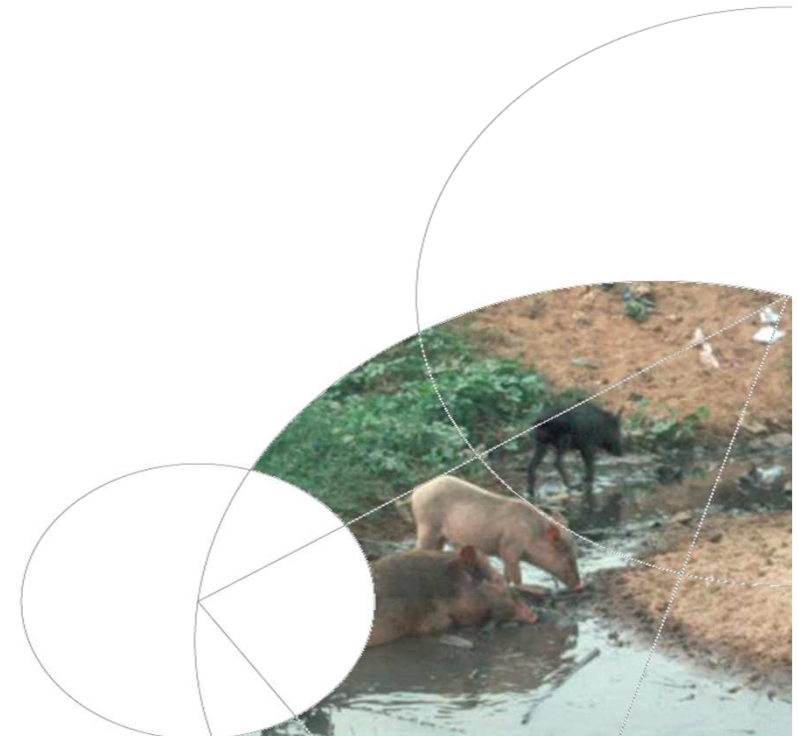




Social determinants of *Taenia solium* cysticercosis

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Once upon a time in Tanzania

Mid 1970s....

Danish teacher
in Mbeya

Danish NGO

Pork roast for
chirstmas

2011....



Where does *Taenia solium* cysticercosis best belong?

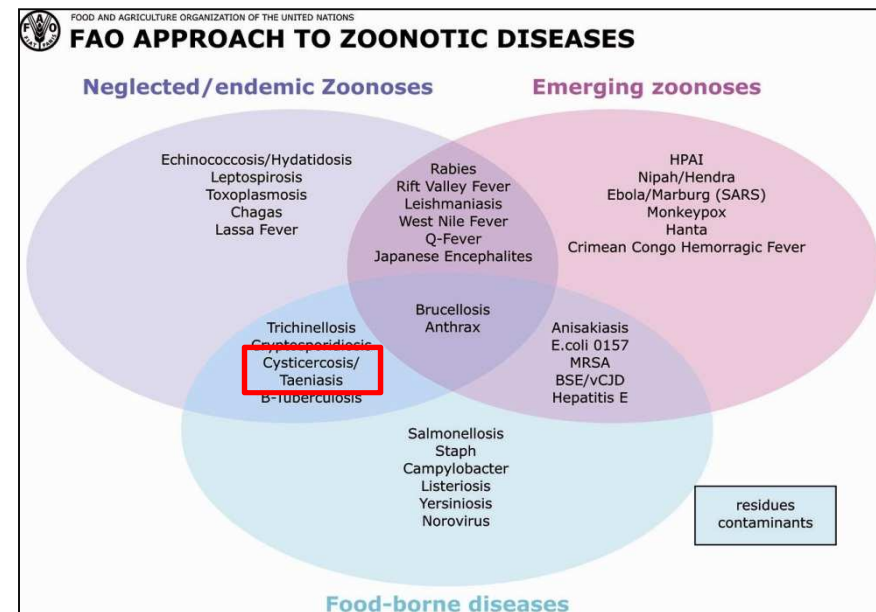
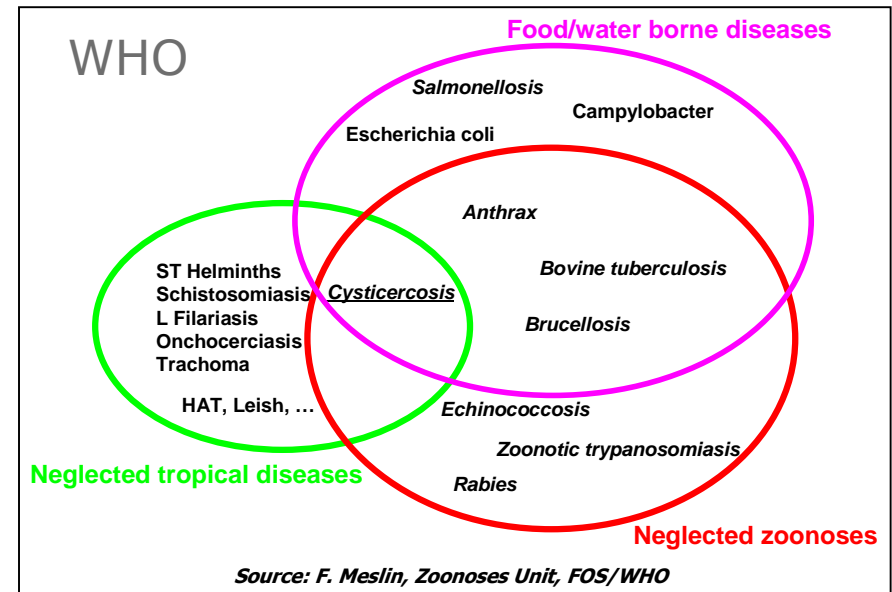
Neglected **Tropical** Disease



