

Facility-level access to electricity and the efficiency of maternal and child health service



In brief

- This project is the first known attempt to directly investigate whether facility level electrification improves the provision of maternal and child health services.
- Rather than simply correlate electrification with levels of utilisations, we study the relationship between electrification and levels of efficiency in the provision of maternal and child health services.
- In addition, we conduct stakeholder interviews to reveal the policy and operational challenges that Zambia is facing in planning and implementing the UN Sustainable Energy for All (SE4All) Agenda on women's health.

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Key results and discussion

1. We find no relationship between electrification of primary health facilities and facility efficiency in providing maternal and child health services.

While this finding may be surprising at first glance, there are at least two reasons that explain this outcome. First, though functional electricity is important in refrigerating essential maternal and child medicines and vaccines, we observe that a majority of the facilities without electricity use alternative cold chain systems (like kerosene or solar fridges) for refrigeration. Second, corroborative expert interviews reveal that the energy intensity in the basic maternal and child health service package in Zambia is still low. Most medical devices and technology currently being used in diagnosis and treatment of maternal and child conditions do not usually require any energy input at present.

2. We find little coordination in policy formulation between the key health and energy stakeholders in Zambia.

There is currently no established inter-ministerial structure that meets regularly to plan and evaluate policies at the interface of health and energy.

3. Health-energy infrastructure programmes and projects in Zambia are inadequately planned and poorly coordinated across the relevant implementers.

Due to various constraints, the Ministry of Energy, Energy Regulation Board (ERB), and the state-owned power company ZESCO do not regularly evaluate and update their electricity sector master plans and strategic plans. Consequently, existing plans do not reflect facility energy needs and fail to incorporate the SDGs' objectives on energy and health in developing countries such as Zambia.

4. There is currently no strategic health sector-specific concessional pricing policy in Zambia to encourage new connections and usage of energy in primary health facilities.

5. There is irregular and under-funding of rural electrification programmes in Zambia.

The Ministry of Finance does not regularly and fully honour its financial obligations to the Rural Electrification Authority (REA). Furthermore, the rural electrification levy is not remitted in full to the REA. These challenges pose significant constraints in the roll out of the rural electrification programme.

Policy recommendations

Based on the key findings in this study. We recommend the following:

1. In the short term, government must ensure that adequate and functional cold chain management systems are available, especially in rural and remote facilities, to mitigate the problem of lack of electricity in ensuring basic maternal and child health provision.
2. In the medium- to long-term, government must equip the health care system with modern, efficient, and energy-dependent technology for efficient management of maternal and child health cases. This is in line with the SDGs' vision of modern and energy-dependent maternal and child health provision by 2030.
3. Government must establish and strengthen inter-ministerial structures that regularly formulate policy and implementation plans regarding the financing and implementation of infrastructure programmes at the intersection of health and energy.
4. Government must review the electricity pricing policy for health facilities to ensure that all facilities pay discounted social tariff prices.
5. The central government must regularly honour its financial obligations to the REA in full, and we further recommend that the rural electrification levy be direct remitted to REA rather than via the national treasury to reduce inefficiencies and leakages.

Policy context

Access to reliable energy is critical in the provision of effective maternal and child health services especially in low-income countries. The availability of electricity at health facility level could support the effective delivery of maternal and child health by:

- Enabling staff to attend to night time emergencies such as deliveries.
- Enabling the carrying out of such lifesaving procedures as quicker blood transfusions, or fetal heart rate monitoring.
- Facilitating the refrigeration of essential medicines and vaccines.
- Increasing facility working hours and thereby serving more patients.
- Improving staff morale and retention, especially in rural areas.

Despite the likely improvement in health services that electrification of health facilities would bring, only about 30% of sub-Saharan Africa's health facilities report reliable access to energy (Adair-Rohani et al, 2013). And just like the rest of the sub-region, Zambia's health facility electrification rates are low: for example, only about 35% of rural primary health facilities have reliable access to energy (Institute for Health Metrics and Evaluation, 2014).

In recognition of the importance of energy in improving women's and children's health, the United Nations' SE4All initiative launched the

women's health agenda in 2011 to mobilise efforts and resources to achieve the twin objectives of 100% access to modern energy in primary health facilities and universal access to health services for women and children in low-income countries by 2030.

While several countries in the region and Zambia in particular have made some progress in planning and implementing the UN SE4All initiative, several research questions remain unanswered. For example, is there any direct relationship between access to energy and improved maternal and child health service provision in Zambia? Secondly, are there any policy and/or operational constraints that impede the achievement of the twin goal of 100% facility electrification and improved maternal and child health service provision by 2030?

Study design

This study used a mixed methods approach to shed light on the above research questions. To find out whether access to energy is in any way correlated with more efficient provision of health services, the study used a sample of about 103 health centres and health posts from the 2010/2011 Institute for Health Metrics and Evaluation's Zambia health facility survey. Hospitals and other specialised platforms were excluded from the sample because essential maternal and child services are primarily provided at the health centre and health post level. Applying techniques from the economic productivity literature, we then calculated efficiency scores (or the rates at which sets of maternal or health outputs were provided for a given set of inputs) for each health facility. In the last stage of the quantitative analysis, we performed a regression analysis of the determinants of maternal and child efficiency including such relevant variables as access to electricity, location of facility, and others.

Second, to explore the policy environment at the nexus of energy and health in Zambia, we conducted in-depth open interviews with nearly 20 public health and energy policy experts working in Zambia. Respondents came from the ministries of health, energy, the state's energy regulator ERB, the state electricity utility ZESCO, and from academic and policy research organisations (University of Zambia, Zambia Institute for Policy Analysis and Research).