UNIVERSITÀ DEGLI STUDI DI MILANO
FACOLTÀ DI MEDICINA E CHIRURGIA

Malattia di Chagas: epidemiologia in Europa/Italia

Spinello Antinori

Dipartimento di Scienze Biomediche e Cliniche "Luigi Sacco"

Milano, 29 maggio 2019

Chagas disease

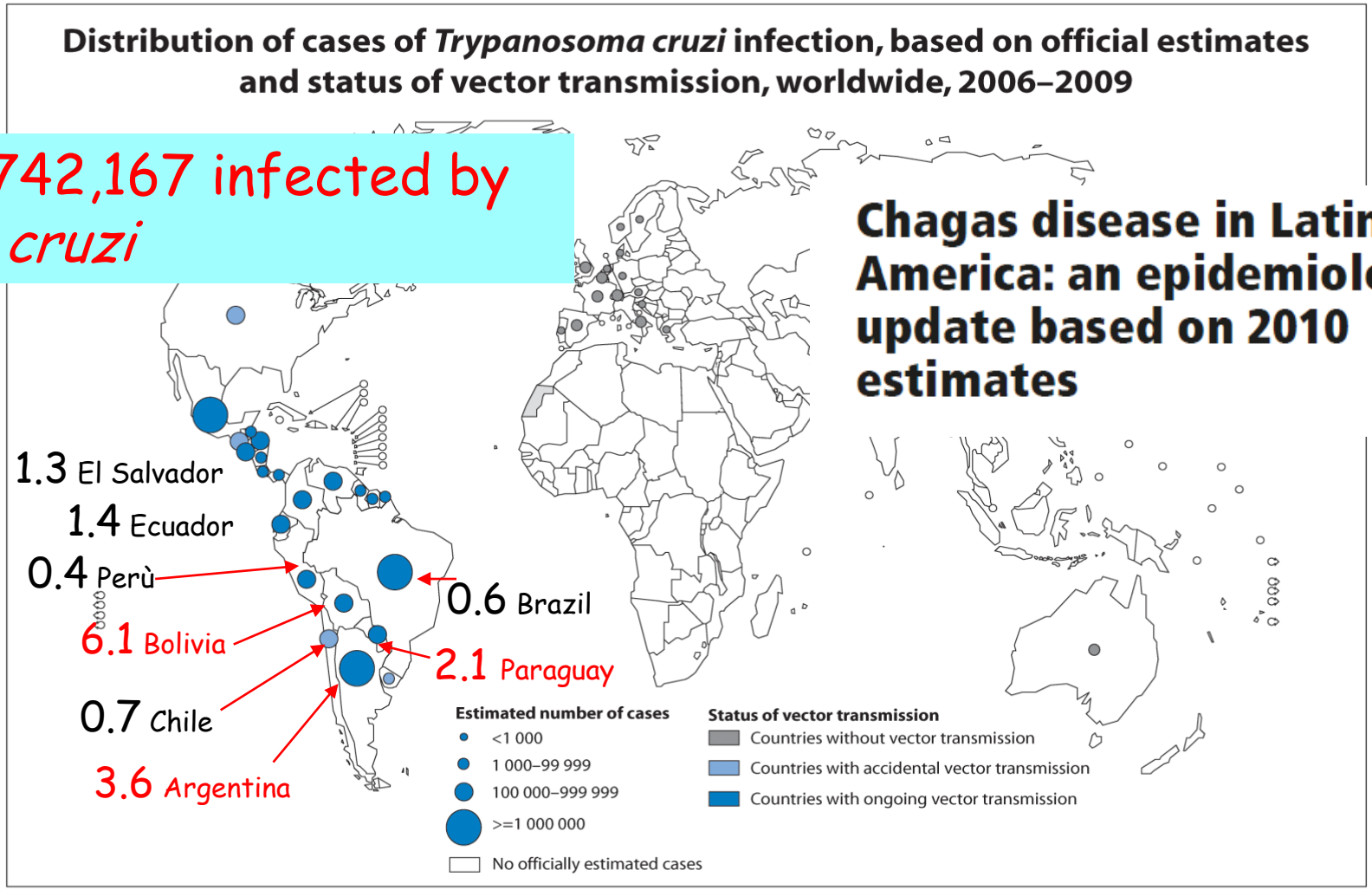
	1980–85	2005	2010
Population at risk (% total)	92 895 000 (25%)	108 595 000 (20·4%)	70 199 360 (12·9%)
Number of infected people	17 395 000	7 694 500	5 742 167
Number of new cases per year	700 000	55 585	38 593
Congenital transmission	7000–49 000*	14 385	8668
Vectorial transmission	Not reported	41 200	29 925
Number of deaths per year	>45 000	12 500	12 000

*Estimation based on data provided in the report in reference 10. Data are from references 10, 29, 32, 33.

Table 1: Changes in prevalence, incidence, and mortality of Chagas disease, 1985–2010, in 21 endemic countries in Latin America

Perez-Molina JA et al. Lancet 2018;391:82-94

5,742,167 infected by *T. cruzi*



More than 70 million people at risk

Chagas disease in Italy

SURVEILLANCE AND OUTBREAK REPORTS

Chagas disease in Italy: breaking an epidemiological silence

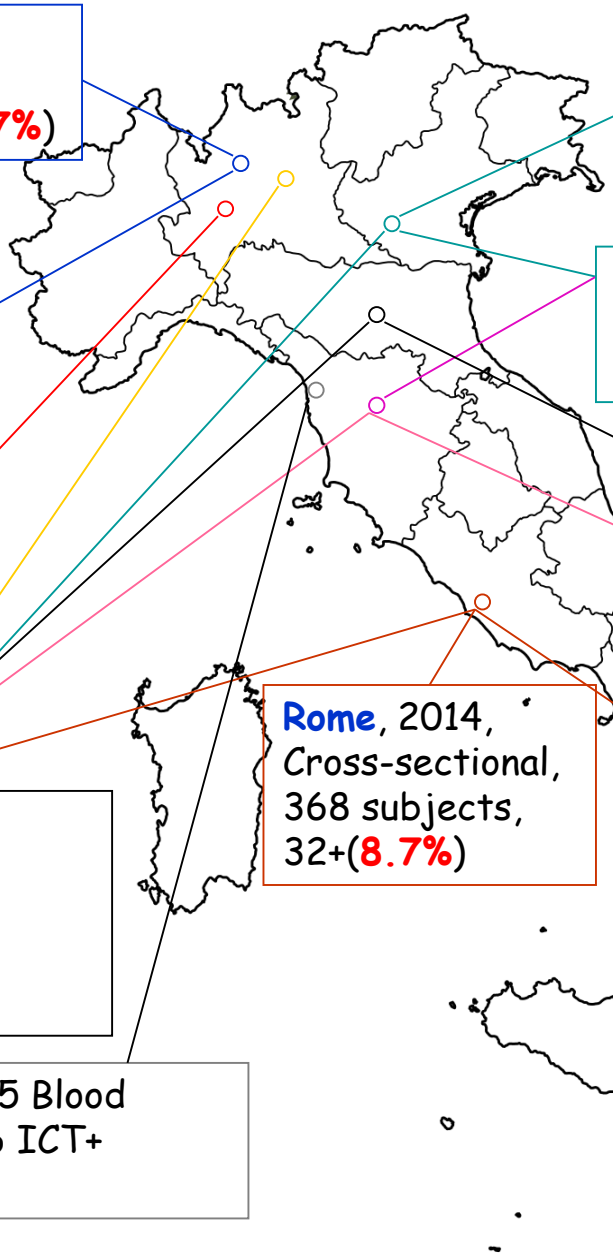
A Angheben (andrea.angheben@sacrocuore.it)[1,2], M Anselmi[1,2], F Gobbi[1,2], S Marocco[1], G Monteiro[1], D Buonfrate[1,2], S Tais[3], M Talamo[4], G Zavarise[5], M Strohmeyer[6,2], F Bartalesi[6], A Mantella[6], M Di Tommaso[7], K H Aiello[7], G Veneruso[8], G Graziani[9], M M Ferrari[10], I Spreafico[10], E Bonifacio[11], G Gaiera[12], M Lanzafame[13], M Mascarello[13], G Cancrini[14], P Albajar-Viñas[15], Z Bisoffi[1,2], A Bartoloni[6,2]

residents from Latin American. Among 867 at-risk subjects screened between 1998 and 2010, the Centre for Tropical Diseases in Negrar (Verona) and the Infectious and Tropical Diseases Unit, University of Florence found 4.2% patients with positive serology for Chagas disease (83.4% of them migrants, 13.8% adoptees).