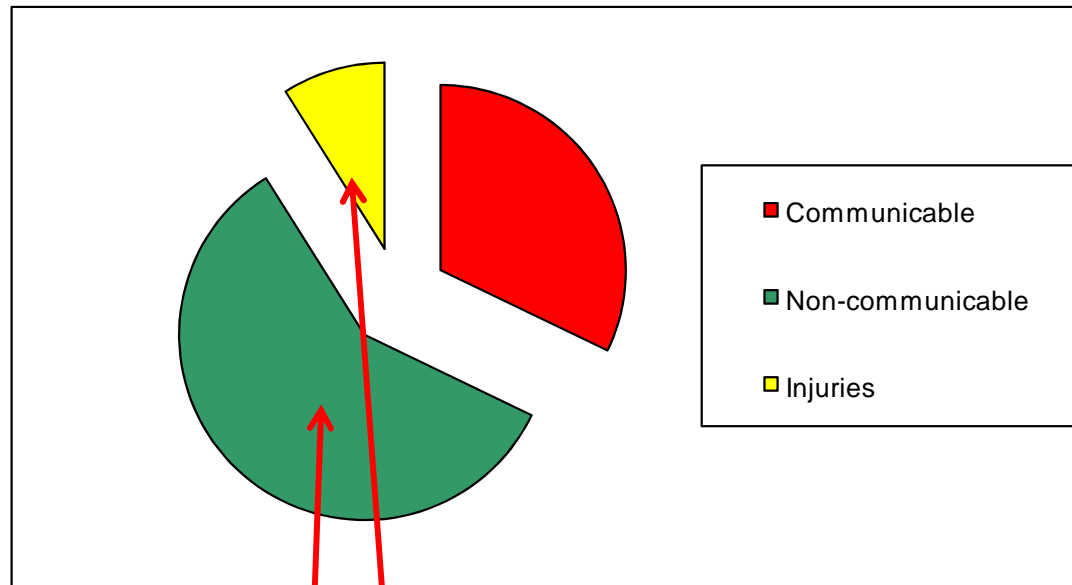
T. solium cysticercosis/taeniosis

The most socially determined disease among all the NTD!

A FAECAL-BORNE ZONOSIS!



Taenia solium cysticercosis: Outcome ?



DALY calculations
Cause of death 2001:
56 mill people
(Lopez et al. 2005)

