Amount of Time Being Served in PAC

Draft 1

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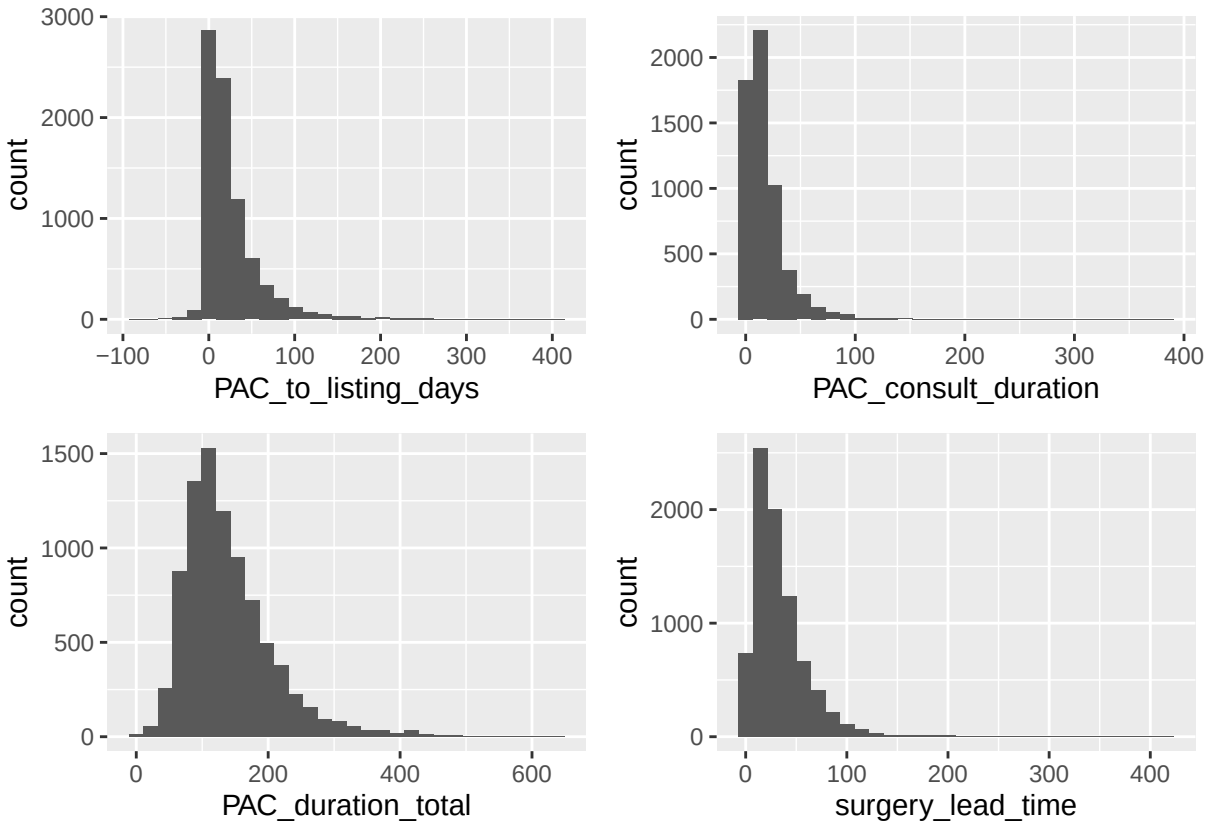
Some things to note:

- Not sure if total duration as denoted by the difference between `PAC Registration Time` and `PAC End Time` is a better fit than the `PAC Consult Duration`.
- Hence, both distributions are included.
- We are also looking preliminarily into other histograms, though we are not sure what to use it for yet.
- `PAC Consult Duration` is for ≥ 15 minutes, then translated to start at 0 instead for CF and exponential. Gamma is not translated. Not sure if this is correct.
- We should decide on whether to split based on ASA, Department or both.

Some questions:

- Clarify that:
  - Visit time = time allocated
  - Listing date = when did they set the consult timing
  - Register time = when did they come
  - End time = when did they leave
  - Consult duration = how long to consult per se
- Department names:
  - e.g. DDR/HPB is it the same as HPB?
  - e.g. H&N ENT is it the same as ENT?
  - Maybe can have a brief explanation so that we can try to cluster things
- How was PAC registration/end time calculated?

