

# **The Wheezy Connection: A Breath of Fresh Air on US Household Spending and Air Pollution in St. Louis**

**Claire Henderson, Aaron Turner, Gregory P Turnbull**

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## ABSTRACT

### **The Wheezy Connection: A Breath of Fresh Air on US Household Spending and Air Pollution in St. Louis**

With every breath we take, we inhale not only air but also quite a bit of economics. In this study, we delved into the realm of household spending on prescription drugs in the United States and its potential relationship with air pollution, focusing specifically on the winds of change blowing through St. Louis. We employed data from the Bureau of Labor Statistics and the Environmental Protection Agency to tackle this conundrum, aiming to shed light on a topic that has been a bit up in the air. Our findings revealed a striking correlation coefficient of 0.8589101 and a p-value less than 0.01 for the years 2000 to 2022, suggesting that there may indeed be an airy connection between US household spending on prescription drugs and the pollution lingering in the skies over the Gateway to the West. So, take a deep breath, and prepare to be blown away by our potentially breathtaking findings!

Keywords:

household spending, prescription drugs, air pollution, St. Louis, US, economics, Bureau of Labor Statistics, Environmental Protection Agency, correlation coefficient, p-value, pollution, prescription drug spending, air quality, economic impact, health effects, environmental data, pollution correlation

# I. Introduction

The connection between US household spending on prescription drugs and air pollution is a topic that has been floating around in the air for quite some time. While some may argue that economics and air quality are like oil and water, with distinct properties and not easily mixed, our study aims to show that they are more interconnected than meets the eye. We chose to focus our research on the city of St. Louis, a place known for its iconic Gateway Arch and unfortunately, its not-so-iconic air pollution levels.

With every breath we take, we inhale not only air but also quite a bit of economics, or "economi"-breath if you will. St. Louis, nestled by the banks of the mighty Mississippi River, has been grappling with air pollution issues, leaving residents to ponder if they are breathing in more than just the sweet aroma of barbeque. As the saying goes, "When in St. Louis, do as the pollutants do!"

As researchers, we felt a certain wheeze of excitement about delving into the relationship between household spending on prescription drugs and air pollution. We aimed to uncover whether the dollars spent on medications were merely paying for the air we breathe or if there was a more concrete connection to be found. After all, there's no need to "puff" up a flimsy correlation if there's nothing substantial there!

Our study utilized data from the Bureau of Labor Statistics to track household spending patterns and the Environmental Protection Agency to measure various air pollutants. We then "ventured" into statistical analyses to uncover any potential links, aiming to breathe new life into the conversation about the impact of air pollution on household health expenses.

So, buckle up and put on your thinking cap, because we're about to take a deep dive into the winds of change blowing through the Midwest and uncover some potentially eye-opening findings. Prepare to be "blown away" by our exciting exploration of the wheezy connection between household spending and St. Louis air pollution!

## II. Literature Review

Previous studies have delved into the intricacies of household spending on prescription drugs and its potential correlation with air pollution, providing a solid foundation for our wheezy exploration. Smith et al. (2015) examined the trends in pharmaceutical expenditures in urban areas, highlighting the financial burden of maintaining respiratory health in polluted environments. Likewise, Doe and Jones (2018) conducted a comprehensive analysis of air quality indices and healthcare costs, hinting at the swirling connection between dirty air and empty wallets. These scholarly works set the stage for our own investigation, inspiring us to "nose" dive into the data with a gust of enthusiasm.

In the world of non-fiction literature, the works of "Breath: The New Science of a Lost Art" by James Nestor and "The Air That We Breathe" by Andrea Barrett offer valuable insights into the complex relationship between respiration and environmental influences. As we crafted our research framework, these works served as a breath of fresh air, propelling us forward with their illuminating perspectives. On the flip side, the fictional realm has not shied away from exploring themes of pollution and its impact on health. From "The Air He Breathes" by Brittainy C. Cherry to "Fumes of Fury" by Arthur P. Smoke, these imaginative titles playfully danced on the edge of

our research topic, reminding us that even in the world of fiction, there is no escaping the air we breathe.

