THE PROXIMITY NETWORK OF PATIENTS IN A HEALTH CARE SYSTEM

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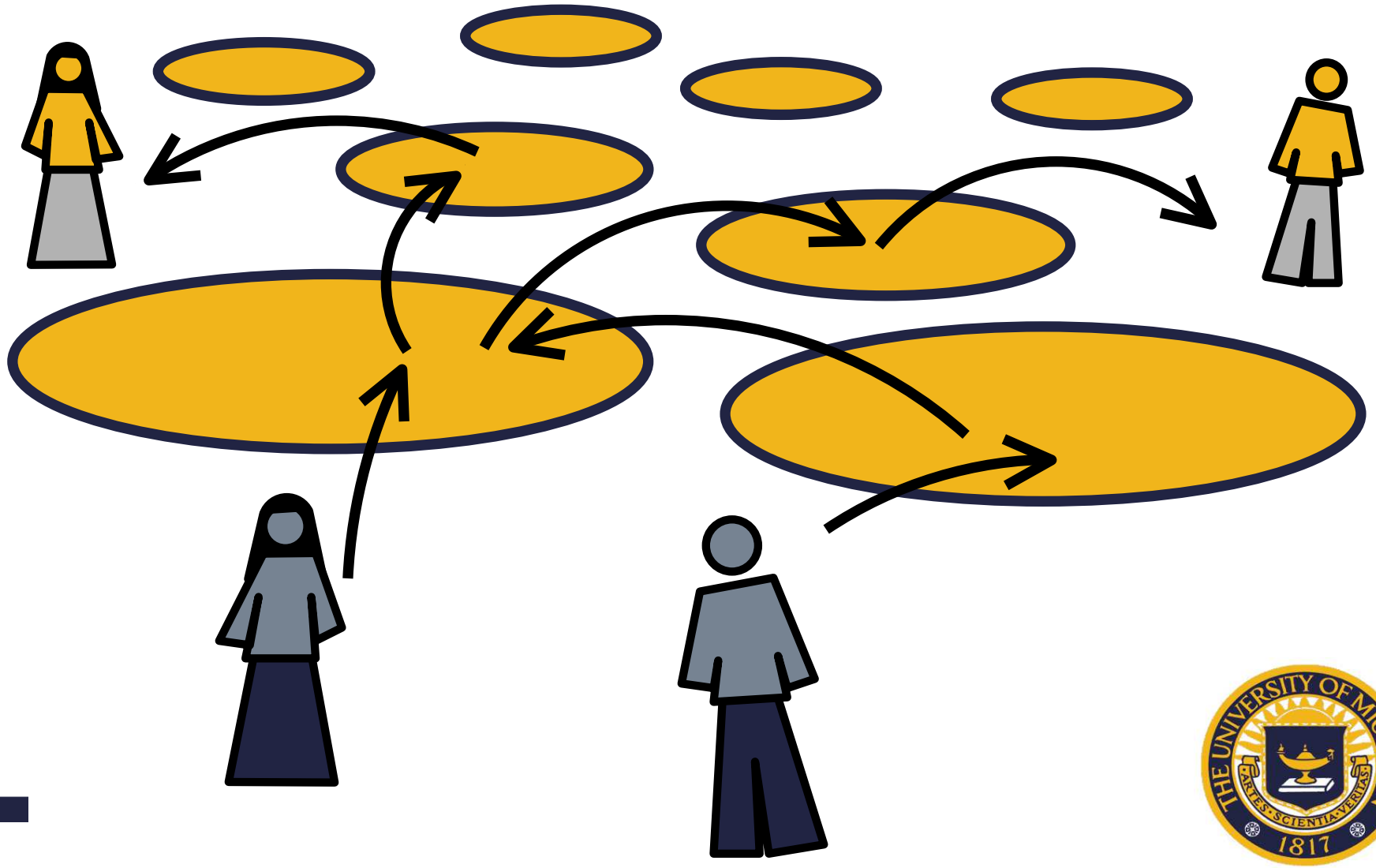
A health care system



