

# Complementarities in the provision of public services

## Evidence from Zambia



### In brief

- This study seeks to understand how the construction of new health facilities affects population health, focusing on health outcomes related to obstetric care and child mortality when the first facility is established in a local area.
- Researchers built a new geo-referenced panel data set containing the universe of health facilities in Zambia by combining health facility censuses conducted by the Zambian Ministry of Health and its partner organisations.
- The data set maps the rollout of new health facilities across space and time from 1990 to 2017, which saw a dramatic rise in the number of facilities, rising from 1,022 to 3,131.
- The authors find that the establishment of a nearby health facility is associated with an increase in the deliveries via caesarean section. In addition, they obtain suggestive evidence for a decline in child mortality.
- These findings may have significant implications for policymakers who hope to make inroads in reducing child mortality.

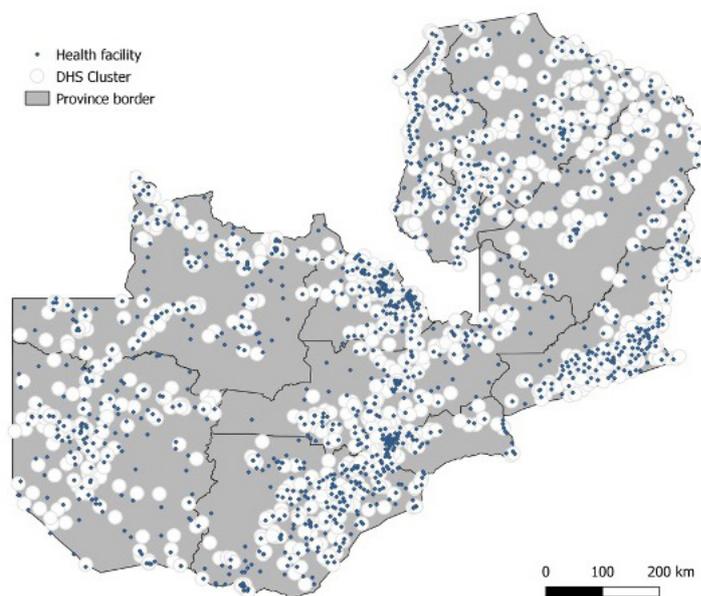
*This project was funded by IGC Zambia.*

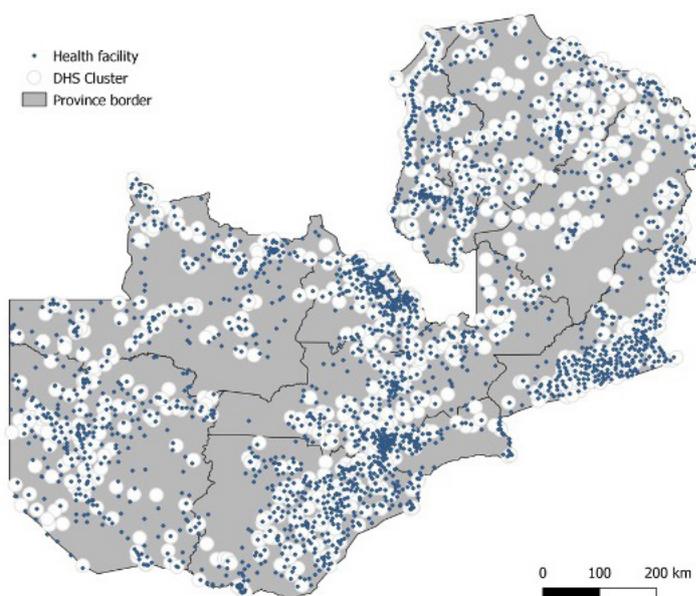
## Overview of the research

This study seeks to understand the relationship between the availability of health facilities and health outcomes in Zambia. The work offers a new contribution to a large body of literature on the relationship between health infrastructure and health outcomes in sub-Saharan Africa. However, this existing research remains far from a consensus, offering divergent views on the benefits of health facility access. Furthermore, such research is thought to be plagued by confounding factors, such as the self-selection of vulnerable mothers into delivery at a health facility or the non-random location of health facilities as policymakers respond to areas in need with poor overall health outcomes.

