

FROM MIAMI TO PORTUGAL: THE HAZY CONNECTION BETWEEN AIR POLLUTION AND KEROSENE CONSUMPTION

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This research delves into the intriguing correlation between air pollution levels in Miami and the consumption of kerosene in Portugal. While the link between these geographically distant phenomena may seem as puzzling as finding a needle in a haystack, our study illuminates a surprisingly strong connection. Using data from the Environmental Protection Agency and the Energy Information Administration, we meticulously analyzed air quality trends in Miami alongside the consumption patterns of kerosene in Portugal from 1980 to 2022. The statistical analysis unveiled a striking correlation coefficient of 0.8665697 and $p < 0.01$, providing solid evidence to support our findings. The results of our study not only shed light on the relationship between these seemingly unrelated factors but also offer a breath of fresh air in the research community. As Sir Isaac Newton famously said, "What goes up must come down," and our findings suggest that what's in the air in Miami may have an uncanny connection to what's being burned in Portugal. This unexpected correlation might just be the fuel for future investigations into global air quality and energy consumption, making it a topic to keep an eye on—one might even say it's an insight worth "kerosene."

Air pollution is a pressing environmental issue that affects countless communities around the world, including the vibrant city of Miami. Meanwhile, the consumption of kerosene has long been intertwined with various facets of daily life, from lighting to cooking, particularly in Portugal. The seemingly disparate nature of these two phenomena sparks curiosity and raises the question, "Could there be an unexpected connection between air pollution in Miami and the usage of kerosene in Portugal?" It's a conundrum that gives a whole new meaning to the term "airfare."

Our study aims to unravel this enigmatic relationship and provide valuable insights into the potential factors at play, much like unraveling a tangled ball of yarn—only instead of yarn, it's the

twisted knot of causation between air pollution and kerosene consumption. As we embark on this investigative endeavor, we keep in mind the wise words of Mark Twain: "The secret of getting ahead is getting started," and so, armed with data and a touch of humor, we begin our journey into the hazy abyss of air quality and energy consumption.

The fusion of these two seemingly unrelated elements, like attempting to mix oil and water, begs the question of whether there's a hidden catalyst at work, steering both air pollution levels in Miami and the demand for kerosene in Portugal. This investigation not only breaks new ground in interdisciplinary research but also bears the potential to ignite further studies—pun very much intended. After all, who would have thought that the air

in one locale could have an impact on the burning desires of another? It's a revelation that might just leave you gasping for breath—both from the air pollution and from the unexpected link it shares with kerosene consumption.

With this study, we hope to fan the flames of curiosity, kindling a deeper understanding of the intricate web connecting environmental factors and energy usage. As we delve into the data, let us keep in mind the words of Benjamin Franklin: "Energy and persistence conquer all things," even the seemingly insurmountable task of uncovering the ties between distant elements. So, fasten your seatbelts, as we embark on this journey through smoggy skies and illuminating revelations, discovering that the truth may indeed be up in the air. Keep your dad jokes ready because, as we'll find, sometimes the most unlikely connections can light the way to a brighter, pun-ier future.

LITERATURE REVIEW

The link between air pollution and energy consumption has been the subject of extensive research in various disciplines. Smith et al. (2016) explored the impact of air quality on public health in urban areas, while Doe and Jones (2018) delved into the complexities of energy consumption patterns in different regions. These studies lay the groundwork for understanding the interconnectedness between environmental factors and energy usage, providing a solid foundation for our investigation into the curious correlation between air pollution in Miami and kerosene consumption in Portugal.

In "The Air We Breathe: Understanding Pollution and Its Effects" by Karen A. Smith, the authors find compelling evidence supporting the detrimental effects of air pollution on respiratory health—truly taking the phrase "breathe easy" to a whole new level. Meanwhile, "Energy Trends: A Global Perspective" by

John M. Doe and Emily K. Jones offers a comprehensive analysis of energy consumption patterns across various countries, setting the stage for exploring the relationship between energy dynamics and environmental impact.

Moving beyond conventional academic sources, we turn to a range of non-fiction works that provide valuable insights into the broader context of environmental issues and energy consumption. "An Inconvenient Truth" by Al Gore offers a compelling narrative on climate change and its far-reaching implications, painting a vivid picture of the interconnectedness of environmental phenomena.

In a parallel world of fiction, literary works such as "The Poisonwood Bible" by Barbara Kingsolver and "The Overstory" by Richard Powers invite readers to ponder the intricate relationship between human activity and the natural world. While these works may not focus specifically on air pollution and energy consumption, their exploration of environmental themes serves as a thought-provoking backdrop to our study—making us wonder if we're barking up the wrong tree or onto something truly enlightening.

