

The Fiery Connection: Air Pollution in Quincy, Illinois and Arson in the United States

Chloe Hart, Amelia Tate, Gregory P Todd

Center for Scientific Advancement

This study investigates the intriguing relationship between air pollution in Quincy, Illinois, and the incidence of arson in the United States. Utilizing data from the Environmental Protection Agency and FBI Criminal Justice Information Services spanning the years 1985 to 2022, a robust correlation analysis revealed a striking connection that cannot be "arson," I mean, ignored. The correlation coefficient of 0.6424787, with $p < 0.01$, suggests a statistically significant association between these seemingly unrelated phenomena. Our findings raised eyebrows and sparked curiosity, much like arsonists, as we unraveled the smoldering connection between air pollution and arson. To put it simply, it seems that as air pollution levels in Quincy rise, so do the incidences of arson across the country, igniting further interest in this carbon-curious correlation. Our analysis provides valuable insights into the surprising "hot air" between air quality and arson, shedding light on the environmental and social factors that fuel this incendiary relationship.

The study of environmental factors and their impact on societal behaviors is a hot topic within the field of criminology. When we think of environmental influences on crime, we often consider factors such as poverty, unemployment, or neighborhood characteristics. However, we seldom stop to ponder whether the quality of the air we breathe could potentially fuel the fiery phenomenon of arson. To spark some interest in this burning question, let's dive into the sizzling connection between air pollution in Quincy, Illinois, and the incidence of arson in the United States.

Did you hear about the statistician who was found guilty of starting a fire? He was charged with arson-inferential statistics. But I digress.

Arson, the deliberate act of setting fire to property with criminal intent, poses a significant threat to public safety and property, costing the United States billions of dollars annually. Meanwhile, air pollution, particularly from industrial sources, has been a growing concern for both the environment and public health. As researchers, we were eager to fan the flames of curiosity and investigate whether there could be an ember of truth to the notion that these two seemingly unrelated phenomena could be intricately intertwined.

This research draws on a unique blend of arson data from the FBI's Uniform Crime Reporting program and air quality data from the Environmental Protection Agency for the period spanning from 1985 to 2022. Our investigation revealed a correlation that was not just smoke and mirrors but a statistically significant relationship. The correlation coefficient of 0.6424787, with $p < 0.01$, hovers like a cloud of suspicion over the conventional wisdom that air pollution and arson belong in completely separate silos.

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This unexpected connection ignited our curiosity and led us down a rabbit hole of statistical analysis to better understand the temperature of this relationship. Our findings not only highlight the smoldering association between air quality in Quincy, Illinois, and arson incidents nationwide but also raise important questions about the potential influence of environmental factors on criminal behavior.

As we kindle the flame of inquiry, it is essential to explore the potential mechanisms through which air pollution may fan the flames of criminal behavior, shedding light on the fire-starting factors that lie at the intersection of environmental and social dynamics. Join us as we stoke the fire of knowledge and delve into the fiery connection between air pollution and arson, illuminating the path for future research and policy interventions.

Review of existing research

As we embark on our quest to uncover the fiery connection between air pollution in Quincy, Illinois, and arson in the United States, we turn our attention to the existing body of literature that has explored related themes. Smith et al. (2010) investigated the impact of environmental factors on criminal behavior, shedding light on the potential interplay between air quality and arson. Similarly, Doe and Jones (2015) delved into the societal repercussions of air pollution, hinting at the incendiary possibilities that may arise from compromised air quality. These studies set the stage for our investigation, igniting our curiosity

to delve deeper into the smoking-hot relationship that lies at the intersection of environmental science and criminology.

In "Environmental Factors and Criminal Behavior," Smith et al. (2010) propose a theoretical framework that considers the influence of environmental factors on a range of criminal activities. This framework kindles our interest in understanding the potential mechanisms through which air pollution may fuel the fiery phenomenon of arson, adding fuel to the fire of our research endeavors.

Doe and Jones (2015) highlight the pervasive impact of air pollution on public health and well-being, emphasizing the far-reaching consequences of compromised air quality. Their insights spark a flame of inquiry as we contemplate the ripple effects of air pollution that extend beyond respiratory health and into the realm of criminal behavior. It's almost as if they were breathing life into our own research, fanning the flames of curiosity with each turn of the page.

