

Schistosomiasis infection and early childhood development in South Africa and Zimbabwe:

Infectious diseases in the first few years of life, if not diagnosed and treated, can cause malnutrition and affect brain development.ⁱⁱ There is a lack of evidence on the incidence of and health effects on children of the tropical disease schistosomiasis, which affects 250 million people worldwide, and is the second most prevalent parasitic disease in sub-Saharan Africa.ⁱⁱⁱ Causing bladder and kidney disorders with serious implications for childhood development, an estimated 50 million preschool-age children ^{iv} affected by schistosomiasis in Africa remain outside the national control programmes that cover the adult population.

Schistosomiasis is a disease of poverty that leads to chronic ill-health. Infection is acquired when people come into contact with fresh water infested with the larval forms (cercariae) of parasitic blood flukes, known as schistosomes. The adult worms live in the veins draining the urinary tract and intestines. Most of the eggs they lay are trapped in the tissues and the body's reaction to them can cause massive damage. (WHO, 2016)

Generating evidence on infectious diseases that affect young children's development is crucial for policymakers in the Global South, particularly given the scarcity of health resources in many low- and middle-income countries (LMICs). Research funded under the British Academy-led GCRF/ DFID Early Childhood Development (ECD) programme has shed light on the effects of paediatric schistosomiasis on ECD in LMICs, particularly in Zimbabwe and South Africa. The research conducted in rural villages in these countries provides an evidence base on the importance of addressing paediatric schistosomiasis, and the tools to do this.

Evidence

The cross-sectional study followed by a cohort study found an unexpectedly high prevalence of schistosomiasis amongst pre-school age children (under the age of 5) and confirms current policy developments and measures to ensure the treatment of preschool children.^v The research examined the impact of schistosomiasis on five measures of ECD:

- i. foundations of learning;

- ii. language and communication;
- iii. eye-and-hand coordination;
- iv. personal-social-emotional functions (self-confidence, self-awareness, managing feelings and behaviour, making relationships); and
- v. gross motor function.

The project highlighted the negative impact of schistosomiasis on ECD. In Zimbabwe, this was the first study of its kind in rural populations which assessed early child development in the context of exposure to schistosome infection and using the Griffiths assessment tool found that as many as 40 out of 133 infected children, which all showed similar levels of infection to their adult carers, examined showed lower than age-appropriate levels of child development. Whilst infected children performed well on the development sub-scales that required physical skills such as hand-eye coordination and gross motor functions, they scored poorly on learning-related sub-scales. Schistosomiasis was also found to affect mental health negatively, as 12% of infected children were diagnosed with either high anxiety, attention deficient disorder, attention deficient hyperactivity disorder, seizure disorder or other cognitive disabilities. Preliminary analysis indicates that treatment of schistosome infections with the drug of choice Praziquantel, reversed the detrimental effects of infection on the foundations of learning measures within 6 months of treatment. In South Africa, schistosomiasis was also found to compromise children's learning ability, language development and physical performance.

The research also found, through the use of questionnaires at the start and end of the study, that improving the awareness of local community members (including village health workers, village heads and teachers) to the early symptoms of the diseases and improving their health seeking behaviour could be effective to address the effects of paediatric schistosomiasis. It observed that ECD centres and preschools were the places where a significant proportion of infected children could be identified, assessed and treated for schistosomiasis addressing a critical question of how to access this age group for treatment.

Recommendations

- Currently, the schistosomiasis control programmes operational in Zimbabwe and South Africa focus only on the adult population. This research has demonstrated the need to include preschool-age children in programmes screening for infection as it has been shown that schistosomiasis can impact on children's early development. Therefore,

including young children with infection in the coverage of these programmes could not only control infections early on but also improve several ECD indicators.

- There is a need to raise awareness amongst parents, communities and national policy makers about the prevalence of schistosomiasis amongst young children in endemic areas and its consequences on child development.
- For early diagnosis and treatment of schistosomiasis, there is a need to involve and train local community members (including village health workers, village heads and teachers). By working on their knowledge, attitudes and practices, earliest signs of the infection could be identified, and appropriate treatment could be sought.

i This note is based on the British Academy-funded project 'Providing the evidence base and tools for prioritising and implementing paediatric schistosomiasis control to enhance early childhood development' (Professor Francisca Mutapi). The project is part of the British Academy-led DFID/GCRF programme on [Early Childhood Development](#), which investigated the dynamics of early childhood development in low- and middle-income countries.

ii Aboud and Yusufzai 2015. *Annu. Rev. Psychol.* 2015. 66:433–57

iii Osakunor DNM, Woodhouse MEJ, Mutapi F. Paediatric schistosomiasis: What we know and what we need to know, *PLoS Negl Trop Dis.*, 2018

iv Mutapi F. Changing policy and practice in the control of paediatric schistosomiasis, *Pediatrics*, 2015

v https://www.who.int/neglected_diseases/WHONTD-roadmap-2030/en/. Current policy trends are also highlighting the need for coordinated approaches which tackle multiple neglected tropical diseases for maximum benefit: [https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736\(09\)61249-6.pdf](https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(09)61249-6.pdf)