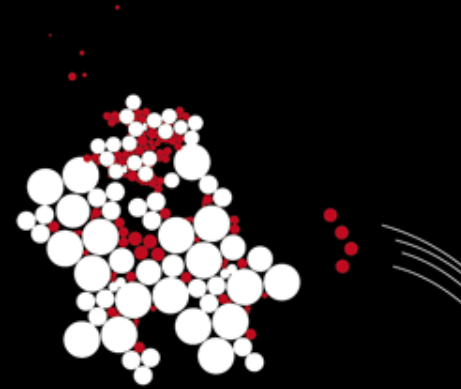


UNIVERSITY OF TWENTE.

# Forecasting Occupancy at Covid-19 Departments



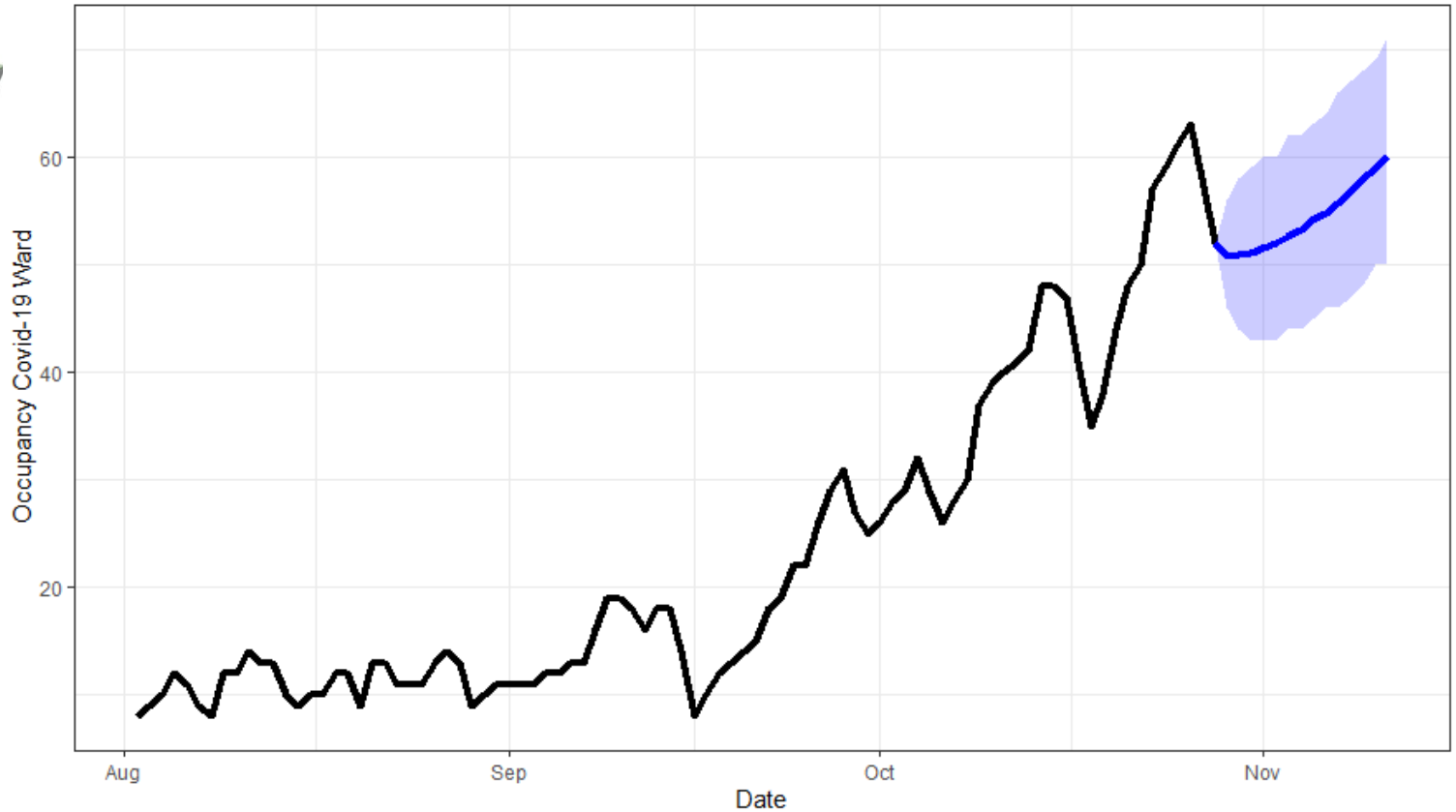
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## Predicting Occupancy at Covid-19 Departments

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- **Tradeoff** between care for Covid-19 and regular patients
- First six months 2020: 791.000 less referrals to specialist care
- Now: -20% capacity regular care (possibly heading towards -75%!)
  - Forecasting model for capacity demand Covid-19 patients
  - Short term, for one hospital
  - Supporting tool for capacity managers



