

## Publication

## Assessing seasonal variations and age patterns in mortality during the first year of life in Tanzania

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Lack of birth and death registries in most of developing countries, particularly those in sub-Saharan Africa led to the establishment of Demographic Surveillance Systems (DSS) sites which monitor large population cohorts within defined geographical areas. DSS collects longitudinal data on migration, births, deaths and their causes via verbal autopsies. DSS data provide an opportunity to monitor many health indicators including mortality trends. Mortality rates in Sub-Sahara Africa show seasonal patterns due to high infant and child malaria-related mortality which is influenced by seasonal features present in environmental and climatic factors. However, it is unclear whether seasonal patterns differ by age in the first few months of life. This study provides an overview of approaches to assess, capture and detect seasonality peaks and patterns in mortality using the infant mortality data from the Rufiji DSS, Tanzania. Seasonality was best captured using Bayesian negative binomial models with time and cycle dependent seasonal parameters and autoregressive temporal error terms. Seasonal patterns are similar among different age groups during infancy and timing of their mortality peaks do not differ. Seasonality in mortality rates with two peaks per year is pronounced which corresponds to rainy seasons. Understanding of these trends is important for public health preparedness.

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