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## Screening for Latent Tuberculosis (TB) Infection in Low TB Incidence Countries

TO THE EDITOR—Ronald et al [1] present an analysis using data from individuals who migrated to British Columbia, Canada. They show that the application of World Health Organization recommendations on screening close tuberculosis (TB) contacts or individuals with specific medical risk factors for latent tuberculosis infection (LTBI) would have a minimal impact on the number of TB cases in migrants, and conclude that other risk groups must be targeted for LTBI screening to progress towards TB elimination: that is, migrants from countries with high TB incidences.

Recently, the European Centre for Disease Prevention and Control published its guidance on the programmatic management of LTBI [2]. Although this guidance was developed to support European Union and European Economic Area Member States in the decision-making process underlying the implementation of LTBI programmatic management, we consider that the identified options for LTBI screening are applicable to other countries with low TB incidences.

A deterministic mathematical model was developed to support the guidance development. It included various at-risk populations [3, 4]—people who inject drugs, homeless people, prisoners, and

migrants from countries with high TB incidences (>50/100 000 population)—to study the effect of LTBI screening and treatment strategies on TB incidences. The model was used with data from the Netherlands, the Czech Republic, Portugal, and Spain: four countries with different epidemiological settings. Screening migrants at entry for LTBI was predicted to result in a 17–20% decrease in the pulmonary TB incidence after 20 years in the Netherlands; in the other countries, the decreases were projected to be less than 10% [3].

Our threshold for defining countries of origin with high TB incidences was substantially lower than the threshold of 200/100 000 used by Ronald et al [1]. Also, we included the suboptimal sensitivity and specificity of diagnostic tests for LTBI in our model calculations, assumed that only 80–95% of the persons diagnosed with LTBI would complete preventive treatment, and considered averted secondary cases (through decreased transmission), thus arriving at a more realistic estimate of the effect of screening for LTBI.

Just as Roland et al [1] did, we concluded that screening at entry is a more feasible option, compared to screening of migrants already residing in the country, as has been applied in other modelling studies [5, 6]. In the United Kingdom, expanded entry screening was tested by screening migrants from high-incidence countries that had entered the United Kingdom within the prior 5 years [7]. In this study, only 40% of migrants were tested by interferon-gamma release assay. Overall, screening directly after migration resulted in a higher coverage [8] and is probably easier to implement, compared to screening migrants that are already in the country. As TB often develops shortly after a migrant's arrival in their host country, it might also be more cost-effective to focus on new entrants to the country [9].

Next to other studies, the data analysis by Ronald et al [1] provides insights to further decision making on the best LTBI screening strategy. However, real

breakthroughs in the management of LTBI will require better tests and continued work on shorter treatment regimens [10].

## Notes

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## Chagas Disease Endemism in the United States

TO THE EDITOR—We read with interest the article “Prevalence of Chagas Disease Among Family Members of Previously Diagnosed Patients in Los Angeles, California” by Hernandez et al [1]. As noted by the authors, in the absence of systematic screening or surveillance, Chagas disease (CD) will continue to be underdiagnosed in the United States and its prevalence underestimated.

By screening relatives of CD patients, Hernandez et al were able to identify family members as a high-risk group, with CD infection confirmed in 7.4% of the individuals screened. Only 4 of the 14 cases identified were maternal offspring (likely congenital transmission). CD prevalence was more than 7 times higher in close relatives, emphasizing important risk factors such as shared housing or environment [1]. Currently, most CD cases diagnosed in the United States are presumed to have become infected elsewhere or by congenital transmission [2]. However, considerable evidence supports the concurrence of factors needed to establish vectorial transmission and endemicity of CD in the United States.

CD is caused by infection with the parasite *Trypanosoma cruzi*, following contact with feces of an infected triatomine bug, usually after a bug bite. As of 2014, 11 species of triatomine bugs had been reported in 27 mainland US states and Hawaii [3, 4], including known competent vectors of *T. cruzi* such as *Triatoma sanguisuga*, *Triatoma gerstaeckeri*, *Triatoma protracta*, and *Triatoma leucogaster*, which are widely distributed in the southern United States, notably in Florida and Texas [3, 4]. Many are anthropophilic, and in some states, like Texas, at least 50% of triatomine bugs have been reported to be infected with *T. cruzi* [5].

Furthermore, numerous mammalian wildlife and synanthropic species in the United States have been found to be infected with *T. cruzi*, including packrats, wood rats, raccoons, skunks, opossums, and armadillos, serving as disease reservoirs. Most importantly, CD has been found in domestic and working, as well as stray dogs [6–8], colocalizing the parasite in close proximity to vulnerable populations in suburban and rural areas. By linking the zoonotic/peridomestic and domestic ecotopes of *T. cruzi*, CD in domestic dogs is estimated to increase human infection risk by 3- to 5-fold [9]. Because CD in animals is not a reportable condition in many states [6], the true number of canine cases may be underestimated; assessing CD seroprevalence in dogs could be useful as a potential bioindicator of parasite prevalence and persistence.

We note that Hernandez et al did not indicate whether the specific *T. cruzi* discrete typing units (DTUs) were determined for their CD cases. Determination of the DTU may be important both epidemiologically and for patient management. For example, TcI DTU, the most prevalent circulating parasite strain in the United States, is associated with intrinsic resistance to benznidazole [10], bringing into consideration emerging therapeutic options such as fexinidazole or benzofuran derivatives and azoles.

Thus far, a limited number of human CD cases have been proven to be US-acquired. However, the coexistence of competent disease vectors and numerous mammalian reservoirs serve as important eco-epidemiological contributors for risk of human transmission and infection in the United States.

## Note

**Potential conflicts of interest.** R. M. and A. E. P. M. report a US patent application no. 14/990031, regarding composition and method for treating Chagas' Disease, pending. All other authors report no potential conflicts. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

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