Medical Physics Innovations in Eswatini's Resource-Limited Cancer Diagnostic and Therapeutic Contexts

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Abstract

This study addresses a current research gap in Physics concerning Application of Medical Physics Techniques in Cancer Diagnosis and Treatment in Resource-Limited Settings in Eswatini. The objective is to formulate a rigorous model, state verifiable assumptions, and derive results with direct analytical or practical implications. A mixed-methods design was used, combining survey and interview data collected over the study period. The results establish bounded error under perturbation, a convergent estimation process under stated assumptions, and a stable link between the proposed metric and observed outcomes. The findings provide a reproducible analytical basis for subsequent theoretical and applied extensions. Stakeholders should prioritise inclusive, locally grounded strategies and improve data transparency. Application of Medical Physics Techniques in Cancer Diagnosis and Treatment in Resource-Limited Settings, Eswatini, Africa, Physics, original research This work contributes a formal specification, transparent assumptions, and mathematically interpretable claims. The empirical specification follows $Y = \vec{\beta}_{0+\beta} \, p \, X + varepsilon$, and inference is reported with uncertainty-aware statistical criteria.

Keywords: *Sub-Saharan, African, SpatialStatistics, ClinicalPhysics, MolecularImaging, DataAnalytics, HealthInformatics*

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