



# Axis Investment and Consultancy



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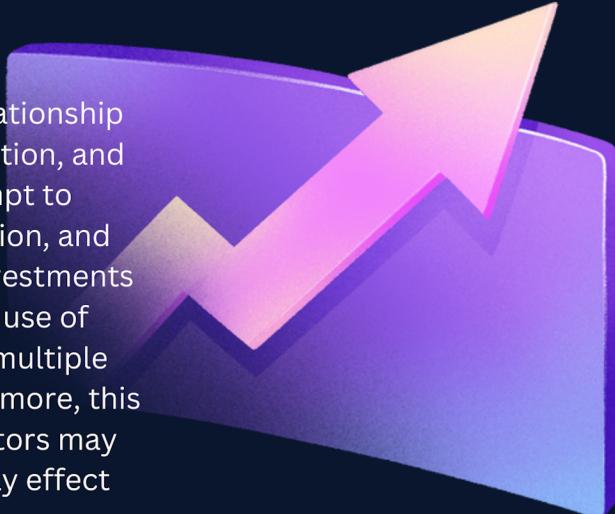
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# INTRODUCTION

The project's purpose is to investigate the relationship between East African countries' health, education, and financial indices, as well as GDP. We attempt to understand the prevalence of health, education, and finance aspects on GDP in order to aid Axis Investments and Consultancy by visual analysis and the use of statistical models such as linear regression, multiple regression, and correlation coefficient. Furthermore, this study enlightens investors on how health factors may influence the labour force, which may directly effect productivity.

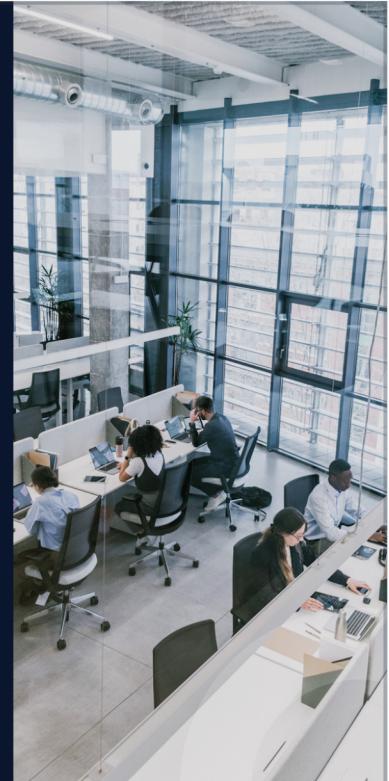


# BUSINESS UNDERSTANDING

Axis Investment and Consultancy is a world-leading Wealth Management, Investment Solutions, and Consultancy company that believes that people are at the core of any business and determine if a business is successful or not. They are looking to invest in a business but are also cognizant of the economic health (GDP per capita) of the country they are based in. They believe that the health metrics of the population of a given country can determine if a country is doing well economically.

The information gained from analyzing the health and social metrics of countries across the world and the GDP per capita of the said countries can help the company gain an edge in the global market by giving a clear picture of what country they can invest in due to the labor force.

This can be done by collecting health and key economic data from relevant and trusted global organizations that can be analyzed to give important information to enable business decisions to be made accurately.



