USING MOLECULAR EPIDEMIOLOGY TO CHARACTERIZE HIV TRANSMISSION NETWORKS OF TW AND MSM

1388

Jessica Long[1], Joshua T. Herbeck[1], Hugo Sanchez[2], Sari Reisner[3], Kenneth H. Mayer[4], James Mullins[1], Javier R. Lama[5], **Ann Duerr[6]**
[1]University of Washington, Seattle, WA, USA, [2]Epicentro, Lima, Peru, [3]Harvard T.H. Chan School of Public Health, Boston, MA, USA, [4]The Fenway Institute, Boston, MA, USA, [5]Asociacion Civil Impacta Salud y Educacion, Lima, Peru, [6]Fred Hutchinson Cancer Research Center, Seattle, WA, USA

BACKGROUND

- HIV prevalence in Peru is ~30% among transgender women (TW), 12-18% among men who have sex with men (MSM), and <1% in the general population
- TW report high prevalence of behavior associated with HIV risk, but the source of HIV among TW is unclear
- HIV spreads in other risk groups through intra-group transmission (e.g. MSM, injection drug users) but TW primarily report cisgender male sexual partners who they identify as bi- or heterosexual
- If TW and MSM comprise different sexual networks, we expect to observe minimal overlap in HIV transmission networks
- Alternately, MSM sexual networks may be a source of HIV that spreads to TW, through men who have sex with both TW and MSM

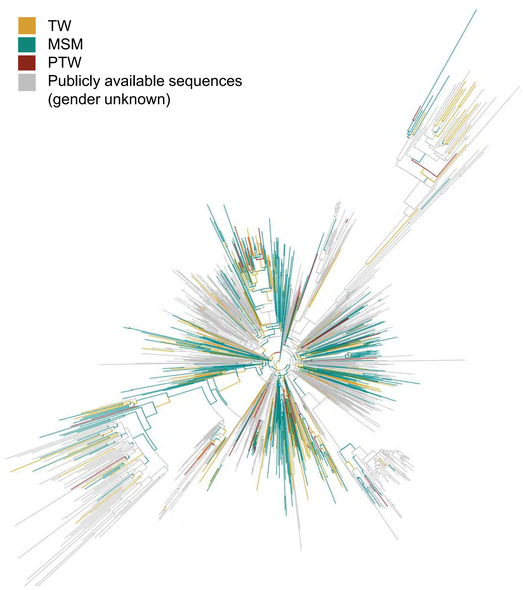
METHODS

- HIV-1 *pol* sequences and epidemiologic data were collected through 3 research studies conducted among high-risk MSM, TW, and sexual partners of TW in Lima from 2013–2017
- An HIV phylogeny and putative transmission network were reconstructed; the alignment used newly collected sequences plus all South American sequences from the Los Alamos HIV Database (as of 2018; n=552)
- Molecular clusters were defined as ≥2 sequences linked to each other based on a TN93 pairwise genetic distance threshold of 0.015 substitutions/site
- Patterns in clustering were assessed with chi squared tests and correlates of clustering were assessed using Poisson regression to calculate prevalence ratio with 95% confidence intervals (CI) and p-values (α of 0.05)

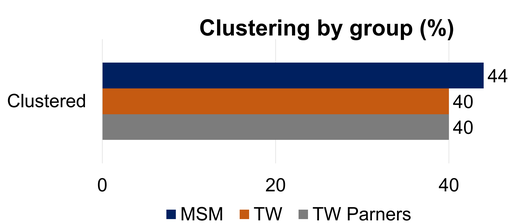
RESULTS

Of 467 participants, 303 were MSM, 139 TW, and 25 TW partners. Overall, 200 (43%) of participants were found in 62 transmission clusters, with no difference in likelihood of clustering by group.

In Peru, transgender women and MSM are found in the same HIV transmission clusters, suggesting overlap in their sexual networks.



Phylogenetic tree of study participants



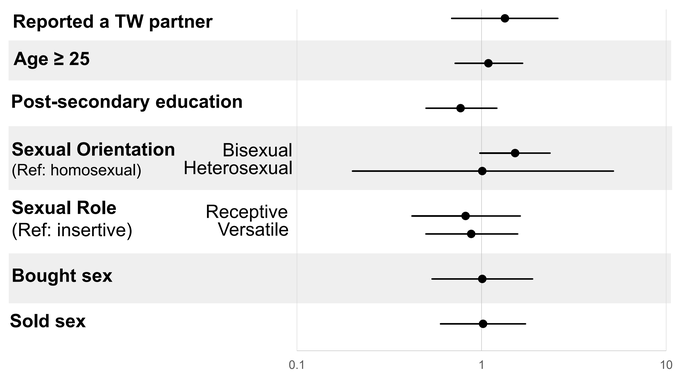
Co-clustering of participants by group

While only 28% of the sample were TW, 77% of TW found in a cluster were clustered with TW (p<0.001)
While 67% of the sample were MSM, 91% of clustered MSM were found in clusters with MSM (p<0.001)
TW were less likely to be found in clusters with MSM than would be expected (57% observed vs 67% expected, p=0.086)
No individual characteristics were significantly associated with being found in a cluster

Group	Frequency in sample	Clustered with TW	Clustered with MSM	Clustered with TW partners
TW	28%	77%	**57%**	9%
MSM	67%	**37%**	91%	5%
TW Partners	5%	50%	60%	20%

ACKNOWLEDGEMENTS
We would like to thank the research participants and staff at Impacta and the HOPE Research Group who helped complete this project. We acknowledge NIDA (R01DA032106 & R01DA040532), the UW CFAR, amfAR and the Northern Pacific Global Health Fellows Program (#D43 TW009345) for funding this research. We also thank Gilead Sciences, Inc and Merck & Co Inc for ART donation.
Contact: Jessica Long jesslong@uw.edu

Correlates of clustering with TW among male participants



- No characteristics were significantly associated with clustering with TW
- Some evidence that those who identify as bisexual were more likely to cluster with TW compared to those who identify as homosexual (PR 1.52, 95% CI 0.98, 2.35)
- Data trends suggest that those who reported a TW partner may be more likely to be found in a cluster with a TW, and those who engage in receptive or versatile anal intercourse may be less likely

CONCLUSIONS

- TW and MSM were found in HIV transmission clusters less frequently than would be expected by chance, but frequently enough to suggest overlap in sexual transmission between TW and MSM
- This contrasts with reported sexual behavior in TW and partners of TW (who rarely report sex with MSM)
- These findings may indicate that a subset of high-risk men who have sex with both TW and men drive HIV transmission between these two populations
- Future research is needed to investigate men who have sex with TW and men, identify their HIV burden, and ensure that HIV prevention and treatment programs are reaching them