

We declare no competing interests.

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## Towards the elimination of HTLV-1 infection in Japan



The reported high prevalence of human T-cell leukaemia virus type 1 (HTLV-1) among the Aboriginal population in Australia triggered an open letter to WHO by Fabiola Martin and colleagues, urging action against HTLV-1 infection in May, 2018.<sup>1</sup> Japan is well known for having 1 million people living with HTLV-1 infection, the largest number in the world.<sup>2,3</sup> HTLV-1 infection is concentrated in the southern islands of Kyushu and Okinawa, but it has also spread to urban areas such as Tokyo and Osaka because of internal migration. Given the large burden of HTLV-1 in Japan, the Government of Japan has maintained its strong commitment towards the elimination of HTLV-1 and has been a leader in implementing various policies to address HTLV-1 infection and related diseases.

Japan has been taking a leading role in advancing science regarding HTLV-1, from the identification of mechanisms of HTLV-1 transmission to the discovery and treatment of HTLV-1-related diseases, including adult T-cell leukaemia-lymphoma, HTLV-1-associated myelopathy and tropical spastic paraparesis (HAM-TSP), and various inflammatory disorders.<sup>4–6</sup>

Japan was the first country to implement two main strategies for prevention of HTLV-1 transmission. For the prevention of mother-to-child transmission (MTCT) through breastfeeding, antenatal HTLV-1 antibody screening and the recommendation for mothers with positive results to refrain from breastfeeding have been implemented in the Nagasaki prefecture in Kyushu since 1987;<sup>7</sup> and HTLV-1 antibody screening of all donated blood in Japan has been implemented by the Japanese Red Cross since 1986.<sup>3</sup>

Efforts towards the elimination of HTLV-1 were further accelerated after the establishment of the HTLV-1 Task Force and endorsement of the Comprehensive Measures for HTLV-1 by the Japanese Government in 2010. The Comprehensive Measures consist of five main pillars. First, routine HTLV-1 antibody testing was incorporated into antenatal pregnancy screening throughout Japan in 2010. Second, counselling was made available for people living with HTLV-1 infection and associated diseases, and training materials and courses for health-care providers and counsellors were organised. Third, the coordination of care for HTLV-1-associated diseases was strengthened, with better coordination between health-care facilities that care for patients with HTLV-1-associated diseases and the development of guidelines for the management of adult T-cell leukaemia-lymphoma and HAM-TSP. Fourth, the website of the Ministry of Health, Labour and Welfare was updated to provide information on HTLV-1 infection and associated diseases, and communication materials were developed and distributed to raise public awareness. Fifth, research on epidemiology, pathophysiology, diagnosis, and therapy was strategically promoted, with JP¥10 billion (approximately US\$9 million) specifically assigned on a recurring annual basis for the research of HTLV-1-associated diseases.

To promote these five main pillars of policy, the Comprehensive Measures introduced the establishment of the HTLV-1 Control Promotion Council, consisting of patient groups, scientists, health-care professionals,

and government officials; of public health councils in each prefecture for the prevention of MTCT of HTLV-1; and of conferences to better coordinate projects among the various research groups on HTLV-1 infection and associated diseases.

Further progress after the endorsement of the Comprehensive Measures in 2010 include the following measures. A manual on prevention of MTCT of HTLV-1 was developed, which was revised in 2016 to recommend exclusive formula feeding for all mothers who are positive for HTLV-1.<sup>8</sup> Previous recommendations included short-term breastfeeding or frozen-thawed breastmilk feeding, in addition to formula feeding. For pregnant women positive for HTLV-1 antibody, but with an indeterminate result with the western blot test, confirmatory PCR tests are now recommended. 135 health-care facilities provide care for people living with HTLV-1 infection, 146 for people with adult T-cell leukaemia-lymphoma, and 92 for people with HAM-TSP. The Japanese Society of HTLV-1 and Associated Diseases offers accreditation to registered health-care facilities, core hospitals that provide counselling and support services for people living with HTLV-1 and training for health-care workers. This accreditation started in 2018, and six hospitals have been accredited. Lastly, a public awareness campaign, in collaboration with Hataraku Saibou (Cells at Work!; a Japanese animation series), was launched in 2018.

We need to acknowledge further challenges to be tackled. Progress is still needed in basic and clinical research; it is still very difficult to save the life of patients with adult T-cell leukaemia-lymphoma, there is no cure for HAM-TSP, and it is also difficult to prevent the development of HTLV-1-associated disease in

people living with HTLV-1 infection. The promotion of preventive measures and awareness of horizontal transmission, mainly sexual transmission, is needed. Routine screening for HTLV-1 in organ donors needs to be considered and more data are needed to assess the prognosis of organ recipients from donors positive for HTLV-1.

Japan continues its strong commitment towards the elimination of HTLV-1. We believe that our progress towards this goal, and our approach to current challenges and future directions, could serve as a good model for other countries in tackling HTLV-1 infection.

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