



Figure. Regression coefficients for the effect of influenza labels on worry for infection and intentions for vaccination. Label conditions were dummy coded to estimate the effects of “H11N3 influenza” (X_1) and “Yarraman flu” (X_2) labels compared with the “horse flu” label. The effect of influenza labels on vaccination intentions, controlling for worry, is in parentheses. ** $p < 0.01$; *** $p < 0.001$.

worry ($p = 0.281$) and vaccination intentions ($p = 0.467$) did not significantly interact with country status.

Our results indicate that the choice of disease labels for public communications about outbreaks cannot be made by personal preference. In this study, an animal reservoir label evoked weaker responses from participants than other labels. Although these results could be specific to the animal we chose, using an animal reservoir label may produce greater misconceptions (e.g., exposure to the animal necessary for transmission) that undermine suspicions of risk. Further research is needed to determine whether this effect is context-specific or generalizes to other animal reservoir labels for infectious diseases and whether our findings replicate in a nonhypothetical context.

All authors contributed to the intellectual property of this manuscript, including contributing to study design, interpretation of data, and writing of the report. We have no competing interests to declare. All of the authors have had full access to the data, have seen and approved the submission of this version of the manuscript, and take full responsibility for the integrity of the data, the accuracy of the data analysis, and the manuscript.

Funding for this research was provided to A.F. from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement #278763. The funding agreement assured the authors’ independence in designing the study, in the collection, analysis, and reporting of the data, and in the decision to submit the article for publication.

Dr. Scherer is an Associate of Internal Medicine at the University of Iowa. His research focuses on the psychological mechanisms that shape our responses to health risks in order to better design effective health risk communication.

References

- Scherer AM, Scherer LD, Fagerlin A. Getting ahead of illness: using metaphors to influence medical decision making. *Med Decis Making*. 2015;35:37–45. <http://dx.doi.org/10.1177/0272989X14522547>
- Hauser DJ, Schwarz N. The war on prevention: bellicose cancer metaphors hurt (some) prevention intentions. *Pers Soc Psychol Bull*. 2015;41:66–77. <http://dx.doi.org/10.1177/0146167214557006>
- Scherer LD, Finan C, Simancek D, Finkelstein JI, Tarini BA. Effect of “pink eye” label on parents’ intent to use antibiotics and perceived contagiousness. *Clin Pediatr (Phila)*. 2016;55:543–8. <http://dx.doi.org/10.1177/0009922815601983>
- Scherer LD, Zikmund-Fisher BJ, Fagerlin A, Tarini BA. Influence of “GERD” label on parents’ decision to medicate infants. *Pediatrics*. 2013;131:839–45. <http://dx.doi.org/10.1542/peds.2012-3070>
- Rothman AJ, Bartels RD, Wlaschin J, Salovey P. The strategic use of gain- and loss-framed messages to promote healthy behavior: how theory can inform practice. *J Commun*. 2006;56(s1):S202–20. <http://dx.doi.org/10.1111/j.1460-2466.2006.00290.x>
- Loewenstein GF, Weber EU, Hsee CK, Welch N. Risk as feelings. *Psychol Bull*. 2001;127:267–86. <http://dx.doi.org/10.1037/0033-2909.127.2.267>
- Determann D, de Bekker-Grob EW, French J, Voeten HA, Richardus JH, Das E, et al. Future pandemics and vaccination: Public opinion and attitudes across three European countries. *Vaccine*. 2016;34:803–8. <http://dx.doi.org/10.1016/j.vaccine.2015.12.035>

Address for correspondence: Aaron M. Scherer, Department of Internal Medicine, University of Iowa, 200 Hawkins Dr, Iowa City, IA 52242, USA; email: aaron-scherer@uiowa.edu

Zika Virus Screening among Spanish Team Members After 2016 Rio de Janeiro, Brazil, Olympic Games

