

COVID Spread Simulation

Duke 2020 Intern Team



The TROSA Community

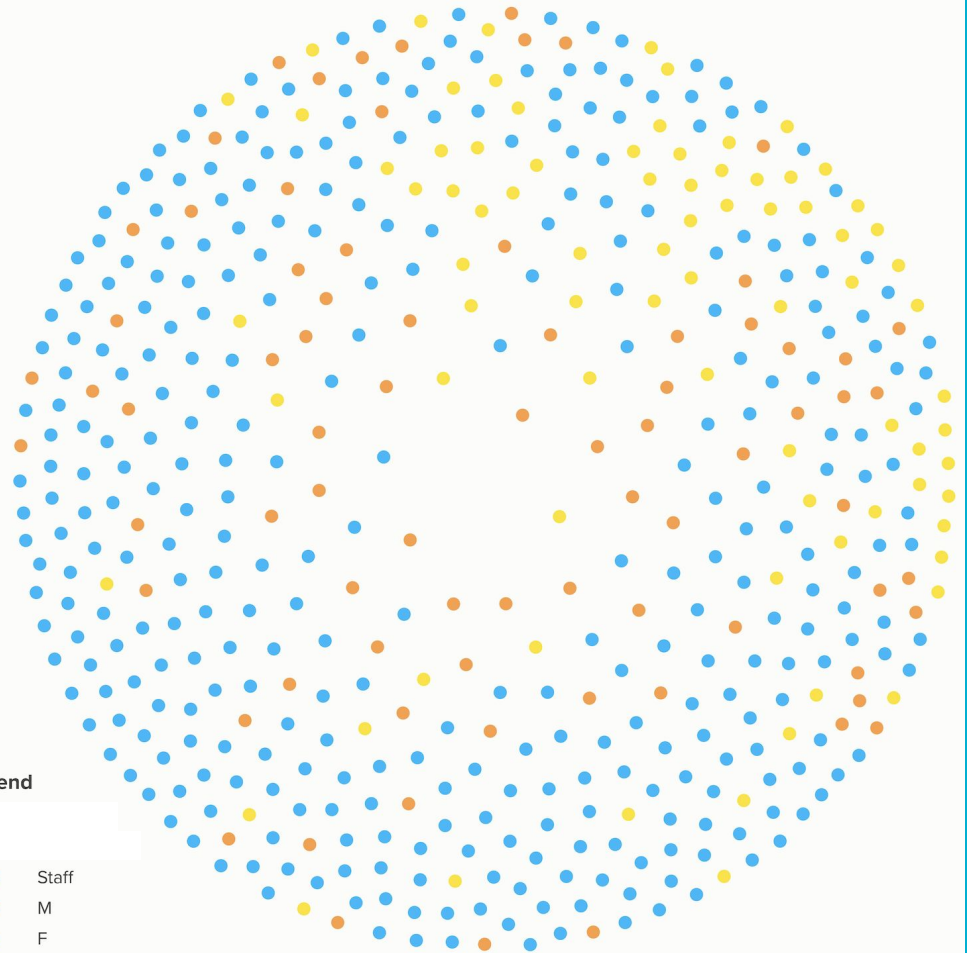
This map shows the entire TROSA
community: residents and staff

Orange circles represent staff members

Blue and Yellow circles represent
residents by sex

Legend

- Staff
- M
- F



Housing

This map connects the residents by their residential communities. You can see some of the larger, more populated dorms towards the center of the diagram.

