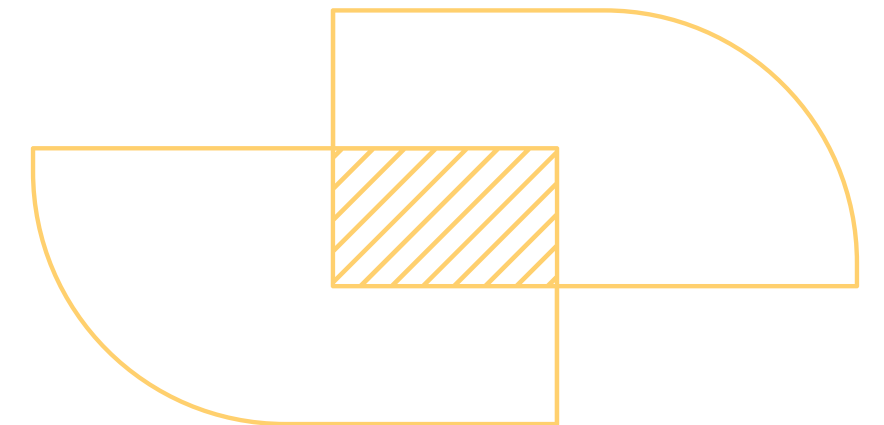# STUDY ON THE RELATIONSHIP BETWEEN CONTAINMENT RATES AND ADOPTION RATES AND MORTALITY RATES IN PUBLIC ANIMAL SHELTERS

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General Background Information

2015年，農委會修正《動物保護法》，宣布自2017年2月6日起，全國公立動物收容所禁止撲殺「經通知或公告逾12日而無人認領、認養或無適當之處置」的動物，曾經的12夜悲歌就此消失，但是零撲殺會帶來什麼問題呢？據農委會統計，全國遊蕩犬數量在110年已達159,697隻，且相對於107年的146,773不減反增。這意味著收容所的動物只會不斷增加，各地收容所都面臨超收的問題，政府投入相當多的預算依據「源頭減量、改善收容、多元認養」原則，推動各項措施，但成效有限。

零安樂死政策——流浪動物的新天堂樂園？（上）- 報導者 The Reporter

2017年2月，零安樂死政策將正式實施，表面上看來似乎是台灣動保運動的一大里程碑。然而，關乎流浪動物的諸多問題仍未解決。倉促上路的結果，是對動物福利造成更多的傷害，衝擊最深的，將是第一線工作人員。

twreporter.org

Motivation

▶ 提昇動物福利

動物福利是社會文明發展的指標之一，而其中收容所的運行與管理又是極其重要的一環。然而，台灣現行制度下，收容所的狀況卻沒有那麼樂觀

- 有限的資源
- 收容率過高

》

- 照護品質下降
- 死亡率升高

若能了解收容率、認領養率與死亡率的關係，能制定有效的政策，以改善收容所的現況。

Methods

▶ **Data Cleaning and Preprocessing**

- Remove data points that fall outside 1.5 times the IQR to ensure robust analysis.
- Handle missing values using imputation (mean, median, or KNN) or remove rows with extensive missing data.

▶ **Exploratory Data Analysis**

- Pairwise Correlations: Analyze relationships between key variables using correlation matrices and scatter plots.
- Descriptive Statistics: Summarize central tendencies and spread for numeric columns.
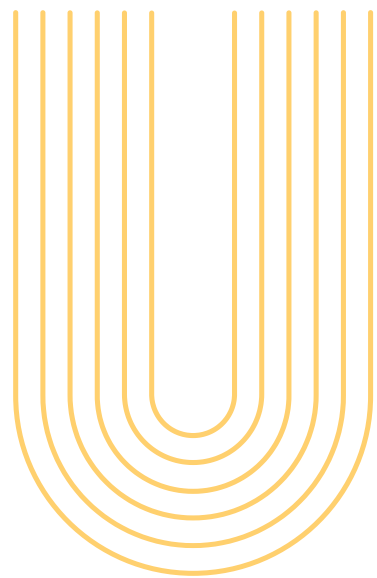
Methods

▶ Statistical Analysis

- Regression Modeling:
  - Perform linear regression to assess the predictive power of containment and adoption rates on mortality rates.
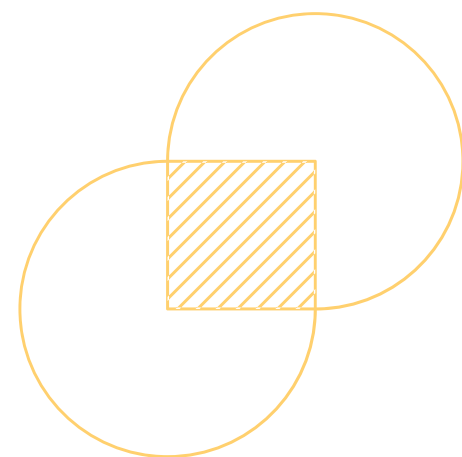
▶ Advanced Visualizations

- Heatmap: Monthly Average Mortality Rates by Year

- Time Series of Mortality Rates by Region

Research Purpose

喚醒公眾對流浪動物的關注與反思。動物收容所的高死亡率問題往往被社會忽視。本研究不僅希望透過數據揭露現狀，更期望以數據引發公眾對流浪動物議題的關注，促進更多人參與解決流浪動物問題的行動。

數據分析

Calculate correlation coefficients

Adoption Rate vs Mortality Rate:

Correlation ≈ 0.22, P-value = 2.8e-22

Containment Rate vs Mortality Rate:

