

NETWORK CENTRALITY MEASURES

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OVERVIEW

01

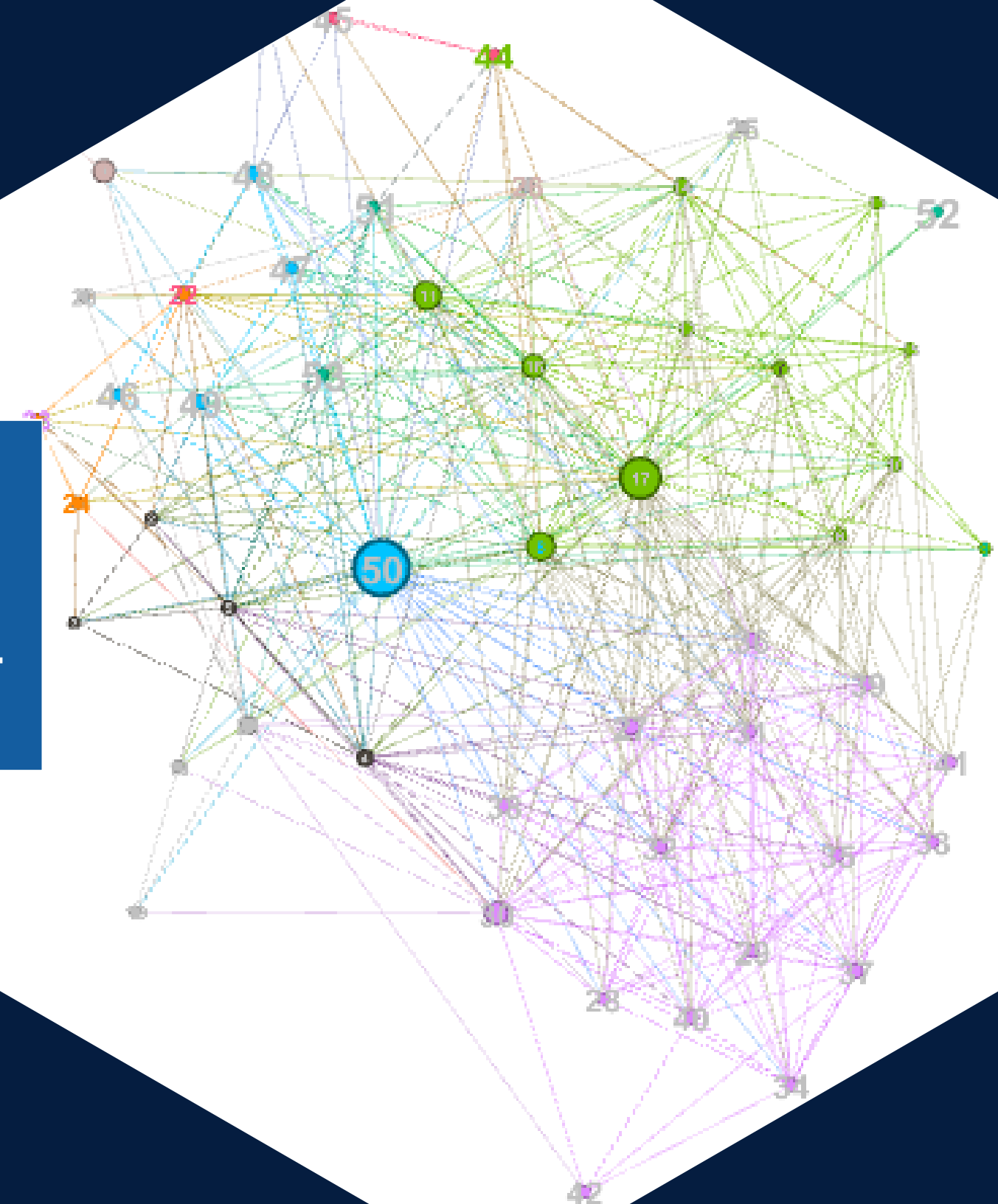
PROBLEMATIC

02

NETWORK STUDY

03

RESULTS



HOW CAN WE USE THE NETWORK TO SOLVE PUBLIC HEALTH PROBLEMS?