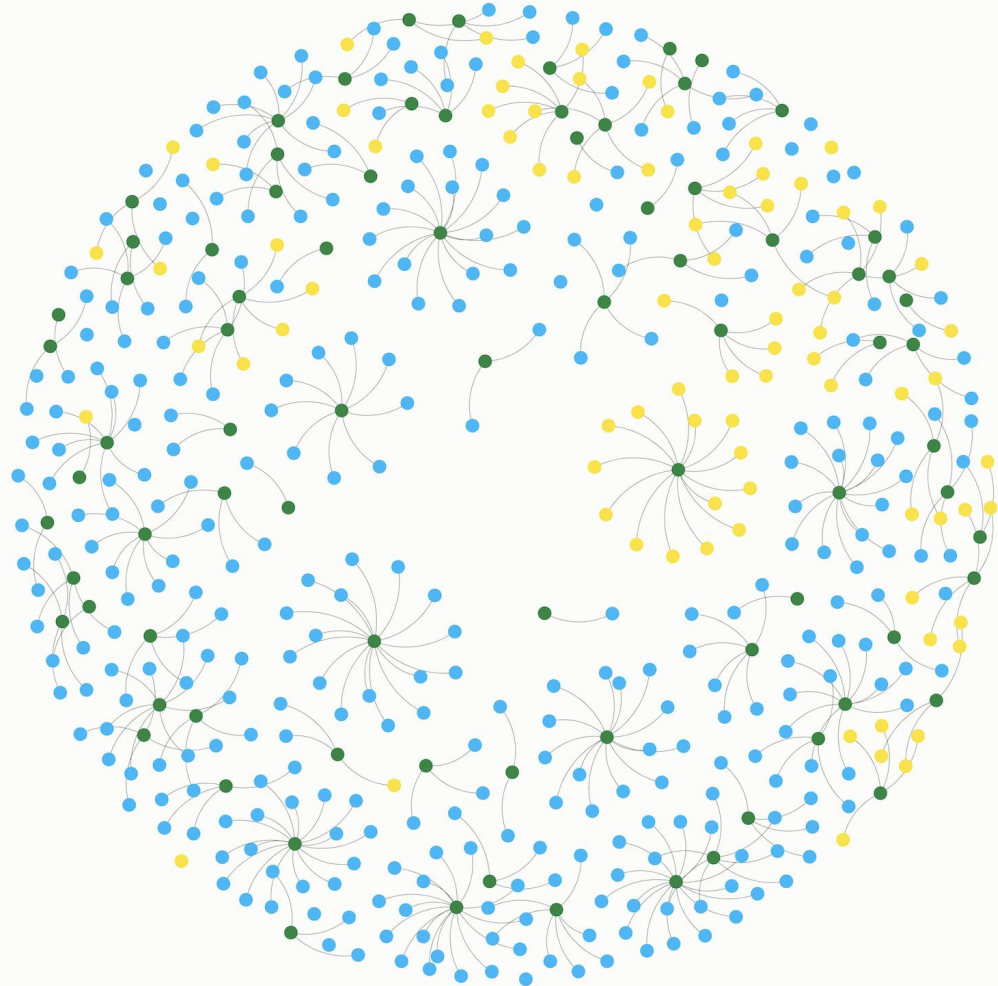
The individual dorms are represented by green dots.

