The Impact of Reliable Electricity on Maternal and Newborn Healthcare in Rural Uganda

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Sector(s): Health

Fieldwork: Innovations for Poverty Action (IPA)

Location: Uganda

Sample: 30 maternity care facilities

Target group: Health care providers Mothers and pregnant women

Outcome of interest: Mortality

Intervention type: Energy efficiency In-kind transfers Technology

AEA RCT registration number: AEARCTR-0003078

Partner organization(s): We Care Solar

Maternal and newborn morbidity and mortality are persistent challenges despite increasing rates of deliveries within health care facilities over the last decade. Especially in low-resource contexts, improving infrastructure in facilities through access to reliable electricity may enable healthcare workers to provide higher-quality obstetric and newborn care. Where large investments in infrastructure are likely to be unsustainable in low-resource settings, solar energy systems for health care facilities could provide the essential lighting needed to deliver quality care. In Uganda, researchers are evaluating the impact of the “Solar Suitcase” designed specifically for maternity care facilities on the reliability of light, quality of care, and health worker satisfaction.

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Every year in sub-Saharan Africa (SSA), 1.2 million women and newborns die in delivery or shortly thereafter. Policies and programs aimed at reducing home births have led to dramatic increases in births in health care facilities. Yet, these gains have not always translated into meaningful improvements in maternal and newborn health outcomes. One potential reason behind this disconnect is poor access to quality infrastructure in facilities—namely reliable electricity and lighting.

Poor lighting has major implications for delivering routine and emergency obstetric and newborn care—hindering the ability to monitor the progression of labor, manage emergency complications, and, when needed, provide timely life-saving care. Expanding the electrical grid to generate access to reliable electricity for facilities, however, often requires significant investments in resources and infrastructure. Could a solar electric system designed for maternity care facilities in low-resource environments provide reliable electricity to improve the quality of maternal and newborn health care?

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In Uganda, where this evaluation takes place, nearly all women (97 percent) receive antenatal care from a skilled provider and 73 percent of births are delivered in a health facility. Yet, the maternal mortality ratio remains high at 375 deaths per 100,000 as of 2017. Often health care facilities rely on kerosene lamps to address their lighting needs, which are not enough to provide the focused, bright light that maternity and newborn care requires. To better understand interventions that could overcome these obstacles, researchers are evaluating the impact of a solar electric system designed to provide reliable light in maternity care facilities.



We Care Solar Suitcase® installed in a maternity care facility in Uganda.

Photo Credit: Aude Guerrucci, IPA

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We Care Solar partnered with researchers to evaluate the impact of the We Care Solar Suitcase® on the reliability and quality of light during and following birth, the quality of obstetric and newborn care, and health worker satisfaction. The Solar Suitcase is a complete solar electric system that provides essential lighting and power for charging phones and small medical devices. Installations were done by a local solar contracting firm. One Solar Suitcase was installed in each facility, with 2–4 overhead LED lights for each delivery room, depending on its size. Health workers received training on how to use and maintain the Solar Suitcase during installation and on subsequent check-ins done in person or over the phone. Installers also followed up with maintenance requests. Health facilities did not incur any cost during the evaluation for installation, operation, or maintenance.

Researchers evaluated the Solar Suitcase in thirty public sector health facilities without reliable electricity in the Central, Eastern, and Western regions of Uganda. Type of health facilities ranged from the first point of contact with the formal health sector, covering outpatient services and some maternity care when necessary, to more advanced facilities covering emergency medical and obstetrical care. Researchers staggered the installation of Solar Suitcases creating two groups to which facilities were randomly assigned: 15 facilities received Solar Suitcases first, while facilities in the comparison group received the intervention 10-12 weeks later. By the end of study, Solar Suitcases were installed in all thirty facilities.

Over the course of the evaluation, researchers captured data on the availability and brightness of light in the health care facility, quality of intrapartum care, and health worker satisfaction. In addition to directly observing light and electricity, researchers installed light sensors in delivery rooms which collected light voltage data for the duration of the evaluation and, in facilities connected to the grid, detected whether the grid power was on or off. Enumerators used an observation checklist during each delivery to monitor the quality and timeliness of care provided. Enumerators also conducted interviews with health facility providers and administrative staff.

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Evaluation ongoing; results forthcoming