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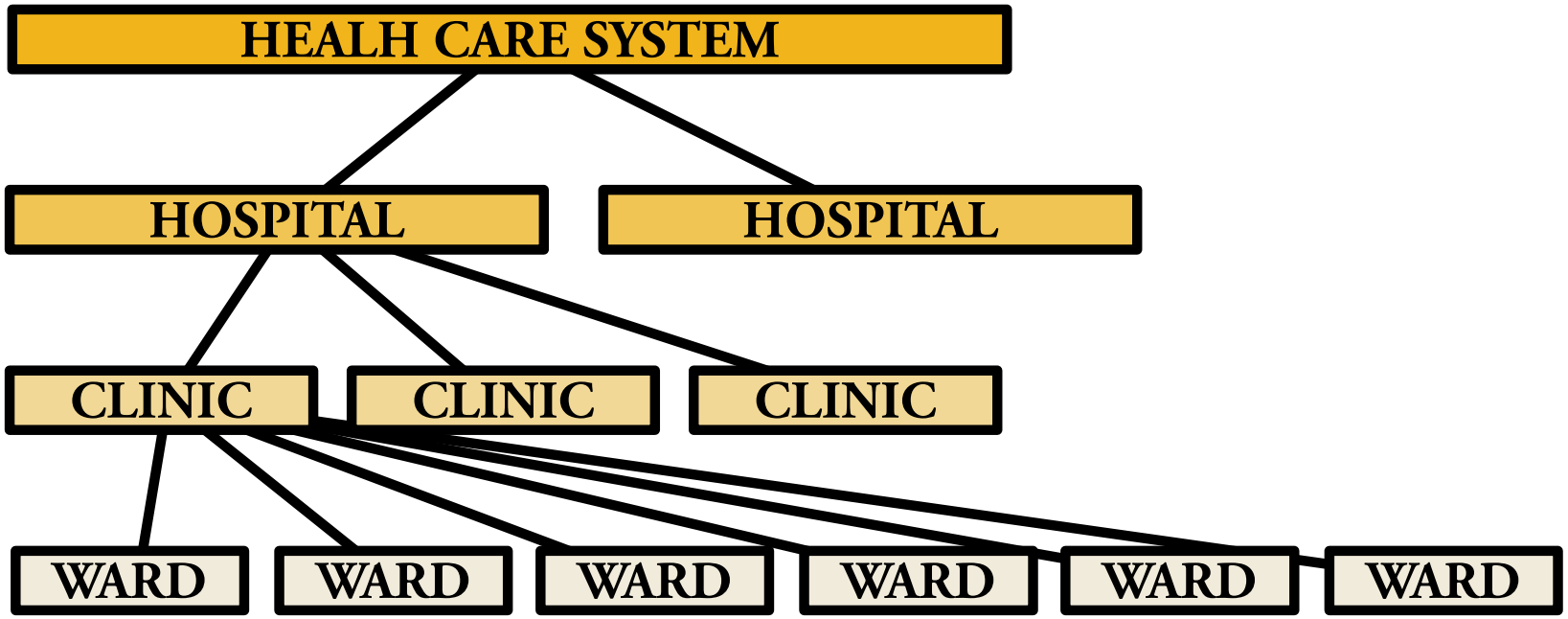

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Outbreak	R_0
Boston, USA (1721)	4.3
Burford (1758)	3.4
Chester (1774)	5.8
Warrington (1773)	4.0-5.3
Paris, France (1766)	4-5
London (1836-1870)	~ 5
Kosovo (1972)	10.8
Europe (1958-1973)	10-12

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- In epidemies of smallpox, Ebola and SARS hospitals have played a crucial role.
- Other pathogenes like MRSA and *Mycoplasma pneumoniae* can be endemic within a healthcare system.

Our data

- All hospitalizations of people in the Stockholm-region of Sweden the years 2001 and 2002.

