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PERSPECTIVE

Non-Chinese Immigrants: Challenge Faced by Yunnan of China to Achieve the 90–90–90 Goals

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China's AIDS epidemic started among people who inject drugs (PWID) in Ruili county-level city, a China–Myanmar border city of Yunnan Province, in 1989 (Fig. 1). Since then HIV has spread rapidly across the country (He and Detels 2005). China launched a "Four Frees and One Care" policy in 2003 to fight against HIV/AIDS. As one of the worst hit regions by HIV/AIDS in China, Yunnan initiated a people's campaign to fight against HIV/AIDS with already over 670 million US dollars spent on the fight since 2005. After three rounds of the campaign, great achievements were obtained. By October 2016, there were 93,437 people living with HIV/AIDS (PLWHA) in Yunnan, accounting for 14.3% of the total cases in China (Gao 2016). HIV detection and antiretroviral treatment (ART) rates increased from 40% to 78%, and 12.1% to 74.1%, from 2005 to 2016, respectively, and the viral suppression (with viral load less than 50 copies per milliliter) rate of PLWHA receiving ART achieved 88.6% in 2016 (Gao 2016). Now, the fourth round of the campaign has been launched and these efforts may make Yunnan the first province to achieve the Joint United Nations Programme on HIV/AIDS (UNAIDS) 90–90–90 goals in China.

However, Yunnan still faces a huge challenge in achieving the 90–90–90 targets by 2020 and eradicating AIDS from the population by 2030. The concern arises from the cross-bordering immigrants from surrounding countries where there is a prevalence of HIV/AIDS. Compared with surrounding countries, rapid economic development, stable political and comprehensive social environments, as well as abundant tourism resources, make Yunnan an attractive region for a large number of cross-border immigrants. Approximately 16 million immigrants were estimated to enter Yunnan annually from 2003 to 2012, via the land ports of Dehong Prefecture (Fig. 1), the highest HIV/AIDS burden region of Yunnan Province (Zhang *et al*. 2017). Some immigrants frequently crossed the China–Myanmar border for work and trade, and the others settled in Yunnan (Li *et al*. 2014); for example, there are more than 50,000 Burmese living in Ruili county-level city alone (Fig. 1).

In response to the large influx of immigrants with HIV/AIDS, Yunnan Province has implemented several measures to aid in the diagnosis and treatment of these individuals. Up until 2016, Yunnan offered free HIV testing services for the nearly 70,000 immigrants living in the region, which identified 10,198 HIV cases, and provided free ART and prevention of mother-to-child transmission services to 1106 people in the immigrant community (Gao 2016). In September 2016, UNAIDS Executive Director Michel Sidibé traveled to China on a week-long fact-finding mission regarding the progress of reducing the number of PLWHA, and was highly impressed with the effective strategies adopted by Dehong Prefecture, which opened its key HIV services to non-Chinese people who had residence and employment permits and health certificates (UNAIDS 2016). These services, including HIV counselling and testing, health education, needle exchange, and methadone maintenance treatment, were mainly aimed at the high-risk Burmese in Yunnan, such PWID and truck drivers (Li *et al*. 2014; UNAIDS 2016). As a result, Dehong became the only prefecture in Yunnan Province to receive public recognition for having reversed its AIDS

