

Dog Bites Analysis

The file dogbites.total.csv contains the daily number of admissions to hospital of people being bitten by dogs from 13th of June, 1997 through to 30th of June, 1998.

a) Fit a Poisson distribution to the dog bites data using maximum likelihood. What is the estimated rate, λ^{ML} , of dog bites in Australia during this period?

```
> file2 <- read.csv("dogbites.total.csv", header = TRUE) >
mean(file2$daily.dogbites)
```

And lambda estimated value is equal to expected value of distribution so it's 4.505291 5b)

Plug the estimated λ^{ML} into the Poisson distribution, and use this to make predictions about future dog bite incidences.

i)

What is the probability of at most one admission for a dog-bite in a day?

To get the at most one admission,

$\Pr(X \leq 1) = 0.06085$

```
> ppois(1, mean(file2$daily.dogbites))
```

ii)

What number of dog-bite admissions is most likely to occur on a given day?

It can be seen using the command:

```
table(file2)
```

The most likely number to occur is 3 as it comes up with 62 times in the distribution.

iii) Over a four-week period (i.e., 28 days), how many dog-bite admissions would the hospital system expect to see?

lambda or expected value * 28 days.

The hospital would expect to see dog-bite admissions of 126.14 so around 126 to be hospitalized.

iv) What is the probability of seeing six or more dog-bite admissions for at least 8 of the days in a 28-day period?

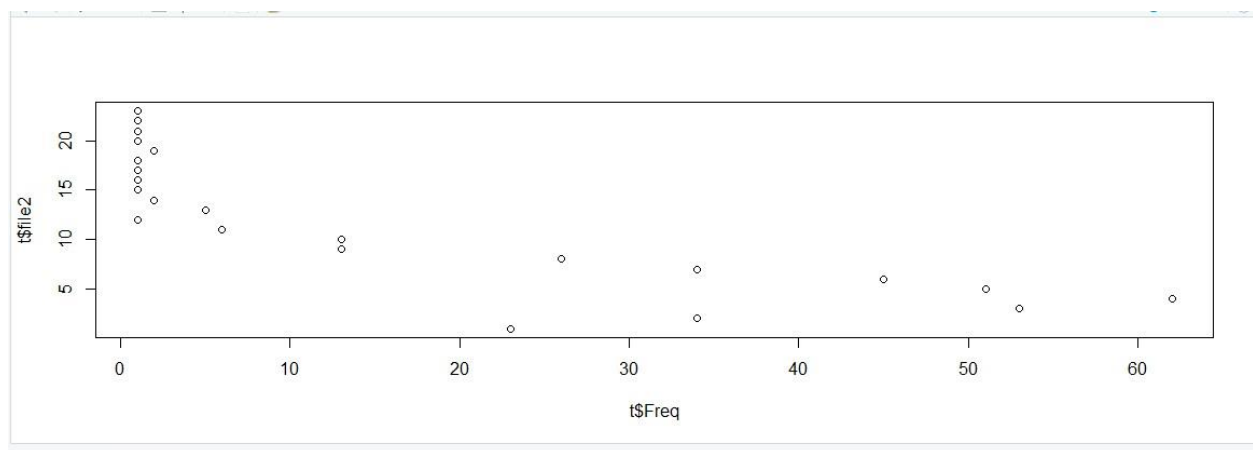
```
> 1-pbinom(8,28,1-ppois(6,mean(file2$daily.dogbites)))
```

As the probability is 0.03682306 using syntax above by using binomial and Poisson distribution.

5c) Is the Poisson distribution an appropriate model for the dog bites data? Plot the observed probabilities of the different number of daily dog-bites against the frequencies predicted by your Poisson model. If you believe the distribution is not a good fit, justify why and discuss possible reasons it might not be an appropriate model for this phenomena?

```
t=as.data.frame(table(file2))
```

```
> plot(t$Freq,t$file2)
```



the observed probabilities of the different number of daily dog-bites against the frequencies predicted by the Poisson model is plotted above and it can be seen that the numbers inside the data are shown according to the frequency. That seems legit in the graph but it could be improved by having the variety of plotting and by plotting different unique values against each other rather than just frequency with number which doesn't distinguish between two number as they are grugged and the number of pointer can also be shown to see which number has what kind of frequencies.