

*Symposium on Big Data in Finance, Retails and Commerce:
Statistical and Computational Challenges
Lisbon, 2-3 November 2017, Portugal*

Effect of age, state of survival and proximity to death on the care costs of the beneficiaries of a health care operator

Rômulo Alves Soares (Speaker)

Universidade Federal do Ceará, romuloalves61@gmail.com

Sílvia Maria Dias Pedro Rebouças

Universidade Federal do Ceará, smdpedro@gmail.com

Cleber de Souza Gondim

Unimed Fortaleza, cleversg@gmail.com

Abstract

The objective of this article is to evaluate the effect of age, survival status and proximity to death on care costs in a health plan operator (OPS). For this, information about 300,000 beneficiaries of a large OPS in the state of Ceará, between the years of 2014 and 2015, was used. The information collected was related to the monthly costs of these users in the analyzed period, their age, whether they remained alive or not in the period, their sex and the number of months until the death for the beneficiaries who died. The statistical analyzes conducted involved T and Wilcoxon tests for the comparison of the annual costs of surviving and non-surviving beneficiaries and quantum regression to verify the influence of the independent variables on the cost of care. In addition, the classification and regression tree and random forest techniques were used to verify the degree of importance of these variables in determining the cost. The results show that both age and survival status are able to influence cost when considering all beneficiaries, which is also observed for age and proximity to death when only beneficiaries who have died are taken into account. However, it is important to note that the importance given to age in relation to other variables (survival status and proximity to death) is quite low, while sex in some of the analyzes is not even significant. Based on the results obtained, it is important that the state of survival and proximity to death be taken into account for the projection of healthcare costs in OPS, in order to guarantee its sustainability in a sensitive and increasingly competitive market.

Keywords: Care costs, Near death, Survival status, Random forest, Classification and regression tree.