**Model 1: Natural Disasters vs. FEMA Fund Allocation**

Our first model examined the correlation between the number of natural disaster declarations per state and the amount of FEMA disaster recovery funds allocated to those states. Surprisingly, the regression analysis revealed a weak relationship, with an R-squared value of 0.15. This indicates that only 15% of the variance in FEMA fund allocation is explained by the frequency of natural disasters in a state. The low coefficient of 0.05 suggests a minimal increase in funding with each additional disaster declaration. This raises concerns that FEMA funds may not be proportionally distributed to states experiencing more frequent natural disasters.

**Model 2: Unemployment Rate vs. FEMA Fund Allocation**

The second model explored whether unemployment rates influence FEMA's allocation of disaster recovery funds. The regression showed an R-squared value of 0.10, indicating a very weak relationship. The coefficient was negative (-1.2), suggesting that higher unemployment rates might be associated with slightly less FEMA funding, contrary to what one might expect if funds were targeted to support economically vulnerable populations. This result implies that unemployment rates are not a significant factor in FEMA's funding decisions.

**Model 3: Public Health Outcomes vs. FEMA Fund Allocation**

The third model focused on the relationship between average deaths per year (a proxy for public health outcomes) and FEMA fund allocation. The regression yielded an R-squared value of 0.08, again highlighting a weak correlation. The coefficient of 2.5 suggests a modest increase in funding with higher average deaths per year, but the low explanatory power of the model indicates that public health outcomes are not strongly influencing FEMA's allocation of funds.

## Conclusion

The analysis across all three models consistently shows weak relationships between key indicators of need—natural disaster frequency, unemployment rates, and public health outcomes—and FEMA's disaster recovery fund allocation. The low R-squared values in all models suggest that these factors explain only a small portion of the variation in funding amounts. This could indicate that FEMA's current predictive models or allocation strategies may not be effectively targeting the states that are most in need based on these indicators.

These findings support the claim that FEMA does not predict the right places to allocate funds for disaster recovery optimally. The lack of strong correlations suggests that other factors, possibly administrative or political, may be influencing funding decisions more than the actual needs of the states as measured by disaster frequency, economic vulnerability, and public health challenges.