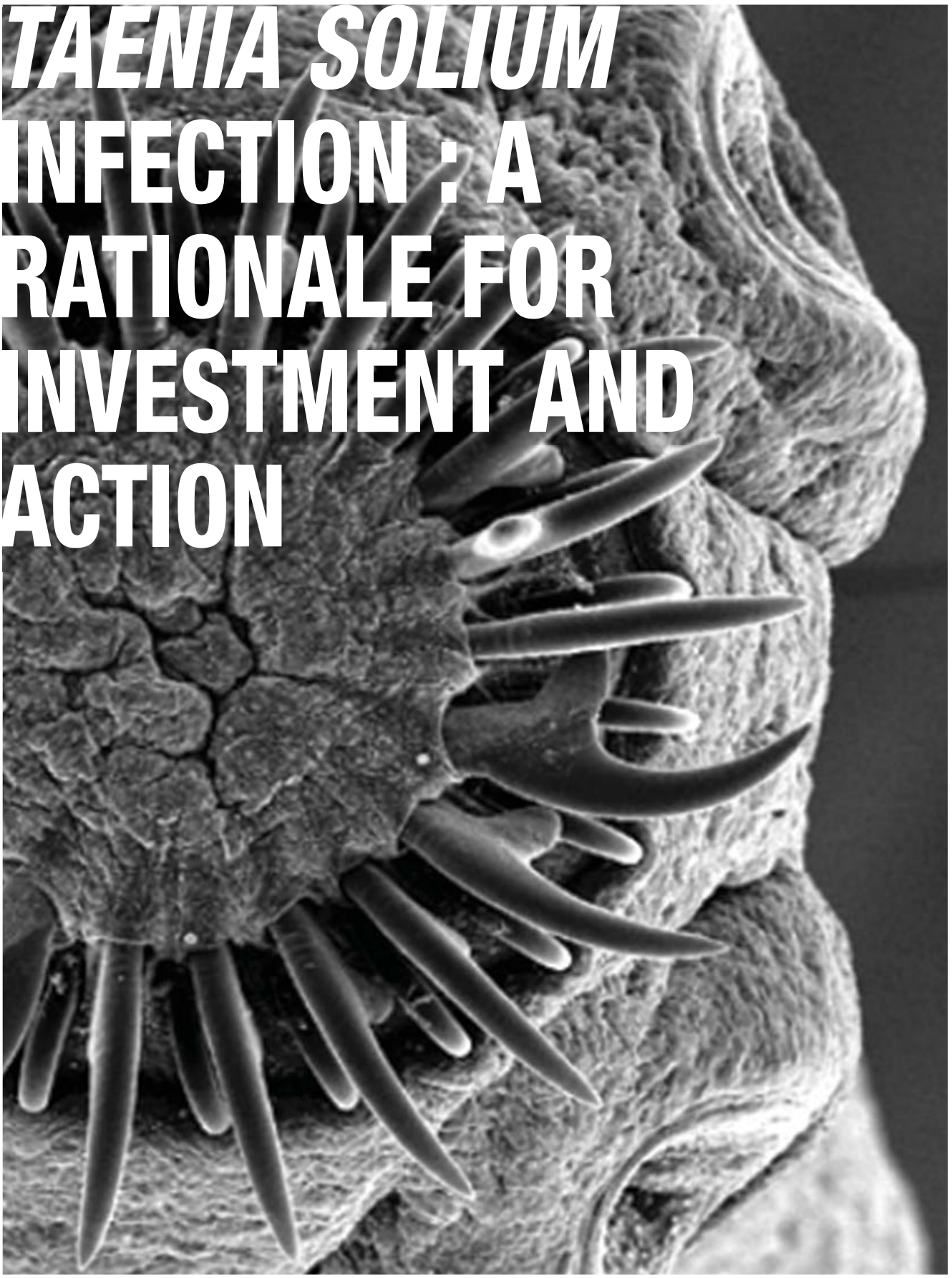
PREVENTABLE EPILEPSY: *TAENIA SOLIUM* INFECTION BURDENS ECONOMIES, SOCIETIES AND INDIVIDUALS

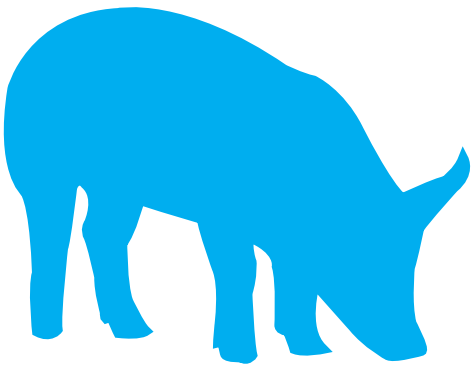
A RATIONALE FOR INVESTMENT AND ACTION

World Health Organization

TAENIA SOLIUM INFECTION : A RATIONALE FOR INVESTMENT AND ACTION



NEUROCYSTICERCOSIS IS THE LEADING CAUSE OF PREVENTABLE EPILEPSY WORLDWIDE.