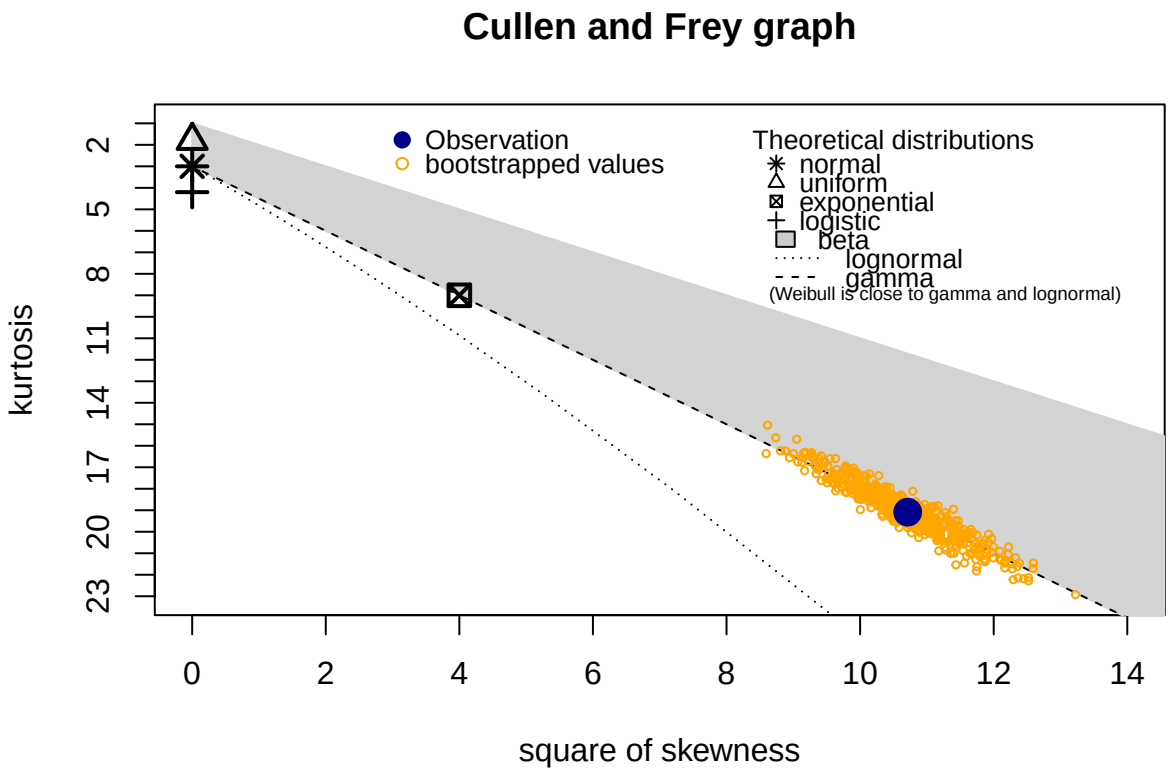
1 Histograms

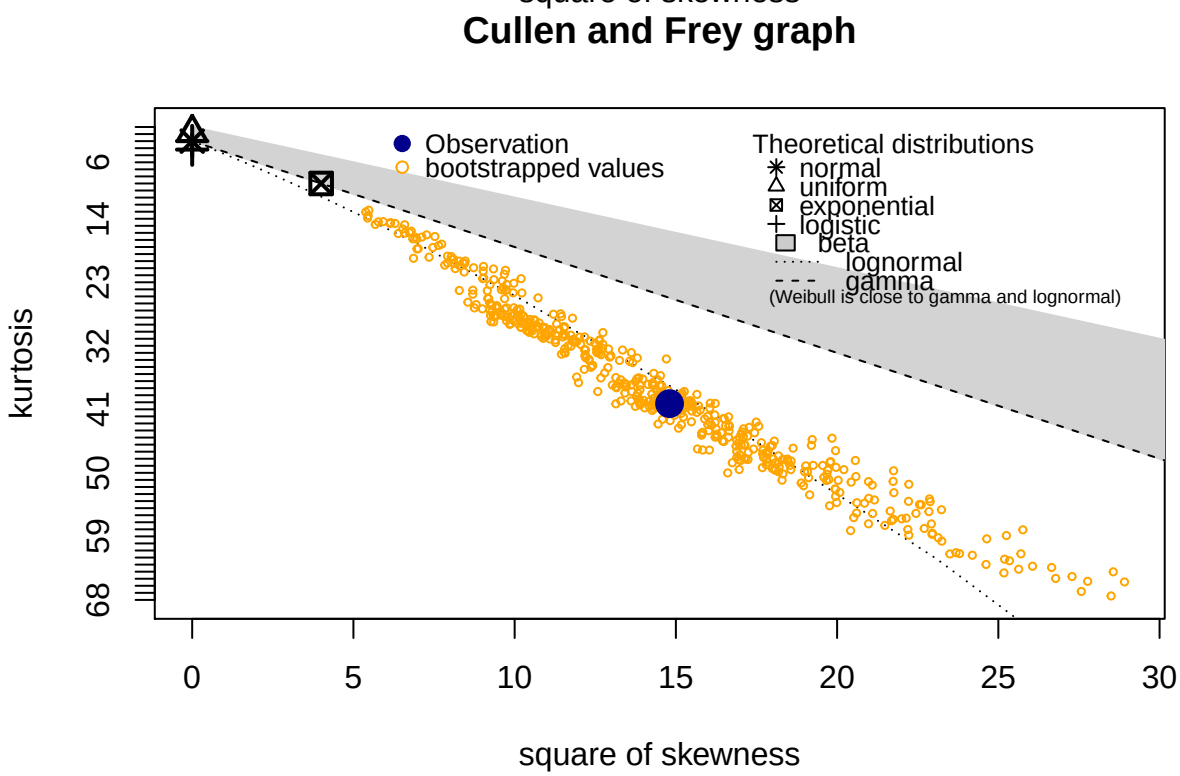


2 Cullen and Frey Graphs

In order of:

1. `PAC_to_listing_days`
2. `PAC_consult_duration`
3. `PAC_duration_total`
4. `surgery_lead_time`


