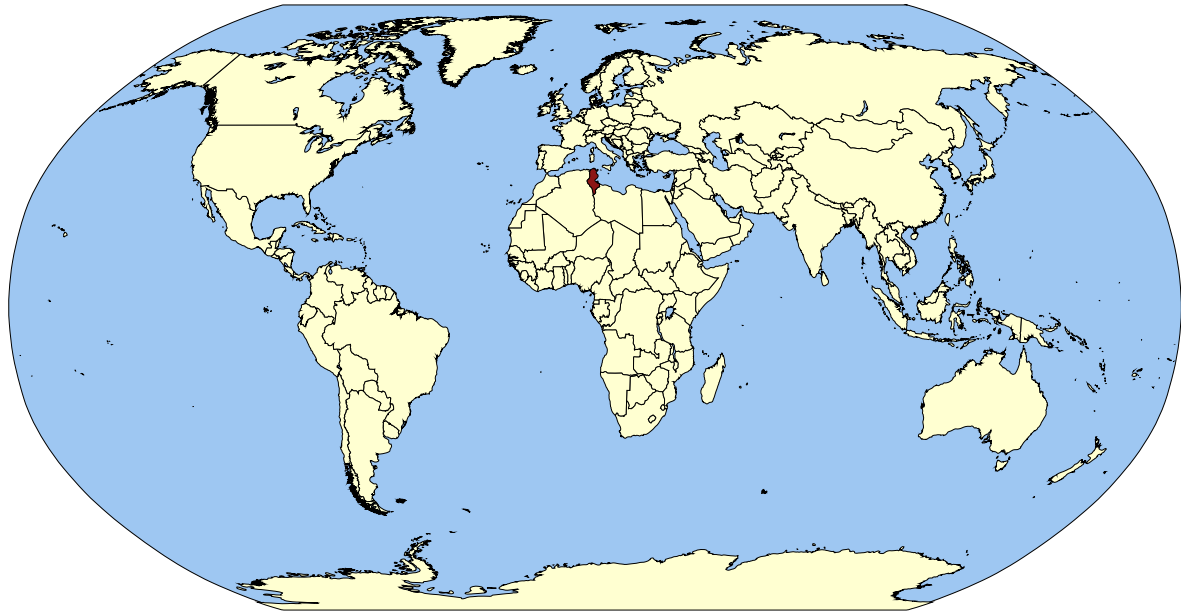


Tunisia

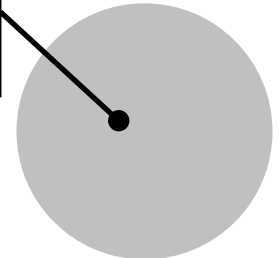


The Story of Tunisia: Isolated Cases and Systematic Control

Schistosomiasis was first officially reported in southern Tunisia in 1908, and this region remained endemic with high prevalence rates for decades.[1] In 1967, before the implementation of a decade-long, government-supported control initiative in the 1970s, 11.6% of the country's population was exposed and prevalence was as high as 64% in southern regions like the district of El Hamma.[2] Strategies to approach schistosomiasis control in Tunisia have been straightforward, as *Schistosoma haematobium* is the sole human schistosome species, *Bulinus truncatus* is the sole intermediate host snail, and oases are the primary disease transmission sites. Though oases were frequently used by nearby communities, they are isolated and easy to treat.[3] Before executing the first control initiative in 1970, control teams found baseline prevalence of 41.3% in transmission sites that contained the host snail *B. truncatus*, and estimated that 160,000-200,000 Tunisians were at risk of infection.[1] Nationwide prevalence was estimated at 8.9%, with maximum local prevalence up to 80% in school-age children from the endemic region.[4]

Schistosomiasis in Tunisia

Schistosomiasis
eliminated
due to successful
snail control



Overview of Tunisia [7]

