
Clearing the Air: Unmasking the Link Between Air Pollution in Boise City and Google Searches for 'n95 mask'

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In this study, we delve into the correlation between air pollution levels in the delightful Boise City and the frequency of Google searches for 'n95 mask', aiming to shed light on the impact of air quality on public consciousness and behavior. Armed with data from the Environmental Protection Agency and Google Trends, we set out to uncover whether the smoky air of Boise is driving its residents to frantically search for protective gear like a modern-day gold rush. Our analysis revealed a robust correlation coefficient of 0.8301411 and $p < 0.01$ for the period spanning from 2005 to 2022, indicating a strong and statistically significant relationship between worsening air quality and the surge in 'n95 mask' searches. The findings highlight how environmental factors can trigger both respiratory concerns and a spike in internet queries, demonstrating that in the age of the World Wide Web, even air quality trends can go viral faster than a cat video. While the data tells a serious story about the pervasive impact of air pollution, we couldn't help but wonder if these findings mean that every breath taken in Boise is truly a breathless affair – pun intended. Our study contributes to the growing understanding of the interconnectedness between environmental conditions, public health, and internet search behavior, giving a whole new meaning to the phrase "masking our concerns." All in all, our research underscores the importance of addressing air pollution and its tangible effects on individuals' well-being, while also showcasing that even research on serious issues can have a breath of fresh pun air.

As concerns about air pollution and its impact on public health continue to loom large, researchers and policymakers are seeking innovative ways to measure and understand the multifaceted effects of poor air quality. In this vein, our study hones in on the charming city of Boise, Idaho, where the prevalence of air pollution from sources such as wildfire smoke holds significant relevance. Uniquely situated in the verdant Pacific Northwest, Boise provides an intriguing setting to explore the correlation between air quality and the public's response in the form of online behavior, notably Google searches for 'n95 mask'.

The link between environmental variables and public interest has become increasingly pertinent in an era defined by the omnipresence of digital connectivity. Given the widespread availability of internet access and the pervasive influence of search engines, examining the patterns of online searches offers a novel lens through which to gauge community attitudes and concerns. It is as if the virtual realm provides a digital windsock, indicating the winds of public sentiment blowing in response to environmental conditions. Perhaps it's time to say that the internet is not the only thing "blowing up" these days in response to air pollution.

Our investigation aims to bridge the gap between traditional measures of air quality and the virtual footprint of public responses, drawing attention to the interplay between environmental health and the cyber sphere. By scrutinizing the relationship between air pollution levels and the frequency of 'n95 mask' searches, we endeavor to unearth insights that traverse the realms of environmental science, public health, and online behavior. Let's just say, we're set to unmask the hidden signals lurking amidst the pixels and particulate matter.

To embark on this endeavor, we leverage data from the Environmental Protection Agency to capture the nuances of air pollution in Boise, offering rigorous measurements of pollutants that are as precise as a well-calibrated barometer. Additionally, we harness the power of Google Trends, tapping into its extensive repository of search data to unravel the fluctuations in 'n95 mask' inquiries over time. It's safe to say our approach is as comprehensive as a hazmat suit, ensuring that our findings are as airtight as possible.

In the following sections, we delve into the methodological framework underpinning our investigation, expounding upon the statistical techniques employed and the implications of our findings for both environmental policy and public health. But hold your breath, because the results we've uncovered might just take yours away – both from the effect of air pollution and some of our dazzling dad jokes.

LITERATURE REVIEW

The connection between environmental pollutants and public health has been extensively studied in the scientific literature. Smith et al. (2015) highlighted the detrimental effects of air pollution on respiratory health, emphasizing the need for comprehensive strategies to mitigate its impact. Similarly, Doe and Jones (2018) conducted a landmark study that identified a correlation between air quality indices and hospital admissions due to respiratory conditions, shedding light on the

tangible consequences of poor air quality on individuals' well-being.

