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Cost-effectiveness of Drone-delivered Blood Products for Postpartum Haemorrhage in Remote Oromia, Ethiopia: A Short Report

Tewodros Bekele[1], **Hana Mohammed**[2], **Mekdes Abebe**[1,3], **Sisay Tadesse**[4]

[1] Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

[2] Jimma University

[3] Department of Public Health, Jimma University

[4] Department of Surgery, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa

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Correspondence: tbekele@hotmail.com

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Author notes

Tewodros Bekele is affiliated with Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa and focuses on Medicine research in Africa.

Hana Mohammed is affiliated with Jimma University and focuses on Medicine research in Africa.

Mekdes Abebe is affiliated with Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa and focuses on Medicine research in Africa.

Sisay Tadesse is affiliated with Department of Surgery, Africa Centers for Disease Control and Prevention (Africa CDC), Addis Ababa and focuses on Medicine research in Africa.

Abstract

Postpartum haemorrhage (PPH) is a leading cause of maternal mortality in Ethiopia. Timely access to blood products remains a critical challenge in remote areas due to difficult terrain and dispersed health infrastructure, particularly in the Oromia Region. This short report assesses the cost-effectiveness of using unmanned aerial vehicles (drones) to deliver blood products to remote health centres in Oromia, compared with traditional road-based transport. A modelled cost-effectiveness analysis was conducted from a health system perspective. Operational costs for a proposed drone network serving selected remote health centres were compared against current road transport costs. Effectiveness was measured in blood delivery time saved and potential maternal deaths averted, using established clinical parameters. Preliminary modelling indicates drone delivery could reduce median blood transport time by approximately 75%, from over four hours to under one hour on the studied routes. The incremental cost-effectiveness ratio suggests drone delivery could be a cost-effective intervention, with an estimated cost per disability-adjusted life year averted falling below a recognised willingness-to-pay threshold. Implementing a drone delivery system for blood products in remote areas of Oromia appears to be a potentially cost-effective strategy to reduce PPH-related mortality by significantly shortening transport times. Further feasibility studies, including detailed route planning and community engagement, are recommended. Policymakers should consider piloting drone-based blood delivery systems in selected zones to gather real-world operational and health outcome data. maternal health, postpartum haemorrhage, drones, unmanned aerial vehicles, cost-effectiveness analysis, blood supply, Ethiopia, remote health systems This report provides preliminary evidence to

inform health policy and logistics planning for emergency obstetric care in geographically challenging regions of Africa.

Keywords: *Postpartum haemorrhage, Cost-effectiveness analysis, Medical drones, Maternal mortality, Sub-Saharan Africa, Blood transfusion, Remote healthcare*

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