Disease and contagion models

The ASSOCC simulation used the following parameters for disease and contagion:

Disease Model

The disease model describes how the COVID-19 disease is implemented in the model. The following states are implemented:

State	**Days between transition**
Infection	2
Asymptomatic contagiousness	4
Symptomatic contagiousness	7
Critical or Heal	2
Terminal	7
Death	-

Contagion model

Contagion mechanics consists of a procedure that fires a sequence of check for contagion, i.e. one becoming infected:

- Local travelling contagion (when agents move from one gathering point to the next)
    - General travel (depends on population density)
    - Means of travel (e.g. bus vs. bike vs. shared car)
    - Queuing when travelling
- Migration contagion (when agent move abroad)
- Gathering point contagion (i.e. contagion that occurs when performing a given activity/staying at a given point)

Local travelling & gathering contagion

For local travelling contagion & gathering point contagion consists in picking a set of people and repeating the following probability check

- For each healthy non-immune person
    - For each contagious person in the spot
        - If random 1 < personal risks x density factor : set the person as incubating.

Where:

- personal risk depends on the condition of the agent (currently, its age)
- density factor depends on the location (e.g. people are closer in a car than in a workplace) and somehow the “expected duration” of the activity

Key variables modelled:

- Crowdedness plays a role here: more people, more contacts (n-to-n, quadratic)
- Number of infected people
- Rough agglomerating estimator of the relative contamination risk
- Personal sensitivity to contagion

Migration contagion

People get a fixed % of chance to get sick when exiting the area.

Not yet modeled:

- Asymmetric contacts for gathering points (e.g. cashiers at shops meeting many customers; whereas customers meet only few people).
- Detailed duration
- Size of the space, distance in meters between people
- Points of contacts, confined highly-used, one-person-at-a-time areas (e.g. elevators)
- Advanced model of air flows (indoors vs. outdoors, vs. ventilation)