# Preventive chemotherapy for Lymphatic filariasis

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## Description of condition and intervention

Lymphatic filariasis disease (also known as elephantiasis) is caused by infection with nematodes (roundworms) of the family Filariodidea, propagated through the bites of infected mosquitos. With the bite of the infected mosquitoes, the larvae enter the human body depositing on the skin and then migrating to the lymphatic vessels. Transformation of larvae to adult worms occurs in these lymphatic vessels. Estimates indicate that 859 million in 50 countries are at risk to this infection. Lymphatic filariasis is a painful and disfiguring condition. Treatment goals target management of morbidity and disability in those affected with this disease. Preventive chemotherapy is a strategy indicated to interrupt transmission of infection by mosquitoes by eliminating the microfilariae from the blood of infected individuals. Thus, mass drug administration of appropriate drug regimen with an annual dose being given to at risk population is recommended. Included drug regimens-albendazole alone or in combination with either ivermectin or diethylcarbamazine citrate are given, depending upon the co-endemicity with other filarial diseases. (WHO 2021)

We assess the effect and cost of preventive chemotherapy from lymphatic filariasis intervention that is being analysed in FairChocies: DCP Analytics tool.

### International guidelines

Preventive chemotherapy for
Lymphatic filariasis
(DCP4 ID: NTD02-04)
Cluster: Neglected Tropical Diseases

**FairChoices**
DCP Analytic Tool

| Organization | Indications/recommendations |
|---|---|
| World Health Organization | Lymphatic filariasis |

# 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 Lymphatic filariasis 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 Lymphatic filariasis 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 Lymphatic filariasis state.

# Intervention effect and safety

*Table 1: Effect and safety of preventive chemotherapy of Lymphatic filariasis*

| Effect of intervention | | Certainty of evidence |
|---|---|---|
| Prevalence | 0.39 (relative risk reduction) with the intervention (assumed) | 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 Lymphatic filariasis** | |
| **Cost calculation** | | |
| Treated population | Based on prevalence of Lymphatic filariasis | 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 preventive chemotherapy for lymphatic filariasis per person is estimated to be USD 0.4 (Year: 2012). The unit cost was calculated based on modeling economic costs associated with implementing MDA (Christopher M Stone et al.).

# References

WHO 2021: World Health Organization. Health topics-Lymphatic filariasis. Available at https://www.who.int/news-room/fact-sheets/detail/lymphatic-filariasis

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.

Stone CM, Kastner R, Steinmann P, Chitnis N, Tanner M, Tediosi F. Modelling the health impact and cost-effectiveness of lymphatic filariasis eradication under varying levels of mass drug administration scale-up and geographic coverage. BMJ Glob Health. 2016 Apr 6;1(1):e000021. doi: 10.1136/bmjgh-2015-000021. PMID: 28588916; PMCID: PMC5321305.

# 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 lymphatic filaraisis.

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, metaanalysis, systematic review, clinical practice guidelines)