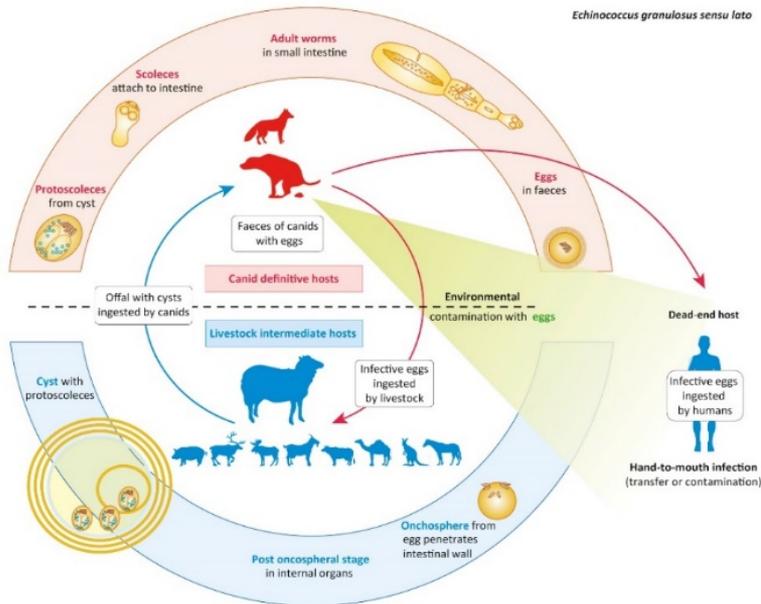


ADOPTED: 25 October 2018

doi: 10.2903/j.efsa.2018.5495

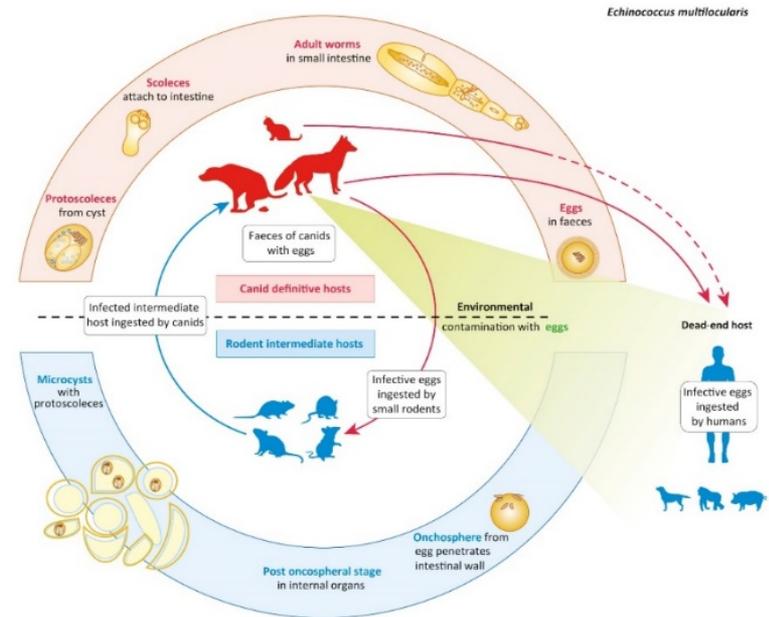
Public health risks associated with food-borne parasites

Echinococcus granulosus s.l.
CYSTIC ECHINOCOCCOSIS

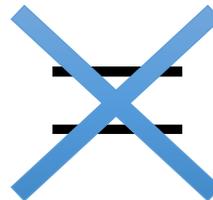


CHRONIC DISABLER
(2% death in cohorts at hospital level)

Echinococcus multilocularis
ALVEOLAR ECHINOCOCCOSIS

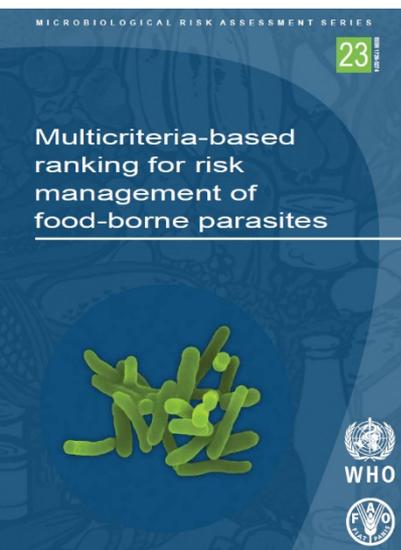


KILLER
(fatality rate in the absence of treatment > 90% in 10y)



