Objective:
Development of a generic method to build simulation models for ambulance systems.

**Standardisation**
The model captures features of several systems in different countries.

**Reusability**
The model can be tailored and reused in an easy and quickly way.

The model:
- Call Generation
  - Arrival rates;
  - Geographical distribution;
  - Types of emergency;
  - Ambulance requirements, etc.
- Main Cores
  - Dispatch of ambulances
    - Rules of dispatch.
- Ambulance journey
  - Ambulance journey;
  - Traffic seasonality;
  - Service on scene;
  - Delivery at hospitals;
  - Restocking, etc.
- Dispatch

The three cores of the model:

Performance Measures:
- Response time (RT) for each category of emergency;
- Utilisation of ambulances and other resources.

Optimisation for simulation:
- The method proposes guidelines to build optimisation for simulation models in order to get high-quality configurations for the system.

Some benefits of standardisation / reusability:
- The same model can be used to analyse several systems with minor adjustments;
- We can try rules adopted by one system in another in order to investigate the impact, e.g., rules of UK systems can be applied in Brazilian systems.

Implementation:
- The model was implemented using Arena (Rockwell Soft).

Validation of the model:
- The model was validated using real data from a Brazilian city. Average Response Time and Utilisation of Ambulances was used in validation.

Standardisation and reusability:
- The model was used to analyse the impact that one might observe if some policies used in UK system were adopted in Brazil:
  - The results show that if Brazilian system adopted a calendar schedule to allocate ambulances the RT could be reduced by 4.1%, without extra costs;
  - The Brazilian system could improve its performance in emergencies that require ALS units using RRV’s as UK systems have used.

Conclusions:
- The main guidelines to build generic simulation models for ambulance systems were proposed;
- The input data and performance measures were explained;
- The proposed method seems wide comprehensive and the model is able to analyse aspects from UK and Brazil;
- Guidelines to build optimisation for simulation models were proposed;
- A simulation model was built and validated with real data;
- The results show that Brazilian system can improve its performance without extra costs by adopting some policies used in UK.