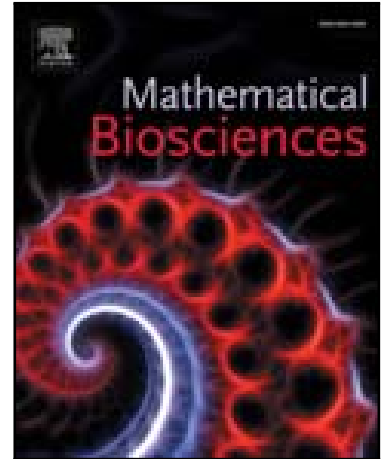


## Accepted Manuscript

Mathematical models for the effects of hypertension and stress on kidney and their uncertainty

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## HIGHLIGHTS

- Deterministic models for kidney disease are established in which the hypertension and stress are considered as the prime causes of damaging and removing of nephrons.
- Stochastic models for kidney disease related to the discussed deterministic models are developed.
- The equilibrium for both presented deterministic and stochastic models is studied and theorems regarding the stability and stochastic stability of the models are provided.
- The uncertainty problem for stochastic models is discussed.
- In several examples simulated in MATLAB, the uncertainty of the stochastic models is calculated and predictions for the future of the models in the case of the presented examples are made.
- Using a parameter study, some relations between the models' parameters and the entropy of the experimental data are detected.

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