



**Vlaanderen**  
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gezond samenleven

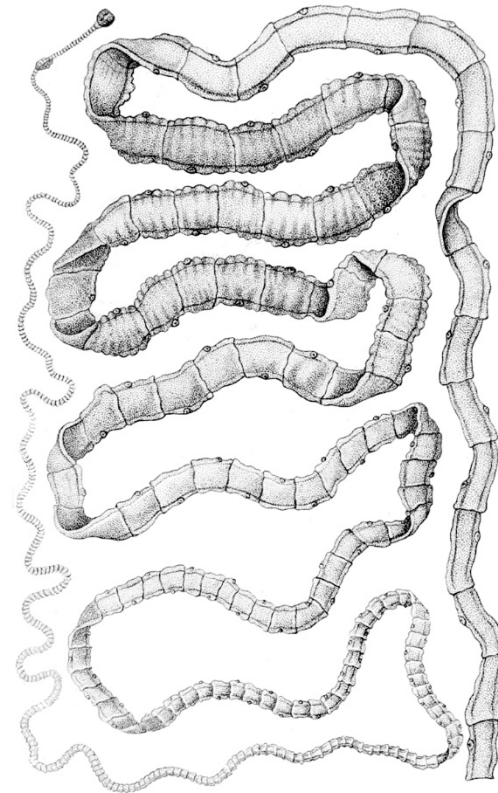
# Cluster of cysticercosis in a school

# Introduction

Taenia solium & cysticercosis

# Taenia solium

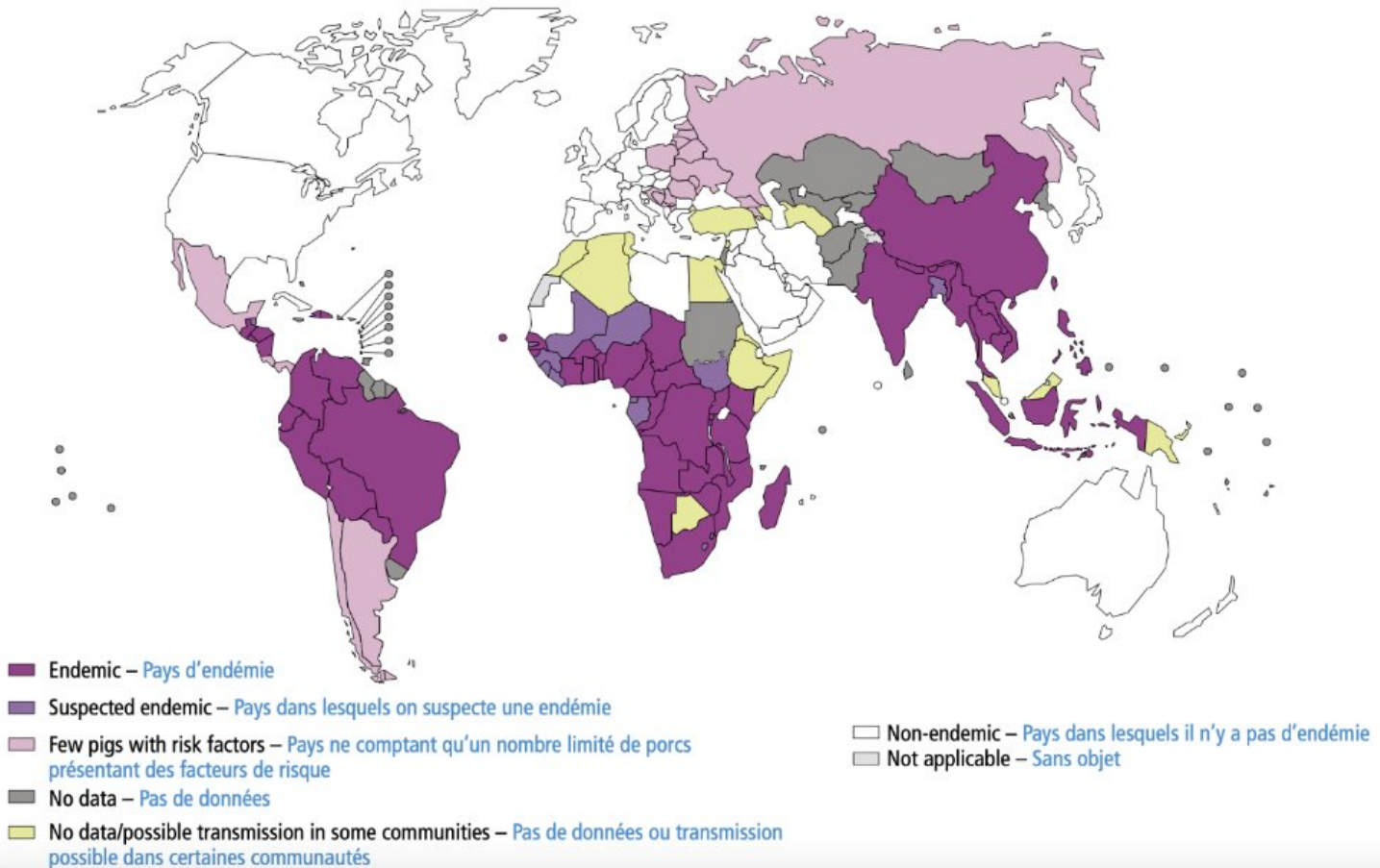
- ▶ Pork tapeworm
- ▶ Flat, white, 2-3m long
- ▶ Scolex – strobila (proglottids)
- ▶ Hermaphroditic species
- ▶ Circulates between humans and pigs



