

# **Application of machine learning methods to burden of disease research and predictors of cause specific adult mortalities in rural Uganda**

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## **Background**

A health and demographic surveillance site (HDSS) provides useful platform for studying population-level mortality and health research since they record and ascertain cause of death for every death occurring in defined geographical area.

## **Objective**

To determine predictors of adult cause specific mortalities from 2010 – 2016.

## **Design**

Mortality data was collected through Verbal Autopsies at Iganga Mayuge HDSS in Eastern Uganda. We classified the causes of death into major disease categories of communicable diseases, non-communicable diseases and injuries. Potential predictors including death place, age, gender and death year were used in model building. A data mining methodology called TreeNet was used to explain key drivers of cause-specific mortalities and their interactions.

## **Results**

More than a half (60.8%) of the deaths occurred at home and 0.4% of the deaths occurred in water bodies. There were more deaths (46.6%) due to Non-communicable diseases (NCDs) compared to other causes. The most important predictors of any death was age, death place and death year. Most injury related deaths occurred among those aged less than 35 years and most NCDs deaths were among elderly (60years plus). Health seeking patterns were higher among those who died due to communicable while those who died due to injuries were less likely to reach a health system. NCD related deaths have increased since 2014.

## **Conclusions**

The trends of mortalities due to NCD have increased in recent years. Injuries are mostly affecting the young and productive population groups. The machine learning approaches like TreeNet is a flexible and powerful tool capable of consistently generating easy to interpret results and accurate models. This evidence informs burden of disease research and policy.