

Final Results for Elimination of Five Intestinal Parasites in 535 Tibetan Primary School Students in Kham (Sichuan) June-December 2019

Please scroll down to read our most recent 2019 project flyer (4 pages), dated 3 October 2019. Dr. Li returned to the schools in December 2019 to collect a second stool sample from the students. However, her follow-up laboratory work was delayed because of COVID-19. Clinical specimens from suspected cases in hospitals and communities were tested for COVID-19 on the same floor where Dr. Li's molecular analysis equipment is located. So she suspended her molecular analysis work for safety.

In early 2020, Dr. Li completed the microscope examination of the second stool samples. That work allowed her to measure the efficacy of the September 2019 treatments for roundworm and whipworm. In mid-July 2020, she returned to her laboratory to perform molecular analyses on the stool samples in order to complete her study of the efficacy of the September 2019 treatments for tapeworms.

Questionnaires, Stool Samples, & Blood Serum Samples

For the 535 students in Eya and Ninglang Primary Schools,

- 535 questionnaires were collected in June 2019, indicating that 62 students had passed worm segments in stools.
- 893 stool samples (478 in June 2019 and 415 in December 2019) were collected and examined.
- 526 blood serum samples were collected and tested.

Treatment for Tapeworms

65 students were treated for tapeworms.

- For the first stool samples from these 65 students (collected pre-treatment), molecular analysis showed 24 positive cases, with 5 as *T. solium*, 8 as *T. saginata*, and 11 as *T. asiatica*.
- Among these 24 cases, 17 were treated with **triple-dose albendazole** (400mg on each of 3 consecutive days).
- The other 7 received **Chinese herbal medicines** (peeled pumpkin seeds & areca nut extract). The blood serum testing indicated that these students may have undiagnosed latent NCC, for which triple-dose albendazole would not be safe.
- Of the 17 cases treated with **triple-dose albendazole**, 15 were available for efficacy assessment. Of these 15 cases, 7 (47%) were cured, including all of the 3 *T. solium* cases. All 7 cases treated with **Chinese herbal medicines** were cured.
- Sometime in 2021, Dr. Li hopes to resume her field work and return to the schools to provide treatment with **Chinese herbal medicines** to the 8 students having uncured taeniasis and other students with new taeniasis infection, as indicated by the second stool samples.

Treatment for Roundworms and Whipworms

For the 74 students treated for tapeworms and/or whipworms,

- 10 received single-dose albendazole (400mg) for roundworms.
- 64 received single-dose albendazole & levamisole for whipworms (50) or roundworms & whipworms (14).
- The single-dose albendazole treatment for roundworms proved to have a cure rate of 100%.
- The single-dose albendazole & levamisole treatment for whipworms proved to have a cure rate of only 40%. However, Dr. Li believes that this cure rate would have been much higher (as high as 96%) if the second stool samples had been collected three weeks after treatment, instead of three months. Within the three months, many of the students probably became re-infected.

Conclusions

- **The tapeworm cure rate of 47% for triple-dose albendazole is less than a level sufficient for mass treatment of tapeworm diseases.** (Dr. Li's parallel study of adults in 2019 also showed a tapeworm cure rate less than 50%.)
- This was the first longitudinal (not cross-sectional) study of the efficacy of **triple-dose albendazole** for tapeworm diseases. This study type provides definitive cause-and-effect data.
- **Our successful collaborative project will provide valuable information for Dr. Li and other experts in their future work to alleviate suffering from tapeworms, roundworm, and whipworm.**

98% Fundraising Progress for Helping 535 Tibetan Primary School Students in Kham



Five Parasitic Diseases Prevalent in 535 Students at Eya and Ninglang Primary Schools