	Number of individuals n (% of all 867)	Seropositive patients: n (% of 36 seropositive patients)
Country of origin		
Argentina	17 (2)	2 (5.5)
Bolivia	157 (18)	28 (77.7)
Brazil	255 (29.4)	1 (2.8)
Chile	35 (4)	0 (0)
Colombia	120 (13.8)	0 (0)
Costa Rica	10 (1.2)	0 (0)
Ecuador	17 (2)	1 (2.8)
Guatemala	5 (0.6)	0 (0)
Italy	11 (1.3)	1 (2.8)
Mexico	16 (1.9)	1 (2.8)
Nicaragua	1 (0.1)	0 (0)
Paraguay	3 (0.4)	1 (2.8)
Peru	91 (10.4)	0 (0)
Uruguay	1 (0.1)	0 (0)
Venezuela	12 (1.4)	0 (0)
Unknown[b]	116 (13.4)	1 (2.8)

77.7% from Bolivia

EuroSurveill 2011;16(37):ppp=19969



Bergamo,2012-13, Retrospective cohort, 1305 subjects, 263+ (**17%**)

Bergamo,2014-16,Prospective, 376 pregnant women,28+ (**8.7%**)

Milan,2013-14, Cross-sectional: 501 subjects, 48+ (**9.6%**)

Bologna, Brescia, Florence, Negrar, Rome,2012-14, Cross-sectional,180 subjects, 7+(**3.9%**)

Pisa, 1605 Blood donors, 6 ICT+ (**0.4%**)

Negrar, 2005-13, Retrospective, 332 pts CD

Negrar & Florence,1998-2010, Retrospective, 867 subjects, 36+ (**4.2%**)

Bologna, 2010-13, Cross-sectional, 151 subjects, 12+ (**7.9%**)

Florence,2010-15, retrospective 19pts/289NTD (**6.6%**)

Rome, 2014, Cross-sectional, 368 subjects, 32+(**8.7%**)

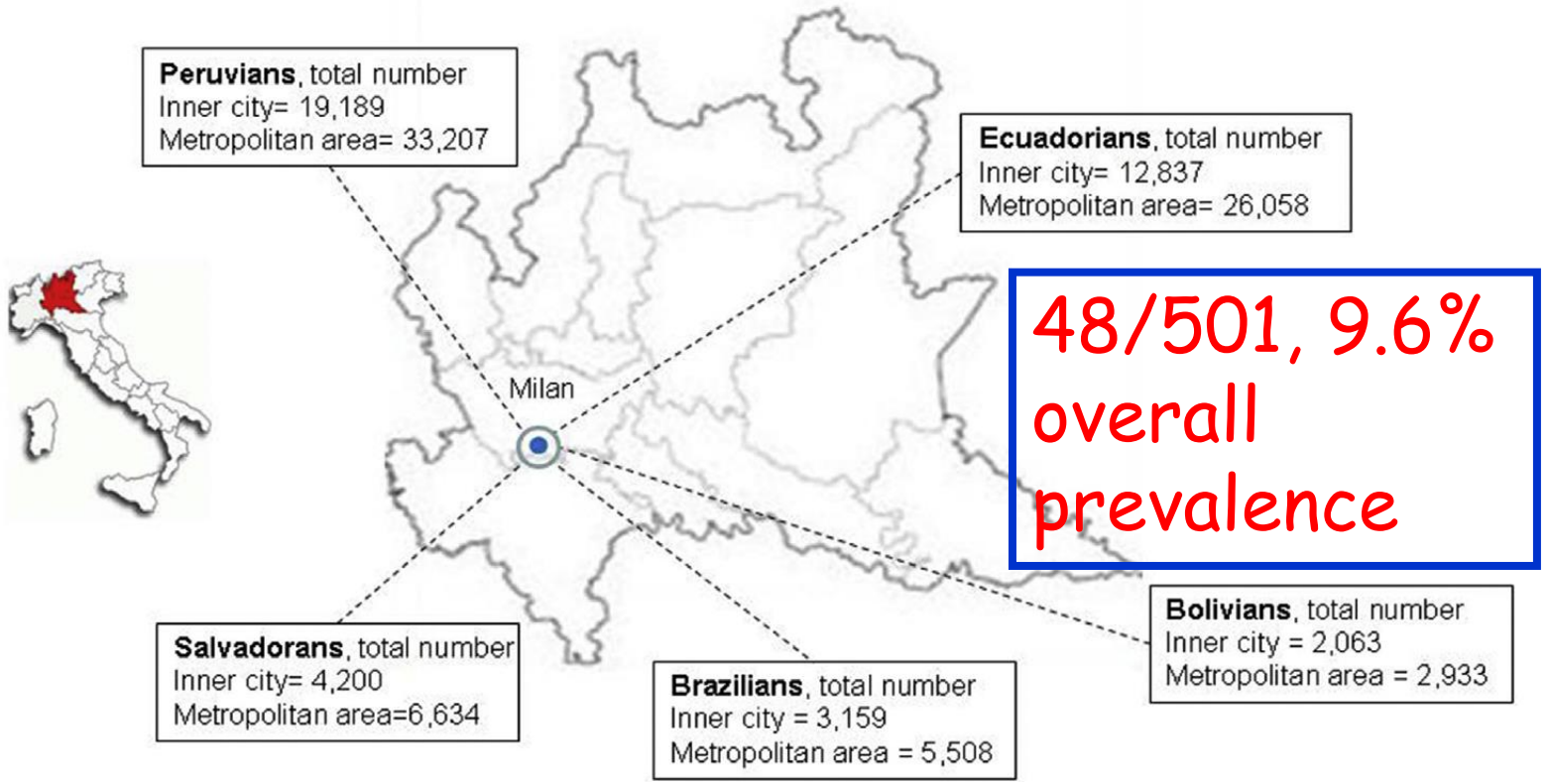
Rome,2010-12,128 Blood donors,5+(**3.9%**)

Antinori S, PanMinerva Medica in press

Original article

Chagas disease knocks on our door: a cross-sectional study among Latin American immigrants in Milan, Italy

S. Antinori [1, 2, *], L. Galimberti [2], R. Grande [3], R. Bianco [4], L. Oreni [2], L. Traversi [2], D. Ricaboni [2], G. Bestetti [2], A. Lai [1], D. Mileto [3], M.R. Gismondo [3], M. Petullà [4], S. Garelli [6], G. De Maio [6], C. Cogliati [5], D. Torzillo [5], A.M. Villa [7], A.M. Egidi [6], E.C. Repetto [6], A.L. Ridolfo [2], M. Corbellino [2], M. Galli [1, 2]



Clin Microbiol Infect 2018;24:1340.e1-1340.e6

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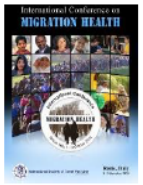
ASST Fatebenefratelli Sacco

UNIVERSITÀ DEGLI STUDI DI MILANO

OSF OPERA SAN FRANCESCO PER I POVERI FRATI CAPPUCCINI



Prevalence of Positive Serology for *T. cruzi* in a sample population of El Salvador and Honduras Migrants Residents in Metropolitan Area of Milan (MAM)

Grande R[1], Piliafas A[1], Morlando R[2], Gismondo M.R[1], Antinori S[3],Galimberti L[3], Fadelli S[4], Adamoli M[4], Olivieri E.A.[4] Villa A.M[4]

[1] Clinical Microbiology, Virology and Bioemergency Diagnosis Lab(CLIMVIB), L.Sacco Teaching Hospital, University of Milan, Italy
[2] Biology Department, Bicocca University, Milan, Italy
[3]Tropical and Infectious Diseases University Ward, L. Sacco Teaching Hospital, University of Milan, Italy
[4] Outpatient Clinic For Not Guaranteed People Opera S.Francesco Milan, Italy.

