

## A relationship between happiness and life expectancy in breast cancer

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**Abstract:**

The second most common cancer among world women is breast cancer. We have many categorize of breast cancer. About 40000 women die for this cause in resent year[1]. We consider the relationship between happiness and life expectancy with death anxiety in patients with breast cancer. In this article we use logistic regression in R. Results show us that by increasing the awareness and understanding of people's beliefs about this disease, they can increase the ways of happiness and life expectancy in these people which reduces the anxiety of death in these patients.

**Key words:** *Cancer, logistic regression, life expectancy.*

**1. Introduction:**

Breast cancer has many type and many stages. Time is so important factor for detection cancer. Radiologists should detect cancer soon as soon. Type of regression can help to radiologist for prediction of cancer[2].

Information about patient like age and history of menopause and age of menopause is important for prediction or detection in first phase[3].

In this case assume that we have two patient with two history. First person has a sister with breast cancer and second person has a mother or sister and mother with breast cancer. Which is more probability for detection? Second person[4].

Many different kind of cancer are the problems that can affect a person's physical and mental health[5]. cancers patients suffering from depression experience a drop in quality of life and have a higher rate of mortality than others. In addition, depression in cancer patients can stimulate the abandonment of therapy stages and lead the patient to severe renal complications and death. Therefore, patients with this disease as well as other cancer diseases need for compatibility due to the stress. In this regard, one of the best supports for people coping with problems is feelings of joy and happiness. Happiness leads to a positive attitude to life, a positive self-concept and enjoyment of physical[6].

**2. Related work:**

many research published in this scope. Vikas used simple logistic and RBF and rRepTree for detecting breast cancer[9].

A comparative study between neural network and decision tree and genetic algorithm done by wei-pin chang[10]. The result of this study represent that combine of neural network

and decision tree is the best solution for cancer detection[10].

Senturk had comparative study about seven data mining algorithm in cancer detecting. Their experimental result shows that support vector machine has high accuracy[11].

**3. Materials and methods:**

**3.1 data sets:**

Data sets related to the 50 states of the United States of America. It consists of[1]:

- state.abb
- state.area
- state.center
- state.division
- state.name
- state.region
- state.x77

R currently contains the following “state” data sets. Note that all data are arranged according to alphabetical order of the state names.

Table1:datasets and descriptions

Data set	description
State. abb	character vector of 2-letter abbreviations for the state names.
State. Area	numeric vector of state areas (in square miles).
State. center	list with components named x and y giving the approximate geographic center of each state in negative state. Division longitude and latitude.

	Alaska and Hawaii are placed just off the West Coast.
State.name	factor giving state divisions (New England, Middle Atlantic, South Atlantic, East South Central, West South Central, East North Central, West North Central, Mountain, and Pacific).
State.region	character vector giving the full state names.
State.x77	factor giving the region (Northeast, South, North Central, West) that each state belongs to.
Population	matrix with 50 rows and 8 columns giving the following statistics in the respective columns
Income	population estimate as of July 1, 1975
Illiteracy	per capita income (1974)
Life EXP	illiteracy (1970, percent of population)
Murder	life expectancy in years (1969–71)
Hs Grad	murder and non-negligent manslaughter rate per 100,000 population (1976)
Frost	percent high-school graduates (1970)
Area	mean number of days with minimum temperature below freezing (1931– 1960) in capital or large city

### 3.2. logistic regression analysis:

There are hundreds of types of regressions. Linear regression: Oldest type of regression, designed 250 years ago; computations (on small data) could easily be carried out by a human being, by design. Can be used for interpolation, but not suitable for predictive analytics. Logistic regression: Used extensively in clinical trials, scoring and fraud detection, when the response is binary. Types of regression showed in below:

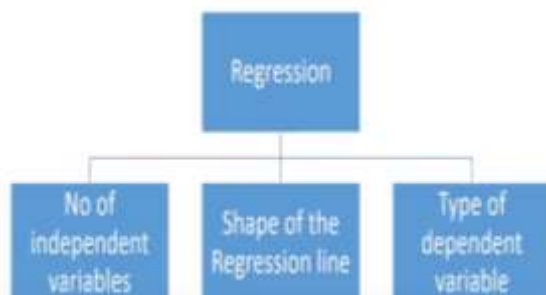


Fig.1 types of regression

In linear regression have:

