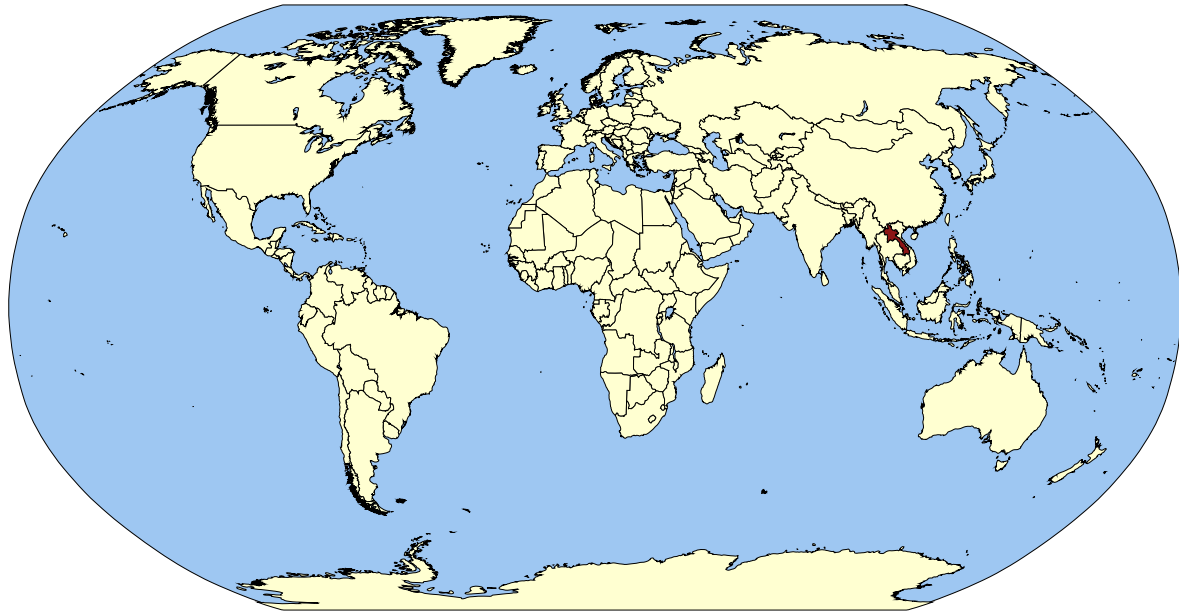


Laos



The History of Schistosomiasis in Laos

The first record of schistosomiasis transmission in Laos comes from 1957, when an immigrant from Khong Island was diagnosed. This was also thought to be the first record of *Schistosoma mekongi*, although it was identified as *Schistosoma japonicum* at the time [1]. In 1968, cases of 'S. japonicum' were reported from 5 villages on Khong Island, the primary region of transmission in Laos [2]. One 1969 survey found 79.8% prevalence in its sample population from the Khong district [3], and another from the same year found 14.4% prevalence on Khong Island itself [4]. Laos had reported 'low endemicity' in 1977 [5], and in 1986, about 100,000 Laotians were estimated infected with schistosomiasis and 400,000 were estimated at risk [6]. In 1989, 42.2% of 2,249 individuals near Khong Island tested positive for schistosomiasis using the Kato-Katz method [3], and a large-scale chemotherapy-based control program began that same year. Before treatment, 60,000 people were at risk in the targeted region and approximately 50.7% of the area's children were infected [4].

Schistosomiasis in Laos [12]

School-age children are primarily at risk for contracting the disease

<1% of the population requires preventative chemotherapy for schistosomiasis

Control programs in Laos treat over 65,000 people -- above and beyond the roughly 9,000 people requiring treatment

Overview of Laos [13]

- » Population in 2015: 6,911,544
- » Official Language: Lao
- » Capital: Vientiane
- » Communist State
- » Percentage of Population with Access to Improved Drinking Water in 2012: 71.5%
- » Percentage of Population with Access to Improved Sanitation in 2011: 64.6%

A War-Torn Country

There were no control programs and limited research on schistosomiasis from the 1960s through the 1980s, due, as in neighboring Cambodia, to 'political and economical confusion' [1]. After experiencing civil war in the early 1960s, Laos was brought into the Vietnam War later in the decade by the North Vietnamese, who crossed Laos for supply routes. As a consequence, United States and South Vietnamese forces bombed and invaded Laos during the 1960s and 1970s to disrupt their aiding North Vietnam and to weaken their communist government. Laos is still the most heavily bombed country, per capita, in the world.



