2012 WORKPLACE FATALITIES

REVIEW AND ANALYSIS

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INTRODUCTION

In 2012, more than 3 million workplace-related injuries and illnesses were reported in the United States. According to the U.S. Bureau of Labor Statistics, with an estimated workforce of approximately 156.2 million people that year, nearly 2% of all workers were affected. Tragically, many of these incidents resulted in fatalities.

This report aims to analyze workplace safety data to uncover meaningful insights from these cases. First, it compares how various federal and state programs perform across a wide range of health and safety incidents. Then, it explores potential relationships between reported incidents, regulatory inspections, and monetary penalties.

The broader goal is to use this analysis to inform strategies that reduce workplace hazards, protect lives, and minimize costs for employers. Whether you're an employer, an employee, or someone interested in occupational safety, the findings in this report offer valuable perspectives on improving workplace health and safety across the nation.

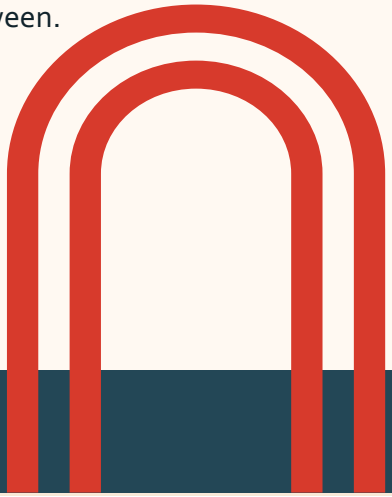
METHODOLOGY

Source data was provided in a .csv file format containing 51 rows (one for each state, including a header) and 11 columns including categories such as the amount and rate of fatalities and injuries/illnesses in 2012, as well as a ranking of the state, penalties paid in 2013, the number of inspectors and years it would take to inspect each workplace once, and whether the data values originated from a state or federal program. The file was uploaded to an editable excel spreadsheet for processing and analysis.

As the original dataset contained missing values, the available data for any column containing an empty cell was first plotted as a histogram chart to visually determine the distribution of the category. Any missing numerical data which represented a normal distribution would be imputed with the chart's mean value, whereas skewed data would be replaced with its median value, so long as the total missing values represented less than 5% of the entire set. It was determined that all missing values belonged to distributions which were skewed and represented under 5% of the total, so every unavailable metric was imputed with the relevant median value.

Such values included the Number of Injuries/Illnesses for Florida, Colorado, North Dakota, Mississippi, South Dakota, Idaho, New Hampshire, and Rhode Island, which were imputed with a median of 47,250, as well as the Injuries/Illness rate for those same states, imputed with a median of 3.55. The only other missing value was the Number of Inspectors for South Dakota, which received a median value of 26.

Next the data was plotted as various charts in a visual dashboard according to appropriate groupings. Box and whisker charts were used to determine national distributions, column charts were used to compare state maximum and minimum values, and scatter charts were employed to analyze the relationship between two sets of values. A correlation coefficient was further determined for each scatter chart, where a strong correlation would be any value greater than 0.7, a weak correlation would be less than 0.3, and medium somewhere in between.



KEY FINDINGS

KEY FINDING #1

The Federal program had the highest rate of fatalities.

KEY FINDING #2

California was the state with a State program that had the highest number of injuries and illnesses.