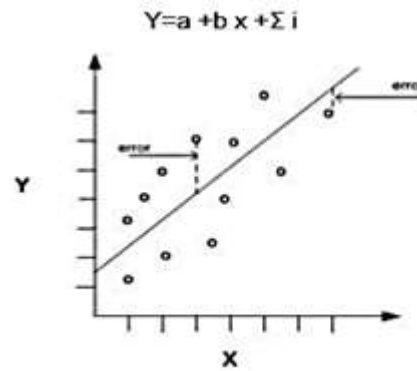


Fig.2 linear regression

If you have more than one variable, we can use multivariable regression[2]. In this article we use this model:  

$$y_i = \beta_0 + \beta_{1x_1} + \beta_{2x_2} + \dots + \beta_{pxip} + \epsilon_i \quad i=1, \dots, n$$
(1)

In that formula y is answer variable and  $x_1, x_2, \dots, x_p$  are independent variable that p is the count of independent variables.

The goal is to find two-variable relationship so that new information can be obtained.

After regression we do summary for showing results.

```

> summary(st)
  Population      Income      Illiteracy      Life.Exp
Min.   : 365      Min.   :3098      Min.   : 0.500      Min.   :167.96
1st Qu.: 1090      1st Qu.:3993      1st Qu.: 0.625      1st Qu.:170.12
Median : 2030      Median :4519      Median : 0.950      Median :170.67
Mean   : 4246      Mean   :4436      Mean   : 1.170      Mean   :170.88
3rd Qu.: 4968      3rd Qu.:4814      3rd Qu.: 1.575      3rd Qu.:171.89
Max.   :21199      Max.   :6315      Max.   : 2.800      Max.   :173.60

  Murder      Hs.Grad      Frost      Area
Min.   : 1.400      Min.   :37.00      Min.   : 0.00      Min.   : 1049
1st Qu.: 4.350      1st Qu.:48.05      1st Qu.: 66.25      1st Qu.: 36985
Median : 6.950      Median :53.25      Median :114.50      Median : 54277
Mean   : 7.378      Mean   :53.11      Mean   :104.46      Mean   : 70726
3rd Qu.:10.675      3rd Qu.:59.15      3rd Qu.:139.75      3rd Qu.: 81163
Max.   :15.100      Max.   :67.30      Max.   :188.00      Max.   :156642

  Density
Min.   : 0.6444
1st Qu.: 25.3352
Median : 73.0154
Mean   :149.2245
3rd Qu.:144.2028
Max.   : 975.0033
  
```

Fig3. Summary of data

Now you must calculate the correlation matrix. After draw correlation matrix as like below:



Fig4. Correlation matrix

Now we made the linear model and Analysis of Variance Table:

Model 1: Life.Exp ~ Population + Income + Illiteracy + Murder + HS.Grad + Frost + Area + Density  
 Model 2: Life.Exp ~ Population + Income + Illiteracy + Murder + HS.Grad + Frost + Density  
 Res.Df

	RSS	Df	Sum of Sq	F	Pr(>F)
1	41	22.0683			
2	2	42	22.4247	-1	-0.3564 0.6621 0.4205