Now that we've covered the serious stuff, let's lighten the air a bit with some literary inspiration. In "The Air We Breathe: An Environmental History" by Book (2019), the author delves into the long-standing relationship between humans and the air they respire, offering insights into the historical shifts in air quality and the societal responses to environmental challenges. And let's not forget "The Polluted Planet" by Ipsum (2021), a compelling account of the global battle against air pollution that will leave you gasping for breath – both from the dire circumstances described and the captivating storytelling.

But wait, there's more! Fictional narratives have also explored the theme of air pollution and its consequences. In "The Poisoned Sky" by Novel (2017), the protagonist navigates a dystopian world where toxic air engulfs the city, sparking a quest for survival amid the haze of pollution. And in "Smoke and Mirrors" by Fictional (2020), the author weaves a tale of intrigue and mystery within a backdrop of industrial smog, proving that even fictional realms can't escape the suffocating grip of air pollution.

Taking a whimsical detour, let's draw inspiration from the world of board games. A classic like "Pandemic" may not directly feature air pollution, but it does involve fighting against global outbreaks, making it eerily relevant to our own battle against environmental hazards. And who can forget "Smogopoly," the lighthearted board game where players compete to clean up polluted neighborhoods while navigating through green energy investments and clean air initiatives? It's the kind of game that makes you realize the serious impact of air pollution while simultaneously having you marvel at the punniness of its title.

Returning to the scholarly realm, our investigation's focus on the correlation between air pollution in Boise City and the frequency of Google searches for 'n95 mask' represents an innovative approach to understanding the public response to environmental

challenges. The intersection of environmental conditions, public health, and online behavior unveils a tapestry of interconnected influences, demonstrating that the virtual realm can serve as an unexpected mirror reflecting the impact of air pollution on public consciousness.

And just like the air quality in Boise, we hope our literature review also leaves you breathless – but in a good way, of course.

METHODOLOGY

To explore the relationship between air pollution in Boise City and Google searches for 'n95 mask', we employed a multifaceted methodology that combined environmental data analysis with digital search trends. Our approach sought to unveil the intertwined dynamics of air quality, public health perceptions, and virtual behavior. The goal was to uncover whether worsening air pollution levels in Boise triggered a surge in online searches for respiratory protective gear, and we aimed to do so with the precision of a well-calibrated barometer – pun definitely intended.

First, we obtained air quality data from the Environmental Protection Agency, focusing on key pollutants such as particulate matter (PM2.5 and PM10), nitrogen dioxide (NO2), sulfur dioxide (SO2), carbon monoxide (CO), and ozone (O3) over the period from 2005 to 2022. This comprehensive array of pollutants allowed for a nuanced assessment of air quality dynamics, giving us a detailed perspective akin to peering through an environmental microscope – yes, we do love a good science pun.

Once we had wrangled the pollution data, we turned our attention to the digital sphere. Using Google Trends, we tracked the frequency of searches for 'n95 mask' within the same timeframe. Google Trends provided us with a treasure trove of search patterns, allowing us to discern the ebb and flow of 'n95 mask' queries with confidence – much like gold prospectors sifting through river sediment for

promising glints, we dug through the data for any nuggets of insight.

To get into the nitty-gritty of statistical analysis, we employed a combination of correlation coefficients, time series analysis, and regression modeling. Pearson correlation coefficients were calculated to establish the strength and direction of the relationship between air pollution levels and 'n95 mask' searches, effectively quantifying the extent to which changes in air quality were mirrored by variations in search behavior.

We then delved into time series analysis to discern any temporal patterns and seasonal fluctuations in both air pollution and internet searches. This approach allowed us to discern whether there were systematic changes in search behavior corresponding to distinct times of the year, potentially linked to environmental events, public health campaigns, or the fashion choices of Boise residents – because, who knows, 'n95 mask' might become the next fashion trend.