Natalia Rodríguez-Valero, Alberto M. Borobia, Mar Lago, Maria Paz Sánchez-Seco, Fernando de Ory, Ana Vázquez, Jose Luis Pérez-Arellano, Cristina Carranza Rodríguez, Miguel J. Martínez, Alicia Capón, Elías Cañas, Joaquin Salas-Coronas, Arkaitz Azcune Galparsoro, Jose Muñoz

Author affiliations: IS Global-Hospital Clínic de Barcelona, Barcelona, Spain (N. Rodríguez-Valero, J. Muñoz); Hospital La Paz-Carlos III, Madrid, Spain (A.M. Borobia, M. Lago); Instituto de Salud Carlos III, Madrid, Madrid, Spain (M.P. Sánchez-Seco, F. de Ory, A. Vázquez); Complejo Hospitalario Universitario

Insular Materno Infantil, Las Palmas de Gran Canaria, Spain (J.L. Pérez-Arellano, C. Carranza Rodríguez); Hospital Clinic de Barcelona, Barcelona, Spain (M.J. Martínez, A. Capón); Hospitales Universitarios Virgen del Rocío, Sevilla, Spain (E. Cañas); Hospital de Poniente, El Ejido, Spain (J. Salas-Coronas); Hospital Universitario de Donostia, Donostia, Spain (A. Azcune Galparsoro)

DOI: <https://doi.org/10.3201/eid2308.170415>

We evaluated the risk for the Spanish Olympic Team acquiring Zika virus in Rio de Janeiro, Brazil, during 2016. We recruited 117 team members, and all tested negative for Zika virus. Lack of cases in this cohort supports the minimum risk estimates made before the Games.

The current Zika virus epidemic became a major concern for national Olympic delegations before they traveled to Rio de Janeiro, Brazil, during summer 2016. Fear about individual consequences of the infection, such as congenital or neurologic disorders, were common among athletes and other participants of the Olympic Games and led some persons not to attend the Games for these reasons. The possibility of the Olympics contributing to a global spread of the Zika virus epidemic also was a concern, initially raised by ≈100 academic researchers, expressed in an open letter addressed to the World Health Organization (WHO) in May 2016 (1,2).

The risk for Zika during the Rio de Janeiro Olympic Games was estimated to be very low in different models published in medical journals (9×10^{-6} to 3×10^{-5}) (3–6). After considering these figures, WHO advised that the Games should not substantially affect the epidemic (7).

To evaluate the risk for the Spanish Olympic Team acquiring Zika virus, our research group from 6 hospitals in Spain invited members of the Spanish delegation to participate in a serologic study of Zika virus 20 and 30 days after returning from Rio de Janeiro. The study was conducted in 6 different recruiting Tropical Medicine Units in cities in Spain (Barcelona, Madrid, Sevilla, San Sebastian, Las Palmas de Gran Canaria, and Almeria).

Athletes and other participants were invited to participate in the study through the Spanish Olympic Committee. A total of 117 Olympics participants accepted and were included in the study during September and October 2016. After providing oral and written information, study participants signed an informed consent form, and demographic and health data were recorded in a medical questionnaire. A total of 10 mL of blood was drawn from each participant, and serologic tests for Zika virus (immunofluorescence antibody assay; EUROIMMUN, Luebeck, Germany), dengue virus (ELISA; Panbio, Kyonggi-do, Republic of Korea), and chikungunya virus (immunofluorescence assay;

EUROIMMUN) were conducted at the Instituto de Salud Carlos III (Spanish National Reference Laboratory, Madrid, Spain). For all samples initially testing positive for Zika virus, we conducted microneutralization testing.

Twenty-one participants had ≥1 signs or symptoms while in Brazil: 18% rash, 23% fever (temperature >38°C), 14% itching, 9% of conjunctival hyperemia, 9% arthralgia, 14% myalgia, 40% malaise, 9% lymphadenopathy, 32% headache, and 19% gastrointestinal symptoms. Ninety-nine percent of participants received Zika virus counseling before they traveled to Rio de Janeiro, including the advice of having protected sex during and after the Games (Table).

