LA-report

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Contents

1 EXPLORATORY DATA ANALYSIS

We start with importing our data set and storing it in data frame "data", using read.csv function.

```
data <- read.csv("C:\\Users\\LENOVO\\OneDrive\\Desktop\\praveen\\EDA\\LA-1\\USA Covid Data.csv", header

show(data)
```

```
##             State Total.Cases Total.Deaths Total.Recovered Active.Cases
## 1         Alabama      551298        11358              NA           NA
## 2          Alaska       68674          370           66087         2217
## 3         Arizona      898283        18004          867042        13237
## 4        Arkansas      353095         5933          341896         5266
## 5      California     3828483        63758         2077558      1687167
## 6        Colorado      560419         7056          467669        85694
## 7     Connecticut      349743         8278          339469         1996
## 8        Delaware      109900         1695          107493          712
## 9         Florida     2382980        37985         2215966       129029
## 10        Georgia     1137560        21467         1056403        59690
## 11         Hawaii       38121          518              NA           NA
## 12          Idaho      195552         2162          115460        77930
## 13       Illinois     1394235        25733         1358187        10315
## 14        Indiana      756070        13892          730685        11493
## 15           Iowa      405303         6149          366566        32588
```

```
## 16         Kansas      319586         5166          309373         5047
## 17       Kentucky      466244         7250           53643       405351
## 18      Louisiana      484577        10763              NA           NA
## 19          Maine       69156          861              NA           NA
## 20       Maryland      462736         9755           11041       441940
## 21  Massachusetts      710519        18008          691163         1348
## 22       Michigan     1000908        21031          868294       111583
## 23      Minnesota      606034         7693          597632          709
## 24    Mississippi      323214         7436          312956         2822
## 25       Missouri      626126        10114          562379        53633
## 26        Montana      114102         1671          112003          428
## 27       Nebraska      224873         2262              NA           NA
## 28         Nevada      336562         5705          315944        14913
## 29  New Hampshire       99652         1374           98083          195
## 30     New Jersey     1024748        26490          983195        15063
## 31     New Mexico      205996         4347          195187         6462
## 32       New York     2176123        54065         1992360       129698
## 33 North Carolina     1016262        13460          994472         8330
## 34   North Dakota      110779         1528          109127          124
## 35           Ohio     1113006        20366         1085985         6655
## 36       Oklahoma      459675         7406          449960         2309
## 37         Oregon      209764         2788          195932        11044
## 38   Pennsylvania     1217879        27821         1176921        13137
## 39    Puerto Rico      275539         2552          121227       151760
## 40 South Carolina      598229         9843          575173        13213
## 41   South Dakota      124641         2039          122424          178
## 42      Tennessee      868738        12583          853563         2592
## 43          Texas     3010445        52722         2903306        54417
## 44           Utah      417653         2387          407664         7602
## 45        Vermont       24440          258           24067          115
## 46       Virginia      681599        11436           57321       612842
## 47     Washington      456423         6029          227194       223200
## 48  West Virginia      164346         2901          160390         1055
## 49      Wisconsin      678232         8154              NA           NA
## 50        Wyoming       62737          751           61420          566
##    Total.Cases.1.mil.population Death.1.mil.population Total.Tests
## 1                        112437                    2316     2830286
## 2                         93875                     506     2395221
## 3                        123412                    2474     5126795
## 4                        117004                    1966     3808827
## 5                         96894                    1614    70392011
## 6                         97316                    1225     3190081
## 7                         98097                    2322     9645449
## 8                        112861                    1741      740119
## 9                        110951                    1769    31249599
## 10                       107141                    2022    12006950
## 11                        26924                     366     1754418
## 12                       109426                    1210     1413139
## 13                       110026                    2031    25989308
## 14                       112306                    2064    10918291
## 15                       128461                    1949     5216309
## 16                       109698                    1773     1455337
## 17                       104359                    1623     6941164
## 18                       104237                    2315     7810833
```

```