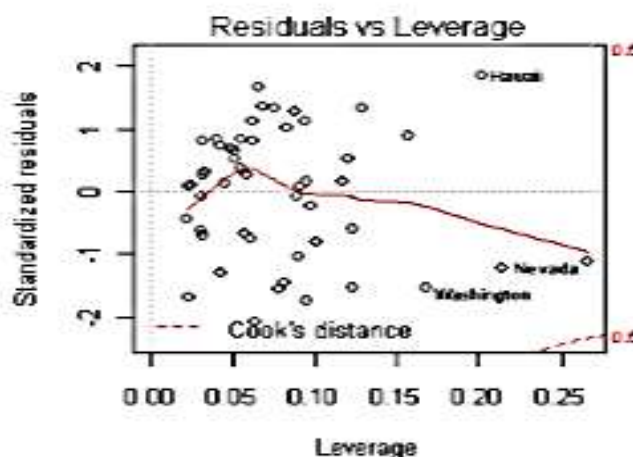
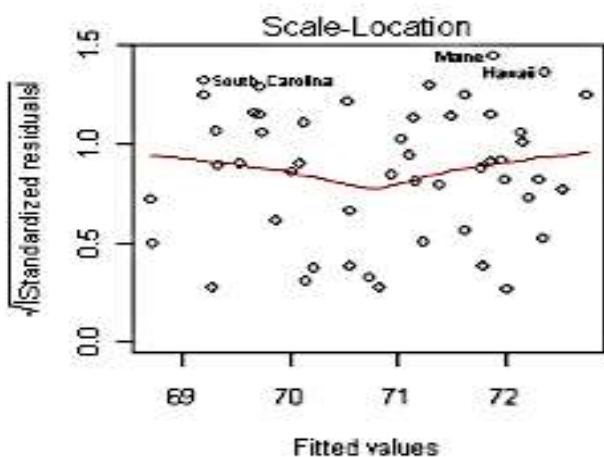
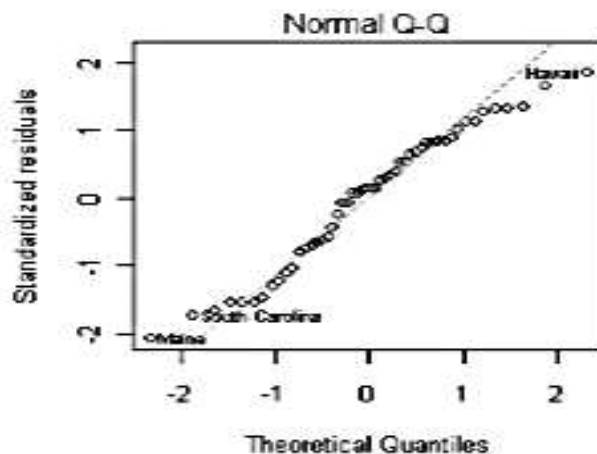
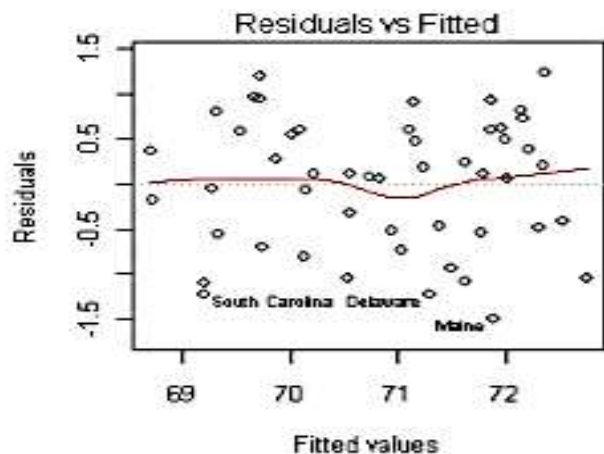


Fig.5.detect regression

**Conclusion:**

Among all types of cancer, breast cancer is the most common cancer as well as the most common cause of death among women breast cancer is a psychological and emotional phenomenon for many women because it is a member of the most sensitive parts of the body and is a sign of the beauty and attractiveness of a woman.

A psychological concept that mean how human could have a better life and could be positive is happiness.

by analyzing the effect of hope on mental health and happiness of cancer patients it is concluded that happiness

**3.3. analysis:**

We analyse this method in R language and see this results. the model should include all relevant variables. more variables generally produce a better model fit to the data. Therefore by increasing the awareness and understanding of people's beliefs about the disease they can increase the happiness and life expectancy of these people which reduces the anxiety of death in these patients.

and hope life can lead to increased happiness among patients undergoing dialysis

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