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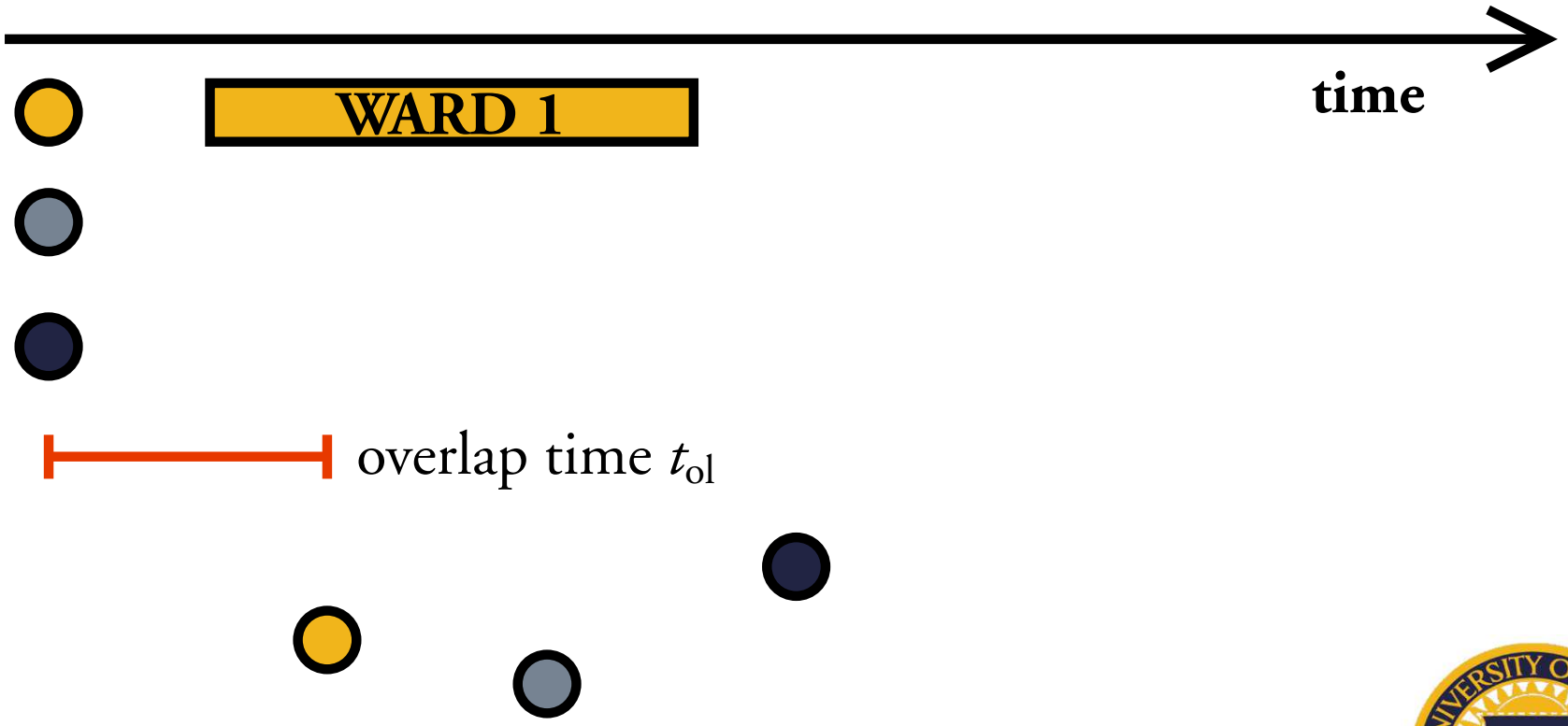
- 702 wards.

Constructing the networks

Some diseases are unlikely to spread if the patients have meet only briefly (less than a certain overlap time).



