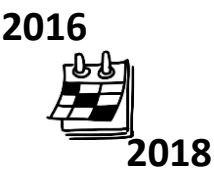


Prediction of Occurrence For Surgical Site Infection in Infected Surgeries

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Background

This research represents an experiment on surgical site infection (SSI) in patients undergoing infected surgery procedures in hospitals in Belo Horizonte,



Period: between July 2016 and June 2018.

Objectives:

- 1 - Statistically evaluate SSI incidences
- 2 - Enable a study of the prediction power of SSI of pattern recognition algorithms based in Multilayer Perceptron (MLP).

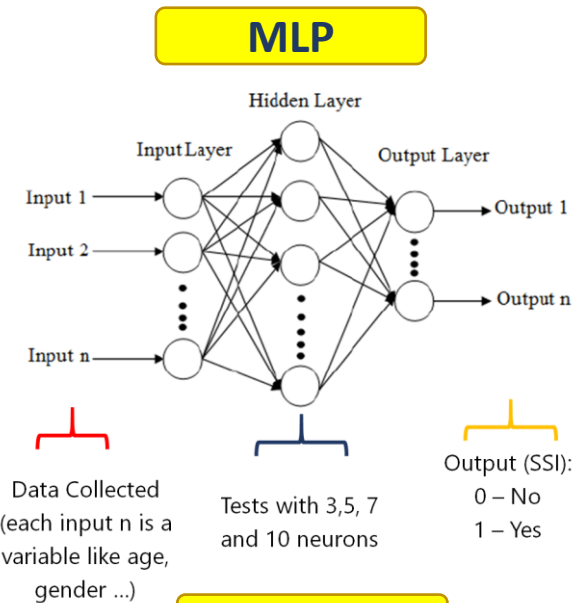
Methods

Data were collected on SSI in five hospitals.

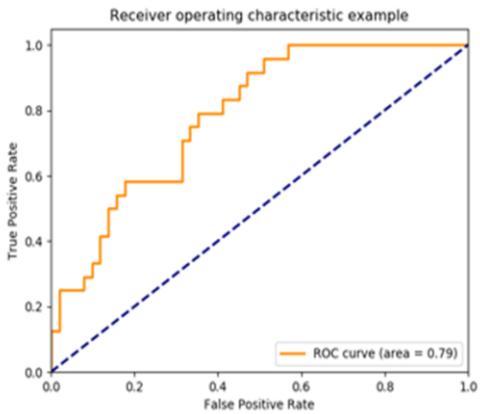
The Hospital Infection Control Committees (CCIH) of the hospitals involved collected all data used in the analysis during their routine SSI surveillance procedures and sent the information to the Nosocomial Infection Study Project (NOIS) through the SACIH to collect data from a sample of hospitals.

Three procedures were performed:

- 1 - A treatment of the database collected for use of intact samples;
- 2 - A statistical analysis on the profile of the hospitals collected
- 3 - An assessment of the predictive power of five types of MLP (Backpropagation Standard, Momentum, Resilient Propagation, Weight Decay, and Quick Propagation) for SSI prediction. They were compared by measuring AUC (Area Under the Curve - ranging from 0 to 1) presented for each of the configurations.



AUC



Results

From 1770 records, 810 were intact for analysis.

It was found that:

- The average age is 53 years old (from 0 to 98 years old);
- The surgeries had an average time of approximately 140 minutes;
- The average hospital stay is 19 days,
- The death rate reached 10.86% and the SSI rate was 6.04%.

A maximum prediction power of 0.729 was found..

Conclusion

There was a loss of 54% of the database samples due to the presence of noise. However, it was possible to have a relevant sample to assess the profile of these five hospitals.

The predictive process, presented some configurations with results that reached 0.729, which promises the use of the structure for the monitoring of automated SSI for patients submitted to infected surgeries.

To optimize data collection and enable other hospitals to use the SSI prediction tool (available in www.sacihweb.com), two mobile application were developed:

- 1 - for monitoring the patient in the hospital
- 2 - for monitoring after hospital discharge.