

Assessing the Relationship Between Demographics and Severe Malaria Risk in Nigeria: A Causal Inference Approach with Doubly Robust Estimator

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BACKGROUND

- According to World Health Organization in 2022, Nigeria has the highest burden of Malaria in the world.
- Severe malaria occurs when infections are complicated by serious organ failures or abnormalities in the patient's blood or metabolism. It is a serious life-threatening disease, because of its many complications that combine to be the causes. In Nigeria, malaria remains a significant public health challenge with estimated 97 million cases and 300,000 deaths annually. Severe malaria is caused by the combination of various health conditions like headache, anemia, liver, prostration, cold, fever, and some serious health problems.

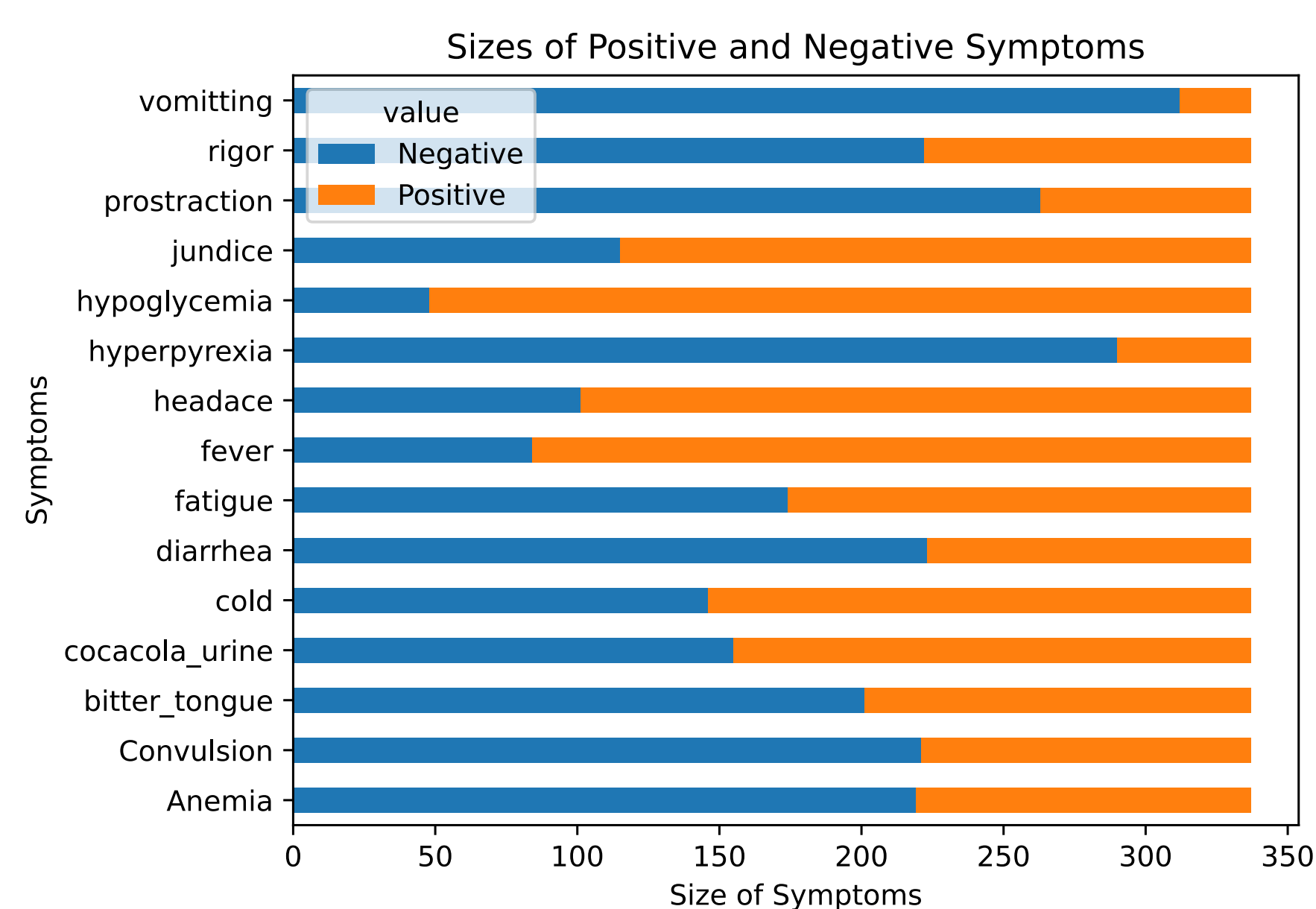
OBJECTIVES

- Understand doubly robust estimator formular as a causal inference method.
- Analyze the sample size of the variables (symptoms, demographics, and severe malaria) under study.
- Average treatment effect with 95% confidence interval for the demographic variables under study.
- Determine the probability risk of demographics to severe malaria using causal inference.