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NEUROCYSTICERCOSIS BURDENS ECONOMIES, SOCIETIES AND INDIVIDUALS BECAUSE OF THE IMPACT OF EPILEPSY ON WAGES, HEALTH COSTS AND SOCIAL STIGMATIZATION OF SUFFERERS.

Burden of T. solium: Neurocysticercosis is a disease induced by *T. solium* larvae penetrating human tissues, especially the nervous system. Neurocysticercosis burdens economies, societies and individuals because of the impact of epilepsy on wages, health costs and social stigmatization of sufferers. Health systems are also burdened as treatments must be tailored to individual needs.

Lack of awareness and understanding: Lack of awareness and understanding about the conditions leading to infection with the pig tapeworm *T. solium* has contributed to the neglect of this disease, which occurs mainly among the poorest populations of the world.

Diagnostic gap: Lack of neuroimaging facilities and point of care tests is an important reason for the gap in diagnosis and treatment of neurocysticercosis and may contribute to the disease burden.

Importing the disease: *T. solium* also threatens developed nations when taeniasis cases are imported.

Rationale 2: *T. solium* control is possible with investment in existing tools

Health Education: Health education campaigns can target the general population, health workers, pig farmers and meat workers and focus on the biology of the disease, improvements in meat preparation and personal hygiene and the need for adequate sanitation/ improved pig husbandry.

Human preventive chemotherapy: Preventive chemotherapy involves the distribution of drugs at regular intervals to human populations at risk in order to destroy parasitic worms.

Chemoprophylaxis and vaccination in pigs: Chemoprophylaxis and vaccination in pigs has been widely used as a control strategy with demonstrated high efficacy in protecting pigs from cysticercosis.

Improved Sanitation: Ensuring that sanitation facilities are available and used has public health advantages beyond *T. solium* control.

Pig farming practices: Encouraging farmers to adopt better farming practices, specifically by confining

pigs to prevent their access to human faecal material, is consistently included in recommendations for *T. solium*.

Meat inspection and processing: The aim of meat inspection is to break the life-cycle of *T. solium*, considered to be the most important foodborne parasitic infection.

An opportunity for One Health: A One Health approach with collaboration between the human and health sectors is warranted for a rapid and sustained reduction in *T. solium* prevalence.

Rationale 3: Investing in collaboration and integration can lead to rapid advances and improvements in health beyond control of *T. solium*

Collaboration: International decisions, collaboration and surveillance are needed to support the wide-scale reduction of *T. solium* globally. Successful control of *T. solium* infection requires collaboration among various sectors within endemic countries and must be driven from within affected countries. Collaboration among the health, veterinary, agricultural, academic, governmental and nongovernmental sectors is vital to ensure that appropriate control programmes are planned and implemented.

Integration: Opportunities exist to combine control of *T. solium* with that of other neglected tropical diseases programmes or other production limiting diseases in pigs for optimized, cost-benefiting interventions.

1. Overview

T. SOLIUM IS A NEGLECTED TROPICAL DISEASE WITH IMPORTANT PUBLIC HEALTH IMPLICATIONS

Taenia solium, a zoonotic tapeworm endemic in Latin America, South and South-East Asia and parts of sub-Saharan Africa, causes two distinct diseases: cysticercosis and taeniasis. Taeniasis refers to intestinal infection with adult tapeworms, while cysticercosis is the development of larval cysts in the tissues, eyes and brain of humans. Neurocysticercosis, the infestation of the cysts in the central nervous system is the leading cause of preventable epilepsy worldwide (WHO, 2015a).

Porcine cysticercosis occurs when pigs ingest *T. solium* eggs, whose larvae form small cysts throughout their body. Consumption of undercooked pork from

Neurocysticercosis is the leading cause of preventable epilepsy worldwide (WHO, 2015a). Because of its importance for public health, *T. solium* cysticercosis was added by WHO to the list of neglected tropical diseases (NTD) in 2010. The WHO Member States called for coordinated action to address the health, social and public knowledge implications of epiliepsy through a resolution endorsed at the 68th World health Assembly in May 2015. In 2015, the WHO Foodborne disease burden Epidemiology Reference Group identified *T. solium* as a leading cause of deaths from food-borne diseases, resulting in a considerable total of 2.8 million disability-adjusted life-years (DALYs).

Tools are available to facilitate the control of T. *solium* in humans and animals. These include health education, improved sanitation, improving pig farming practices, porcine vaccination, improved meat inspection and processing, and anthelminthic medicines for use in humans and pigs. These approaches require interdisciplinary collaboration at a local, national and global level to optimize human, animal and environmental