Correlation = 0.15 P-value = 3.2e-10

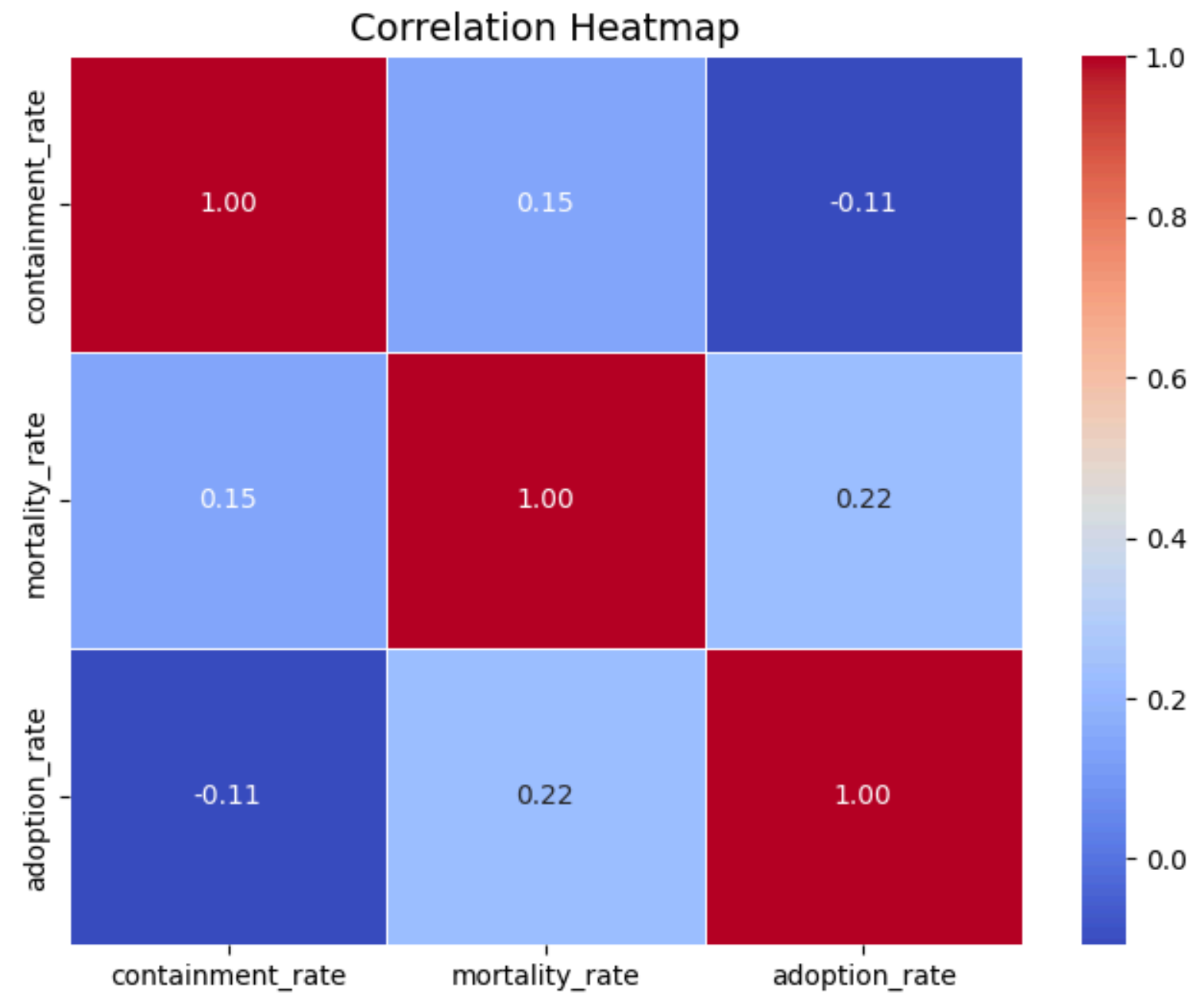認養率與死亡率之間存在輕微正相關，且P值極低，顯示此相關性具統計顯著性。

收容率與死亡率之間的正相關更低，且同樣具統計顯著性。

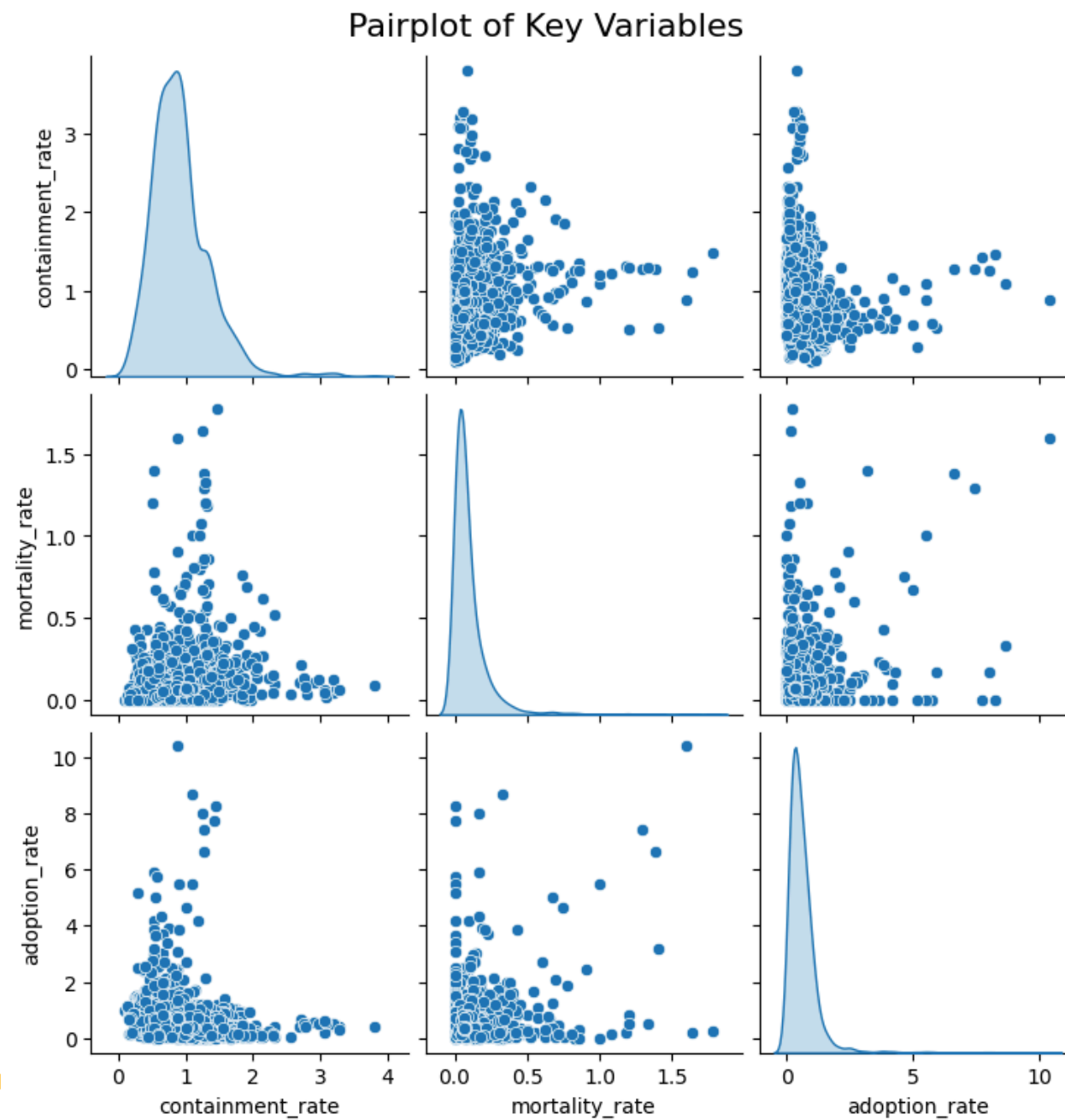Adoption Rate vs Mortality Rate
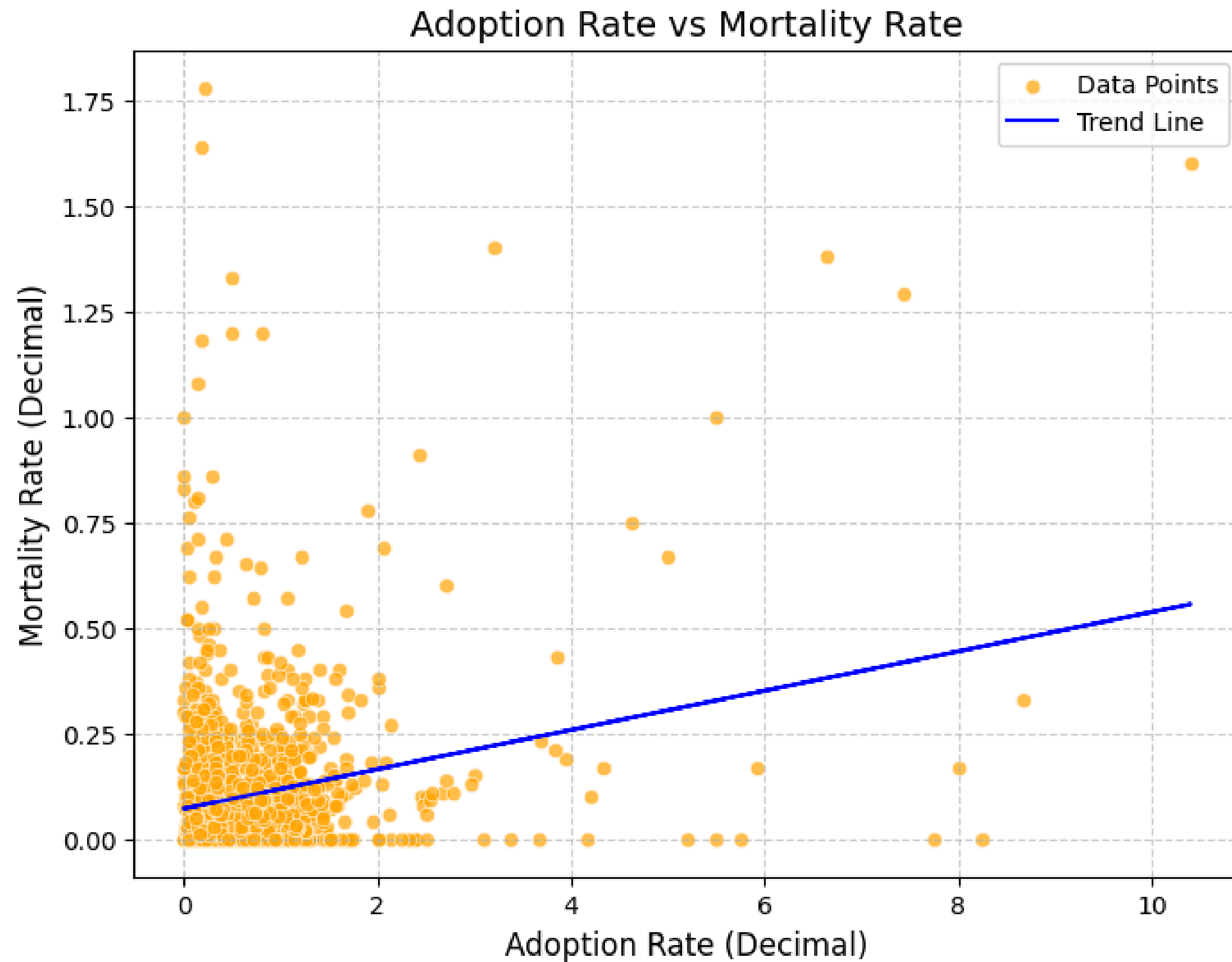
Scatter plot: Containment Rate vs Mortality Rate
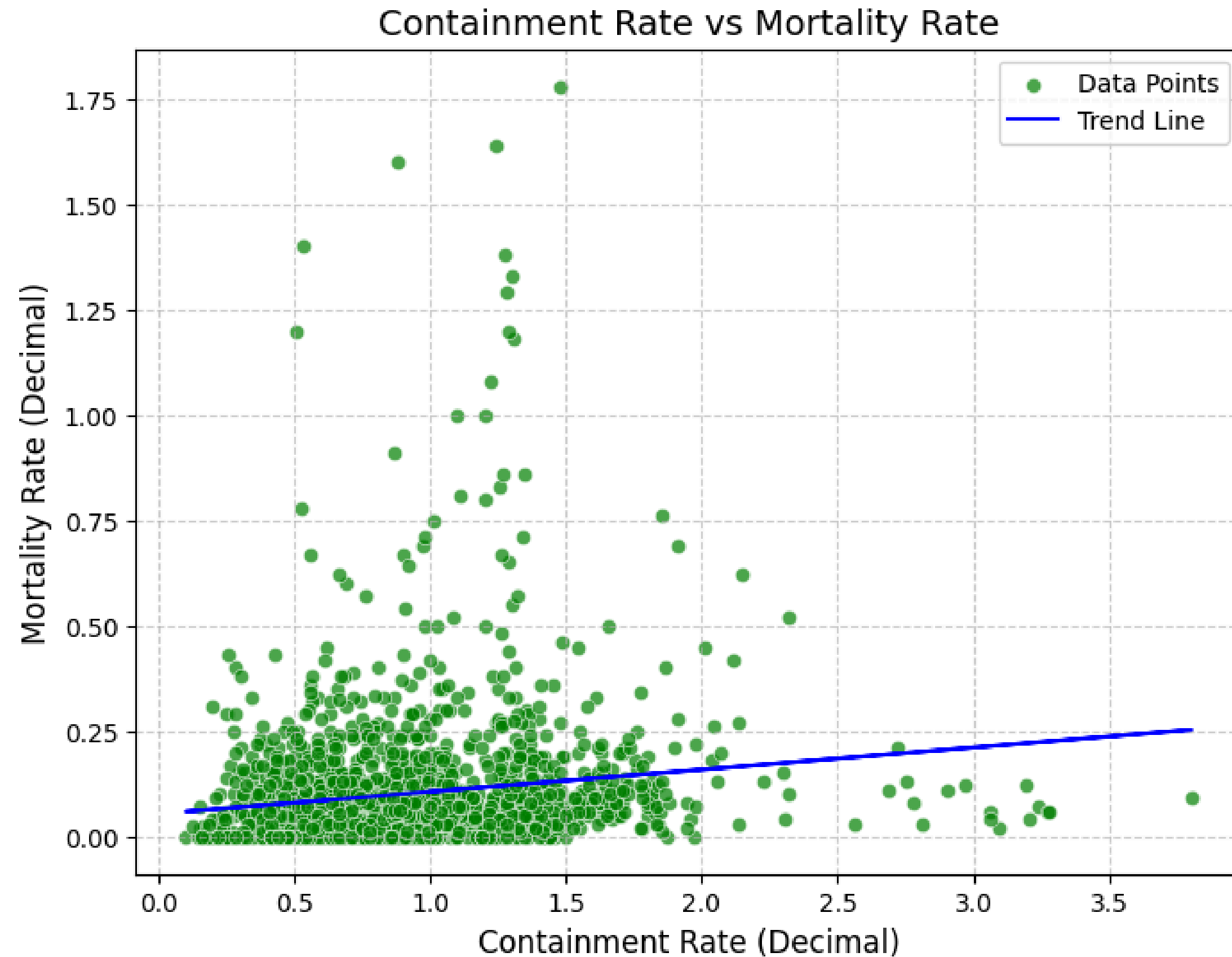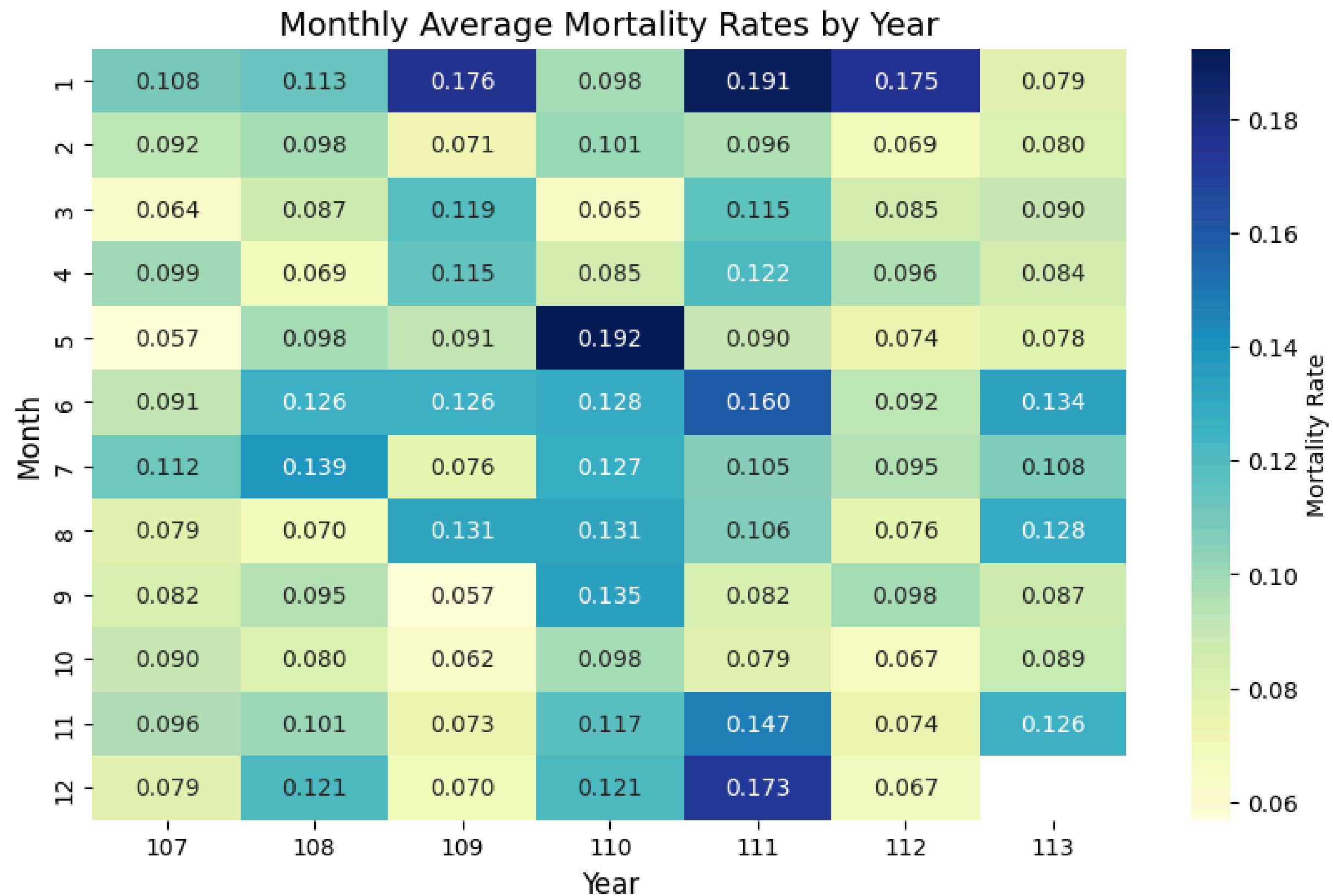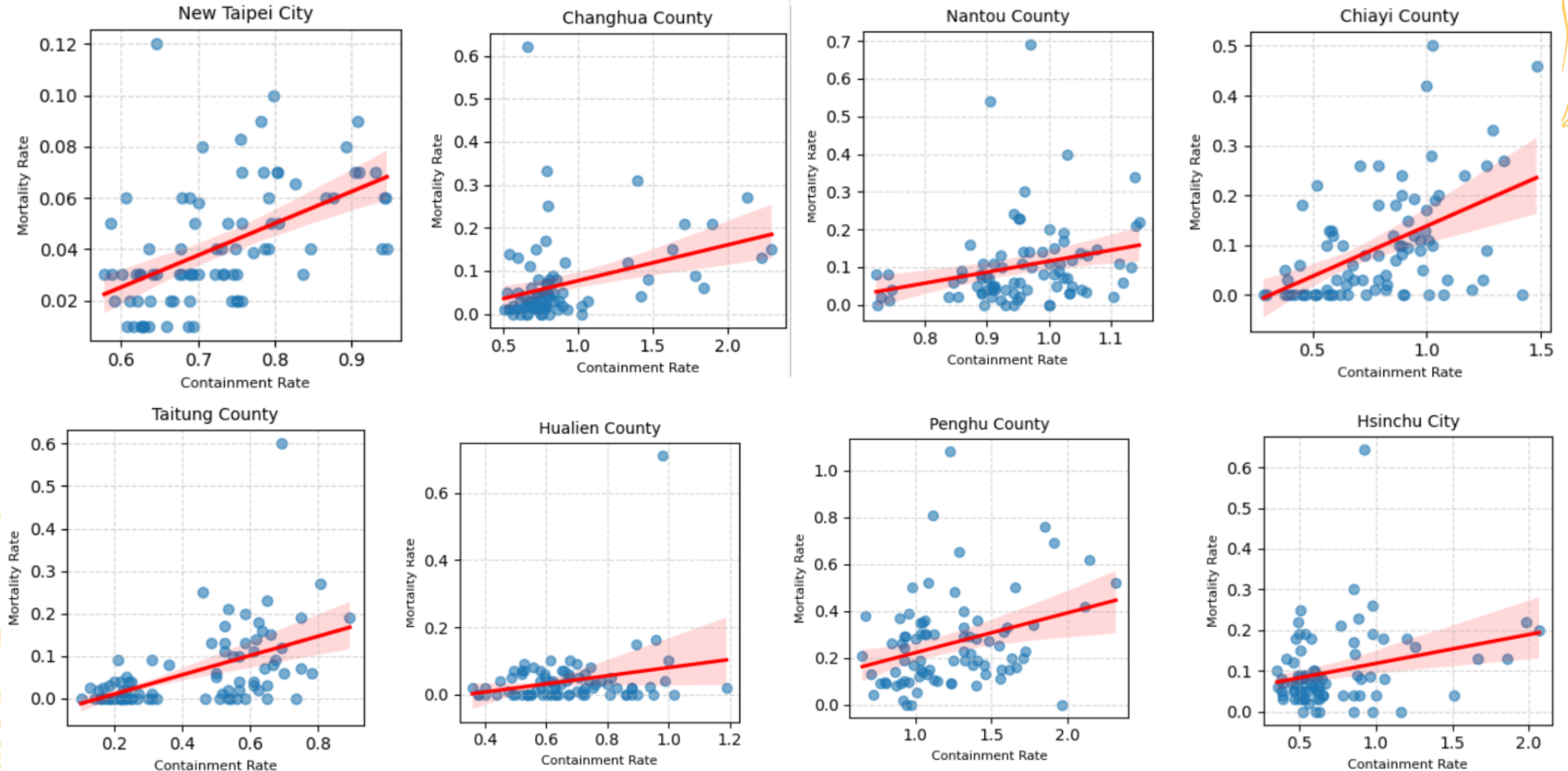
Exploration of Key Variables and Correlation Analysis