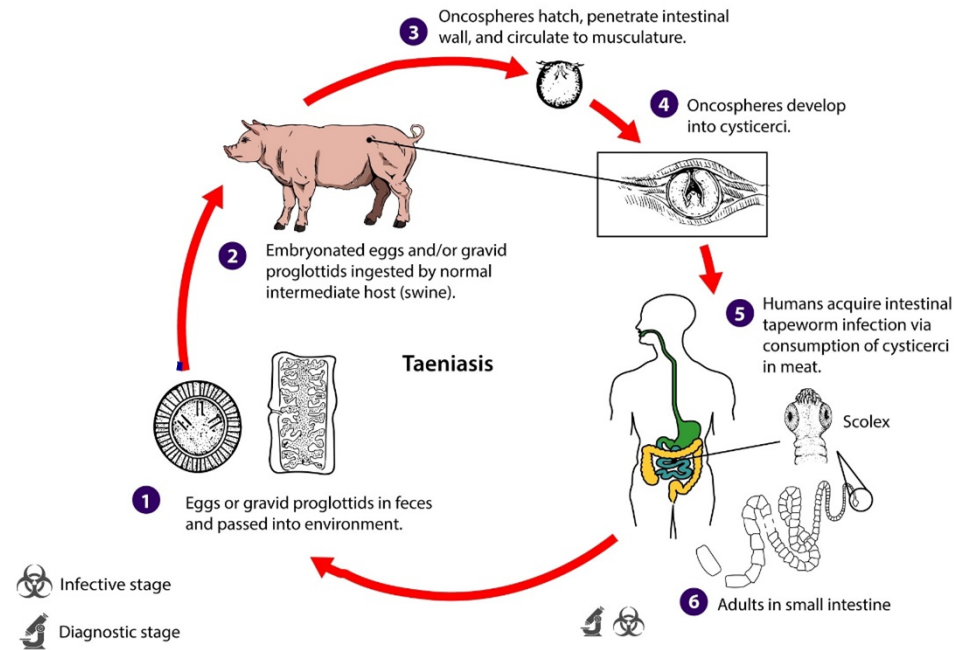
By Unknown author - Memorie sulla storia e notomia degli animali senza vertebre del regno di Napoli Chiaje, Stefano delle, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=11092068>