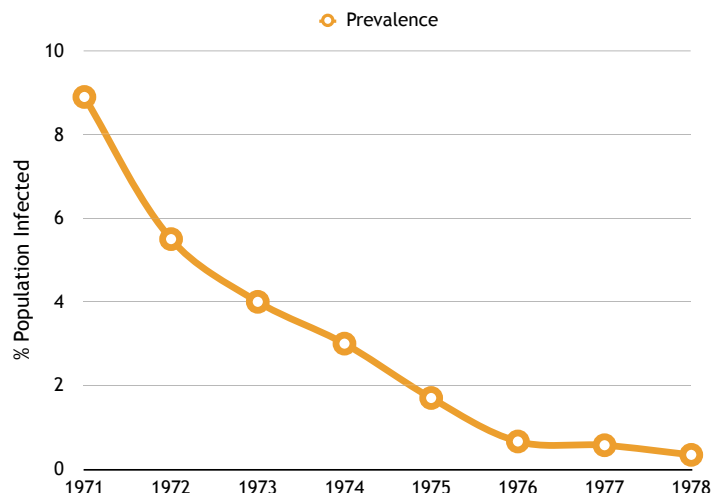
- » Population in 2015: 11,037,225
- » Official Language: Tunis
- » Capital: Tunis
- » Republic
- » Percentage of Population with Access to Improved Drinking Water in 2015: 97.7%
- » Percentage of Population with Access to Improved Sanitation in 2015: 91.6%

The Schistosomiasis Elimination Plan

In 1969, the Tunisian government included schistosomiasis in a disease elimination plan aimed at reducing the burden of infectious disease and increasing tourism.[4] The program began in June of 1970 with three major strategies: (1) monthly surveys of all sites previously identified as containing *B. truncatus*, and subsequent mollusciciding with niclosamide if positive [4]; (2) mass screening and treatment of infected human residents with niridazole (or metrifonate, if subjects presented counterindications to niridazole) [4]; (3) annual comprehensive screening in 10 highly infected villages, until 1978 when screening continued every other year due to rapidly falling infection rates.[1] There is some mention of praziquantel use, though disease was all but eliminated from Tunisia in the early 1980s when the drug became readily available.[4] Personnel from the control teams were inhabitants of the endemic area, which may have helped to avoid cultural and linguistic problems and improve the program's success.[3]

Success with Molluscicides

The first treatment round of molluscicides in 1971-1972 eliminated *B. truncatus* from 75% of infested sites.[4] The government allocated significant resources to the program; for example, in 1976 it budgeted \$65,411 USD (0.1% of \$120,728,410 total healthcare budget that year) to hire and equip 34 employees to treat patients and cover 75 square kilometers of the country with molluscicides.[5] There was a steady decline in prevalence throughout the elimination program. Less than one percent of Tunisians were infected just 5 years after the program's initiation, down from initial estimates of 8.9% prevalence.



Decline in Prevalence

As Tunisia deployed molluscicides in infected oases, prevalence rates drastically decreased to near zero. The last cases of schistosomiasis were reported in 1982.

References

1. Rey, L. *et al.* Schistosomiasis in Tunisia. Results after 10 years of the endemics control. *Bull. Soc. Pathol. Exot. Filiales* **75**, 505-522 (1982).
2. WHO. Atlas of the global distribution of schistosomiasis - Algeria, Tunisia. (1987).
3. WHO. *Elimination of schistosomiasis from low-transmission areas: Report of a WHO Informal Consultation.* (2009).
4. WHO. *Report of the WHO Informal Consultation on Schistosomiasis in Low Transmission Areas: Control Strategies and Criteria for Elimination.* (2001). at <http://whqlibdoc.who.int/hq/2001/WHO_CDS_CPE_SIP_2001.1.pdf>
5. Iatroski, L.S. and Davis, A. The schistosomiasis problem in the world: results of a WHO questionnaire survey. *Bull. World Health Organ.* **59**, 115-127 (1981).
6. Utzinger, J. *et al.* Schistosomiasis and neglected tropical diseases: towards integrated and sustainable control and a word of caution. *Parasitology* **136**, 1859-1874 (2009).
7. Central Intelligence Agency. (2015). Tunisia. In *The World Factbook.* at <<https://www.cia.gov/library/publications/the-world-factbook/geos/ts.html>>

Schistosomiasis was declared eliminated from Tunisia as early as 1980.[6] However, the last autochthonous cases occurred in 1981-1982.[3] By 1994, artesian wells had dried up a large percentage of the oases that had previously harbored *B. truncatus*, diminishing any possibility of the disease's return.[3]