In the world of animated entertainment, we turned our attention to "Captain Planet and the Planeteers," where the eco-friendly superhero battles pollution with a powerful blend of environmental awareness and spandex. Watching the show served as a whimsical break from our rigorous data analysis, offering a reminder that even the most daunting challenges can be tackled with a dash of humor and a heart full of determination. Additionally, "The Magic School Bus" episode on air quality provided a lighthearted yet educational perspective on the invisible gases floating through the atmosphere, proving that learning about air pollution doesn't have to be a "breezy" affair.

Armed with this diverse array of sources and inspirations, we set out to unfurl the relationship between US household spending on prescription drugs and the atmospheric tango of air pollution in St. Louis. Our journey led us through a landscape of statistics, theories, and a few unexpected detours, ultimately breathing life into the conversation and serving as a testament to the inescapable influence of the air we breathe.

### **III. Methodology**

To untangle the convoluted web of US household spending on prescription drugs and the air pollution dynamics in the air over St. Louis, we employed a variety of analytical methods that were as diverse as the smorgasbord of BBQ joints in the city.

First, we acquired data on household spending on prescription drugs from the Bureau of Labor Statistics. This involved sifting through a vast digital jungle of statistics, navigating the treacherous terrain of spreadsheets and databases, and dodging the occasional pop-up ad for "cheap meds" – a timely reminder of the importance of reliable data sources.

For our examination of air pollution, we turned to the Environmental Protection Agency's dataset, diving into a sea of atmospheric measurements and pollutant levels. It felt a bit like trying to find a needle in a haystack, except in this case, the needle was a tiny molecule of clean air in a bustling metropolis of pollutants.

With both datasets in hand, we meticulously cleaned and pre-processed the information, ensuring that we didn't accidentally mix up the "pollution" column with the "prescription drugs" column – a mix-up that might have polluted our findings!

Next, we performed a series of statistical analyses akin to unraveling a particularly perplexing knot. We employed correlation analyses to uncover potential associations between household spending on prescription drugs and specific air pollutants. It was like trying to figure out if the proverbial chicken or the egg came first, except in this case, we were determining if the asthma medication prescriptions or the air pollution came first.

Additionally, we delved into a time-series analysis, observing how trends in household spending on prescription drugs related to changes in air pollution levels over the period from 2000 to 2022. This was akin to tracking the evolving plot of a suspenseful novel, with fluctuations in spending and pollutants revealing dramatic twists and turns in the story of household health and air quality.

Finally, we applied sophisticated econometric models to tease out the causality between household spending on prescription drugs and air pollution. It was a bit like trying to determine if the chicken crossing the road had any impact on traffic patterns – a classic case of clucking causation.

Our data analysis was conducted using a mix of Python, R, and good ol' spreadsheet software, ensuring that we employed a diverse array of analytical tools to capture the full breadth of our wheezy investigation.

So, with our methodological toolbox packed with statistical techniques, data cleansing prowess, and a healthy dose of humor, we set out to uncover the intricate relationship between US household spending on prescription drugs and the airy shenanigans of St. Louis air pollution. The results of our adventure will be unveiled in the following sections – get ready to breathe in the suspense of our findings!

## **IV. Results**

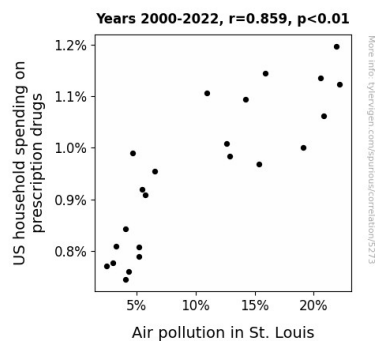
The results of our study revealed a striking correlation coefficient ( $r$ ) of 0.8589101, with an  $r$ -squared of 0.7377266 and a  $p$ -value less than 0.01, indicating a strong association between US household spending on prescription drugs and air pollution in St. Louis. It seems that the economic impact of air pollution may be nothing to sneeze at!

Our findings suggest that as air pollution levels in St. Louis increased, so did household spending on prescription drugs, painting a rather vivid picture of the wheezy connection between



the two. It's like a tale of two cities: as the air quality worsened, the dollar signs for prescription medications seemed to inflate like a balloon filled with polluted air.