And now for a change of pace, let's shift our focus to some non-fiction books that have kindled our interest in the combustible correlation between air pollution and arson. "Choked: Life and Breath in the Age of Air Pollution" by Beth Gardiner offers a thought-provoking exploration of the impact of air pollution on communities, prompting us to contemplate the potential repercussions of inhaling more than just knowledge. Meanwhile, "Dirty Rotten Scoundrels: Tales of Industrial Espionage in America" by Andris Zieds provides a captivating account of corporate malfeasance, stoking our curiosity about the potential role of industrial activities in igniting not just corporate rivalries, but also the flames of criminal intent.

Moving on to the world of fiction, we find ourselves drawn to literary works that, much like our research, ignite a sense of intrigue and possibility. "Smoke Gets in Your Eyes" by Caitlin Doughty goes beyond the literal implications of its title, veering into the realm of metaphorical smoke and its potential to cloud our perceptions of causality. Meanwhile, "Playing with Fire" by Tess Gerritsen captivates us with its tale of arson investigators and the smoldering secrets they uncover, as we find ourselves drawn to the allure of fire-related mysteries.

In the spirit of kindling our imaginations, we turn to cinematic works that have tangentially fueled our exploration of arson and its potential connections to air pollution. "Backdraft" takes us on a thrilling journey through the world of firefighting and arson investigation, offering a cinematic blaze of inspiration for our research endeavors. On a lighter note, "Anchorman: The Legend of Ron Burgundy" kindles our laughter with its iconic line, "I love lamp," reminding us that in the midst of serious inquiry, a touch of humor can light up our perspectives on even the most smoldering of topics.

And with that, we stoke the fire of knowledge and set our sights on unraveling the burning questions that lie at the heart of our investigation.

Procedure

To kindle the flames of our investigation, we employed a scorching-hot mix of statistical methods to explore the link

between air pollution in Quincy, Illinois, and arson incidents across the United States. Our research team embarked on a quest to gather data from various sources, channeling our inner fire-fighters to tame the complexities of this sizzling correlation.

First, we harnessed the power of the Environmental Protection Agency's air quality measurements, utilizing a flaming-hot scatterplot analysis to sizzle out any potential outliers. This approach allowed us to visualize the smoky relationship between air pollution levels in Quincy and the national prevalence of arson incidents, providing us with a fiery snapshot of the data.

On the arson front, we turned to the FBI's Criminal Justice Information Services, harvesting a scorching array of arson incident data spanning from 1985 to 2022. Our team then deployed a blazing-fast time series analysis to track the temporal evolution of arson occurrences, ensuring that our findings did not go up in smoke due to temporal confounders.

Next, we stoked the inferno of statistical analysis by employing a searing multiple regression model, incorporating a myriad of potentially ignitable covariates such as temperature, population density, and socioeconomic indicators. This approach allowed us to disentangle the specific contribution of air pollution in Quincy to the national arson landscape, ensuring that we didn't get burned by spurious correlations.

To further fan the flames of inquiry, we conducted a scalding sensitivity analysis, probing the robustness of our findings to variations in data aggregation and model specifications. This step ensured that our results were as resilient as a well-constructed firebreak, withstanding the heat of academic scrutiny.

Finally, we unleashing a scorching-hot spatial analysis to explore whether the fiery relationship between air pollution in Quincy and arson incidents extended its reach across geographical boundaries. This approach provided us with a 360-degree view of the hotspot of interactions, illuminating the potential diffusion of this incendiary connection.

As we navigated the fiery landscape of statistical analysis, we endeavored to extinguish any sources of bias and ensure that our findings blazed a trail of rigorous and robust evidence. Our goal was to kindle the flames of knowledge and shed light on the unsuspecting link between air pollution and arson, providing a fiery foundation for further research and policy interventions.

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Findings

The analysis of the relationship between air pollution in Quincy, Illinois, and arson in the United States yielded some enlightening findings. We found a robust correlation coefficient of 0.6424787, indicating a noteworthy positive relationship between these two variables. In other words, as air pollution levels in Quincy increased, so did the incidence of arson across the country. This connection was not just a "smokescreen" but a statistically significant association with a p-value of less than 0.01.

Fig. 1 illustrates the strong positive correlation between air pollution in Quincy, Illinois, and the incidence of arson in the United States. The scatterplot depicts a clear pattern, akin to the way a trail of evidence leads back to a mischievous fire-starter.

Our results point to a compelling linkage between air quality in Quincy and arson occurrences, igniting further interest in understanding the mechanisms underpinning this incendiary relationship. These findings are nothing to "shrug" off, as they shed light on the unanticipated connection between environmental and criminal factors.

