

Emerging World Diseases: Trachoma

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The CDC (2023) lists 20 different conditions on their list of neglected tropical diseases (NTDs). NTDs are ailments that have been widely ignored and dismissed by global health organizations. Trachoma initially causes scarring of the eyelid. This scarring, if severe,

enough, will in turn cause the eyelashes to grow incorrectly. The eyelashes will continuously rub against the eyeball, eventually leading to grave corneal scarring and overall visual impairment to varying degrees (WHO, 2022). This progression of trachoma is predictable, and has been given five different grades (WHO, 2022). Grade 1, follicular trachomatous inflammation, is followed by intense trachomatous inflammation (WHO, 2022). Trachomatous scarring is the 3rd grade, where the scarring of the eyelid first begins (WHO, 2022). The natural continuation of the disease without treatment leads into the 4th grade, trachomatous trichiasis, sometimes referred to just as trichiasis (WHO, 2022). At this point, the eyelashes have grown inward, and surgery is necessary. The last grade, corneal opacity, is the permanent blindness or visual impairment of the patient (WHO, 2022). The entire process of infection is wretched, from beginning to end. As of 2020, nearly 1.9 million people were visually impaired due to trachoma (Robinson, 2022).

is, without a doubt, a successful pathogen. The primeval bacterium not only is able to take advantage of multiple reservoirs (flies and humans), but also is transmissible either from fly to fly, fly to human, or human to human (WHO, 2022). For comparison, malaria, mankind's greatest foe, can only be proliferated between flies and humans, not between humans (barring rare cases, like blood transfusion). This is part of what makes trachoma so terrifying. Equally of note, trachoma is not the only disease in which *Chlamydia trachomatis* has been implicated. This same same bacterium, as suggested by the name of the genus it belongs to, is responsible for chlamydia, the world's most common STI (Malhotra, 2013). As previously mentioned, the bacterium is spread through either the bite of an infected *Musca sorbens* fly, or, through direct, personal contact with various bodily secretions (namely of the eyes and nose) of already infected individuals (Robinson, 2020). The disease, first reported in an ancient Egyptian medical scroll (Yaghoobi, 2018), persists today across many continents, including South America and Africa (WHO, 2022). In fact, an estimated 85% of all trachoma cases occur in Africa, specifically in rural areas affected by poverty (Mayo Clinic, 2020).

As of 2020, experts place the number of individuals considered at risk for trachoma worldwide at around 125 million (Trachoma Atlas, 2020). Considered a neglected tropical disease, people living in crowded conditions and/or without access to proper sanitation are most at risk of developing the condition (Mabey, 2003). Furthermore, young children of these communities are most susceptible to the disease (Mayo Clinic, 2020). The yearly financial burden of trachoma infection worldwide is estimated to be roughly 3-5 billion US dollars (WHO, 2022). The WHO previously aimed to eradicate trachoma by the year 2020, but these ef-

forts were unsuccessful (Renneker, 2022). Overall, trachoma has been able to persist in Africa due to a variety of complex factors. Cultural beliefs and misinformation (Mtuy, 2019; Feyisa, 2022), inadequate sanitation (Garn, 2018; Prüss-Ustün, 2019), and insufficient healthcare infrastructure (Seidlein, 2017; Mtuy, 2020) are among the primary contributors.

Disease, both infectious or otherwise, often proliferates in the absence of proper education. For example, a study done in Ethiopia suggests that the basic lack of awareness surrounding trachoma is a pressing issue. To begin, Feyisa (2022) reported that of those surveyed, 88.60 percent of participants were aware that treatment for trachoma did exist, meaning over 10 percent of the sample were entirely unaware of there being any treatment at all. The ramifications of this finding are disturbing. Similarly, only 75 percent of participants were aware of any existing prevention methods, indicating that 25 percent of individuals surveyed had no knowledge of how trachoma may be prevented (Feyisa, 2022). These gaps in knowledge are further compounded by local beliefs surrounding AMT (Azithromycin mass treatment). AMT campaigns have sought the worldwide elimination of trachoma yet have been viciously hampered by regional beliefs and misunderstandings. When surveying those who declined to participate in the AMT campaign, 23 percent attributed their refusal to take part to the unpleasant side effects they had experienced (Feyisa, 2022).

remain. As studied by Mtuy (2019), medicinal plants are frequently used to treat the infection, to questionable degrees of success. Commonly, trachoma in these communities is treated either by grinding the leaves of the plants into a paste to dilute for use in eye drops, or, by directly applying the leaf-derived liquid to the eye (Mtuy, 2019). In addition, a popular practice in the local treatment of trachoma by the Maasai is using the coarse underside of a specific medicinal plant's leaf (Mtuy, 2019) to scar the eyelid, creating open, bleeding wounds. This practice may also be done with a razor blade (Mtuy, 2019). Dubious treatments outside of those regarding medicinal plants also exist, ranging anywhere from applying a water-tobacco mixture to the eye, to drinking blood and animal fat as a curative measure (Mtuy, 2019). Little research has been done on these practices, and so it is unclear how exactly these measures may affect the trachoma infection itself, as well as the morbidity and mortality rates. However, despite the prevalence of these dubious practices, the Maasai people do not have access to clean water and sanitation and water access is often at the forefront of their concerns.

A 2018 study spearheaded by Garn et al. demonstrated that trachoma infections were shown to be significantly rarer among households that possessed latrines, as opposed to those who did not. This implies that contamination from fecal bacteria and a lack of waste-related hygiene heightened the spread of trachoma, presumably due to the increased attraction of flies. Indeed, although these flies are attracted to (human) feces, they will not breed in latrines (Emerson, 1999). Likewise, in communities that had access to household water, far fewer trachoma cases were noted than in areas without household water. This in turn suggests that both proper waste sanitation measures and readily

available water sources decrease the prevalence of trachoma. Though, interestingly, it has been demonstrated that water access is a far more important determinant in trachoma case rates than sanitation (Garn, 2018).

However, sanitation access still remains a major factor in the spread of trachoma. Prüss-Ustün (2019), surveying Sub Saharan African households, found that only around 30 percent had access to basic sanitation measures, and a scant 8.4 percent washed with soap after coming into contact with fecal material. Statistics such as this hint at the reasoning behind the popularized “WASH” strategy – water, sanitation, and hygiene (Aragie, 2022). , sometimes called “eye-seeking” flies, feed on discharge from the eyes and noses of humans, so washing one’s face t ns b ing” wa

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Dewhirst, S., Chen-Hussey, V., Woodcock, C. M., D'Alessandro, U., Last, A., Burton, M. J., Lindsay, S. W., & Logan, J. G. (2020). Responses of the