Pairplot of Key Variables

Correlation Heatmap
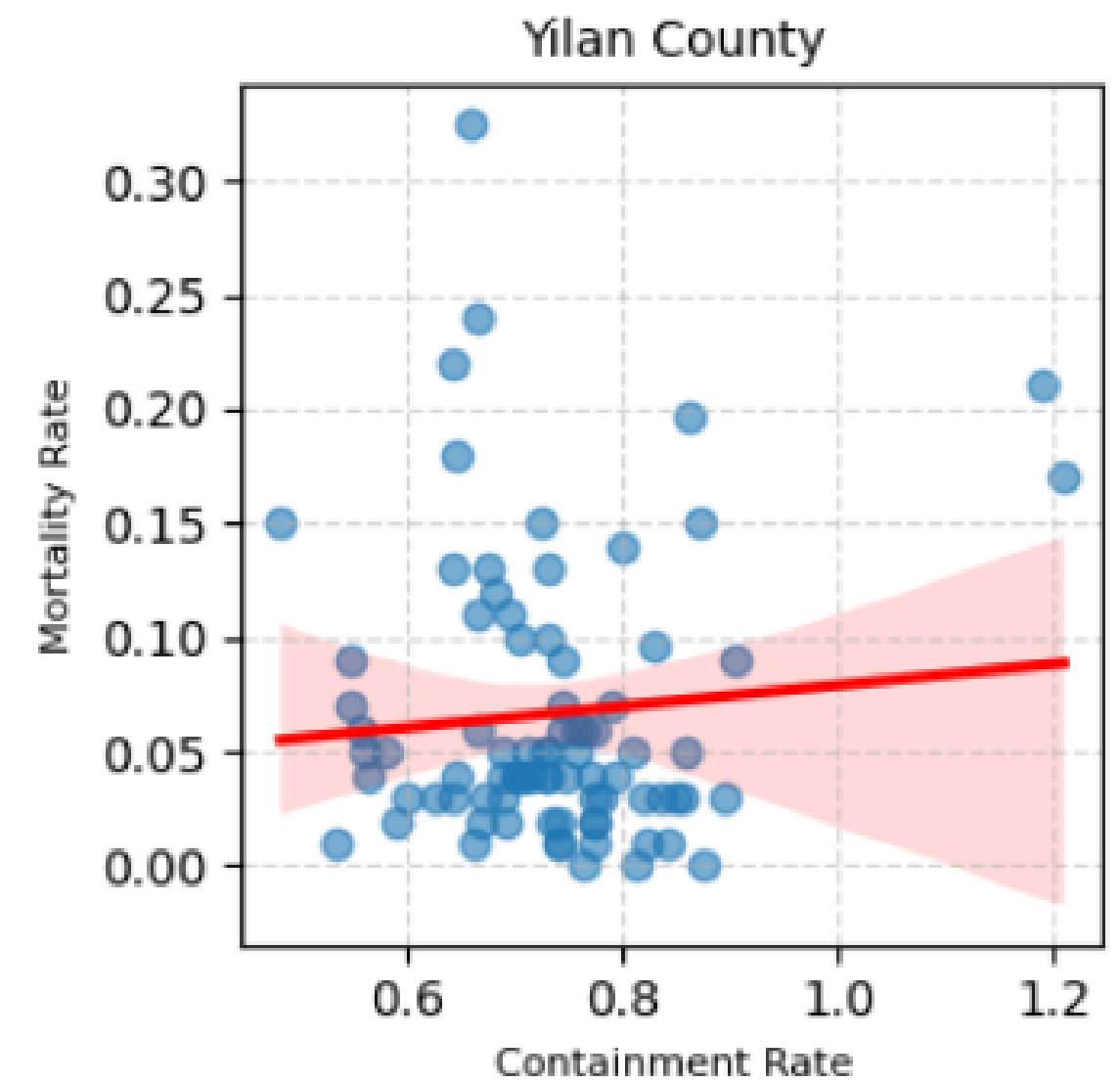
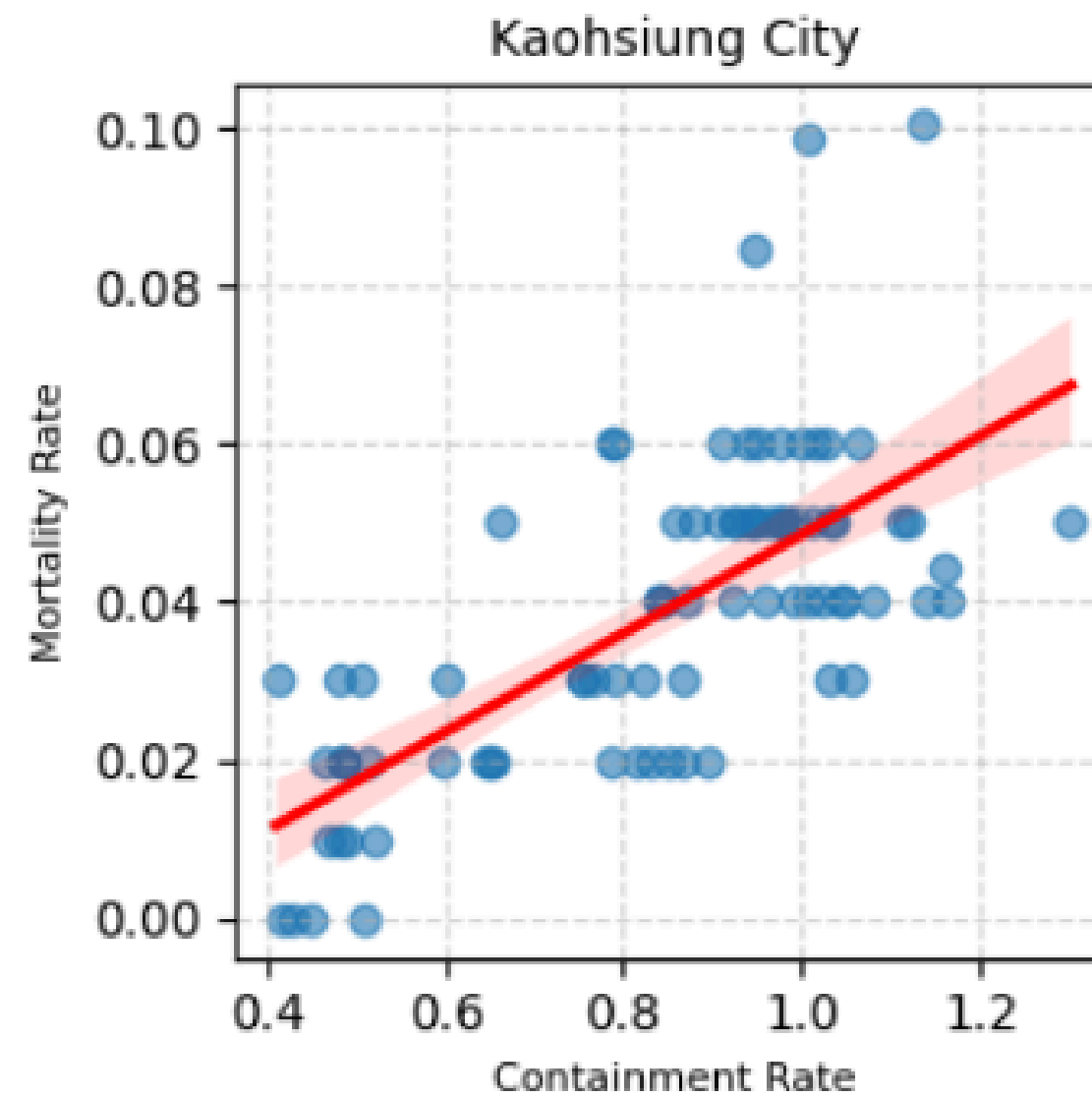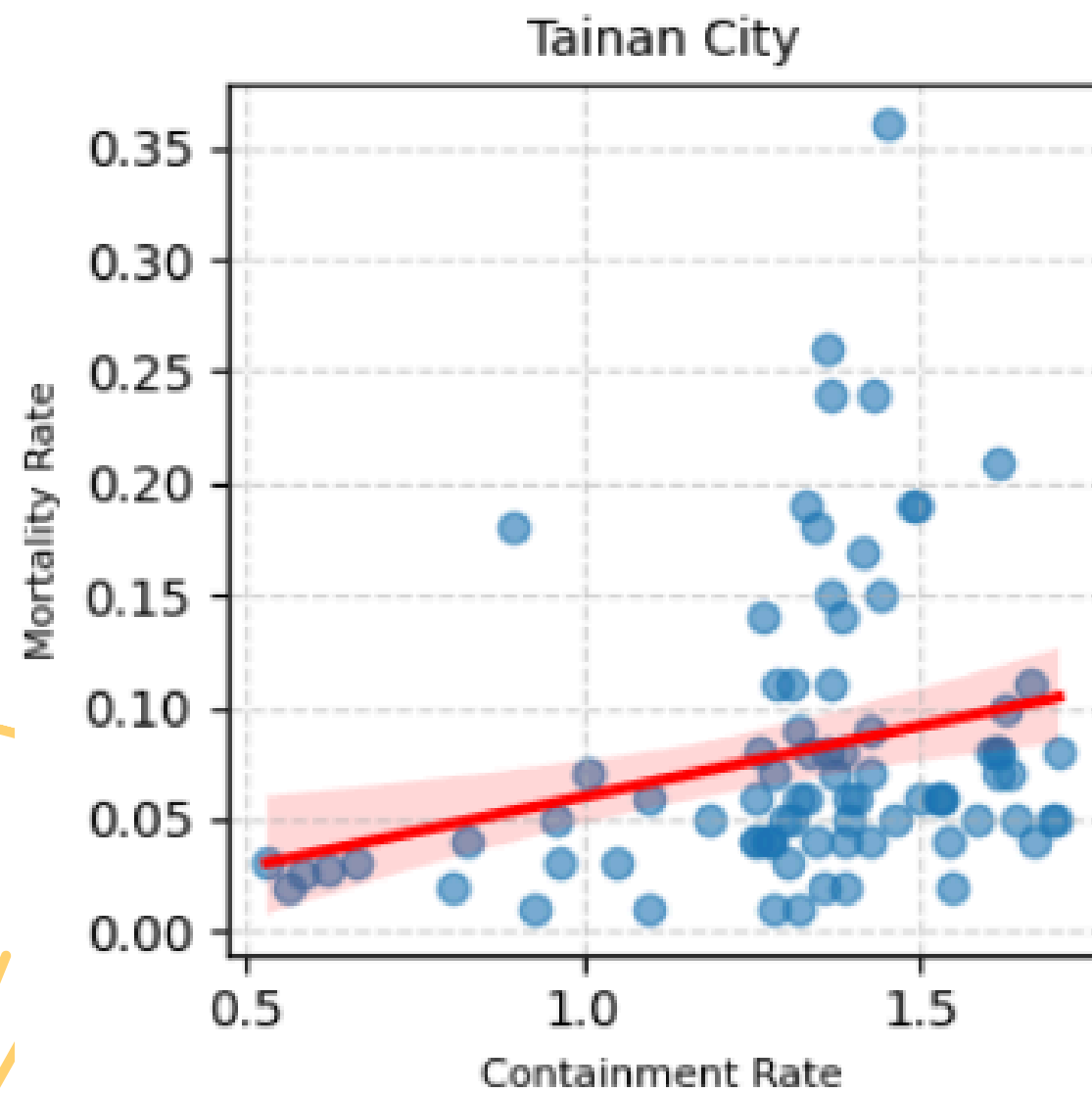# Mortality Rate By Containment Rate Levels Boxplot

Mortality Rate by Containment Rate Levels
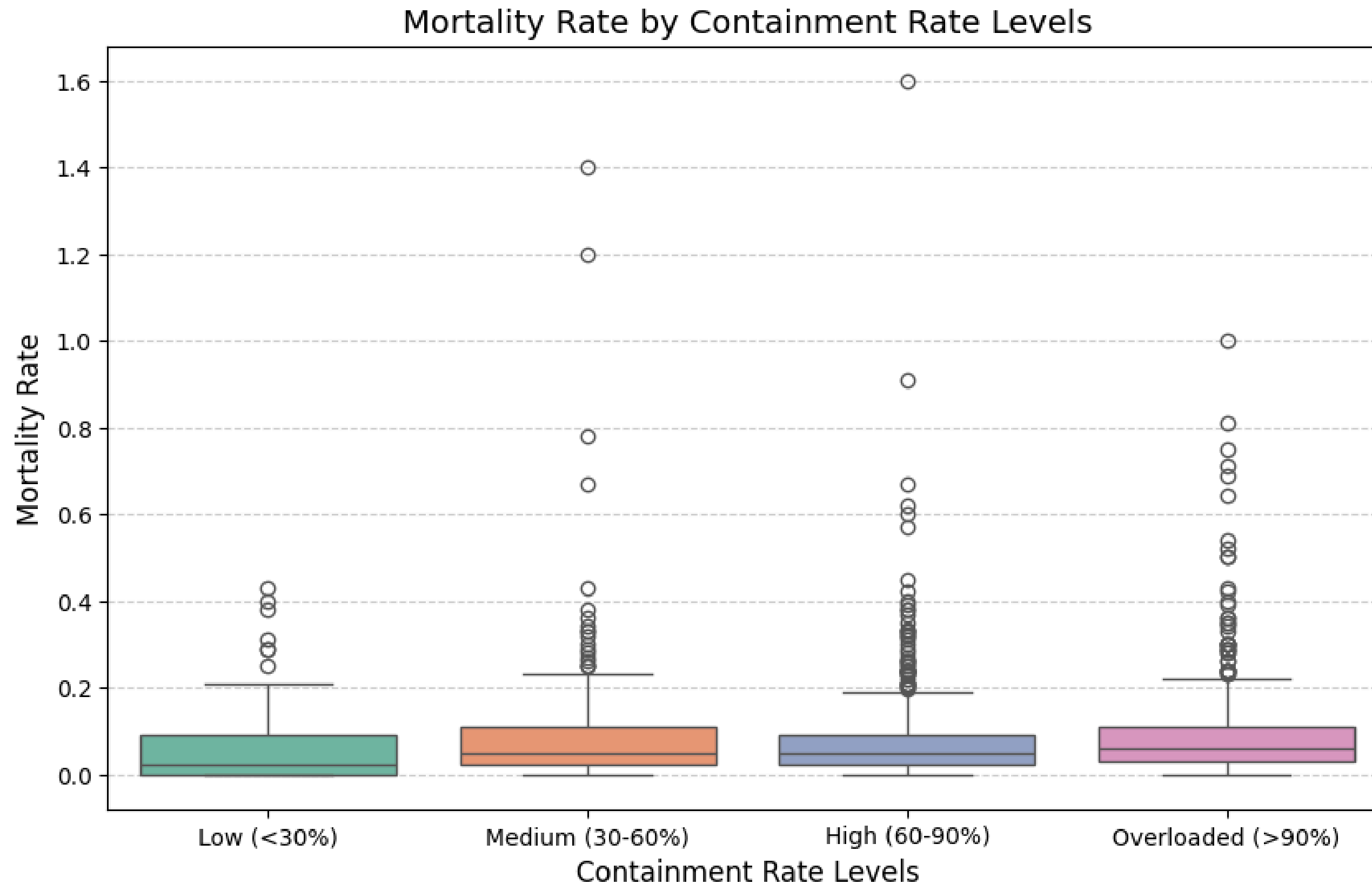
Heatmap of Monthly Averages