The participants were recruited by means of an active outreach to the local El Salvador community with the support of OSF (Opera S.Francesco per i Poveri) Serum samples from 198 subjects (177 females and 21 male) were collected from September 2017 to May 2018 and tested for serological evidence of *T. cruzi* antibodies. The median age of the participants was 34 years (range 10-76).**ALL SUBJECTS WERE ASYMPTOMATICS**

Two different serological methods were performed for every sample: an EIA test based on antigens extracted by a lisate of T.cruzi strains (Chagatest ELISA Lisado Weiner Germany) and an other EIA assay using recombinant antigens (Chagatest ELISA Recombinant Weiner Germany) All subjects positive to both tests

4/198 (2%) positive
3/198 (1.5%) inconclusive-Negative

Congenital Chagas disease in a non-endemic area: Results from a control programme in Bergamo province, Northern Italy

Paola Rodari[a,b,*], Andrea Angheben[a], Giorgio Gennati[c], Livia Trezzi[c], Graziano Bargiggia[d], Marzia Maino[e], Maurizio Ruggeri[f], Stefania Rampello[g], Laura Soavi[b], Marco Rizzi[b]

Distribution of deliveries of Bolivian women and screening coverage by hospital in Bergamo province.

Hospital	Number of deliveries (2014–2016)	Pregnant women tested	Coverage %	Positive (%)
Papa Giovanni XXIII - Bergamo	238	222	96.9	24 (10.8)
Eastern area	84	66	80.5	2 (3.0)
North-Eastern area	41	29	70.7	1 (3.4)
Western area	10	3	30.0	1 (33.3)
North-Eastern area	6	0	0	0 (0)
South-Eastern area	4	1	25.0	0 (0)
South-Western area	3	1	33.3	0 (0)
Northern Bergamo	1	0	0	0 (0)
Total	387	322	85.6	28 (8.7)

Travel Med Infect Dis 2018 (in press)

Prevalence of Chagas Disease in Latin-American Migrants Living in Europe: A Systematic Review and Meta-analysis

Ana Requena-Méndez[1]*, Edelweiss Aldasoro[1], Elisa de Lazzari[1], Elisa Sicuri[1], Michael Brown[2], David A. J. Moore[2], Joaquim Gascon[1], Jose Muñoz[1]

Table 4. Pooled *T. cruzi* prevalence by country of origin in Latin American migrants from European countries.

Country	Number screened	Number of seropositives	Country-specific prevalence* (%)	95% CI	Prevalence in country of origin (National level) PAHO (%)[39]	Prevalence ratio
Argentina	875	16	2.2	0.80–4·13	4.13	0.53
Bolivia	2264	541	18	13.9–22.66	6.75	2.67
Brazil	954	4	0.6	0.16–1.12	1.02	0.59
Chile	290	1	1	0.17–2.36	0.99	1.01
Colombia	1627	6	0.5	0.15–0.92	0.96	0.52
Ecuador	2131	7	0.4	0.18–0.72	1.74	0.23
El Salvador	67	2	3.7	1.62–11.7	3.37	1.10
Honduras	136	3	4.2	1.27–7.36	3.05	1.38
Mexico	166	0	1.5^	0.24–3.76	1.03	1.46
Nicaragua	50	1	4.6	0.76–11.3	1.14	4.04
Paraguay	385	19	5.5	3.46–7.91	2.54	2.17
Peru	1029	4	0.6	0.23–1.18	0.69	0.87
Uruguay	248	0	0.8^	0.08–2.24	0.66	1.21
Venezuela	311	0	0.9^	0.16–2.22	1.16	0.78

4.2%

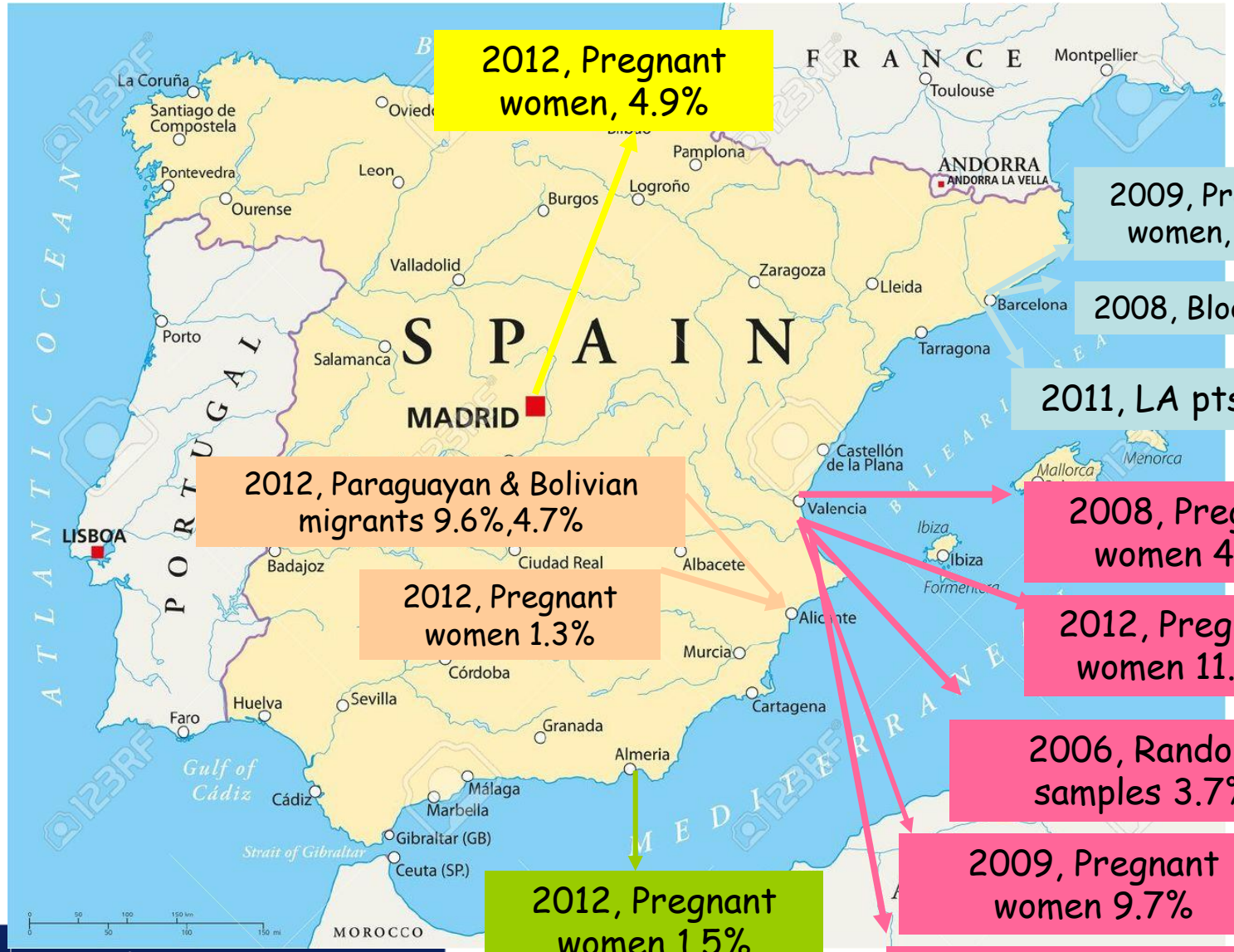
CI: Confidence Interval; PAHO: Pan American Health Organization;

