

# Prediction of electronic cigarette and vape use among Malaysian: decision tree analysis

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## ABSTRACT

**Introduction:** The main objective of this paper is to understand the decision to use electronic cigarette and vape (ECV) and vape among Malaysian adults by assessing the perceptions and demographic variables in relations to the current status (i.e., current, former, and never use). The predictive model was developed using Induction Decision Tree (ID3) algorithm, a popular data mining technique an exploratory tool for knowledge discovery. **Methods:** The dataset was extracted from the National Electronic Cigarette Survey (NECS) 2016. A total of 4,288 responses were collected. The collected data was used to build and verified the model. Eight demographics variables (i.e., age, gender, race, religion, residence (urban/rural), marital, occupation and education) and twenty variables on perception of ECV were included as predictor variables. **Results:** By using the ID3 algorithm, it is possible to consider the relationship among variables and to identify the most informative variables for predicting the classification of the instance. It was identified that the most important variable is gender. This highlight that the decision for ECV use is significantly differ among male and female. The accuracy - i.e., percentage rate of right outcome - of the most optimum model generated in this study is 87.88%. **Discussion:** A number of interesting findings emerged from the ID3 model. Among others, the model indicated that young female (age < 32 years old) who perceived that ECV should be regulated than banned, and believe that ECV reduced coughing is more likely to be the current ECV user. Whereas among male, if the person is older than 44 years old, self-employed, lives in urban area, and agreed that ECV could reduce coughing, less addictive and reduced urge to smoke; he is predicted to be the current smoker. Hence, this study provides meaningful insights into understanding the different perceptions and characteristics between male and female current ECV users.

Med J Malaysia Vol 72 Supplement 1 August 2017:A67

# Premature mortality from non-communicable diseases in Malaysia from 2009 - 2013

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## ABSTRACT

**Introduction:** In the dawn of the third millennium, non-communicable diseases (NCD) are a major problem across all countries. It imposes considerable constrain on developing countries with the double burden to deal with infective and non-infective diseases. Our aim is to calculate the Years of Life Lost (YLL) for NCDs in Malaysia and examine the trend from 2009 to 2013. **Methods:** Methods developed by the World Health Organization (WHO) for the Global Burden of Disease (GBD) Study were applied. YLL is the mortality component and determined by the age-sex specific number of deaths and life expectancy at death. Population data and mortality data were obtained from the Department of Statistics Malaysia. Revised cause specific mortality fraction (CSMF) was applied on hospital and non-hospital deaths to reduce the proportion of ill-defined causes and develop more accurate estimates of national mortality. **Results:** There is an increasing trend of YLL from NCDs seen, from 1,786,719 YLL in 2009 to 1,968,086 YLL in 2013. The YLL/1000 population shows a similar increasing trend from 77.66 YLL/1000 population in 2009 to 79.97 YLL/1000 population in 2013. Males consistently contribute around 55% of the total YLL from NCDs. Diabetes, cardiovascular diseases (CVD), cancers and chronic respiratory diseases contribute around 80% of the burden of NCDs. The YLL and YLL/1000 population from these 4 diseases also show an increasing trend over the 5-year period. **Discussion:** YLL from NCDs continue to rise in Malaysia. Diabetes, CVD, cancers and chronic respiratory diseases are the main contributors to YLL from NCDs. Effective preventive measures on the control of risk factors such as tobacco, alcohol, high blood pressure, diet and physical inactivity would halt the growing trend of NCDs in Malaysia.