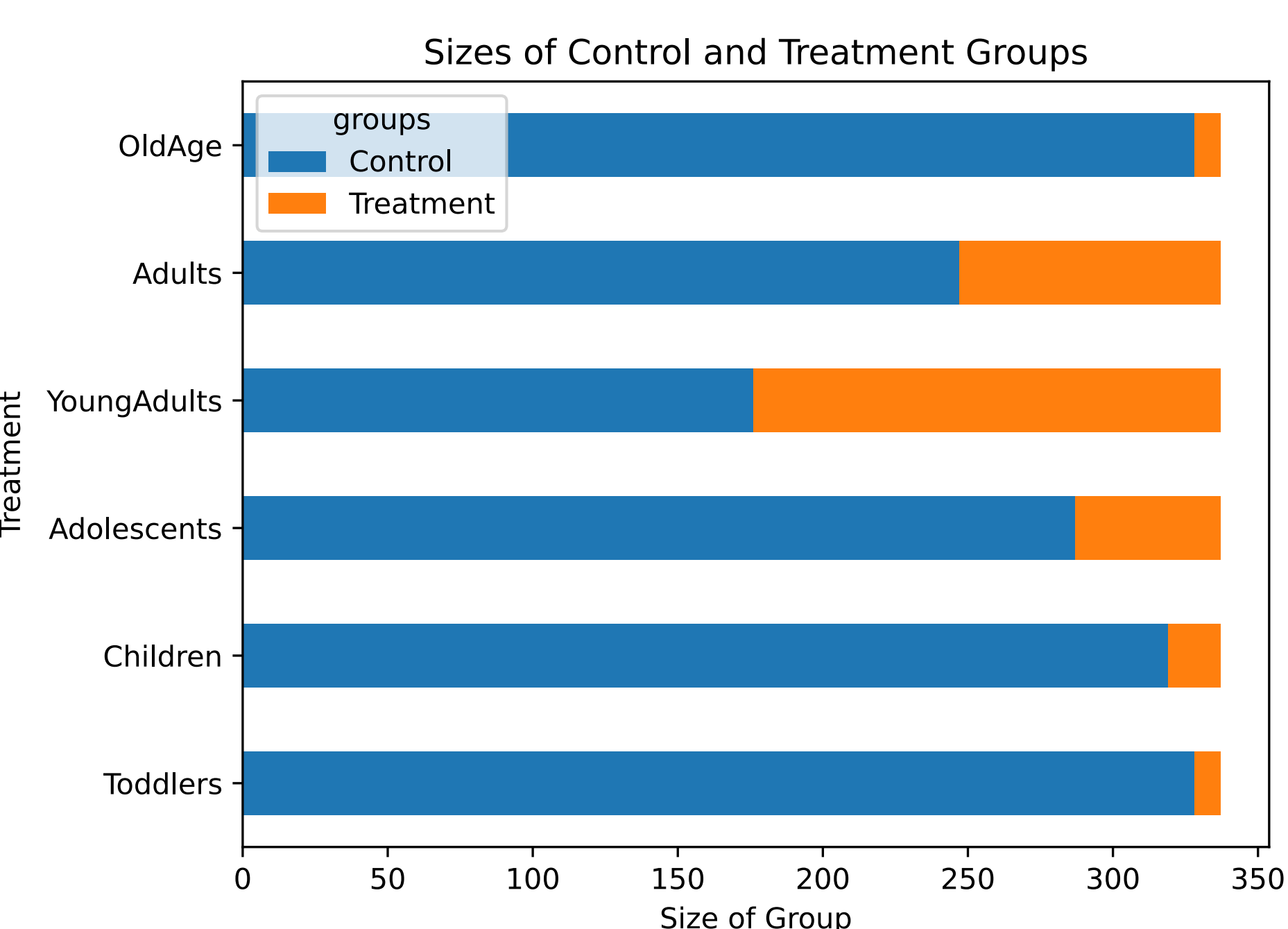
DOUBLY ROBUST ESTIMATOR FORMULAR

$$\hat{\theta}_{DR} = \hat{\theta}_{TM} + \frac{Y - \hat{Q}(X)}{\hat{e}(X)}$$

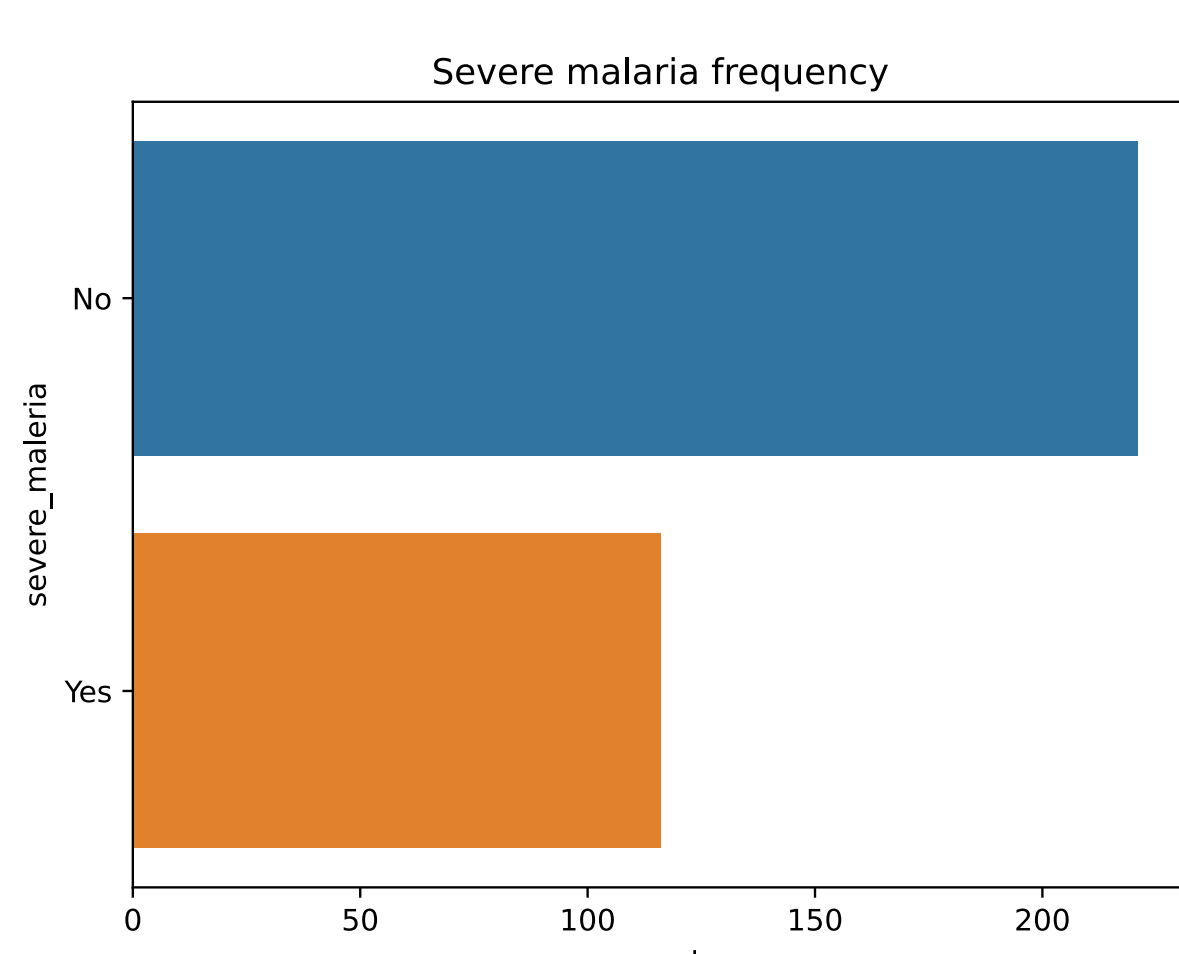