Legend

● Housing

● M

● F



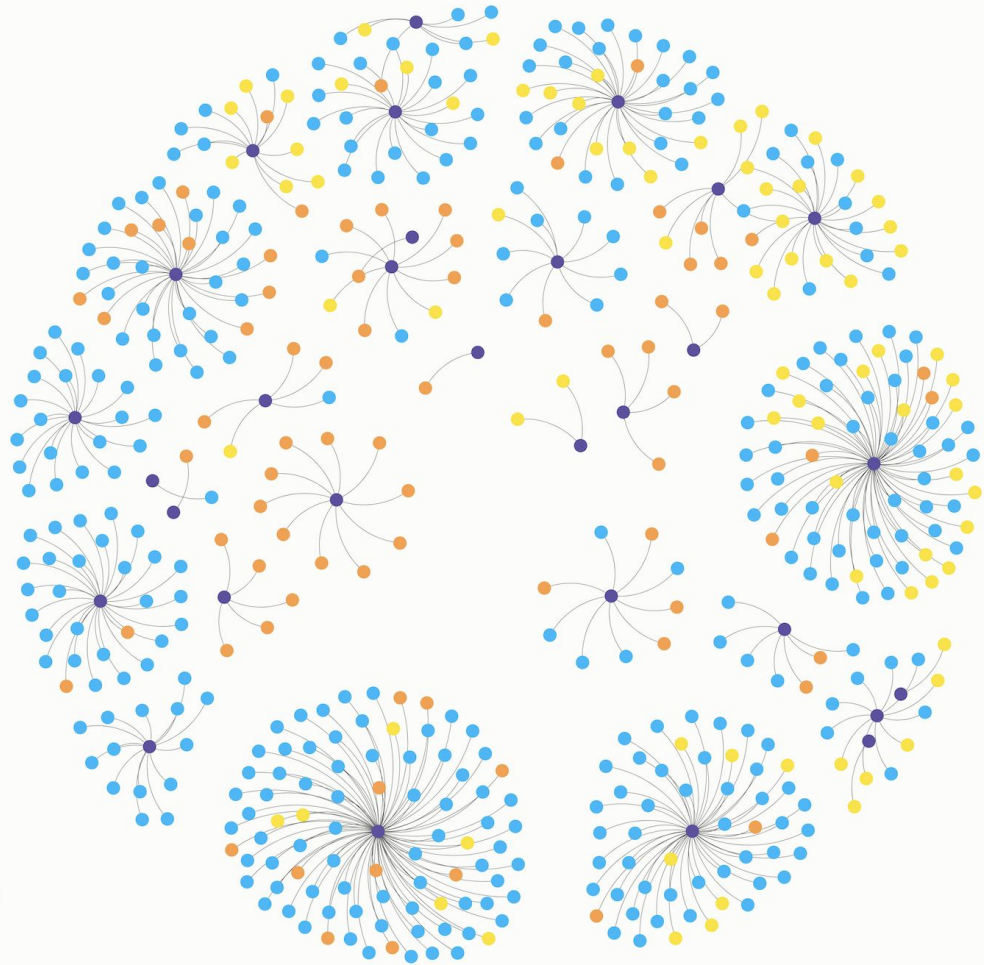
Department

This map separates the residents and staff by department. The largest departments are in the bottom corner of the diagram, and represent the Moving, Thrift, and Lawn Care departments.

The departments are represented by purple dots.

Legend

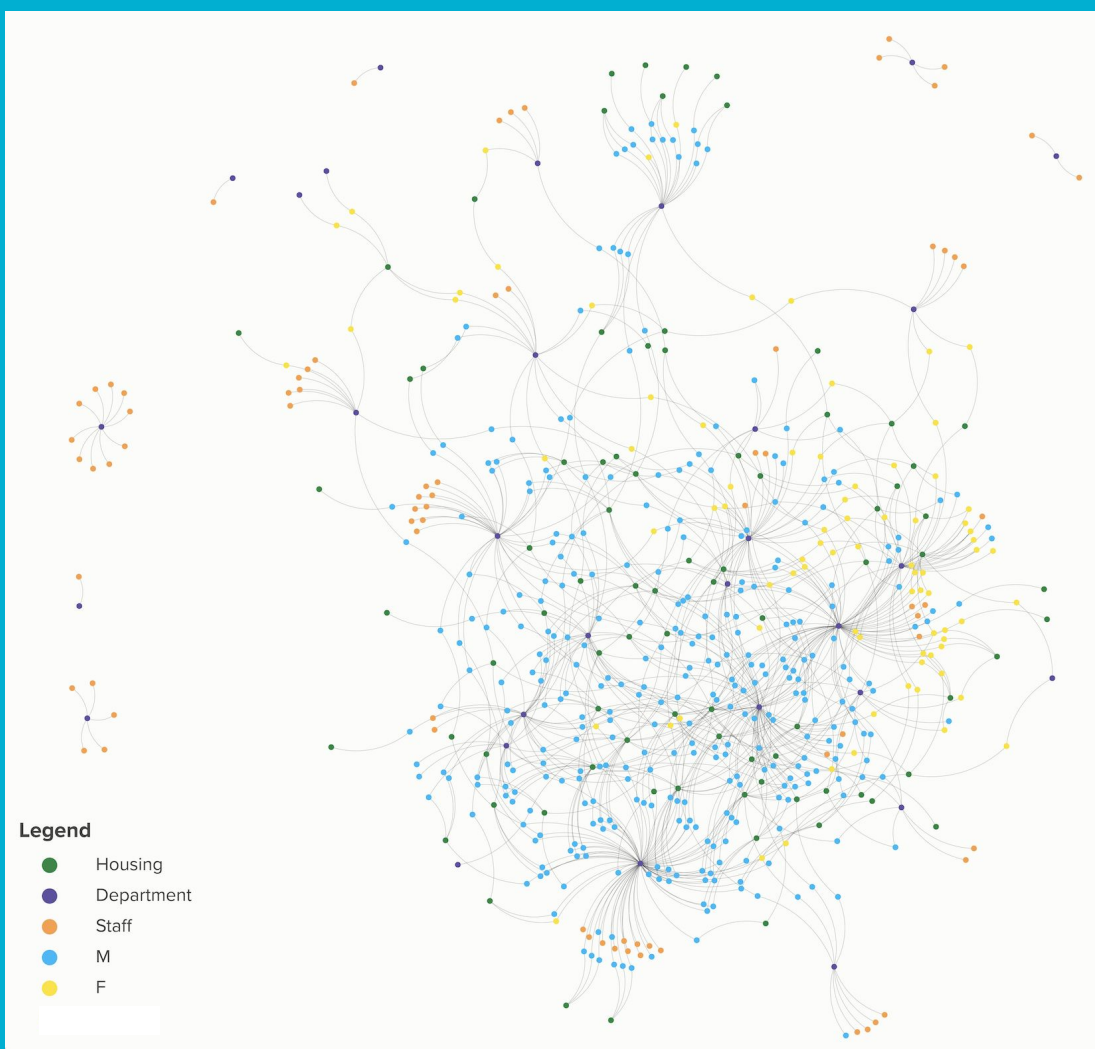
-  Housing
-  Department
-  Staff
-  M
-  F