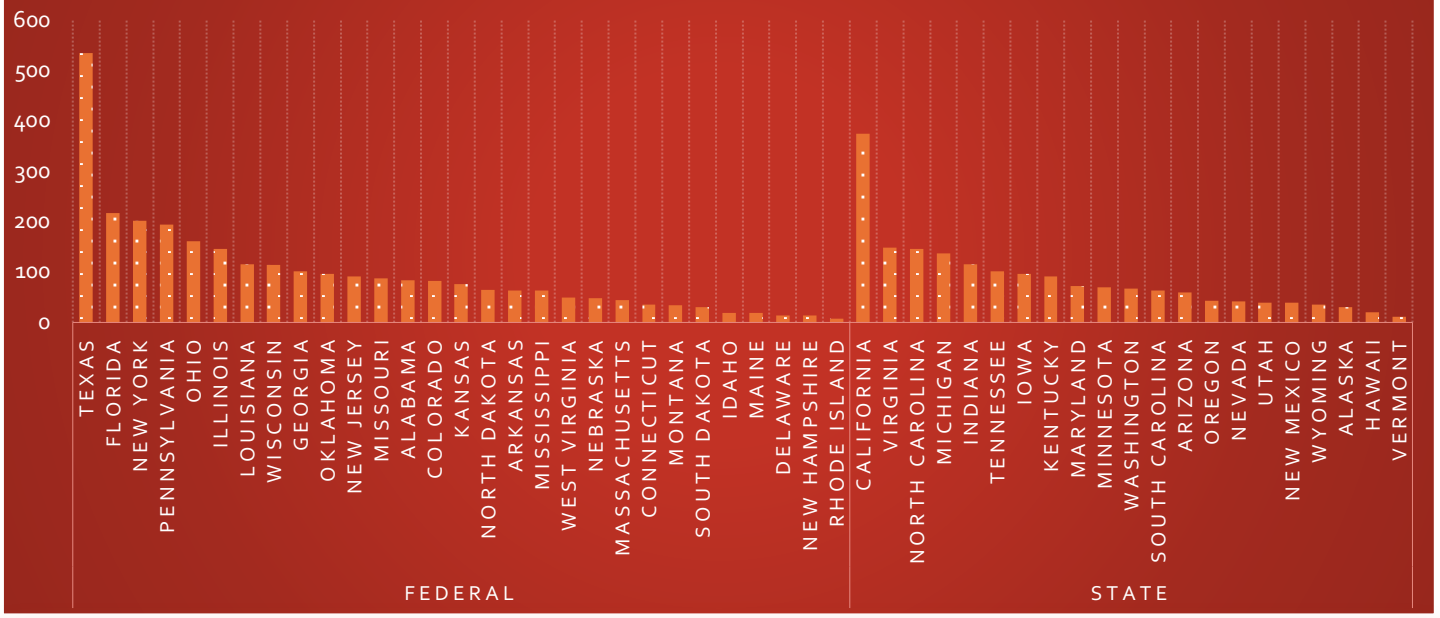
KEY FINDINGS #3

There was very low or no relationship between the average number of years to inspect each workplace once and the average rate of fatalities.

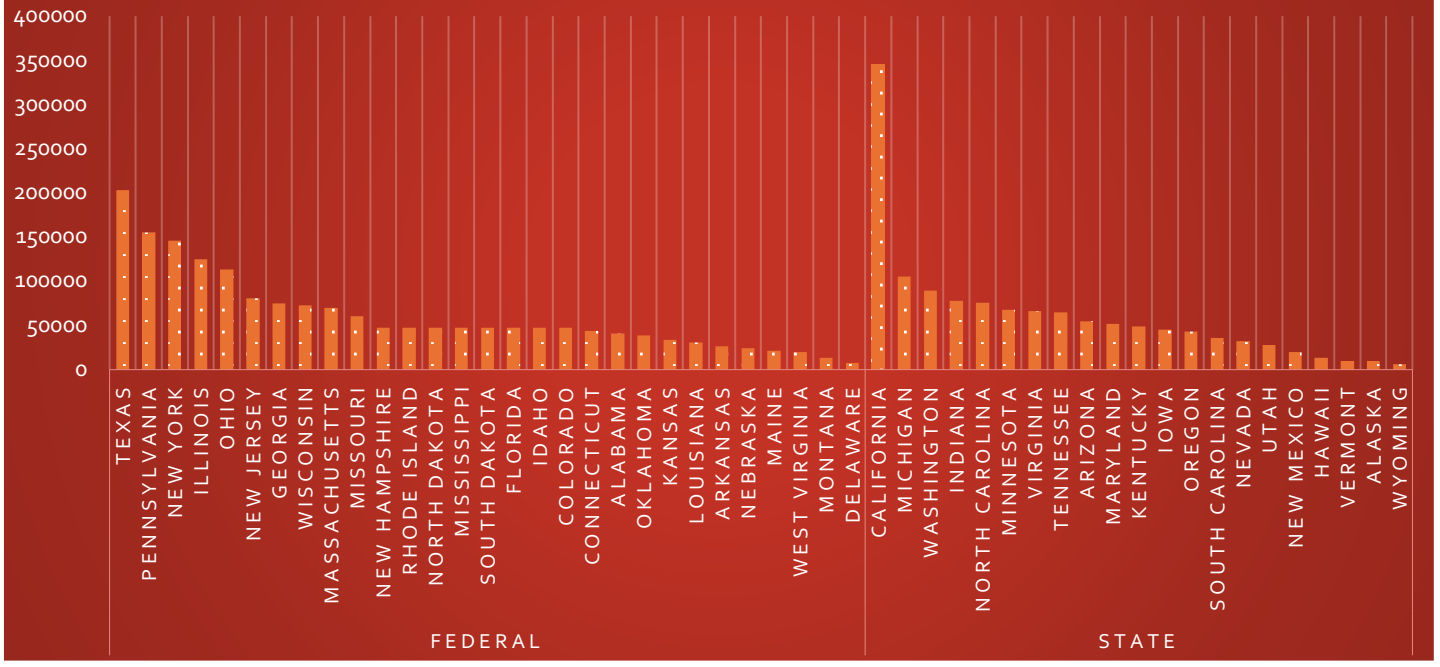
However, there was a strong positive correlation between the number of inspectors and total fatalities.

