**Response to reviewers**

Reviewer 1:

In this paper, author shares a study on modeling and optimizing an emergency medical centers lo-cation problem using meta-heuristic algorithms. Although the subject is interesting, there are many technical issues with this paper. The title is not clear, appealing, interesting and specific. I suggest to revise the paper title to make it more concise and suitable. The text written in various figures, particularly, Figure 1 and Figure 2, are not clear. Please resolve this issue. The figure captions are used differently, like Figure 2, and Fig 3. The author does not demonstrate the knowledge of basic composition skills, including word choice, sentence structure, paragraph development, grammar, punctuation, spelling, and citation of references.

Response:

Reviewer 2:

Advantages and benefits of the proposed approach should be given in detail. Also, the research gaps and the novelty of this study is not clear.

Response:

- Please clarify the novelty of this study compared to the following papers:

Response:

Moadi, S., Mohaymany, A. S., & Babaei, M. (2011). Application of imperialist competitive algorithm to the emergency medical services location problem. International Journal of Artificial Intelligence & Applications, 2(4), 137.

Hamadani, A. Z., Ardakan, M. A., Rezvan, T., & Honarmandian, M. M. (2013). Location-allocation problem for intra-transportation system in a big company by using meta-heuristic algorithm. Socio-Economic Planning Sciences, 47(4), 309-317.

Mohamadi, A., & Yaghoubi, S. (2016). A new stochastic location-allocation emergency medical services healthcare system model during major disaster. Journal of Industrial and Systems Engineering, 9(special issue on location allocation and hub modeling), 85-99.

Hashemi, S. E., Jabbari, M., & Yaghoubi, P. (2022). A mathematical optimization model for location Emergency Medical Service (EMS) centers using contour lines. Healthcare Analytics, 2, 100026.

Tongur, V., Hacibeyoglu, M., & Ulker, E. (2020). Solving a big-scaled hospital facility layout problem with meta-heuristics algorithms. Engineering Science and Technology, an International Journal, 23(4), 951-959.

Azizan, M. H., Go, T. L., WM, W. L., Lim, C. S., & Teoh, S. S. (2017). Comparison of emergency medical services delivery performance using maximal covering location and gradual cover location problems. International Journal of Electrical and Computer Engineering, 7(5), 2791.

Adarang, H., Bozorgi-Amiri, A., Khalili-Damghani, K., & Tavakkoli-Moghaddam, R. (2020). A robust bi-objective location-routing model for providing emergency medical services. Journal of Humanitarian Logistics and Supply Chain Management, 10(3), 285-319.

Hajipour, V., Fattahi, P., Tavana, M., & Di Caprio, D. (2016). Multi-objective multi-layer congested facility location-allocation problem optimization with Pareto-based meta-heuristics. Applied Mathematical Modelling, 40(7-8), 4948-4969.

Response:

- Literature review and references should be updated according to recent studies (2020-2022).

Response:

- The characteristics of current research should be highlighted in the comparative table of literature review from both aspects of theoretical and application.

Response:

- Generally, emergency medical data in are tainted by uncertainty. The authors should discuss the proposed approach under data uncertainty.

Response:

- The proposed approach should be applied in the real-world application. Also, managerial insights should be added at the end of illustrative application.

Response:

- The authors should discuss on the limitations of the study.

Response:

- The authors should discuss on the generalization of the results of the study.

Response:

- The authors should clearly explain and justify the reason for using CSA algorithm among the available algorithms in literature.

Response: