Table. Cysticercosis incidence rates by sex, residence, and age group, Shandong Province, China, 1975–2014

Characteristic	No. (%) patients	Incidence rate, cases/ 1 million population (95% CI)
Sex		
M	1,288 (65.98)	29.1 (27.5–30.7)
F	664 (34.02)	15.5 (14.4–16.7)
Residence		
Rural	1,346 (68.95)	20.6 (19.5–21.7)
Urban	606 (31.05)	27.9 (25.7–30.1)
Age group, y		
<1–9	94 (4.82)	6.7 (5.4–8.1)
10–19	170 (8.71)	12.5 (10.6–14.3)
20–29	410 (21.00)	26.6 (24.0–29.1)
30–39	546 (27.97)	37.2 (34.1–40.3)
40–49	409 (20.95)	32.7 (29.5–35.9)
50–59	185 (9.48)	26.0 (22.2–29.7)
≥60	138 (7.07)	14.3 (11.9–16.7)

and regions than the study by Chen et al., in which the 10–29-year age group and middle regions of the province showed the highest incidence rates (*6*).

Our study has a few limitations. First, the long, asymptomatic latent period of cysticercosis affects diagnostic efficiency and age-specific incidence estimates. Second, our data were incomplete because of some missing information for cases we identified. Third, independent confirmation might affect incidence estimates from early in the study period. However, our multidiagnostic approach substantially reduced misdiagnosis rates and increased the efficiency of diagnosing cysticercosis (*9*).

In summary, our analyses show that Shandong Province has been a cysticercosis-endemic area for many years. Improved surveillance and control are needed to address the elevated risk for cysticercosis in western regions of this province.

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Rickettsia africae and Novel Rickettsial Strain in *Amblyomma* spp. Ticks, Nicaragua, 2013

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We report molecular detection of *Rickettsia africae* in *Amblyomma ovale* ticks from Nicaragua and a novel rickettsial strain in an *A. triste* tick. Of 146 ticks from dogs, 16.4% were *Rickettsia* PCR positive. The presence of *Rickettsia* spp. in human-biting ticks in Nicaragua may pose a public health concern.

Obligately intracellular *Rickettsia* spp., typically transmitted by ticks, cause a multitude of mild to severe rickettsial diseases in humans and other animals. Novel *Rickettsia* species have been identified through molecular

Table. Number of dogs and ticks sampled, tick species, and prevalence of rickettsiae in ticks in 3 indigenous communities, northern Nicaragua

Category	Amak	Raiti	Arang Dak	Total
No. dogs sampled	11	10	19	40
No. ticks collected and tested	25	55	66	146
A. ovale (PCR-positive)	25 (4)	45 (10)	57 (4)	127 (18)
A. mixtum (PCR-positive)	0	4 (3)	8 (2)	12 (5)
A. triste (PCR-positive)	0	6 (1)	1 (0)	7 (1)
Prevalence of rickettsiae in ticks, % (95% CI)	16.0 (5.25–36.9)	25.5 (15.1–39.3)	9.09 (3.75–19.4)	16.4 (11.0–23.7)

techniques (*1*). Rickettsiae in Central America have primarily been reported in ticks, dogs, and humans, with limited data on tick species and rickettsial prevalence in Nicaragua (*1*). In an earlier study, 87% of 77 dogs in the Bosawás Biosphere Reserve were seropositive for rickettsiae (*2*); the ticks in that study were collected from 40 of those dogs.

The Bosawás Reserve in remote northern Nicaragua, part of the second largest tropical rainforest in the Western Hemisphere, is inhabited by 2 rapidly growing populations of indigenous people: the Miskito and the Mayangna. These subsistence-based communities use dogs for hunting in the reserve. Increasing connectivity with outside areas, population growth, and interference of dogs with wildlife pose an increased risk for the emergence of zoonotic rickettsioses. We planned to expand information on zoonotic *Rickettsia* spp. in Nicaragua by surveying ticks from hunting dogs for diversity, number, and presence of rickettsiae.

We collected ticks in 2013 from villages at similar latitude and longitude measured by using global positioning system (GPS): Arang Dak (14.51583, −84.99944), Amak (14.06542, −85.142233), and Raiti (14.59464, −85.02772) (Table). Arang Dak is the smallest of the 3 villages and closest to the densest part of the rainforest; Raiti is the largest and most developed village of the 3 and is situated on a heavily traveled route through the reserve. We obtained owner consent before physical examination and sampling of ticks from dogs and stored ticks in 70% ethanol. In the laboratory, we identified ticks for sex, life stage, and species by using a key (*3*) and screened tick DNA for *Rickettsia* spp. by real-time PCR (*4*). *Rickettsia*-positive samples were further tested by conventional PCR targeting the outer membrane protein A gene (*ompA*) (*5*). We also amplified the *rpmB* and *17kDa* genes of the rickettsia in the *Amblyomma triste* ticks we recovered (*4*). We sequenced each amplicon by using the forward primer at University of California Davis Sequencing (Davis, CA, USA) and compared sequences to those in the GenBank database by using the BLAST algorithm (https://blast.ncbi.nlm.nih.gov).

Of 146 ticks from 40 dogs, 126 (86%) were *A. ovale*, 12 were *A. mixtum*, and 7 were *A. triste*. We detected rickettsial DNA in 24 (16.4%, 95% CI 11.0%–23.7%) of the 146 ticks: 18 *A. ovale*, 5 *A. mixtum*, and 1 *A. triste*. We deposited rickettsial sequences from these ticks into GenBank (accession no. KX530472, KX576685, and KX576686).

By location, the PCR prevalence was 25.5% (95% CI 15.1%–39.3%) in Raiti, 16.0% (95% CI 5.25%–36.9%) in Amak, and 9.09% (95% CI 3.75%–19.4%) in Arang Dak. These differences were statistically significant ($p = 0.05$ by Fisher exact test). The finding of highest prevalence in the most populated community is consistent with peridomestic animals maintaining the infection, and the rainforest and remote wildlife not being significant sources.

For the 576-bp *ompA* sequence, all from *A. ovale* ticks were identical and were 99.6% homologous with sequences from GenBank identified as *R. africae*. *R. africae* has not been reported in *A. ovale* ticks or in North, Central, or South America. *R. africae* causes a mild rickettsiosis known as African tick-bite fever and was first described in a patient in the Western Hemisphere in 1998 (*1*). *R. africae* has been detected in *A. variegatum* ticks by using PCR and in humans in Guadeloupe by using serology (*6*) and more recently in *A. loculosum* ticks from New Caledonia (*7*). In Brazil, adult *A. ovale* ticks bite humans most frequently and are present from the borders of Mexico to those of Argentina (*8*). *A. ovale* is a common human-biting tick in Central and South America and poses a public health concern.

Sequences of *ompA* in 2 of 5 PCR-positive *A. mixtum* matched 99.6% to *Candidatus* R. amblyommii in GenBank (*ompA* of the other samples did not amplify, likely because they were relatively weak on real-time PCR). *Candidatus* R. amblyommii is common among *Amblyomma* spp. ticks in the New World and was reported in *A. mixtum* ticks in Brazil (*9*). *Candidatus* R. amblyommii has unknown pathogenicity but has been implicated in rickettsiosis cases in humans (*9*).

The *ompA* amplicon from *A. triste* ticks matched *Rickettsia* sp. ARAGAOI; sequencing of the *rpmB* and *17kDa* genes was unsuccessful. This rickettsial species was originally described in marsupials in Brazil (*10*). Further monitoring of tick vectors in this remote area is needed to characterize local risk and detect possibly emerging vector-borne disease.

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Amebaborne *Attilina massiliensis* Keratitis, France

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We report a case of *Acanthamoeba castellani* keratitis in a person who wore contact lenses. The amebae hosted an ameba-resistant bacterial symbiont, provisionally named "*Attilina massiliensis*," a yet undescribed α-Proteobacterium.

Amebal keratitis is an aggressive ocular infection that can lead to blindness (*1*). It is usually associated with wearing soft contact lenses; Dart et al. documented that in countries with a high prevalence of contact lens wear, 85%–88% of *Acanthamoeba* keratitis cases occurred in contact lens users (*1*). These amebae host ameba-resistant bacteria, and increase their pathogenicity to the host (*2*). Ameba hosting intra-amebal microorganisms have been rarely documented in cases originating in contaminated contact lenses (*3*) and never in mixed keratitis. We report a case of mixed ameba–amebal-resistant bacterial keratitis.

A 17-year-old woman who wore contact lenses consulted the ophthalmology department of the clinic associated with Hôpital de la Timone, Marseille, France, in July 2016, after experiencing 1 month of keratoconjunctivitis symptoms related to an undocumented clinical diagnosis of herpes virus keratitis of the left eye. The patient had been prescribed a 1-week treatment with valacyclovir (3×/d) and a corneal dressing. Examination of the left eye showed 4/10 visual acuity; the right eye was normal. Slit-lamp examination showed a central radial keratoneuritis, central corneal edema, central diffuse infiltrate, and a punctate superficial keratitis with no predescemetic precipitates and no satellite lesions (Figure). The patient was admitted to the hospital and was administered hourly topical treatments of polyhexamethylene biguanide eye drops, hexamidine, and 1% atropine. The patient, whose diagnosis was early-stage *Acanthamoeba* keratitis infection, was discharged after 5 days of treatment; a corneal swab sample at discharge was negative for herpes virus, varicella zoster virus, adenovirus, enterovirus, cytomegalovirus, and *Chlamydia trachomatis*. Follow-up 7 days later yielded reduced symptoms. We followed up on the patient biweekly and slowly tapered drugs over 4 months; the previously negative