

# A Markovian epidemic model with a limited number of hospital beds

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In this communication, we study a stochastic epidemic model where healthcare facilities, specifically the number of hospital beds for infectives, are limited. We characterize the probability law of the total time that the hospital ward remains functionally full during an outbreak of the disease. Our methodology uses sojourn, first-passage times, and related hitting probabilities in a suitably defined absorbing quasi-birth-death process. Numerical examples illustrate the effects of the person-to-person contact processes and exogenous streams of infection on the dynamics of the epidemic when the occupancy of the hospital ward is maximum.

This talk is based on the article: Gómez-Corral, A., Lopez-Herrero, M.J., Taipe, D. *On a stochastic epidemic model with limited number of hospital beds* for ASMTA/EPEW: The 27th International Conference on Analytical & Stochastic Modelling Techniques & Applications.