Acceptable Levels of HIV Viral Suppression for Men with Long-Term Resident Status Revealed a Gap for Undocumented Internal Migrants in Shanghai During the SARS-CoV-2 Pandemic

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Background:

- > In 2020 there were approximately 249 million rural-to-urban internal Chinese migrants.¹
- > 80% of HIV infections in China were previously found among internal migrants.²
- Prior to SARS-CoV-2 HIV-positive migrants with no Shanghai residence identification were required to return to their home province (Hukou) to receive free antiretroviral treatment (ART) and viral load (VL) testing as part of the national HIV program.

Methods:

- > ART-naïve men in Shanghai were invited to participate if they:
- were newly confirmed HIV-positive
- 18+ years of age
- living in Shanghai
- ➢ initiated care at the downtown satellite facility of the SPHCC
- During SARS-CoV-2, China adopted a person-centered policy focused on provision of ART to migrants where they lived and worked.

Objective:

Our analysis aimed to compare attainment of undetectable viral load (uVL) among migrant men with and without residency status in Shanghai during a locally expanded treatment policy from 2021 to 2022.

Results:

Sample

- 151 of 163 eligible men were recruited from the downtown satellite clinic of the Shanghai Public Health Clinical Center (SPHCC) from May 2021 to March 2022.
 - 23.2% had an external permanent Shanghai residence status
 - 23.8% had Shanghai hukou status
 - 16.6% had a temporary Shanghai residence status
 - 36.4% had no Shanghai residence identification
- Median age = 27 years (IQR: 25, 36.5).

ART initiation

- Most men (98.7%) started ART within 9 months of a confirmatory HIV diagnosis.
- Mean duration from diagnosis to ART start was 20.8 days (SD=22.4, median=15).
- Median time from HIV diagnosis to ART start was shorter for Shanghai hukou residents (9.0 days) compared to other migrant groups (15.0-19.0 days, p=0.023).

- Data sources included
 - an interviewer-administered survey and
 - > follow-up chart extraction or study-administered viral load test 6-months post-ART initiation.
- Per national guidelines, uVL was defined as VL<40 copies/mL.</p>
- Firth logistic regression was used to estimate adjusted odds ratios (aOR) and 95% confidence intervals (CI).

Table 1 – Unadjusted and adjusted Odds of undetectable viral load (uVL) (<40 copies/mL)</th>9-months post-ART initiation by participants' Shanghai residency status.(N=150; 1 participant missing CD4 measure)

Characteristic		Achieved uVL 9				
	Total	months post	Crude Odds of uVL	-	Adjusted Odds of	uVL
		ART initiation		PLR		PLR
	Ν	N (%)	OR (95% CI)	p-value	OR (95% CI)	p-value
Shanghai Residence				0.184		0.0804
External permanent	35	30 (85.7)	1		1	
Hukou	36	23 (63.9)	0.31 (0.09, 0.93) **		0.3 (0.06, 1.17)	
Temporary	25	17 (68.0)	0.37 (0.1, 1.24)		0.24 (0.05, 1.06) *	
None	55	39 (70.9)	0.43 (0.14, 1.21)		0.19 (0.04, 0.72) **	
Age at Interview	150		0.974 (0.84, 1.141)	0.735	1.06 (0.78 <i>,</i> 1.46)	0.701
(centered, scaled by 5 years)		-				
Marital status				0.397		0.120
Single, never married	110	79 (71.8)	1		1	
Married	29	23 (79.3)	1.43 (0.57, 4.02)		1.38 (0.26, 8.07)	
Formerly married	12	7 (58.3)	0.54 (0.17, 1.84)		0.21 (0.03, 1.35)	
Education				0.837		0.933
\leq High school	33	23 (69.7)	1		1	
Vocational/college	92	66 (71.7)	1.12 (0.46, 2.6)		0.81 (0.21, 2.88)	
Professional/ university	26	20 (76.9)	1.41 (0.46, 4.61)		0.76 (0.15, 3.65)	
degree				0.400		0.000
Had consensual sex with	01	(2)	1	0.199	1	0.299
ivien only	91	63 (69.2) 10 (62.5)				
Women only Both man and woman	10	10(62.5)	0.73(0.25, 2.22)		0.59 (0.12, 3.15)	
Both men and women	44	50 (81.8)	1.95 (0.84, 4.82)		1.85 (0.55, 0.88)	
CD4 measure - initial	150	-	1.25 (1.00, 1.60)	0.052	1.40 (1.07, 1.93)	0.0146
(centered, scaled by 100)						
Missed opportunity for VL testing to 9 months	150	-	0.893 (0.85, 0.93)	<0.0001	0.88 (0.83, 0.93)	<0.0001

Attaining undetectable viral load

- \geq 72.7% were undetectable at <40 copies/mL by 9-months after a confirmatory HIV diagnosis.
- Men with no Shanghai residence identification had lower odds of uVL by 9-months (aOR: 0.19, 95% CI: 0.04, 0.72; p=0.0124) compared with other men (Table 1).
- > Routine viral load tests are expected at 6-months after ART start per national guidelines.
- Most participants (88.1%) received a viral load measure by 9-months post confirmatory HIV diagnosis; however, there was no evidence for differences by residence status (p=0.862).
- For each 100 cells/µL increase in baseline CD4 count, participants experienced higher odds of uVL (aOR: 1.40, 95%CI:1.07, 1.93; p<0.0001).</p>

Limitations:

- We found a lower proportion of undetectable participants compared with other Chinese reports (72.7% vs 96.1%).
- > Differing definitions of uVL and a focus on internal migrants may have led to an underestimation of uVL.
- Recruitment occurred sequentially at the downtown satellite clinic of the SPHCC which limited representativeness and generalizability.
- \succ VL measures were missing for 11.9% of the sample which may have biased uVL estimates.

* p≤0.10, ** p≤0.05, *** p≤0.01, **** p≤0.001, **** p≤0.0001,

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Conclusions:

- > Our study found a high proportion of ART initiation (98%) and uVL attainment (73%) within 9 months after HIV diagnoses in Shanghai.
- > Although enhanced person-centered approaches to HIV treatment delivery during SARS-CoV-2 may have expanded access to treatment, undocumented migrant men struggled to attain a level of uVL comparable

to men with other residence statuses.

External permanent residents and those with Shanghai hukou were registered with local authorities; men with no Shanghai residence identification were not, which may enable inequities in access to ART and VL testing.

> Men not born in Shanghai but with permanent Shanghai residence may have benefited from the healthy immigrant effect compared with men born in Shanghai.

> These findings suggest that continued expansion of person-centered HIV treatment in Shanghai can facilitate consistent and sustainable viral suppression in major Chinese urban centers.

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We have no conflicts of interest to declare.