Housing and Department

This map shows the reality of TROSA, a complicated web. The connections between housing and departments show that each resident and staff member has a large network of primary contacts.

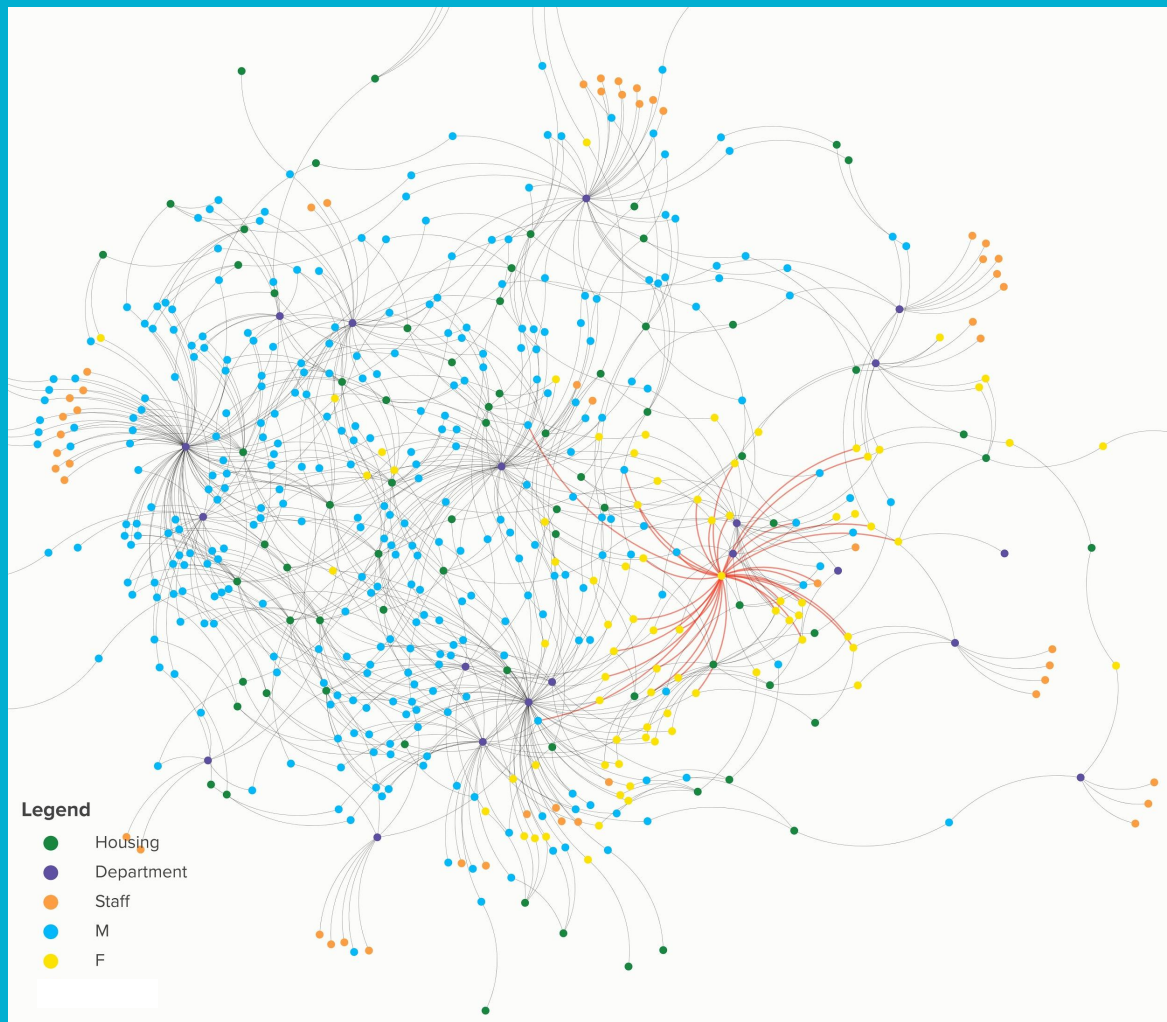
With this web of contacts, a positive COVID-19 test would currently necessitate quarantines for several TROSA residents or staff (as the following simulation will illustrate)



