Addressing the neglect: Chagas disease in London, UK

Chagas disease is an emerging but still largely unrecognised infectious parasitic disease in European countries.[1] It has important public health implications because, although the classic vector-borne route of transmission only occurs in endemic areas of Latin America, the less common transmission routes—blood transfusion, transplantation, and vertical transmission from mother to child—have been shown in Europe.[2] Therefore, providing policy makers with accurate estimates of country-specific prevalence of Chagas disease should inform the design and implementation of the most cost-effective health interventions.[3] We used demographic data from London, UK, and *Trypanosoma cruzi* seroprevalence data from source countries to generate high-resolution estimates of the burden of undetected *T cruzi* infection in London, and compared these estimates with the actual number of cases reported.

The number of residents in London who were originally from the 21 endemic countries in Central and South America was calculated from the 2011 UK National Census[4] and was stratified by borough. We did not include undocumented migrants and individuals born to mothers from endemic Latin American countries.

To calculate the expected number of people infected with *T cruzi*, the number of migrants from each country of origin was multiplied by that country's specific Chagas disease prevalence among migrants living in Europe, as estimated in a meta-analysis.[3] For endemic Latin American countries without data in the meta-analysis, the prevalence was obtained from a report based on 2010 estimates of Chagas disease in Latin America.[5] The minimum and maximum prevalence estimates for countries in the meta-analysis were derived from the 95% CIs. Finally, the total expected number of cases was divided by the total Latin American population living in each London borough.

The actual number of diagnosed cases of Chagas disease in London registered from Jan 1, 2001, to Sept 30, 2014, was derived from the number of positive serological tests reported by the UK National Parasitology Reference Laboratory, where all UK serological testing for this disease is done. To estimate the index of underdiagnosis, we calculated the rate ratio between observed and expected prevalence (ie, the proportion of diagnosed cases divided by the total estimated cases). The index was calculated as 1–rate ratio.

We estimated that 95 579 individuals originally from the 21 *T cruzi* endemic countries of Central and South America were living in London in 2011.[4] Lambeth, Southwark, Wandsworth, and Brent were the boroughs with the largest Latin American migrant populations (figure). 1211 migrants were estimated to have Chagas disease in 2011, giving a London-wide prevalence of 1·27%. The numbers of expected cases of Chagas disease were highest in Lambeth (n=133) and Southwark (n=198). Four other boroughs were predicted to have between 50 and 100 cases of Chagas disease (figure).

Although Brazil, Colombia, Guyana, and Ecuador contributed the largest migrant populations, higher prevalence in Bolivia meant that the predicted estimate of Chagas disease was highest in these migrants (table). In descending order of prevelance, Brazilian, Argentinian, Colombian, and Mexican migrants also contributed notably to the total predicted burden in London.

The total number of reported cases of *T cruzi* infection diagnosed in London from 2001 to 2014 was 41 (Allen J, Hospital for Tropical Diseases, personal communication), giving a prevalence among Latin American migrants in London of 0·043%. The rate ratio between the observed and the