GLOBAL RANKING and RECENT EVIDENCE from the EU

- CE/AE are among the prioritized **NTDs** targeted by **WHO** (2015-20 roadmap)
- **FAO/WHO** most important FB-parasitic diseases **at global level**: AE **2nd**, CE **3rd**
- **Prioritisation in Europe** of FB-parasites: Em **1st**, Eg **4th** (*Euro Surveill*, 2018)
- A cross-sectional US-based study in Bulgaria, Romania and Turkey: **151,000 CE** infections indicating **CE in rural Europe as a major public health problem** (*The Lancet ID*, 2018)
- In this light, in 2018, the **WHO** reinforced **CE prioritization in Europe**, advocating “*new approach needed to tackle parasitic liver diseases in Europe and Turkey*”



Neglected tropical diseases

New approach needed to tackle parasitic liver disease in Europe and Turkey

31 August 2018 | Geneva — A cross-sectional study conducted in Bulgaria, Romania and Turkey has found that the true burden of cystic echinococcosis is poorly understood and that many cases remain asymptomatic, with no appropriate medical diagnosis and treatment. The study assessed the prevalence of the disease among rural populations in the three countries.

“This multicentre study provides, for the first time, the evidence of the number of people who are infected with echinococcosis that shows the real burden of this neglected parasitic infectious disease in WHO’s European Region,” said Dr Adriano Casulli, Director of WHO Collaborating Centre for the Epidemiology, Detection and Control of Cystic and Acanthamoeba Echinococcosis (in humans and animals). “It is important to introduce new health policies to prioritize its control in endemic rural areas.”

Active abdominal cysts were found in participants from all three countries and across all age groups. Participants in whom cystic echinococcosis was diagnosed or suspected were referred to hospitals in the respective country for clinical management.

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HERACLES

Human cystic Echinococcosis ReseArch in Central and Eastern Societies

World Health Organization

THE LANCET
Infectious Diseases

Volume 18, Issue 7, July 2018

Articles

Does long term protection persist after Ebola virus vaccination?
See page 738

Articles

Survey of *Nisseria gonorrhoeae* in Europe
See page 738

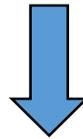
Articles

Prevalence of cystic echinococcosis in rural settings
See page 740

EPIDEMIOLOGICAL INTRINSIC LIMITS

to elucidate pathways of transmission & risk factors

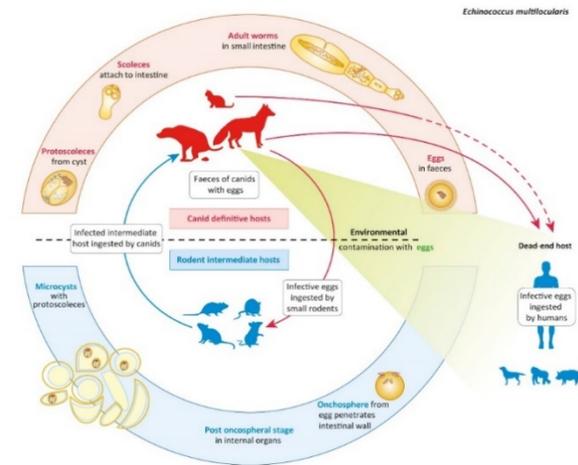
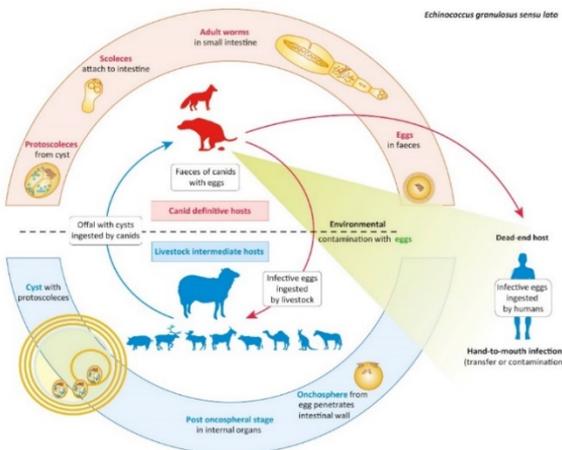
1. Different hosts and an **environmental stage** dispersing resistant eggs;
2. Long **incubation period** between infection and the appearance of clinical signs and/or diagnosis:
 - very difficult to **identify the source of hand-to-mouth infection**;
 - very challenging to **link food exposures to disease**;
 - **outbreaks of CE/AE** cannot be expected (evaluated);
 - **source attribution and risk factor studies are therefore limited!!**



CE/AE infections happened in the past, somewhere, somehow.....

