

Preventive chemotherapy for Onchocerciasis

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Date: 2021-08-13, 2021-12-02

Description of condition and intervention

Onchocerciasis, also known as “river blindness” is a neglected tropical disease caused by the filarial worm *Onchocerca volvulus* transmitted by repeated bites of infected blackflies (*Simulium* spp.). It is a disease of eye and skin, caused by movement of microfilariae around the human body and upon their death induce strong inflammatory responses in the body. Resultantly, infected person may have symptoms like severe itching and experience skin changes. There could be development of eye lesions that can progress to visual impairment and ultimately permanent blindness.

In terms of disease burden WHO estimates report that more than 99% of infected people live in 31 countries in sub-Saharan Africa: Angola, Benin, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Republic of Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Sudan, Sudan, Togo, Uganda, United Republic of Tanzania (WHO 2021). Treatment recommendations by WHO include ivermectin at least once yearly for 10 to 15 years in those infected with onchocerciasis. Community-directed treatment with ivermectin is considered core strategy to help in eliminating this disease. (WHO factsheet onchocerciasis).

This evidence brief details about the effect and cost of preventive chemotherapy for onchocerciasis.

International guidelines

Organization	Indications/recommendations
	Onchocerciasis

Intervention attributes

Type of interventions

Curative

Delivery platform

This intervention may be delivered at the community level.

Equity

In addition to considerations like cost-effectiveness and health systems factors, dimensions of equity can be relevant for priority setting. The opportunity for a long and healthy life varies according to the severity of a health condition that individuals might have, so there are inequities in individuals' opportunities for long and healthy lives based on the health conditions they face. Metrics used to estimate the severity of illness at an individual level can be used to help prioritize those with less opportunity for lifetime health. FairChoices: DCP Analytics Tool uses Health adjusted age of death (HAAD), which is a metric that estimates the number of years lived from birth to death, discounting years lived with disability. A high HAAD thus represents a disease less severe in terms of lifetime health loss, while a low HAAD represents a disease that is severe on average, causing early death or a long period of severe disability. It is also possible to estimate the distribution of HAAD across individuals with a health condition. FairChoices shows for each intervention an average HAAD value of the conditions that are affected by respective interventions that have health effects. Additionally, a plot shows HAAD values for around 290 conditions (Johansson KA et al 2020).

Time dependence

Moderate level of urgency. Treatment outcomes may be affected by some days of delay.

Population in need of interventions

Treated population: All individuals (prevalent cases) of Onchocerciasis in the age group of 0 to 99 years and gender are eligible to receive the intervention. The treated fraction is assumed to 100% for this intervention.

Affected population: The affected population includes those with the Onchocerciasis in the age-group of 0 to 99 years, both genders. The affected fraction by this intervention is assumed to be 100%.

Disease states addressed

This intervention targets Onchocerciasis infection state.

Intervention effect and safety

Table 1: Effect and safety of preventive chemotherapy of Onchocerciasis

Effect of intervention		Certainty of evidence
Prevalence	0.39 (relative risk reduction) with the intervention	See appendix

Model assumptions

Table 2: Summary of model parameters and values used in FairChoices – DCP Analytical Tool

Category	Model parameter	Notes
Intervention	Preventive chemotherapy for Onchocerciasis	
Cost calculation		
Treated population	Based on prevalence of Onchocerciasis	Global Burden of disease study 2019
Gender	Both	
Age	0 to 99 years	
Treated fraction	1	
Effect calculation		
Affected Population	Those with condition	
Affected gender	Both	
Affected fraction age	0 to 99 years	

Affected fraction	1	
Comparison	placebo or other care	
Prevalence Reduction (RRR)	0.39	

Intervention Cost

The total unit cost for providing preventive chemotherapy for Onchocerciasis per person is estimated to be USD 0.42 (Year: 2012). Based on cost data collected in savannah foci in Ghana, it was estimated that the economic cost of annual community-directed treatment with ivermectin (CDTI) is \$41,536 per target population of 100,000 individuals (overall population) per year in 2012 prices (Turner HC et al.).

References

WHO 2021: World Health Organization. Health topics- Onchocerciasis. Available at <https://www.who.int/news-room/fact-sheets/detail/onchocerciasis> (accessed on 2 Dec 2021)

Johansson KA et al 2020: Johansson KA, Coates MM, Økland JM, Tsuchiya A, Bukhman G, Norheim OF, Haaland Ø. Health by disease categories. Distributional Cost-Effectiveness Analysis: Quantifying Health Equity Impacts and Trade-Offs. 2020 Sep 30:105.

Turner HC et al 2014: Turner HC, Walker M, Churcher TS, Osei-Atweneboana MY, Biritwum NK, Hopkins A, Prichard RK, Basáñez MG. Reaching the london declaration on neglected tropical diseases goals for onchocerciasis: an economic evaluation of increasing the frequency of ivermectin treatment in Africa. Clin Infect Dis. 2014 Oct;59(7):923-32. doi: 10.1093/cid/ciu467. Epub 2014 Jun 18. PMID: 24944228; PMCID: PMC4166981.

Appendix

Literature Review for effectiveness & safety

This literature search is an example of a level 1 search of literature and guidelines for preventive chemotherapy for Onchocerciasis.

Preventive chemotherapy for

Onchocerciasis

(DCP4 ID: NTD02-03)

Cluster: Neglected Tropical Diseases

FairChoices

DCP Analytic Tool

Level 1: intervention inputs taken from DCP3 or generated in an ad hoc manner (e.g., quick google search found one study of cervical cancer screening cost-effectiveness that was used to create an effectiveness parameter for that intervention).

Level of evidence of efficacy studies:

1. low (expert opinions, case series, reports, low-quality case control studies)
2. moderate (high quality case control studies, low quality cohort studies)
3. high (high quality cohort studies, individual RCTs)
4. very high (multiple RCTs, meta-analysis, systematic review, clinical practice guidelines)