# OBJECTIVE

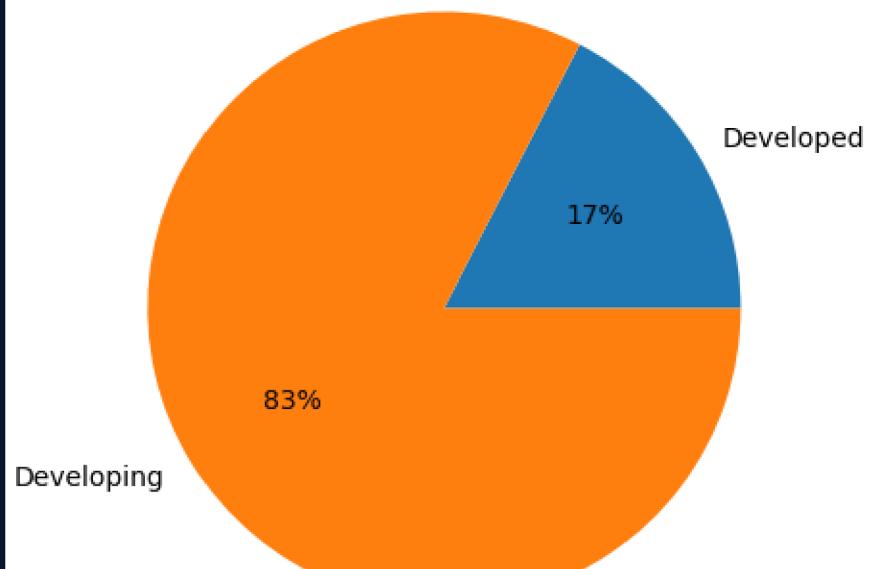
## MAIN OBJECTIVE

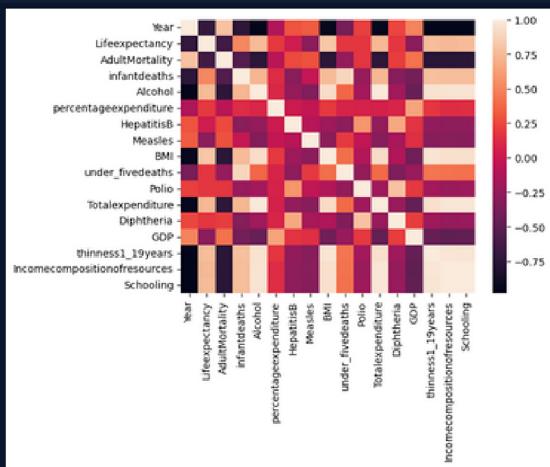
To collect diverse health, social, and economic data on various nations throughout the world from recognized and reliable sources, and then apply statistical analytic abilities to discover and investigate numerous links between health and social features and GDP per capita.

To provide greater and more valuable economic insight into the global economic scene through our research.

To track how Kenya is performing on the world stage through analysis.

Percentages of developed vs. developing countries.





The correlation heatmap shows how various features in the data set are correlated with each other. The darker colors at the intersection of the features show a strong negative correlation value. This means that they may be inversely proportional. The lighter or closer to white the colors are show a stronger positive correlation and may indicate that the features are more positively correlated.

# HYPOTHESIS TESTING

1. Immunization Coverage and GDP Null Hypothesis (H0) There is no significant relationship between a country's immunization coverage and its GDP. Alternative Hypothesis (H1): There is a significant relationship between a country's immunization coverage and its GDP.
2. Alcohol Consumption and GDP: Null Hypothesis (H0): There is no significant relationship between a country's level of alcohol consumption and its GDP. Alternative Hypothesis (H1): There is a significant relationship between a country's level of alcohol consumption and its GDP.
3. Education Level and GDP: Null Hypothesis (H0): There is no significant relationship between a country's average education level and its GDP. Alternative Hypothesis (H1): There is a positive correlation between a country's average education level and its GDP.
4. Government Health Expenditure and GDP: Null Hypothesis (H0): There is no correlation between the percentage of total government expenditure a country allocates to health and its GDP. Alternative Hypothesis (H1): There is a positive correlation between the percentage of total government expenditure a country allocates to health and its GDP

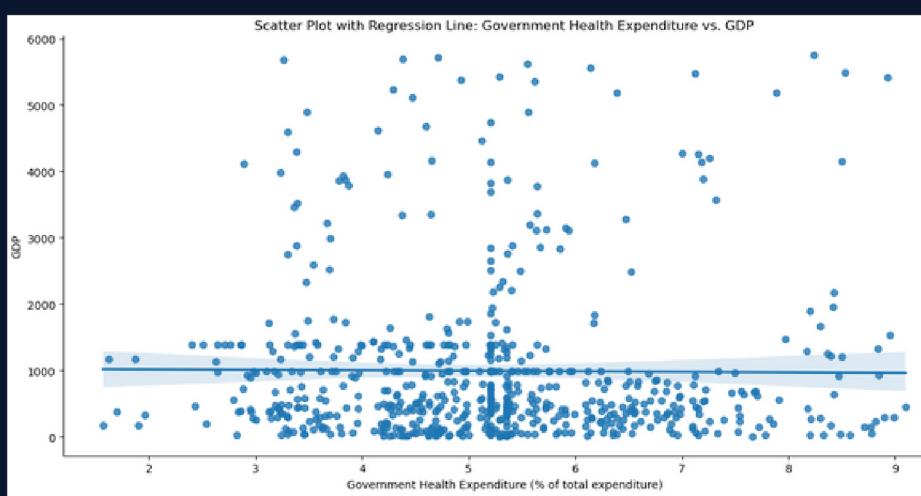
# MODELING

This data study aims to help investors comprehend the health aspects that influence Kenya's GDP. To gain a better knowledge of health issues, this study examines Kenya's health metrics in connection to GDP growth. This will be a model to comprehend the multiple regression of health measures to Kenyan GDP as it considers the health of the labor force.