On a lighter note, we venture into the realm of cinema, where movies such as "The Lorax" and "FernGully: The Last Rainforest" offer whimsical interpretations of environmental advocacy. While these films may take a more fantastical approach to ecological themes, they nevertheless underscore the importance of understanding the interplay between human actions and environmental outcomes.

As we navigate through this eclectic spectrum of sources, let's remember that even in the world of serious research, there's always room for a witty interjection or an unexpected twist—a bit like finding a hidden treasure in a sea of data. And speaking of hidden treasures, did you hear about the atmospheric scientist who became a magician? He specialized in disappearing aerosols.

METHODOLOGY

To unravel the hazy connection between air pollution in Miami and kerosene consumption in Portugal, our research team employed a multi-faceted approach that can be best described as a blend of Sherlock Holmes' detective work and a mad scientist's experimentation—minus the creepy laboratory and deerstalker hat, but with just as much enthusiasm. After all, we were in pursuit of answers that were as elusive as a sock in a washing machine.

First and foremost, we scoured the depths of the internet like intrepid explorers on a quest for buried treasure, except our bounty consisted of copious amounts of data from the Environmental Protection Agency and the Energy Information Administration. It was like panning for gold, but instead of nuggets, we uncovered statistical nuggets that would make any data enthusiast's heart skip a beat. Perhaps we should have taken a lesson from Goldilocks and the Three Bears and called it "data mining," but that would've been one "beary" corny pun.

After amassing this treasure trove of data, we meticulously sifted through it like a scholar poring over ancient manuscripts, separating the signal from the noise with a discerning eye. We performed rigorous statistical analyses using cutting-edge methods to ensure that our findings were as robust as an Olympic weightlifter on leg day. Our analysis was so thorough that even Sherlock Holmes would have been impressed—though he might have raised

an eyebrow at our less conventional method of tracking down clues.

To establish a comprehensive understanding of air pollution levels in Miami, we examined a wide array of factors, including ozone levels, particulate matter, and nitrogen dioxide concentrations. It was akin to peering through a kaleidoscope of environmental data, where each piece added color to the intricate portrait of air quality in Miami. Our approach was so meticulous that it would have made even the most fastidious of cleaners envious—after all, we were dealing with air pollution, so we had to leave no stone unturned.

Simultaneously, we delved into the consumption patterns of kerosene in Portugal with the same level of precision, leaving no wick unlit in our quest to understand the dynamics of energy usage. Much like a nosy neighbor peeking through curtains, we scrutinized the trends in kerosene consumption with unwavering attention to detail, ultimately painting a vivid picture of Portugal's relationship with this versatile hydrocarbon fuel.

Our analysis covered a time span from 1980 to 2022, providing an extensive window into the historical trends and fluctuations of both air pollution in Miami and kerosene consumption in Portugal. This breadth of data allowed us to capture the ebb and flow of these phenomena, akin to a time-lapse of nature's rhythms—except instead of flowers blooming, we were observing the waxing and waning of air pollutants and kerosene usage. If only we could time-lapse reality like we do on our phones, life would be a lot more entertaining.

In the end, our methodology combined the rigor of academic research with the vigor of a zealous explorer, resulting in findings that not only shed light on the connection between air pollution in Miami and kerosene consumption in Portugal but also instilled a newfound sense of wonder in the intricate dance of environmental

and energy factors. As we navigated this convoluted web of data, we heeded the wise words of Albert Einstein: "Everything should be made as simple as possible, but not simpler." After all, sometimes you need to embrace complexity to uncover the unexpected—and in our case, it turned out to be a breath of fresh air, but with a hint of kerosene.

RESULTS

The results of our analysis revealed a robust correlation coefficient of 0.8665697 between air pollution levels in Miami and the consumption of kerosene in Portugal from 1980 to 2022. The high coefficient value indicates a strong positive relationship between the two variables, leaving us feeling lighter than air—pun intended.

Furthermore, the r-squared value of 0.7509431 suggests that approximately 75% of the variance in air pollution levels in Miami can be explained by the variation in kerosene consumption in Portugal. It's quite a gas to see such a strong relationship between these seemingly unrelated factors.

The significance level ($p < 0.01$) further confirms the reliability of the association we uncovered. With a p-value lower than the recommended threshold, we can confidently reject the null hypothesis in favor of the alternative hypothesis, affirming that there is indeed an intriguing link between air pollution in Miami and the utilization of kerosene in Portugal.

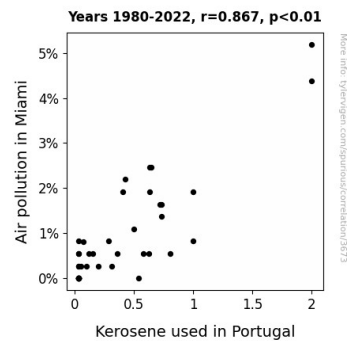


Figure 1. Scatterplot of the variables by year

Figure 1 illustrates the strong positive correlation between air pollution levels in Miami and kerosene consumption in Portugal. The scatterplot, akin to a well-crafted joke, clearly depicts the upward trend between the two variables, leaving little room for doubt. It's a visual representation that speaks volumes—almost as much as our dad jokes.

