

Understanding Social Networks for Disease Transmission and Information Interventions in rural Madagascar



BASS CONNECTIONS

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Bass Connections in Global Health

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Background

- Social contact facilitates spread of diseases^{4,6}
- Contact between individuals can be analyzed using a social network^{4,6}
- Madagascar has high infectious disease burden and limited health infrastructure^{1,2}
- Information interventions curb negative behavior in the short term^{3,5}

Objectives

- Understand key health concerns of the community
- Construct social networks of villager relationships
- Examine homophily and distance on social networks for potential spread of infection and disease prevention information

Methods



Study Site:
Mandena, Madagascar

Population:
2,700 people
in 646 households

Demographics:
Rural, small-scale
farmers

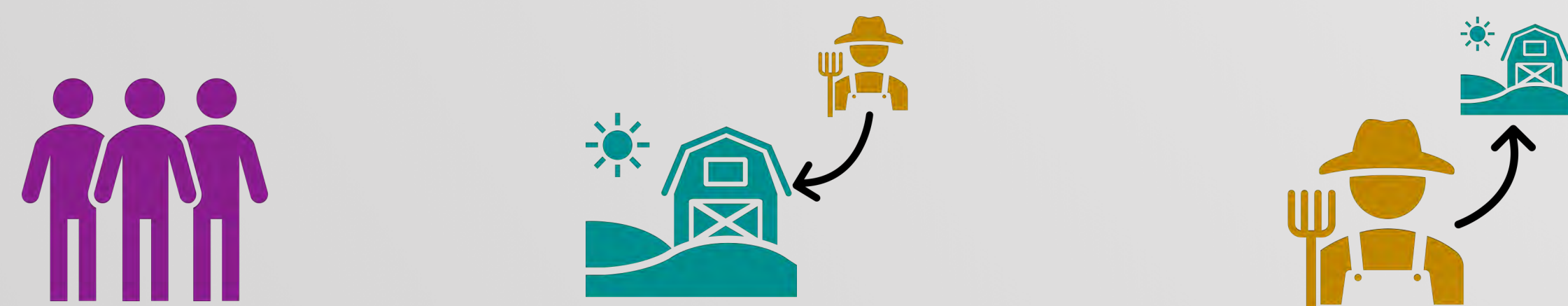
Household Survey

Random sample of 354 individuals in 94 households on:



Social Network Survey

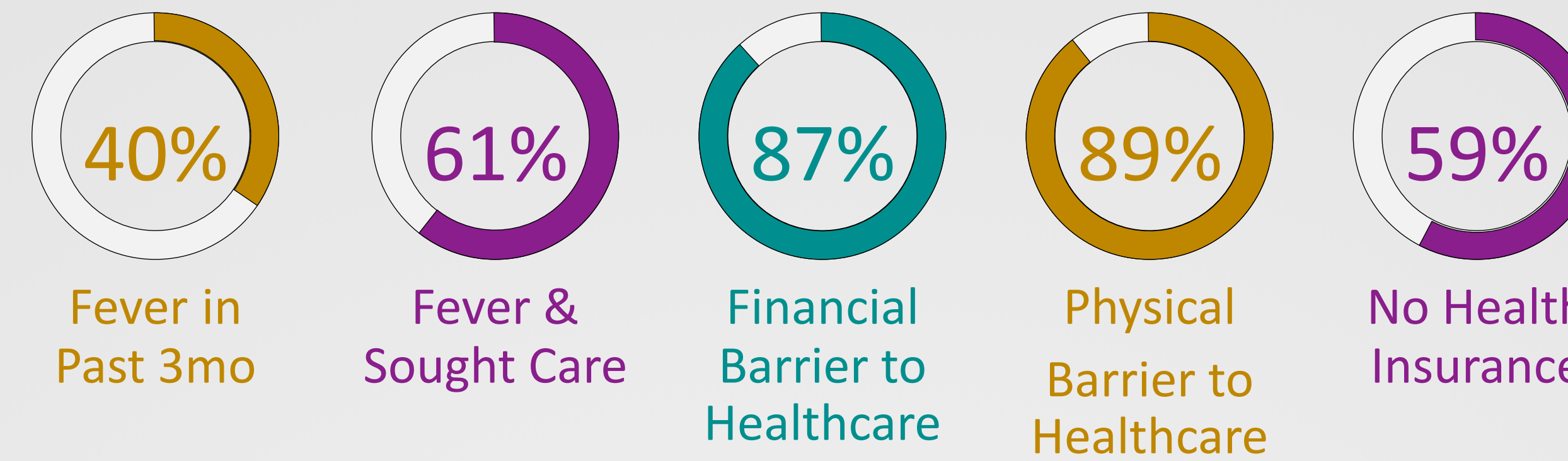
Snowball sampling of 177 people connected to 746 unique individuals



