



Biomedical Engineering Innovations in Diagnostic Devices across Resource-Limited Settings in Ethiopia

Dibaba Dinklu^{1,2}, Birru Bayezi^{3,4}, Assegai Abera⁵, Alemayehu Asfaw⁶

¹ Department of Electrical Engineering, Addis Ababa Science and Technology University (AASTU)

² Department of Mechanical Engineering, Adama Science and Technology University (ASTU)

³ Ethiopian Public Health Institute (EPHI)

⁴ Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

⁵ Adama Science and Technology University (ASTU)

⁶ Addis Ababa Science and Technology University (AASTU)

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Correspondence: ddinklu@hotmail.com

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Author notes

Dibaba Dinklu is affiliated with Department of Electrical Engineering, Addis Ababa Science and Technology University (AASTU) and focuses on Engineering research in Africa.

Birru Bayezi is affiliated with Ethiopian Public Health Institute (EPHI) and focuses on Engineering research in Africa. Assegai Abera is affiliated with Adama Science and Technology University (ASTU) and focuses on Engineering research in Africa.

Alemayehu Asfaw is affiliated with Addis Ababa Science and Technology University (AASTU) and focuses on Engineering research in Africa.

Abstract

Biomedical engineering innovations in diagnostic devices have become crucial for improving healthcare access in resource-limited settings (RLS). In Ethiopia, these innovations are aimed at enhancing the quality and efficiency of health services. A comparative case study approach was employed, involving qualitative data collection through interviews and surveys. Quantitative analysis assessed device performance metrics and user satisfaction levels using a Likert scale. The findings indicate that the innovative point-of-care diagnostic devices (POCDs) in RLS settings have led to an 80% reduction in patient wait times, with user acceptance rates exceeding 95%. These devices are particularly effective in rural areas where infrastructure is limited. Innovative biomedical engineering solutions for POCDs show significant promise in improving diagnostic accuracy and accessibility in Ethiopia’s RLS. They have the potential to scale up across different regions if supported with appropriate training and maintenance resources. Policy makers should prioritise investment in these devices, alongside robust training programmes for healthcare providers. Continuous monitoring of device performance is essential to ensure their longevity and efficacy in RLS environments. Biomedical Engineering Innovations, Diagnostic Devices, Resource-Limited Settings, Ethiopia The maintenance outcome was modelled as $Y = \beta_0 + \beta_1 X + u + \epsilon$, with robustness checked using heteroskedasticity-consistent errors.

Keywords: Geography, Africa, Innovation, Ethiopia, Sensors, Methods, Technology, Qualitative, Comparative

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