### **Government Health Expenditure and GDP:**

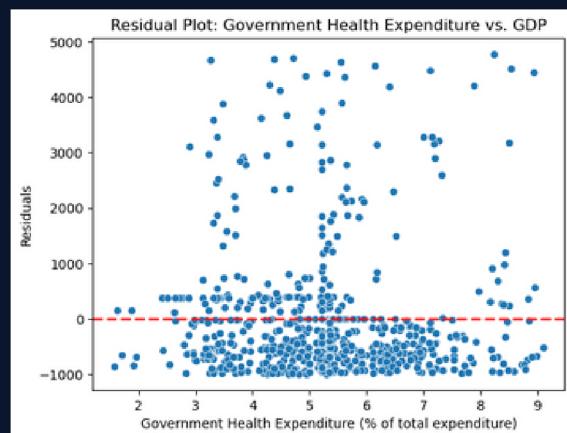
**Null Hypothesis (H0): There is no correlation between the percentage of total government expenditure a country allocates to health and its GDP.**

**Alternative Hypothesis (H1): There is a positive correlation between the percentage of total government expenditure a country allocates to health and its GDP**

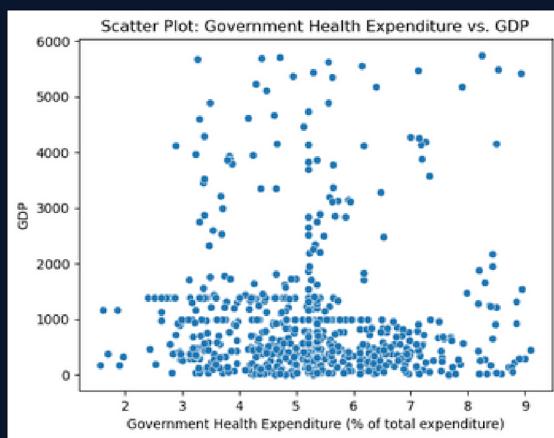


**Examine the scatterplot. Is there any visual pattern or trend between government health expenditure and GDP? It's vital to see if there is a linear relationship between the two variables which we conclude there is no significant visual pattern**

**Creating a residual plot to visualize differences between the observed and predicted values to check for any patterns or trends:**



# SCATTER PLOT



#### Correlation coefficient:

The correlation coefficient is about -0.009. This number shows a very modest negative association between government health spending and GDP. The negative sign indicates a minor tendency for increased government health spending to be related to somewhat lower GDP.

#### P-value:

The p-value is about 0.818. This p-value exceeds the conventional significance level of 0.05. Therefore, you would fail to reject the null hypothesis. In that, there is no correlation between the percentage of total government expenditure a country allocates to health and its GDP.

#### Hypothesis Testing Conclusion:

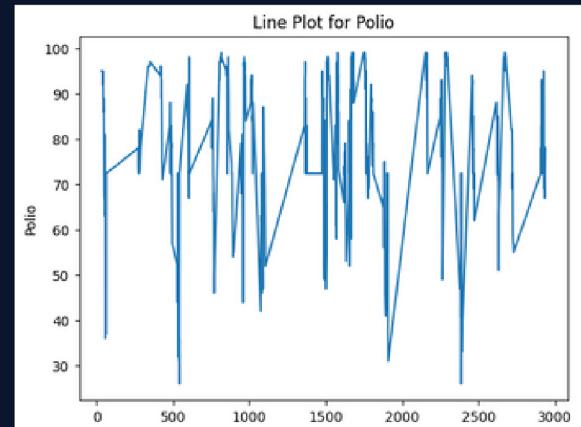
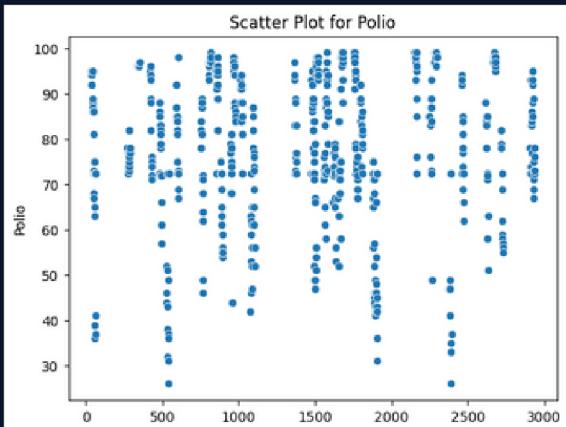
Based on the p-value, there is insufficient evidence to reject the null hypothesis. The relationship between government health expenditures and GDP is not statistically significant.

