

Detecting Food Shortages Using X

Northeast Regional Center for Rural Development

Overview

NERCRD researchers along with faculty from the Institute for Computational and Data Sciences (ICDS) in the College of Information Sciences and Technology at Penn State University and the Qatar Computing Research Institute at Hamad Bin Khalifa University in Qatar studied whether tweets posted on Twitter (now X) can be used to predict real-time food shortages during crises such as pandemics, wars, or natural disasters. We analyzed COVID-19-related tweets in the U.S. from February to August 2020, focusing on food security-related content. Using a large language model to identify sentiments and emotions in tweets, we found strong correlations between negative emotions expressed in tweets and actual food insufficiency rates in certain U.S. states during the early stages of the COVID-19 pandemic.



Key findings:

- Tweets expressing anger, disgust, or fear were strongly correlated with actual food insufficiency in certain U.S. states early in the COVID-19 pandemic.
- The most common emotion in food-related tweets was joy, which researchers interpreted as relief that the U.S. food supply remained relatively stable despite early concerns about supply chain disruptions.
- At the state level, tweets expressing fear were most strongly correlated with actual food insufficiency rates in California, Illinois, New York, Texas, and Wisconsin.
- This method of analyzing real-time social media data could be developed into a low-cost early warning system in the future for identifying areas where food-security interventions are most urgently needed.

Resources

- Goetz, S. J., Heaton, C., Imran, M., Pan, Y., Tian, Z., Schmidt, C., Qazi, U., Ofli, F and Mitra, P. (2023). Food insufficiency and Twitter emotions during a pandemic. *Applied Economic Perspectives and Policy*, 45(2), 1189–1210. <http://dx.doi.org/10.1002/aep.13258>

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