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Editorial

Special Issue: "Echinococcosis"

Maria Victoria Periago [1,2]

[1] Consejo Nacional de Investigaciones Científicas y Técnicas, Buenos Aires C1425FQB, Argentina; vperiago@mundosano.org
[2] Fundación Mundo Sano, Buenos Aires C1061ABC, Argentina

Echinococcosis is a neglected tropical disease (NTD) that affects more than 1 million people, manifested mostly as cystic or alveolar echinococcosis (CE or AE, respectively) [1]. The causative agents of Echinococcosis are *Echinococcus granulosus sensu lato* for CE and *Echinococcus multilocularis* for AE. Many infected individuals will develop severe clinical syndromes, which are life-threatening if left untreated, and there are an estimated 19,300 deaths and around 871,000 disability-adjusted life-years (DALYs) globally each year. As this is a zoonotic disease, there are also costs associated with CE that are estimated to be US$3 billion for treatment and losses to the livestock industry [1]. The World Health Organization's response to this disease aims at strengthening control and prevention through the creation of an Informal Working Group on *Echinococcosis* (WHO-IWGE), in collaboration with strategic partners and relevant sectors [2].

Additionally, the Pan American Health Organization (PAHO) considers CE to be a priority in the region of the Americas, with a special emphasis on surveillance, diagnosis, management, and prevention of human cases, and a "South American initiative for the control and surveillance of cystic echinococcosis" was created and conformed by Argentina, Brazil, Chile, Paraguay, Peru, and Uruguay [3]. During the period from 2019 to 2021, 9511 cases were notified (79% of them from Peru, 12% from Argentina and 8.6% from Chile) [3]. CE is a notifiable disease in Argentina, Chile, and Paraguay, while in Brazil, its only notifiable in one state [3].

In this Special Issue, we presented studies that deal with different aspects of the disease that need to be further developed, according to the new roadmap for NTDs 2020–2030 [4]. Mujica et al. [5] and Avila et al. [5], presented studies that have to do with control measures that take into consideration dogs and livestock as part of the One Health approach. Mujica et al. [5] describe an ongoing diagnosis, treatment, surveillance, and control program for CE in the southern province of Rio Negro (Argentina), that has been implemented since 1980 by the Ministry of Health of the Province, including the use of the EG95 vaccines for lambs since 2006. Due to these coordinated efforts, the prevalence of infection in adult sheep decreased significantly between 2009 and 2020 and during 2020/2021 autopsy of adult goats showed a lack of infection. Moreover, prevalence of infection in dogs, as measured by coproELISA and PCR, also decreased significantly; as did the prevalence in the human population, including children under 16 years old. This program, which was implemented continuously, with the incorporation of new technologies as they became available, in an endemic province from a continental country, has been a success in reducing the prevalence of CE.

Avila et al. [6] describe a study that was conducted in another province of Argentina, located in the north, whose control program was started more recently, in 2013. Therefore, in this province, collection and mapping of epidemiological data is still needed to detect risk areas, establish priorities, and monitor progress and evaluate outcomes. Through this study, the authors showed the presence of *E. granulosus* s.l. in dogs and CE in humans in rural areas of Añatuya, Santiago del Estero Province, including a child under 16 years old [6]. The data collected serve as baseline and a starting point for the implementation

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of a program like the one implemented in Rio Negro [5] to minimize transmission of the parasite.

Another study conducted in a country from the Americas, in the Magallanes region of Chile, shows the importance of continuous monitoring, despite having a successful control program, to evaluate the need of complementary activities. Through the collection of environmental dog samples and analysis using PCR, Alvarez et al. [7] detected a possible resurgence of Echinococcosis in Ultima Esperanza Province. The control program was implemented until 2004 in this region and then in the following years sporadically for short periods of two to four years, therefore the results obtained through this monitoring in dogs highlights its usefulness for the implementation of focal control activities to keep transmission to livestock and humans low [7].

Finally, Halasz et al. [8], focus on *E. multilocularis*, given that there has been a recent increase of human AE cases throughout Europe. The authors conducted a study in southwestern Hungary focused on determining the prevalence of *E. multilocularis* in two sympatric wild carnivore species, the golden jackal and red fox, and the driving factors in infection dynamics using geomatic tools like spatial clustering analysis and land cover data [8]. Through this study, the authors highlight the role of the jackal, like that of the red fox, in the spread of *E. multilocularis* in this micro-epidemiological study with can serve as an example for other similar regions and point to the importance of the role of wild animals in the transmission of this zoonotic disease.

The studies presented in this Special Issue have all used innovative tools, either diagnostic or geomatic, as well as traditional prevention and control measures, to better understand the dynamics of infection of *Echinococcus* spp. in endemic areas for either *E. granulosus* s.l. or *E. multilocularis*. Moreover, they highlight the importance of the One Health approach for this zoonotic disease were animals (domestic and wild), humans and the environment all have a role to play.

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