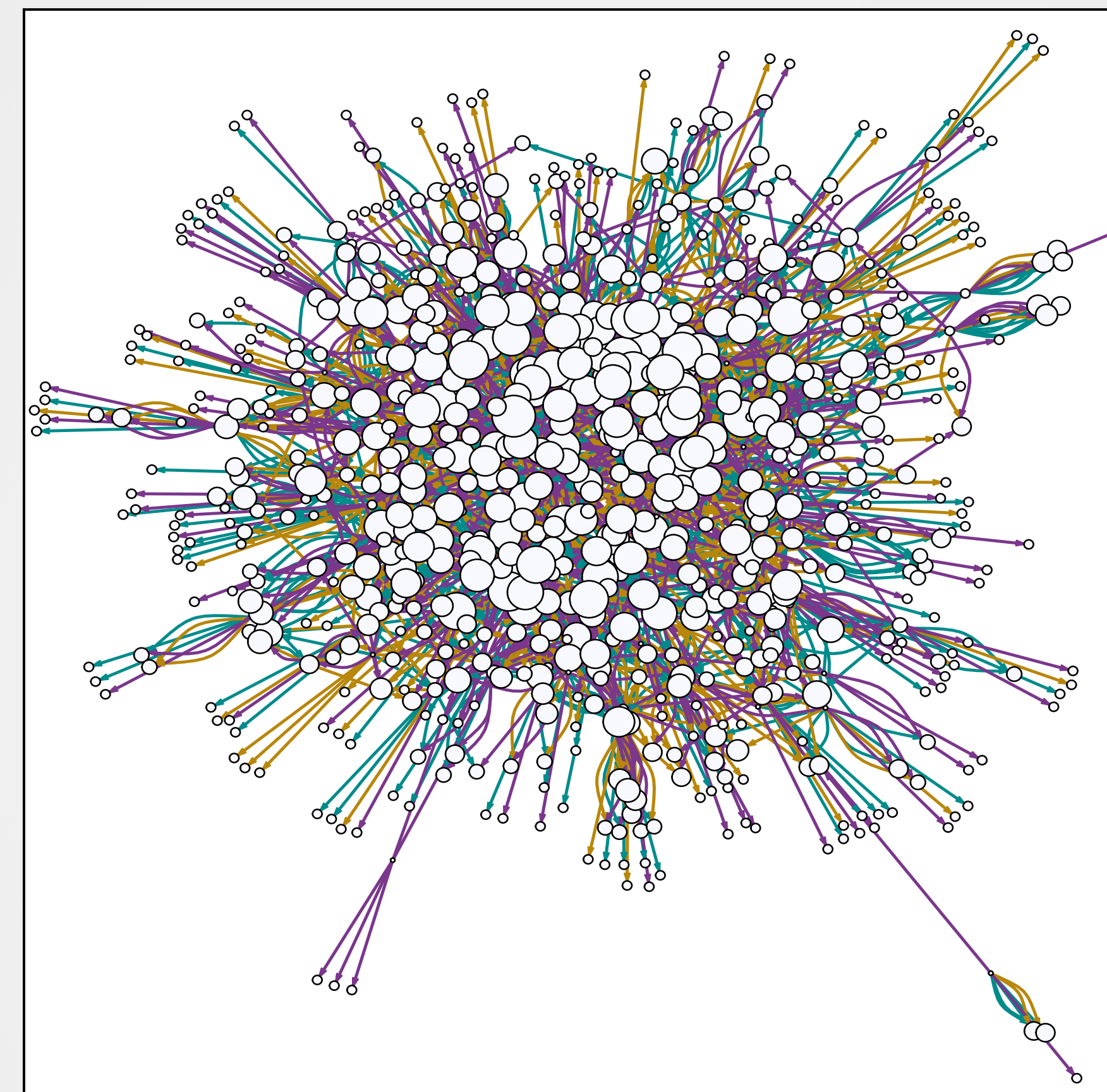
Who do you spend time with in your free time? Who you would ask to help on your farmland? Who would ask for your help on their farmland?

