Subnational variation of under five mortality and its determinants in Kenya since 1965

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Introduction

Kenya did not achieve Millennium Development Goal (MDG) 4 despite substantial health funding and significant decline in under five mortality (U5M) in the last three decades.

The launch of Sustainable Development Goal (SDG) 3.2 (reduce U5M to 25 deaths per 100 live births by 2030) calls for better understanding of U5M variation, its determinants and the role of the determinants in U5M variation at sub national units of decision making

This will inform what interventions are needed and where needed to accelerate national U5M reductions and achieve set targets.

Objectives

We characterized spatio-temporal variation and inequalities in child survival and its determinants at decentralized health planning units (counties) in Kenya since 1965

Data and methods

We assembled 20 household surveys and 3 population census conducted in Kenya between 1989 and 2015.

To estimate U5M, five demographic techniques were applied on birth histories data from the assembled surveys. A Gaussian Process Regression was then used to harness spatio-temporal structure of the data, account for sampling errors, heterogeneities in data sources and demographic methods to obtain an annual estimate for each county between 1965 and 2015.

Determinants of U5M were defined according to existing frameworks of child survival. Their coverage levels were estimated by each county and year using Bayesian conditional autoregressive models that address issues around small sample sizes by accounting for the large sampling variance and harnessing spatial and temporal relatedness to increase predictive power.

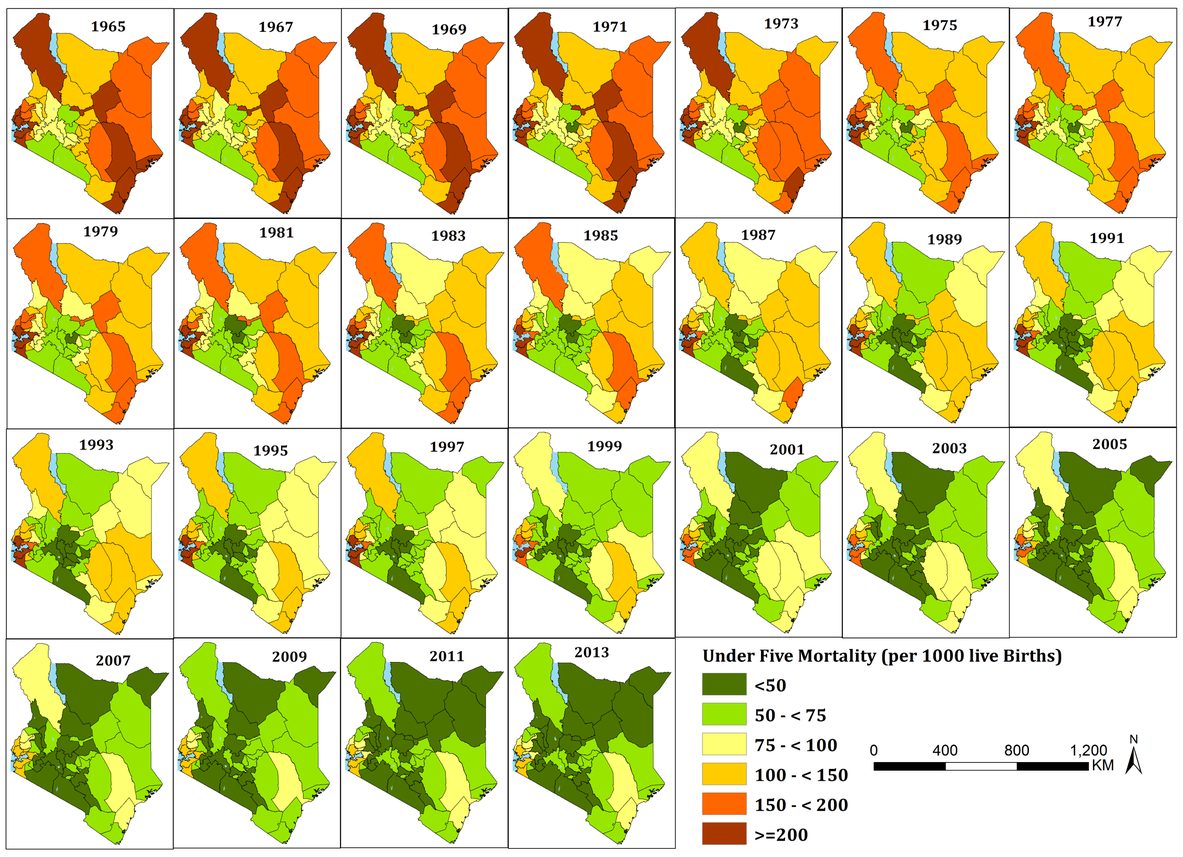
The contribution of these determinants to U5M variability will be estimated via counter factual analysis and population attributable fraction