Monthly Average Mortality Rates by Year

| Month \ Year	107	108	109	110	111	112	113
1	0.108	0.113	0.176	0.098	0.191	0.175	0.079
2	0.092	0.098	0.071	0.101	0.096	0.069	0.080
3	0.064	0.087	0.119	0.065	0.115	0.085	0.090
4	0.099	0.069	0.115	0.085	0.122	0.096	0.084
5	0.057	0.098	0.091	0.192	0.090	0.074	0.078
6	0.091	0.126	0.126	0.128	0.160	0.092	0.134
7	0.112	0.139	0.076	0.127	0.105	0.095	0.108
8	0.079	0.070	0.131	0.131	0.106	0.076	0.128
9	0.082	0.095	0.057	0.135	0.082	0.098	0.087
10	0.090	0.080	0.062	0.098	0.079	0.067	0.089
11	0.096	0.101	0.073	0.117	0.147	0.074	0.126
12	0.079	0.121	0.070	0.121	0.173	0.067	

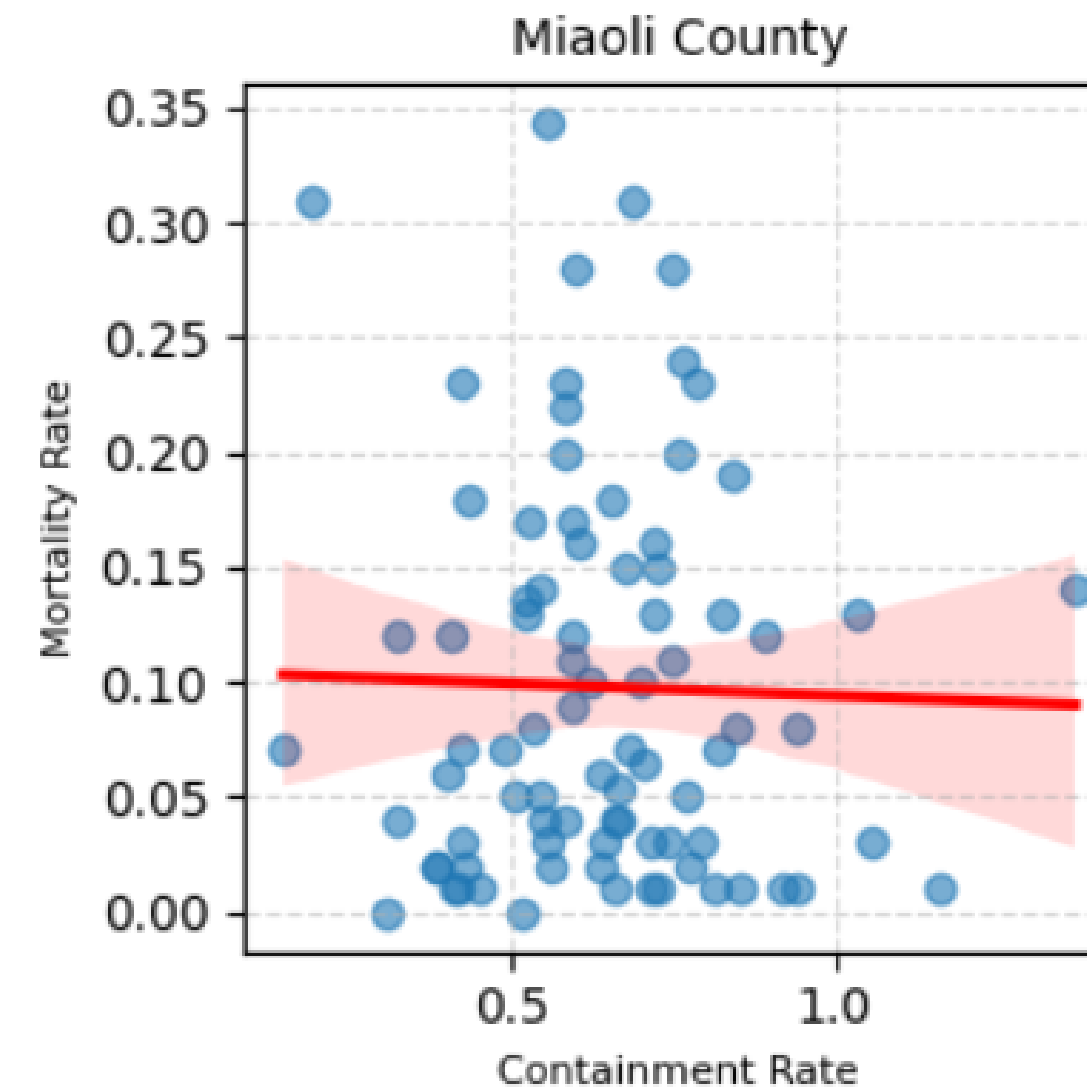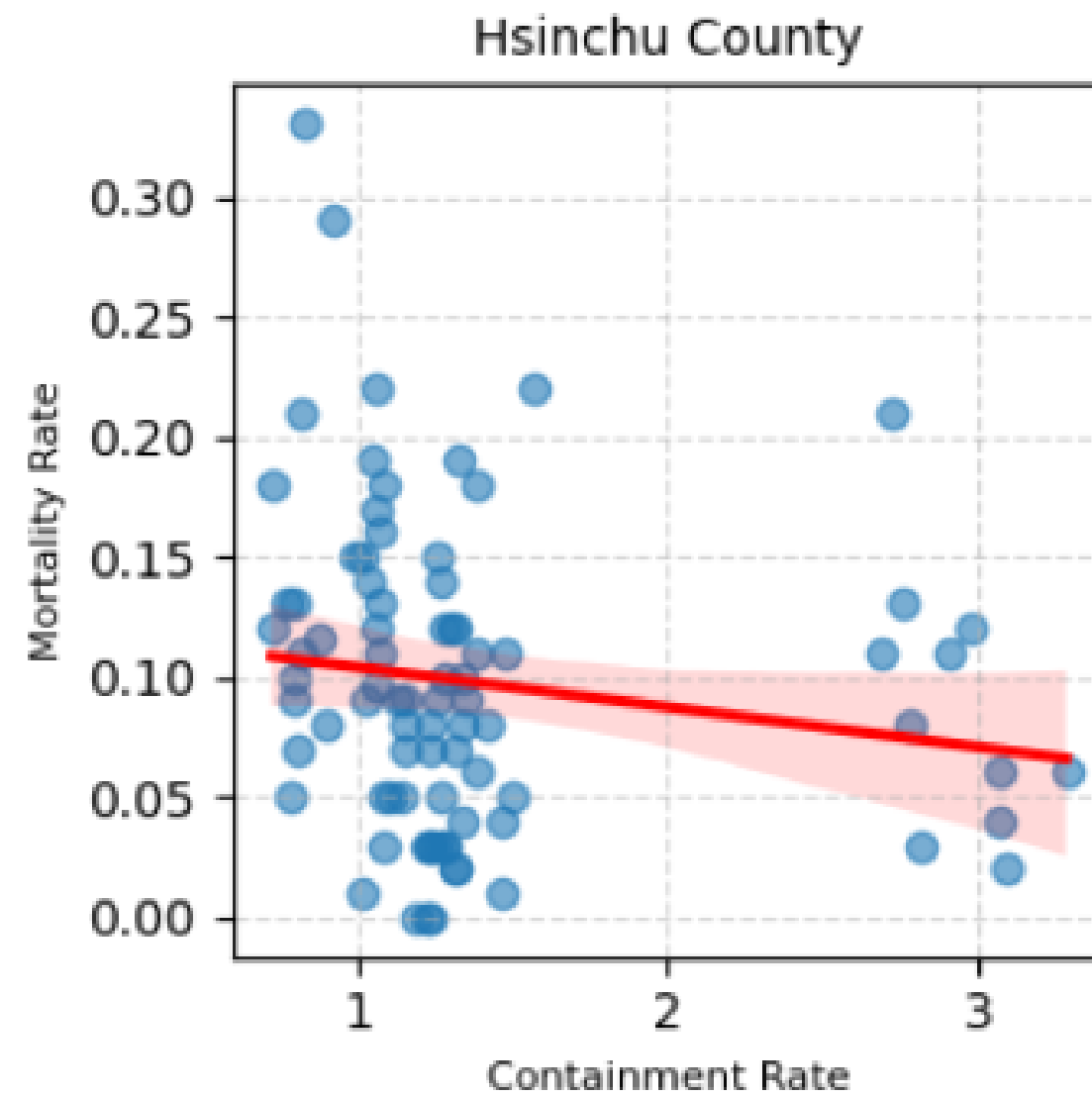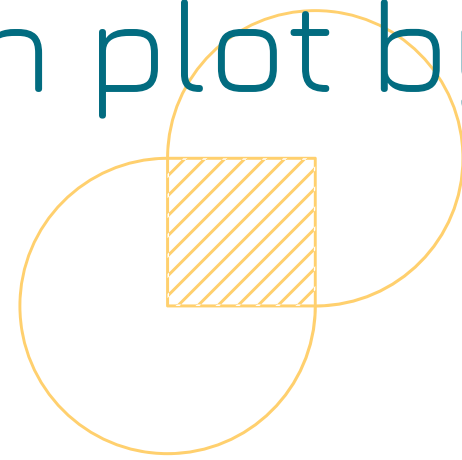# Regression plot by county branch-Positive

