A SIMULATION MODEL FOR HOSPITAL BED OCCUPANCY MANAGEMENT: A CASE STUDY OF BENUE STATE UNIVERSITY TEACHING HOSPITAL

AGADA, P.O.[1], KORVE, K.N.[2] AND KWAGHAAH, T.T.[1]
[1]Department of Mathematics/Statistics/Computer Science,
[2]Department of Business Administration,
University of Agriculture, Makurdi, Nigeria

ABSTRACT

The quality of Medical Care in the Accident and Emergency (A&E) Wards of the Benue State University Teaching Hospital (BSUTH), Makurdi, is constantly faced with the challenges of under provision and over provision of hospital beds. . It is important to mention that the consequences of these are dissatisfaction, frustration and build-up of waiting list on the part of patients and loss of revenue and goodwill on the part of the hospital. This paper therefore, seeks to solve this problem via the simulation modeling approach. This approach was adopted because preliminary data analysis shows that data on inter admission times (days) and hospital stay times (days) do not follow any known probability distribution. Consequently, it does not only make it impossible to apply existing queuing models in solving the bed occupancy problem, but also in applying the probability distribution sampling technique in the simulation modeling process. This challenge was addressed via the use of the functionality for sampling from empirical distributions provided by PSIM, the Pascal simulation shell used in this work. The result shows that the optimal number of beds required is 10, 9, 7 and 2 for the Male, Female, Pediatrics and Gynecology wards respectively, while the mean number of empty beds are 3, 3, 3 and 1 respectively for these wards. The study concludes that though the model has being able to solve the problem of under provision, over provision of beds and that of revenue lost on the part of the hospital management, it is not without the challenge of providing for the holding cost of empty beds that will serve as buffer.