**Simulation: What happens when
someone tests positive?**

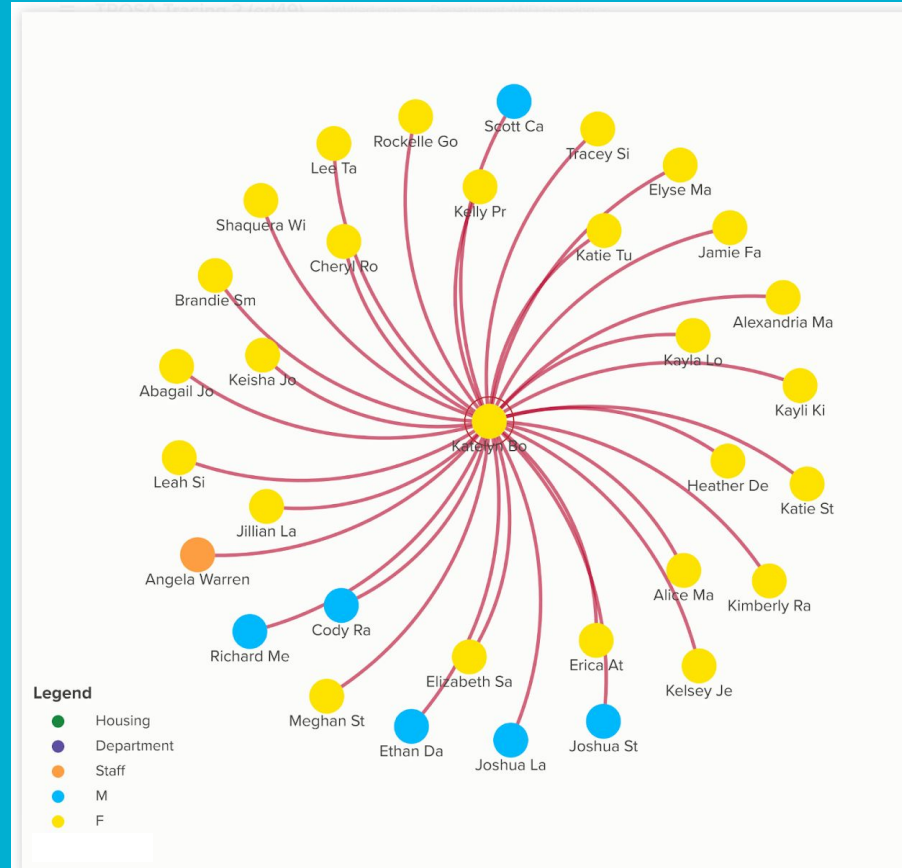
One Person

If just one person gets sick, their immediate contacts are at risk and must be quarantined. Red lines represent connections from patient zero to their primary contacts.