*Weighted prevalence with Random effect model;

^ although there was not any reported case of Chagas disease in migrants coming from this country, the weighted prevalence is not "0" due to the Random Effect model

Plos Neglect Trop Dis 2015;9:e0003540

Prevalence of Chagas disease in Spain



Chagas screening and treatment among Bolivians living in Madrid, Spain: The need for an official protocol

María Romay-Barja[1,2]*, Teresa Boquete[1,2], Obdulia Martinez[1], Marlene González[1], Débora Álvarez-Del Arco[3], Agustín Benito[1,2], Teresa Blasco-Hernández[1,2]

Chagas prevalence and treatment behaviour

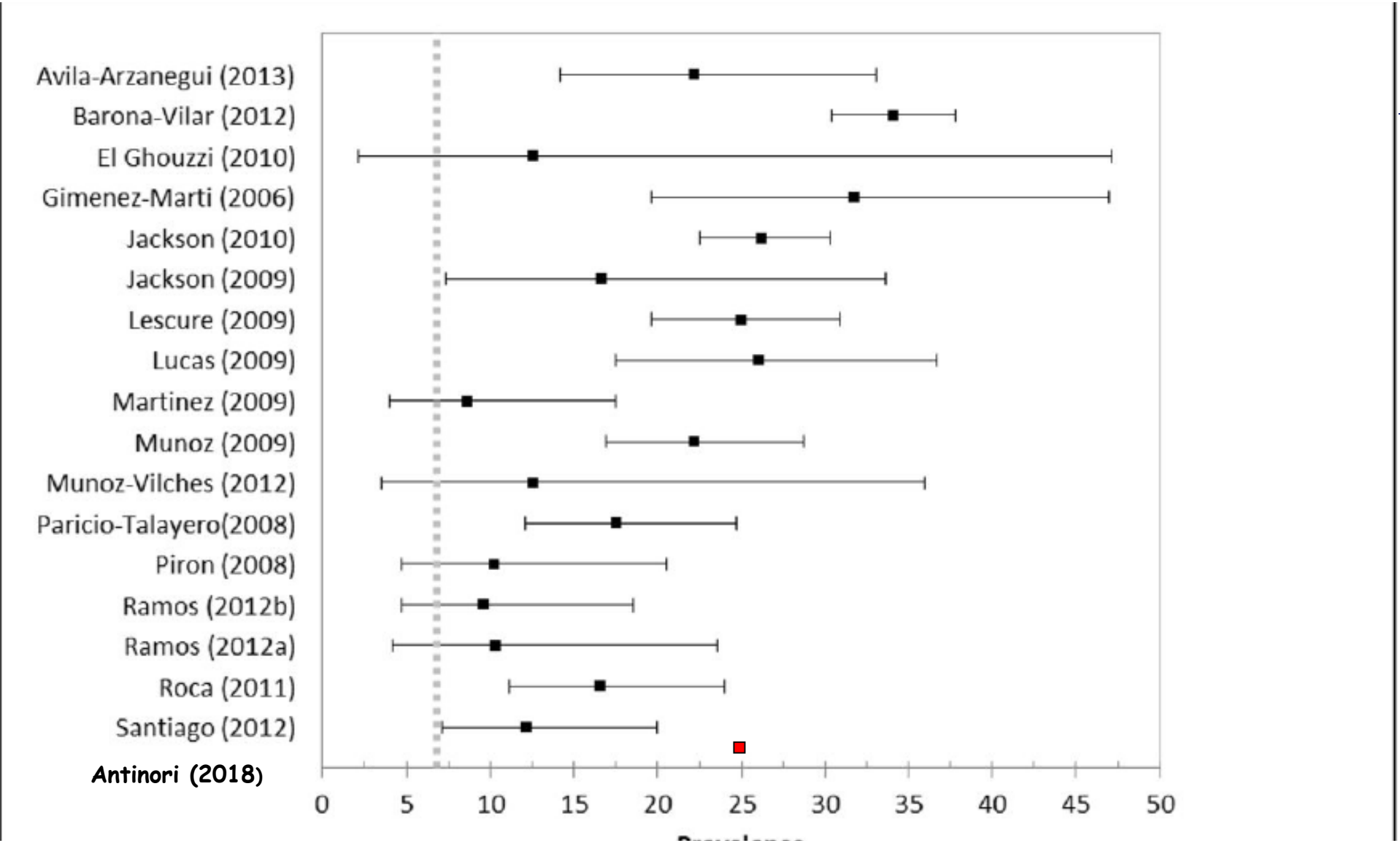
The prevalence Chagas among the Bolivians who have been screening was 27.7%, with not significant differences between the sexes. Among those positive for Chagas, 63.0% were women, between 35–44 years old (50%) with no positive cases under 31 years old. Most of them came from a rural area (41.3%) of Santa Cruz or Cochabamba (47.8% and 41.3% respectively), where they lived in a house of adobe (50.0%) or mixed, adobe and brick (21.7%), and have seen a Vinchuca (89%).

Almost 24.0% of the Bolivians positives for Chagas reported not having initiated treatment (Fig 2). Men and women further differed about their reasons. Among the women, the principal reasons cited for not having done so were "I do not have time" (37.5%) and "I feel fine" (25.0%). Men cited "I feel fine" most often (66.7%).

Among those who did start treatment, 42.9% interrupted it mainly because of side-effects (90.0% of women vs 40.0% of men) or because they moved (10% of women vs 40.0% of men). Regarding which treatment they received, 25 (71.4%) did not remember, 9 people said benznidazole, and only one woman mentioned nifurtimox.

Only 45.7% of the group testing positive for Chagas had had their children tested. Women