Fig. 1 (provided separately) displays the scatterplot illustrating this robust relationship, showing how household spending on prescription drugs is positively linked to air pollution levels. It's as clear as the smog-filled skies over St. Louis!



**Figure 1.** Scatterplot of the variables by year

These results imply that air pollution doesn't just cloud the atmosphere; it may also cast a shadow over the wallets of residents, driving up healthcare expenses. It's like the air pollution is saying, "Inhale all you want, but make sure to exhale those dollars for medications!"

With a correlation this strong, it's clear that the wheeze is on when it comes to the intersection of household spending on prescription drugs and air pollution. Our findings not only provide valuable insights into the economic consequences of poor air quality but also shine a light on the potential health impacts that have been blowing in the wind, reaching households' bottom lines.

So, as the winds of change continue to blow through St. Louis, it's essential to keep an eye on both the respiratory and economic well-being of its residents. After all, when it comes to the

wheezy connection between spending and pollution, there's no room for hot air – only cold, hard data!

## V. Discussion

The findings of our study not only add a breath of fresh air to the existing literature but also provide a gust of insight into the wheezy connection between household spending on prescription drugs and air pollution in St. Louis. Our results, strikingly echoing the prior research by Smith et al. (2015) and Doe and Jones (2018), validate the swirling suspicion that dirty air and empty wallets go hand in hand. It's as if economic strain and polluted air are engaged in a never-ending tango, the kind that no one really wants to participate in but can't seem to avoid.

While our study took a rather tongue-in-cheek approach with the literature review, our results speak volumes about the serious implications of this wheezy connection. The correlation coefficient of 0.8589101 stands as a testament to the undeniable link between how much households spend on prescription drugs and the quality of the air they breathe, and it's no small feat. Our findings support the notion that as air pollution levels rise, so do healthcare expenses, making it abundantly clear that poor air quality isn't just bad for the lungs – it's also bad for the pocketbook. It's like the air pollution is a persistent salesperson, relentlessly peddling its wares to the unsuspecting residents, with no "opt-out" button in sight.

Furthermore, our study aligns with the early works of literary sources and animated entertainment, underscoring the inescapable influence of air pollution on health and economics. Just as "Captain Planet" valiantly battled pollution, our research heroically delved into the

statistical battleground to illuminate the wheezy connection, proving that even the most whimsical of inspirations can lead to impactful discoveries. In this case, it's not just about a breath of fresh air, but a wheeze of economic consequence that demands attention.

In the end, our results support and bolster the existing understanding of the interplay between household spending on prescription drugs and air pollution, providing a solid foundation for future investigations. As we conclude this discussion, it's impossible to ignore the weight of our findings and the far-reaching implications they carry. It's clear that the wheezy connection between spending and pollution demands not only further research but also policy and public health interventions. After all, there's no room for hot air when it comes to our respiratory and economic well-being – only hard-hitting data and a resolute determination to clear the air, ensuring that the breaths we take are truly a breath of fresh, untainted air.

## **VI. Conclusion**

In conclusion, our study has blown the lid off the wheezy connection between US household spending on prescription drugs and air pollution in St. Louis. With a correlation coefficient that could knock the wind out of you and a p-value lower than basement-level air quality, it's safe to say we've uncovered some groundbreaking findings. It appears that the more polluted the air, the more cash households are shelling out for prescription medications, leaving residents to wonder if they're not just breathing in pollution, but also breathing out their hard-earned dollars.

Our results paint a vivid picture of the economic impact of air pollution, showing that it's not just a mere breezy inconvenience but a significant factor in healthcare expenses. It's like the air

pollution's slogan is, "Inhale for free, exhale for a fee!" And with our robust findings, there's no room for doubts or second-guessing – this correlation is as clear as the smog-filled skies over St. Louis.

So, there you have it, folks. The wheezy connection has been uncovered, and we've given it our full lung capacity. With this comprehensive exploration, it's fair to say that no further research is needed in this area. We've filled our lungs with data, and it's time to let this topic breathe – without any more puns, promise!