

## **Doppler to Improve Fetal Heart Rate Assessment in Intrapartum Care in Tanzania: Does It Save Newborn Lives, and What Are Implications for Scale-Up?**

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**Abstract:** In low and middle income countries (LMIC), intrapartum stillbirth and newborn death, associated with lack of or poor quality obstetric care, cause staggering levels of perinatal and neonatal death. Globally, over 2.7 million neonates die annually, including roughly 700,000 intrapartum stillbirths. In Tanzania, an estimated 46,000 infants died in the neonatal period in 2017. Intermittent fetal heart rate (FHR) monitoring is a key intrapartum intervention recommended by WHO. The standard of care for FHR monitoring in most LMIC is the Pinard stethoscope, but studies in Uganda, Zimbabwe and Tanzania have shown that using a hand-held Doppler can be more effective in detecting abnormal FHR.

This mixed methods study used qualitative and quantitative methods to assess outcomes of Doppler use in health facilities and attitudes around scale up of Doppler in Tanzania. In a qualitative assessment, nine high-level experts/policymakers were interviewed based on theoretical domains drawn from Proctor's implementation outcomes. Findings included high alignment between national priorities and improving intrapartum FHR monitoring using Doppler, and a need to learn lessons from Helping Babies Breathe (HBB) program experience, including effective training, clinical mentoring, and a system for monitoring outcomes.

A quantitative study assessed changes in cesarean delivery and perinatal mortality in 10 health facilities in Kagera region, Tanzania before and after a six-month intervention (Doppler to assess FHR upon admission to maternity ward). Costs ranged from \$2.13–\$0.20 (average \$0.46) per woman assessed. Cesarean delivery increased and perinatal mortality decreased in one out of the ten intervention sites in Kagera, but perinatal mortality also decreased in the comparison (Mara region) site in the same period. Cesarean delivery did not significantly increase in any sites other than Kagera regional hospital. These largely negative findings indicate that the proposed pathway between Doppler use and reduced perinatal death may be less directly related than assumed. Further research should address contextual factors and be designed to capture implementation outcomes.

My Plan for Change includes disseminating the findings through professional associations including Association of Gynecologists and Obstetricians of Tanzania (AGOTA) and educating health care providers and district administrators on measurement of intrapartum mortality in health facilities.

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