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# Prevalence and intensity of human soil transmitted helminth infections in the Akonolinga health district (Centre Region, Cameroon): Are adult hosts contributing in the persistence of the transmission?



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#### ABSTRACT

Background: Soil-transmitted helminthiases (STHs) are among the most prevalent afflictions of the developing world, with approximately 2 billion people infected worldwide. Heavily infected individuals suffer from severe morbidity that can result in death. These parasitic diseases also impair physical and mental growth in childhood, thwart educational advancement, and hinder economic development. Periodic deworming with Albendazole or Mebendazole of high-risk groups (school-age children, preschool children, and pregnant women) can significantly lower the levels of infections below the threshold associated with morbidity. However, an important proportion of the population (adults) is excluded from this high-risk group treatment based-strategy, and might lead to the persistence of these diseases in endemic areas despite the repeated treatments. The main objective of this study was to evaluate the contribution of this neglected atrisk group in the spread and persistence of STH in Cameroon.

*Methods*: A cross sectional survey was conducted in the Akonolinga health district (Centre Region, Cameroon) to assess the prevalence and intensity of these helminth infections. Stool samples were collected from males and females, aged 18 years and over, and analyzed using the Kato-Katz technique. *Results*: A total of 334 patients, among which 181 (54.2%) females and 153 (45.8%) males, were examined. The STH of major concern was found in this group of individuals, with overall prevalence equal to 18.0% (95% CI: 14.2–22.4) for *Ascaris lumbricoides*, 43.7% (95% CI: 38.5–49.1) for *Trichuris trichiura*, and 7.5% (95% CI: 5.1–10.8) for *Necator americanus*.

Conclusion: This study reveals that STH infections are prevalent in adults in the Akonolinga health district, with moderate to high risk and light intensity of infection. These infected adults might constitute a potential parasite reservoir and a source of dissemination and persistence of these infections, highlighting the need to really take into account this neglected group of individuals in the mass treatment policy.

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#### 1. Introduction

Soil-transmitted helminth (STH) infections refer to a group of parasitic diseases caused by nematode worms that are transmitted to humans by fecally-contaminated soil. The STH of major concern to humans are the roundworm (*Ascaris lumbricoides*), the whipworm (*Trichuris trichiura*), and the hookworms (*Necator americanus* and *Ancylostoma duodenale*). They are among the most common infections worldwide which heavily affect the poorest and most deprived communities where the sanitation is inadequate and water supplies unsafe (WHO, 2012a). Latest estimates indicate that approximately 2 billion people (24% of the world's population) are infected with STH infections worldwide (WHO, 2015). Infections are widely distributed in tropical and subtropical areas, with the greatest numbers occurring in sub-Saharan Africa, the Americas, China and East Asia (WHO, 2015).

Although soil-transmitted helminthiases inflict tremendous disability and suffering, they can be controlled or eliminated. The control of STH is based on the periodic single-dose Albendazole (400 mg) or Mebendazole (500 mg) deworming of at-risk population living in endemic areas. At-risk groups are preschool-age children (aged 1-4 years), school-age children (aged 5-14 years), women of reproductive age (including pregnant women in the second and third trimesters and lactating mothers), and adults particularly exposed to STH infections (for example, tea-pickers and miners) (WHO, 2012a; WHO, 2015). The WHO global target is to eliminate morbidity due to STH in children by 2020, through regular treatments of at least 75% of the 873 million children living in endemic areas (WHO, 2015). To be completely successful, this strategy needs to be supported by the improvement in sanitation and health education. Indeed, healthy behaviors may help reducing transmission and reinfection; provision of adequate sanitation is also important but very challenging in resource-constrained settings (WHO, 2008). As schools provide an important entry point for an appropriate deployment of control activities (periodic deworming, health education, sanitation), efforts are mostly focused on school aged children, the other high risk groups being somehow neglected. This situation appears obvious since anthelminthic drug donations are only available for the treatment of school-age children (Hotez, 2009). However, it was recently demonstrated that age groups other than school-age children can have similar exposure risk, by eating similar food as sibling after weaning, and displaying even greater propensity to have dirty hands in mouth (Addiss, 2015; Hollingsworth, 2015). Mathematical modeling further revealed that it would be better to broaden treatments across all age classes instead of treating school-age children twice a year if one needs to interrupt transmission (Anderson et al., 2015). Furthermore, recent survey mappings conducted in Cameroon

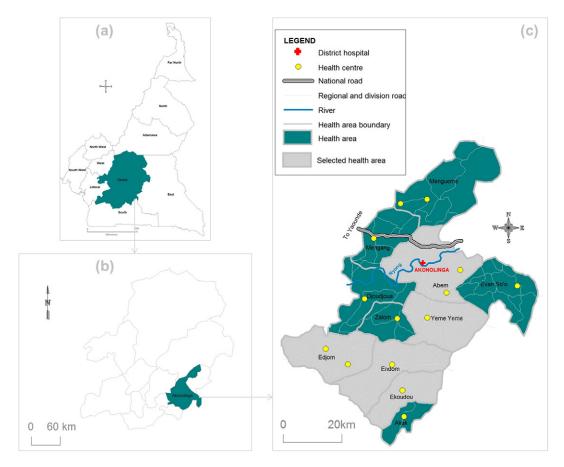


Fig. 1. Map showing health areas surveyed (gray zones) in the Akonolinga health district (Centre Region, Cameroon). (a) Location of the Centre Region in Cameroon; (b) location of the Akonolinga health district in the Centre Region of Cameroon; (c) spatial distribution of health areas of the Akonolinga health district.

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