

TVD Team



Buruli ulcer: the neglected threat

Rationale

Buruli ulcer is caused by a bacterium called *Mycobacterium ulcerans*. It often affects the skin and sometimes the bone and can lead to permanent disfigurement. The bacterium produces a toxin that causes skin damage. Without early treatment, Buruli ulcer (BU) can lead to long-term disability and stigma, with the associated socioeconomic burden. The exact mode of transmission remains unknown. Buruli ulcer has been reported in 33 countries in Africa, the Americas, Asia and the Western Pacific. Out of the 33 countries, 14 regularly report data to WHO. Most cases occur in tropical and subtropical regions except in Australia and Japan. More than 90% of global cases are reported in Africa, where nearly 50% of the people affected are children under the age of 15 years.

The annual number of suspected Buruli ulcer cases reported globally was around 5000 up until 2010 when it started to decrease. In the WHO African Region, the annual trend in BU cases reflects the global trend, as more than 90% of global cases are reported in Africa. In 2021, a total of 1370 BU cases were reported in the African Region compared to 3845 in 2011 (a 64% reduction in reported cases).

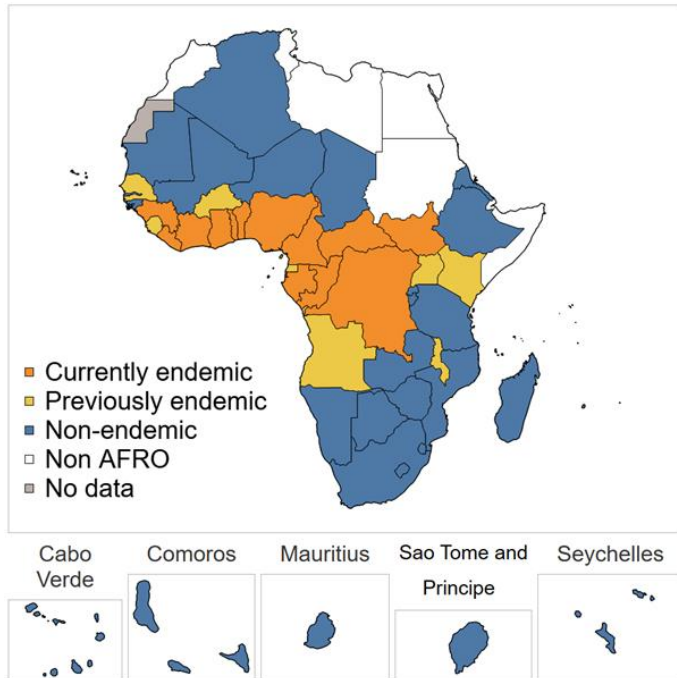
Key messages

- Buruli ulcer is the third most common mycobacterial disease affecting humans, after leprosy and tuberculosis.
- The mode of transmission is unclear, but somehow the bacteria get into the skin and begin to grow; there is no prevention for the disease.
- In the African Region, 13 out of the 47 Member States are known to be endemic.
- Nearly half of the people affected in Africa are children under the age of 15 years.
- Integrated early detection and antibiotic treatment are the cornerstones of the control strategy.

Burden of disease

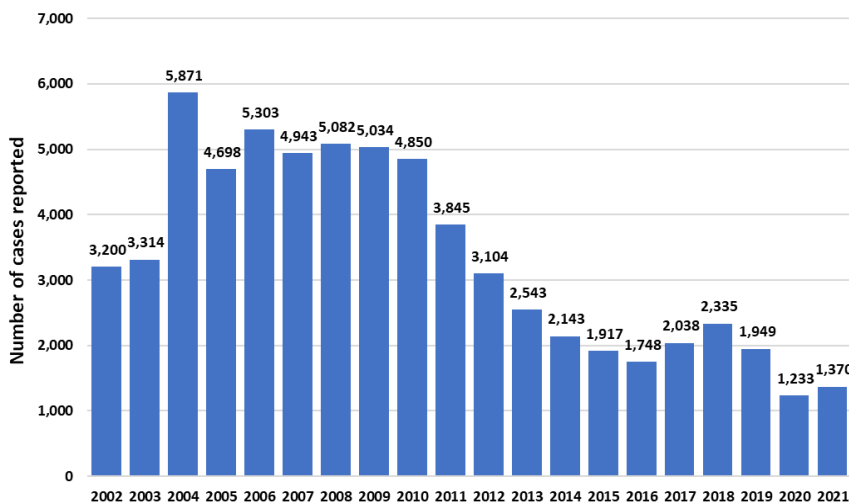
The status of endemicity of Buruli ulcer is declared in countries that have reported a case of Buruli ulcer at least once.

Figure 1: Status of endemicity of Buruli ulcer in the African Region, 2021 (source: WHO)



- In 2021, 13 of the 47 countries in the African Region were endemic for Buruli ulcer (see Figure 1).
- Eight countries were classified as previously endemic in 2021.
- In the African Region, Buruli ulcer essentially occurs in tropical and subtropical climate areas.