The unique feature of this report is its endeavour to employ an event study to overcome these identification challenges. By leveraging an original dataset which knit together health facility censuses conducted by the Zambian Ministry of Health and partner organisations, researchers were able to map the rollout of new health facilities in Zambia over space and time. They document an increase in the total number of health facilities from 1,022 in 1990 to 3,131 in 2017 across the entire country.

**Figure 1: Health Facilities in 2005 (Top) and 2017 (Bottom)**





Facilities were then spatially linked to the Demographic and Health Surveys (DHS) from 2007, 2013 and 2018, providing longitudinal insight into health outcomes in areas where new facilities were established. The event study approach allows the researchers to specifically examine if there is a change in local birth outcomes associated with the precise time when a health facility opens up in an area. If there is a clear trend break at that point, it strongly suggests that there is a causal effect of the new health facility on local outcomes. Typically, the cross-sectional nature of the DHS data would prohibit such an event study, which requires panel data. However, the authors overcome this by leveraging survey questions that ask women to report their birth history. This allows them to construct a retrospective history of birth outcomes that occurred in a given DHS cluster.

While the results are preliminary and subject to further scrutiny, the study yields compelling insights into the role health facility access plays in influencing health outcomes.

- Firstly, researchers found that when a facility first opens in a given DHS cluster, there is no significant change in the proportion of mothers who deliver at a facility or at home. Likewise, they find no statistically significant change in the proportion of mothers who have an assisted delivery.
- However, they do find that the share of deliveries that happens with a caesarean section increases both substantially and significantly. Two periods after a health facility first opens up in a DHS cluster, the share of births with a c-section increases by 17 percentage points. Given a baseline rate of 4.4%, this corresponds to a 386% increase.
- In addition, the study also offers suggestive evidence that child mortality decreases.

- Two periods after the arrival of the health facility, infants are 4.6 percentage points more likely to survive up until age 2. Although this estimate is not statistically significant, the economic magnitude is large since it represents a decline in early child mortality of around 50%.
- In addition to the above analysis, the study also examined outcomes related to infant vaccinations, but did not find any significant patterns.

This report focuses on average effects on birth outcomes in a local population. Future work will look at heterogeneous effects and effects on maternal health. For example, the impact of a health facility opening may be stronger for households in the lower segments of the income distribution. Finally, further attention will be given to maternal health outcomes.

## Policy motivation for the research

This study naturally lends itself to the public health objective of reducing child mortality in Zambia, as well as efforts to integrate more of the population into the health system and provide medical care. Furthermore, it is part of a larger body of work in line with the Zambian Government's 7th National Development plan, examining synergies in the provision of different types of public services. Future work will pair these health results with the education sector, matching them with school-level data on teacher recruitment and retention. Researchers will test the hypothesis that the presence of a health facility serves as an amenity, incentivising teachers to remain at a school.

## Policy recommendations

The study aims to provide information on how business owners were affected by and adjusted to the lockdown measures and the economic downturn that followed. We expect that the findings would be used for developing appropriate policy responses for supporting SMEs both during and after the pandemic.

- **Health facility construction may play a key role in reducing childhood mortality**

Given the results of this study, the construction of new public health facilities should be viewed as a possible tool in efforts to lower childhood mortality across Zambia. Particular attention should be paid to providing access to facilities in locales where there is no existing facility.

- **Improve data management to support research on health infrastructure**

One of the most significant hurdles faced by researchers was the construction of a panel dataset which tracked health facilities over time. In the absence of common facility identifiers, facilities were matched based on facility, district, and province name, which presented two key challenges. First, idiosyncrasies in the spelling of facility names between years were common.

Second, frequent redistricting resulted in changes in the district and province associated with a particular facility. The resources required to construct coherent datasets under these circumstances hinders public health research and an evidence-based assessment of public health infrastructure. The Government of Zambia should institute unique facility identifiers and a process to regularly collect data from all facilities, logging facility openings and closures, and automatically linking facility information across years so panel data is readily available for analysis.