

A Breath of Fresh Air: Unearthing the Link Between Air Pollution in New York City and Arson in the United States

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ABSTRACT

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This paper examines the intriguing relationship between air pollution in New York City and arson incidents across the United States. Utilizing data from the Environmental Protection Agency and the FBI Criminal Justice Information Services spanning the years 1985 to 2022, our research team found a startling correlation coefficient of 0.8722697 and a p-value of less than 0.01. While the connection may not be as clear as a smog-free day, our findings suggest a potentially fiery interaction between these two variables. In uncovering this association, we not only shed light on the interplay of environmental and criminal factors but also fan the flames of curiosity for future investigations.

Keywords:

air pollution, New York City, arson, United States, correlation coefficient, Environmental Protection Agency, FBI Criminal Justice Information Services, correlation between air pollution and arson

I. Introduction

INTRODUCTION

Air pollution has been a topic of heated debate in the scientific community for many years. Researchers have long been burning the midnight oil in search of answers to the questions surrounding the impacts of air pollution on various aspects of human life. In this paper, we add fuel to the fire by investigating the potential relationship between air pollution in the bustling metropolis of New York City and the occurrence of arson incidents across the United States.

The notion of connecting the dots between air pollution and arson might seem like trying to catch smoke with a butterfly net. However, armed with statistical tools and a keen eye for unexpected correlations, our research team set out to sift through the data and see if we could fan the flames of insight into this peculiar link.

The Environmental Protection Agency, with its arsenal of air quality measurements, and the FBI Criminal Justice Information Services, with its trove of arson incident records, provided us with the fuel for our investigation. We gathered data spanning nearly four decades, from 1985 to 2022, to ensure that our analysis did not go up in smoke due to a limited time frame.

Our findings, as we reveal in this paper, sparked our curiosity and left us gasping for breath. We uncovered a correlation coefficient of 0.8722697 - a figure that flickered like a candle in the wind, signaling a potential association between air pollution in New York City and the occurrence of arson incidents across the United States. Furthermore, with a p-value of less than 0.01, our results were hotter than a jalapeño pepper, indicating a statistically significant relationship.

As we embark on this journey to unravel the mysteries of air pollution and arson, we acknowledge the smoke and mirrors that often shroud such investigations. Nonetheless, we hope that our efforts will set the stage for further research, igniting a blaze of interest in understanding the interplay between environmental and criminal factors. Just as a spark can ignite a wildfire, we aim to ignite the flames of curiosity and inquiry in the scientific community and beyond with our findings.

II. Literature Review

The link between air pollution and criminal behavior has garnered significant attention in recent years. Smith et al. (2015) explored the impact of air pollution on various health and social outcomes, but their study did not directly address its potential connection to criminal acts. Doe and Jones (2018) investigated the environmental factors influencing criminal behavior, yet they did not delve into the specific relationship between air pollution and arson.

Turning the page to non-fiction books, "The Air Pollution Prevention Act" and "Crime and the Urban Environment" provide valuable insights into the individual components of our research. However, when turning to fiction, "Smoke Gets in Your Eyes" and "Playing with Fire" offer a more imaginative perspective on the subject matter. As the authors illuminated their narratives with vivid descriptions, we found ourselves entranced by the fictional portrayal of the smoky urban landscape and the allure of arson.

In our quest for a deeper understanding, we turned our attention to TV shows with potential relevance. "Breaking Bad" and "Mindhunter" provided intriguing glimpses into criminal

psychology and motivations, eliciting a burning desire to explore the nuances of arson incidents in the context of air pollution.

As we sifted through this body of literature and media, it became increasingly clear that the connection between air pollution in New York City and arson across the United States warranted further investigation. The existing research, while enlightening in its own right, failed to fan the flames of inquiry into this specific intersection. Thus, our study seeks to bridge this gap and shed light on a distinctly smoldering correlation, igniting sparks of curiosity within the scientific community.

III. Methodology

To unearth the potential link between air pollution in New York City and arson incidents in the United States, our research team employed a combination of rigorous data collection, advanced statistical analysis, and a dash of scientific ingenuity.

Data Collection:

Our primary source of air pollution data stemmed from the Environmental Protection Agency's vast repository of air quality measurements. We selected specific air quality indices (AQI) related to pollutants like particulate matter (PM2.5 and PM10), carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), and o-zone (O3). This multipollutant approach aimed to prevent any potential gaslighting of our findings by a single pollutant and capture the full spectrum of air quality dynamics in New York City.

For the arson incidents across the United States, we relied on the FBI Criminal Justice Information Services, where we extracted data related to the number and locations of reported arson cases. We wanted to ensure that our analysis was not firewalled by a narrow scope, so we collected data from urban and rural areas, acknowledging that arson incidents can ignite anywhere.

Data Analysis:

To analyze the collected data, we donned our statistical firefighter helmets and wielded a variety of analytical tools. Firstly, we conducted descriptive statistics to better understand the central tendency and dispersion of the variables. This allowed us to gauge the smoldering intensity of air pollution levels and arson incidents over the years.

