Kolloquium „Statistische Methoden in der empirischen Forschung“

Wann: 25. Oktober 2016, 17:00 – 18:30 Uhr

Wo: Robert Koch-Institut | Nordufer 20 | 13353 Berlin (Wedding),
S41, S42, U9 Westhafen | U9, Bus 142 Amrumer Str

Vitaly Belik (FU Berlin)

Ausbreitung von Epidemien auf Krankenhausnetzwerken

Spread of contagious nosocomial diseases, in particular drug resistant pathogens represent a major health challenge worldwide. One of the key spreading mechanisms is the transfer of patients, carrying the pathogen, between hospitals.

We investigate referral patterns of approx. 1 million of patients in one federal state of Germany over the period of three years.

Based on the evaluation of the empirical dataset we built a network of hospitals — a substrate for the pathogen spread. We investigate static as well as dynamical properties of the obtained network, allowing insights into the risk potential of a disease outbreak and vulnerability of hospitals.

Furthermore, we build an extensive discrete event- and agent-based computational model of an endemic disease. For this purpose we tackle some methodological challenges, such as bootstrapping of the artificial patient populations for the simulation and identifying hospitals located in the federal state under consideration. We use the model to assess the effect of control measures, such as screening, isolation and decontamination, leveraging the knowledge of the hospital network structure.

Our results and computational model could be used for informed study design and control of contagious nosocomial diseases.