RELATIVE IMPORTANCE of FB-PATHWAYS

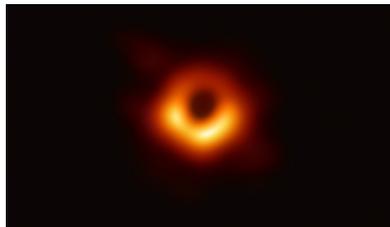
- Exact mechanisms and vehicles of transmission to humans remain controversial, with quantification based solely on expert knowledge elicitation.
- Transmission vehicles might vary based on sociocultural/economic factors.
- Transmission could partially be linked to a typical food-borne mechanism, after ingestion of viable eggs present on unwashed vegetables, fruit, and berries but.....
- ...Expert knowledge elicitation indicates wide uncertainty as FB for both CE [(4-40% of cases) and AE (12-79%)].
- Risk factors based on systematic review and meta-analysis indicate the need for more primary studies.



KNOWLEDGE GAPS

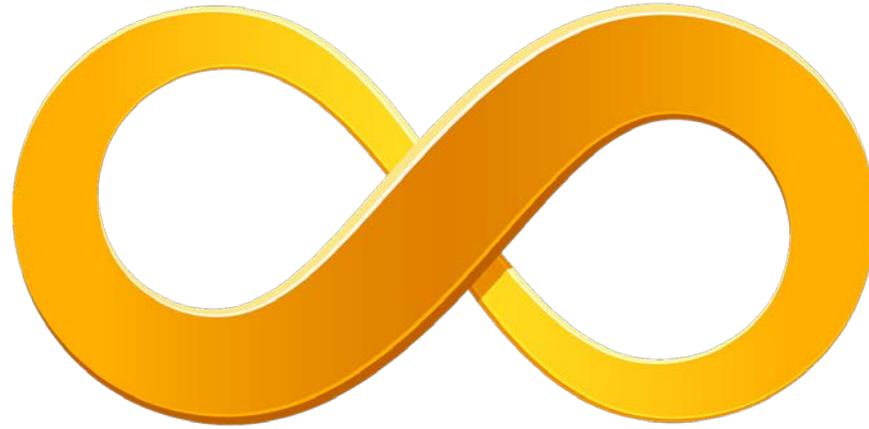
Keywords: not known, not yet available, not understood, lacking, not investigated, not determined, not elucidated.

- The **relative importance of food-borne infections** (food/water vs hand-to-mouth).
- **Validated methods to detect eggs** in fresh produce & **data for QMRA-based**.
- **Dose-response data in humans** (necessary to translate exposure in infection risk).
- Factors determining the **susceptibility of humans to infection**.
- The **efficacy of intervention strategies** to reduce the environmental contamination with eggs and their effective **contribution towards minimising the likelihood of infection**.
- The **correlation of infectivity, pathogenicity and treatment response** with the different species/genotypes causing CE.
- **Ecological parameters** favouring the persistence of the *E.m.* lifecycle (including the impact of climate change).



The LOOP:

Unavailability of (validated)
DETECTION METHODs



Lack of (robust) EPIDEMIOLOGICAL DATA
on pathways of transmission

PERITAS



MOLECULAR EPIDEMIOLOGICAL STUDIES on PATHWAYS of TRANSMISSION and LONG LASTING CAPACITY BUILDING to PREVENT CYSTIC ECHINOCOCCOSIS INFECTION

1. CROSS-SECTIONAL ultrasound-based population surveys for CE cluster identification;
 2. CASE-CONTROL village-based study for identification of eggs in different matrices;
- PERITAS is aiming to elucidate pathways of transmission by molecular analysis.



<http://eulachealth.eu/>



MULTICENTRE STUDY on *Echinococcus multilocularis* and *Echinococcus granulosus s.l.* in EUROPE: DEVELOPMENT and HARMONIZATION of DIAGNOSTIC METHODS in the FOOD CHAIN

- Developing **SOPs** for the detection of eggs in the food chain;
- Validating **parasitological** and **molecular diagnostic methods**;
- Organization of **PTs** and inter-laboratory **training schemes**;
- Producing **epidemiological data** on PRF and on eggs contamination in the food chain.
- Producing **innovative tools** (NEW molecular markers, qPCR, NGS, proteomics).

