

Extending National Health Accounts for Estimating Out-of-Pocket Spending on Maternal Health

 IHME

Hans Elliott, Carolyn Shyong, Golsum Tsakalos, Angela E. Apeagyei

Institute for Health Metrics and Evaluation, University of Washington, USA

SUMMARY

Improving maternal health outcomes is one of the key Sustainable Development Goal targets related to health and well-being. While maternal health services are effective in reducing morbidities and mortalities related to pregnancy and childbirth, there is a growing evidence base showing that the household costs required to obtain these services can be a barrier to access or lead to catastrophic health spending.¹ Therefore, out-of-pocket (OOP) spending on maternal health can be an important indicator of a health system’s ability to support families at a time when they are financially vulnerable. However, little data exists for characterizing OOP spending on maternal health, making it difficult to study or estimate this indicator. We estimate OOP spending on maternal health for countries in Sub-Saharan Africa using a statistical model that leverages related health spending indicators to overcome the lack of relevant data.

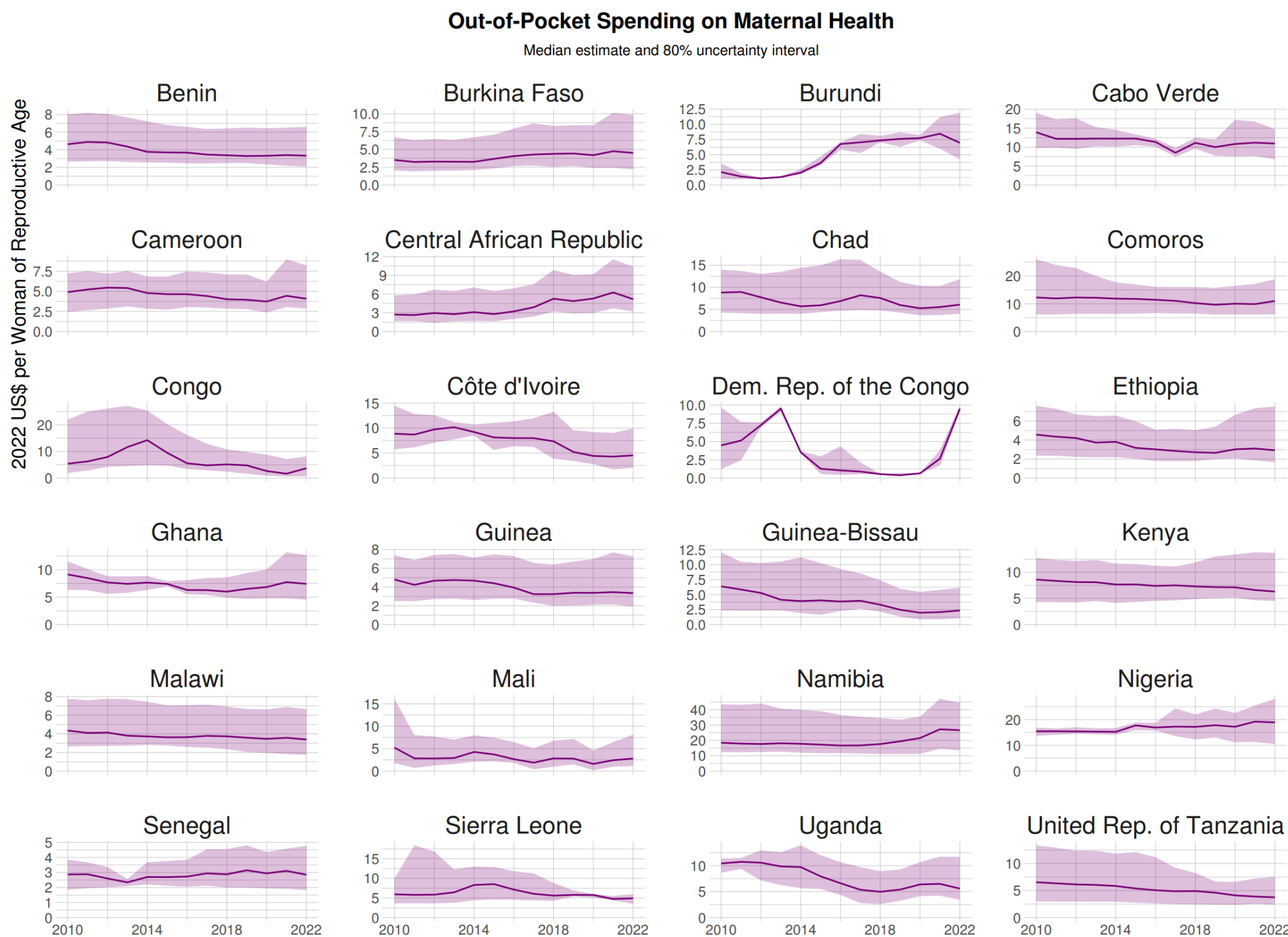
METHODS

We use the World Health Organization’s collection of National Health Accounts – an effort to systematically track national health spending – to extract country-reported household spending on maternal health. The availability of reproductive health data in these accounts varies substantially by country and year, and overall, we find minimal data reported specifically about household spending on maternal health. However, higher-order indicators that encompass household spending on maternal health, like total spending on reproductive health, are more commonly reported. This motivates a Bayesian hierarchical approach to jointly estimate household spending on maternal health along with the more commonly reported total health spending on reproductive health and total health spending, allowing for information to be shared across countries and across indicators. The model uses covariates and a time trend to estimate the indicators from the sparse, noisy data. Estimates shown in these figures were produced using 1,000 draws from the posterior distribution. Values are adjusted for inflation and scaled by the reproductive population to facilitate cross-country comparisons. Estimates were produced for years 2010 – 2022 for all countries in Sub-Saharan Africa with at least one observation of total reproductive health spending during this period.

