

Early detection and treatment of nationally important NTDs: Echinococcosis

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Description of condition and intervention

Echinococcosis is a type of parasitic infection that occurs as cystic echinococcosis (or hydatidosis) caused by tapeworm *Echinococcus granulosus*, and as alveolar echinococcosis by *Echinococcus multilocularis*. Both these types of disease have long asymptomatic periods until the parasite larvae develop and manifest clinically in human body. In cystic echinococcosis, the parasite larvae develop around liver and lungs primarily.

Serological tests and imaging tools like ultrasound or computed tomography may be employed to detect human cystic echinococcosis. Treatment options include anti-infective drug treatments, percutaneous treatment of the hydatid cysts with the PAIR (Puncture, Aspiration, Injection, Re-aspiration) technique, or surgery (Source: WHO 2021). In this evidence brief, we present the effect and cost of the following intervention being analysed in FairChoices:DCP Analytical tool:

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International guidelines

Organization	Indications/recommendations
	Echinococcosis

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). A progressive universalist approach is assumed where all individuals with Echinococcosis are eligible for the intervention that includes early detection and treatment of this disease.

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 Cystic Echinococcosis) of Echinococcosis estimated from the prevalence of neglected tropical diseases in the age group of 0 to 99 years

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and gender are eligible to receive the intervention. The treated fraction is taken as 0.2 for this intervention assuming that in 20% of the patient the cysts will reactivate.

Affected population: The affected population includes those with the cystic echinococcosis disease condition in the age-group of 0 to 99 years, both genders. The affected fraction is same as treated fraction.

Disease states addressed

This intervention targets cystic echinococcosis disease state.

Intervention effect and safety

Table 1: Effect and safety of early detection and treatment of Echinococcosis

Effect of intervention		Certainty of evidence
Mortality (due to condition)	95% cure rate with PAIR treatment (ultrasound guided percutaneous treatment) for hydatid cysts (Filice C, Brunetti E. 1997)	See appendix
Disability	In a placebo-controlled double-blind parallel group randomized trial in Iran, effect of albendazole on hydatid cysts was studied. This trial reported either cure or improvement in treatment arm in 82% of the total sample size (n=22 patients) (Keshmiri et al 2001).	

Model assumptions

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

Category	Model parameter	Notes
Intervention	Echinococcosis	
Cost calculation		
Treated population	Based on prevalence of Cystic Echinococcosis	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	Effectiveness for an average patient that may require surgery in addition to treatment
Mortality Reduction (RRR)	0.95	

Intervention Cost

The cost for early detection and treatment of Cystic Echinococcosis was estimated to be 4481 USD per patient in Tunisia in 2000 (average cost per surgical case) (Budke, Deplazes, Torgerson 2006).

References

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.

Filice C, Brunetti E. 1997: Filice C, Brunetti E. Use of PAIR in human cystic echinococcosis. Acta Trop. 1997 Apr 1;64(1-2):95-107. doi: 10.1016/s0001-706x(96)00642-0. PMID: 9095291.

Budke, Deplazes, Torgerson 2006: Budke CM, Deplazes P, Torgerson PR. Global socioeconomic impact of cystic echinococcosis. Emerg Infect Dis. 2006 Feb;12(2):296-303. doi: 10.3201/eid1202.050499. PMID: 16494758; PMCID: PMC3373106.

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 Echinococcosis.

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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)