Cullen and Frey graph
Observation
bootstrapped values
Theoretical distributions
normal
uniform
exponential
logistic
beta
lognormal
gamma
(Weibull is close to gamma and lognormal)
kurtosis
2
5
8
11
14
17
20
23
0
2
4
6
8
10
12
14
square of skewness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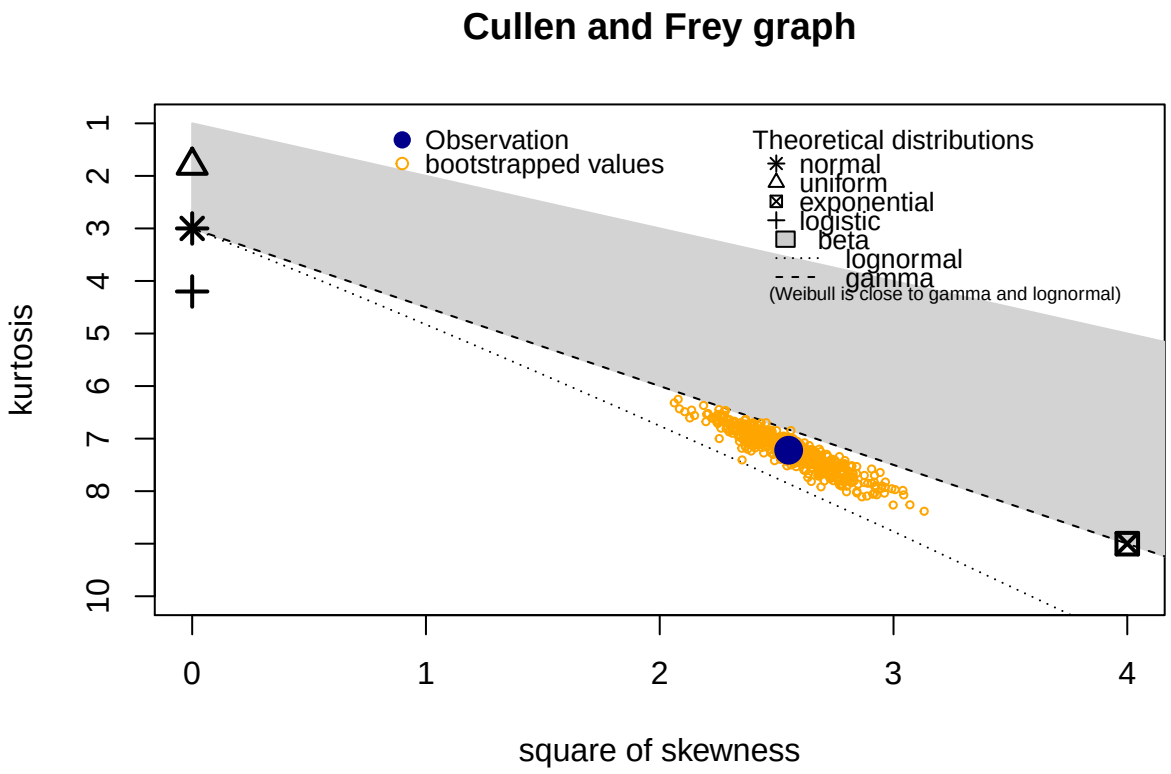
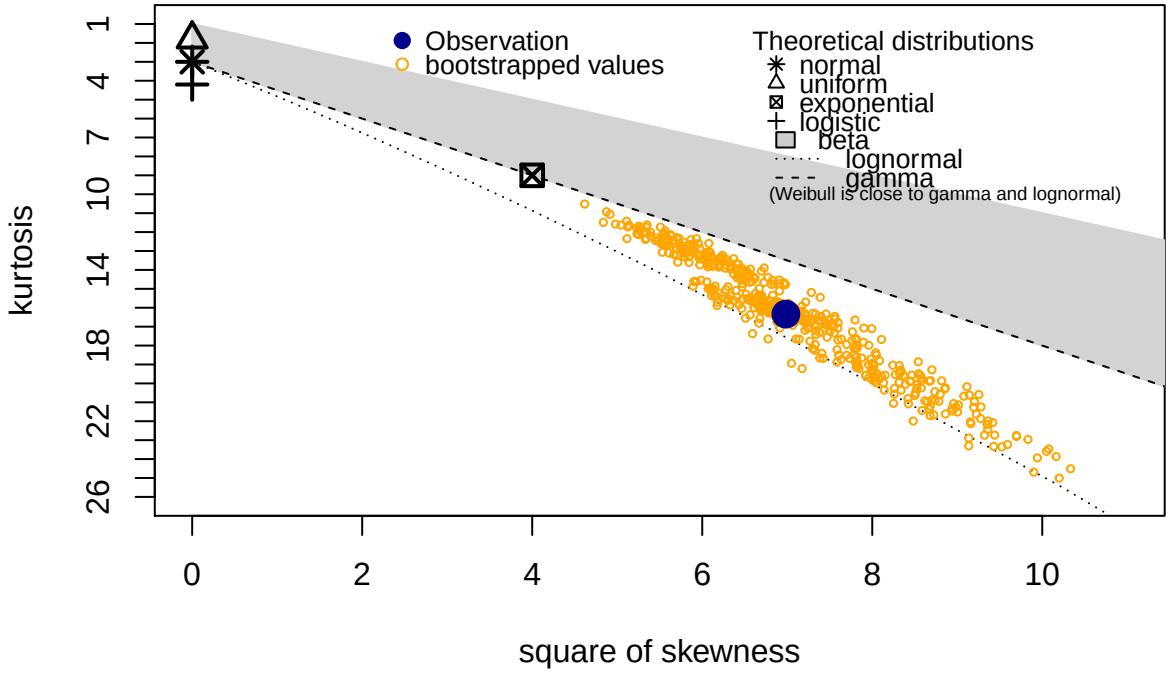
(Weibull is close to gamma and lognormal)
kurtosis
6
14
23
32
41
50
59
68
0
5
10
15
20
25
30
square of skewness





