

# MYCETOMA

## Developing safe, affordable treatments to prevent amputation and disability

One of the world's most neglected diseases, mycetoma is a devastating, slow-growing infection most likely transmitted by a thorn prick. It occurs across the so-called 'mycetoma belt', which stretches from Central and South America to the Sahel, the Middle East, and South Asia. The fungal version of mycetoma, known as eumycetoma, leads to horrible deformities and disability. Currently, people living with eumycetoma are confronted with ineffective, toxic, and overpriced drugs. For many, the only option is amputation.

### The push for progress

Following advocacy from DNDi and our partners, the World Health Organization (WHO) added mycetoma to its list of neglected tropical diseases in 2016 – an important step in raising awareness of the disease and encouraging investment in research for diagnostics and treatments that can be utilized easily in affected communities. In 2017, DNDi partnered with the Mycetoma Research Center (MRC), a WHO Collaborating Centre in Khartoum, Sudan, and Japanese pharmaceutical company Eisai Co., Ltd., to begin enrolling patients in the first-ever clinical trial for fungal mycetoma treatment.

**Our goal is now** to develop a new treatment for mycetoma that can prevent devastating amputation and disability – and to ensure access for all people in need.

### Moving forward with a simpler, more affordable treatment

DNDi and the MRC began enrolling patients in **the first-ever double blind, randomized clinical trial for fungal mycetoma** treatment in 2017. The initial trial studied the efficacy of treating moderate-sized lesions over a period of 12 months with a weekly dose of fosravuconazole compared to daily treatment with itraconazole, the current standard of care, in patients requiring surgery, which was performed in all patients at six months from treatment onset. Follow-up for all trial participants continued in 2021, with completion of all trial visits late in the year.

**Results presented in 2022 showed that fosravuconazole and itraconazole had similar efficacy, with fosravuconazole having practical advantages over the current standard of care** – including weekly as opposed to twice-daily administration, no need to administer with food, and no contraindication to other drugs. With a favourable safety profile,



Only **35%**  
of people with  
fungal mycetoma  
are cured



Occurs most often  
in the so-called  
'**mycetoma belt**'  
between latitudes  
15°S and 30°N



**Unknown**  
global burden

“

I used to enjoy riding bicycles with my brothers. Ever since I got this disease, I have not been able to do anything. I am forced to stay at home.

Adam Mohamed, 12 years old, is a patient at the Mycetoma Research Center in Khartoum, Sudan.

The mycetoma infection in his foot has become so severe that he may have to undergo amputation if it does not respond to current treatment.



Photo credit: Lameck Ododo-DNDi

it showed efficacy even at a low dose. A follow-up study is now underway to determine relative rates of long-term disease recurrence.

In 2022, DNDi initiated discussions with the regulatory authorities in Sudan ahead of submitting fosravuconazole for approval. Given the urgent medical and public health need, the Ministry of Health of Sudan has authorized the importation of fosravuconazole for patient treatment at the MRC, although the full impact of the unrest in Sudan in 2023 is not yet known.

## Identifying new drug candidates: MycetOS

The Mycetoma Open Source project (MycetOS) uses an **'open-source pharma' approach to discover new treatments targeting *Madurella mycetomatis***, the most common cause of fungal mycetoma. Participating researchers engage through community-driven, in-kind scientific contributions, with all ideas and results published immediately in real time to an open-access database, free of intellectual property constraints. **Drug discovery efforts continued throughout 2022** as leadership of the MycetOS project was transitioned from DNDi to University College London, with DNDi continuing to act in a supporting role.

## Building a new vision for mycetoma treatment around the world

While fosravuconazole shows promise as a drug that will make treatment of fungal mycetoma simpler and more accessible, much more is needed to tackle the disease across the mycetoma belt. In Sudan, the organism that causes this devastating disease is *Madurella mycetomatis*. In Mexico, it is *Nocardia brasiliensis*. In India, the picture is mixed. And the global burden of disease is unknown.

**Epidemiological studies are urgently needed to understand where fungal mycetoma occurs**, what causes it, and how many people are affected. It is also critical to find newer, better treatments that offer alternatives to amputation, and that are suitable for children as well as women of childbearing potential.

DNDi began building **a new strategy for mycetoma** in 2022, applying the learning gained during the world's first clinical trial for fungal mycetoma to address the global complexities of the disease.