Social Network Analysis: distance between connections, gender segregation, connectedness of individuals

Health Concerns

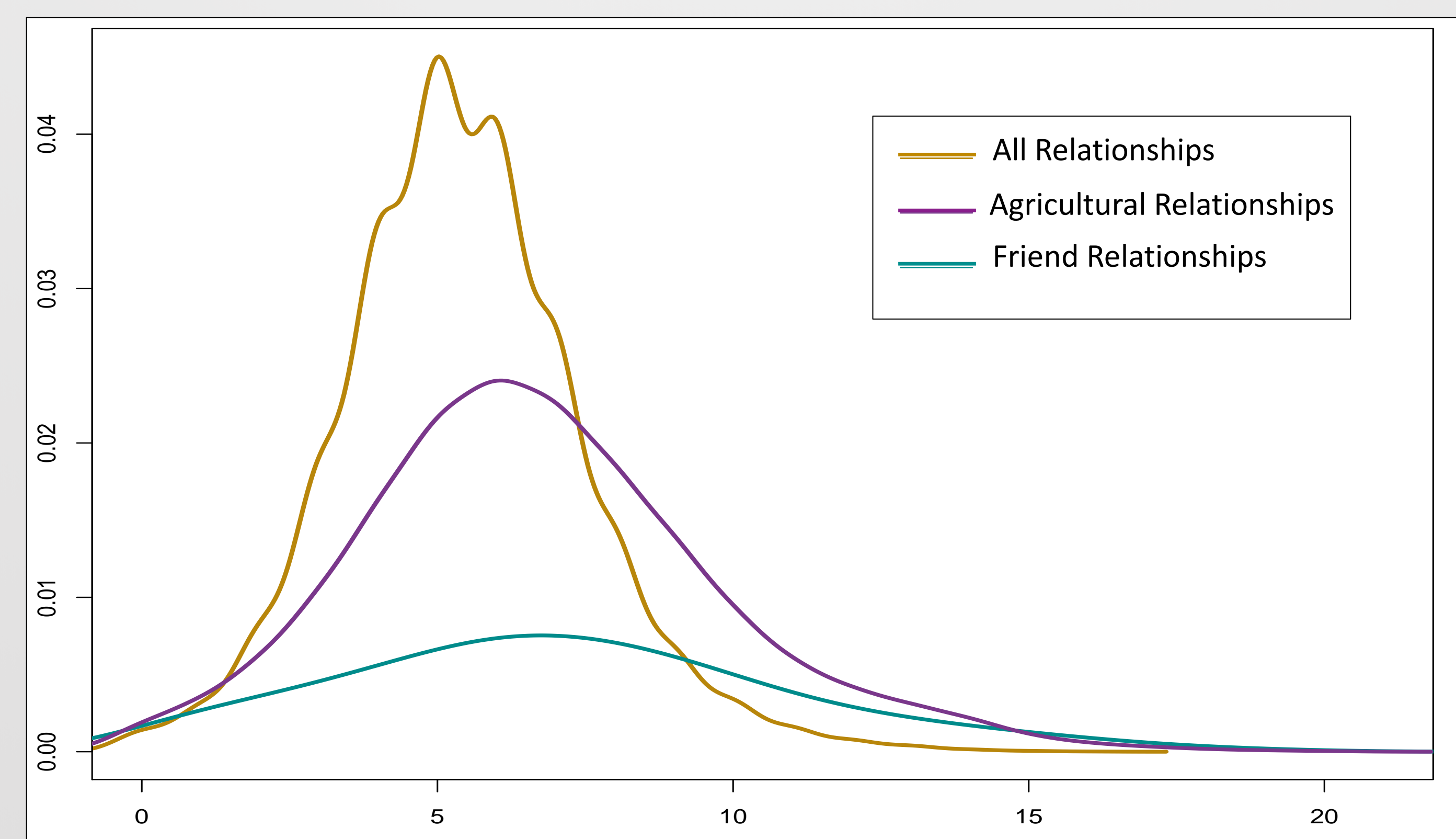


Social Network



Network colored by relationship; size=connectedness

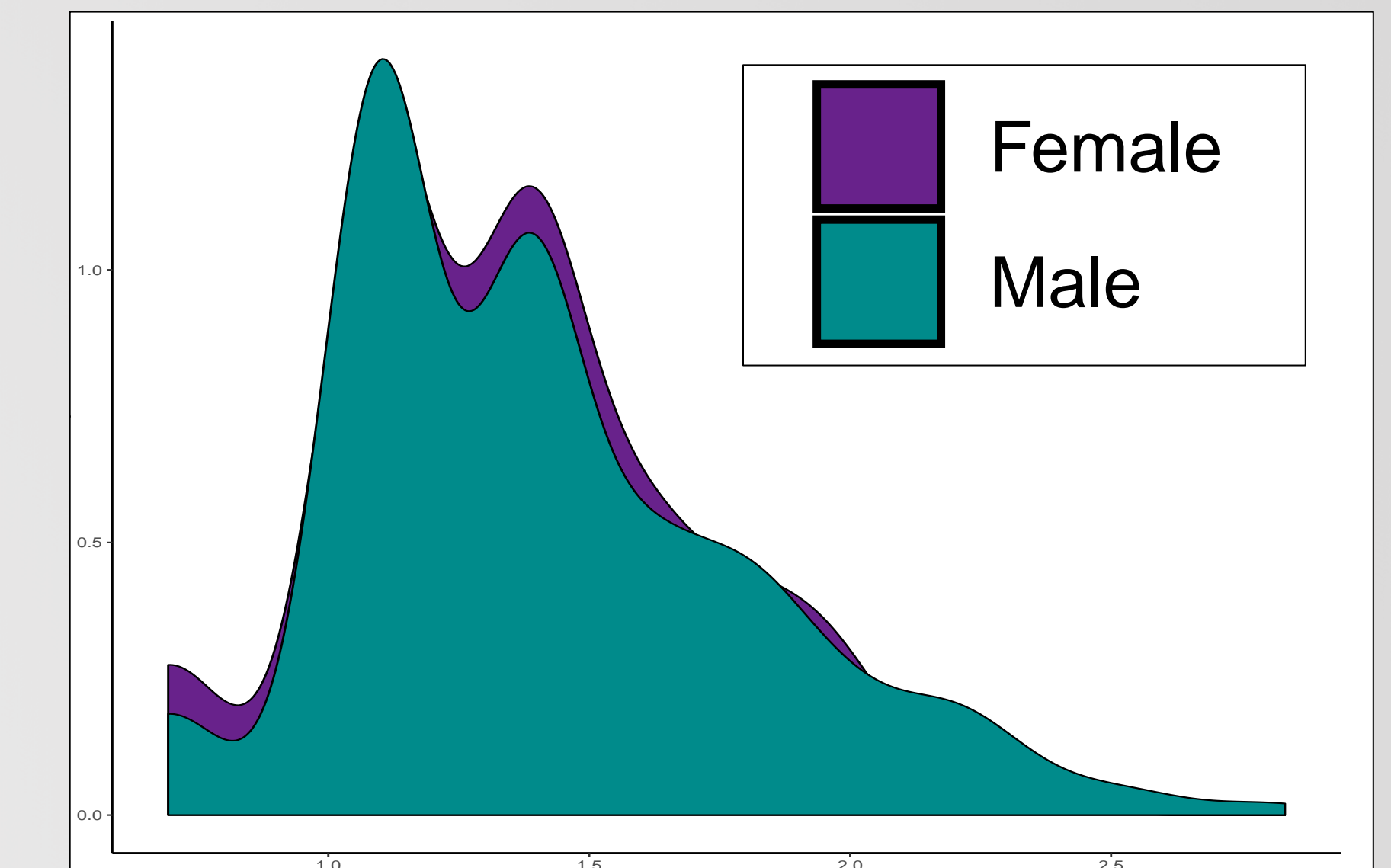
Distance on Network



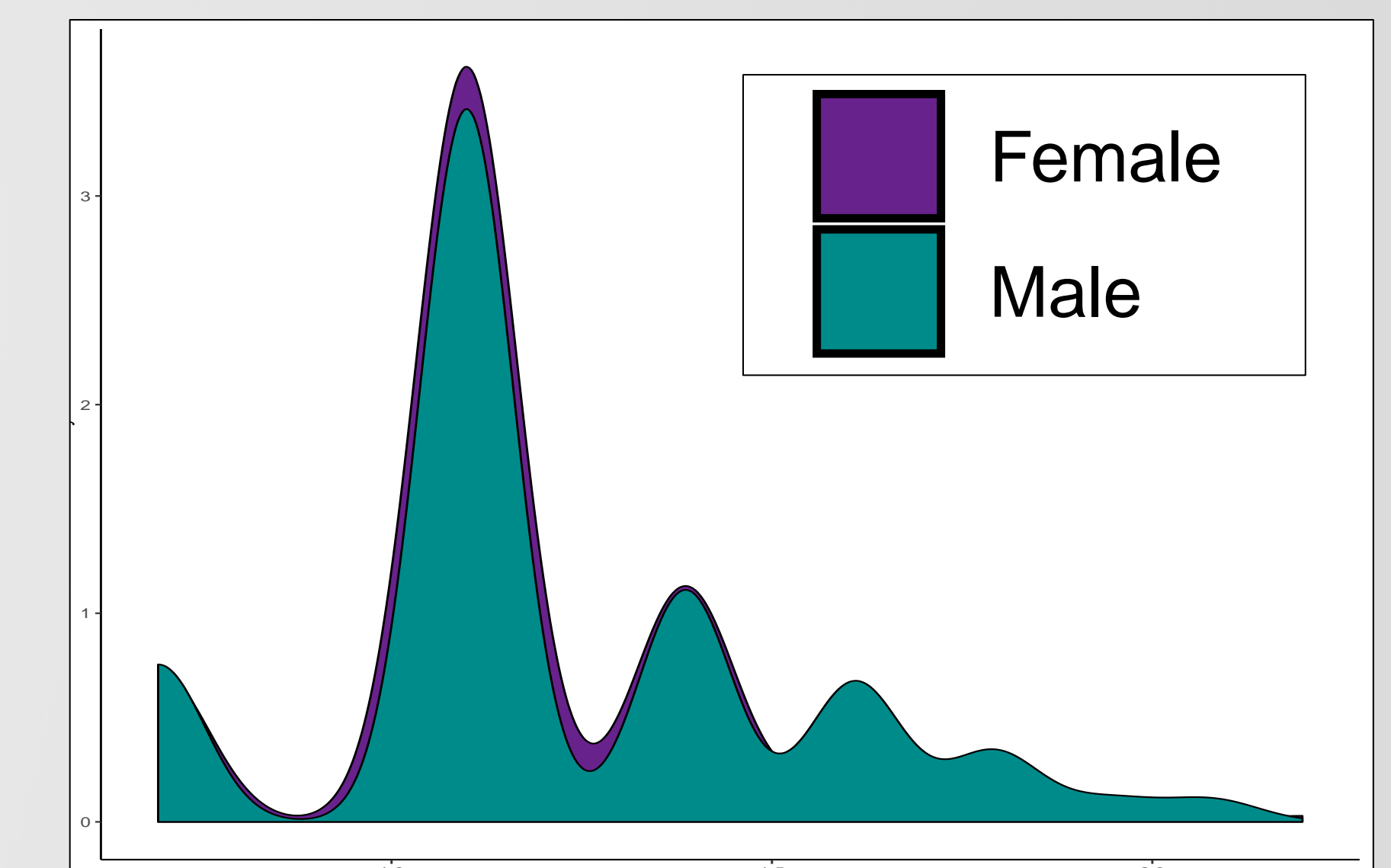
Distance Between Individuals on Network

Gender Homophily

- Agricultural Relationships: **2.2x** more likely to have relationship with person of same gender
- Friend Relationships: **6.5x** more likely to have relationship with person of same gender



Connectedness among Agricultural Relationships



Connectedness among Friend Relationships

Summary

- Fever, financial barriers and physical barriers to healthcare are key health concerns
- Networks with diverse relationships give more accurate depiction of an individual's contact network
- Networks of different relationships have different gender segregation, connectivity and distance, impacting how infections and information would diffuse

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