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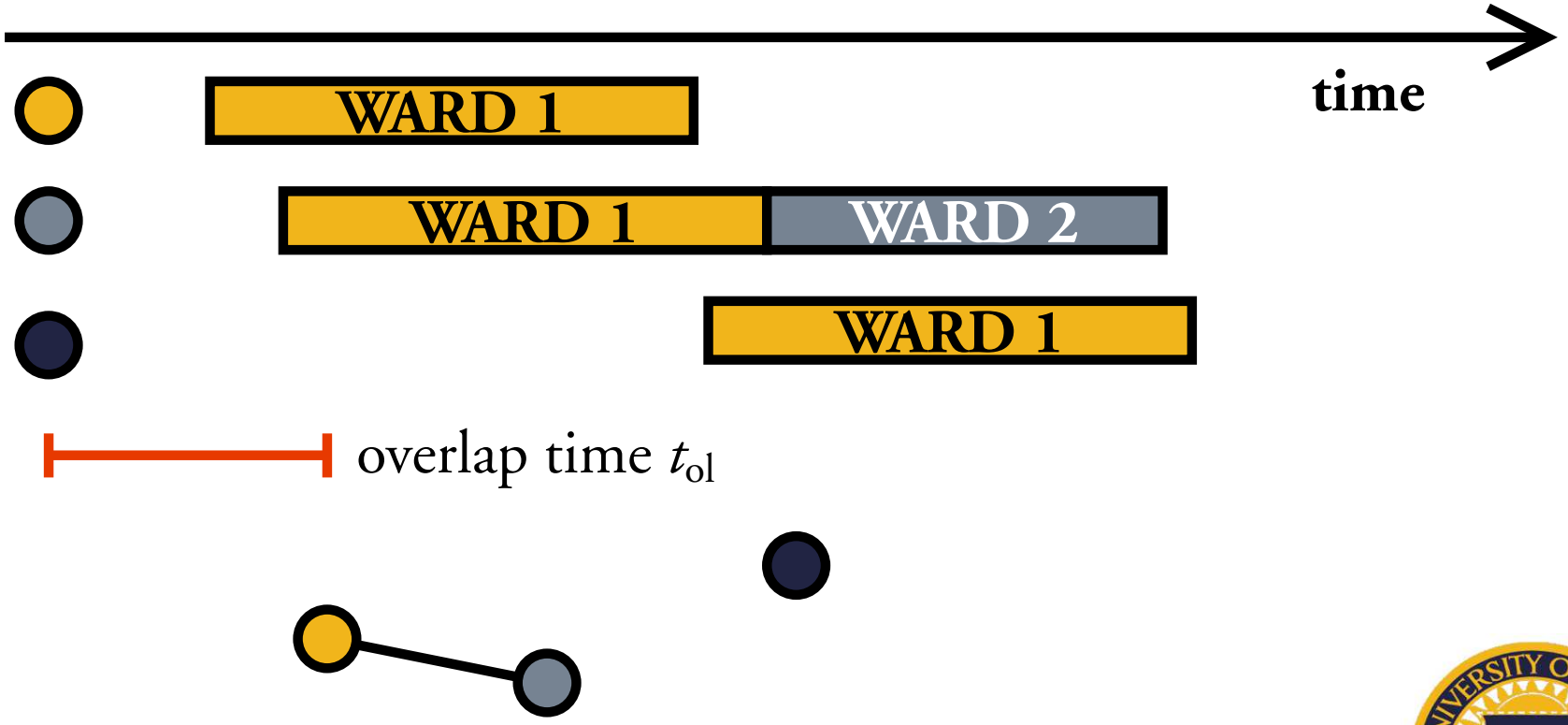