Aetiology: *Taenia solium*

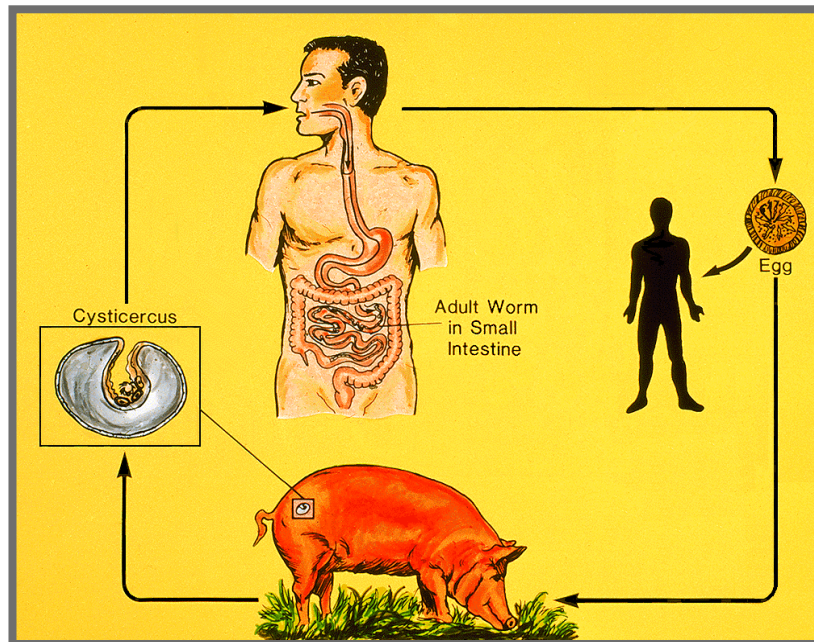
Disease: Neurocysticercosis

Symptoms: Epilepsy, headache

Sequelae: Stigmatization, decreased working capacity

Outcome: Traffic accidents, falls, burns, drawing, isolation

Can *T. solium* cysticercosis in sub-Saharan Africa be eliminated by a "one-size-fits-all" quick fix strategy?

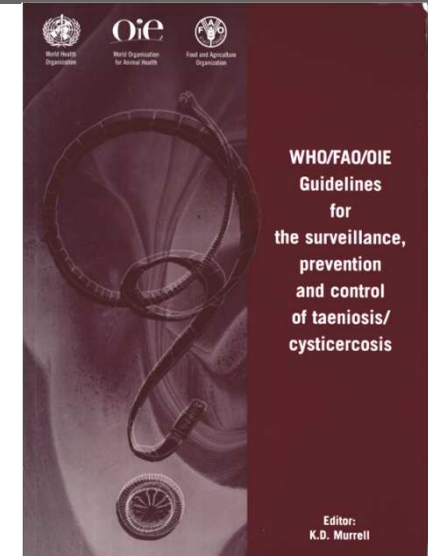


One parasite – three diseases

1. Taeniosis
2. Human cysticercosis
3. Porcine cysticercosis

Risk factors

1. Open defecation
2. Free roaming pigs
3. Lack of meat inspection
4. Eating undercooked pork
5. Bad personal hygiene
6. Poor sanitation
7. Low economic status
8. Large populations of flies



Social determinants of *T. solium* cysticercosis

From individual risk to social vulnerability!

Macro and micro perspectives

Religion/superstition
Culture/traditions/habits
Economical determinants
Political determinants
Social determinants
Age
Gender/sex
Education
Occupation

(Farmer, 1999)

Individual
Household
Society } level



There is a great need to dig deeper!

Cross-disciplinary Risk Assessment of Cysticercosis in Eastern and Southern Africa (CESA) 2006 - 2009

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Claudio Gule
Esmeralda Mariano
Carlos Cuinhane
Alberto Pondja
Yunus Assane
Emilia Noormahomed
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Eliakunda Kimbi
Helena Ngowi
James Mlangwa
Malongo Mlozi
Pilika Mwakilembe
Sharadhuli Kimera
Faustin Lekule

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3 PhDs
2 MScs
2 Masters



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AIM

Assess community perceptions and practices related to *Taenia solium* cysticercosis in Mbeya region, Tanzania



Mbeya province, Tanzania

Mbeya region

App. 1 mill people

App. 300.000 pigs

20% of Tz pig population

Population fluctuates due to African swine fever)



Taeniosis and cysticercosis prevalence In Mbeya Rural and Mbozi districts 2007 -2009



Disease	Method	Numbers	Prevalence (%)
Pig cysticercosis	Tongue	53/600	9
	Ag-ELISA (ITM-B158/B60)	188/600	31
Human taeniosis	Copro-Ag	43/820	5
	Coprology	9/820	1
Human cysticercosis	Ab-ELISA (CDC-rT24h)	376/830	45
	Ag-ELISA (ITM-B158/B60)	139/830	17
(Human NCC)	Questionnaire (history of seizures)	123/830	15

(Komba et al, Mwanjali et al., in prep)