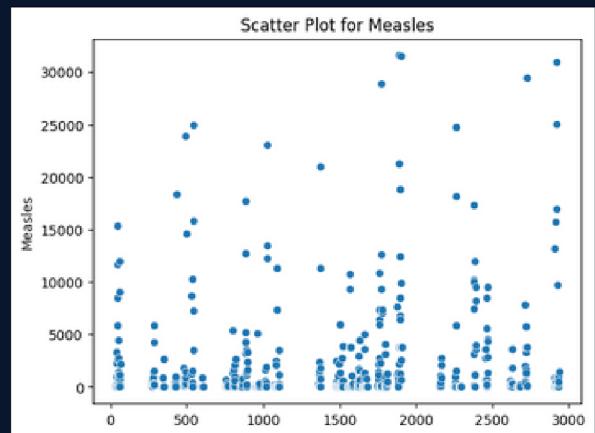
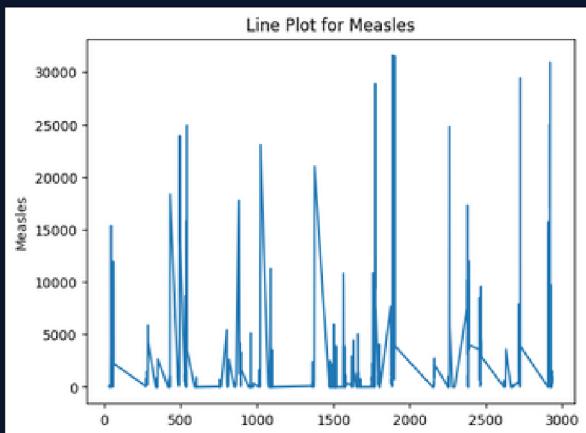
#### Considerations:

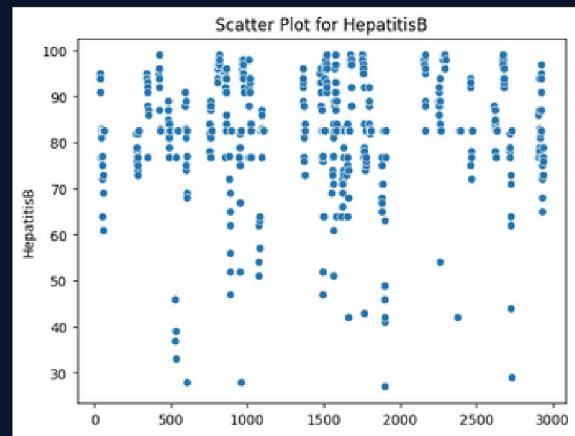
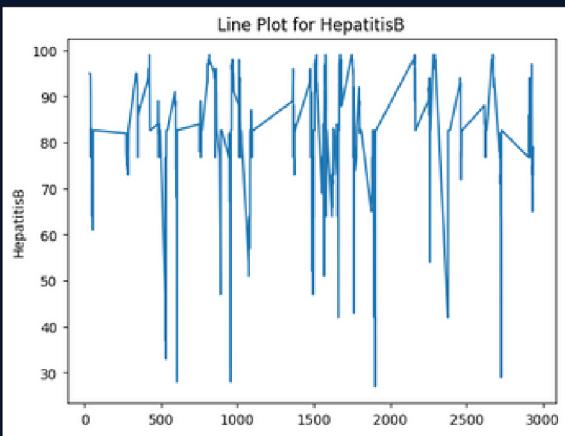
Keep in mind that correlation does not always imply causality. Even if the association is statistically significant, it does not always imply that government health spending directly influences GDP.