# Epidemiology

Map 1 **Endemicity of *Taenia solium*, 2022**  
Carte 1 **Endémicité de *Taenia solium*, 2022**

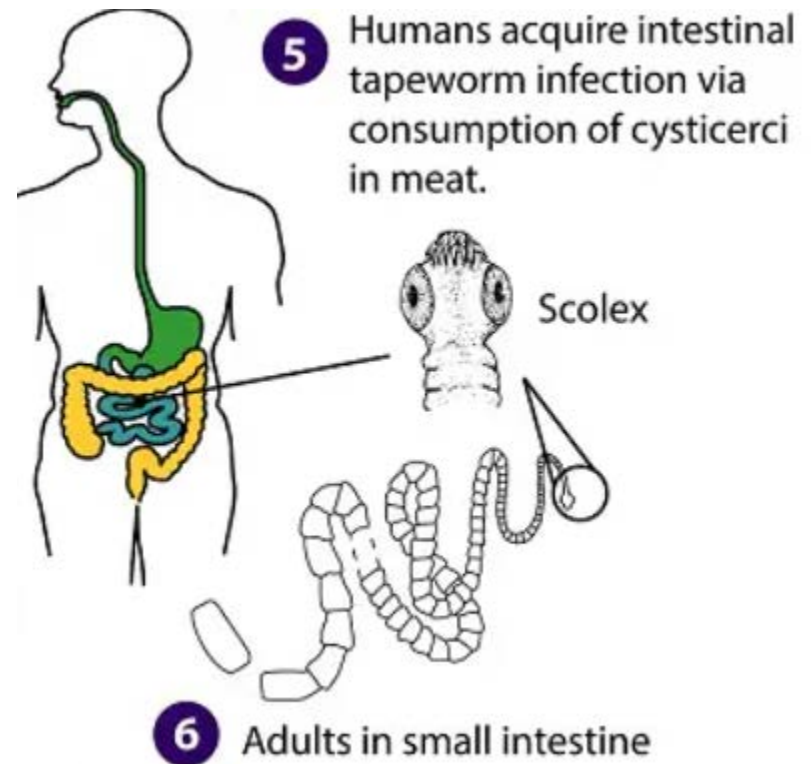


# Life cycle



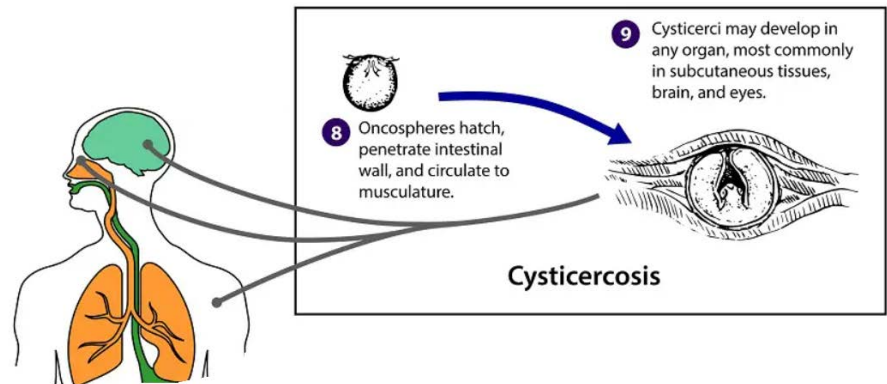
# Taeniasis

- ▶ Intestinal infection
  - raw/undercooked infected pork
- ▶ No major impact on health
  - Mild gastrointestinal complaints
- ▶ Excretion of eggs
  - May contaminate environment
  - Infective for pigs
  - May infect others/self.
- ▶ Incubation: 8 weeks