Disease	Symptoms	Actual Prevalence	Critical Information
<i>T. solium</i> tapeworm	abdominal discomfort, diarrhea, constipation, anemia, malnutrition	65 (12%) - one or more of the three species	Carriers can cause NCC brain disease.
<i>T. saginata</i> tapeworm			
<i>T. asiatica</i> tapeworm			
roundworm	abdominal pain, diarrhea, loss of blood & appetite, growth retardation	74 (14%) - one or both	Carriers do not cause NCC brain disease but can suffer from intestinal obstruction.
whipworm			

Muli Parasitic Diseases Project

Project Budget \$25,920

2018 surplus \$6,126

Additional donations \$19,540

Expenses \$240

Amount raised \$25,426
(70 different donors, 98% of goal)

Balance needed \$494



...thanks for helping these kids be healthy

Boulder-Lhasa Sister City Project

HELPING TIBETANS IN TIBET

Help Us Complete Our 2019 Project...



The Diseases

- **Taeniasis** refers to the parasitic infection of adult stages (tapeworms) of three *Taenia* species (*Taenia solium*, *Taenia saginata*, and *Taenia asiatica*).
- *T. solium* taeniasis carriers are the source of cysticercosis infection to oneself, other people around, and pigs.
- This is a very serious disease that usually infests human brains, causing neurocysticercosis (NCC).
- NCC destroyed the eyesight of Lhungtse, for whom BLSCP raised \$19,000 for life-saving brain surgery in 2013.
- **Roundworm** and **whipworm** are soil-transmitted parasitic infections. Transmission sources include contaminated fruits, vegetables, and water.

Results so far

- When Dr. Li Tiaoying, Sichuan CDC, Chengdu, visited the schools during late June 2019 to collect blood and stool samples and questionnaires from the students, the 96 sixth graders had already graduated and were therefore not available. So 535 was the total number of students examined.
- Dr. Li in early September treated the 139 students (26%) who were confirmed or suspected to be infected with one or more of the five parasitic diseases.

Remaining work

- Dr. Li will return to the schools in December to collect a second stool sample from all of the students. She will analyze these samples in her laboratory in Chengdu to confirm that the treatments in early September were effective.
- A confirmation that albendazole was effective for the treatment of taeniasis will indicate that this medicine is a safe, effective, easily-taken medicine for world-wide mass treatment of the three taeniasis diseases.
- If albendazole unexpectedly proves to be ineffective for taeniasis, Dr. Li will treat the children with pumpkin seeds and areca nut extract, which is safe and effective but not easily taken.



These 11 *T. solium* tapeworms were passed by an 11-year-old Tibetan boy treated by Dr. Li.

