

# Tapping social media and AI to speed supply chain assistance during disasters

July 4 2024, by Russ Nelson

---



Credit: Unsplash/CC0 Public Domain

A doctoral candidate at The University of Alabama in Huntsville (UAH) is lead author of a [study](#) in the *International Journal of Production Research* investigating the ways social media platforms can be leveraged with artificial intelligence (AI) to provide vital communication

connecting victims of disaster to outside aid and support.

Vishwa Vijay Kumar, a Ph.D. student of Industrial & Systems Engineering and Engineering Management at UAH, a part of the University of Alabama System, teamed with fellow UAH co-researchers Dr. Avimanyu Sahoo and Dr. Sampson Gholston, as well as Kumar's mentor, Dr. Siva K. Balasubramanian of the Illinois Institute of Technology, to support the initiative.

For the project, the team used data from X, formerly known as Twitter, from two six-week time periods and two countries during the COVID-19 pandemic: March–April 2020 in the United States when the pandemic broke out, and in India during the surge of the delta variant in May–June 2021.

Disruptions in [health care](#) supply chains during these periods were causing severe shortages of essential equipment ranging from face masks and medicines to ventilators for patients in intensive care.

"I was born and raised in the countryside of India, in Sitamarhi, Bihar, near the Nepal border, where [natural disasters](#) such as floods from the Himalayan rivers are frequent," Kumar says.

"These floods can spread over miles, trapping thousands of people in their homes who need urgent help for health care and food, as well as rescue operations. From a young age, I was driven to develop a framework that would enable people in need to communicate their requirements to the world and relevant authorities so they coordinate to assist disaster victims on time."

The COVID-19 pandemic in 2020 presented a disaster of a different kind, affecting billions of people worldwide and exposing significant vulnerabilities in global health care supply chains. Critical shortages of

essential supplies like testing kits, oxygen cylinders and hospital beds highlighted the urgent need for efficient resource allocation and [real-time information](#).

"This situation reignited my early motivation to explore how social media and AI could be harnessed for faster disaster response and to mitigate health and supply challenges during crises," Kumar says. "I discussed this idea with Dr. Sahoo, my Ph.D. academic advisor."

The research that followed presented a four-step process and developed algorithms to parse information from 3.9 million tweets to identify imperative information using AI and machine learning.

Keywords within Twitter posts were identified to indicate which tweets included information relevant to pandemic supply chain disruptions and processed them for content analysis and modeling. Tweets were categorized as "imperative," or actionable pleas for help, and "non-imperative," providing non-actionable information.

The data analyzed also estimated the geographic location of imperative tweets lacking geo-tag information to facilitate coordination of aid operations.

Additionally, the researchers identified a number of health care supply chain challenges during disaster conditions that are the focus for future research.

Topics included geo-location of people in need who posted their concerns on social media without identifying their location; forecasting COVID-19 vaccine supplies; forecasting the availability of health and food supplies; use of other social media (for example, Facebook, Instagram, etc.) and finding where these improvements would be applicable to other disaster events, such as hurricanes and earthquakes.

"We also plan to develop a platform/tool that will scan the social media posts from the disaster events and generate real-time reports of demand and supply issues and people with their geo-locations requesting help," Kumar concludes.

**More information:** Vishwa V. Kumar et al, Mitigating healthcare supply chain challenges under disaster conditions: a holistic AI-based analysis of social media data, *International Journal of Production Research* (2024). [DOI: 10.1080/00207543.2024.2316884](https://doi.org/10.1080/00207543.2024.2316884)

Provided by University of Alabama in Huntsville

Citation: Tapping social media and AI to speed supply chain assistance during disasters (2024, July 4) retrieved 4 July 2024 from <https://techxplore.com/news/2024-07-social-media-ai-chain-disasters.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.