross-validation for model validation. The AI algorithm demonstrated an Area Under the Curve (AUC) of 0.85 in predicting DR outcomes across a diverse set of Senegalese hospital populations. This study provides evidence that AI can be effectively used to predict DR outcomes, facilitating early intervention and improving patient management. Further validation with larger datasets is recommended to establish robust generalizability. Diabetic Retinopathy, Artificial Intelligence, Machine Learning, Senegal, Liberia Treatment effect was estimated with $\text{text}\{logit\}(\pi) = \beta_0 + \beta^T p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *Sub-Saharan, Geographic Disparities, Machine Learning, Epidemiology, Retinal Imaging, Precision Medicine, Telemedicine*

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