# (neuro-)Cysticercosis

- ▶ Human as intermediate host
- ▶ Cysts in muscles, skin, eyes or central nervous system
- ▶ Symptoms:
  - headache, dizziness, epilepsy, problems with eyesight, blindness, hydrocephalus, paraplegy
  - depending on:
    - Location
    - Size
    - Amount
    - Immune response
- ▶ Incubation: months to years



# Diagnosis Taeniasis

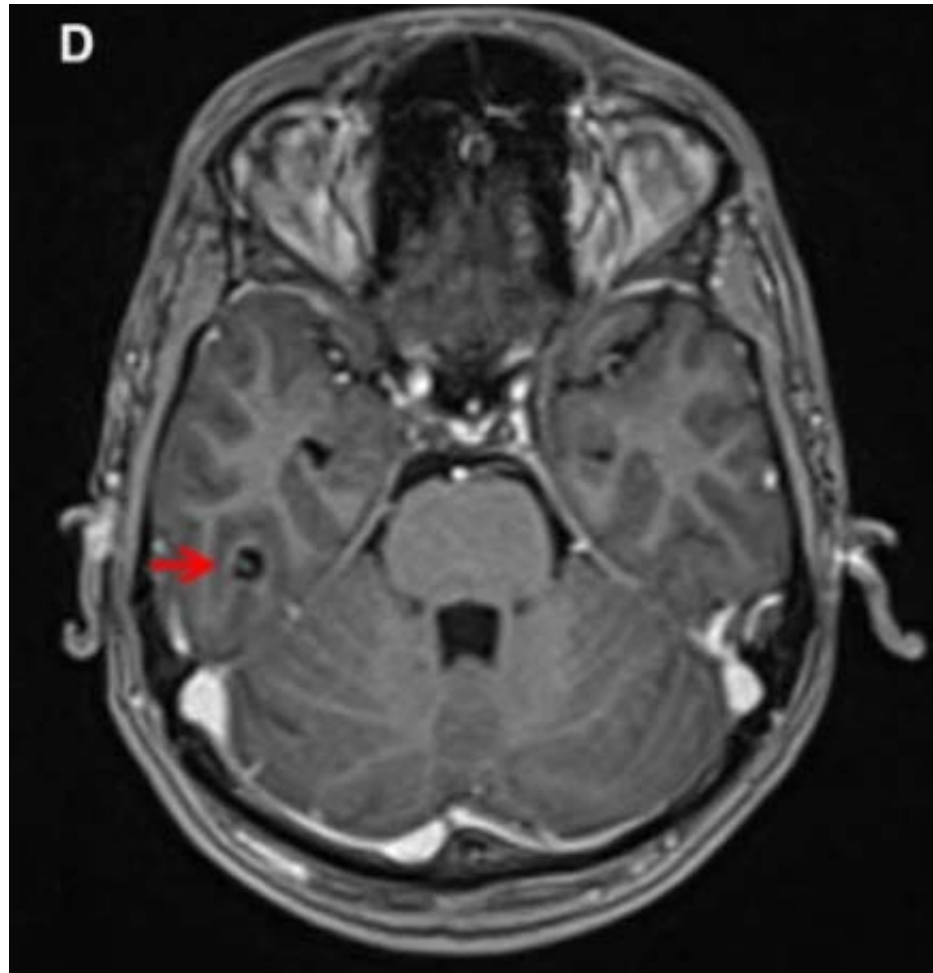
- ▶ Stool sample
  - Microscopy
    - Repeated 3 times
    - Difficult for untrained personnel
  - copro antigen
- ▶ Blood
  - Serology

# (neuro-)Cysticercosis

- ▶ MRI
  - Golden standard
- ▶ Blood
  - Tested in endemic countries
  - Low sensitivity in single lesions
  - Elisa / WB