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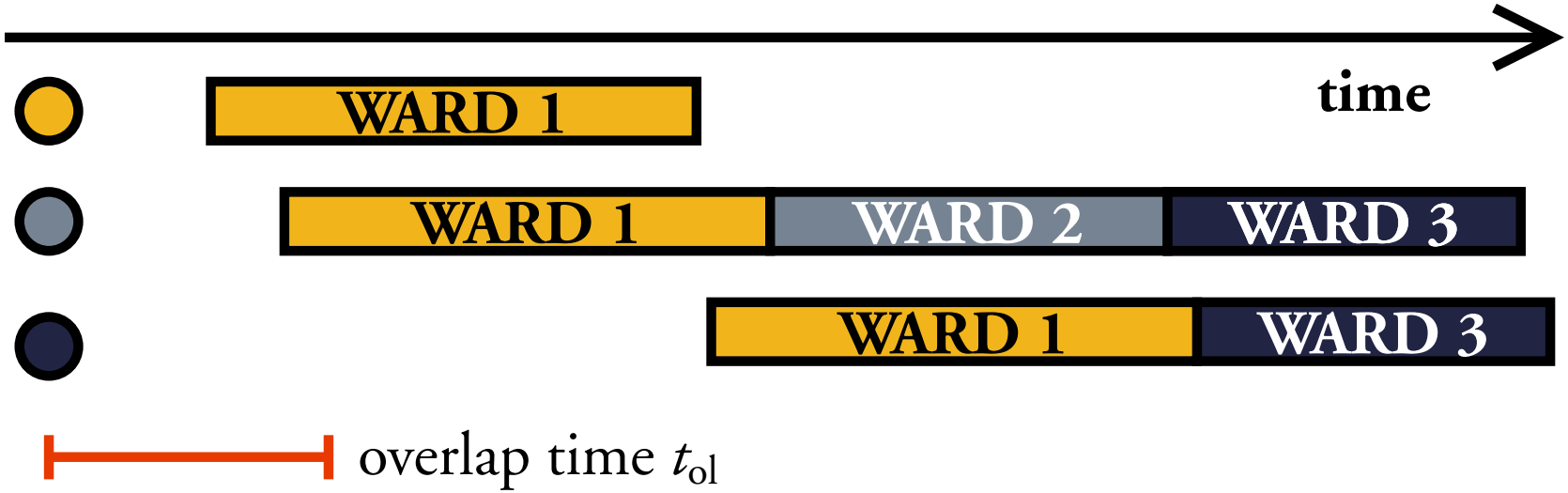
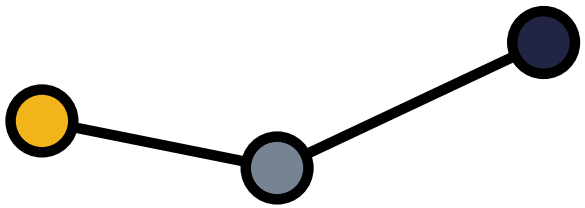
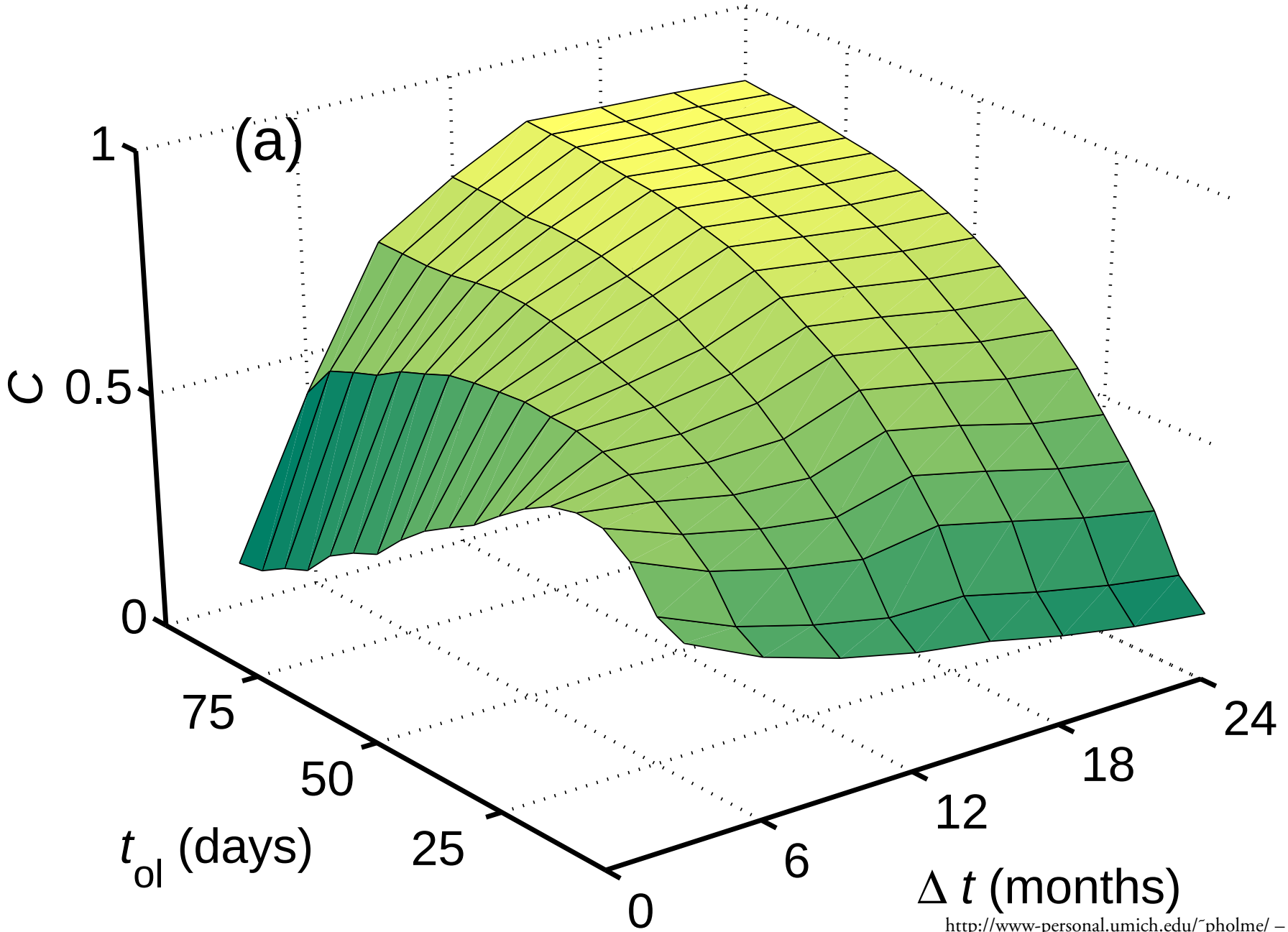