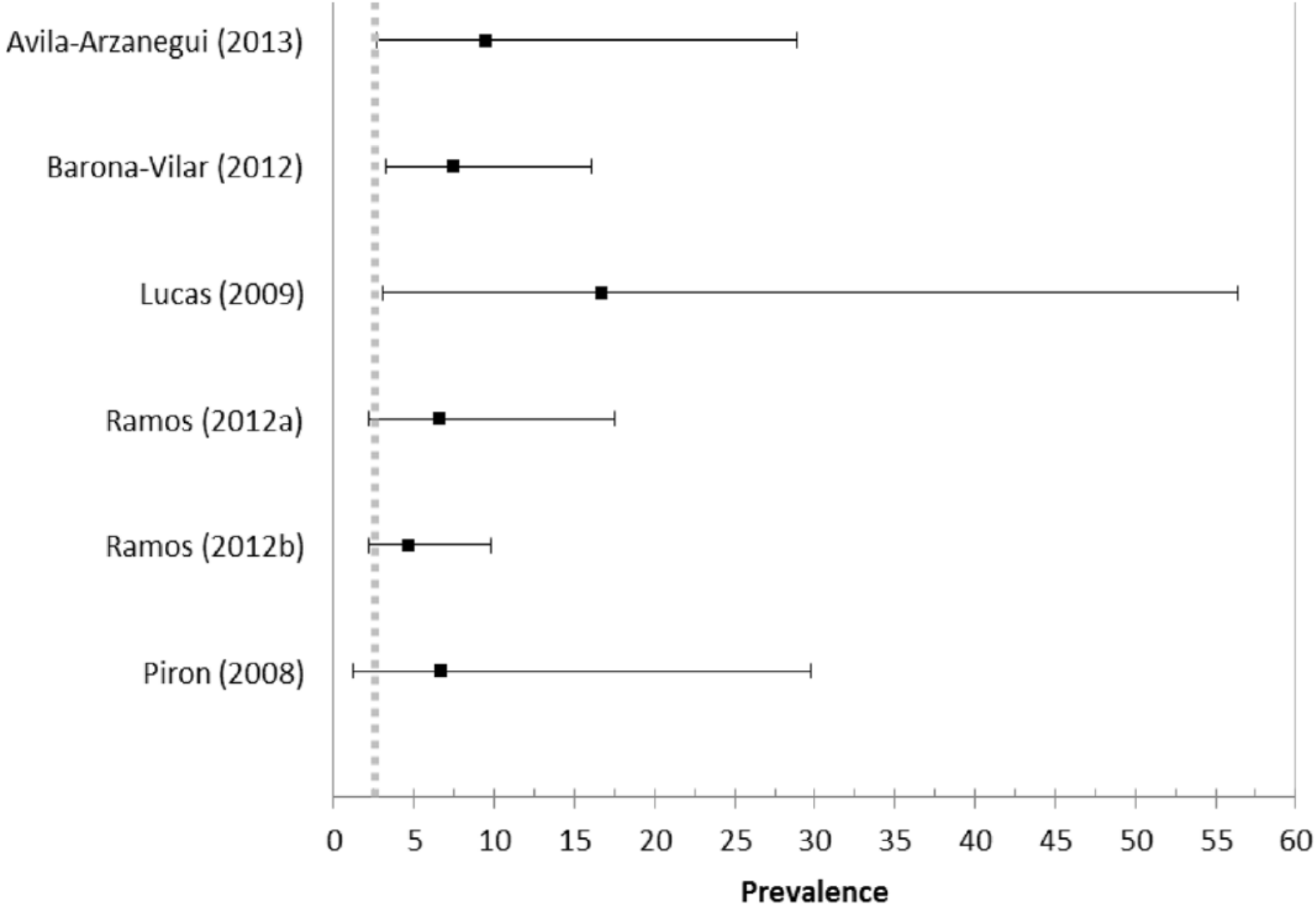
Plos One 2019;14:e0213577



Forest plot of prevalence estimates of Chagas disease among migrants from Bolivia from systematic review articles compared to estimates of countrywide prevalence (dashed grey lines indicate the countrywide prevalence estimate for Bolivia)

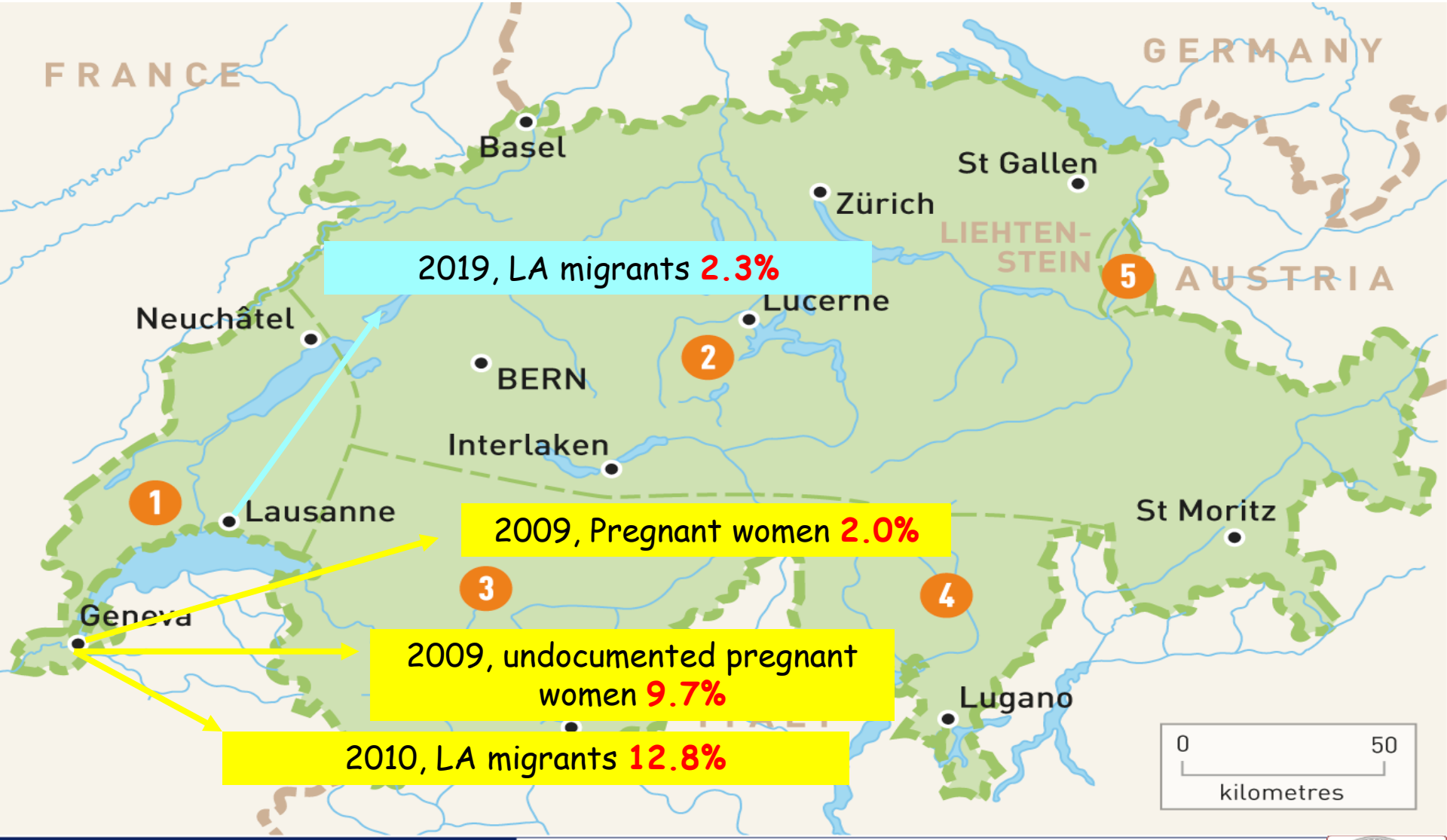
Conners EE et al. Acta Tropica 2016;156;68-78

Forest plot of prevalence estimates of Chagas disease among migrants from Paraguay from systematic review articles compared to estimates of countrywide prevalence (dashed grey lines indicate the countrywide prevalence estimate for Paraguay)

