Predicting the duration of time it takes for patients to receive metastatic cancer diagnosis

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01. Introduction

Metastatic Triple-negative Breast Cancer (TNBC) is considered the most aggressive TNBC and requires urgent and timely treatment. Unnecessary delays in diagnosis and subsequent treatment can have devastating effects in these difficult cancers. Differences in the wait time to get treatment is a good proxy for disparities in healthcare access.

02. Objective

The goal of this project is to detect relationships between demographics of the patient with the likelihood of getting timely treatment.

References

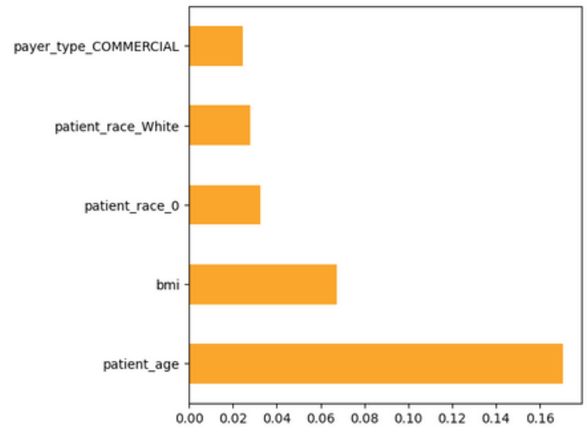
https://towardsdatascience.com/machine-learning-with-fuzzy-logic-52c85b46bfe4 (15.06.2024)
https://jdvelasq.github.io/fuzzy-expert/tutorials/tutorial-1.html (15.06.2024)
https://www.kaggle.com/competitions/widsdatathon2024-challenge2 (15.06.2024)

03. Methodology

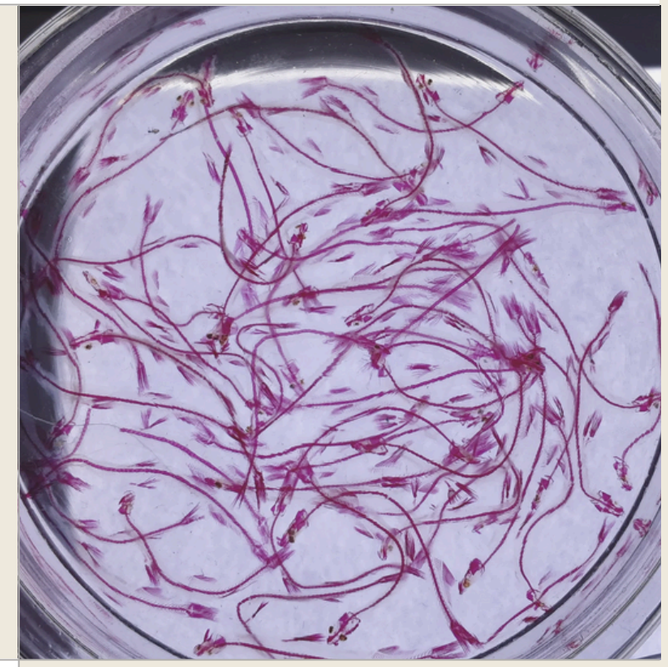
- Obtaining the data
- Cleaning the data
- Analysing the data and defining the two most important features
- Fuzzifying variables
- Extracting the rule set from the training data
- Specifying variables for a Mamdani fuzzy inference system
- Specifying the rules for Mamdani fuzzy inference system
- Evaluating crisp values from the test data

04. Results/Findings

Patient age and bmi are the most important factors related to the time of diagnosis.



The most important features for predicting the duration of time it takes for patients to receive metastatic cancer diagnosis



05. Conclusion

A Mamdani fuzzy inference system is suitable for meeting the objective of this study.
Nevertheless, significantly more effort has to be put in analysing the data and more features need to be selected for the model in order to make reliable predictions that could be used in the field of medicine.