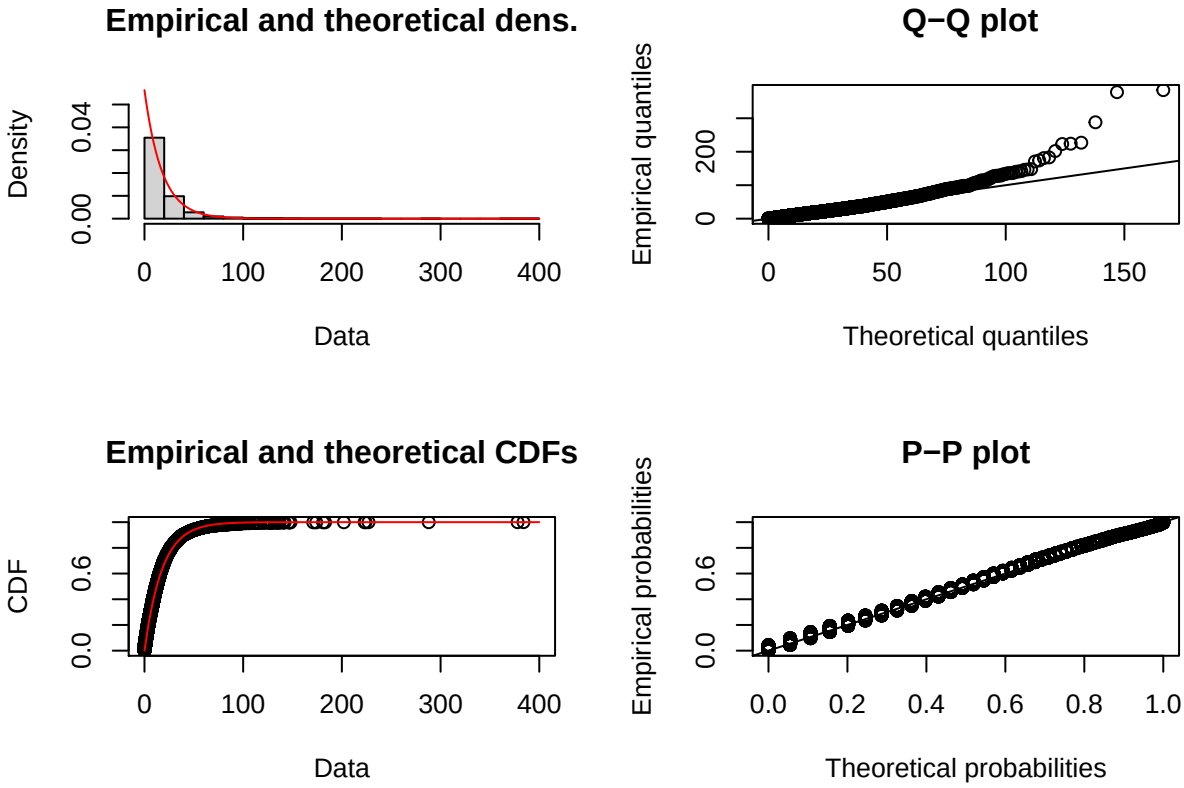

```
## $PAC_to_listing_days
## summary statistics
## ------
## min:  -88   max:  402
## median:  14
```

```
## mean:  26.85764
## estimated sd:  36.66795
## estimated skewness:  3.272974
## estimated kurtosis:  19.0876
##
## $PAC_consult_duration
## summary statistics
## ------
## min:  0   max:  399
## median:  21
## mean:  26.14305
## estimated sd:  21.18122
## estimated skewness:  3.847633
## estimated kurtosis:  40.18922
##
## $PAC_duration_total
## summary statistics
## ------
## min:  1   max:  639
## median:  125
## mean:  140.1687
## estimated sd:  69.36644
## estimated skewness:  1.597334
## estimated kurtosis:  7.221109
##
## $surgery_lead_time
## summary statistics
## ------
## min:  0   max:  416
## median:  26
## mean:  33.68705
## estimated sd:  29.02239
## estimated skewness:  2.642722
## estimated kurtosis:  16.33736
```