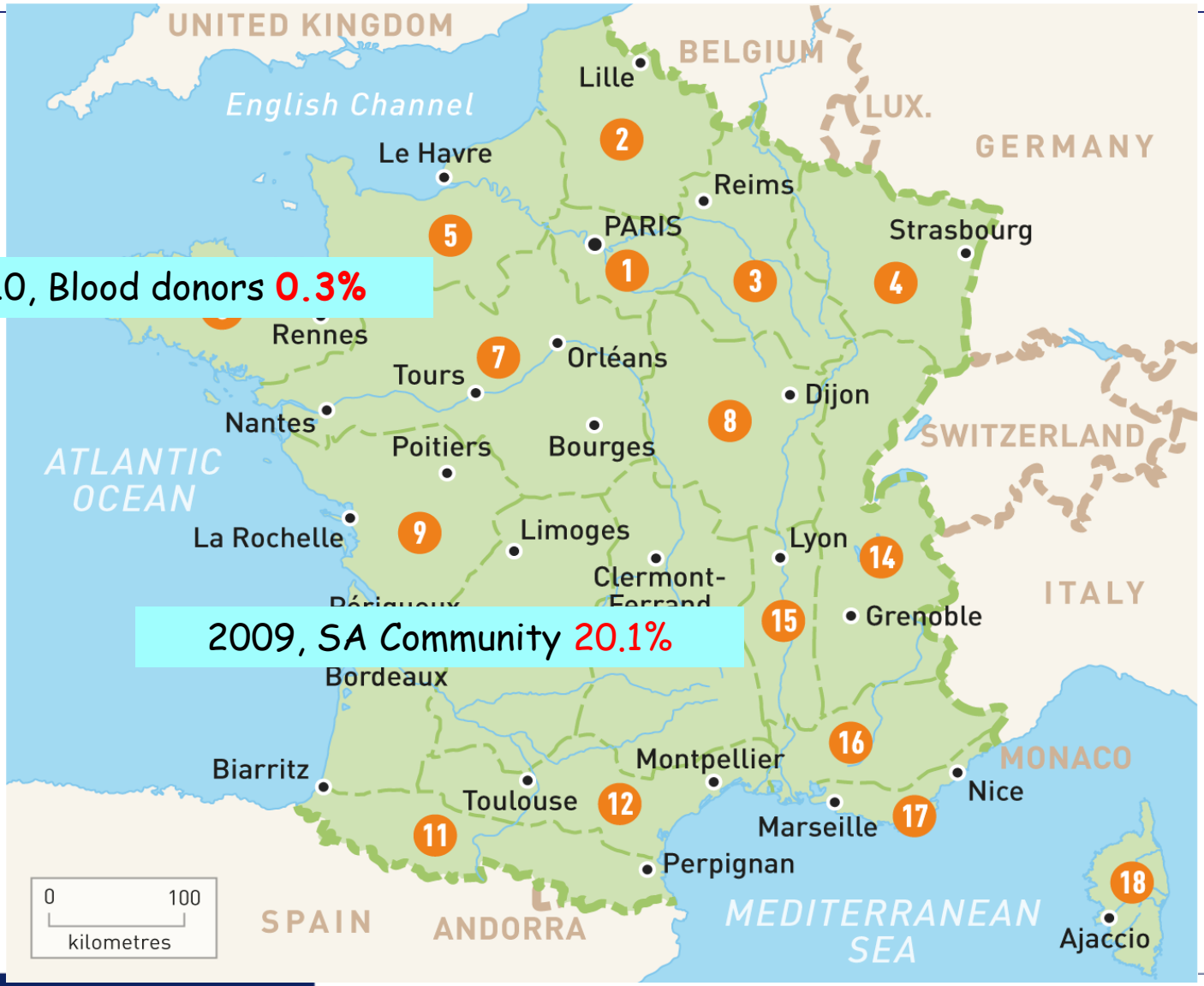


Conners EE et al. Acta Tropica 2016;156;68-78

Prevalence of Chagas disease in Switzerland



Prevalence of Chagas disease in France



2010, Blood donors 0.3%

2009, SA Community 20.1%

Chagas Disease, France

François-Xavier Lescure,* Ana Canestri,† Hugues Melliez,‡ Stéphane Jauréguiberry,* Michel Develoux,* Richard Dorent,* Jean-Baptiste Guiard-Schmid,* Philippe Bonnard,* Faïza Ajana,‡ Valeria Rolla,§ Yves Carlier,¶ Frederick Gay,† Marie-Hélène Elghouzzi,# Martin Danis,† and Gilles Pialoux*

Figure. Romaña sign. Photo of female patient from French Guiana who lives in a metropolitan area of France. She had returned to Maripassoula to visit her parents during the holidays between July 13, 2004, and September 3, 2004. When the patient sought treatment on September 3, 2004, she had fever and unilateral periorbital edema.

Patient no.	Sex/ age	Year	Source	Type	Functional signs	Clinical signs	NYHA/ LVEF	ECG results	Serology and direct	Cardiac treatment	BNDZ duration, wk	Tolerability	Outcome
1	F/26	2004	French Guiana (Maripassoula)	ACM	Romaña, polyalgia	Hyperthermia	CI 1	Anterior ST-segment depression	TC in bulla (direct) IIF† 16	–	7	PN (wk 7)	Favorable
2	F/36	2004	Bolivia (Santa Cruz)	ICC	Asthenia, dyspnea, lipothymia	–	CI 3 70%	–	IIF‡ + 1600 ELISA§ + 4.6 (BM) 6.2 (BK)	–	–	Not relevant	Stable
3	F/40	2005	Bolivia (Santa Cruz)	CCC	Asthenia, abdominal and chest pain, lipothymia	Bradycardia, HJR, ELL	CI 2 65%	SAB, AVB3, VES	IIF¶ + 800 ELISA¶ + 5.2 (BM) 6.9 (BK)	PM, bisoprolol, perindopril	8	Fair	Favorable
4	M/38	2005	Bolivia (Santa Cruz)	CCC	Dyspnea, fainting	HJR, bradycardia	CI 4 20%	BAV3, VES, SAB	IIF§ + 400 ELISA¶ + 5.9 (BM) 6.6 (BK)	PM, bisoprolol, perindopril	8	PN (wk 6)	Favorable
5	M/48	2005	Bolivia (Santa Cruz)	ICC	Chest pain, striction	–	CI 1 70%	–	IIF§ + 400 ELISA¶ + 5.6 (BM) 6.8 (BK)	–	8	Fair	Favorable
6	M/38	2005	Bolivia (Santa Cruz)	CCC	Chest pain, lipothymia	Bradycardia	CI 1 70%	BBD, HBAG, VES	IIF§ + 1600 ELISA¶ + 5.2 (BM) 6.9 (BK)	–	4	PN (wk 4)	Favorable
7	F/42	2006	Bolivia (Santa Cruz)	CCC	Asthenia, polyalgia, constipation	Bradycardia	CI1 70%	Sinus bradycardi a	IFS + 80 ELISA¶ + 0.57	–	8	PN (wk 8)	Favorable
8	M/24	2006	Bolivia (Santa Cruz)	ICC	Asymptomatic	–	CI1	–	IIF§ + 320 ELISA¶ + 1.88	–	8	Fair	Favorable
9	F/25	2006	Bolivia (Cochabamba)	ICC	Asymptomatic	–	CI1	–	IIF§ + 320 ELISA¶ + 1.46	–	2	Rash (wk 2)	Favorable

