African Remote Sensing and GIS in Earth Sciences (Earth

GIS Integration for Zoonotic Disease Surveillance in Ethiopian Health Facilities: A Comparative Study of Southwest Towns

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Abstract

Zoonotic diseases pose significant health threats in Ethiopia, necessitating effective surveillance systems to mitigate their spread. A comparative study design was employed, involving GIS mapping of healthcare facility records with survey data collected from June to December . Data were analysed using geographic information systems (GIS) software for thematic analysis and statistical modelling. Spatial distribution patterns of zoonotic diseases showed a clear clustering effect in certain towns, indicative of environmental risk factors such as proximity to wildlife habitats. The GIS integration demonstrated improved data accuracy and accessibility for disease surveillance, highlighting the need for standardised protocols across health facilities. Standardization of GIS mapping practices is recommended to enhance consistency and facilitate inter-town comparisons in zoonotic disease surveillance. GIS, Zoonotic Diseases, Health Surveillance, Spatial Analysis, Ethiopian Towns Model estimation used $\hat{\{}\theta\}=argmin\{\theta\}sumiell(yi,f\theta(\xi))+\lambda lVert\theta rVert2^{2}$, with performance evaluated using out-of-sample error.

Keywords: *Geographic Information Systems (GIS), Spatial Analysis, Remote Sensing, Health Informatics, Epidemiology, Map Overlay Techniques, Mobile GIS Deployments*

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