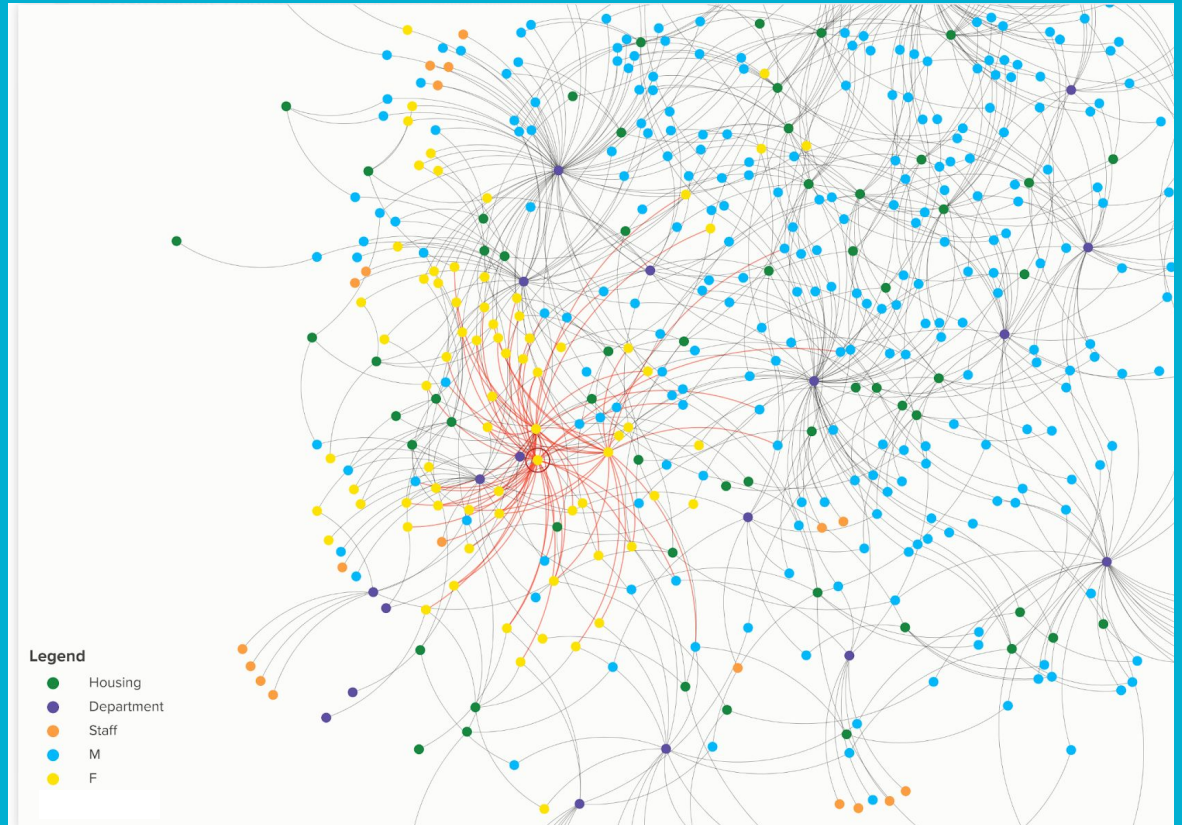
Primary Contacts

Primary contacts come from one's housing, department, and any other individual the person frequently spends time with. (Within 6ft)



Three People

If patient zero gets two of their primary contacts sick, the network of potential exposure expands even further, as illustrated by the increase in red lines.



Secondary Contacts

The two newly infected people expand the network to their primary contacts. Certain departments, such as lawn care, can expand this network to a large number of people. Every person shown here must be quarantined due to potential exposure.

Red star represents patient zero, grey stars represent new infections