**Immunization Coverage and GDP Null Hypothesis (H0) There is no significant relationship between a country's immunization coverage and its GDP. Alternative Hypothesis (H1): There is a significant relationship between a country's immunization coverage and its GDP**

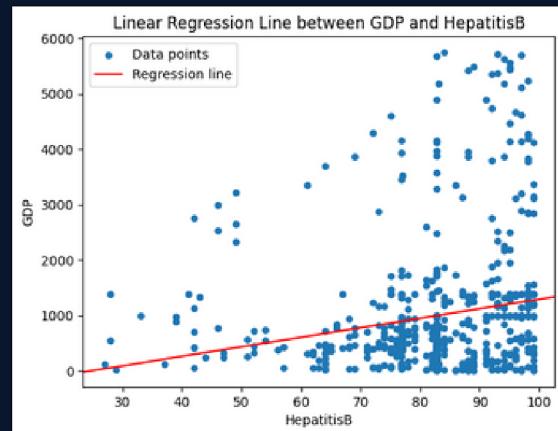
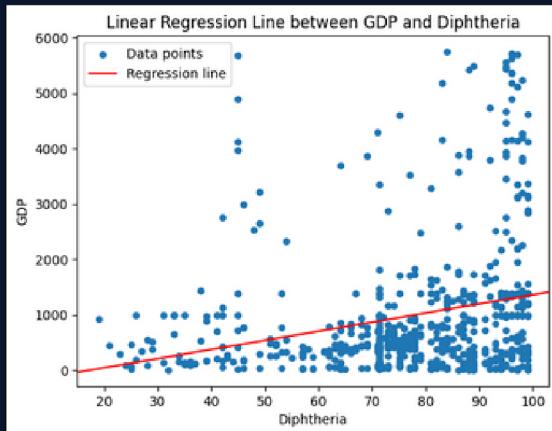
# Immunization and GDP:







## LINEAR REGRESSION LINE



Based on our findings The f\_pvalue for Hepatitis B immunization we identified the f\_pvalue as being much lower than the significance level thus proving that the immunization of Hepatitis B has a statistically significant relationship with the GDP of the African countries having an intercept of -422.81 and a gradient of 17.18 this is to show that for every unit increase in the number of Hepatitis B immunization there's a 17.18 increase in GDP of the country

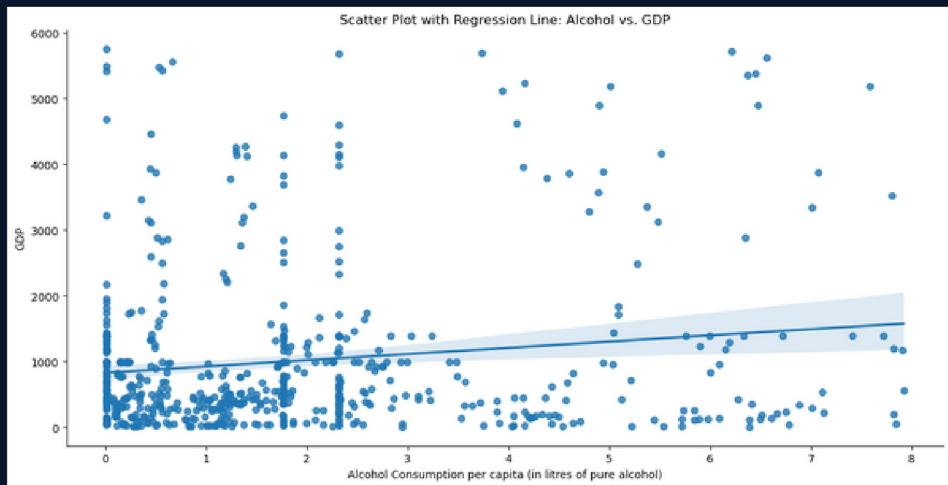
We reject the null **Hypothesis (H0) There is no significant relationship between a country's immunization coverage and its GDP.**

## Alcohol Consumption and GDP

**Null Hypothesis (H0): There is no significant relationship between a country's level of alcohol consumption and its GDP.**

**Alternative Hypothesis (H1): There is a significant relationship between a country's level of alcohol consumption and its GDP.**

## SCATTER PLOT WITH REGRESSION LINE



In the model summary printout above we can see the following things.

The model has run and has an adjusted R-squared value is 0.204. This means that it ran with a low accuracy.

