# Shiny App for Interactive Visualization of Malaria Burden in Ethiopia

https://mbeshir.shinyapps.io/Malaria_Burden_app/.

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**Problem Statement**

Malaria is a life-threatening disease that is caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. In 2019, there were an estimated 89 million people encountered as prevalence of malaria worldwide, and the disease caused approximately 333,769 deaths. The burden of malaria is highest in sub-Saharan Africa, where the disease is a leading cause of morbidity and mortality.

The aim of this project is to create a data visualization tool that can be used to explore the burden of malaria in Ethiopia at a subnational level. The tool should allow users to visualize trends in malaria burden over time, as well as differences in burden across different regions of the country. The tool should also allow users to explore differences in burden by sex and by different metrics, such as incidence, prevalence, and disability-adjusted life years (DALYs).

**Proposed Solution**

To address the problem, I propose developing a Shiny app that uses data from the Global Burden of Disease study to visualize the burden of malaria in Ethiopia.

The app will allow users to interact with the data in several ways, including:

1. Selecting different measures of malaria burden (e.g., incidence, prevalence, DALYs).
2. Selecting different subnational regions of Ethiopia to visualize.
3. Selecting different time periods to visualize.
4. Selecting different genders to visualize.

The app will include several visualizations, including:

- A line chart showing trends in malaria burden over time for the selected regions.
- A heat map showing differences in malaria burden across the selected regions.
- A table showing the raw data underlying the visualizations.

The app will be built using R and the Shiny package and will use data from the Global Burden of Disease study. The app hosted on a Shiny server and can be accessible via a web browser (https://mbeshir.shinyapps.io/Malaria_Burden_app/ ). The app will be designed to be user-friendly and intuitive, with clear instructions on how to use the app and can be easily interpret the results from plots.

**Impact**: The impact of the app will be assessed by tracking changes in the use of malaria prevention and for treatment interventions in Ethiopia. Specifically, the app can be used to inform malaria control

strategies at the national and subnational level, with the goal of reducing the burden of malaria in Ethiopia.

**Description about the App.**

The app has a UI section where the user can select various options such as gender, metric, and region, and it has also included a server section where the selected data is filtered and plotted using ggplot2.

**Here's a summary of what the code does:**

- The necessary packages are loaded: shiny, ggplot2, and dplyr – If you were not already install it, please use the following commands **`install. package(package_name)`**
- The malaria burden data for Ethiopia is read from a CSV file and stored in a data frame called "df".
- The UI is defined using the fluidPage() function, which creates a Shiny app layout that contains a title, sidebarPanel, and mainPanel. The sidebarPanel contains several input controls (radio buttons and a checkbox group) that allow the user to select various options for filtering the data. The mainPanel contains several tabs that display the plots and raw data table.
- The server is defined using the server() function. It contains a reactive() function that filters the data based on the user's selected options. Two output functions render the line plot and heat map using ggplot2.
- The Shiny app is run using the shinyApp() function.