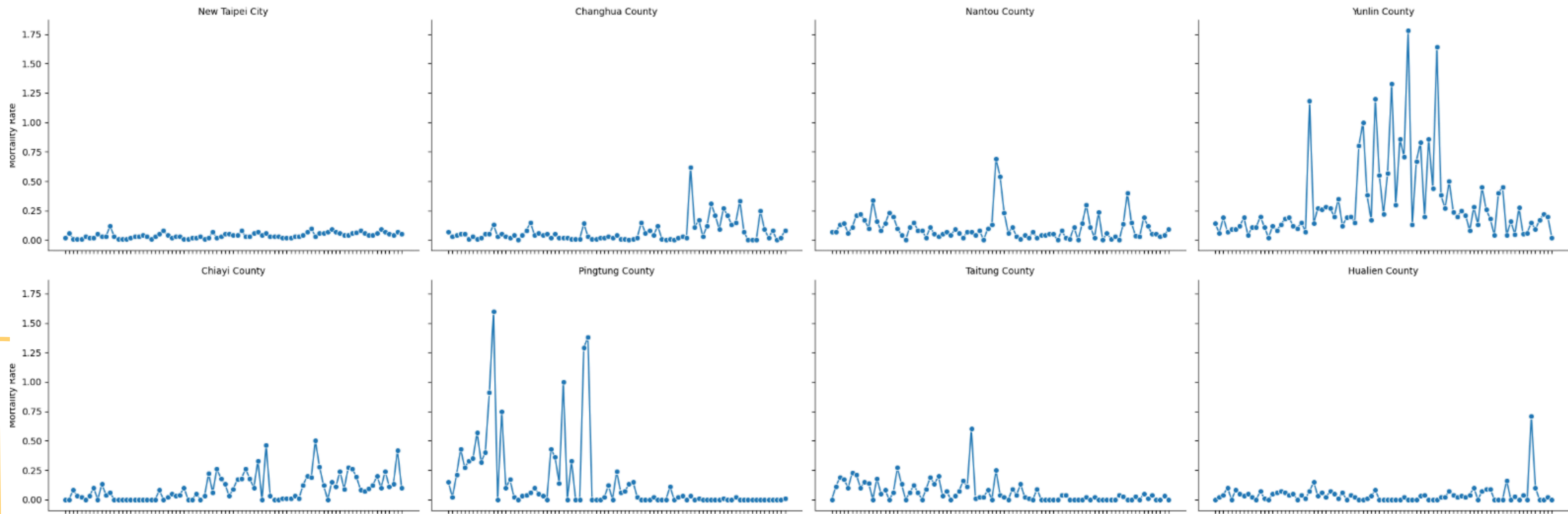# Regression plot by county branch-Positive

