pandemics of the 21st century, including severe acute respiratory syndrome, ebola, avian and swine flu, dengue, chikungunya, zika, monkeypox, and above all, COVID-19, that have raised unprecedented awareness on global health. They are all zoonoses or use an animal vector.

In 2018, four international organizations (WHO, Food and Agriculture Organization, UN, and World Organization for Animal Health [WOAH]) signed an agreement for collaboration and joint promotion of "*One health*", highlighting the close relationship and interdependence between human, animal, and environmental health (Fig. 1). It is a comprehensive and unifying approach to balancing and optimizing the health of people, animals, and ecosystems. It addresses the full spectrum of disease control, from prevention to diagnosis, management, and treatment, contributing to global health security.

According to the WHO, the "*One health*" concept refers to the global goal of increasing interdisciplinary collaboration (public health, medicine, sanitary, veterinary, research, environmental sciences, etc.) in the care of health of people, animals, and the environment, to develop and implement programs, policies, and laws in favor of improving global health.

The relationship between humans, other living beings, and ecosystems is dynamic. With a holistic vision, "*One health*" seeks to adapt to changing relationships that, in recent decades, are especially significant due to phenomena such as globalization, human travel and migration, changes in the geographical distribution of different animal species, climate change, deforestation, intensive livestock farming, new animal migratory routes, environmental pollution, etc. All this has favored the transmission of diseases, with jumps of microbes from animals to people (zoonoses), as new opportunities for contact between humans and animals have arisen, in altered ecosystems.

According to the WOAH, 60% of known human infectious diseases and more than 75% of emerging infectious diseases are of animal origin, either domestic or wild animals. Therefore, animal health is essential for the maintenance of public health. This integration of the health of humans, animals, and ecosystems must be reflected in the new policies of all countries. Areas where "*One health*'s" focus is particularly needed are food safety, zoonosis control, and the fight against antimicrobial resistance.

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HTLV-1 in Brazil: epidemiological scenario in the highest endemic country in the world

HTLV-1 infection is widely disseminated, mainly in developing countries, such as South America, and the Caribbean basin. Japan is also considered an important place for endemicity[1]. Since HTLV-1 is responsible for developing inflammatory diseases in almost 30% of infected people[2] and adult T-cell leukemia/lymphoma in 5-10% of carriers[3], it is important to implement measures to block virus transmission in a long fashion.

Brazil implemented a national HTLV screening in blood banks in 1993[4]. In 2023, discussions on universal maternal screening nationwide are taking place, after the publication of a cost-effectiveness study to implement this procedure in the Brazilian population[5]. Japan implemented national screening for HTLV-1 to prevent mother-to-child transmission (MTCT) in 2011, due to similar high prevalence of infection and vertical transmission[6].

A recent Japanese study evaluated a prefecture-wide antenatal adult T-cell leukemia prevention program in Nagasaki, where 57,323 pregnant women were screened for anti-HTLV-1 antibodies during 2011-2018. The results showed that 133 (0.79%) pregnant women were HTLV-1-positive during their first pregnancy and 9 (0.05%) seroconverted before or during subsequent pregnancies[7]. These data reinforce the importance of the implementation of programs to prevent MTCT of HTLV-1 in endemic countries, such as Brazil.

Since both strategies, inhibition of breast-feeding from HTLV-infected women and blood bank screening for HTLV antibodies showed important benefits for controlling and reduce new HTLV-1 infections, in Japan[8], similar initiatives in other endemic countries would perform equally well. These strategies should also be considered by health authorities in countries that receive migrants from areas known to have high HTLV-1 endemicity.

In Brazil, as the country with the largest number of HTLV-1 carriers in Latin America, the estimated number of infected persons approaches one million[9]. Paradoxically, HTLV screening is only recommended in blood banks since 1993[4], and public health policies miss other key populations, such as pregnant women, organ transplant donors, and clinics for sexually transmitted infections. Furthermore, there is a lack of infrastructure for caring with good clinical support to people already diagnosed with HTLV-1 infection.

Figure 1. *Estimated number of HTLV-1 infected people in Brazil (215 millions in year 2023).*

The most recent survey of HTLV prevalence in Brazil showed 10-year results (2007-2016) in first-time blood donors. HTLV-1/2 infection predominated in women, donors over 50 years of age, black skin color, and low education level. The rate of HTLV-1/2 infection remained stable during the study period, but a trend was noticed for an increased rate among the youngest ($p < 0.001$), males ($p = 0.049$), whites ($p < 0.001$), and higher education profile ($p = 0.014$)[10].

Considering the prevalence of HTLV in blood banks for the entire country, and despite the study being published in the mid 90's, estimates around 0.5% for the general population can be made[11]. Using prediction models such as those reported by Catalan-Soares[11] and the Instituto Brasileiro de Geografia e Estatística (IBGE)[12], nationwide estimates can be inferred (Fig. 1).

Approximately 1,150.000 individuals with HTLV-1 infection are currently living in Brazil, with the highest prevalence being noticed in the North and Northeast states. Accordingly, a recent study conducted in Belém city, Pará state (North Brazil), identified 2% of HTLV-1 infection in the general population, which could account for around 15,000 cases of myelopathy associated with HTLV-1 (HAM) in the region[13].

Based on this scenario, it would be naïve to plan or claim for HTLV elimination programs in the absence of effective measures to unveil people unaware of the infection and stop HTLV transmission. At this time, HTLV-1 transmission routes are clear[14-18], the risk of clinical development is well established[2,3,19-26] and death rates well figured out[27].

Given the lack of specific treatment and/or vaccine, any control of the HTLV-1 pandemic worldwide should follow the Japanese strategy, which relies in universal blood donor screening and avoidance of breastfeeding in HTLV-1+ pregnant women.

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