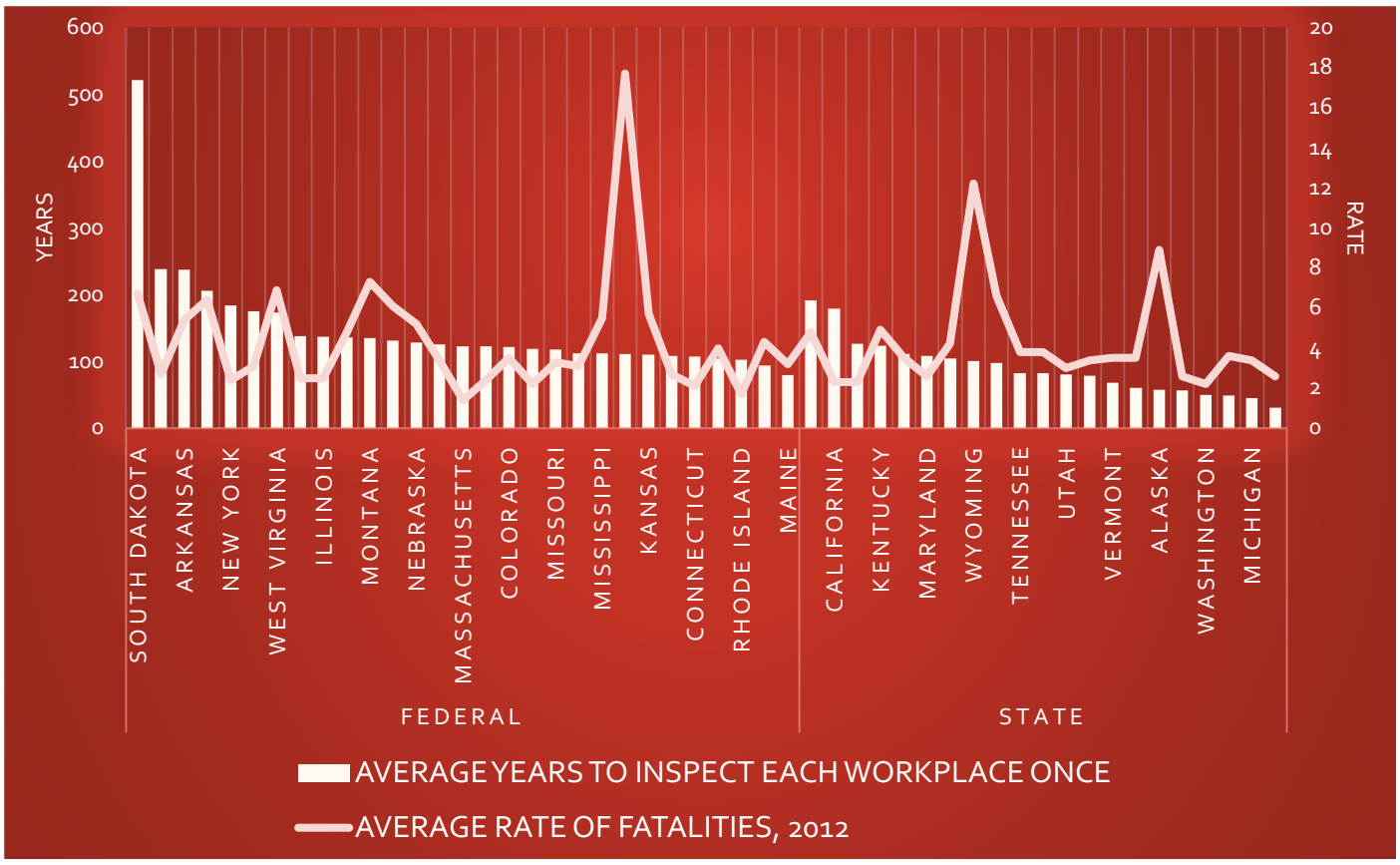
VISUAL DATA

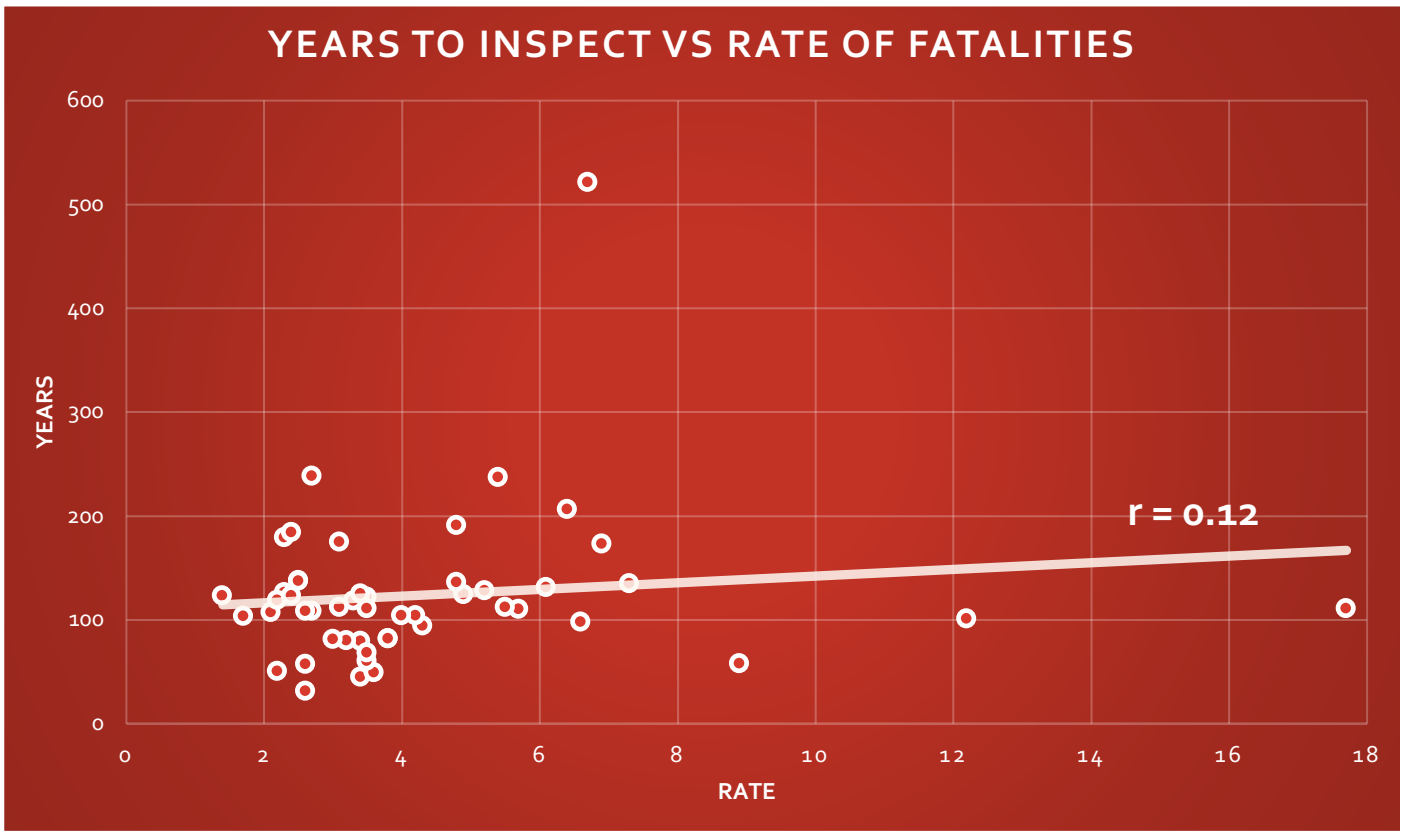
FATALITIES IN 2012

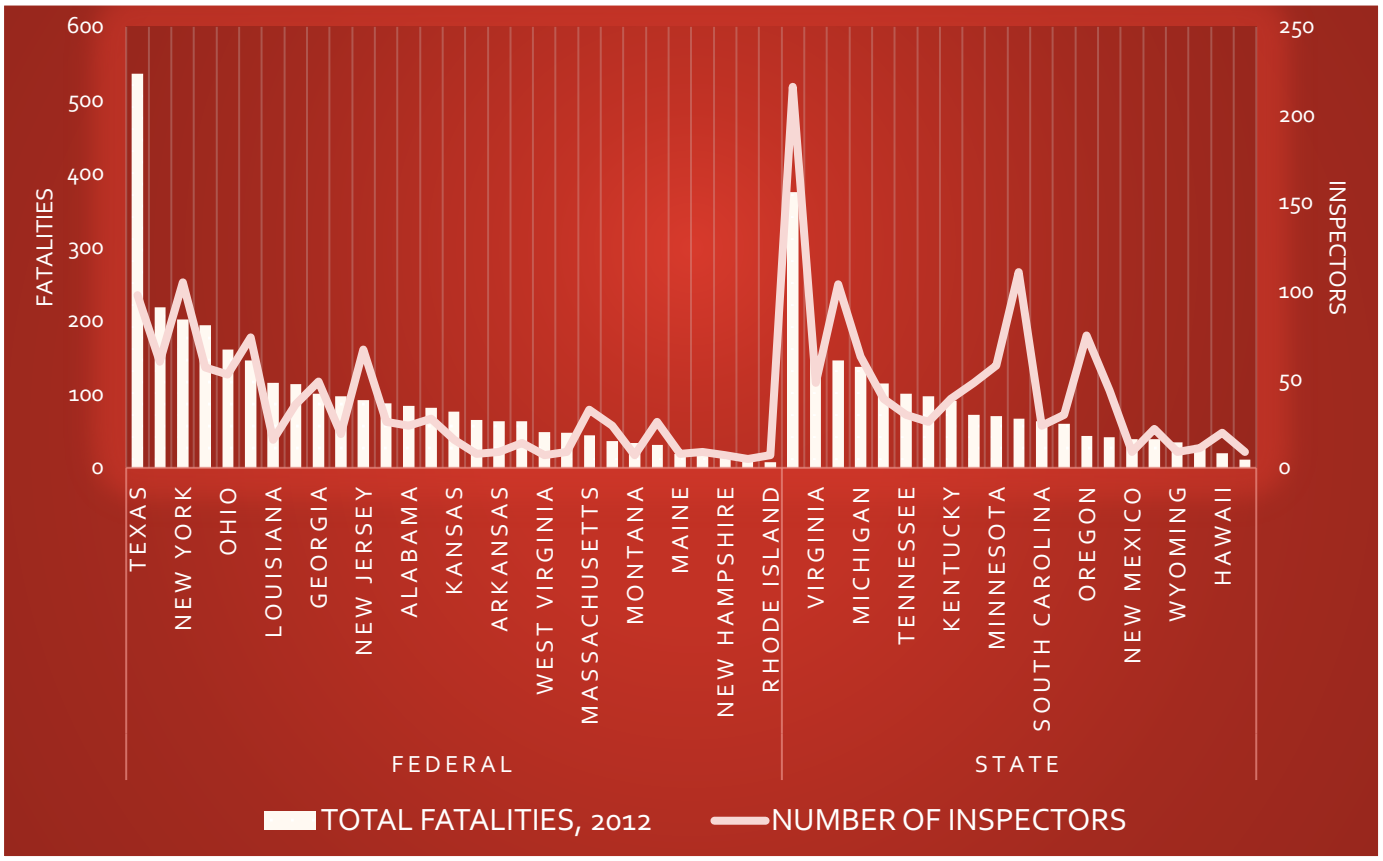


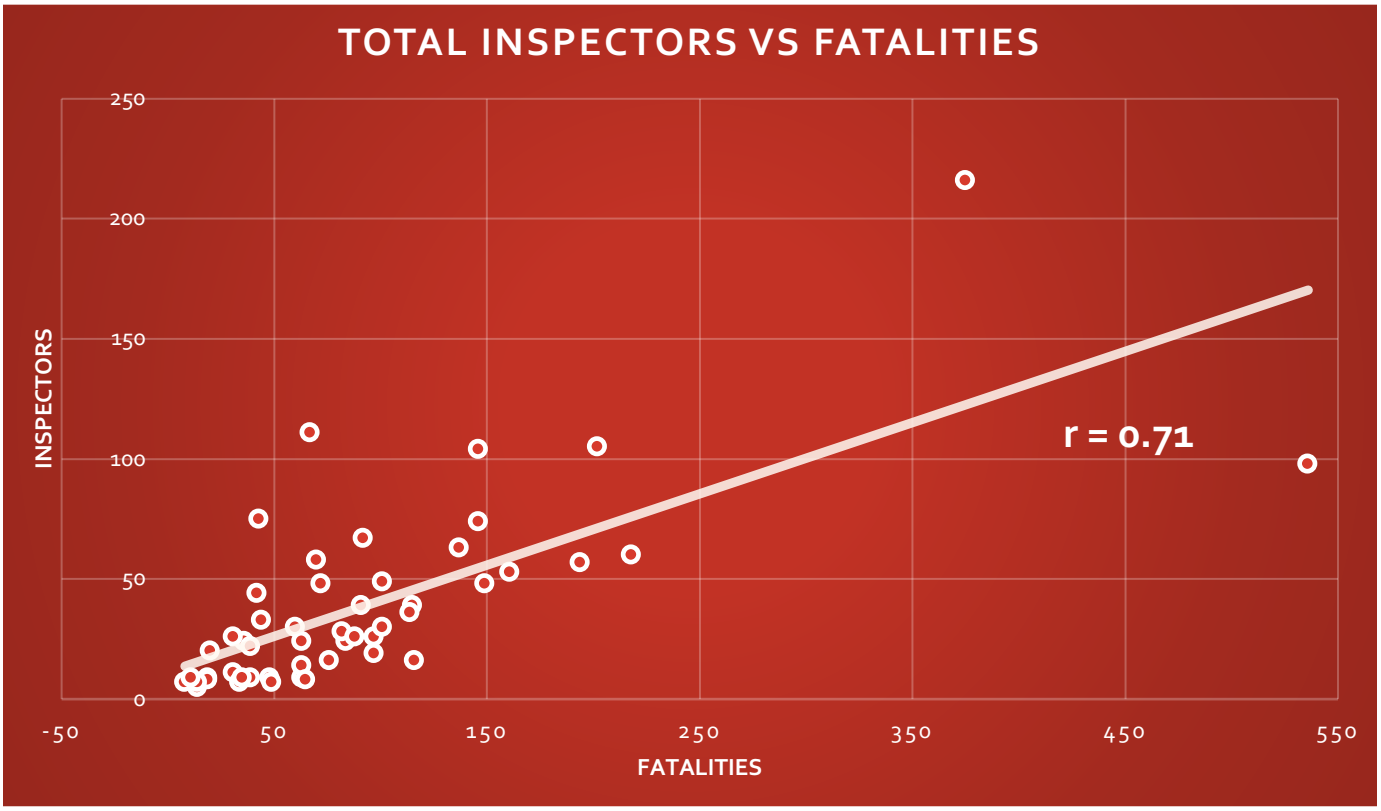
INJURIES & ILLNESSES IN 2012




600
500
400
300
200
100
0
YEARS
20
18
16
14
12
10
8
6
4
2
0
RATE
SOUTH DAKOTA
ARKANSAS
NEW YORK
WEST VIRGINIA
ILLINOIS
MONTANA
NEBRASKA
MASSACHUSETTS
COLORADO
MISSOURI
MISSISSIPPI
KANSAS
CONNECTICUT
RHODE ISLAND
MAINE
CALIFORNIA
KENTUCKY
MARYLAND
WYOMING
TENNESSEE
UTAH
VERMONT
ALASKA
WASHINGTON
MICHIGAN
FEDERAL
STATE
AVERAGE YEARS TO INSPECT EACH WORKPLACE ONCE