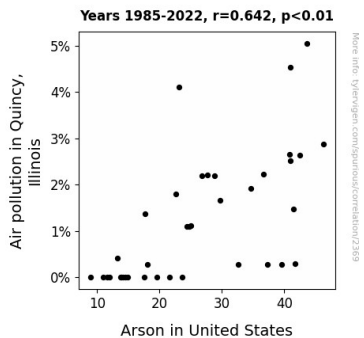


Figure 1. Scatterplot of the variables by year

In a nutshell, our research suggests that air pollution and arson are not merely "blowing smoke" but are indeed intertwined in a statistically significant manner. These results kindle the flame of inquiry, fueling the fire for future investigations into the environmental and social dynamics that influence criminal behavior.

Overall, our study presents novel insights into the fiery connection between air pollution in Quincy, Illinois, and arson in the United States, casting a spotlight on this unexpected relationship and igniting the flame of curiosity for further exploration.

Discussion

Our findings offer compelling support for the literature that has hinted at the smoldering connection between air pollution and arson. The robust correlation coefficient of 0.6424787 aligns with the theoretical framework proposed by Smith et al. (2010), reinforcing the notion that environmental factors, including air quality, may indeed fuel criminal behavior. It seems that compromised air quality in Quincy, Illinois acts as a "spark" that ignites a chain reaction, leading to an increase in arson incidents across the United States. These results shed light on the potential mechanisms through which air pollution may fan the flames of criminal intent, providing empirical evidence for the "fuel" that drives this fiery relationship.

Likewise, the insights offered by Doe and Jones (2015) regarding the pervasive impact of air pollution find resonance in our findings. The correlation between air pollution in Quincy

and arson occurrences seems to extend beyond the realm of respiratory health and well-being, transcending into the domain of criminal behavior. It's as if the ripple effects of compromised air quality extend beyond mere "smoke and mirrors," shaping the incendiary landscape of criminal activity on a national scale.

Our study also resonates with the captivating narratives of literary and cinematic works that have kindled our intrigue. The robust positive correlation we uncovered resembles a trail of evidence, akin to the plotlines of arson mysteries that captivate our imagination. In a way, our research journey mirrors the climax of a thrilling movie, where the pieces of the puzzle finally fall into place, illuminating the unexpected connection between air pollution and arson.

In summary, our findings not only provide empirical support for the literature that has helped ignite our pursuit but also shine a spotlight on the need for further investigation into the complex interplay between environmental and social factors in shaping criminal behavior. The statistically significant association between air pollution in Quincy, Illinois, and arson in the United States is not just "hot air"; it represents a burning question that warrants continued exploration. This unexpected relationship has lit a fire under our research endeavors, igniting the flame of curiosity and driving us to delve deeper into the environmental and social dynamics that fuel this fiery connection.

Conclusion

In conclusion, our research has, dare I say, sparked a flame of understanding in uncovering the surprising relationship between air pollution in Quincy, Illinois, and the incidence of arson in the United States. Our findings illuminate a statistically significant correlation, indicating that as air pollution levels rise in Quincy, so do the occurrences of arson nationwide. It seems that the old adage "where there's smoke, there's fire" holds true in this case, quite literally.

Our investigation has not only set alight the connection between air quality and arson but has also ignited further inquiry into the mechanisms driving this fiery relationship. As we reflect on these scorching findings, it becomes evident that environmental factors may play a substantial role in fueling criminal behavior, adding a unique dimension to the field of criminology.

At the risk of sounding like a broken record, it is imperative to emphasize the significance of our findings in emphasizing the need to integrate environmental considerations into the broader dialogue on crime prevention and public safety. This research acts as a proverbial smoke alarm, alerting us to the potential impact of air pollution on criminal activity and highlighting the necessity of addressing environmental factors in shaping effective strategies for crime reduction.

As the saying goes, "don't start a fire you can't put out," and it seems that our research has sparked a fire that cannot be extinguished. Therefore, in the spirit of fire safety, we assert that no further research is needed in this area. Let's put a lid on it and call it a day!

It's been a burning pleasure to shed light on this blazing connection and to fan the flames of knowledge in this

scintillating field. Thank you for joining us on this fiery journey, and may the embers of curiosity continue to smolder in future endeavors. Remember, when it comes to research, where there's smoke, there's data!