3 Distribution for Consult Duration

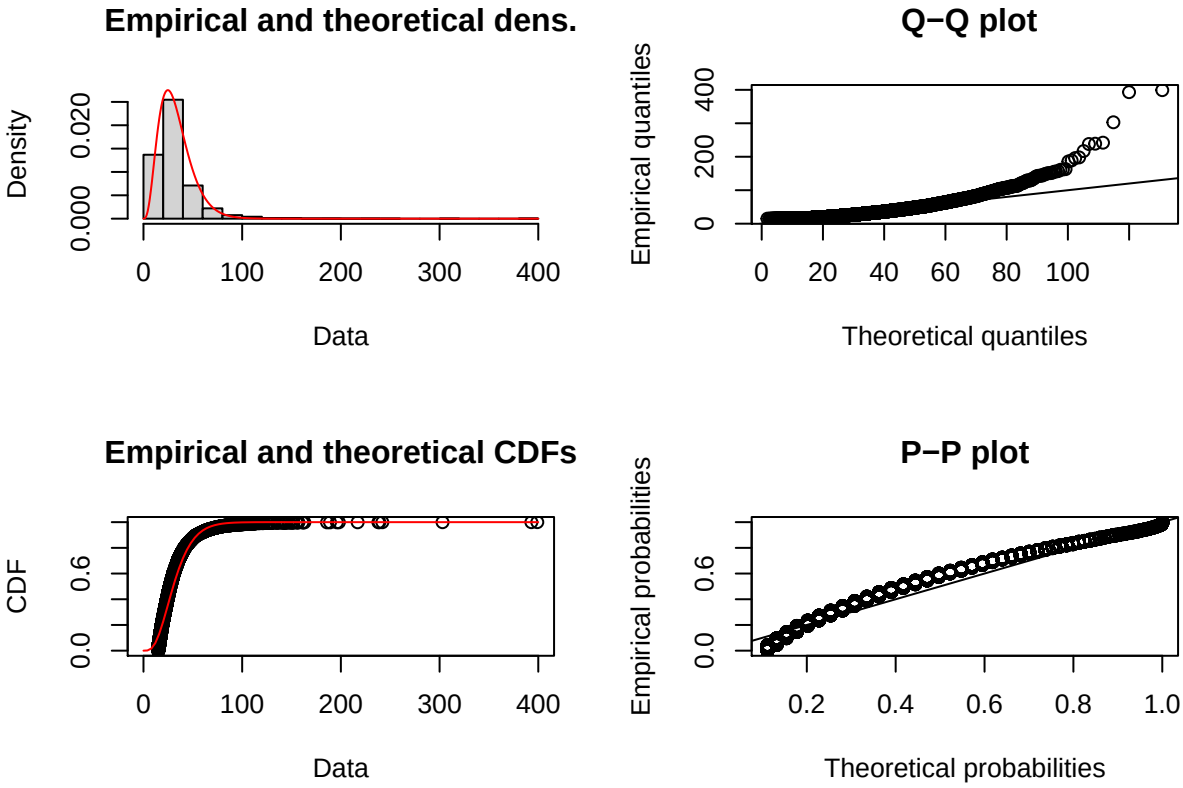
Disclaimer: distributions are not validated by chi-squared test yet but through other tests. Will need to ask James about these too. Will do the chi-squared tests soon.

3.1 Exponential Fit (PAC Consult Duration Adjusted)




```
## [[1]]
## Goodness-of-fit statistics
##                                1-mle-exp
## Kolmogorov-Smirnov statistic 0.04387912
## Cramer-von Mises statistic   1.73260324
## Anderson-Darling statistic          Inf
##
## Goodness-of-fit criteria
##                                 1-mle-exp
## Akaike's Information Criterion  45417.33
## Bayesian Information Criterion  45424.01
##
## [[2]]
## Fitting of the distribution ' exp ' by maximum likelihood
## Parameters :
##       estimate   Std. Error
## rate 0.05630269 0.0007354522
## Loglikelihood:  -22707.66   AIC:  45417.33   BIC:  45424.01
```