Schistosomiasis is mostly confined to a small island in Laos -- Khong Island -- depicted in the photo above and the map below



Early Schistosomiasis Treatment Programs

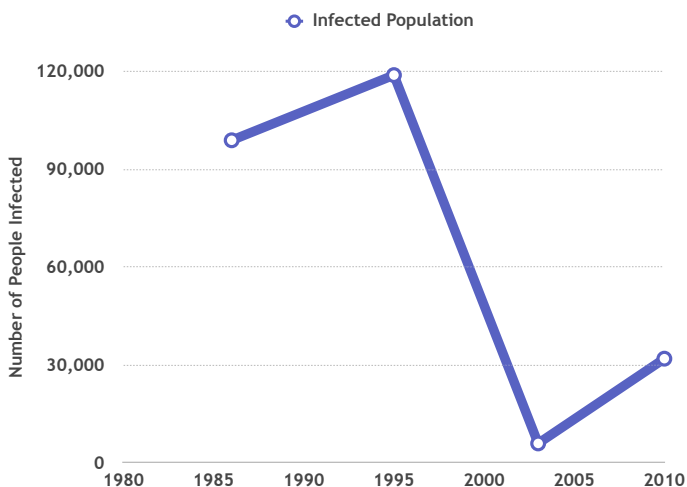
Though originally planned as an annual program, only six rounds of treatment were carried out from 1989-1998 [3]. Selected chemotherapy was employed in the program's first year, but universal treatment was adopted all other years. Universal treatment involved treating an entire village's population if prevalence was above 50%, treating schoolchildren if village-wide prevalence was 25-50%, and treating only infected schoolchildren if village prevalence was below 25% [3,7]. There is some evidence of health education and sanitation support in the region during the program; for example, water pumps and latrines were installed in the Khong district in 1989. Initial results from the program indicated significant success. Prevalence decreased to 2.1% in the Khong district after control [3], and by 1994, prevalence in schoolchildren had fallen to 0.4% from an initial level of 30% and authorities declared that schistosomiasis was officially controlled in Laos but that water contact with the Mekong must cease for it to remain interrupted [7]. In 1999, *S. mekongi* only appeared in 5 of 21 villages surveyed and rates were all below 8% [7].

Disease Resurgence

However, these successes do not appear permanent. For one, Ohmae simply states that "On Khong Island, Laos, mass treatment with PZQ failed to stop transmission of *S. mekongi*" [1]. In 1995, there were still an estimated 120,000 infected Laotians and 490,000 at risk of infection, and by 2000, there was evidence of re-emergence in several villages in the endemic region (some had infection rates between 3 and 10%, one as high as 26.8) [7]. In 2006, a multi-parasite stool sample study of 669 people in the Khong, Mounlapamok, and Paksong districts found 24.2% prevalence of *S. mekongi* [9]. Between 2003 and 2010, estimated nationwide prevalence increased from 0.1% to 0.5% [10].

Snail Control in Laos

Laos is the only country to use snail control on the intermediate host populations of *S. mekongi*. A small-scale trial in May 1991 used niclosamide at one location on the Mekong River [4]. Results were not positive, as the snail population density 10m downstream fell to 1% of original levels the day after treatment, rose to 2400% of original levels 5 days after treatment, then fell back to original levels 4 days later. A similar phenomenon was observed 150m downstream [4]. However, Attwood does suggest that not enough niclosamide was used and that 'The control of *N. aperta* is likely to prove effective in a combined anti-schistosomiasis programme with chemotherapy of villagers in endemic areas' [4].



Infection Rates in Laos

The number of people in Laos infected with schistosomiasis experienced a sharp decrease, until experiencing a recent resurgence.

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