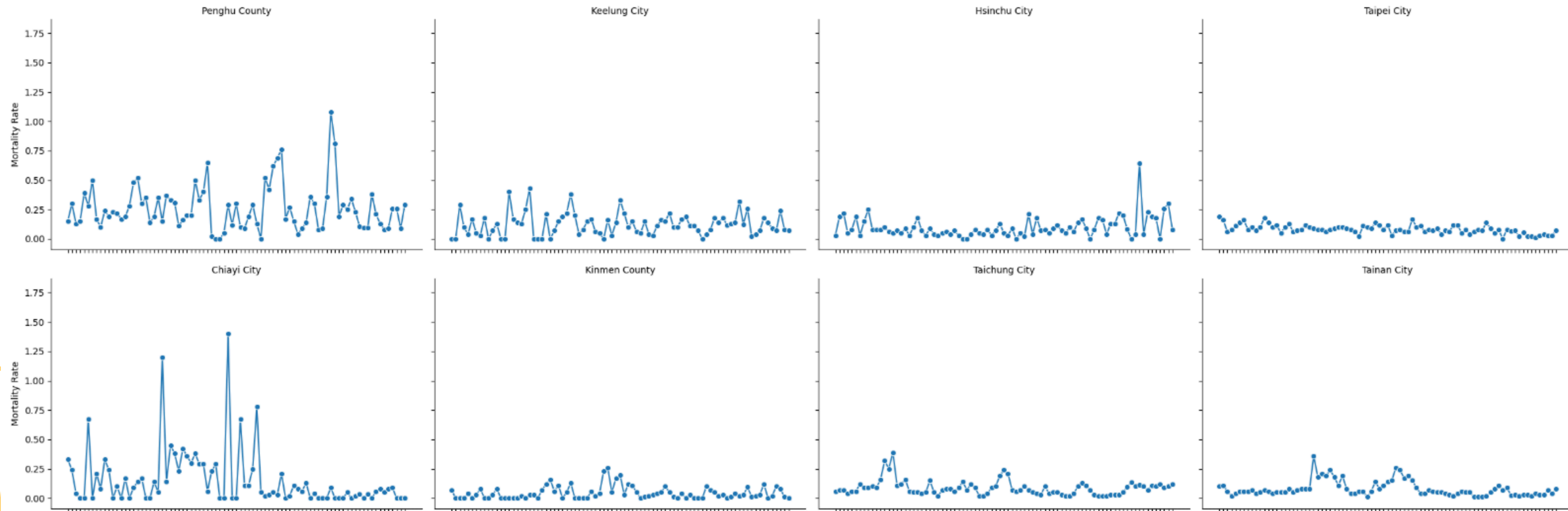# Regression plot by county branch-Negative
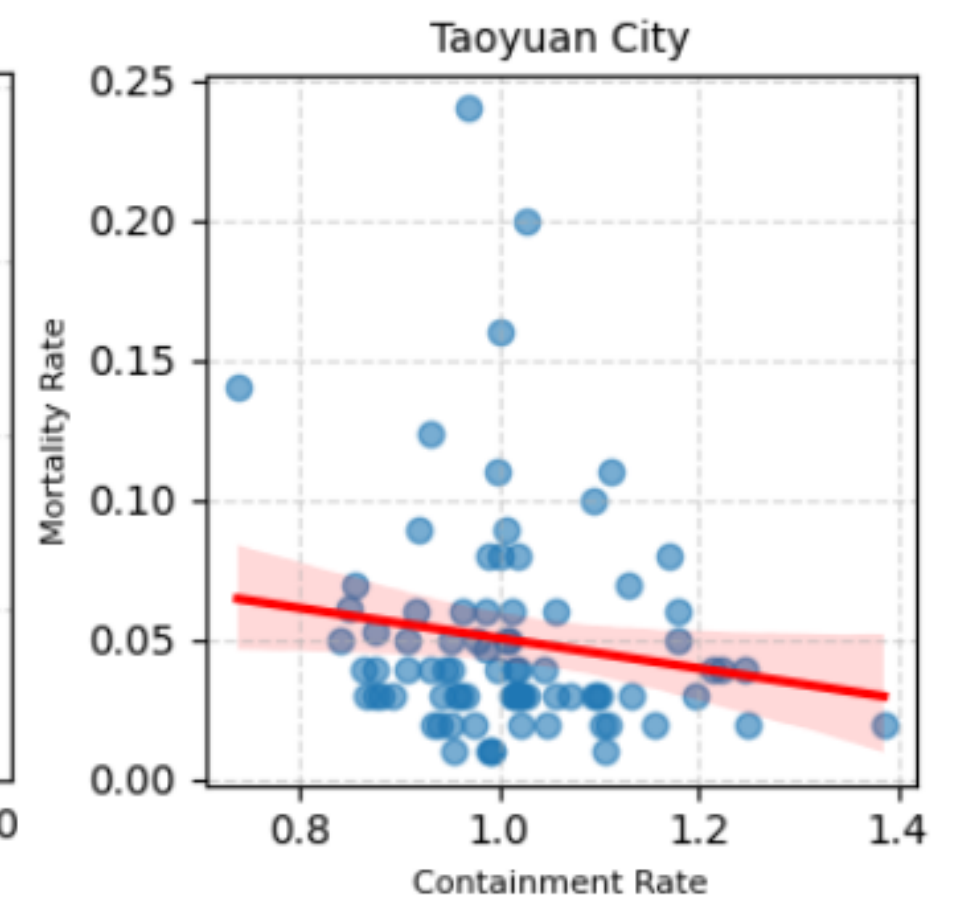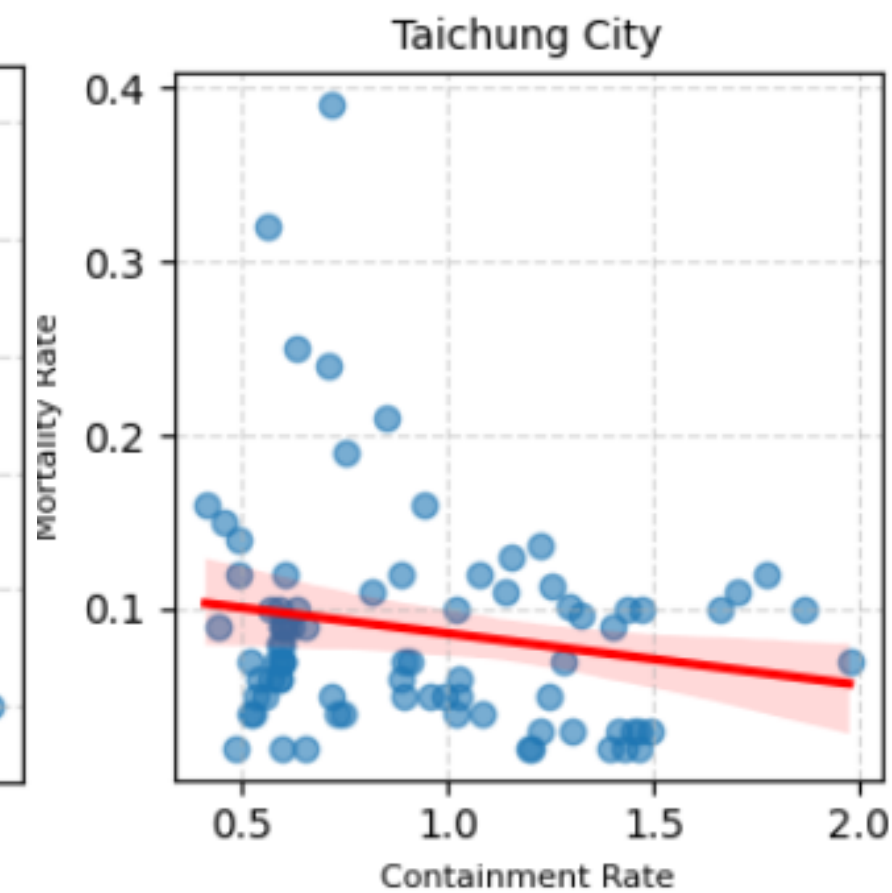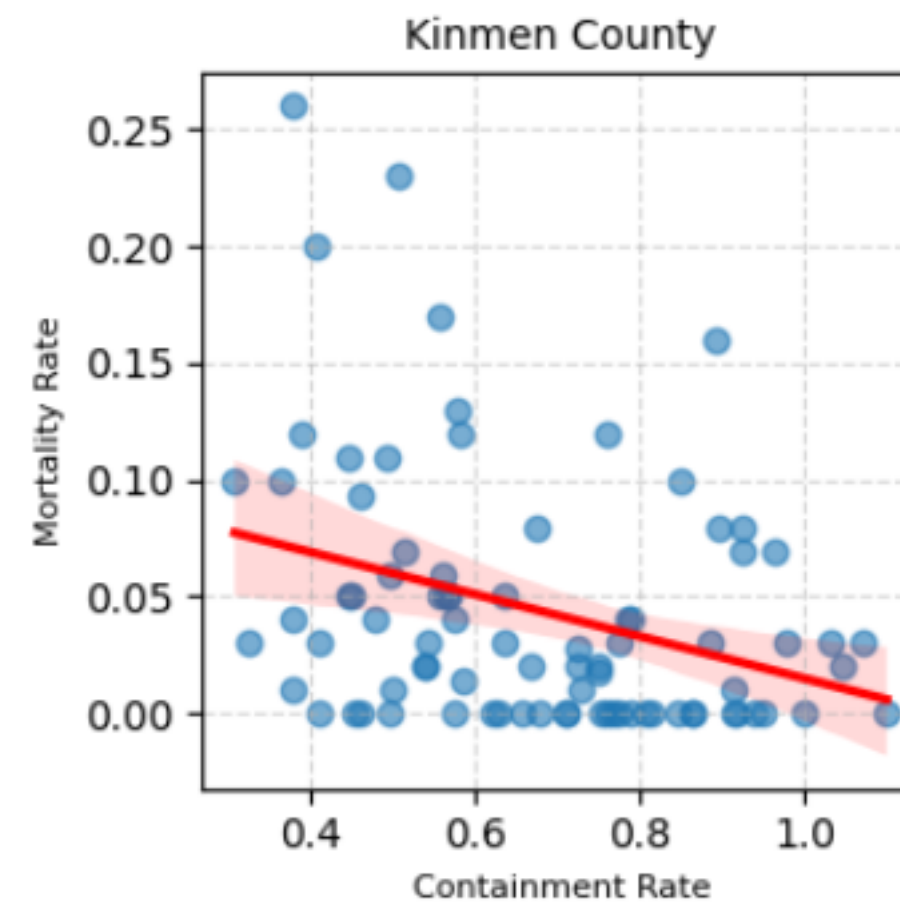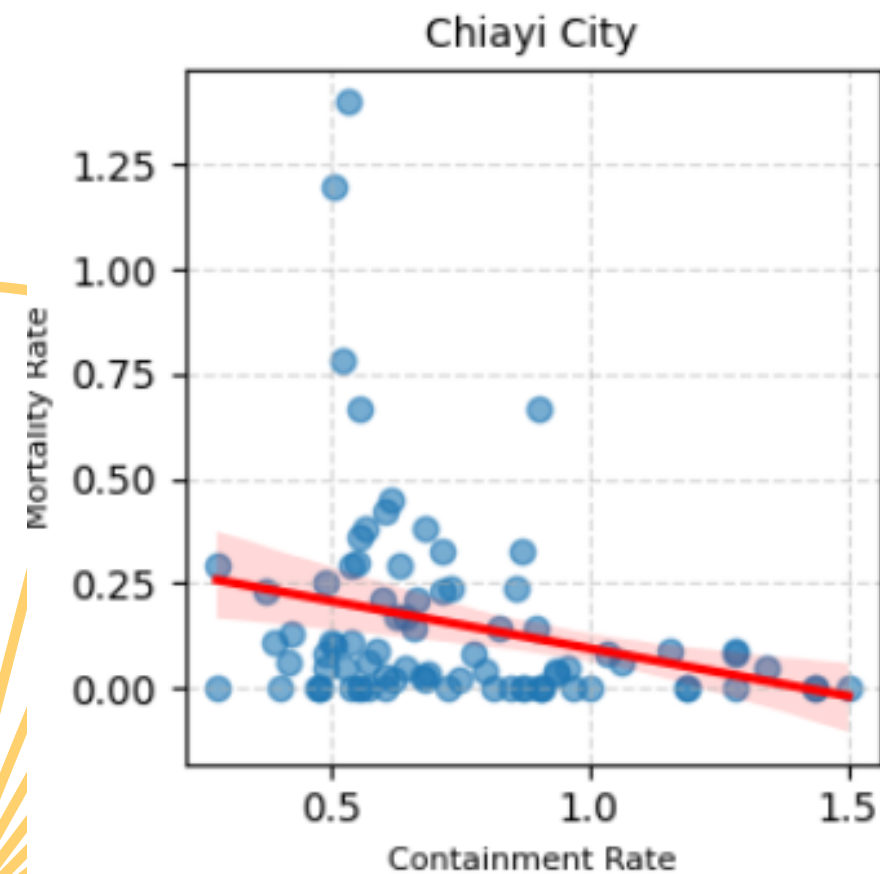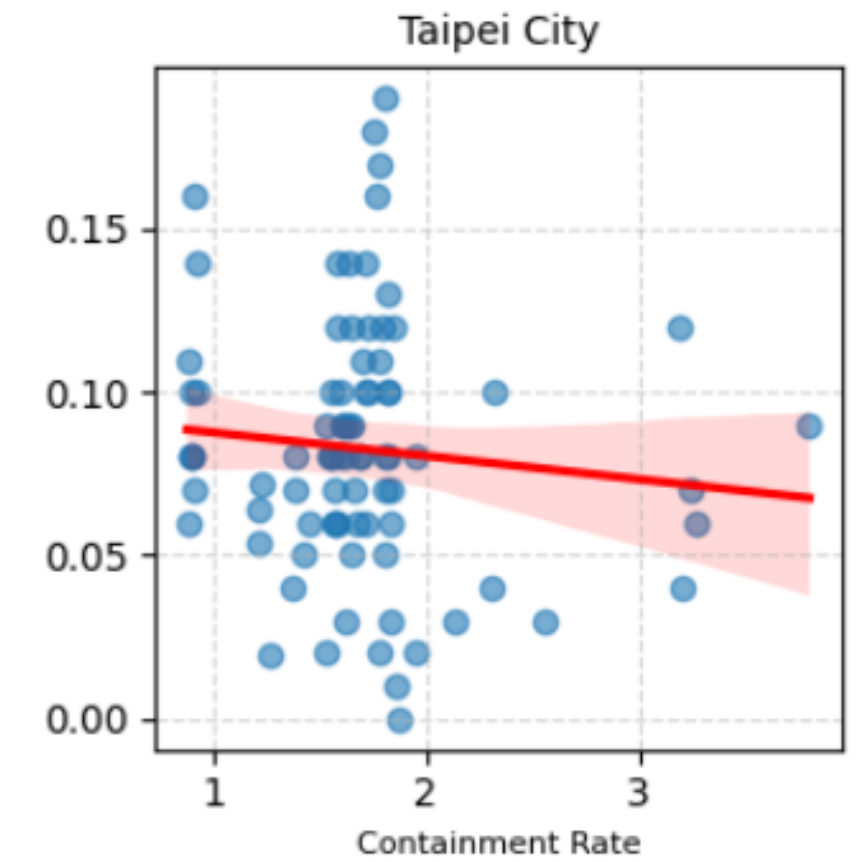