PREDICTING THE LENGTH OF STAY OF EYE PATIENTS IN BSMMU HOSPITAL

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Abstract— We have tried to analyze the data to find out the length of stay of patients in a hospital. Thus they can define the severity level of any patient. We have also analyzed the data to watch the scenario which will help the hospital to come to a specific decision for the overall betterment of the patients. We have chosen graph to analyze the data, the graphical representation leads us to a result.

Index Terms— Los, Analysis, Prediction, Graphs

I. INTRODUCTION

To find out the length of stay we follow some specific steps. LOS can reduce costs and can improve efficiency. Accurate system can be found from the analysis. We took our data from BSMMU hospital and we have tried to focus on a specific disease and that is eye disease.

II. ANALYZING DATA

A. Age Basis

Basis on age we may find the following image for the eye patients of the hospital.

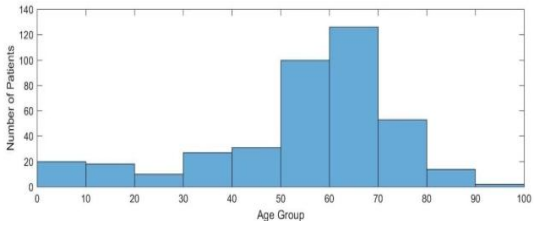


Fig. 1

Here on the horizontal axis age is shown and on the vertical axis numbers of patients are shown. It can be said that between 50 years to 80 years, people are suffering from the problem most.

B. Length of Stay

In most of the cases it is seen that people are staying in the hospital between 0 to 5 days for eye problem. The following graph shows the same.

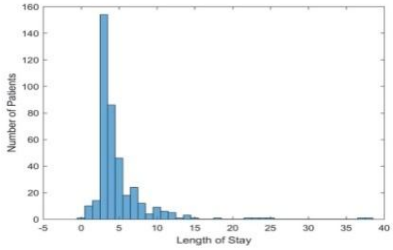


Fig. 2

And almost all the patients are staying between 0 to 10 days.

C. Age Vs LOS

From the age vs. LOS graph we can come to the point that most of the high aged people are staying long time in the hospital for the problem.

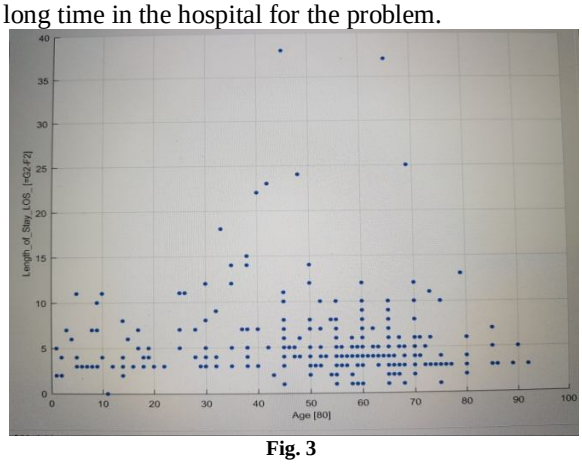


Fig. 3

And high aged people are also affected by the problem most. Low aged people are less sufferer and during staying is also low for that.

D. Gender Basis

If we see from the point of gender, then we can see that female are less affected and male are more affected by it.

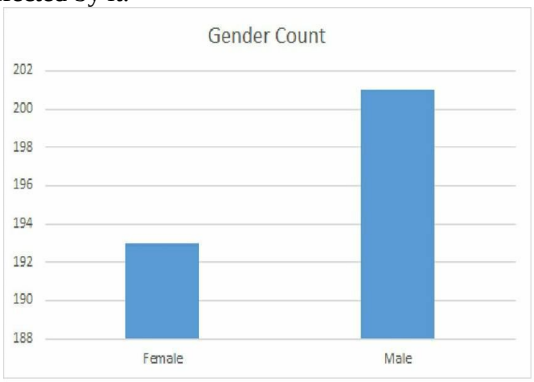


Fig. 4

Amount of female patient is less than half of the male. Doctors may find out the possible reasons behind it.

E. Unit Basis

It can be said that on the basis of unit the scenario is like the below graph. Proper doctors or nurse can be assigned based on this for the better treatment of the patients.