## 19                        51447                   641     2765484
## 20                        76540                  1614    10927231
## 21                       103086                  2613    23969707
## 22                       100223                  2106    14953233
## 23                       107460                  1364    10377218
## 24                       108601                  2499     2911438
## 25                       102018                  1648     7800545
## 26                       106759                  1563     1457325
## 27                       116249                  1169     3056982
## 28                       109268                  1852     3555730
## 29                        73289                  1011     2448734
## 30                       115371                  2982    14458068
## 31                        98242                  2073     3686555
## 32                       111862                  2779    59267467
## 33                        96897                  1283    13902865
## 34                       145367                  2005      447733
## 35                        95217                  1742    13728606
## 36                       116168                  1872     4040035
## 37                        49734                   661     5471841
## 38                        95132                  2173    14680614
## 39                        81353                   753      464073
## 40                       116190                  1912     8227548
## 41                       140892                  2305      490627
## 42                       127210                  1843     8227135
## 43                       103823                  1818    32192208
## 44                       130274                   745     5141040
## 45                        39167                   413     1741050
## 46                        79854                  1340    10293262
## 47                        59938                   792     7673465
## 48                        91703                  1619     3030600
## 49                       116486                  1400     3604344
## 50                       108399                  1298      791749
##    Tests.1.mil.population Population
## 1                  577234    4903185
## 2                 3274195     731545
## 3                  704354    7278717
## 4                 1262119    3017804
## 5                 1781525   39512223
## 6                  553955    5758736
## 7                 2705378    3565287
## 8                  760060     973764
## 9                 1454976   21477737
## 10                1130872   10617423
## 11                1239108    1415872
## 12                 790760    1787065
## 13                2050953   12671821
## 14                1621797    6732219
## 15                1653310    3155070
## 16                 499547    2913314
## 17                1553642    4467673
## 18                1680185    4648794
## 19                2057327    1344212
## 20                1807444    6045680
## 21                3477649    6892503
```

```
## 22                1497291    9986857
## 23                1840052    5639632
## 24                 978257    2976149
## 25                1270979    6137428
## 26                1363543    1068778
## 27                1580319    1934408
## 28                1154399    3080156
## 29                1800922    1359711
## 30                1627759    8882190
## 31                1758157    2096829
## 32                3046613   19453561
## 33                1325587   10488084
## 34                 587528     762062
## 35                1174479   11689100
## 36                1020992    3956971
## 37                1297340    4217737
## 38                1146745   12801989
## 39                 137018    3386941
## 40                1597981    5148714
## 41                 554594     884659
## 42                1204704    6829174
## 43                1110234   28995881
## 44                1603589    3205958
## 45                2790193     623989
## 46                1205933    8535519
## 47                1007692    7614893
## 48                1691044    1792147
## 49                 619044    5822434
## 50                1368012     578759
```

This data set we are working on is state-wise stats for Covid-19 in USA. The data contains the several stats like active cases, total cases, total recovery etc.

to make our data more rich, we will add a few more columns, based on our need.

```
f_data <- mutate(data, Percent_Death = (data$Total.Deaths*100)/data$Total.Cases)
f_data <- mutate(f_data, Percent.Recovered = (data$Total.Recovered*100)/data$Total.Cases)

show(f_data)
```

```
##             State Total.Cases Total.Deaths Total.Recovered Active.Cases
## 1         Alabama      551298        11358              NA           NA
## 2          Alaska       68674          370           66087         2217
## 3         Arizona      898283        18004          867042        13237
## 4        Arkansas      353095         5933          341896         5266
## 5      California     3828483        63758         2077558      1687167
## 6        Colorado      560419         7056          467669        85694
## 7     Connecticut      349743         8278          339469         1996
## 8        Delaware      109900         1695          107493          712
## 9         Florida     2382980        37985         2215966       129029
## 10        Georgia     1137560        21467         1056403        59690
## 11         Hawaii       38121          518              NA           NA
## 12          Idaho      195552         2162          115460        77930
## 13       Illinois     1394235        25733         1358187        10315
```

```