Parasitic Diseases Budget \$25,920

Already Raised

\$25,426

Balance Needed

\$494

As of
3 Oct 2019

Boulder-Lhasa Sister City Project

HELPING TIBETANS IN TIBET

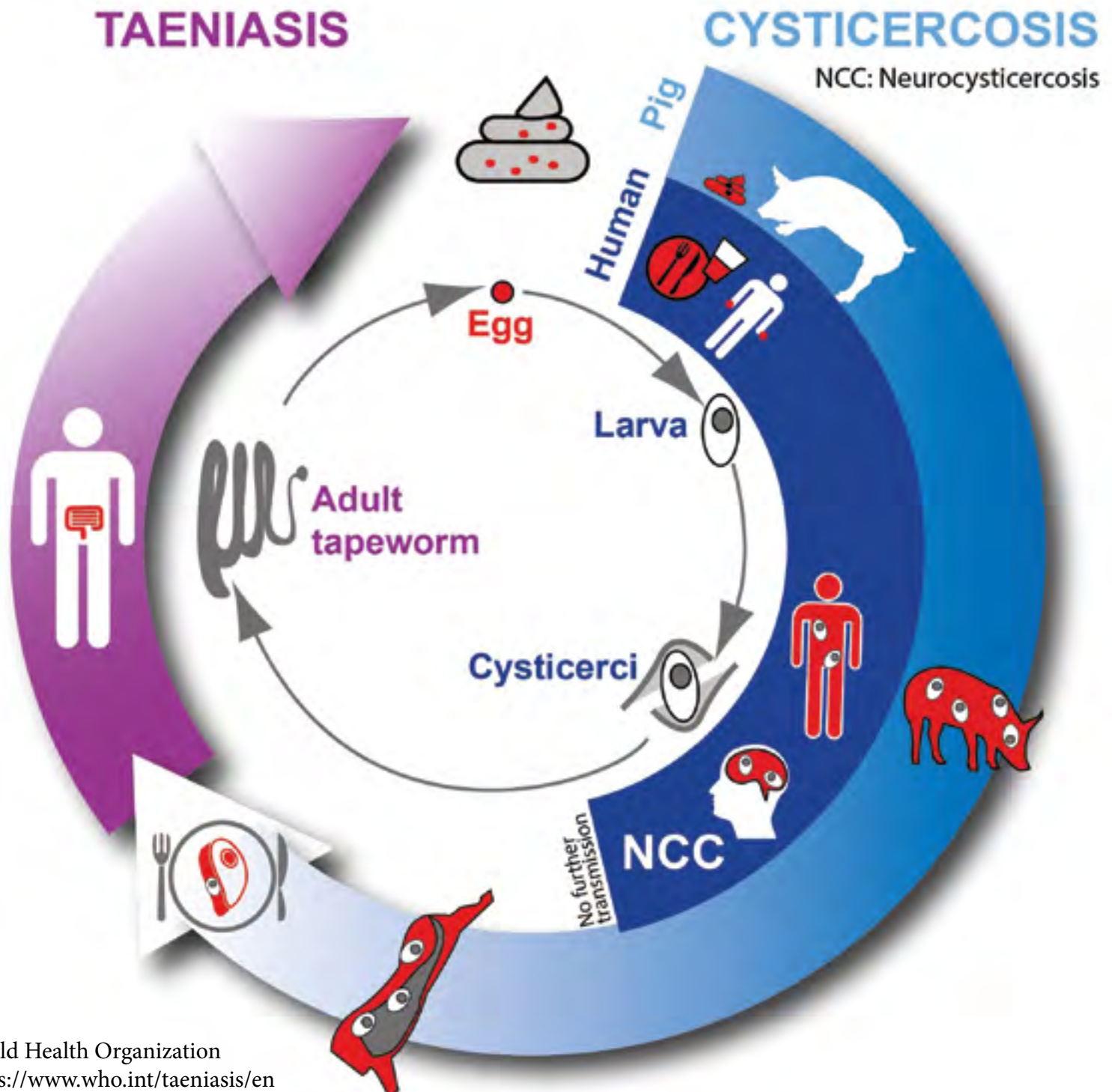
Your donation of any amount is important. Kindly give as generously as possible.

You may donate by credit card to Parasite Medical Program at boulder-tibet.org/paypal.html.

Checks may be mailed to BLSCP, 776 Cottage Ln, Boulder CO 80304-0758.



Taenia solium - Transmission and life-cycle



Budget for Elimination of Intestinal Parasites in 631 Students at 2 Primary Schools in Muli County		
Item	Cost	Total
Rental of two 4WD vehicles	147 USD/car/day	$147 \times 2 \times 24 = 7,056$ USD
Accommodations & meals for 6 staff members	59 USD/person/day	$59 \times 6 \times 24 = 8,496$ USD
Allowances for 6 staff members	44 USD/person/day	$44 \times 6 \times 24 = 6,336$ USD
Questionnaire investigation	1.47 USD/person	$1.47 \times 631 = 928$ USD
Stool examination	1.47 USD/sample	$1.47 \times 2 \times 631 = 1,855$ USD
Stool containers	0.22 USD/tube	$0.22 \times 2 \times 631 = 278$ USD
Accident insurance for 6 staff members	29 USD/person	$29 \times 6 = 174$ USD
Treatment with albendazole	2.90 USD/case	$2.90 \times 121 = 351$ USD
Others		446 USD
Total		25,920 USD