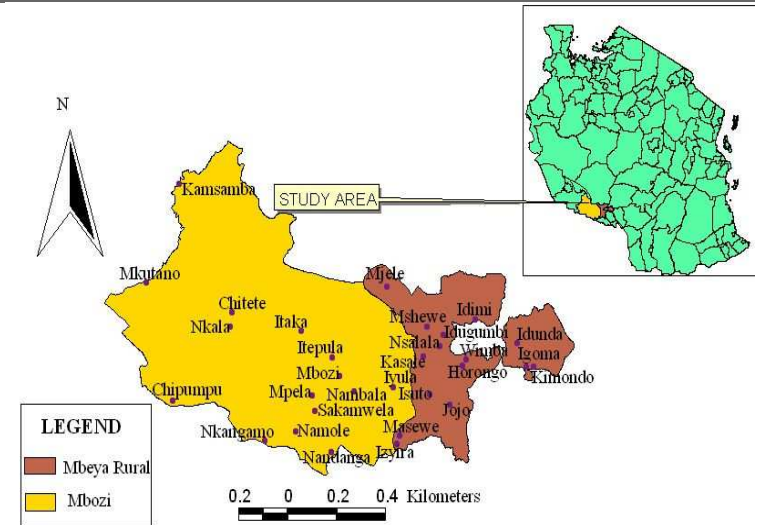
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Methodology

Cross-sectional study 2008 -2009

Mbozi district, Mbeya region



Population

Farmers (>18 y) from 10 randomly selected villages

Questionnaire survey (149 – 15 persons in 10 villages)

Focus group discussions (45 - 5 [3 + 2] x 9)

In-depth interviews (14)

Direct observations (5 structured)



Results

Basic information

QD

Among the 149 QD participants 89 % kept pigs

Main reason for keeping pigs

Easy access to capital

Main criterions for price of a pig

Age, size, presence of cysts

Main reasons for not keeping pigs

Lack of capital

Low profit

Diseases

Lack of knowledge about pigs

Pigs are noisy:



*"I do not keep pigs because I cannot afford to feed them and if they do not get enough feeds, they make so much noise"
(a 27 years old woman).*



Results

Latrines and their use

Among the QD participants 92% had a latrine in their household



FGD IDI

Latrine condition

- Pit latrines often without doors
- Built far away from the house
- Built next to the pigs due to smell
- Not applicable to children

Reasons for not having a latrine

- Latrine had been destroyed
- Scarcity of building material
- Long rain seasons

Alternatives to own latrine

- Neighbours
- Open defecation



*“The stench of pigs is the same as that of the toilet. I built the pig pen far from the house so as to avoid the stench”
(a 24 years old man).*

Results Knowledge and perceptions - farmers

Porcine cysticercosis = *White nodules*

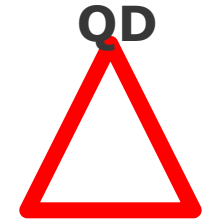
1. Known to all participants
2. Perceived as a result of poor pig management
3. Most people knew where to look for white nodules
4. No knowledge about aetiology or transmission
5. Perceived routes of transmission:
 - Eating raw/dirty food/local brew waste
 - Pig to pig transmission
 - Free roaming
 - Eating human faeces
5. Farmers with infected pigs were looked down upon by other farmers



"If a pig gives a loud noise when pressed hard at the back of the neck, that is enough to tell you that the pig is infected with white nodules" (a 24 years old man)

Results

Perceptions - farmers



Human cysticercosis

Assessed through a proxy for the major symptom epilepsy = repeated acts of fits

Perceived as:

- Witchcraft
- Being possessed by bad spirits
- Contagious condition

Perceived route of transmission:

- Eating pork
- Walking barefoot
- Close contact with pigs
- Drinking dirty water
- Mother to child
- Through body fluids

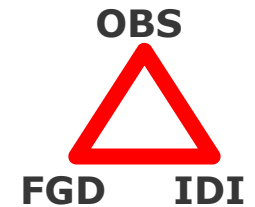
Caused social discrimination & great economical loss

"Each 4 and 26 day of the month, people with this problem, experience severe fits because these are the dates when the moon is coming out and landing, respectively." (a 50 years old folk healer).

Results

Practices

Treatment



Porcine cysticercosis

Fed salt and sodium bicarbonate – to hide the cysts
Used the pig for breeding
Leave the pigs to die

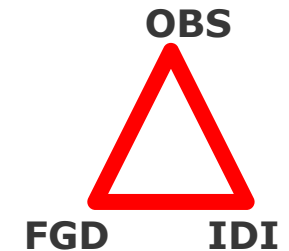
Boiled the feed
Provided local herbs
Consulted veterinary field officers
Consulted traditional healers

89% practised
free roaming of
pigs

The price of an infected pigs was reduced between 50 – 100%

“I sought assistance from our field veterinary officer and he told me that there was no treatment for white nodules and that the best I can do is to wait for them to die ...” (a 41years old man)



Results**Practices****Treatment**

Human cysticercosis (NCC)