Addressing the neglect: Chagas disease in London, UK

*Ana Requena-Méndez, David A J Moore, Carme Subirà, Jose Muñoz

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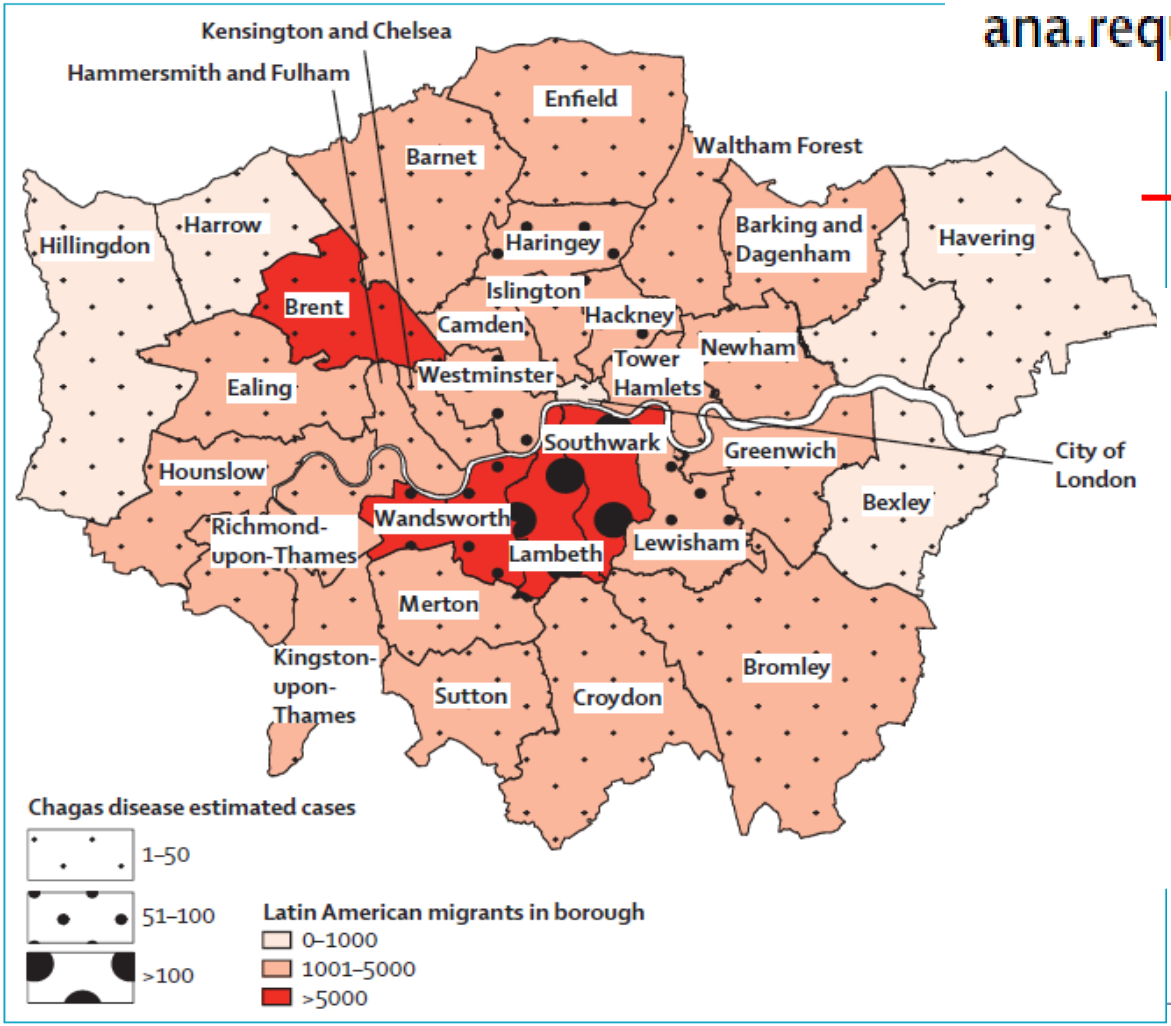

we estimate (albeit crudely) that 133 500 Latin American migrants would have been in London in 2011.[9]

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]

Lancet Global Health 2016;4:e231-2

	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	13798	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

BMJ Open

Cross-sectional, descriptive study of Chagas disease among citizens of Bolivian origin living in Munich, Germany

Table 1 Socioeconomic factors and CD status

	Total number of participants: n=43 (%)	Participants tested *T. cruzi*–: n=39 (%)	Participants tested *T. cruzi*+: n=4 (%)
Sex			
Female	29 (67.4)	26 (66.7)	3 (75.0)
Male	14 (32.6)	13 (33.3)	1 (25.0)
Country of birth			
Bolivia	29 (67.4)	26 (66.7)	3 (75.0)
Germany	12 (27.9)	12 (30.8)	0
Peru	1 (2.3)	1 (2.6)	0
Argentina	1 (2.3)	0	1 (25.0)
Main habitation in Bolivia			
La Paz	15 (34.8)	15 (38.5)	0
Cochabamba	10 (23.3)	7 (17.9)	3 (75.0)
Santa Cruz	2 (4.7)	2 (5.1)	0
Sucre/Chuquisaca	1 (2.2)	1 (2.6)	0
Potosí	2 (4.7)	2 (5.1)	0
Oruro	3 (7.0)	3 (7.7)	0
Tarija	2 (4.7)	1 (2.6)	1 (25.0)
Bolivian mothers only	8 (18.6)	8 (20.5)	0

Navarro M et al. BMJ Open 2017;7:e013960

BMJ Global Health

Chagas disease among pregnant Latin American women in the United Kingdom: time for action

Cristina Fernandez Turienzo,[1] Carmen Cabeza Brasa,[2] William Newsholme,[3] Jane Sandall,[1] Peter L Chiodini,[2,4] David A J Moore[2,4]

- Chagas disease—caused by infection with parasite *Trypanosoma cruzi* (*T. cruzi*)—is an emerging but still largely unrecognised parasitic disease in the United Kingdom (UK).
- The classic vector-borne route of transmission by infected triatomine bugs only occurs in the endemic areas of Latin America, but less common routes of transmission—organ transplantations, blood transfusions and vertical transmission—have been reported in Europe.
- The UK has implemented health policy measures to control the transmission, including the systematic screening of at-risk blood and organ donations.
- Determining the prevalence of *T. cruzi* infection in Latin American women living in London remains a key priority to inform evidence-based screening policy and practice.

BMJ Glob Health 2017;2:e000478

Challenges in the management of Chagas disease in Latin-American migrants in Europe

B. Monge-Maillo, R. López-Vélez*

European countries and years of implementation of the screening programmes for congenital Chagas disease transmission [16]

Country	Year and area of implementation of screening programmes for Chagas disease in pregnant women.
Spain	• Valencia 2009. Total target population 95.4%. Seroprevalence: 11.4%. Congenital transmission rate 11.4% • Catalonia 2010: Total target population reached 85% in 2011. Congenital transmission rate in all LA immigrants 5.8% and in the Bolivian community 6.5%. • Galicia 2012: Seroprevalence in all LA 2% and in the Bolivian community 16%. • Madrid 2013: The Study Group in the Community of Madrid called for improvements in the detection of *Trypanosoma cruzi* in pregnant woman but no systematic screening programme has been established. Screening programmes were implemented by regional organizations of the National Health System
Italy	• Tuscany 2012: establishment of a CCD programme. • Bergamo, Negrar, Roma and Bologna 2013: establishment of a programme. Screening programmes were implemented by regional organizations of the National Health System. Currently there are no published studies with data from these programmes.
Switzerland	• Geneva 2009: establishment of a CCD programme. • Lausanne 2014: establishment of a CCD programme. Screening programmes were implemented only in this two areas, in Switzerland there are no national health policy regarding CD control and management. A previous serological survey investigating pregnant LA women treated at Geneva University Hospital found an overall prevalence of CD of 9.7% and a prevalence of 16.6% specifically among Bolivians.

Abbreviations: CCD, congenital Chagas disease; LA, Latin America.

Clin Microbiol Infect 2017;23:290-5

Challenges in the management of Chagas disease in Latin-American migrants in Europe

B. Monge-Maillo, R. López-Vélez*

Table 2

European countries with directives regarding blood transfusion transmission of Chagas disease [15]

Country	Year of implementation of directives regarding control of blood transfusional transmission of Chagas disease.
Spain	• 2005: Real Decreto 1088/2005.[a]
France	• 2009: Arrèteddu 12 January 2009: Lagifrance, editor. NOR SJSP0901086A[a].
United Kingdom	• 2005: Guidelines for the blood transfusion service in: Service UBTT. The Stationery Office (TSO)[a]
Switzerland	• 2013: Prescriptions du Service de transfusion sanguine CRS[a]

[a] At risk donors are: 1, born or resident in endemic countries; 2, born to mothers native of endemic countries; 3, recipients of blood transfusion in endemic countries. They must be tested for *Trypanosoma cruzi* infection before blood donation.

