Review of: "A population-based model for rationing COVID-19 vaccine"

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A population-based model for rationing COVID-19 vaccine

The topics of this paper are interesting.

Abstract has to clarify goals, and health and social implications. Results are not clear.

Introduction has to better clarify the research questions of this study and provide more theoretical background. Authors have to better describe the level of vaccination as a measure to cope with pandemic diffusion. After that they can focus on the topics of this study to provide a correct analysis for fruitful discussion. (See suggested readings that must be all read and used in the text).

Methods of this study is not clear. The section of Materials and methods must be re-structured with following three sections to be clear:

- Sample and data
- Measures of variables
- Models and Data analysis procedure.

Result.

Avoid acronyms in tables.

Or insert a note to clarify them.

The paper has a lot of figures that are difficult to digest, some of them can be put in appendix and inserting in the text the most important ones to improve the readability…

Discussion.

First, authors have to synthesize the main results in a simple table to be clear for readers and then show what this study adds compared to other studies.

Conclusion has to be created and has not to be a summary, but authors have to focus on manifold limitations of this study and provide suggestions of health, crisis management and social policy, as well as how nations can prevent, with a good governance, next pandemics with vaccination and nonpharmaceutical measures of control.

Overall, then, paper is interesting, but results are not clear as well as implications.

Suggested readings to reinforce theoretical framework.

- Zhou, L., Li, J., Shi, D., Xu, L., Huang, S.-X. 2022. Predicting Influenza Epidemic for United States International Journal of Environmental Health Research. 32(6), pp. 1231-1237

- Coccia M. 2022. Optimal levels of vaccination to reduce COVID-19 infected individuals and deaths: A global analysis. Environmental Research, vol. 204, Part C, March 2022, Article number 112314, https://doi.org/10.1016/j.envres.2021.112314

- Macias, A.E., McElhaney, J.E., Chaves, S.S., Nealon, J., Nunes, M.C., Samson, S.I., Seet, B.T., (...), Yu, H.. 2021. The disease burden of influenza beyond respiratory illness .(2021) Vaccine, 39, pp. A6-A14.

- Coccia M. 2022. COVID-19 pandemic over 2020 (with lockdowns) and 2021 (with vaccinations): similar effects for seasonality and environmental factors. Environmental Research, Volume 208, 15 May 2022, n. 112711. https://doi.org/10.1016/j.envres.2022.112711

- Rey, D., Hammad, A.W., Saberi, M. 2023Vaccine allocation policy optimization and budget sharing mechanism using reinforcement learning. Omega (United Kingdom)115,102783

- Coccia M. 2021e. Pandemic Prevention: Lessons from COVID-19. Encyclopedia, vol. 1, n. 2, pp. 433-444. doi: 10.3390/encyclopedia1020036

- Tutsoy, O. 2022Pharmacological, Non-Pharmacological Policies and Mutation: An Artificial Intelligence Based Multi-Dimensional Policy Making Algorithm for Controlling the Casualties of the Pandemic Diseases. IEEE Transactions on Pattern Analysis and Machine Intelligence44(12), pp. 9477-9488