

# Fungus responsible for five deaths in the wake of massive tornado

December 14 2012

---

A fast growing, flesh-eating fungus killed 5 people following a massive tornado that devastated Joplin, Mo., according to two new studies based on genomic sequencing by the Translational Genomics Research Institute (TGen) and the U.S. Centers for Disease Control and Prevention (CDC).

Health officials should be aware of infections caused by the fungus *Apophysomyces*, according to the studies, which tracked 13 people infected by the pathogen during the Class EF-5 tornado—the most powerful category—whose 200-plus mph winds plowed through Joplin on May 22, 2011, initially killing 160 and injuring more than 1,000.

The common fungus—which lives in soil, wood or water—usually has no effect on people. But once it is introduced deep into the body through a blunt trauma puncture wound, it can grow quickly if the proper medical response is not immediate, the studies said. Five of the 13 people infected through injuries suffered during the Joplin tornado died within two weeks.

"Increased awareness of fungi as a cause of necrotizing soft-tissue infections after a natural disaster is warranted ... since early treatment may improve outcomes," concluded one study published Dec. 6 in [The New England Journal of Medicine](#).

Using [whole genome sequencing](#), which decoded the billions of chemical letters in the fungus' DNA, [TGen](#) scientists concluded that the Joplin

infections represented the largest documented cluster of *Apophysomyces* infections, according to a study published Nov. 27 in the journal *PLOS One*.

"This is one of the most severe fungal infections that anyone's ever seen," said David Engelthaler, Director of Programs and Operations for TGen's [Pathogen Genomics](#) Division. Engelthaler was the senior author of the *PLOS One* study, and a contributing author of the NEJM study.

"We're able to apply the latest in science and technology to explore these strange and dangerous pathogens, like we've never been able to before," said Engelthaler, adding that this is the latest in a series of collaborations between CDC and TGen. "This is the first peek into the genome of this dangerous fungus."

Dr. Benjamin Park, chief of the Epidemiology Team at the CDC's Mycotic Diseases Branch, said the victims were infected when their injuries from the tornado were contaminated with debris from the storm, including gravel, wood and soil, as well as the aerosolized fungus.

Without the multiple and deep wounds caused by the storm, cases involving fungal infection are rare, said Dr. Park, the senior author of the NEJM study and a contributing author of the *PLOS One* study. "A typical hospital might normally see one case in a year."

Engelthaler said *Apophysomyces* infections rapidly ravage the body, quickly sealing off capillaries, shutting off the blood supply and leaving tissue to rot. Physicians try to get ahead of the infection by surgically removing sections of dead, damaged or infected tissue, a process called debridement.

For example, Engelthaler said, one victim who suffered a deep wound to the upper right chest required a new titanium rib cage after the fungus

rapidly destroyed skin and bones.

"It's unlike anything you've ever seen before," said Engelthaler, a former State of Arizona Epidemiologist and former Arizona Biodefense Coordinator. "It's unreal. It looks like there is no way this person can be alive."

The studies show the need for rapid and accurate identification of the exact mold causing an infection, since only two FDA-approved drugs—amphotericin B and posaconazole—are commonly used against mucormycetes, the group of molds that includes *Apophysomyces* and causes mucormycosis.

"It is not known whether the outcomes for these case patients would have been different if mucormycete-active agents had been used initially," said the NEJM study. "The timely diagnosis of mucormycosis is essential for guiding therapy, because the early initiation of appropriate anti-fungal medication and aggressive surgical debridement are associated with improved outcomes."

Both the NEJM and [PLOS One](#) studies said whole genome sequencing could lead to better diagnosis and a better understanding of this pathogen.

TGen's DNA sequencing identified *Apophysomyces* in all 13 of the Joplin cases. The DNA analysis also established that several strains of *Apophysomyces* were involved in the outbreak, giving scientists further clues that this fungus was well established in the area, and probably had been so for a long time.

"These disasters put us at risk for exposure to organisms that are around us, but don't normally cause disease," Engelthaler said. "There's clearly an entire world out there that we're not seeing on a regular basis. It takes

a severe event like this tornado for us to come face-to-face with some of the more [dangerous pathogens](#) out there."

**More information:** PLOS One paper link:

[www.plosone.org/article/info](http://www.plosone.org/article/info)

%3Adoi%2F10.1371%2Fjournal.pone.0049989

NEJM paper link: [www.nejm.org/doi/full/10.1056/NEJMoa1204781](http://www.nejm.org/doi/full/10.1056/NEJMoa1204781)

Provided by The Translational Genomics Research Institute

Citation: Fungus responsible for five deaths in the wake of massive tornado (2012, December 14) retrieved 6 May 2024 from <https://medicalxpress.com/news/2012-12-fungus-responsible-deaths-massive-tornado.html>

<p>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.</p>
--