Clin Microbiol Infect 2017;23:290-5

Prevalence estimates of Chagas disease among migrants from systematic review articles compared to estimates of countrywide prevalence, by country of origin (endemic) or country of destination (non-endemic)

Country	Study	N	Migrant Study Prevalence	Calculated Migrant Study 95% C.I.	Countrywide Prevalence	Migrant vs. Countrywide Prevalence[a]
Endemic countries						
Argentina	Barona-Vilar (2012a)	74	5.3	2.1 – 12.9	4.13[b]	≈
	Munoz-Vilches (2012)	56	1.8	0.3 – 9.4		≈
	Gimenez-Marti (2006)	8	12.5	2.2 – 47.1		≈
	Piron (2008)	298	0.7	0.2–2.4		Below
Colombia	Lucas (2009)	63	4.8	1.6 – 13.1	0.96[b]	Above
	Patricio-Talayero (2008)	131	1.5	0.4 – 5.4		≈
	Gimenez-Marti (2006)	185	0.5	0.1 – 3.0		≈
Ecuador	Barona-Vilar (2012a)	571	0.2	0 – 1.0	1.74[b]	Below
	Lucas (2009)	118	1.7	0.5 – 6.0		≈
	Paricio-Talayero (2008)	195	1.5	0.5 – 4.4		≈
	Gimenez-Marti (2006)	185	0.5	0.1 – 3.0		≈
	Piron (2008)	223	0.5	0.1–2.5		≈
El Salvador	El Ghouzzi (2010)	14	14.3	4.0 – 39.9	3.37[b]	Above
Honduras	Barona-Vilar (2012a)	55	3.6	1.0 – 12.3	3.05[b]	≈

Testing blood donors for Chagas disease in the Paris area, France: first results after 18 months of screening

Marie-Hélène El Ghouzzi, Elisabeth Boiret, Françoise Wind, Claudine Brochard, Sébastien Fittere, Luc Paris, Dominique Mazier, Nicole Sansonetti, and Philippe Bierling

TABLE 1. The distribution of blood donors and results of *T. cruzi* antibody testing in blood donors grouped by place of birth

Country	Total number	Negative results (%)	Positive results (%)	Indeterminate results (%)
Africa	908	895-98.57	0-0	13-1.43
LA	972	948-97.53	3-0.31	21-2.16
Central America*	124	120-97.77	2-1.61	2-1.61
South America	848	828-97.64	1-0.12	19-2.24
North America United States-Canada	192	188-97.92	0-0	4-2.08
French Caribbean islands*	307	300-97.72	0-0	7-2.28
Other Caribbean islands*	36	36-100	0-0	0-0
Asia	257	255-99.42	0-0	2-0.58
Europe	27,994	27,729-99.05	0-0	265-0.95
Oceania	53	53-100	0-0	0-0
Unknown	118	117-99.15	0-0	1-0.85
Total	30,837	30,521-99.98	3-0.01	313-1.02

* In this study, donors born in Mexico were included with those born in Central America and donors born in Caribbean islands are considered to be a distinctive group.

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TABLE 2. Distribution of blood donors from LA

Birth place	Number of donors tested	Chagas positive	% Positive results/ birth place	Birth place	Number of donors tested	Chagas positive	% Positive results/ birth place
Costa Rica	6		0.00	Argentina	61		0.00
Guatemala	14		0.00	Bolivia	8	1	12.50
Honduras	5		0.00	Brazil	205		0.00
Mexico	75		0.00	Chile	91		0.00
Nicaragua	7		0.00	Colombia	179		0.00
Panama	3		0.00	Ecuador	17		0.00
El Salvador	14	2	14.29	Guyana	161		0.00
				Paraguay	6		0.00
				Peru	66		0.00
				Uruguay	14		0.00
				Venezuela	40		0.00
Central America	*124*	*2*	*1.61*	*South America*	*848*	*1*	*0.12*

Transfusion 2010;50:575-83

The early implementation of *Trypanosoma cruzi* antibody screening of donors and donations within England: preempting a problem

Alan D. Kitchen, Patricia E. Hewitt, and Peter L. Chiodini

TABLE 3. Referral of samples for *T. cruzi* antibody testing

Year	Number of samples screened	Number of samples referred for confirmation (%)	Number confirmed positive	Number inconclusive	Number confirmed negative
1998	4,406	9 (0.2)	1	8	0
1999	4,939	58 (1.2)	0	0	58
2000	4,127	40 (1)	0	6	34
2001	4,870	58 (1.2)	0	0	58
2002*	2,530	10 (0.4)	0	0	10
2003	1,979	11 (0.6)	0	0	11
2004	1,003	0 (0)	0	0	0
2005	2,317	7 (0.3)	0	0	7
2006	2,319	9 (0.4)	0	0	9
2007	2,233	18 (0.8)	0	0	18
2008	2,588	1 (0.04)	0	0	1
2009	2,902	2 (0.07)	2	0	0
2010	2,372	0 (0)	0	0	0
2011	805 (end March)	0 (0)	0	0	0
Totals	38,585	223 (0.6)	3	14	206

* Implementation of new donor selection guidelines.

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TABLE 6. Confirmed-positive donors

Donor	Basic demographics	Declared risk
1	Female, aged 43 at pick-up	Born in Uruguay, mother Brazilian, father British, came to UK age 26. No clear risk for exposure but family holiday home in rural area of Uruguay. Fit and well. Referred to HTD London for care.
2	Male, aged 57 at pick-up	Born in Brazil, parents Brazilian, came to UK age 26. Traveled in Amazon basin. Fit and well. Referred to HTD London for care.
3	Female, aged 22 at pick-up	Born in Argentina, mother born in Argentina. No further information available.

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Surveillance of Chagas disease among at-risk blood donors in Italy: preliminary results from Umberto I Polyclinic in Rome

Simona Gabrielli[1,4], Gabriella Girelli[2,5], Francesco Vaia[3], Mariella Santonicola[2], Azis Fakeri[2], Gabriella Cancrini[1,4]

Table I - Nationality and age of blood donors enrolled in the screening programme, and results of serological and molecular findings.

Donors' origin	Examined N°	Age <40 years	Age >41 years	N. positive to BioELISA	N. positive to NovaLisa	N. positive to ICT	N. positive to PCR
Argentina	14	6	8	0	0	0	0
Bolivia	5	4	0	0	1	1	0
Brazil	7	7	0	1	0	0	0
Chile	3	2	1	0	0	0	0
Colombia	9	5	4	0	0	1	0
Cuba	3	2	1	0	0	0	0
Ecuador	15	9	6	0	0	0	0
El Salvador	1	1	0	0	0	0	0
Mexico	5	5	0	0	0	0	0
Nicaragua	1	0	1	0	0	0	0
Paraguay	1	1	0	0	0	0	0
Peru	29	17	12	0	0	0	0
Dominican Rep.	1	0	1	0	0	0	0
Venezuela	8	6	2	0	0	0	0
Italy	26	12	14	A: 1 B: 0	A: 0 B: 0	A: 0 B: 1	A: 0 B: 1
Total	128	78	50	2	1	3	1

Legend A: travelled through Mexico; B: worked in Mexico and Brazil.

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Cost-effectiveness of Chagas disease screening in Latin American migrants at primary health-care centres in Europe: a Markov model analysis

Ana Requena-Méndez, Sheila Bussion, Edelweiss Aldasoro, Yves Jackson, Andrea Angheben, David Moore, Maria-Jesús Pinazo, Joaquim Gascón, Jose Muñoz, Elisa Sicuri

Methods We constructed a decision tree model that compared the test option (screening of asymptomatic individuals, treatment, and follow-up of positive cases) with the no-test option (screening, treating, and follow-up of symptomatic individuals). The decision tree included a Markov model with five states, related to the chronic stage of the disease: indeterminate, cardiomyopathy, gastrointestinal, response to treatment, and death. The model started with a target population of 100 000 individuals, of which 4·2% (95% CI 2·2–6·8) were estimated to be infected by *Trypanosoma cruzi*. The primary outcome was the incremental cost-effectiveness ratio (ICER) between test and no-test options. Deterministic and probabilistic analyses (Monte Carlo simulations) were performed.

Interpretation Screening for Chagas disease in asymptomatic Latin American adults living in Europe is a cost-effective strategy. Findings of our model provide an important element to support the implementation of *T cruzi* screening programmes at primary health centres in European countries hosting Latin American migrants.

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