Figure 2: Trends in the number of new reported cases of Buruli ulcer in the African Region, 2002–2021 (source: WHO)



- The average annual number of Buruli ulcer cases reported in the African Region was around 5000 until 2010 when it started to decrease.
- In 2021, a total of 1370 cases were reported in the following countries: Angola, Benin, Cameroon, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Gabon, Ghana, Nigeria and Togo.
- The reductions seen in 2020 and 2021 could be linked to the impact of COVID-19 on active detection activities (see Figure 2).

Transmission, signs and symptoms

Transmission

The exact mode of transmission of *Mycobacterium ulcerans* (*M. ulcerans*) is still unclear. Buruli ulcer usually occurs near slow moving or stagnant bodies of water, where *M. ulcerans* is found in aquatic insects, molluscs, fish and the water itself. It is not clear how *M. ulcerans* is transmitted to humans.

Signs and symptoms

Buruli ulcer often starts as a painless swelling (nodule), a large painless area of induration (plaque) or a diffuse painless swelling of the legs, arms or face (oedema). The disease may progress with no pain or fever. Without treatment or sometimes during antibiotic treatment, the nodule, plaque or oedema will ulcerate within four weeks. The bone is occasionally affected, causing deformities.

Nodule (credit WHO)



Plaque (credit Yves Thierry Barogui)



Oedema (credit Yves Thierry Barogui)



Ulcer (credit Yves Thierry Barogui)



The disease has been classified into three categories of severity: Category I, single small lesion (32%) less than 5 cm in diameter; Category II, non-ulcerative and ulcerative plaque and oedematous forms of 5–15 cm (35%); and Category III, lesions more than 15 cm in diameter, including disseminated and mixed forms such as osteomyelitis and joint involvement, and lesions at critical sites (head, breast, genitalia), (33%).

Lesions frequently occur in the limbs: 35% on the upper limbs, 55% on the lower limbs, and 10% on the other parts of the body. Health workers should be careful in the diagnosis of Buruli ulcer in patients with lower leg lesions to avoid confusion with other causes of ulceration such as diabetes, arterial and venous insufficiency lesions.

Diagnosis and treatment

Diagnosis

Differential diagnoses of Buruli ulcer include tropical phagedenic ulcers, chronic lower leg ulcers due to arterial and venous insufficiency (often in elderly populations), diabetic ulcers, cutaneous leishmaniasis, extensive ulcerative yaws and ulcers caused by *Haemophilus ducreyi*.

Early nodular and papular lesions may be confused with insect bites, boils, lipomas, ganglions, lymph node tuberculosis, onchocerciasis nodules or deep fungal subcutaneous infections. Cellulitis may look like oedema caused by *Mycobacterium ulcerans* infection but in the case of cellulitis, there is pain and fever. Four standard laboratory methods can be used to confirm Buruli ulcer: IS2404 polymerase chain reaction (PCR), direct microscopy, histopathology, and culture. The bacterium grows best at temperatures between 29 °C and 33 °C (*Mycobacterium tuberculosis* grows at 37 °C) and needs a low (2.5%) oxygen concentration.

In 2019, WHO established the [Buruli ulcer Laboratory Network for Africa](#) to help strengthen PCR confirmation in nine endemic countries in Africa. Thirteen laboratories participate in this network, supported by the American Leprosy Missions, Anesvad, Raoul Follereau Foundation and coordinated by the Centre Pasteur in Cameroon.

In 2021, WHO completed an online consultation for a draft document on target product profiles to develop rapid tests for the diagnosis of Buruli ulcer. With the availability of simple oral treatment for Buruli ulcer, a rapid test to allow early confirmation of diagnosis can facilitate the timely treatment of the disease. The current turnaround time of a PCR test is too long to guide early treatment decisions.

Treatment

Treatment consists of a combination of antibiotics and complementary treatments. A combination of rifampicin (10 mg/kg once daily) and clarithromycin (7.5 mg/kg twice daily) is now the recommended treatment. Interventions such as wound and lymphoedema management and surgery (mainly debridement and skin grafting) are used to speed up healing, thereby shortening the duration of hospitalization. Physiotherapy is needed in severe cases to prevent disability. Those left with disability require long-term rehabilitation. These same interventions are applicable to other neglected tropical diseases, such as leprosy and lymphatic filariasis.

WHO has developed [a treatment guidance for health workers](#).

HIV infection complicates patient management, making clinical progression more aggressive and resulting in poor treatment outcomes. WHO has published [a technical guide](#) to help clinicians in the management of coinfection.



Oral treatment for Buruli ulcer (credit Yves Thierry Barogui)

Prevention and control

There are currently no primary preventive measures for Buruli ulcer. The mode of transmission is unknown. Bacillus Calmette-Guérin (BCG) vaccination appears to provide limited protection.

The objective of Buruli ulcer control is to minimize suffering, disability and the resultant socioeconomic burden. Early detection and antibiotic treatment are the cornerstones of the control strategy. In many countries, community health workers play a critical role in case detection.