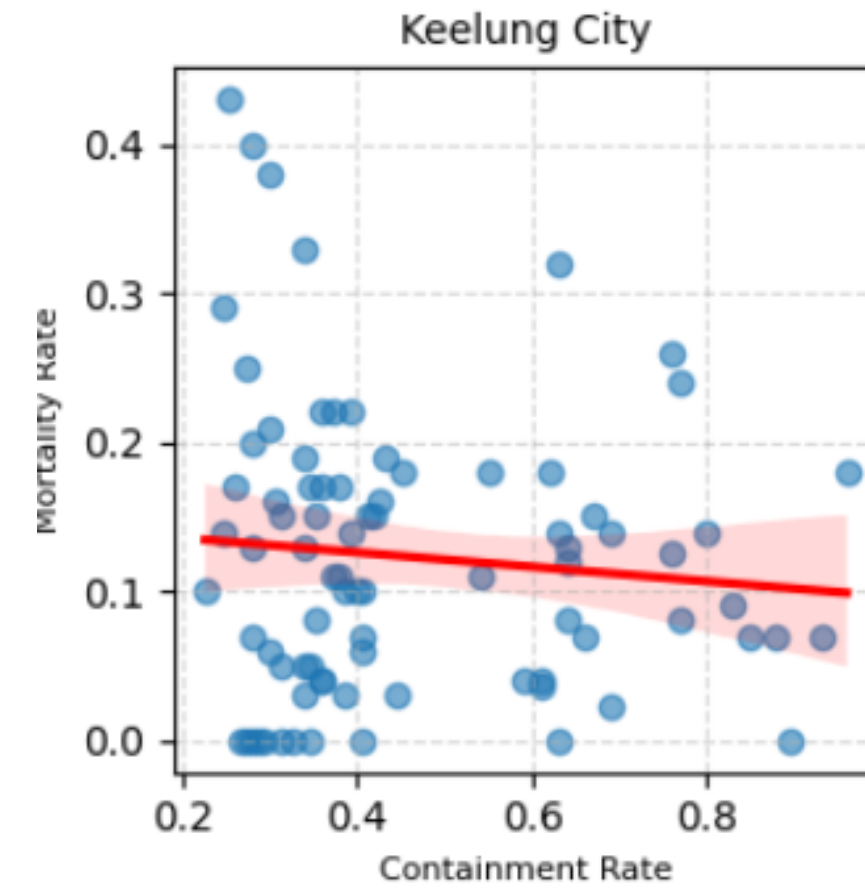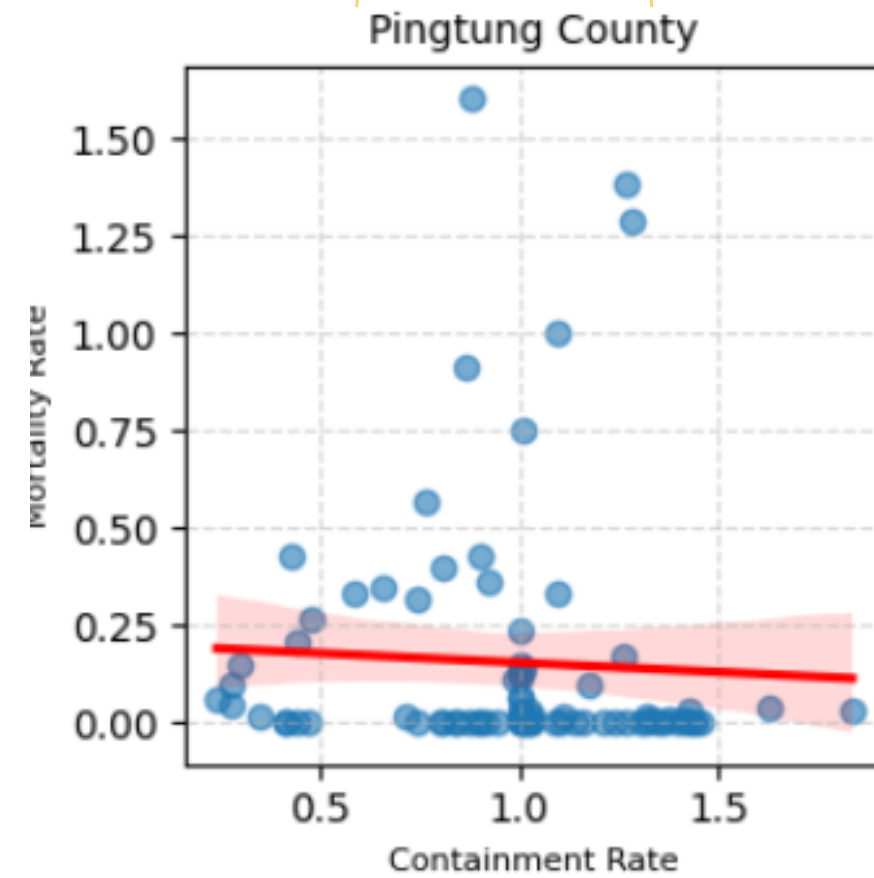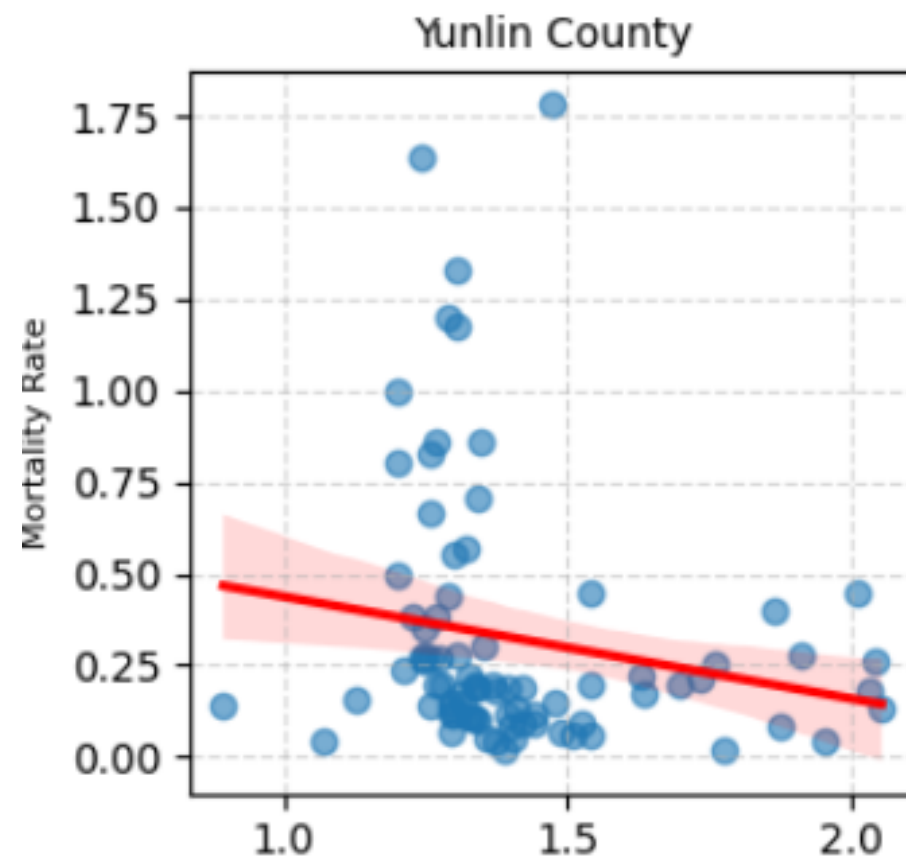
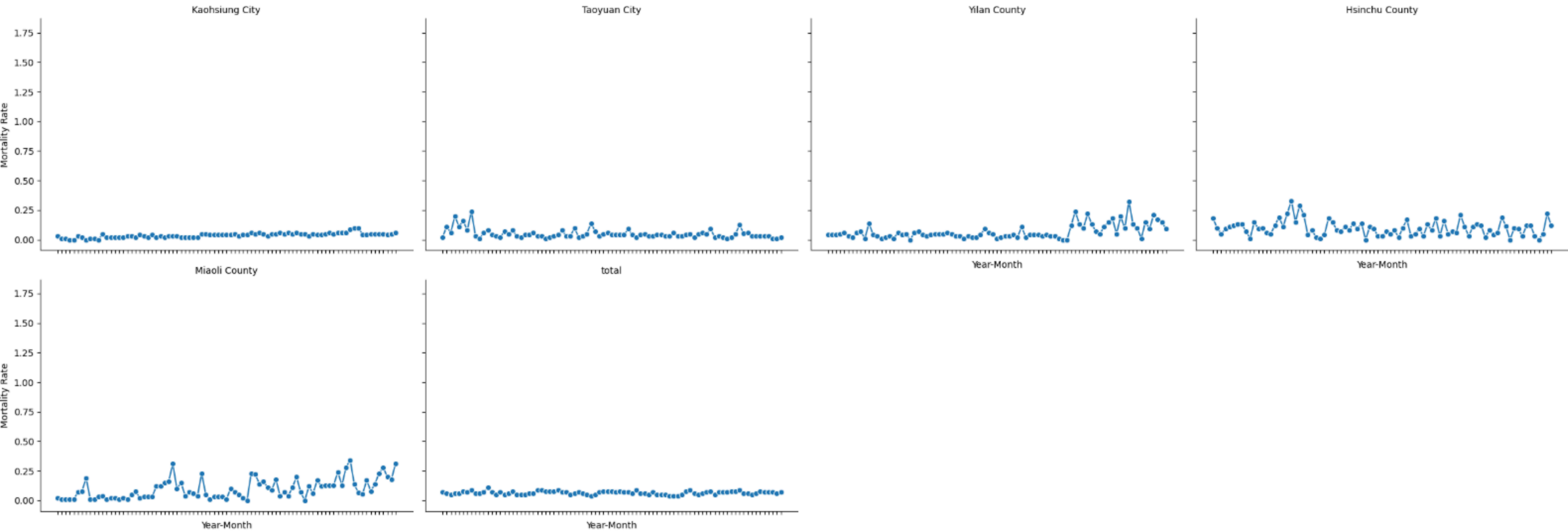# Regression plot by county branch-Negative
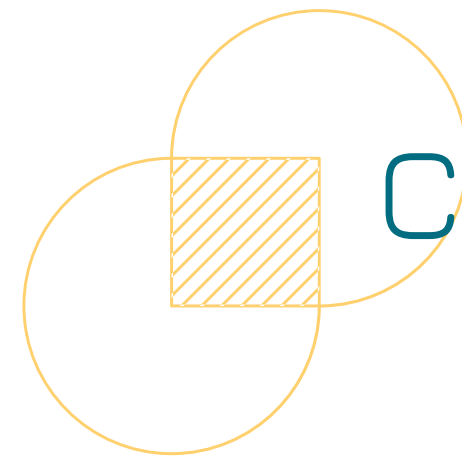
Faceted line chart for each county