## 14        Indiana      756070        13892          730685        11493
## 15           Iowa      405303         6149          366566        32588
## 16         Kansas      319586         5166          309373         5047
## 17       Kentucky      466244         7250           53643       405351
## 18      Louisiana      484577        10763              NA           NA
## 19          Maine       69156          861              NA           NA
## 20       Maryland      462736         9755           11041       441940
## 21  Massachusetts      710519        18008          691163         1348
## 22       Michigan     1000908        21031          868294       111583
## 23      Minnesota      606034         7693          597632          709
## 24    Mississippi      323214         7436          312956         2822
## 25       Missouri      626126        10114          562379        53633
## 26        Montana      114102         1671          112003          428
## 27       Nebraska      224873         2262              NA           NA
## 28         Nevada      336562         5705          315944        14913
## 29  New Hampshire       99652         1374           98083          195
## 30     New Jersey     1024748        26490          983195        15063
## 31     New Mexico      205996         4347          195187         6462
## 32       New York     2176123        54065         1992360       129698
## 33 North Carolina     1016262        13460          994472         8330
## 34   North Dakota      110779         1528          109127          124
## 35           Ohio     1113006        20366         1085985         6655
## 36       Oklahoma      459675         7406          449960         2309
## 37         Oregon      209764         2788          195932        11044
## 38   Pennsylvania     1217879        27821         1176921        13137
## 39    Puerto Rico      275539         2552          121227       151760
## 40 South Carolina      598229         9843          575173        13213
## 41   South Dakota      124641         2039          122424          178
## 42      Tennessee      868738        12583          853563         2592
## 43          Texas     3010445        52722         2903306        54417
## 44           Utah      417653         2387          407664         7602
## 45        Vermont       24440          258           24067          115
## 46       Virginia      681599        11436           57321       612842
## 47     Washington      456423         6029          227194       223200
## 48  West Virginia      164346         2901          160390         1055
## 49      Wisconsin      678232         8154              NA           NA
## 50        Wyoming       62737          751           61420          566
##    Total.Cases.1.mil.population Death.1.mil.population Total.Tests
## 1                        112437                    2316     2830286
## 2                         93875                     506     2395221
## 3                        123412                    2474     5126795
## 4                        117004                    1966     3808827
## 5                         96894                    1614    70392011
## 6                         97316                    1225     3190081
## 7                         98097                    2322     9645449
## 8                        112861                    1741      740119
## 9                        110951                    1769    31249599
## 10                       107141                    2022    12006950
## 11                        26924                     366     1754418
## 12                       109426                    1210     1413139
## 13                       110026                    2031    25989308
## 14                       112306                    2064    10918291
## 15                       128461                    1949     5216309
## 16                       109698                    1773     1455337
```

```
## 17                     104359                 1623     6941164
## 18                     104237                 2315     7810833
## 19                      51447                  641     2765484
## 20                      76540                 1614    10927231
## 21                     103086                 2613    23969707
## 22                     100223                 2106    14953233
## 23                     107460                 1364    10377218
## 24                     108601                 2499     2911438
## 25                     102018                 1648     7800545
## 26                     106759                 1563     1457325
## 27                     116249                 1169     3056982
## 28                     109268                 1852     3555730
## 29                      73289                 1011     2448734
## 30                     115371                 2982    14458068
## 31                      98242                 2073     3686555
## 32                     111862                 2779    59267467
## 33                      96897                 1283    13902865
## 34                     145367                 2005      447733
## 35                      95217                 1742    13728606
## 36                     116168                 1872     4040035
## 37                      49734                  661     5471841
## 38                      95132                 2173    14680614
## 39                      81353                  753      464073
## 40                     116190                 1912     8227548
## 41                     140892                 2305      490627
## 42                     127210                 1843     8227135
## 43                     103823                 1818    32192208
## 44                     130274                  745     5141040
## 45                      39167                  413     1741050
## 46                      79854                 1340    10293262
## 47                      59938                  792     7673465
## 48                      91703                 1619     3030600
## 49                     116486                 1400     3604344
## 50                     