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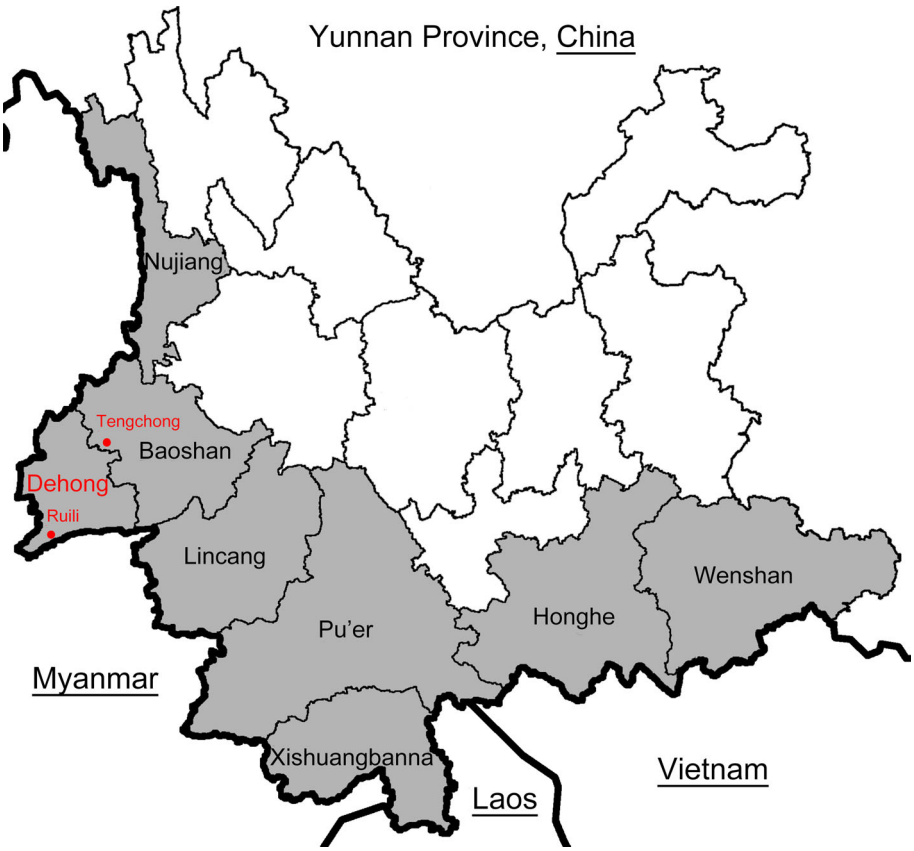

Fig. 1 The geographic location of Yunnan Province of China. The gray shadows indicate the prefectures of Yunnan Province which border with other countries.

epidemic, this was a remarkable turnaround in the control of HIV/AIDS in Yunnan.

Although these services were made available, the majority of non-Chinese people in Yunnan still find it difficult to access HIV services provided by the Yunnan government, and the rate of ART in these non-Chinese is relatively lower compared with ethnic Chinese. From 2010 to 2013, we recruited 442 Burmese PWID in communities and detoxification centers in Dehong Prefecture, and revealed that 44.2% (34/77) of HIV infected Burmese self-reported to have tested HIV previously (knew of HIV status), and 41.6% (32/77) were currently receiving ART, substantially lower than those of Chinese individuals in Yunnan (78% and 74.1%; $P < 0.001$). From 2013 to 2014, we recruited 431 drug users from detoxification centers in northern Myanmar, and found that HIV detection rates among them were only 8.9% (4/45), significantly lower than Burmese PWID in Yunnan ($P < 0.001$). Phylogeographic analyses showed that the cross-border transmission of HIV between Myanmar and Yunnan was ongoing during the last two decades, and was mainly associated with Burmese PWID (unpublished data). Another often-neglected at-risk group is foreign brides, of which about 25,000 Burmese brides are estimated to live in Yunnan (Hackney 2015). A previous cross-sectional investigation revealed a 2.2% HIV prevalence among 600 Burmese brides in Tengchong county-level city (Fig. 1), neighboring with Dehong, and about 65.6% of HIV infected brides knew their status (Xu *et al*. 2014). These HIV infected non-Chinese immigrants, who were not receiving ART and were outside of the HIV monitoring system, are likely to be a large reservoir for the continuous spreading of HIV, which blocks Yunnan's advance to the 90–90–90 targets.

The question then arises, what is the underlying cause for the high proportions of non-Chinese immigrants that do not avail of HIV tests and ART treatment? We believe there are three causes: (1) Yunnan's economic development has produced a large demand for an immigrant labor force. Additionally these immigrants actively contribute to the working economy of Yunnan, they are also more likely to be infected with AIDS/HIV (Zhang *et al*. 2017; Zhou *et al*. 2014); however, except for Dehong Prefecture, few neighboring prefectures open their key HIV services to non-Chinese immigrants (Fig. 1); (2) the majority of immigrants come to Yunnan for jobs and are not willing to avail of HIV services since they (especially the undocumented immigrants) are afraid of exposing their identities and therefore may face deportation; financial concerns also limit the use of HIV testing services and treatment; and (3) the high mobility of the immigrant population makes it difficult to trace and monitor, HIV positive individuals,

even if they did avail of HIV/AIDS prevention and care service sites.

