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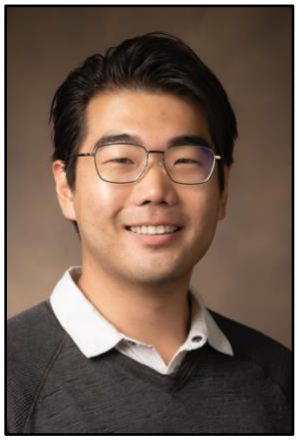

The Role of Clinician Peer Networks in Buprenorphine Adoption

Introduction: Despite buprenorphine's status as the gold standard of treatment for opioid use disorder (OUD), clinician uptake has been low. Qualitative research has established the potential of peer physicians as both facilitators (i.e., conduits of knowledge, social signaling) and as barriers (i.e., stigma) for buprenorphine adoption. Verifying the mechanism of buprenorphine adoption via social learning can potentially address the critical access issues for patients with OUD.

Methods: The data includes the universe of buprenorphine-waivered providers from the Drug Enforcement Administration Registrant data from 2018-2022, Medicare fee-for-service clinician shared patient network data, and Physician Compare data. We restrict our analysis to primary care physicians (PCPs) and use the Walktrap community detection algorithm to group closely interacting PCPs together. For each PCP, we calculated min-max normalized centrality measures (degree, betweenness, eigenvector, and complex centrality) and calculated the proportion of directly connected peer PCPs who become waivered after 2018. We run both ordinary least squares (OLS) regressions and multilevel models on each waivered PCP who were waivered by Q2 2018 and observe which measures are most predictive for spread of subsequent buprenorphine adoption amongst a waivered PCP's peers.

Results: We have obtained 78,321 PCPs who have never adopted buprenorphine, 4,290 PCPs who have adopted by 2018, and 2,153 PCPs who have adopted from 2018-2022. All centrality measures were statistically significant in OLS analyses at the 5% significance level. Eigenvector centrality had the highest coefficient (7.84%, $p<0.001$). After controlling for contextual effects, only complex centrality remained significant (1.71%, $p=0.012$).

Conclusions: The significance of eigenvector centrality suggests that PCPs who are well-connected to other highly connected PCPs are best positioned to diffuse buprenorphine amongst their peers, whereas the significance of complex centrality suggests that models incorporating social reinforcement are important as well. Understanding peer effects can inform targeted interventions in high-need communities and increase access to underused medications.