# Simulation and Modeling Efforts to Support Decision Making in Healthcare Supply Chain Management

## 1.1 Motivation/purpose/aims/hypothesis

Simulation Modelling(SM) is used in various fields to allow developers and users to represent a system and examine its operations using different scenarios and conditions. This paper aims to present and analyze past simulation and modeling (SM) efforts to support decision-making in healthcare SCM, identify the key challenges associated with SM in healthcare SCM, and discuss new technologies that emerged to meet these challenges.

## 1.2 Contribution

The authors presented the importance of having a good understanding of the benefits of SM in SCM optimization and identified the current issues and challenges in the field.

## 1.3 Methodology

The methodology focuses on decision-making processes within healthcare supply chain management (SCM) at strategic, planning, and operational levels which are: Strategic Decision Making, Budgetary Constraints, Planning Decision Making, and Operational Decision Making

## 1.4 Conclusion

Simulation modeling (SM) emerged as a tool to develop specific functional and decision systems that provided flexibility, specificity, and consistency. Healthcare simulation modeling is a way to test changes in a computerized environment that will hopefully put forward ideas for improvements and subsequent implementation.

## 2.1 First Limitation

The model was set to perform under the following constraints: demand satisfaction (no stock-out allowed), flow persistence between SC members (represented by nodes in the graph), storage capacity, aggregating all items, producer's supply capacity affecting all potential buyers,non-negativity, and integrality of decision variables.

## 2.2 Second Limitation

The model included types M1 and M2 which were set to perform under several constraints as (i) set time restrictions on manpower to accomplish the required activities;(ii) deliveries are restricted to products received within the current period; (iii) demand satisfaction; (iv) respect of storage capacity; (v) no product is received if the supplier does not visit the hospital; and (vi) products at CU can only be replenished if the unit is visited.

## 3 Future Scope:

As steps are being developed for the success of simulation, it should be viewed not just in the use of current and future technologies but also in its application to the clinical environment. As new technologies emerge to mitigate concerns regarding implementation, potential impact, and value-added for healthcare SC processes, it then becomes necessary for healthcare organizations to realize the likelihood of simulation modeling to enhance their operations and maximize the benefits.