For 4 persons, test results for Zika virus IgG was positive; IgM and neutralization testing yielded negative results. The 4 Zika virus IgG-positive participants had received previous yellow fever vaccination and were asymptomatic. One sample showed Zika virus IgM in the absence of specific IgG; the results were confirmed in a follow-up sample. Thus, the sample was classified as false positive.

Table. Demographic and travel-related characteristics of 117 Spanish athletes who attended the Olympic Games, Rio de Janeiro, Brazil, 2016*

Characteristic	Results
Sex	
M	76 (65.0)
F	41 (35.0)
Age, y, median ± SD	35.54 ± 9.46
Athletes	
All athletes	53 (45.3)
Outdoor athletes	35 (66.0)
Spanish nationality	112 (95.7)
Chronic disease	6 (5.1)
Immunosuppression	0
Current pregnancy, own or partner's	9 (7.7)†
Intention to conceive within the following 6 mo	29 (24.8)
Sex	
M	22 (75.9)
F	7 (24.1)
Vaccination and travel advice	
Vaccine	
Yellow fever	23 (19.6)
Japanese encephalitis	0
Tickborne encephalitis	0
Attendance at a travel clinic	115 (98.3)
Zika advice included	116 (99.2)
>1 Visit to a tropical country	74 (63.3)
Previous diagnosis of dengue	0
During the trip	
Length of stay, d, median ± SD	21.35 ± 9.05
Places visited	
Rio de Janeiro	103 (88)
Rio de Janeiro, Deodoro, and Barra	7 (6.0)
Rio de Janeiro and Ilha Grande	4 (3.4)
Rio de Janeiro and Paraty	1 (0.85)
Rio de Janeiro and French Polynesia	1 (0.85)
Use of bed nets or air conditioners	61 (52.6)
Use of repellent	111 (94.9)
Risky sexual behavior	2 (1.7)
Recall ≥1 mosquito bite during stay	56 (47.9)

*All values are no. (%) unless otherwise indicated.

†Male participants' partners who were pregnant before the Games.

Study participants were advised to wait to conceive in accordance with WHO specifications: 6 months for men, 2 months for women. Participants with pregnant partners were advised to use condoms during the entire pregnancy.

A lack of Zika cases in this cohort supports the risk calculations made before the Games and the WHO statement that there were no Zika cases associated with the Olympic Games (8). Although 48% of participants in our study recalled at least 1 mosquito bite during the stay, the overall absence of cases in the Rio de Janeiro population during July and August 2016 (9,10) is believed to be due to the vector-control efforts by Brazilian authorities before the Games and to the winter weather, leading to a low presence of adult mosquitoes and mosquito bites (5,6).

This work was supported by La Caixa Foundation and the Spanish Olympic Committee. The laboratory work was supported by RICET (Network Biomedical Research on Tropical Diseases), RD16CIII/003/003.

Dr. Rodriguez-Valero is an internal medicine specialist working in travel medicine since 2015. Her research interests include new technologies in travel medicine, outbreaks, and emerging infectious diseases.