Problematic

About 1 in 5 deaths in the United States is due to tobacco

Proporsal

Data network to help agencies communicate more effectively in order to more rapidly reduce tobacco use and, ultimately, tobacco-caused morbidity and mortality

Citation

SCott, Leischow Luke, Douglas Harris, Jenine Ponder, Paris Marcus, Stephen Clark, Pamela. (2010). Mapping U.S. government tobacco control leadership: Networked for success?. Nicotine tobacco research : official journal of the Society for Research on Nicotine and Tobacco. 12. 888-94.

10.1093/ntr/ntq112

NETWORK SCIENCE METHODS IN TOBACCO CONTROL

01

SNA

Utilizing Social Network Analysis (SNA) to delve into relationships and patterns within the Department of Health and Human Services (DHHS) network, specifically focusing on centrality measures like betweenness.

02

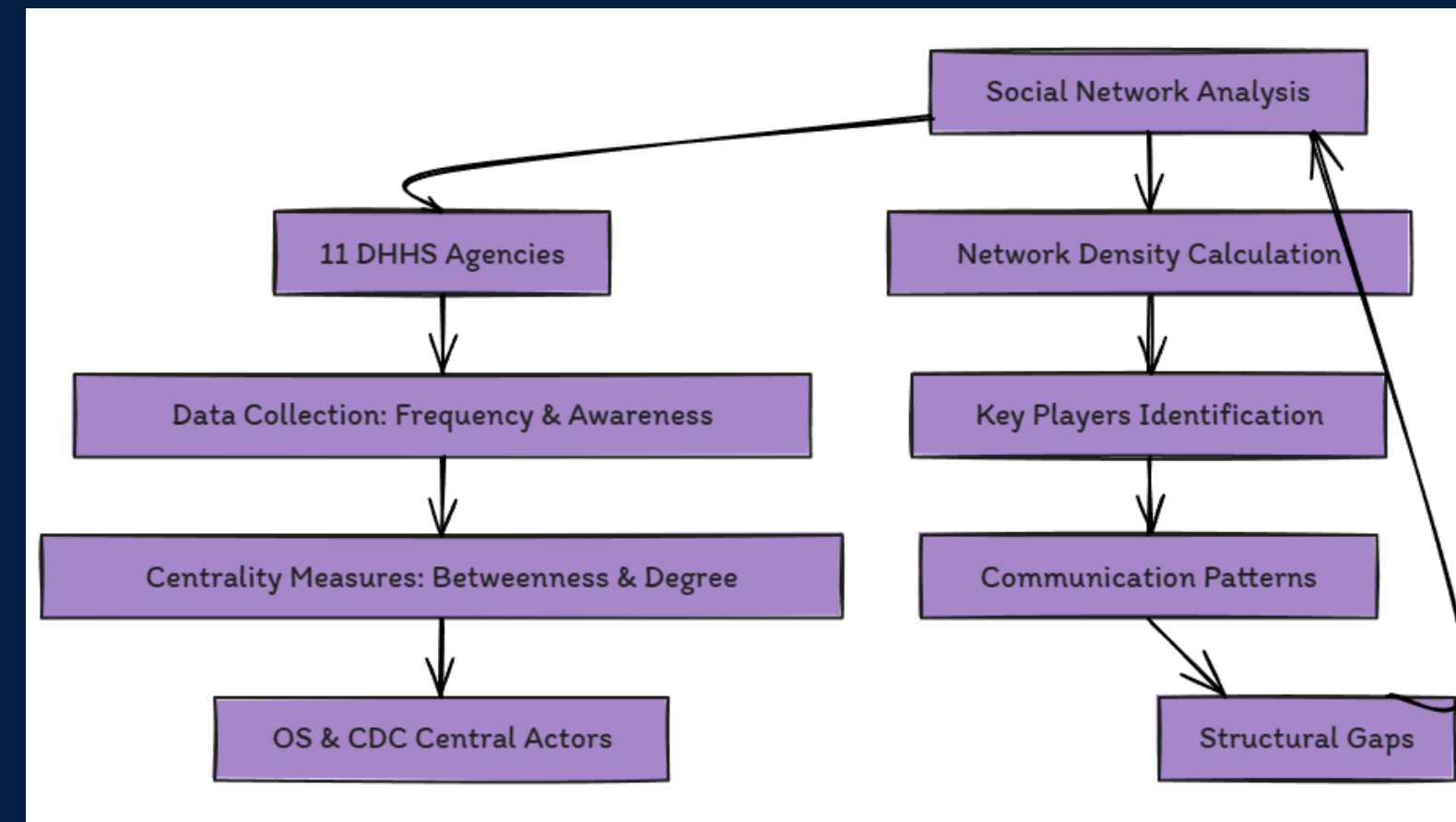
CENTRALITY
MEASURES

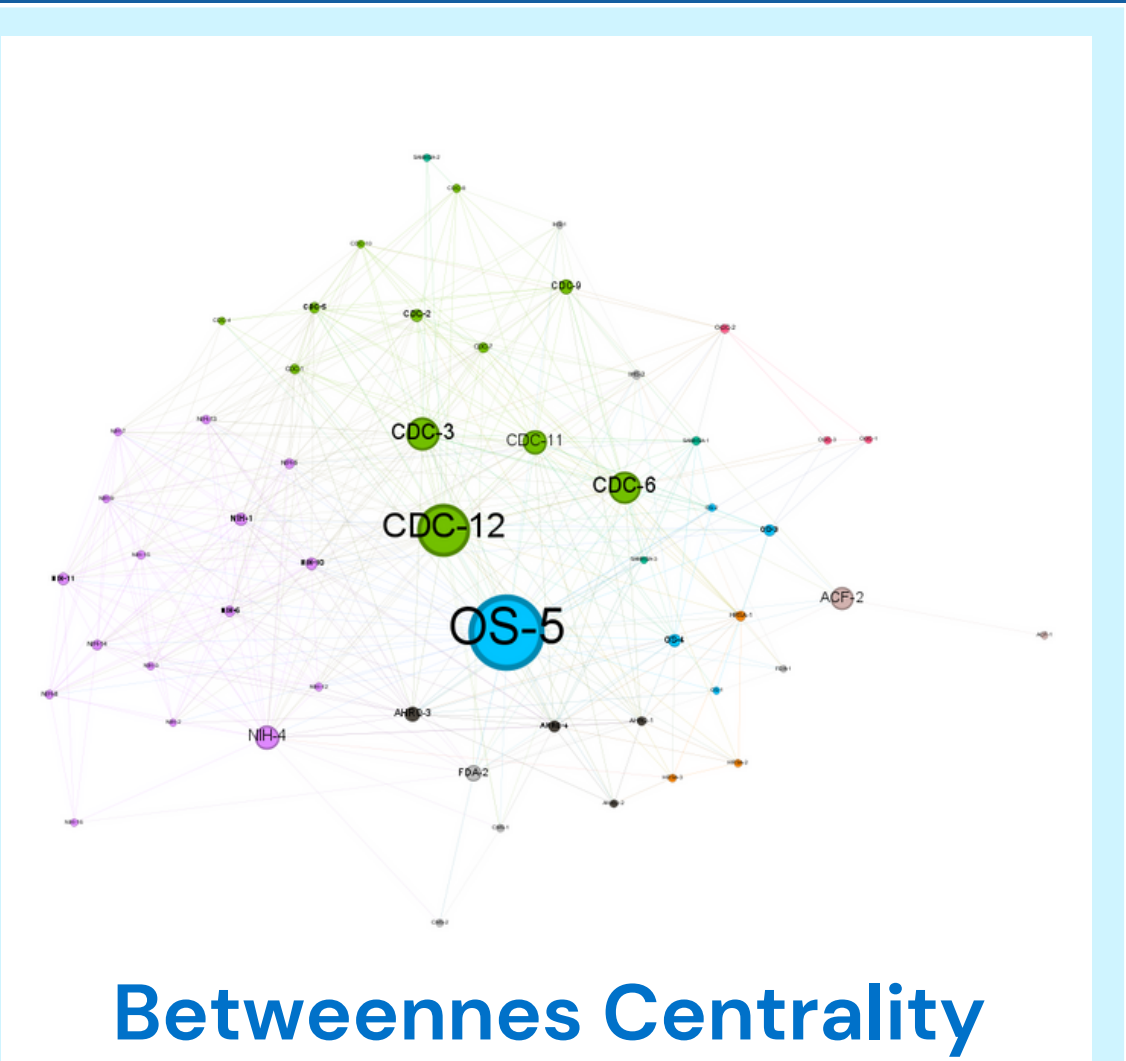
Betweenness centrality is vital in network analysis as it assesses a node's role as an information bridge. Unlike degree centrality, which counts connections and may inflate a node's importance, or closeness centrality, which doesn't always reflect communication efficacy in complex networks, betweenness captures the indirect control nodes exert on information flow.

