

Supply chains of crucial drugs threatened by climate risks

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Drugs used to treat heart and kidney failure were among a dozen medicines that Pfizer had to limit to emergency orders after a July tornado ripped through Rocky Mount, N.C., injuring 12 and devastating

one of the pharmaceutical company's manufacturing facilities.

About 42% of FDA-registered manufacturing companies, including many pharma plants, are in high-risk areas for tornadoes, according to a new University of Maryland analysis conducted in the wake of the North Carolina storm by risk management expert Clifford Rossi and two of his students in the Master of Quantitative Finance program.

Rossi, professor of the practice, executive-in-residence and director of the Smith Enterprise Risk Consortium, worked with students Matthew Rumrill and Harini Mantripragada to analyze domestic drug manufacturing sites via the Food and Drug Administration's [Drug Establishments Registration Site](#) database in conjunction with data from FEMA's [National Risk Index](#). The latter includes risk ratings for 18 different natural hazards and assigns an overall risk rating for each census tract and county in the United States.

"Extreme weather events and increased concerns over [climate change](#) further pressure already-strained drug supply chains and pose significant risk not only to the manufacturers, but also to insurers and end users such as patients and consumers," said Rossi. "Having the ability to know where potential hazard risk exists can be of enormous value to [drug](#) manufacturers in deciding where to locate plants as well as to harden them against these hazards."

Beyond tornadoes, another frequent hazard to the 6,024 FDA-registered facilities—many of which manufacture pharmaceuticals—was river flooding; 31% are located in areas that are at high risk for rising waters. Many such plants also exist in high-risk areas for lightning, general winter weather (and ice storms in particular) and strong windstorms other than tornadoes.

But several causes of widespread destruction and death around the U.S.

in recent years pose lesser threats to pharma and other FDA-registered facilities: Only 17% of them are in high-risk wildfire areas, 11% are in high-risk hurricane areas, and 6% are menaced by coastal floods.

Overall, they found that that states with the highest risk exposure to [natural hazards](#) are California, Florida and Texas. In California, about 95% of pharma plants are in hazard areas ranging from relatively high to very high across all hazard types.

"The assessment's implications are critical to maintaining a continuous supply of drugs across the U.S.," Rossi said. "The work also illustrates Smith students—in this case Matt and Harini—producing analysis that's real time and impactful to markets."

Provided by University of Maryland

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