References

1. World Health Organization. Zika virus and the Olympic and Paralympic Games Rio 2016 [cited 2016 Dec 26]. <http://www.who.int/mediacentre/news/statements/2016/zika-olympics/en/>
2. Attaran A, Caplan A, Gaffney C, Igel L. Open letter to Dr. Margaret Chan, Director-General, WHO (copied to the International Olympic Committee) [cited 2017 June 9]. <http://www.gannett-cdn.com/usatoday/editorial/sports/olympics/zika-olympics-open-letter.pdf>
3. Massad E, Tan S-H, Khan K, Wilder-Smith A. Estimated Zika virus importations to Europe by travellers from Brazil. *Glob Health Action*. 2016;9:31669. <http://dx.doi.org/10.3402/gha.v9.31669>
4. Zumla A, McCloskey B, Bin Saeed AA, Dar O, Al Otabi B, Perlmann S, et al. What is the experience from previous mass gathering events? Lessons for Zika virus and the Olympics 2016. *Int J Infect Dis*. 2016;47:1–4. <http://dx.doi.org/10.1016/j.ijid.2016.06.010>
5. Codeço C, Villela D, Gomes MF, Bastos L, Cruz O, Struchiner C, et al. Zika is not a reason for missing the Olympic Games in Rio de Janeiro: response to the open letter of Dr Attaran and colleagues to Dr Margaret Chan, Director-General, WHO, on the Zika threat to the Olympic and Paralympic Games. *Mem Inst Oswaldo Cruz*. 2016;111:414–5. <http://dx.doi.org/10.1590/0074-02760160003>
6. Grills A, Morrison S, Nelson B, Miniota J, Watts A, Cetron MS. Projected Zika virus importation and subsequent ongoing transmission after travel to the 2016 Olympic and Paralympic Games—country-specific assessment, July 2016. *MMWR Morb Mortal Wkly Rep*. 2016;65:711–5. <http://dx.doi.org/10.15585/mmwr.mm6528e1>
7. World Health Organization. Public health advice regarding the Olympics and Zika virus [cited 2016 Dec 26]. <http://www.who.int/mediacentre/news/releases/2016/zika-health-advice-olympics/en/>
8. World Health Organization. Fourth meeting of the Emergency Committee under the International Health Regulations (2005) regarding microcephaly, other neurological disorders and Zika virus [cited 2016 Dec 26]. <http://www.who.int/mediacentre/news/statements/2016/zika-fourth-ec/en/>
9. Ministerio da Saude. Secretaria de Vigilância em Saúde. Boletim Epidemiológico. Vol 47-nº33.; Brasilia 2016 [cited 2017 June 11]. <http://portalarquivos.saude.gov.br/images/pdf/2016/setembro/16/2016-028---Dengue-SE32.pdf>
10. Ministerio da Saude. Secretaria de Vigilância em Saúde. Boletim Epidemiológico. Vol 47-nº34.; Brasilia 2016 [cited 2017 June 11]. <http://portalsauze.saude.gov.br/images/pdf/2016/outubro/18/2016-029-Dengue-publicacao-n-34.pdf>

Address for correspondence: Natalia Rodriguez-Valero and Jose Muñoz, Department of Tropical Medicine and International Health, Hospital Clinic Barcelona. ISGlobal, Barcelona Centre for International Health Research (CRESIB), Hospital Clínic-Universitat de Barcelona C/Rosselló 132 2º2ª, 08036, Barcelona, Spain; email: natalia.rodriguez@isglobal.org and jose.munoz@isglobal.org

***Candidatus* *Dirofilaria hongkongensis* as Causative Agent of Human Ocular Filariasis after Travel to India**

Stefan Winkler, Andreas Pollreis, Michael Georgopoulos, Zsuzsanna Bagò-Horvath, Herbert Auer, Kelvin Kai-Wang To, Jürgen Krücken, Sven Poppert, Julia Walochnik

Author affiliations: Medical University of Vienna, Vienna, Austria (S. Winkler, A. Pollreis, M. Georgopoulos, Z. Bagò-Horvath, H. Auer, J. Walochnik); University of Hong Kong, Pokfulam, Hong Kong, China (K.K.-W. To); Freie Universität Berlin, Germany (J. Krücken); Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany (S. Poppert); Regio Klinikum, Wedel, Germany (S. Poppert)

DOI: <https://doi.org/10.3201/eid2308.170423>

We report a human case of ocular *Dirofilaria* infection in a traveler returning to Austria from India. Analysis of mitochondrial sequences identified the worm as *Candidatus* *Dirofilaria hongkongensis*, a close relative of *Dirofilaria repens*, which was only recently described in Hong Kong and proposed as a new species.

Dirofilariasis, caused by *Dirofilaria repens* or *D. immitis* nematodes, is a zoonotic filarial infection transmitted through the bite of various mosquitoes. The most frequent