03

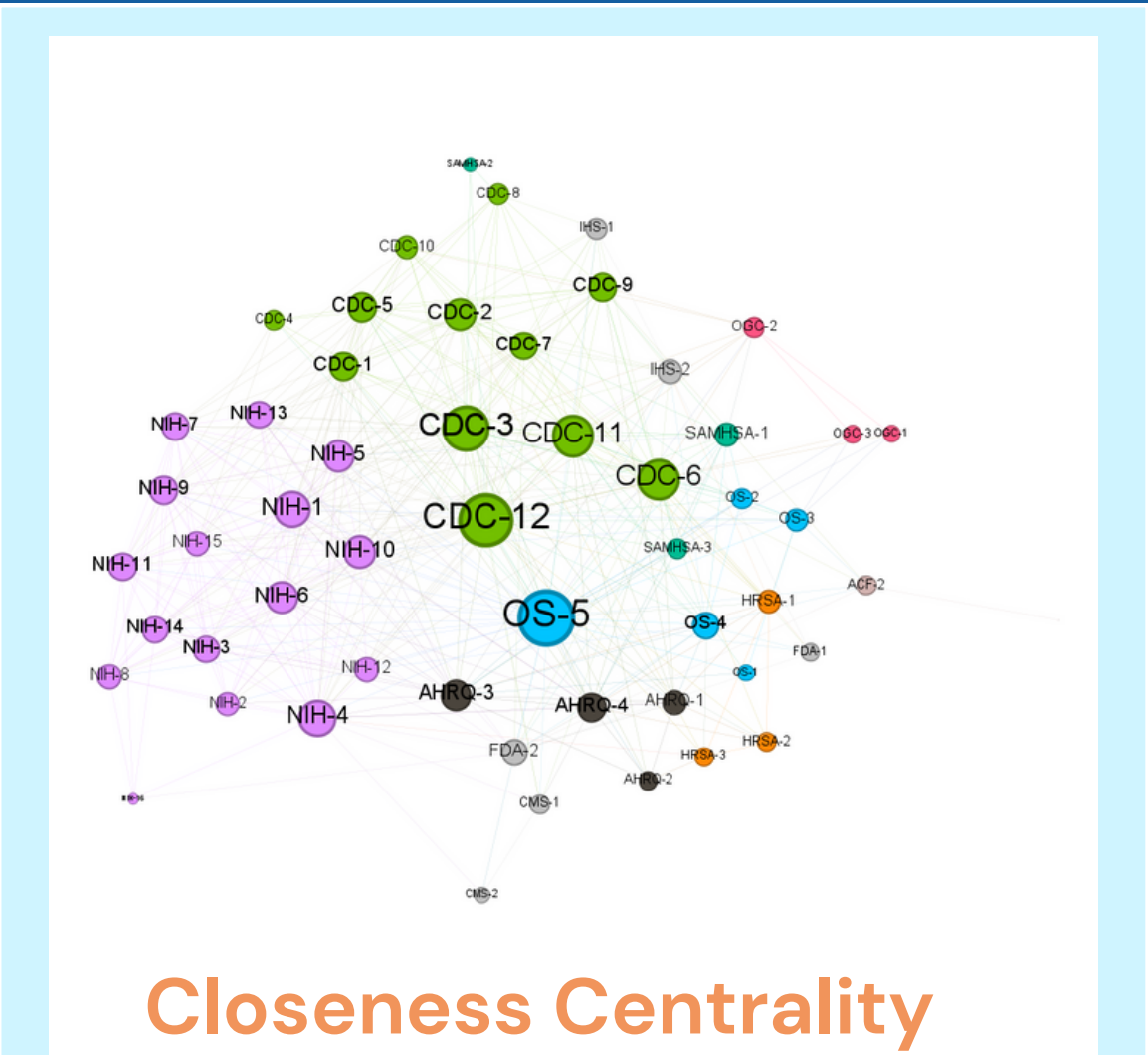
DENSITY
CALCULATIONS

Network density was analyzed in the DHHS to assess connectivity, using data reconstruction to address 7.3% missing values and symmetrization to even out the network. Density metrics indicated strong intra-agency links, particularly within the CDC at 70%, but weaker interagency connections at 14%. The modest increase in density post-symmetrization validated the network's structural accuracy, emphasizing the role of key players in information flow for tobacco control.