AVERAGE RATE OF FATALITIES, 2012


YEARS TO INSPECT VS RATE OF FATALITIES
600
500
400
300
200
100
0
YEARS
0
2
4
6
8
10
12
14
16
18
RATE
r = 0.12


600
500
400
300
200
100
0
FATALITIES
250
200
150
100
50
0
INSPECTORS
TEXAS
NEW YORK
OHIO
LOUISIANA
GEORGIA
NEW JERSEY
ALABAMA
KANSAS
ARKANSAS
WEST VIRGINIA
MASSACHUSETTS
MONTANA
MAINE
NEW HAMPSHIRE
RHODE ISLAND
VIRGINIA
MICHIGAN
TENNESSEE
KENTUCKY
MINNESOTA
SOUTH CAROLINA
OREGON
NEW MEXICO
WYOMING
HAWAII
FEDERAL
STATE
TOTAL FATALITIES, 2012
NUMBER OF INSPECTORS


TOTAL INSPECTORS VS FATALITIES
250
200
150
100
50
0
INSPECTORS
r = 0.71
-50
50
150
250
350
450
550
FATALITIES

CONCLUSION

This analysis highlights the importance of data-driven approaches to workplace safety. By comparing programs and examining trends in incidents, inspections, and penalties, we gain valuable insights into how safety can be improved. While challenges remain, applying these findings can help prevent future injuries, protect workers, and reduce costs for employers.

TAKEAWAYS

Analyzing this data enabled us to compare state-by-state metrics, evaluate federal versus state program performance, and examine how 2012 incidents translated into penalties issued in 2013. One particularly surprising finding is a positive correlation between the number of inspectors and the number of fatalities reported per state. However, as correlation does not imply causation, further investigation is needed to better understand the underlying factors behind this relationship.

INCONSISTENCIES

Based on the available data, several key metrics show no clear correlation: fatality rates do not align with total fatalities per state, injury and illness rates do not reflect total case counts, and the number of inspectors does not correlate with the average time needed to inspect each workplace. However, the dataset is limited in scope and contains notable gaps across categories, making it difficult to fully assess the accuracy or implications of these figures.

IMPROVEMENTS

To enable more accurate predictions and deeper insights, additional data is essential. At a minimum, future datasets should include details such as the type of workplace or industry involved, the dates of incidents, the total number of worksites, the size of the population sample, and a clear explanation of the data collection process and methodology.