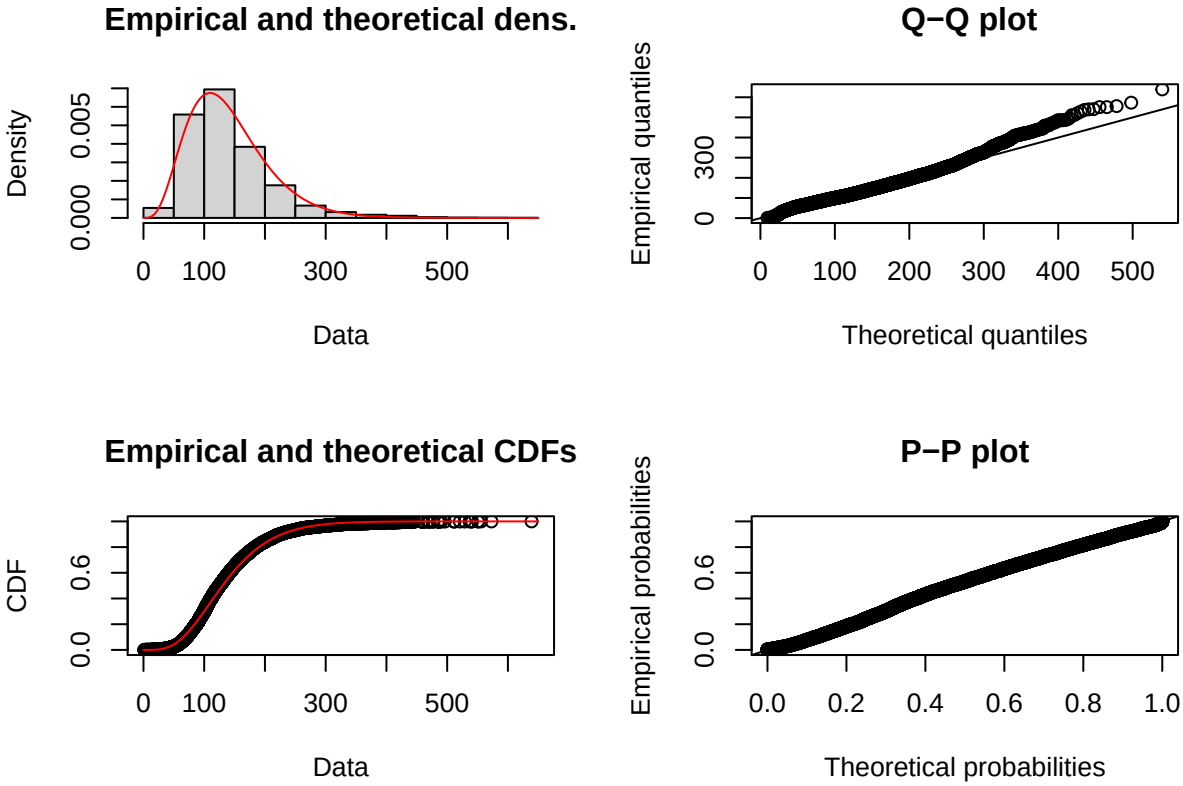
3.2 Gamma Distribution (Not Adjusted)




```
## [[1]]
## Goodness-of-fit statistics
##                                1-mle-gamma
## Kolmogorov-Smirnov statistic   0.1114596
## Cramer-von Mises statistic    21.8765605
## Anderson-Darling statistic           Inf
##
## Goodness-of-fit criteria
##                                  1-mle-gamma
## Akaike's Information Criterion    48265.95
## Bayesian Information Criterion    48279.30
##
## [[2]]
## Fitting of the distribution ' gamma ' by maximum likelihood
## Parameters :
##       estimate  Std. Error
## shape 4.0636951 0.072198700
## rate  0.1240448 0.002345722
## Loglikelihood:  -24130.98   AIC:  48265.95   BIC:  48279.3
## Correlation matrix:
##           shape      rate
## shape 1.0000000 0.9394272
## rate  0.9394272 1.0000000
```

4 Distribution for Total Duration

Disclaimer: distributions are not validated by chi-squared test yet but through other tests. Will need to ask James about these too. Will do the chi-squared tests soon.




```
## [[1]]
## Goodness-of-fit statistics
##                                1-mle-gamma
## Kolmogorov-Smirnov statistic  0.03771329
## Cramer-von Mises statistic    4.24456876
## Anderson-Darling statistic   26.83696804
##
## Goodness-of-fit criteria
##                                  1-mle-gamma
## Akaike's Information Criterion    95013.17
## Bayesian Information Criterion    95027.29
##
## [[2]]
## Fitting of the distribution ' gamma ' by maximum likelihood
## Parameters :
##         estimate   Std. Error
## shape 4.60412998 0.0674521985
## rate  0.03284457 0.0005079449
## Loglikelihood:  -47504.58   AIC:  95013.17   BIC:  95027.29
## Correlation matrix:
##           shape      rate
```

```
## shape 1.0000000 0.9458523
## rate  0.9458523 1.0000000
```