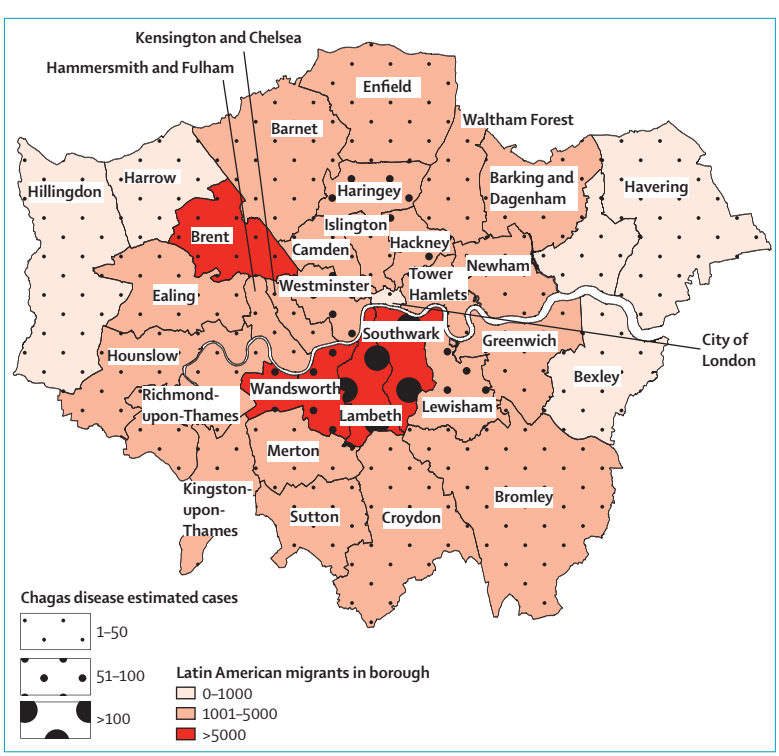

Figure: **Spatial distribution of Latin American migrants and estimated Chagas disease cases in boroughs of London, 2011[4]**

	Number of migrants	Expected cases (range*)	Estimated prevalence†
Argentina	4567	100 (37–189)	2·2%
Belize	212	1	0·3%
Bolivia	2694	485 (374–610)	18·0%
Brazil	31 357	188 (50–351)	0·6%
Chile	2913	29 (5–69)	1·0%
Colombia	19 338	97 (29–178)	0·5%
Costa Rica	254	0	0·2%
Ecuador	7171	29 (13–52)	0·4%
El Salvador	364	36 (6–43)	3·7%
French Guiana	121	1	0·8%
Guatemala	305	4	1·2%
Guyana	13 798	116	0·8%
Honduras	164	7 (2–12)	4·2%
Mexico	3785	57 (9–142)	1·5%
Nicaragua	154	7 (1–17)	4·6%
Panama	229	1	0·5%
Paraguay	287	16 (10–23)	5·5%
Peru	3301	20 (8–39)	0·6%
Suriname	203	2	0·8%
Uruguay	540	4 (0–12)	0·8%
Venezuela	3822	34 (6–85)	0·9%
Total	95 579	1211	1·3%

*Minimum and maximum values could be derived from 95% CIs in the meta-analysis but not the 2010 report.
†Based on a meta-analysis[3] and a report of Chagas disease prevalence in Latin America in 2010.[5]

Table: **Expected prevalence of Chagas disease in London in 2011, by country of origin**

expected prevalence of *T cruzi* infection was 3·34%, resulting in an index of underdiagnosis of 96·6%.

On the basis of epidemiological and demographic predictions, the estimated Chagas disease prevalence among Latin American migrants exceeds 1%. However, with only 41 reported cases, this finding would mean that more than 1000 people in London are unknowingly infected with *T cruzi*. The level of underdiagnosis is very high,[6] although the proportion is similar to those other non-endemic countries.[1,7]

Despite the increase in the number of people arriving in London from endemic countries each year, studies of Chagas disease and the health status of Latin America migrants are scarce.[8] Thus, health-care providers' knowledge of this disease might not be proportionate to the increasing chance that they could unknowingly encounter infected patients.

Estimation of the real size of the Latin America migrant population is constrained by the use of official data. Accordingly, our analysis did not include irregular migrants or second-generation Latin American migrants in London. If these groups are included, we estimate (albeit crudely) that 133 500 Latin American migrants would have been in London in 2011.[9] Inclusion of second-generation Latin American migrants might be useful because they could have been exposed to *T cruzi* through vertical transmission without ever having travelled to Latin America. Another group to consider is Latin America migrants who have been granted citizenship in other European countries and, therefore, might no longer be identifiable as being of Latin America origin.[9]

Antenatal screening for and treatment of vertically infected neonates are not being done in the UK, although these strategies are recommended by WHO because of high treatment efficacy.[10] Implementation of Chagas disease screening strategies in antenatal care programmes in London, where half of all Latin American migrants in the UK reside, should be urgently considered by policy makers. Integration into existing antenatal screening programmes for other infectious diseases (eg, HIV and syphilis) or haemoglobinopathies (for which data on country of origin are already collected) could facilitate uptake by antenatal units.

To be cost-effective, screening should be limited to people from countries likely to yield the most cases. We found that Bolivian migrants had the highest burden of infection despite the number of residents in London not being high. Argentina, Brazil, and Colombia were also associated with high predicted numbers of Chagas disease cases in London. Moreover, efforts to promote screening should target those for whom screening could be most beneficial, such as pregnant Latin American women or those of childbearing age. Finally, prioritising screening in boroughs of London with the largest burdens of underdiagnosis should deliver the greatest yields on time and resources invested.

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