# Imaging

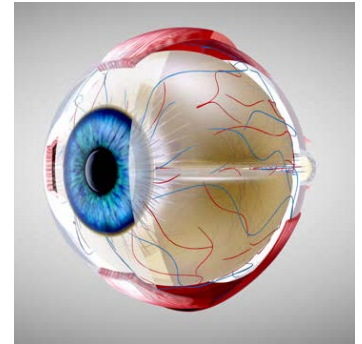


Venkat, B., Aggarwal, N., Makhaik, S. *et al.* A comprehensive review of imaging findings in human cysticercosis. *Jpn J Radiol* 34, 241–257 (2016).  
<https://doi.org/10.1007/s11604-016-0528-4>

# Case

Endemic outbreak in a school

# June 2023



- ▶ 2 cases:
  - 1 boy (10yo) with a new diagnoses of epilepsy
    - MRI +, serology -
  - 1 boy (8yo) with vision impairment, cyst in ocular muscle
    - MRI +, WB +
- ▶ Source research:
  - Same school in the province of Antwerp
  - Contact with school health service and principal
    - Identification of a third boy who previously had brain surgery (9yo)
      - PCR positive

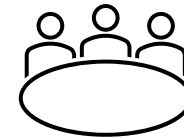
# June 2023

## ▶ Start workinggroup

- UZA
- ITM
- UGent
- Heilig Hart Lier
- prof. Garçia, Universidad Peruana



UNIVERSIDAD PERUANA  
**CAYETANO HEREDIA**  
FACULTAD DE SALUD PÚBLICA Y ADMINISTRACIÓN



**HEILIGHART**  
ALGEMEEN ZIEKENHUIS LIER

## ▶ Inform parents, general practitioners and pediatricians

# Strategy

- ▶ Source finding
  - Question 1: Is there a continued risk?
  - Question 2: Who is at risk?
  
- ▶ Case finding
  - Question 1: Who currently has symptoms?
  - Question 2: Who is infected?
  - Question 3: What can we learn from new cases?

# July – September 2023

- ▶ Stool sampling:
  - Everyone involved with food at the school
  - Teachers
  - Private bussiness delivering soup at school
  - Family of patients
  - Questionnaire for children and family members
  - Personnel of indoor playgarden
  - 98 stool samples total.
- ▶ Repeated information to parents and clinicians.
- ▶ Media attention



# October – December 2023

- ▶ 2 new cases (11 & 12 yo)
  - Asymptomatic
  - Due to high alert
  - Serology after imaging -
- ▶ Enlarge working group:
  - Sciensano, later ECDC



# January – February 2024

- ▶ Wastewater surveillance
  - Sewage: several samples in the course of a week
  - Septic tank of the school: deposits over a longer period
- ▶ Organize MRI-screening:
  - All school years where cases were found
  - 77 children were screened:
    - 6 potential cases, eventually 3 confirmed
    - 2 non-related incidental findings
    - All cases are boys

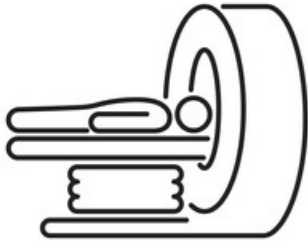


# February 2024

- ▶ Source found
  - Spontaneous evacuation August 2022
  - Confirmation: family pos. serology + father has NCC
- ▶ Stop source investigation
- ▶ Assess risk profile and identify students at risk
  - Boys
  - Students enrolled before August 2022

# Future

- ▶ New round of screening
  - Only children enrolled before august 2022
  - Every schoolyear not yet screened
  - Cleaning personnel



# Difficulties

- ▶ Unique outbreak in non-endemic region
- ▶ Source no longer active: impossible to be sure with stool samples
- ▶ Diagnosis: serological tests validated for endemic regions
- ▶ Long incubation period
- ▶ When NCC is found: do we treat?
- ▶ When treated: symptoms can be triggered



**Vlaanderen**  
is zorgzaam en  
gezond samenleven

# Thank you for your attention

**Dr Aaron Devos**  
**Arts infectieziektebestrijding**  
**DEPARTEMENT ZORG**  
**Afdeling Preventief Gezondheidsbeleid**