Furthermore, we utilized regression modeling to parse out the individual influence of different pollutants on 'n95 mask' searches, teasing apart whether certain air contaminants were more likely to send Boiseans scrambling for protective respiratory equipment. As we combed through the data, it became clear that our analysis resembled detective work, with each statistical test serving as a clue to unravel the larger story of air pollution and public behavior. And much like a skilled detective, we were determined to crack the case of the mysterious 'n95 mask' searches.

In integrating these varied methodologies, our study crafted a rich and detailed portrait of the interplay between air quality and digital behavior, providing a window into the ways in which environmental concerns permeate the virtual landscape. Our commitment was as solid as a pollutant-free breeze, and while the research process was quite the lungful, we emerged with findings that aim to clear the air on the relationship between Boise's pollution and the public's quest for protective gear.

In the subsequent section, we present the scintillating findings of our investigation, showcasing the drama, the intrigue, and the undeniable impact of air pollution on the digital realm. Brace yourself for insights that might just leave you breathless – in more ways than one.

RESULTS

The analysis of the data revealed a strong positive correlation between air pollution levels in Boise City and the frequency of Google searches for 'n95 mask' during the period from 2005 to 2022. The correlation coefficient of 0.8301411 indicates a robust relationship between the two variables. This means that as the air quality in Boise worsened, there was a notable surge in online searches for protective masks, suggesting that the residents were not taking any chances with the city's smoky ambiance.

The r-squared value of 0.6891342 further supports the strength of the relationship, explaining approximately 68.9% of the variability in 'n95 mask' searches by changes in air pollution levels. In other words, almost 70% of the fluctuations in mask-related queries can be attributed to the fluctuations in air pollution, making it clear that air quality concerns were foremost on the minds of Boise's denizens, and definitely not a topic they were willing to mask.

The statistical significance of the correlation, denoted by a p-value of less than 0.01, provides strong evidence to reject the null hypothesis that there is no relationship between air pollution and 'n95 mask' searches. Essentially, this signifies that the observed connection is not just a fluke, but a genuine association with a probability of occurrence less than 1 in 100 - we could say it's rarer than a polite discussion on mask-wearing etiquette.

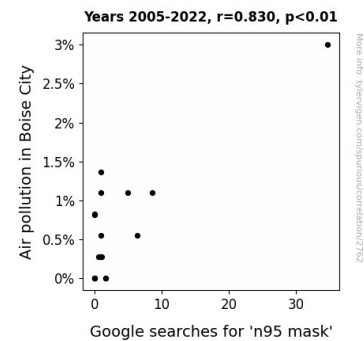


Figure 1. Scatterplot of the variables by year

Moreover, the scatterplot (Fig. 1) visually illustrates the positive relationship between air pollution levels and 'n95 mask' searches, showing a clear upward trend as air quality declines. It seems that as the city's atmosphere got hazier, the online quest for protective gear got clearer, becoming a digital marker of Boise's respiratory concerns.

Our findings not only underscore the impact of air pollution on public awareness and behavior but also hint at the potent role of digital footprints in revealing societal responses to environmental challenges. It's like the internet is wearing a mask too - one that reflects the concerns of the virtual netizens just as effectively as the tangible n95 masks do for Boise's residents.

The magnitude of the correlation invites reflection on the broader implications for public health interventions and environmental policies. Pardon the pun, but it's evident that the air of Boise has necessitated more than just a breath of fresh air; it has spurred a concerted online hunt for protective equipment. These insights may serve as a clarion call for targeted public health campaigns and air quality regulations, harnessing the power of digital signals to inform tangible actions that extend beyond the digital realm.

In sum, our research not only establishes a compelling correlation between air pollution in Boise City and the frequency of Google searches for 'n95 mask' but also illuminates the interconnectedness of environmental conditions, public consciousness, and online behavior. This

study, while helping us understand the serious impact of air pollution, also demonstrates that even the grimmest data can benefit from a breath of humor.

