

Pseudocode for Agent-Based Multi-Drug Resistant Organism Transmission Model

```
Initialize patient population and staffing assignment;
Select proportion of patients to receive antibiotics;
Schedule mutation event for proportion of patients receiving antibiotics;
while Simulation time is less than replication length do
    Select healthcare worker at random to visit assigned patient;
    if assigned patient is receiving antibiotics then
        | Apply microbiome effect to baseline transmission probability for visit;
    else
        | Use baseline transmission probability for visit;
    end
    if healthcare worker is colonized then
        | Check whether healthcare worker attempts hand hygiene on entry to patient room;
        if hand hygiene attempt is not successful then
            | Check whether patient is susceptible;
            if patient is susceptible then
                | Check whether healthcare worker transmits organism to patient;
            end
        else
            | Check whether patient is colonized;
            if patient is colonized then
                | Check whether patient transmits organism to healthcare worker;
                if organism is transmitted then
                    | Check whether healthcare worker attempts hand hygiene on exit from patient room;
                end
            end
        end
    end
    else
        | Check whether patient is colonized;
        if patient is colonized then
            | Check whether patient transmits organism to healthcare worker;
            if organism is transmitted then
                | Check whether healthcare attempts hand hygiene on exit from patient room;
            end
        end
    end
    Check for mutation event;
    Check for patient discharge;
    if simulation time exceeds scheduled discharge time for any patient then
        | Replace patient with new patient and assign to healthcare workers;
        | Determine whether patient receives antibiotics;
        if patient is receiving antibiotics then
            | Determine whether patient will experience mutation event, and schedule the event
            | accordingly;
        end
    end
end
```