Agent based model for Omicron (Covid 19)

Achraf Bouhamdy, Oumaima Laraj, Beçem Rezgui, Martina Guillermo R. , Farouk Hammami

February 24, 2024

Introduction

Agent-based modeling (ABM) play several important roles in understanding and managing infectious diseases.

- Understanding transmission dynamics.
- Exploring Intervention Strategies.
- Assessing Public Health Policies.

Model's Purpose: Predict severe cases of omicron among vaccinated and unvaccinated adult people who go to work in Nabeul Tunisia during 2024.

ODD Protocol

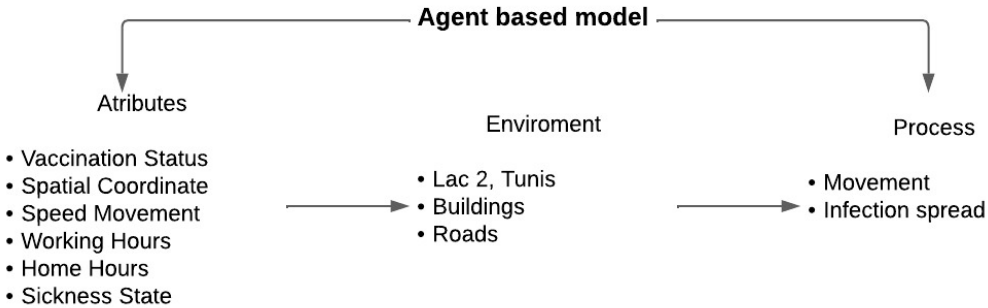

Figure: Overview of ODD Protocol

ODD Protocol

Purpose: Predict severe cases of omicron among vaccinated and unvaccinated adult people who go to work in Lac2 at Tunis during 2024.

Entities, state variables, and scales:

1. Agents: Human.
2. State variables.
   - Vaccination status:
     - ⋆ Effective vaccinated $p_1 = 0.2$.
     - ⋆ No effective Vaccinated $p_2 = 0.5$.
     - ⋆ Non-vaccinated $p_3 = 0.9$.
   - Spatial coordinate: start randomly in residential places.
   - Speed movement: random 1km-5km.
   - People at work: random from 6-8.
   - People at home: random from 16-20.
   - Working time: 50 time step.
   - Home time: 50 time step.
   - Sick: 1% population.

ODD Protocol

Environment:

- Lac 2 - Tunis.
- Urban zone.
- Population: 100 people
- Buildings: Residentials and six working places
- Road: connect buildings

Assumptions:

- Only one vaccine is available, and it is effective.
- All of the population is older than 18.
- All people work.

Thank you for your attention