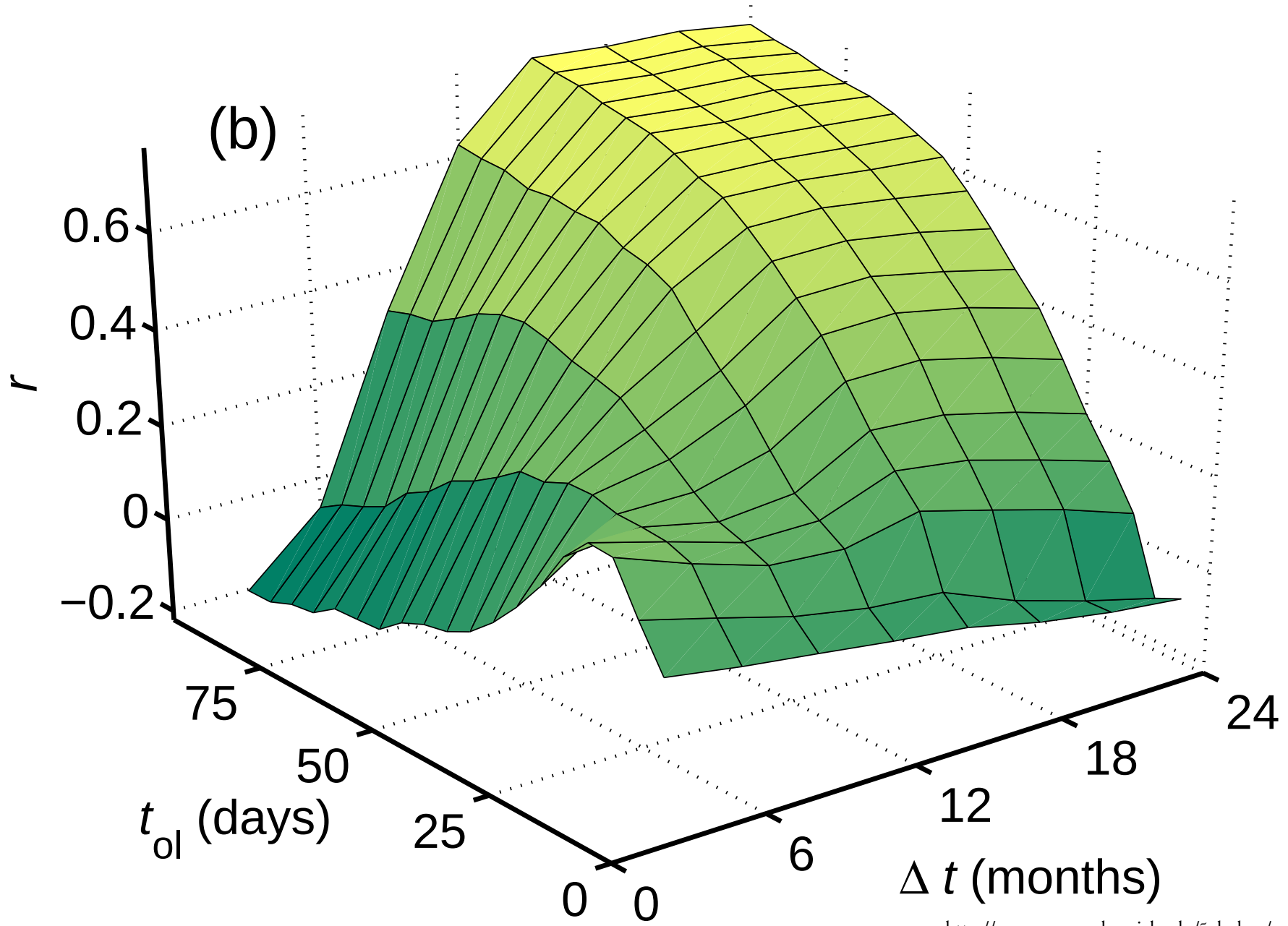


Degree distribution

Clustring coefficient



Degree-degree correlations



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- Each healthy (non-hospitalized) agent is, with probability p_1, hospitalized at a random ward.
- A hospitalized patient is assigned a duration $t \in P_t$ of the hospital stay.
- After a t days the patient is, with probability $p_2 > p_1$, rehospitalized at a random ward.

Results for the model

Conclusions