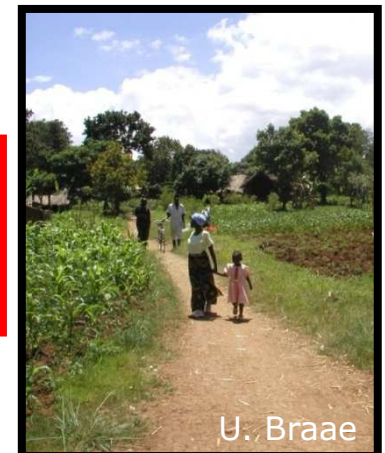
Traditional healers

-used mainly herbs, leaves and plant roots combined with rituals and instructions

Payment provided through gifts

Reason for not going to hospital: bad experiences, no cure, waist of money

“I restrict my customers, those suffering from neurological disorders from taking pork, chicken, fish, goat and beef ”
(a 49 years old folk healer).



Results Other stakeholders

Porcine cysticercosis

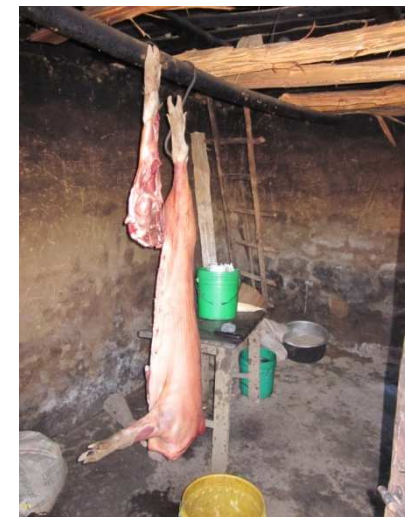
1. Traders
Beer-pork bar
2. Meat inspectors
3. Ag. extension workers (crop or livestock - Earn app 1 kg pork per inspected animal - no education)
4. Para vets. (Earn on ivermectin injections against parasites – no diagnosis)

By-law:
Total condemnation



U. Braae

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Results

Other findings

Animal welfare issues

1. No water provided to pigs
2. Pig transportation
3. Pig housing/tethering
4. Examination for cysticercosis



A. Pondja



H. Mejer



A. Pondja



H. Mejer

Conclusion

1. Lack of farmers knowledge
 - Pig management
 - Taeniosis/cysticercosis – but know ‘white nodules’
 - Transmission and risks
 - Human health consequences
 - Pig welfare

2. Lack of knowledge among professionals
 - Taeniosis/cysticercosis
 - Treatment and prevention

3. Practices favoring transmission
 - Lack of meat inspection (beer-pork bars)
 - Keep infected pigs as breeders
 - Let infected pigs out to die
 - Open defecation
 - Free-roaming pigs

In line with Ngowi et al., 2008, Sarti et al, 1994, Sanches et al., 1997, Sarti et Rajshekaar, 2003

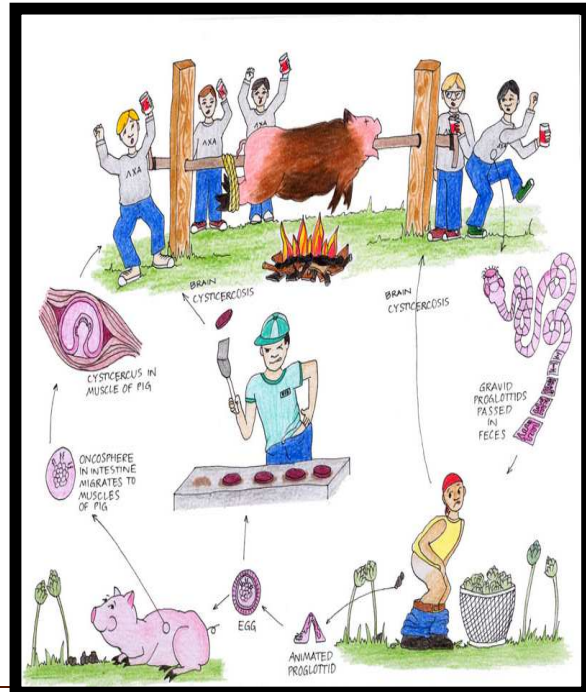


Conclusion

Lack of knowledge should be regarded as a major risk factor for *Taenia solium* cysticercosis

and

Health education should be an essential component of any *T. solium* control programme



Thank you!



**TAENIA SOLIUM IS A PUBLIC THREAT
IN TANZANIA, CALLING FOR URGENT
CONTROL MEASURES**

POLICY BRIEF