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THE RELATIONSHIP BETWEEN THE HIV-1 TRANSMISSION NETWORK AND THE HIV CARE CONTINUUM IN LOS ANGELES

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BACKGROUND

Successful public health action combatting HIV relies on navigation through the HIV continuum of care: timely diagnosis of infection followed by linkage to care and initiation of antiretroviral therapy to achieve and maintain viral suppression.

QUESTION: How do genetic transmission clusters relate to progression through the care continuum?

METHODS

- *Population:* 5,226 adults residing in Los Angeles (LA) county, diagnosed between 2010-2014, with an HIV-1 *pol* sequence
- *Independent Variable:* Cluster growth at diagnosis based on HIV-TRACE (genetic distance threshold ≤0.015 substitution/site)
- *Outcome:* Months to (i) linkage to care, (ii) viral suppression, and (iii) post-suppression viral rebound
- *Statistic:* Cox proportional hazard and gamma frailty models, adjusted for transmission risk and demographic

RESULTS

Members of the same HIV genetic transmission clusters have similar trajectories through the HIV care continuum

Individuals in rapidly growing clusters at time of diagnosis take longer to experience viral rebound

Heterogeneity in timing to events in the care continuum due to cluster membership (θ) was highly significant

Continuum Interval	Cluster growth	Time Ratio	95% CI	θ	*P*
Diagnosis to care	Low	Ref.	–		–
	Medium	0.98	0.85-1.14		0.848
	High	0.91	0.77-1.07		0.252
				0.11	**<0.001**
Care to suppression	Low	Ref.	–		–
	Medium	1.07	0.99-1.14		0.061
	High	1.04	0.96-1.11		0.349
				0.28	**<0.001**
Suppression to rebound	Low	Ref.	–		–
	Medium	1.10	0.91-1.31		0.321
	High	1.38	1.14-1.68		0.001
				0.13	**0.005**

Table 1. Adjusted time ratios for months to events by cluster growth accounting for membership in same transmission cluster. Heterogeneity due to cluster membership is shown in **red**.

Cases in high growth clusters took longer to experience viral rebound than cases in low growth clusters

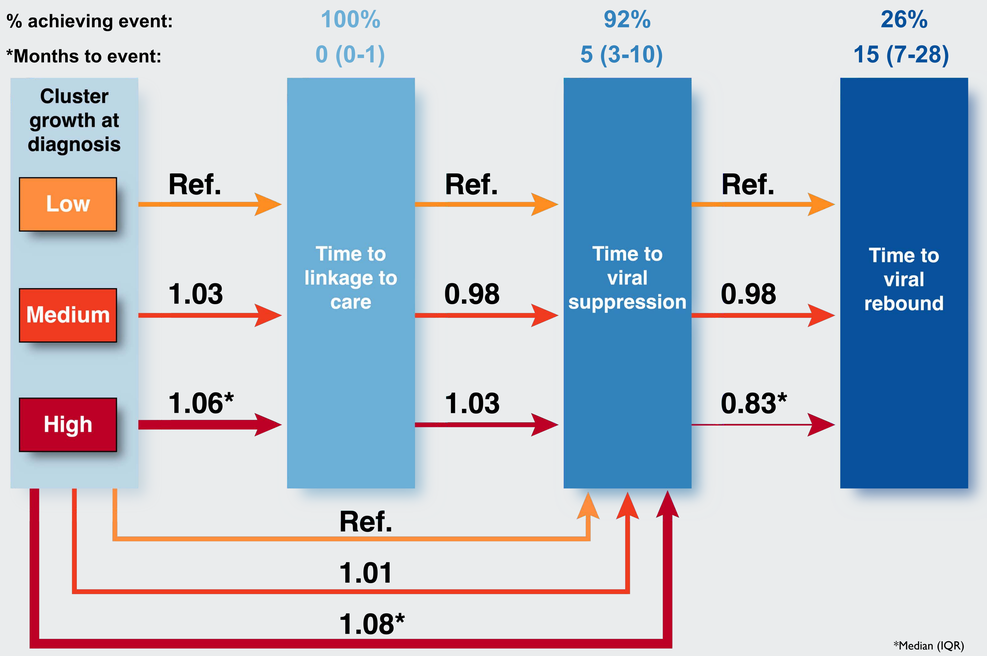


Figure 1. Flow diagram of progression through the HIV care continuum based on cluster growth at diagnosis. Reported adjusted hazard ratios with arrows showing path between care continuum events.

If linked to care >2 months after diagnosis, cases in medium and high growth clusters reached suppression faster compared with low growth clusters

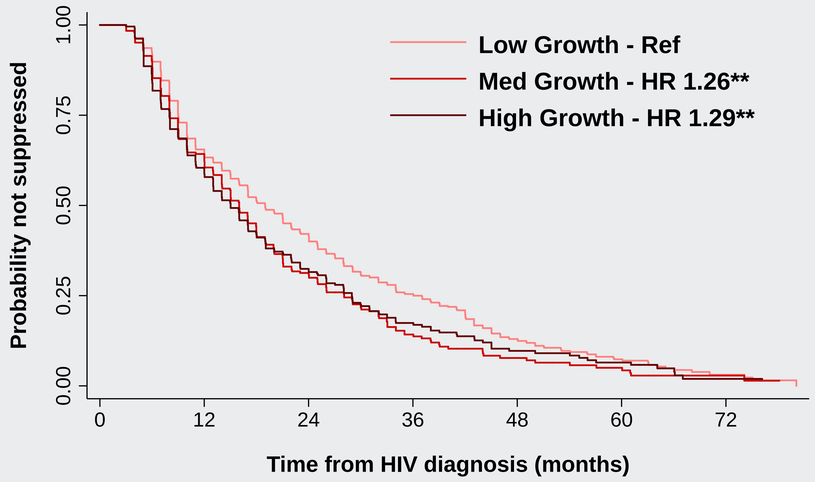


Figure 2. Kaplan-Meier estimates and adjusted hazard ratios (HR) of time from diagnosis to viral suppression if linked to care in >2 months.

CONCLUSIONS

- Our results do not support the hypothesis that rapidly growing clusters is associated with prolonged viremia due to slower progression through the HIV care continuum.
- Timing of progression to events in the HIV care continuum was more similar among individuals from same transmission cluster than among individuals in different transmission clusters
- Molecular epidemiology can identifying clusters of individuals who may benefit from assistance in navigating the HIV care continuum
- Planned efforts to reduce HIV incidence through *Ending the HIV Epidemic Initiative* can benefit further from this studying this relationship

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