

R Data Analysis Project

Weather and Malaria Incidence and Intervention Data for Mozambique

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The write-up should include a background section with a literature review and citations (at least one page), a description of the problem and data (approximately one page), results (no page expectation, but there should be 4-5 figures and at least one should be a map), conclusions, references and any supplemental material you choose to include.

we can assume that the IRS (indoor residual spraying) variable has 75% protection 6 months after the start date. The ITNs (insecticide treated bednets) are thought to be 60% protective 24 months after the start date. When merging these data, these coverages need to be applied to the subsequent weeks after the start week. For simplicity, you can assume a constant decrease per week to achieve the protection described above, where we can assume that IRS and ITNs start with 100% effectiveness at the start week

The incidence data today are likely related to exposure up to 14 days prior and the effects of weather and temperature, etc, are likely related to exposure at an uncertain time before that. This time is typically thought to be 2, 4 or 8 weeks from the day the person showed up in the health center. You are expected to create the lagged variables and explore their relationships with malaria incidence.

Background (1 page)

malaria affecting a lot of people life threatening, # people kills Mozambique stats preventions include insecticide treated bed-nets, indoor residual spraying seasonal effect, rainy season, mosquitos breed in standing water after rain they breed and increase in number which increases bites/infections some time after rain we see rise in cases which is unknown, and something that will be explored in this analysis

Data (~ 1 page)

The data for this analysis include incidence data, malaria intervention data, weather data, and spatial data. The incidence data contains information on the weekly number of cases of malaria reported by districts along with information about each district, and spans from 2010 to 2017. The district information includes square kilometers, province, region, population, and x and y coordinates. Incidence was calculated by dividing cases by the population and multiplying by 1000. The intervention data contains the week and year for each district that the two preventative interventions occurred— insecticide treated bed nets (ITN) and indoor residual spraying (IRS). The weather data originally contained daily information by district on five weather measures— rainfall, temperature, relative humidity, saturation vapor pressure deficit, and surface barometric pressure. This data was averaged by week in order to be merged with the other datasets. Lastly the spatial data was geospatial information on the country of Mozambique in order to map the other data spatially. Data was merged based on the district, week, and year.

In order to capture the seasonal effect of weather on malaria trends, the weather information has a lagged relationship with the incidence data. With this lag being unknown, the incidence data was lagged by two, four, and eight weeks to the weather data. This analysis also explored the protection of the interventions over time, in which 100%

protection from malaria is assumed at the start week that slowly decays. RATES OF DECAY.

Results

Conclusions

References

Appendix