SYMPTOMS SAMPLE SIZE



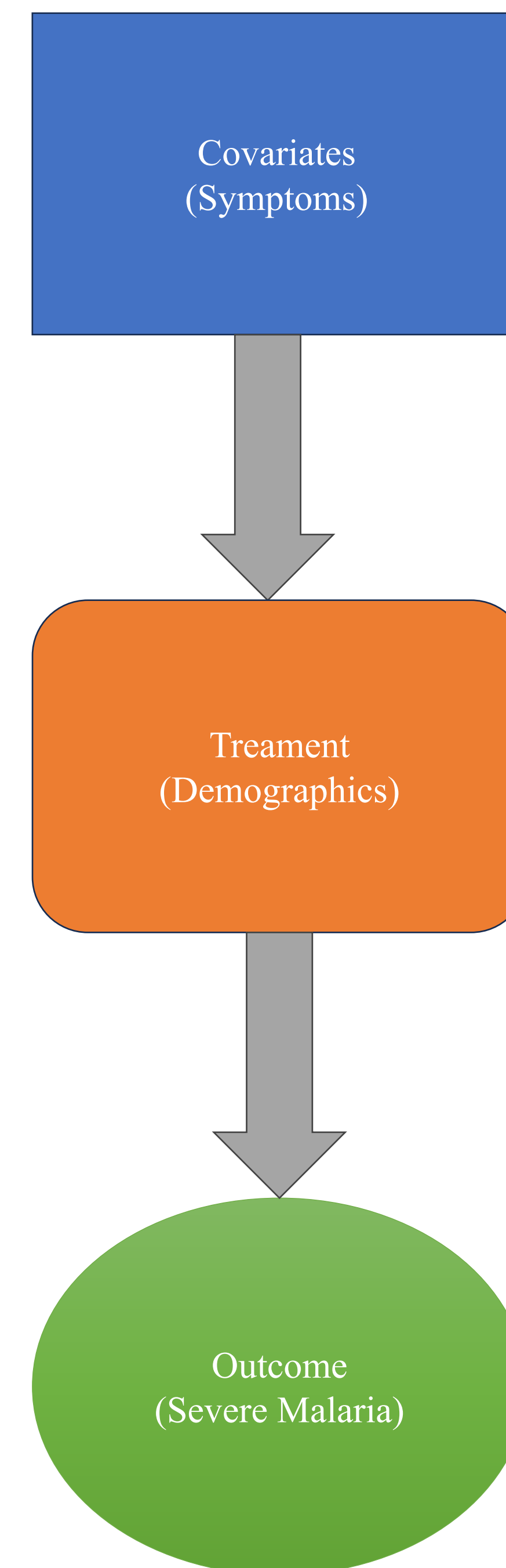
DEMOGRAPHICS SAMPLE SIZE



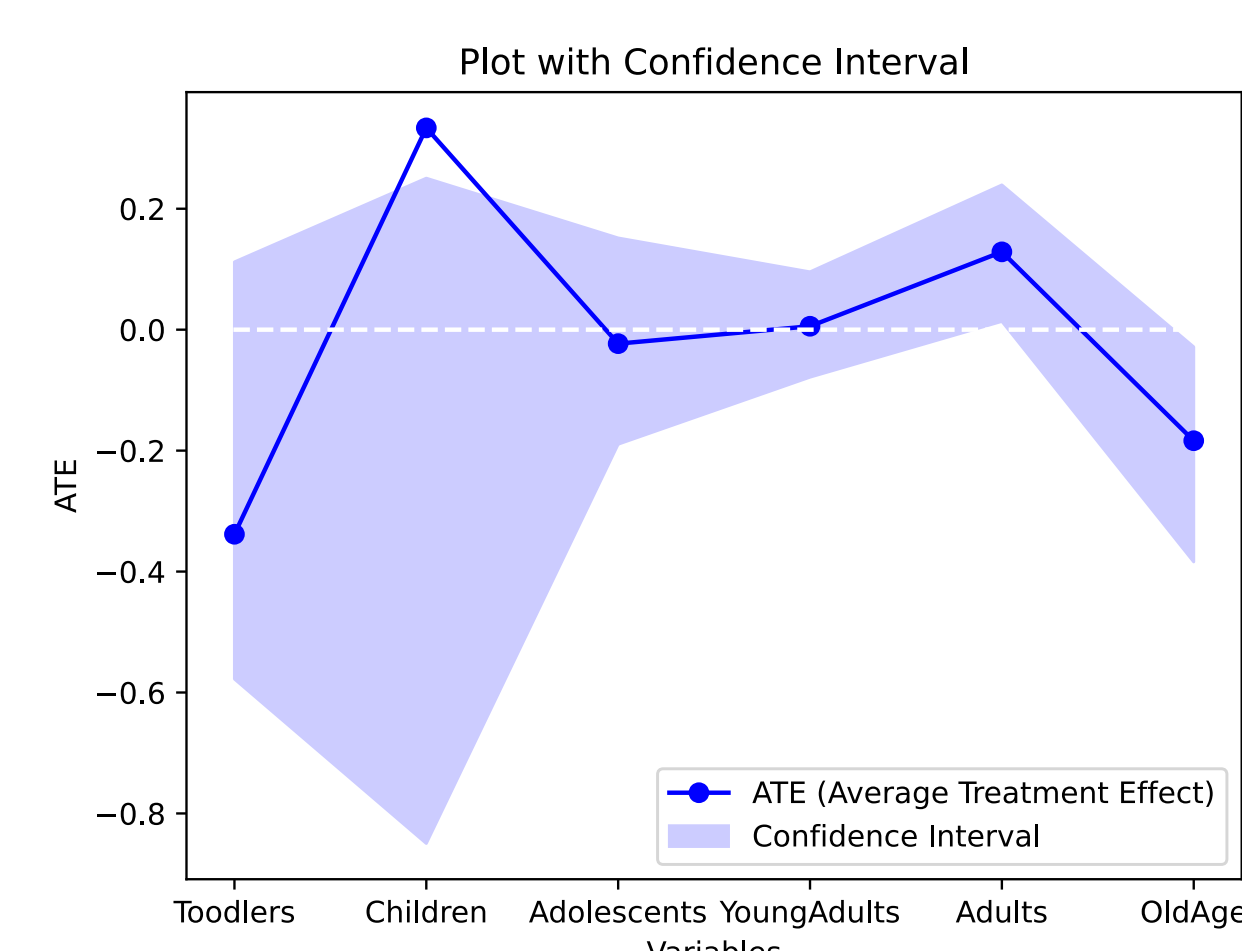
SEVERE MALARIA SAMPLE SIZE



METHODOLOGY



AVERAGE TREATMENT EFFECT WITH C.I



RESULTS

- There is 33.36% of increased risk in severe malaria for Children
- There is 12.87% of increased risk in severe malaria for adults
- There is 0.56% of increased risk in severe malaria for young adults.
- There is a low risk of severe malaria for Adolescents, Old

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