TITLE:

People born in non-main English speaking countries are less likely to start HIV treatment early in Australia: A national cohort analysis, 2014-15.

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Introduction

In Australia, people born in Sub-Saharan Africa, South-East Asia and North-East Asia have HIV diagnosis rates 2-4 times higher than people born in Australia\(^1\), and are more likely to be diagnosed late with a CD4 count < 350 cells/µl\(^1\). Late presentation is associated with a significantly increased incidence of AIDS or death\(^2\). Once diagnosed, overseas-born people living with HIV (PLHIV) can face numerous linguistic, cultural and financial barriers to linkage and retention into HIV treatment and care\(^3\).

Prompt diagnosis and treatment of HIV is beneficial both for individuals and for reducing onward transmission in the community\(^4,5\). Many studies in high-income countries have focused on late diagnosis among migrant PLHIV, but few on clinical pathways and outcomes after diagnosis with these populations. In Australia there has only been one study comparing Australian-born HIV patients with those born overseas in high or low/middle-income countries, which found no differences in routine monitoring of HIV infection, loss to follow up or outcomes such as undetectable viral load\(^6\), but utilised a patient cohort who were treatment-experienced rather than newly diagnosed, with 30% excluded because country of birth information was missing\(^6\). A Canadian study also found foreign-born PLHIV were as likely as Canadian-born non-Aboriginal PLHIV on anti-retroviral treatment (ART) to achieve virological suppression, but did not investigate differences between groups in the likelihood of being on treatment once diagnosed\(^7\).
Research to date in other high-income countries utilised patient data prior to 2014, before guidance was released internationally and in Australia recommending ART be initiated in all adults living with HIV\textsuperscript{8,9}. As of November 2013, all Australian citizens and residents diagnosed with HIV can access subsidised ART through the Pharmaceutical Benefits Scheme (PBS) irrespective of CD4 count\textsuperscript{10}. The aim of this study – the first we are aware since universal ART guidelines were introduced - was to estimate the proportion of patients born in non-main English speaking countries and newly diagnosed with HIV in Australian sexual health clinics who had initiated treatments six months after diagnosis, compared to other patients.

**Methods**

We used de-identified data from 43 publically funded sexual health services participating in the Australian Collaboration for Coordinated Enhanced Sentinel Surveillance of Blood Borne Viruses and Sexually Transmitted Infections (ACCESS) network in New South Wales, Western Australia, Victoria, Queensland and the Northern Territory\textsuperscript{11}. All patients diagnosed with HIV between 1 January 2014 and 30 June 2015 were included and categorised as ‘culturally and linguistically diverse (CALD)’ or ‘other’. CALD patients were those born in a country where English is not the main language spoken, in line with definitions used by government health and statistics bodies\textsuperscript{12,13} and scientific literature showing CALD populations have specific health care needs\textsuperscript{14}. Other patients were born in Australia or a main English-speaking country i.e. United Kingdom, Republic of Ireland, New Zealand, Canada, United States of America\textsuperscript{12}. Though designated as main-English speaking, South
African-born patients were included in the CALD category as evidence suggests they can face similar barriers to other CALD patients in accessing HIV services after migration to a high-income country\textsuperscript{15,16}.

Patients were followed up for a maximum of 183 days (6 months) following diagnosis and assessed as having commenced treatment early if they had recorded ART initiation prior to this time. Patients were excluded from the primary analysis if they were recorded in the treatment file as accessing HIV management at another clinic.

Demographic and clinical variables were included in the analysis\textsuperscript{17}. Missing values of viral load at diagnosis were imputed using ordinal logistic regression. Data on year of arrival variable was available but collinear with CALD patient status and excluded from further analysis.

The primary outcome was the proportion of patients in each group on treatment six months after diagnosis. The demographic profiles of CALD and other patients were compared using Pearson X\textsuperscript{2} test for categorical variables and Wilcoxon rank-sum test for median values. We explored differences in time to treatment by CALD status using Kaplan-Meier curves and log-rank tests. Univariate and multivariate Cox proportional hazards models stratified on treatment centre were used to assess unadjusted and adjusted associations with being on treatment 6 months after diagnosis. A model was also developed adjusting for the competing risk of loss to follow up, and sensitivity analyses conducted - one, including men who have sex with men (MSM) only, two, excluding patients with incomplete follow-up (more than 6 months between clinic visits) and three, including patients managed at other clinics,
with these patients assigned late treatment status unless otherwise indicated on file.

Only variables significant at the 5% in the level in the univariate analysis were
included in the multivariate model. All events were censored at 31 December 2015.

STATA statistical software, version IC 14 (StataCorp, College Station, Texas, USA) was
used for all analyses.

