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The Number of Malaria Cases Among Various Amounts of Rainfall

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Introduction:

Malaria, a major global health concern, is influenced by environmental factors, with rainfall impacting the breeding and survival of malaria-transmitting mosquitoes. Understanding this relationship is crucial for effective public health strategies. The study aims to analyze data, uncover patterns, and contribute insights to inform targeted interventions. By delving into the intricate connections between malaria and precipitation, the research seeks to advance our understanding of environmental determinants in malaria transmission, facilitating more nuanced approaches to combat this infectious disease on a global scale. The alternative hypothesis states countries with higher rainfall will have a higher amount of malaria cases. The null hypothesis states there is no relationship between the amount of rainfall and number of malaria cases.

Materials and Methods:

Research and data was acquired via the World Health Organizations 2022 “World Malaria Report”. The WHO was able to accumulate accurate and extremely detailed data regarding the statistics in malaria cases for nearly every country, some countries even spanning over the course of multiple decades. Data regarding the amount of rainfall in the countries, this research study is interested in, was obtained from numerous sources, such as the Climate Change Knowledge, National Weather Surface, and Statista.

Malaria: Disease that changes the shape, rigidity, and permeability of red blood cells

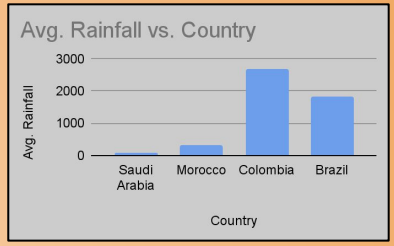
Rainfall: The quantity of rain falling within a given area in a given time

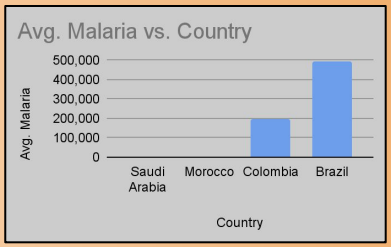
Results:

Country	P-value
Saudi Arabia	0.0230792657
Morocco	0.00000004864
Colombia	0.00000336065
Brazil	0.00000025408

The T-test has a P-value of 0.023 for Saudi Arabia and lower than five decimal places for Morocco, Colombia, and Brazil. A P-value less than 0.05 is considered statistically significant so the null hypothesis had to be rejected.

A correlation test was also conducted for each individual country. The R-value concluded there is no relationship among different amounts of rainfall and the number of malaria cases in Morocco, Colombia, and Brazil. For a correlation test the coefficient should be over 0.8 to be considered a strong relationship. Saudi Arabia has a R-value with a coefficient of 0.385 which falls into the weak category.





Literature Cited:

Climate Change Knowledge Portal: Home, https://climateknowledgeportal.worldbank.org/. Accessed 15 November 2023.

“World malaria report 2022.” World Health Organization (WHO), 8 December 2022, https://www.who.int/publications/i/item/9789240064898. Accessed 15 November 2023.

Conclusion:

Based on the results, there is a statistical significance between number of malaria cases among various amounts of rainfall so the null hypothesis is rejected. Because the null hypothesis is rejected, the alternative must then be accepted. Countries with higher rainfall will have a higher amount of malaria cases. The study concludes that mosquitoes who transmit malaria live in rainier conditions. With more mosquitoes there is more malaria. This concludes a positive correlation between rainfall and number of malaria cases. Some errors that could have occured in this study could come from incorrect measurement of malaria cases and rainfall. Since this study used past data, implications could have arose.