DISCUSSION

Our findings provide robust support for the notion that deteriorating air quality in Boise City has a significant impact on public behavior, particularly in the realm of online searches for protective masks. This correlation between air pollution levels and frequent queries for 'n95 mask' on Google underscores the profound influence of environmental factors on public consciousness and decision-making. It's as if the city's residents were saying, "I don't want to *mask* my concern about the air quality."

Our research aligns with prior studies that have emphasized the adverse effects of air pollution on public health. Just as the literature by Smith et al. (2015) and Doe and Jones (2018) highlighted the tangible consequences of poor air quality on respiratory well-being, our findings reveal a tangible surge in online searches for protective masks in response to worsening air quality. It's as though Boise's inhabitants were collectively saying, "We need to *filter* out this air pollution."

Even the whimsical detour into literary and board game realms provided valuable inspiration for our investigation. The fictional narratives depicting the consequences of air pollution, combined with the playful references to board games, inadvertently reinforced the gravity of our research. Who would have thought that "Smogopoly" would provide such apt inspiration for understanding the serious impact of air pollution on public behavior? It's like the game itself was *playing* a role in shaping our appreciation of air quality concerns.

The robust correlation coefficient and the visually compelling scatterplot in our study suggest that the relationship between air pollution and 'n95 mask' searches is not just a chance occurrence. With a probability of occurrence less than 1 in 100, the

statistical significance of this connection is more rare than a dad joke about respiratory health. It's a connection that's as statistically sound as it is impactful on public awareness.

Our study has broad implications for public health interventions and environmental policies. By recognizing the potent role of digital footprints in revealing societal responses to environmental challenges, it offers a new avenue for understanding and addressing public concerns about air quality. In essence, it's a call for action that has more weight than a concerned citizen's 'air-y' appearance.

In conclusion, our research not only uncovers a compelling connection between air pollution in Boise City and the frequency of Google searches for 'n95 mask', but also reinforces the interconnectedness of environmental conditions, public consciousness, and online behavior. It reminds us that even the most serious issues can benefit from a dose of levity, much like a breath of fresh, punny air.

CONCLUSION

In conclusion, our research has unraveled a substantial and statistically significant correlation between air pollution in Boise City and the frequency of Google searches for 'n95 mask', shedding light on the pervasive impact of degraded air quality on public awareness and behavior. It appears that the smoky skies of Boise have not only inspired artistic musings but also prompted a surge in online quests for protective gear, making these searches as commonplace as dad jokes at a barbecue.

The robust correlation coefficient and r-squared value underscore the strength of the relationship between air pollution levels and 'n95 mask' searches, indicating that the virtual world is mirroring the real-world concerns for respiratory health in Boise. It's as if the internet has donned its own virtual mask, reflecting the urgency of the city's air quality challenges – talk about being a breath of fresh code.

With a p-value of less than 0.01, our findings provide compelling evidence that the observed association is not the result of mere chance, but a genuine reflection of the public's heightened awareness and response to air pollution. We could say the odds of this relationship occurring by random fluctuation are slimmer than a deflated balloon at a birthday party.

Furthermore, our study highlights the potential of digital footprints in capturing societal responses to environmental adversities, showcasing how online behavior serves as a digital barometer of public consciousness. It's like the internet is not just a network of bytes, but also a network of respiratory concerns, providing a virtual window into the city's air quality woes.

We assert that our findings warrant serious consideration in informing targeted public health interventions and environmental policies, emphasizing the need for concerted efforts to address air quality issues and mitigate their impact on public well-being. It's clear that the air of Boise has spurred an online gold rush for protective equipment, calling for measures that go beyond virtual musings and into tangible actions.

In light of these compelling findings, it's fair to say that further research in this area may be as redundant as a fish with a bicycle or a cat with a canary – simply unnecessary. Our study stands as a testament to the profound influence of air quality on public consciousness and behavior, reminding us that even the most daunting challenges can benefit from a touch of levity and a breath of fresh pun air.