

disnet

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disnet has been designed to simulate influenza over a network created by combining satellite imagery, population data, and road network information.

Main functions

1. **disnet_commuting** - Comuting function. Takes in network object (in **graphml** format, and calculates the commuting rates for all outgoing edges in network
2. **disnet_sim_setup** - Simulation setup function. Takes in the graph file with commuting rates added to it, and preps it up for runnning simulations. *NOTE*: This function will create a folder in **supplement/data/intermed** to save the resulting data. You can specify a different folder.
3. **disnet_simulate** - Simulation function. This function runs the simulations *NOTE*: This function will create a folder in **supplement/data/simulation-results** (unless you specify a different folder) in your working directory, so it can save the simulation results.

```
# Read in sample graph/network
f = system.file("sampleData", "g.rds", package = "disnet")
g = readRDS(f)

# calculate commuting rates over it
g_comm = disnet_commuting(g)

# select random node to seed infection in
set.seed(890)
nodes = igraph::vcount(g_comm)
seed_nd = igraph::vertex_attr(g_comm, "name", sample(1:nodes, 1))

# set up the network for simulations
for_sim = disnet_sim_setup(g_comm, seed_nd = seed_nd, output_dir = NA)

# run the simulations over the network
simres = disnet_simulate(sim_input = for_sim, sim_output_dir = NA)
```

Sample datasets

- **g.RDS**: The raw graphml/network object which we calculate commuting rates.

To access the sample dataset:

```
f = system.file("sampleData", "g.rds", package = "disnet")
g = readRDS(f)
```

Note: The steps to convert the ArcGIS output to raw **g** network have not yet been included.