

Early detection and treatment of nationally important NTDs: Lymphedema management

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Description of condition and intervention

Lymphedema pertains to swelling of limb due to chronic inflammation of lymphatic vessels. This condition mostly occurs as a late sequela of lymphatic filariasis disease (also known as elephantiasis). Lymphatic filariasis 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 lymphatic filariasis affected 120 million people in over 72 countries spanning in Asia, Africa, Western Pacific, the Carribean and South America. This is a painful and disfiguring condition. Treatment goals target management of morbidity and disability in those affected. In case of development of hydrocoele, surgery may be indicated.

This evidence brief details on effect and cost of lymphedema management intervention that is being analysed in FairChoices: DCP Analytical tool.

International guidelines

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 lymphedema estimated from the prevalence 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 0.05 from GBD Visualization tool for this intervention.

Affected population: The affected population and fraction are same as treated above.

Disease state addressed

This intervention targets lymphedema disease state (based on prevalence of lymphatic filariasis).

Intervention effect and safety

Table 1: Effect and safety of early detection and treatment of lymphedema management

Effect of intervention		Certainty of evidence
Disability	0.85 (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	Lymphedema management	
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	0.05	
Effect calculation		
Affected Population	Those with condition	
Affected gender	Both	
Affected fraction age	0 to 99 years	
Affected fraction	0.05	
Comparison	placebo or other care	
Disability Reduction (RRR)	0.85	

Intervention Cost

The cost for early detection and treatment of Lymphedema was estimated to be 68 USD per patient in Malawi in 2015, using the cost for hydrocele surgery as a proxy.

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.

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Cluster: Neglected Tropical Diseases

Sawers L, Stillwaggon E, Chipwanya J, Mkwanda SZ, Betts H, Martindale S, Kelly-Hope LA. Economic benefits and costs of surgery for filarial hydrocele in Malawi. PLoS Negl Trop Dis. 2020 Mar 25;14(3):e0008003. doi: 10.1371/journal.pntd.0008003. PMID: 32210436; PMCID: PMC7094819.

Appendix

Literature Review for effectiveness & safety

This literature search is an example of a level 1 search of literature and guidelines for early detection and treatment of lymphedema management.

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)