Social Network Analysis (SNA)

Lecture 2
Chapter 3
Example: NEJM article on spread of obesity in a social network

The Spread of Obesity in a Large Social Network over 32 Years

• N. Christakis & J. Fowler, NEJM 2007; 357: 370-9
• Background The prevalence of obesity has increased substantially over the past 30 years. We performed a quantitative analysis of the nature and extent of the person-to-person spread of obesity as a possible factor contributing to the obesity epidemic.

• Methods We evaluated a densely interconnected social network of 12,067 people assessed repeatedly from 1971 to 2003 as part of the Framingham Heart Study. The body-mass index was available for all subjects. We used longitudinal statistical models to examine whether weight gain in one person was associated with weight gain in his or her friends, siblings, spouse, and neighbors.
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• Results Discernible clusters of obese persons (body-mass index [the weight in kilograms divided by the square of the height in meters], 30) were present in the network at all time points, and the clusters extended to three degrees of separation. These clusters did not appear to be solely attributable to the selective formation of social ties among obese persons.

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• Results A person's chances of becoming obese increased by 57% (95% confidence interval [CI], 6 to 123) if he or she had a friend who became obese in a given interval.

• Among pairs of adult siblings, if one sibling became obese, the chance that the other would become obese increased by 40% (95% CI, 21 to 60).

• If one spouse became obese, the likelihood that the other spouse would become obese increased by 37% (95% CI, 7 to 73).

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• Results These effects were not seen among neighbors in the immediate geographic location. Persons of the same sex had relatively greater influence on each other than those of the opposite sex. The spread of smoking cessation did not account for the spread of obesity in the network.
Information about previous slide

- Each circle (node) represents one person in the data set. There are 2200 persons in this subcomponent of the social network.
- Circles with red borders denote women, and circles with blue borders denote men.
- The size of each circle is proportional to the person's body-mass index.
- The interior color of the circles indicates the person's obesity status: yellow denotes an obese person (body-mass index, \( \geq 30 \)) and green denotes a nonobese person.

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- The colors of the ties between the nodes indicate the relationship between them: purple denotes a friendship or marital tie and orange denotes a familial tie.
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