

Analysis shows rise and fall of angry, fearful tweets with passage, implementation of Philadelphia beverage tax

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Tweets about the 2017 Philadelphia beverage tax that showed high levels of anger and fear prior to the tax were replaced by more favorable

sentiments years later, according to an analysis by researchers. The researchers used the controversial tax on non-alcoholic sweetened beverages to track the social media platform's potential for measuring public reaction to health policies.

Researchers found that Twitter posts about the tax shifted from anger to acceptance, reflecting factors such as media coverage, lawsuits challenging it, and the eventual health and economic benefits of the funds. Published in the *Journal of Public Health Management & Practice*, the findings illustrate how Twitter can be used to influence public opinion when a policy is introduced, and later, to research the public's reaction to it.

"There is a crucial need to more dynamically understand how everyday people experience a [health policy](#)," says Shahmir Ali, lead author and postdoctoral researcher at the National University of Singapore, who completed the research while a doctoral student at the NYU School of Global Public Health. "Analyzing [social media data](#) can be a uniquely cost-effective, and comprehensive way to glean some of these insights, which has been made easier with the 2021 roll out of the Twitter program for academics to analyze large amounts of historic Twitter data."

For their analysis, the authors used the Academic Twitter Application Programming Interface to evaluate 45,891 tweets related to the Philadelphia beverage tax from 2016, before the tax, until 2019, two years after its implementation. Using tools that analyze text for positive, negative, and neutral sentiment, they examined tweets related to the tax and categorized the sentiment of the tweets, their timing, and the location of the tweeter (in and around the Philadelphia area).

Initially, lawsuits from businesses to prevent the tax and related [media coverage](#) led to negative sentiment. But tweets indicating positive

sentiments increased in 2018 when the Pennsylvania Supreme Court upheld the tax, and published analyses revealed how the tax successfully helped reduce sales of sugary beverages. Additionally, the authors found a higher concentration of negative tweets in the suburbs near Philadelphia than in the New Jersey and Delaware suburbs, likely driven by Pennsylvanians being more affected by the tax.

"For [policy makers](#), insights from this Twitter data can help pinpoint who important conversation-makers are on policies like the Philadelphia beverage tax and how to prepare for, or leverage, their influence on these policy discussions," says Ali. "However, we must remember that not everyone is on [social media](#), and sentiment analysis through emotional lexicons comes with its own limitations. Thus, findings from this type of Twitter data can set the foundation for more in-depth public opinion evaluations."

"There have been many sweetened beverage taxes implemented in the country and around the globe. Collecting sentiments around each tax can inform local contextual differences. This information analyzed together with the tax's impact on consumer purchase or consumption behavior can shed light on the how and why a tax succeeded or even failed to do what it intended to do," says Angela Trude, a study co-author and assistant professor of nutrition and food studies at NYU Steinhardt.

The authors say that despite challenges in using social media for research purposes, the [free access](#) to Twitter API was valuable to students and scientists interested in online behaviors.

"There are some signs that Twitter may end access to its free data, and if it does, the transparent and equal access to the data will end too, and we will have to be creative in ways to leverage social media data for the public good," says Trude.

More information: Shahmir H. Ali et al, Leveraging Multiyear, Geospatial Social Media Data for Health Policy Evaluations: Lessons From the Philadelphia Beverage Tax, *Journal of Public Health Management and Practice* (2023). [DOI: 10.1097/PHH.0000000000001804](https://doi.org/10.1097/PHH.0000000000001804)

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