The figures below show the jointly estimated health spending indicators for four countries, along with the observed data, where available. Each indicator encompasses those to its left, so having data for one indicator provides information about the others. This is the basic motivation for our approach.

RESULTS

Our initial results show that our method is effective in producing reasonable estimates given minimal reported data on out-of-pocket spending on maternal health. The four examples shown to the left demonstrate how our model handles different data scenarios. Burundi and Nigeria have relatively many observations of OOP spending on maternal health, while Ghana only has a single observation and Ethiopia has none. In years where data is lacking, trends in OOP spending on maternal health are driven by the observed trends in higher-order indicators, as well as variation in country-level covariates over time. Uncertainty is highest in country-years with little data.



IMPLICATIONS AND CONCLUSIONS

OOP spending on maternal health varies across Sub-Saharan Africa, with Namibia and Nigeria having the highest estimated total spending per woman over this period, and Mali and Senegal the lowest. Differences in OOP spending on maternal health across countries and time may reflect differing patterns in the utilization of maternal health services, costs of services, sources of maternal health financing, and the interplay of these factors.

While our modeling approach provides a way to overcome the lack of data for OOP spending on maternal health, it still has many limitations. Notably, the quality of data reported in National Health Accounts may vary, and we would like to better incorporate this data-uncertainty into our estimates. Additionally, we believe we can incorporate multiple data sources into this framework, and future work will explore how to combine evidence from interviews and field surveys with the National Health Accounts to improve these estimates.

ACKNOWLEDGMENTS

Funding for this research came from the United Nations Population Fund.

REFERENCES

1. Banke-Thomas, Aduragbemi et al. “Cost of maternal health services in low and middle-income countries: protocol for a systematic review.” *BMJ open* vol. 9,8 e027822. 20 Aug. 2019, doi:10.1136/bmjopen-2018-027822
2. Susmann, Herbert, Monica Alexander, and Leontine Alkema. "Temporal models for demographic and global health outcomes in multiple populations: introducing a new framework to review and standardise documentation of model assumptions and facilitate model comparison." *International Statistical Review* 90.3 (2022): 437-467.