**ANALYZING INTERACTION EFFECTS/FACTORS – POPULATION DENSITY VS. INFRASTRUCTURE VARIABLES**

1. mean\_population\_density vs. camp\_count

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mean\_population\_density is a strong and significant predictor of injuries

camp\_count and the interaction term are not significant predictors

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1. mean\_population\_density vs. barren\_count

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mean\_population\_density is a strong, significant predictor of injuries.

barren\_count alone and the interaction term are not significant predictor of injuries.

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1. mean\_population\_density vs. suburban\_count

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mean\_population\_density is a strong predictor of injuries.

Areas with higher population density are expected to have significantly more injuries.

significant negative interaction term (p=0.006) -> suggests that the positive effect of mean\_population\_density on injuries diminishes as suburban\_count increases, and vice versa.

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1. mean\_population\_density vs. urban\_count

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Both variables and int. term statistically significant -> strong predictor of injuries

Result: Statistically significant (p=0.046), indicating that the combined effect of population density and urban count significantly moderates injuries

negative interaction term -> as both mean\_population\_density and urban\_count increase, their combined effect on injuries diminishes; implies that the influence of one variable (e.g., population density) on injuries is weaker in areas with high urban count

unlike in combined multivariate model, urban\_count is strong predictor

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1. mean\_population\_density vs. tent\_count

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Statistically significant (p=0.000) -> population density is a strong predictor of injuries.

Statistically significant (p=0.010) -> suggesting that tent count has a meaningful positive effect on injuries

significant negative interaction term -> suggests that as both mean\_population\_density and tent\_count increase, their combined effect on injuries diminishes

in areas with both high population density and high tent counts, the increase in injuries is less pronounced compared to areas where one variable is high and the other is low (dampening effect)

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Summary:

Pop density vs. suburban count, urban count, and tent count have significant int. effects

ADDED SIGNIFICANT INTERACTION FACTORS to combined multivariate:

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Did not affect R^2, coef, and significance much

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Total predicted injuries: 123510.82

Total surgeries: 29025.04

Total injuries 95% CI: [0.61, 4833950538114319515648.00]

Total surgeries 95% CI: [0.14, 1135978376456864268288.00]

Dropped insignificant Variables (barren count, camp count):

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Total predicted injuries: 123967.43

Total surgeries: 29132.35

Total injuries 95% CI: [5828.53, 8153862543557633024.00]

Total surgeries 95% CI: [1369.70, 1916157697736044288.00]

Dropping infrastructure insignificant Variables (barren count, camp count) WITHOUT adding int. factors:

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Total predicted injuries: 71129.53

Total surgeries: 16715.44

Total injuries 95% CI: [7431.26, 728057.77]

Total surgeries 95% CI: [1746.35, 171093.58]

Dropping other insignificant Variables (barren count, camp count, civil unrest count, other attack count) WITHOUT adding int. factors:

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A graph with green and blue lines

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Total predicted injuries: 97917.92 -> **closest to ~90k – 100k?**

Total surgeries: 23010.71

Total injuries 95% CI: [11011.66, 935530.52]

Total surgeries 95% CI: [2587.74, 219849.67]

**IMPLEMENTING STEP-WISE REGRESSION**

predictor with the highest p-value (p>0.05) or the smallest impact on model fit removed first

Recalculate the model and AIC/BIC.

Stop when all predictors are significant or when removing a variable worsens the model fit (AIC, (Akaike Information Criterion) /BIC (Bayesian Information Criterion) increases)

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Total predicted injuries: 80926.86

Total surgeries: 19017.81

Total injuries 95% CI: [6935.90, 30896017357.06]

Total surgeries 95% CI: [1629.94, 7260564078.91]

Add tent\_count back in:

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Total predicted injuries: 141045.77

Total surgeries: 33145.76

Total injuries 95% CI: [5086.79, 20783439954.40]

Total surgeries 95% CI: [1195.40, 4884108389.28]