How to then do we prevent new HIV infections caused by non-Chinese immigrants? Relative to the government-led service agencies, these immigrants may prefer to avail of services from non-governmental organizations (NGOs). Several NGOs have participated in the control of HIV/AIDS in Yunnan by providing health education, HIV counselling and testing, needle exchange, and condom distribution (Des Jarlais *et al*. 2007; Zhang *et al*. 2016). More NGOs should be encouraged to join the campaign in the fight against HIV/AIDS by providing additional services for non-Chinese immigrants such as access to free ART. On the other hand, at the government level, a snowball sampling method is recommended to investigate the exact numbers of non-Chinese immigrants in Yunnan with HIV, as previously described (Wohl *et al*. 2017; Magnani *et al*. 2005). Furthermore, we suggest largely simplifying the application process of non-Chinese immigrants for legal identity, which will benefit the undocumented immigrants, and make access to HIV services easier for this population. Finally, to achieve the 90–90–90 goals, free ART should cover the entire non-Chinese immigrant population, not just the non-Chinese mother-to-child transmission cohort.

In August 2017, the "Belt and Road High Level Meeting for Health Cooperation" held in Beijing, aimed to build a Health Silk Road (Sidibé 2017). As the most important land gate of China to connect with Southern Asia countries, Yunnan should implement new policies and strategies to control the HIV epidemic among non-Chinese immigrants in order to achieve the 90–90–90 targets by 2020.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Animal and Human Rights Statement This study was approved by the Ethics Committee of Kunming Institute of Zoology, Chinese Academy of Sciences (approval number: SWYX-2009021; approval date: January 7, 2009). Written informed consents were obtained from all participants.

References

Des Jarlais DC, Kling R, Hammett TM, Ngu D, Liu W, Chen Y, Binh KT, Friedmann P (2007) Reducing HIV infection among new injecting drug users in the China–Vietnam Cross Border Project. AIDS 21(Suppl 8):S109–S114

Gao F (2016) 39th Meeting of the UNAIDS Programme Coordinating Board [Internet]. http://www.unaids.org/sites/default/files/media/documents/PCB-39_Yunnan-Province-vice-governor_en.pdf. Accessed 2 Mar 2018

Hackney L (2015) Re-evaluating Palermo: the case of Burmese women as Chinese brides. Anti-Traffick Rev 4:98–119

He N, Detels R (2005) The HIV epidemic in China: history, response, and challenge. Cell Res 15:825–832

Li L, Assanangkornchai S, Duo L, McNeil E, Li J (2014) Cross-border activities and association with current methamphetamine use among Chinese injection drug users (IDUs) in a China–Myanmar border region. Drug Alcohol Depend 138:48–53

Magnani R, Sabin K, Saidel T, Heckathorn D (2005) Review of sampling hard-to-reach and hidden populations for HIV surveillance. AIDS 19:S67–S72

Sidibé M (2017) Belt and road high level meeting for health cooperation: towards a health silk road [Internet]. http://www.unaids.org/sites/default/files/media_asset/20170818_EXD_speech_belt-and-road-health-forum_en.pdf. Accessed 2 Mar 2018

UNAIDS (2016) Dehong makes remarkable turnaround in its AIDS epidemic [Internet]. http://www.unaids.org/en/resources/presscentre/featurestories/2016/september/20160912_Dehong. Accessed 2 Mar 2018

Wohl AR, Ludwig-Barron N, Dierst-Davies R, Kulkarni S, Bendetson J, Jordan W, Bolan R, Smith T, Cunningham W, Pérez MJ (2017) Project engage: snowball sampling and direct recruitment to identify and link hard-to-reach HIV-infected persons who are out of care. J Acquir Immune Defic Syndr 75:190–197

Xu Y, Fu LR, Jia M, Dai G, Wang Q, Huang P, Zheng H, Peng Z, Wang L, Yu R, Wang N (2014) HIV prevalence and associated factors among foreign brides from Burma in Yunnan Province, China. PLoS One 9:e115599

Zhang J, Dong JQ, Li JY, Zhang Y, Tian YH, Sun XY, Zhang GY, Li QP, Xu XY, Cai T (2016) Effectiveness and impact of the cross-border healthcare model as implemented by non-governmental organizations: case study of the malaria control programs by health poverty action on the China–Myanmar border. Infect Dis Poverty 5:80

Zhang L, Wang B, Liang Y, Feng Y, Dong S, Wang Y, Li Y, Zhang AM, Liu L, Qin W, Xia X (2017) Phylogenetic characteristics of HIV-1 among travelers entering China from Myanmar: a retrospective study. J Med Virol 89:1404–1411

Zhou YH, Liang YB, Pang W, Qin WH, Yao ZH, Chen X, Zhang C, Zheng YT (2014) Diverse forms of HIV-1 among Burmese long-distance truck drivers imply their contribution to HIV-1 cross-border transmission. BMC Infect Dis 14:463