*Figure 1: Example of realised and forecasted occupancy at the Covid-19 ward at a hospital. The forecast starts at 28/10/2020, an 80% confidence interval is also shown.*

# Method

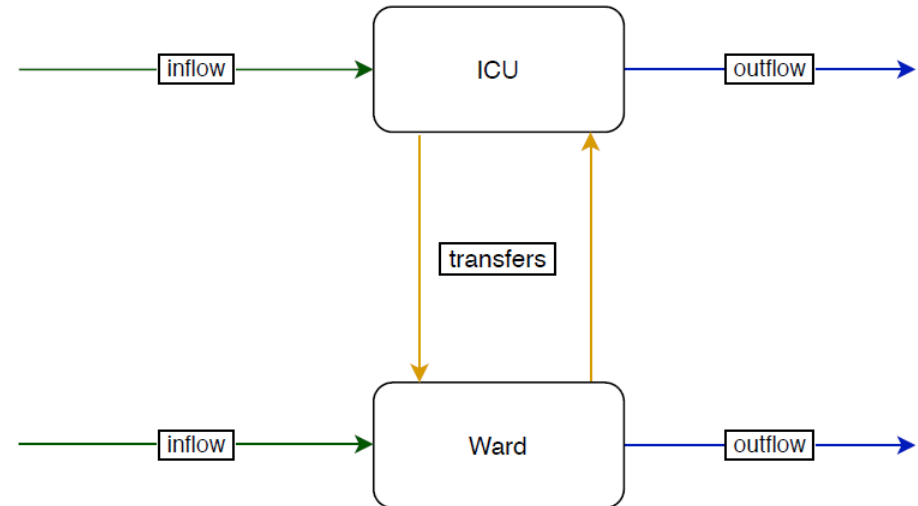
## Estimation of the Model

Two departments:

- Covid-19 ICU
- Covid-19 Ward

Estimation/prediction of:

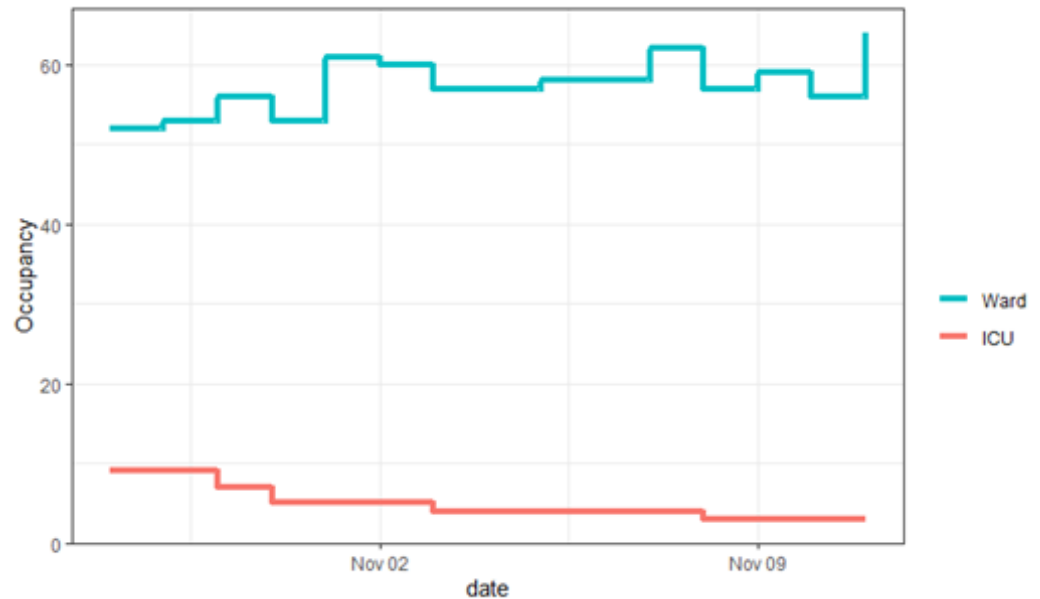
1. Future direct arrivals
2. Length of stay distributions
3. Transfer probabilities



*Figure 2: Schematic drawing of modeled Covid-19 departments and patient flows.*

## Simulation Method

- Based on estimates: Simulate patient paths through system
- Repeat this, take averages (for instance) to forecast occupancy



*Figure 3: Simulation of future occupancy at both Covid-19 departments, starting from 28/10.*

# Results



## Results

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- Implemented at **four** hospitals in the Netherlands
  - Evaluation on first outbreak: forecasts close to true occupancy for 5 days ahead for multiple hospitals.
  - Article in *Health Care Management Science* (submitted this week)
  - Further research: regional model to investigate transfer policies.
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