Under Five mortality

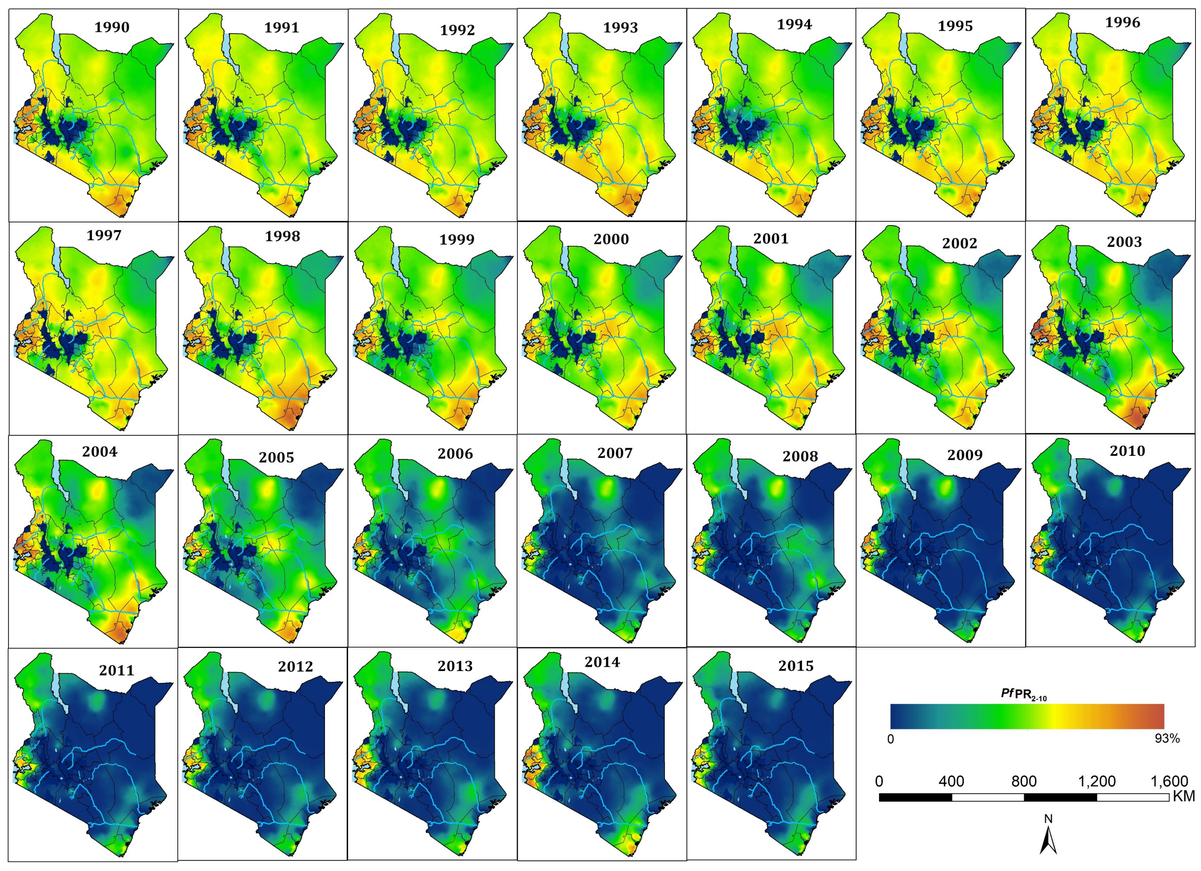
Findings

Some Determinants

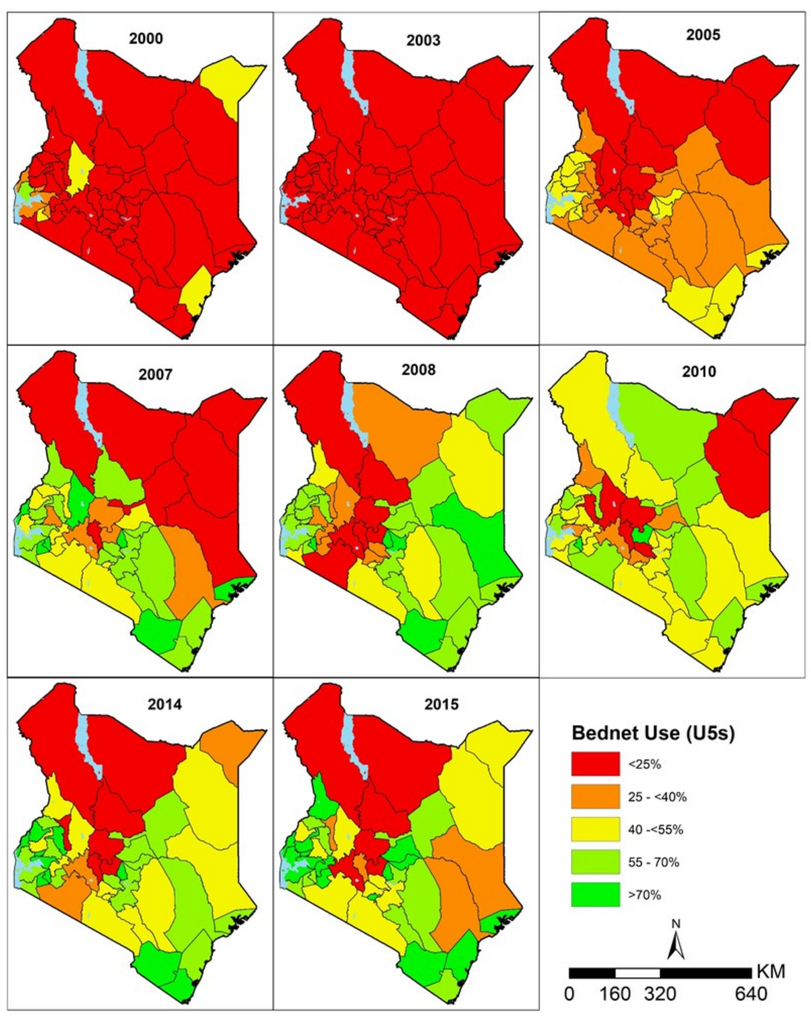
U5M declined heterogeneously between 1965 and 2013 (62% average decline) with high level of inequalities between counties; There was suboptimal performance in meting global targets subnationally.



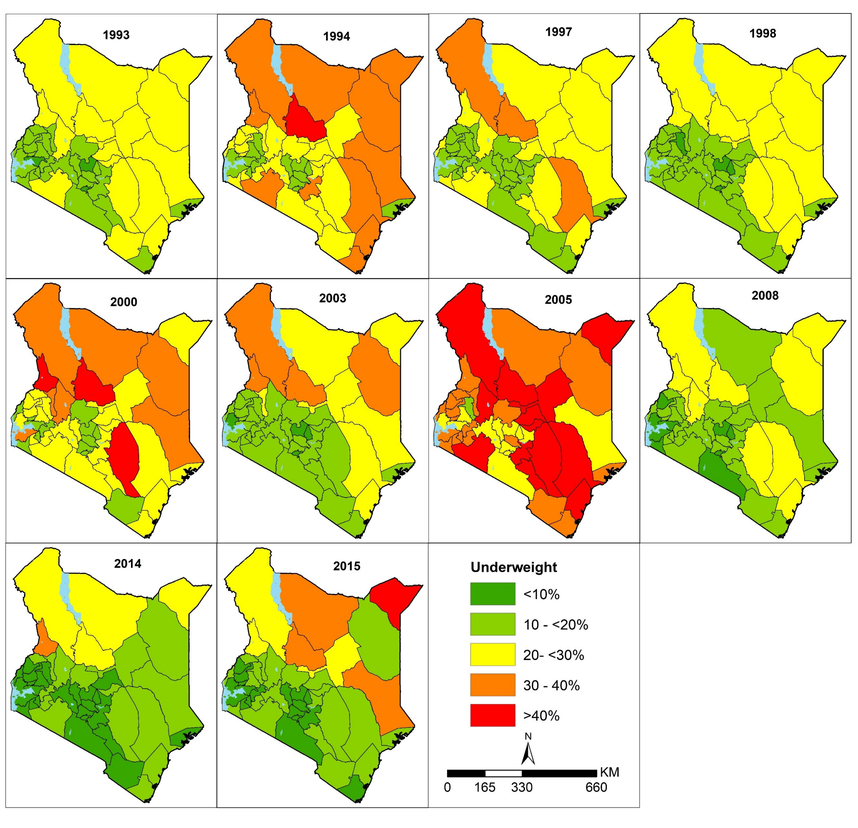
Malaria prevalence declined by 88% from 1990 to 2015. The decline was heterogenous with high transmission associated with areas surrounding Lake Victoria and the Indian Ocean coastline throughout.



Improvements in the use of bed nets by children below age 5 to prevent malaria



Malnutrition: Reductions in the number of children who are underweight over time



conclusions

Results are useful in the decentralized health planning to address inequalities, equity in resource allocation, setting a baseline for tracking SDGs and benchmarking of counties. The modelling framework can be adapted to other countries in LMICs

Link to publications

Child mortality

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Malaria

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