Ethics

The ACCESS Project received ethical approval from the human research ethics
committees of Central Australia, St Vincent’s Hospital (Sydney), Cairns Hinterland
Health Service District, Menzies School of Health Research, South Metropolitan Area
Health Service District, Gold Coast Health Service District, the Alfred Hospital, the
Princess Alexandra Hospital, and Townsville Health Service District.

Results

Between 1 January 2014 and 30 June 2015, 290 patients were diagnosed with HIV at
participating sexual health services - 104 CALD and 186 other patients. CALD patients
were younger, more likely to be female, reside in major cities, be heterosexual and
had a lower median CD4 count at diagnosis compared to other patients (Table 1).

By 6 months follow up, the Kaplan-Meier estimates of being on treatment were
44.2% (95% CI 35.3-54.2) for CALD patients and 58.6 % (95% CI 51.6-65.7) for other
patients (log rank test p=0.011).
In the univariate Cox proportional hazards model, being a CALD patient, being MSM and having a higher CD4 count at diagnosis were associated with a lower probability of having started treatment 6 months after diagnosis (Table 1). In the multivariate model, after adjusting for CD4 count at diagnosis and MSM status, CALD patients were still 47% less likely to have initiated treatment by 6 months after diagnosis (Table 1). When considering MSM only, CALD patients were 41% less likely to be on treatment at 6 months than other patients after adjusting for CD4 count (aHR 0.59, 95% CI 0.38-0.93, p=0.023). A model adjusting for competing risk of loss-to-follow-up (aHR 0.55, 95% CI 0.37-0.82, p=0.003) and sensitivity analyses excluding patients with incomplete follow-up (aHR 0.64, 95% CI 0.43-0.95, p=0.028) or including patients with recorded treatment at other clinics (aHR 0.52, 95% CI 0.35-0.77, p=0.001) produced similar results.

Discussion

This is the first study we are aware of in a high-income country, post universal treatment recommendations, to consider differences in time between diagnosis and treatment initiation for HIV-positive persons born in a non-main English speaking country compared with persons born in Australia or another main-English speaking country. CALD patients were significantly less likely than other patients to have commenced ART at six months after diagnosis, irrespective of CD4 count.

These findings are consistent with previous studies in high-income countries concerning ethnic differences in HIV treatment initiation. Income was an important correlate in some of these studies, but its' effect is likely to be attenuated in Australia, where sexual health services provide health care such as HIV testing to
anyone free of charge and antiretroviral treatment is subsidised for Australian citizens and permanent residents under the PBS. Some people living with HIV in Australia, such as temporary visa holders, are ineligible for treatment subsidies, though at least some are able to access ARVs through compassionate access schemes or state-based public health services including hospitals.\textsuperscript{21}

Other factors causing delays in treatment initiation amongst HIV-positive CALD patients could include difficulty coming to terms with the diagnosis, compounded by the stigma which still surrounds HIV in some communities, and concern about what an HIV diagnosis might mean for their visa status.\textsuperscript{14,21} Linguistic barriers and a lack of access to interpreter services can make it more difficult for health care providers to communicate to migrant patients, particularly those with limited English, around the individual and community benefits of starting ART early. Finally indirect costs for example around transport, and low levels of knowledge about the Australian health care system can also be impediments.\textsuperscript{3,22}

This study has a few limitations. One, the sample size was relatively low and may have reduced the ability to accurately detect differences between migrant and non-migrant patients and adjust for factors such as age, sex, exposure and region of birth. Two, our study focused on sexual health clinics and findings may not be generalizable to CALD patients who receive care in other settings.

In summary HIV-positive CALD patients at sexual health services are less likely than other patients to initiate treatment within six months of diagnosis. Reducing any financial barriers to access, increasing health literacy among CALD migrants and health professionals’ ability to communicate – in a culturally and linguistically
appropriate way – the benefits of starting treatment early may be needed to reduce this gap.

REFERENCES


16. Thomas F, Aggleton P, Anderson J. "If I cannot access services, then there is no reason for me to test": the impacts of health service charges on HIV testing and treatment amongst migrants in England. *AIDS Care*. 2010;22(4):526-531.


Table 1 Association of demographic and clinical factors with being on treatment 6 months after HIV diagnosis

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1. Excludes 8 participants with treatment management at other clinics (3 CALD, 5 other)
2. Includes 38 (36.5%) CALD patients and 50 (26.9%) other patients lost to follow-up at some stage in the first 6 months of the analysis (p=0.086). These participants were assigned late treatment status in primary analysis. The adjusted hazards ratio for multivariate competing risks model for CALD patients was 0.55 (95% CI 0.37-0.82), p=0.003. The adjusted hazards ratio for a multivariate model excluding participants lost-to-follow-up was 0.64 (95% CI 0.43-0.96), p=0.028.