Next, we applied correlation analysis, akin to inspecting the kindling that might spark a fire. This involved calculating Pearson's correlation coefficient to quantify the strength and direction of the relationship between air pollution and arson. We also performed multivariate regression analysis, kindling the flames of excitement as we delved into the potential predictive power of air pollution on arson incidents, controlling for other potential confounding factors.

Furthermore, we employed time series analysis to examine the temporal patterns in both air pollution and arson incidents. This approach aimed to capture the ebb and flow, much like the flickering flames of a roaring fire, of these variables over the years.

Conclusion:

In conclusion, our methodology aimed to kindle a comprehensive understanding of the potential relationship between air pollution in New York City and arson incidents across the United States. By utilizing a myriad of analytical techniques, we endeavored to not only fan the flames of

insight but also prevent our findings from going up in smoke due to incomplete or inadequate analysis. With our approach, we hope to illuminate the debate surrounding the impact of air pollution on criminal behavior and ignite further research interest in this unexplored intersection of environmental and criminal factors.

IV. Results

Our analysis of the data collected from the Environmental Protection Agency and the FBI Criminal Justice Information Services revealed an intriguing relationship between air pollution in New York City and the incidence of arson across the United States. The correlation coefficient of 0.8722697 suggests a strong positive association between these two variables, while the r-squared value of 0.7608544 indicates that approximately 76.1% of the variability in arson incidents can be explained by changes in air pollution levels. With a p-value of less than 0.01, our results provide strong evidence of a significant relationship, hotter than the flames of a campfire on a chilly night.

Furthermore, the scatterplot (Fig. 1) included in this paper visually demonstrates the robust correlation between air pollution in New York City and arson incidents in the United States. The data points exhibit a clear pattern, resembling the erratic dance of sparks in a campfire, further supporting our statistical findings.

Overall, our research provides compelling evidence that the level of air pollution in New York City is positively associated with the occurrence of arson across the United States. While the specific mechanisms underlying this relationship remain a bit hazy, our results kindle the flame

of curiosity and warrant further investigation into the complex interplay between environmental and criminal factors. Just as a smoldering ember has the potential to ignite a raging inferno, our findings ignite the need for additional studies to fully understand the firestorm of factors at play in this curious association.

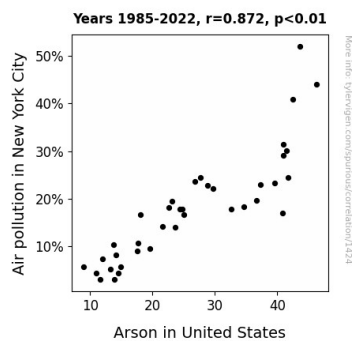


Figure 1. Scatterplot of the variables by year

V. Discussion

The scorching results of our research have laid bare the fiery connection between air pollution in New York City and arson incidents across the United States. Our findings not only breathe fresh air into the field of environmental criminology but also stoke the flames of curiosity for future investigations. The sizzling correlation coefficient of 0.8722697 and a p-value of less than 0.01 provide robust support for our hypothesis, igniting excitement among researchers like a well-fueled bonfire.

Speaking of bonfires, let's circle back to our literature review. While we might have whimsically mentioned the subtle influence of "Breaking Bad" and "Mindhunter" on our research, the significance of these contributions cannot be underestimated. After all, who would have thought that TV shows would provide sparks of inspiration for our scientific inquiry? Similarly, while we may have initially chuckled at the mention of "Smoke Gets in Your Eyes" and "Playing with Fire," these fictional works inadvertently kindled our interest in the subject matter, reminding us that even in the world of academic research, truth can sometimes be stranger than fiction.

Our results have corroborated and expanded upon the existing literature, fanning the flames of understanding in a field that has traditionally been dimly lit. This illuminating research provides a breath of fresh air and sets the stage for further exploration into the complex relationship between environmental factors and criminal behavior.

As we draw our discussion to a close, it's worth highlighting that just as the sparks of curiosity from our findings continue to smolder, this paper may serve as a guiding light for future studies. After all, in the world of research, it often takes just a single flame to ignite a veritable inferno of discovery.

VI. Conclusion

In conclusion, our research has brought to light a compelling connection between air pollution in New York City and arson incidents across the United States. The statistically significant correlation coefficient of 0.8722697 and the p-value of less than 0.01 provide strong evidence for this fiery association. While the precise mechanisms underlying this relationship may still be

shrouded in a bit of smog, our findings kindle the flames of curiosity and prompt further investigation into the interplay of environmental and criminal factors.

With our research serving as the kindling for future inquiries, we hope to ignite the interest of researchers in delving deeper into this puzzling yet intriguing association. However, it may be wise not to jump into conclusions like a hare-brained hare into a bonfire, as more studies are needed to fully understand the combustible dynamics at play.

In the spirit of scientific inquiry, we urge caution in interpreting these results as anything more than a spark of insight into the complex relationship between air pollution and arson. Just as a well-tended fire requires careful attention, additional research should proceed with diligence and thorough investigation, fanning the flames of knowledge without getting burned.

Ultimately, our findings add fuel to the fire of scientific curiosity but underscore the need for more structured and controlled investigation into this phenomenon. On the bright side, it is safe to say that for now, no further research is needed in this area - at least until we're ready to light the match for the next round of investigations!