

Poster #22

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Title of Research: Hospital Patient Sharing Network Structure as a Risk Factor for *C. difficile* Infections

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Introduction/Purpose:

Hospitals commonly share patients with other hospitals via direct transfers and indirect transfers, (via readmission). Patient sharing may help disseminate healthcare-associated infections. An understanding of any dissemination via sharing may have implications for infection control policy.

Experimental Design:

Using the Healthcare Costs and Utilization Project State Inpatient Database (SID) for Arizona, we characterize the effects of connectivity on a hospital's *C. difficile* infection (CDI) rate. The Arizona SID for 2003-2007 contains a unique, persistent identifier for each patient. Using this information, we can construct a network of patient transfers between hospitals. Using the quarterly network of hospitals, we computed the log weighted in degree for each hospital as a measure of hospital centrality within the network. Weighted in degree is simply the number of incoming transfers in a given quarter. We modeled the log incidence of CDI with weighted in degree, hospital fixed effects, log median length-of-stay, fraction of patients over 65, quarter and year. We estimated the model using weighted least squares. To account for the heteroscedasticity in the log transferred incidence, we used weights equal to the inverse of the within hospital standard deviation of the log incidence.

Results:

Increasing the weighted in degree is associated with statistically significant elevations in CDI rates. For direct transfers, expected CDI rates increase by 0.53% ($p = 0.003$) with a 10% increase in weighted in degree.

Conclusions:

Our results demonstrate that hospital centrality is associated with an increased incidence of *C. difficile*: network effects are important for infection control and surveillance.