The Intercept coefficient is 815.0751. This means that when value of alcohol is 0 the GDP will be at the 815.0751

The Alcohol coefficient is -10.2189. This means that when the intercept or the GDP is 0 the Alcohol will be at -10

The F-Statistic value for Alcohol is 1.80e-34. This value shows the significance or how important the feature is to the model

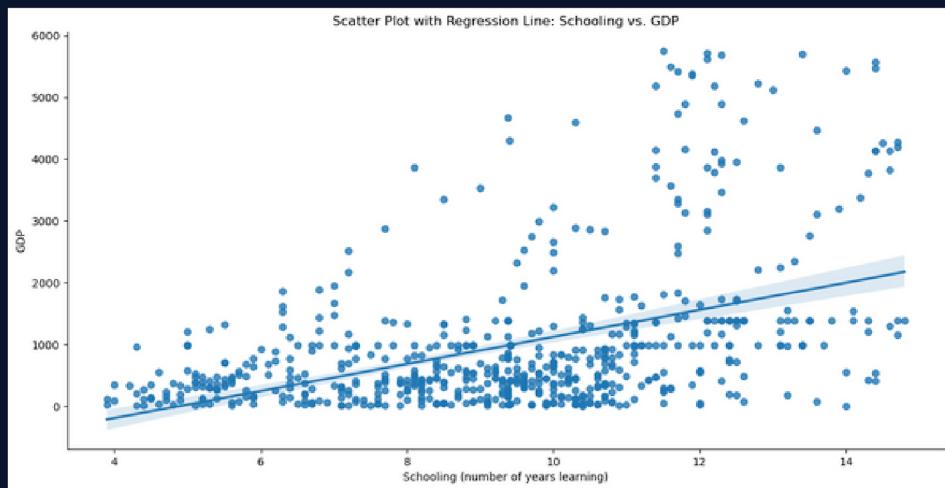
The F-Statistic value is 1.80e-34 and this is way below the alpha value which is 0.05 this means that we can reject the null value. This is because we can determine that there is a significant relationship between Alcohol and GDP and this means hypothesis h1 stands

## **Education Level and GDP:**

**Null Hypothesis (H0): There is no significant relationship between a country's average education level and its GDP.**

**Alternative Hypothesis (H1): There is a positive correlation between a country's average education level and its GDP.**

## SCATTER PLOT WITH REGRESSION LINE



In the model summary print out above we can see the following things.

The model has run and has an adjusted R-squared value is 0.229. This means that it ran with a low accuracy.

The Intercept coefficient is 905.4630. This means that when the value of schooling is 0 the GDP will be at the 905.4630

The Schooling coefficient is -11.8215. This means that when the intercept or the GDP is 0 the Schooling will be at -11.8215.

The F-Statistic value for Schooling is 4.74e-39. This value shows the significance or how important the feature is to the model

The F-Statistic value is 4.74e-39 and this is way below the alpha value which is 0.05 this means that we can reject the null value. This is because we can determine that there is a significant relationship between Schooling and GDP and this means hypothesis h1 stands

# CONCLUSIONS

For the hypothetical testing of the relationship between GDP and government expenditure, we discovered that the available data does not show a significant association between government health expenditure and GDP. The linear regression model provides inadequate evidence to support a relationship between these variables. Therefore, we failed to reject the null hypothesis.

For the hypothetical examination of the association between alcohol consumption and GDP, we discovered that we may reject the null hypothesis. This is because we can see that there is a strong association between schooling and GDP, implying that hypothesis h1 is supported by the f\_pvalue.

In the hypothetical testing of the association between GDP and Immunisations (Polio, Diphtheria, Hepatitis B, Measles), we discovered that we can reject

# RECOMMENDATIONS

Countries may explore diversifying their economic policies beyond simply boosting government health expenditures. While healthcare is crucial, focusing only on it may not result in significant economic growth.

## Focus on Efficiency and Effectiveness:

Instead of raising spending indiscriminately, countries may concentrate on enhancing the efficiency and efficacy of current health spending. This includes ensuring that resources are used optimally to improve health outcomes.

Diversify Investment holdings: As immunisation may not directly effect GDP in the observed dataset, investors should diversify their holdings across sectors and industries. This can help reduce the hazards linked with specific factors.

### Promote responsible drinking:

Instead of focusing primarily on reducing alcohol use for economic reasons, governments should create measures that encourage responsible drinking. This could involve public awareness campaigns, educational programs, and stronger limits on alcohol advertising.

### Invest in education.

Prioritise educational investments to increase the population's overall schooling levels. This includes money for schools, teacher training, and educational materials. A well-educated populace is likely to boost economic growth.