These are the core indicators for measuring progress in the control of Buruli ulcer in [the NTD road map 2021–2030](#).

- proportion of cases in Category III (late stage) at diagnosis
- proportion of laboratory-confirmed cases
- proportion of confirmed cases who have completed a full course of antibiotic treatment.

WHO response

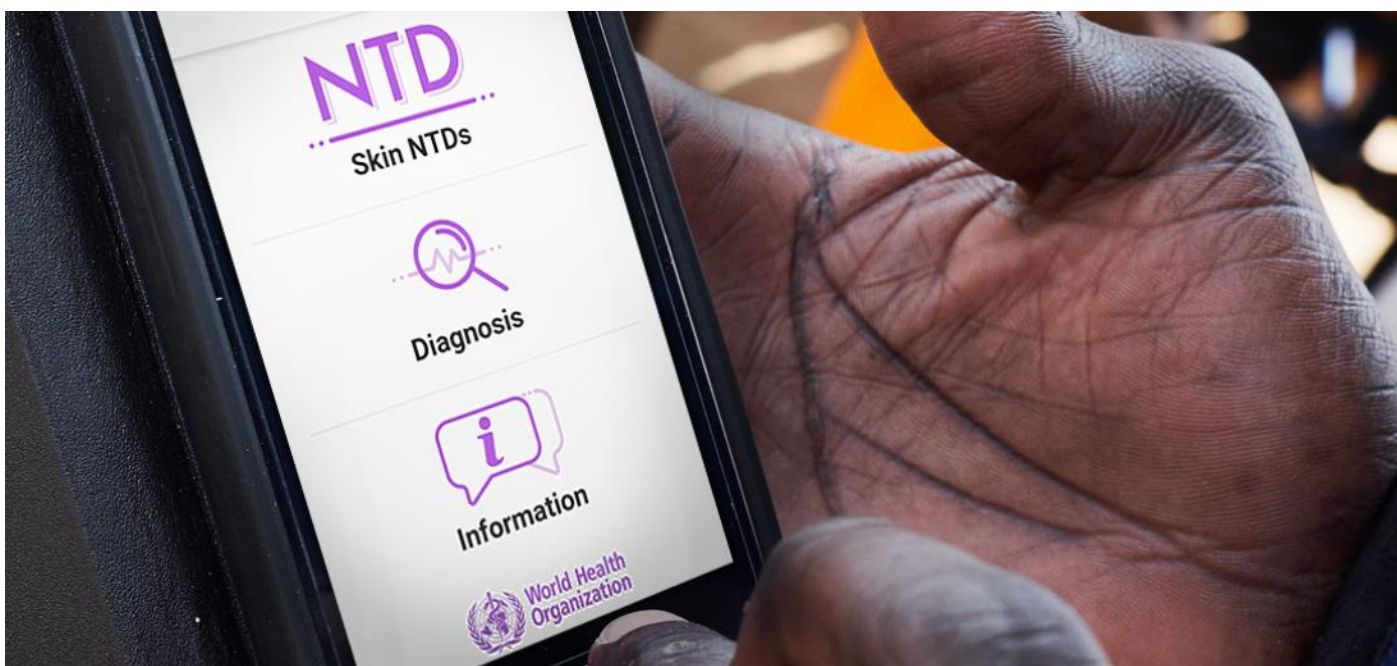
WHO provides technical support, develops policies, guidelines, [standard recording and reporting forms](#), health promotional materials, and coordinates control and research efforts. WHO brings together all major actors involved in Buruli ulcer on a regular basis to share information, coordinate disease control and research efforts, and monitor progress.

WHO provides antibiotics to endemic countries to ensure free-of-charge access to treatment for all patients.

WHO supports work towards three research priorities:

- understanding the mode of transmission
- developing rapid diagnostic tests
- establishing best-case antibiotic treatments.

To ensure efficiency, sustainability and scale, WHO recommends that Buruli ulcer control should be integrated within a skin NTDs approach adapted to the diseases present in a particular country. WHO has developed [online courses](#) and a Skin App for [Android](#) and [iOS](#) to assist health workers in the field with the diagnosis of skin NTDs, including Buruli ulcer.





The Yamoussoukro Declaration on Buruli ulcer

[https://www.who.int/initiatives/global-buruli-ulcer-initiative-\(gbui\)/the-yamoussoukro-declaration-on-buruli-ulcer](https://www.who.int/initiatives/global-buruli-ulcer-initiative-(gbui)/the-yamoussoukro-declaration-on-buruli-ulcer)

Cotonou Declaration on Buruli Ulcer

<https://apps.who.int/iris/bitstream/handle/10665/329410/WHO-HTM-NTD-GBUI-2009.1-eng.pdf>

WHA57.1 Surveillance and control of Mycobacterium ulcerans disease (Buruli ulcer)

<https://www.who.int/publications/i/item/wha57.1>

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Sources

Data are from WHO: [The Global Health Observatory](#) and [integrated African Health Observatory](#).

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