

promote the gradual application of this procedure in intermediate-risk and even low-risk patients.

Other transcatheter interventions, such as mitral annuloplasty and mitral valve replacement, have been introduced for the treatment of mitral regurgitation. At present, predicting the role of each procedure in the percutaneous treatment of this condition is difficult,¹⁴ but it is obvious that a large proportion of patients will continue to benefit from edge-to-edge repair.

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Hunting hidden parasites: *Trypanosoma cruzi*

Pathogens are not aware of international borders, including pathogens that cause emerging and neglected tropical diseases. Although Chagas disease is endemic to Latin America, where it affects around 5–7 million people,^{1,2} it is now a disease of global concern mainly because of the movement of human populations. After the USA, Spain hosts the highest number (more than 50 000) of migrants infected with *Trypanosoma cruzi*, the parasite that causes this life-threatening disease.^{3,4} European countries should therefore adapt their legislation to control the main non-vector modes of *T cruzi* transmission (blood transfusions and haemoderivatives, and organ transplantation). For example, screening of blood donors has been mandatory in Spain since 2005 and organ donors are also screened for *T cruzi*.⁵ However, these measures are insufficient because mother-to-child transmission goes, for the most part, undetected. Mandatory screening of gestating women

from endemic areas is only done in some regions of Spain and Italy, where specific legislation is applied, but it is not regulated in the rest of Europe.⁵

A common European regulation is essential to implement a coherent, unified strategy to detect and treat congenital cases of Chagas disease. Surveillance of mother-to-child transmission is a highly cost-effective method in the control and reduction of the burden of Chagas disease in non-endemic areas.⁶ Screening of gestating women from endemic areas allows infected newborn babies to be properly treated and cured, and it can lead to detection and treatment of previously unidentified familial cases of Chagas disease.⁶

On the basis of the known infection rate among Bolivian nationals living in Spain,^{4,7} an estimated 9200 Latin Americans are living with Chagas disease in Madrid alone. From 2007 to 2016, 75 congenital cases of Chagas disease were confirmed in Spain, although it is estimated that this is the yearly number of new cases.⁸

17 of these cases were reported in Madrid (according to data from the National Microbiology Centre, Institute of Health Carlos III), where a group of health professionals from different hospitals and institutions has produced guidelines encouraging the screening of pregnant women from endemic areas, but this measure is deficient without any specific legislation.⁹

The reality is that more than 90% of people infected with *T cruzi* in Europe are not yet diagnosed,¹⁰ so there is an urgent need to detect these hidden infections. Unfortunately, patients and health-care professionals face several structural barriers such as fear, stigma, and insufficient knowledge about this silent disease, that must be overcome to address persistent underdiagnosis and to detect the disease as early as possible.^{11,12}

Public-private partnerships with a multidisciplinary approach have been established in Spain since 2012 to face the challenges of Chagas disease. Non-profit organisations (such as Fundación Mundo Sano and Salud Entre Culturas), health-care centres (such as Ramón y Cajal University Hospital), and other collective stakeholders (such as the Municipality of Madrid and National Microbiology Centre) have developed a strategy based on health education and comprehensive care of patients with Chagas disease in Madrid. One of the cornerstones of this strategy consists of community screening campaigns, which are done in non-health-care settings on the weekends. Because they address the most common barriers that migrants face in seeking a diagnosis and medical advice during the week (mostly related to irregular jobs and long journeys to work),¹³ these campaigns have been well received. From 2014 to 2016, three Chagas disease campaigns were undertaken within a typical Latin American migrant neighbourhood, complemented by the support of Fundación Mundo Sano's community health workers specifically trained for this purpose.^{14,15} These campaigns led to increased awareness of Chagas disease through the media and various cultural and sporting events, among other forums.^{16,17} The results speak for themselves: in 2014, 229 participants were screened and 50 (21.8%) tested positive for *T cruzi* infection; in 2015, 219 were screened and 48 (21.9%) tested positive; and in 2016, 667 were screened and 123 (18.4%) tested positive (Navarro M, unpublished).

Overall, 1115 migrants at risk were screened and informed about Chagas disease in just three weekends;



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prevalence of *T cruzi* infection in this population was 19.8% (221 confirmed cases). 870 (78.0%) participants screened were from Bolivia, the most affected endemic country, representing 98.6% (218 of 221) of participants diagnosed with Chagas disease (Navarro M, unpublished).

All diagnosed patients were referred to Ramón y Cajal University Hospital, where complementary tests and medical follow-up are provided free of charge, regardless of the patient's legal status. The overall rate of visceral involvement of Chagas disease in patients admitted to the hospital with *T cruzi* infection in the past 3 years has reached 35.5% (88.3% cardiac involvement and 11.7% digestive involvement). In Madrid, patients with Chagas disease have to pay for part of the treatment with benznidazole, but Salud Entre Culturas offers free medication to those in difficult economic circumstances.

These campaigns highlight that Chagas disease is underdiagnosed among migrants, especially those from hyperendemic areas such as Bolivia. Most participants (985 [88.3%] of 1115) stated that they had never been screened before, neither in Spain nor in their country of origin. Quantifying the magnitude of the problem is the first step towards drawing the attention of public health authorities to implement comprehensive screening and control measures.

Specific treatment is indicated for acute, congenital, and reactivated infections and for chronic Chagas disease in children younger than 18 years, but antitrypanosomal therapy for chronic Chagas disease remains controversial. Nevertheless, most experts continue to recommend

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it for adult patients, expecting to avoid progression to the symptomatic phase.¹⁸ Early detection of Chagas disease is crucial in women of childbearing age because antiparasitic treatment has clearly been effective in this group. Mother-to-child transmission of *T cruzi* can be avoided by treating infected women before pregnancy.¹⁹ Of all migrants with a positive *T cruzi* test identified through these campaigns, 63.8% (141 of 221) were women of childbearing age (aged 15–45 years), who were being followed up. The proportion of young women diagnosed through this initiative has also increased annually (52% in 2014, 60% in 2015, and 71% in 2016; Navarro M, unpublished), reflecting our efforts to adapt the programme and improve its efficiency by targeting the population most at risk.

We hope the public health impact of this initiative is evident, as it is helping to control Chagas disease transmission in non-endemic countries and offering comprehensive care to improve the quality of life of the affected population.

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