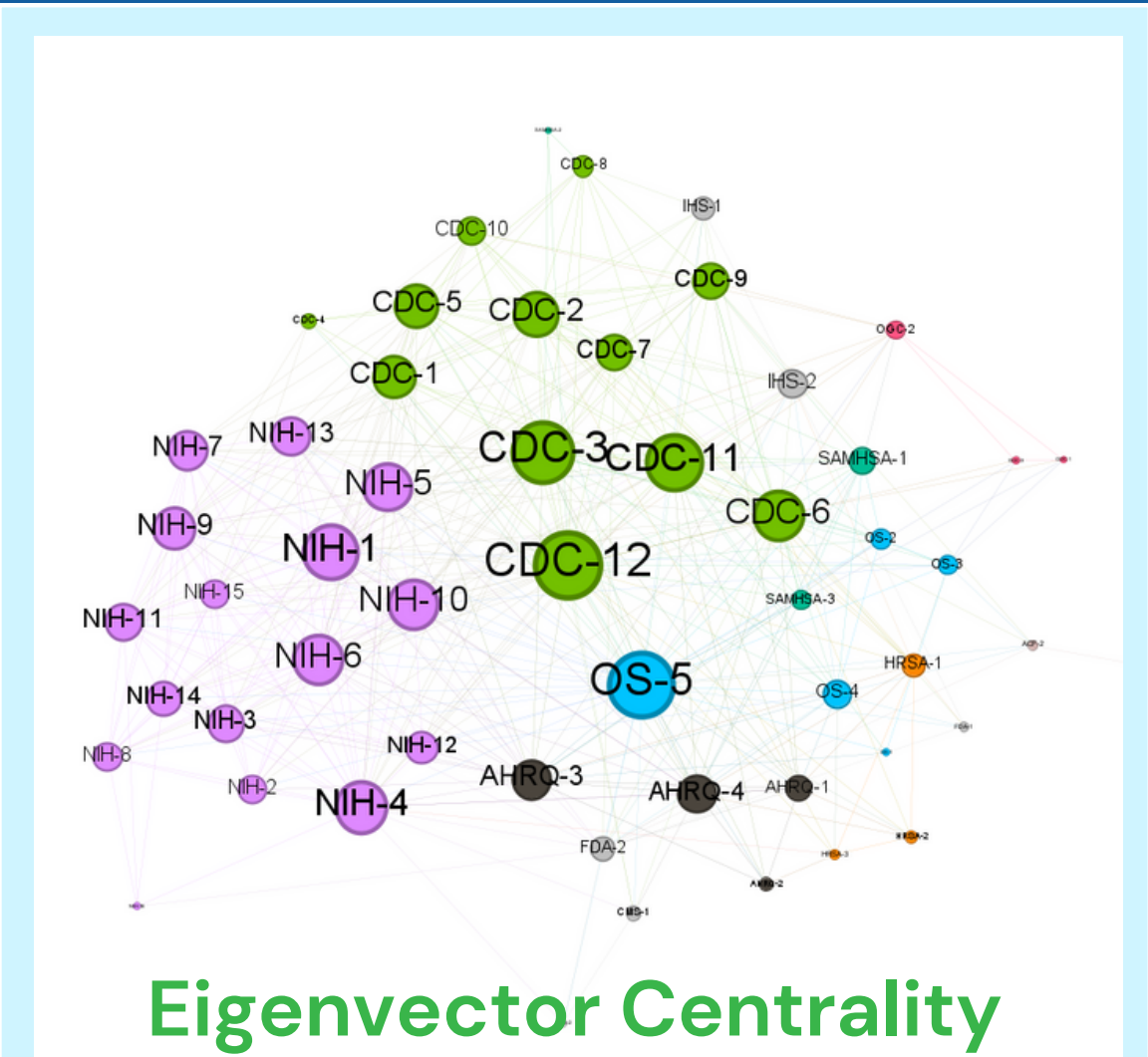




Betweenness Centrality



Closeness Centrality



Eigenvector Centrality

RESULTS

Members belonging to the OS and CDC agencies act as bridges between the other members of the network.

Some agencies such as FDA and CMS have a very limited or no connection.

The network analysis proves the need for greater communication and collaboration on tobacco control across DHHS.



NETWORK DATA SET

Cross-sectional surveys were collected from individuals representing 11 DHHS agencies.

Nodes = 53
Links= 446

collection

Information

Data

Analyse

The survey collected information on participants' contact with others in the network, their experience in tobacco control, length of time at their current organization, and barriers encountered in working with others DHHS agencies on tobacco control.

Assess linkages and map agencies'tobacco control communication.

**Thank's For
Watching**