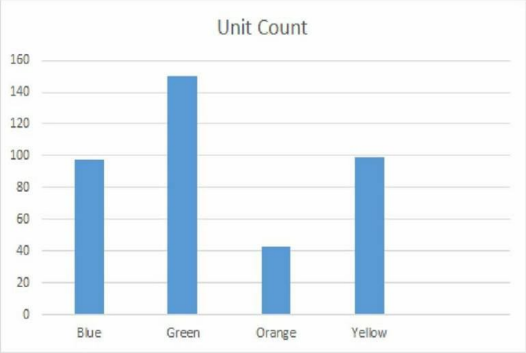


Fig. 5

III. DIAGNOSIS ANALYZING

A. ARC Analysis

From the graph it is seen that most of the patients of the sector is middle aged or high aged and low aged people have less possibility to be affected by it.

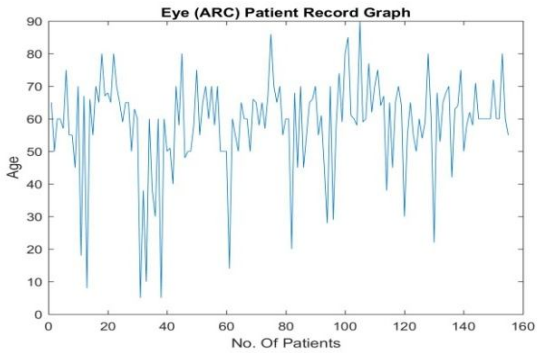


Fig. 6

Fewer patients are staying in the hospital for long time; maximum patients are staying in an average rate.

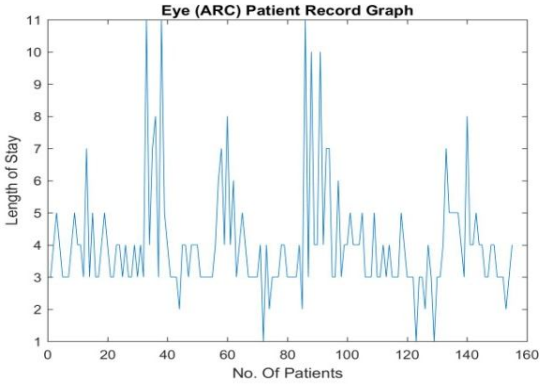


Fig. 7

B. Cataract Analysis

A good range of ups and downs can be seen here. Almost all age of people are suffering from it and get affected by it.

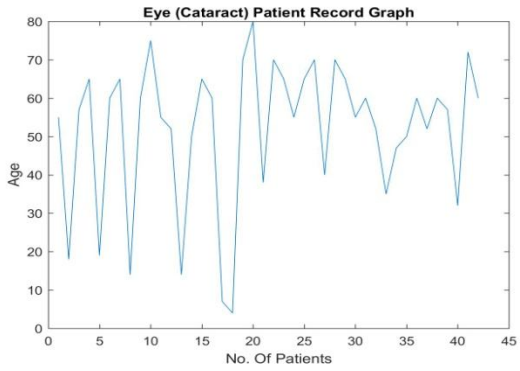


Fig. 8

Same result can be seen for the length of stay. Different types of people are staying in the hospital for different length of time.

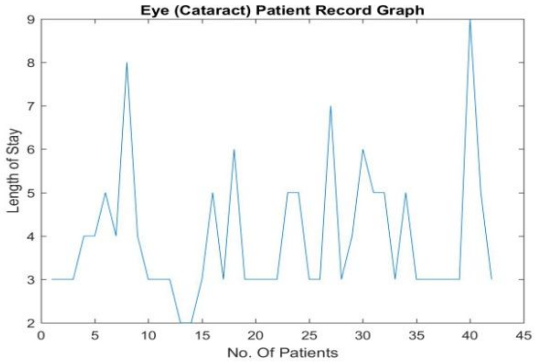


Fig. 9

C. PSC Analyzing

Here we can see most of the high aged people are affected by it and low aged people get injured through this in very rare case.

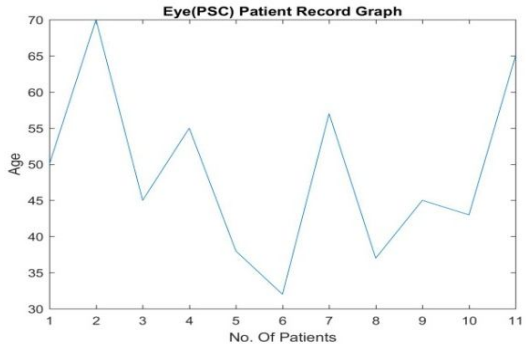


Fig. 10

In case of length of stay more people are staying in the hospital for a long period of time.