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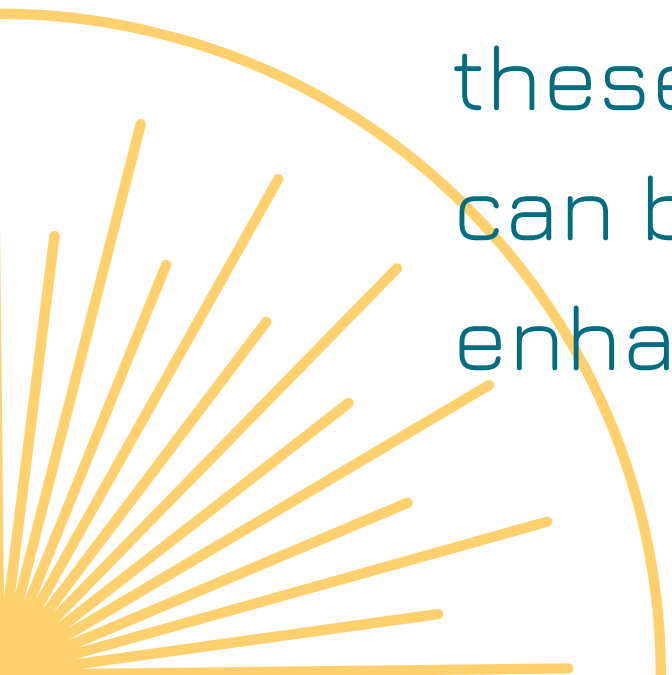
Faceted line chart for each county

Conclusion

This study demonstrates that although containment rates and adoption rates cannot fully explain the variations in animal mortality rates, the weak positive correlation between them is statistically significant, with notable differences observed at the regional level. When formulating relevant policies, the government should consider regional disparities, allocate resources accordingly, optimize management systems, and encourage public participation. Through these measures, the welfare of animals in shelters across Taiwan can be gradually improved, ultimately achieving comprehensive enhancement of the stray animal care and shelter system.

THANK YOU