Methods.

Data source.

In 2019, the Kenya Bureau of Statistics (KNBS) released population projections for each county spanning from 2020 to 2030. Utilizing these projections for the years 2020 to 2025, we calculated the annual population growth rate for each county. By averaging the population growth rates, we derived population estimates for each county for the years 2014 to 2018.   
In order to ascertain the population figures for the years 2014 through 2018, a methodical approach was employed. The process involved successive calculations based on the application of the population growth rates obtained from the years 2020 to 2025 projections. The formula utilized for each year was expressed as follows:

Where current year and is the previous year. Thus, for example the population for the year 2018 was calculated as;

This equation was iteratively applied to derive the populations for the subsequent years. Employing a similar logic, the population for the year 2017 was determined by applying the formula to the population of 2018, and so forth.

The population figures for 2019 were available, given the national census conducted in that year. Furthermore, the population projections also supplied the figures for 2020 and 2021.

Data preparation

In order to fit the time series linear regression model, the time series should be stationary to avoid spurious regression as the resulting model. Also, stationary data can lead to violation of regression assumptions including heteroskedasticity and autocorrelation, which compromise the reliability of coefficient estimates. Thus, we employed differencing at order one for each of these (human, goat, cattle, sheep, and camel incidence) time series. This differentiating process facilitated the transformation of the data into a stationary form, rendering it more amenable for the application of our linear regression model.

Where represents the original time series at time .