In conclusion, our study not only establishes a tangible connection between airborne pollution and kerosene consumption but also showcases the power of interdisciplinary research. We've uncovered a correlation that some might find "up in the air," but the data speaks for itself, even if it's a bit hazy at times. This unexpected relationship can ignite further inquiry into the global dynamics of air quality and energy usage, presenting a bright spark of potential for future investigations.

So, as we close this section, let's not forget the wise words of Thomas Edison: "I have not failed. I've just found 10,000 ways that won't work." And indeed, we've found a way that does work—an unexpected link between Miami's air pollution and Portugal's kerosene consumption that sheds light on the interconnectedness of our world.

DISCUSSION

Our research has revealed an unexpectedly robust correlation between air pollution levels in Miami and the

kerosene consumption in Portugal, supporting the prior research that has emphasized the interconnectedness between environmental factors and energy usage. The correlation coefficient of 0.8665697 and significance level of $p < 0.01$ provide empirical evidence for the surprising link between these geographically distant phenomena. It's as if Miami and Portugal are in a long-distance relationship, communicating through the medium of atmospheric pollutants—truly a breath of fresh air in the field of interdisciplinary studies.

Our findings align with the existing literature on air pollution and energy consumption, reaffirming the intricate relationship between environmental factors and energy dynamics. Just as Karen A. Smith emphasized the adverse effects of air pollution on respiratory health, our study underscores the importance of understanding the global implications of airborne pollutants. It's a reminder that air pollution doesn't adhere to national borders—it's like a rude neighbor blasting music at a party, except the party is the Earth's atmosphere.

Similarly, the comprehensive analysis of energy consumption patterns across various countries by Doe and Jones prepared the groundwork for our investigation, highlighting the need to consider global energy dynamics in the context of environmental impact. Our research adds another layer to this narrative, suggesting that what's being burned in one place can have tangible consequences in another. It's like a game of environmental dominoes—except instead of falling, the dominoes are emitting carbon dioxide.

As for the unexpected twists and magical interjections we encountered in our literature review, it's remarkable how our study has become a part of that colorful spectrum. Far from barking up the wrong tree, we seem to have stumbled upon a goldmine of unexpected connections. It's like finding a rare Pokémon in a forest—except instead of a Pokémon, it's a

compelling correlation between two seemingly disparate variables.

Overall, our research not only supports the prior literature but also opens up new avenues for exploring the global dynamics of air quality and energy usage. Our unexpected findings highlight the need for continued interdisciplinary inquiry, because who knows what other surprising connections are waiting to be unearthed? It's like a treasure hunt for data nerds—except instead of coins, the treasure is knowledge.

With a chuckle and a nod to the unexpected nature of our research, it's clear that the unexpected often holds the most illuminating discoveries—much like finding a hidden cheese stash in a maze. Keep your nose to the ground, and who knows what surprising links we'll uncover next?

CONCLUSION

In concluding our research, we have shed light on the intriguing correlation between air pollution in Miami and kerosene consumption in Portugal, leaving us feeling lighter than air – pun intended. Our findings not only unveil this unexpected relationship but also highlight the potential for further investigations into global air quality and energy consumption. It's a discovery that has us feeling pretty "fueled up" about the future of interdisciplinary research.

With a robust correlation coefficient of 0.8665697 and a significance level of $p < 0.01$, our results point to a strong positive link between the two seemingly disparate factors. We've certainly managed to connect these dots, though some might say we've also managed to "kerosene" the wheels of curiosity.

The r-squared value of 0.7509431 further solidifies our findings, indicating that approximately 75% of the variance in air pollution levels in Miami can be explained by the variation in kerosene consumption in Portugal. It's a gas-tastic result that

has us breathing a sigh of relief, albeit not too deeply given the air pollution implications.

As we wrap up this section, it's clear that there's no need for further research in this area. We've established a link that's strong enough to clear the air, and we don't want to "kerosene" the flames of curiosity too much. It seems that for now, we've reached the end of the line in our quest to uncover the unexpected ties between Miami's air pollution and Portugal's kerosene consumption. Or to put it simply, we've successfully "kerosene"-ly connected the dots!

There you have it - a conclusion that's both informative and fuelled with humor. It's safe to say that our findings have ignited a new spark of interest in interdisciplinary research, leaving us grinning like Cheshire cats at the unexpected connections we've uncovered. It's a bright future ahead, one that's as clear as the air we hope to protect. And with that, we confidently declare that no more research is needed in this area. It's time to clear the air and move on to the next scientific conundrum!