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Using Physician Referral Networks to Identify "Top Doctors"

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Finding a "good" doctor can be difficult

Finding a good primary care doctor or specialist generally require a lot of **research** and **digging around**

Consumer reviews for doctors may not always present **meaningful** and **reliable information**

Malpractice claims??

Office Policies??

Insurance??

Personal Compatibility??

Hospital Affiliation??

Technology??

Patient Experience??

Expertise??

Board Certification??

Awards & Recognition??

What if we let the doctors tell us the story?

Who are the "super" doctors that other doctors like to refer their patients to for consultation or transfer of care?

Data Collection

Data Source:
- CMS Medicare Referral Data 2014
- Physician NPI data
- Specialty Taxonomy Codes

Data Points:
Referring doctor, referred-to doctor, total referrals, unique patient referrals, same day referrals, doctor information (name, address, specialty)

Processing:
- Filtering doctors by specialty (e.g. radiologist and nuclear medicine referrals are excluded, as well as medical students)

Select Network Analysis Metrics:
- Eigenvector Centrality ("importance")
- Clustering Coefficient ("cliquishness")
- Degree ("connectedness")
- Cohesiveness ("tightness of group")
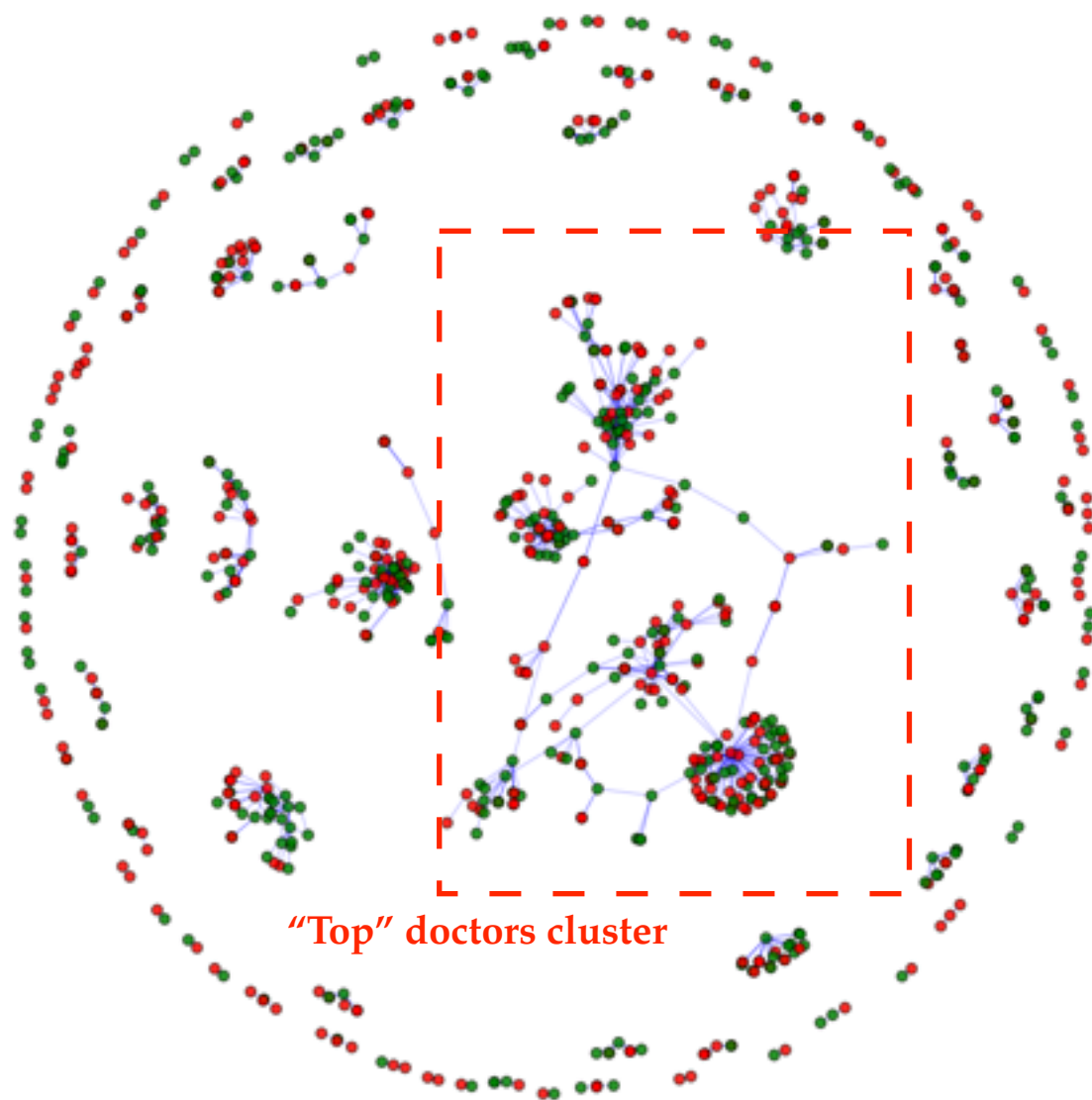- Bridge ("members that connect different clusters")

Processing and Analysis

Network Analysis Example: New York City
PCP to Cardiologists Referrals

Referral Network "Spring" Graph:
PCP to Cardiologists in NYC

"Top" doctors cluster

Interactive Graph

Top 10 Most "Important" Doctors: *by Eigenvector Centrality*		
WAN, ELAINE	PCP,Cardiov.	NewYork-Presbyterian/ Columbia
WHANG, WILLIAM	PCP,Cardiov.	NewYork-Presbyterian/ Columbia
DIZON, JOSE	Cardiov.	NewYork-Presbyterian/ Columbia
WANG, DANIEL	PCP,Cardiov.	NewYork-Presbyterian/ Columbia
GIARDINA, ELSA	Cardiov., Cardiac Electrophysiology	NewYork-Presbyterian/ Columbia
VAHL, TORSTEN	PCP,Cardiov.	NewYork-Presbyterian/ Columbia
REIFFEL, JAMES	Cardiov.	NewYork-Presbyterian/ Columbia
IYER, VIVEK	Cardiov.	NewYork-Presbyterian/ Columbia
BAIRD, STACY	PCP, Nuclear Medicine, Cardiov.	NewYork-Presbyterian/ Columbia
O'CONNOR, DANIEL	PCP	NewYork-Presbyterian/ Columbia