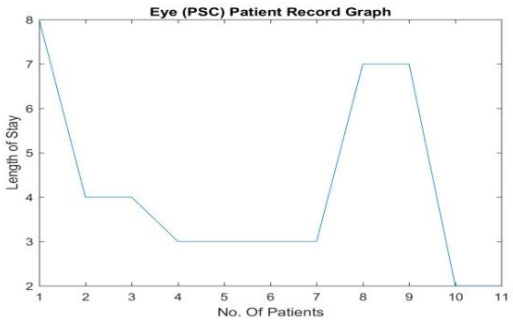


Fig. 11

III. METHOD & RESULT

A. Equations

Equations which are used in calculation are listed here. To count mean if we have n number of sample then, for x1, x2, x3……xn

Mean=(x1+x2+x3+……+xn)/n
Min= lowest value of the sample
Max =highest value of the sample
For standard deviation,

$$s_x = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}}$$

n = The number of data points
$\bar{x}$ = The mean of the x_i
x_i = Each of the values of the data

For variance,

Sample Variance

$$s^2 = \frac{\sum(x-\bar{x})^2}{n-1}$$

Sample Standard Deviation

$$s = \sqrt{\frac{\sum(x-\bar{x})^2}{n-1}}$$

B. Statistical Analysis

TABLE I

Age	• Number of samples=401 • Mean= 53.3715 • Max=92 • Min=1 • Range=91 • Variance=347.8245 • Standard deviation =18.65
Length of Stay	• Number of Samples=401 • Mean= 4.875 • Max=38 • Min=0 • Range=38 • Variance=15.066 • Standard deviation =3.88 • Range=38 • Variance=15.066 • Standard deviation =3.88
Diagnosis ARC based on Age	• Number of samples=155 • Mean= 58.270 • Max=90 • Min=5 • Range=85 • Variance=230.042 • Standard deviation =15.167
Diagnosis ARC based on Length of Stay	• Number of samples=155 • Mean= 4 • Max=11 • Min=1 • Range=10 • Variance=2.987 • Standard deviation =1.728
Diagnosis Cataract based on Age	• Number of samples=42 • Mean= 51.786 • Max=80 • Min=4 • Range=76 • Variance=377.538 • Standard deviation =19.430
Diagnosis Cataract based on Length of Stay	• Number of samples=42 • Mean= 4 • Max=9 • Min=2 • Range=7 • Variance=2.3 • Standard deviation =1.517
Diagnosis PSC based on Age	• Number of samples=11 • Mean= 48.818 • Max=70 • Min=32 • Range=38 • Variance=141.964 • Standard deviation =11.914
Diagnosis PSC based on Length of Stay	• Number of samples=11 • Mean= 4.182 • Max=8 • Min=2 • Range=4.564 • Variance=2.3 • Standard deviation =2.136 • Range=4.564 • Variance=2.3 • Standard deviation =2.136

C. Prediction

TABLE I I

Diagnosis Name	Estimation
ARC	• Age Range 5~90

	• Length of Stay 1~11
Cataract	• Age Range 4~80 • Length of Stay 2~9
PSC	• Age Range 32~70 • Length of Stay 2~8

IV. SUGGESTIONS

The analysis will help the hospital authority for their future management. From the statistical review and prediction they can specify where any problem is going on and according to that they should take steps. From the age based graph we can see that high aged persons are affecting more, so special care need to be taken there. Again high number of patients is staying in the hospital for less than 5 days, it needs to be checked that are they really need to stay those days in hospital or not as it is quite short time. Doctors should find the reasons behind the high rate of male injuries by the disease to care them perfectly.

CONCLUTION

In fact, this type of prediction on any hospital of Bangladesh was never done before. It was a great challenge for us to collect the data from the hospital. But in the end we can come to the point that first we collect the data of eye patients of BSMMU hospital. Then we have tried to analyze the data by setting all the data on a table or sheet. For graphical representation we use mat lab and Microsoft excel. After finding the graphs we try to figure out the problems and calculate the statistical calculation for the better management system of the hospital. Finally we can come up with a prediction for the hospital which may help the authority to gain their future goals. Hopefully the future results will show a different scenario which may have danger today.

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