108399                 1298      791749
##    Tests.1.mil.population Population Percent_Death Percent.Recovered
## 1                  577234    4903185     2.0602288                NA
## 2                 3274195     731545     0.5387774          96.232927
## 3                  704354    7278717     2.0042681          96.522143
## 4                 1262119    3017804     1.6802843          96.828332
## 5                 1781525   39512223     1.6653594          54.265828
## 6                  553955    5758736     1.2590580          83.449883
## 7                 2705378    3565287     2.3668808          97.062414
## 8                  760060     973764     1.5423112          97.809827
## 9                 1454976   21477737     1.5940125          92.991381
## 10                1130872   10617423     1.8871093          92.865695
## 11                1239108    1415872     1.3588311                 NA
## 12                 790760    1787065     1.1055883          59.043119
## 13                2050953   12671821     1.8456716          97.414496
## 14                1621797    6732219     1.8373960          96.642507
## 15                1653310    3155070     1.5171366          90.442459
## 16                 499547    2913314     1.6164663          96.804303
## 17                1553642    4467673     1.5549798          11.505349
## 18                1680185    4648794     2.2211124                 NA
## 19                2057327    1344212     1.2450113                 NA
```

```
## 20               1807444    6045680     2.1081135          2.386026
## 21               3477649    6892503     2.5344854         97.275794
## 22               1497291    9986857     2.1011921         86.750630
## 23               1840052    5639632     1.2694007         98.613609
## 24                978257    2976149     2.3006429         96.826251
## 25               1270979    6137428     1.6153298         89.818822
## 26               1363543    1068778     1.4644792         98.160418
## 27               1580319    1934408     1.0059011                NA
## 28               1154399    3080156     1.6950814         93.873937
## 29               1800922    1359711     1.3787982         98.425521
## 30               1627759    8882190     2.5850258         95.945052
## 31               1758157    2096829     2.1102352         94.752811
## 32               3046613   19453561     2.4844643         91.555487
## 33               1325587   10488084     1.3244616         97.855868
## 34                587528     762062     1.3793228         98.508743
## 35               1174479   11689100     1.8298194         97.572250
## 36               1020992    3956971     1.6111383         97.886550
## 37               1297340    4217737     1.3291127         93.405923
## 38               1146745   12801989     2.2843813         96.636940
## 39                137018    3386941     0.9261847         43.996313
## 40               1597981    5148714     1.6453565         96.145957
## 41                554594     884659     1.6358983         98.221292
## 42               1204704    6829174     1.4484229         98.253213
## 43               1110234   28995881     1.7513025         96.441091
## 44               1603589    3205958     0.5715271         97.608302
## 45               2790193     623989     1.0556465         98.473813
## 46               1205933    8535519     1.6778194          8.409783
## 47               1007692    7614893     1.3209238         49.777071
## 48               1691044    1792147     1.7651783         97.592883
## 49                619044    5822434     1.2022435                NA
## 50               1368012     578759     1.1970607         97.900760
```

Now, we will add values at places that have no values, except in the 2 columns that we have manually added. We add the mean of that column.

```
f_data$Total.Recovered[is.na(f_data$Total.Recovered)]<- mean(f_data$Total.Recovered,na.rm=TRUE)

f_data$Active.Cases[is.na(f_data$Active.Cases)]<- mean(f_data$Active.Cases,na.rm=TRUE)

show(f_data)
```

```
##            State Total.Cases Total.Deaths Total.Recovered Active.Cases
## 1        Alabama      551298        11358        607724.5       100356
## 2         Alaska       68674          370         66087.0         2217
## 3        Arizona      898283        18004        867042.0        13237
## 4       Arkansas      353095         5933        341896.0         5266
## 5     California     3828483        63758       2077558.0      1687167
## 6       Colorado      560419         7056        467669.0        85694
## 7    Connecticut      349743         8278        339469.0         1996
## 8       Delaware      109900         1695        107493.0          712
## 9        Florida     2382980        37985       2215966.0       129029
## 10       Georgia     1137560        21467       1056403.0        59690
## 11        Hawaii       38121          518        607724.5       100356
```

```
## 12          Idaho      195552         2162        115460.0        77930
## 13       Illinois     1394235        25733       1358187.0        10315
## 14        Indiana      756070        13892        730685.0        11493
## 15           Iowa      405303         6149        366566.0        32588
## 16         Kansas      319586         5166        309373.0         5047
## 17       Kentucky      466244         7250         53643.0       405351
## 18      Louisiana      484577        10763        607724.5       100356
## 19          Maine       69156          861        607724.5       100356
## 20       Maryland      462736         9755         11041.0       441940
## 21  Massachusetts      710519        18008        691163.0         1348
## 22       Michigan     1000908        21031        868294.0       111583
## 23      Minnesota      606034         7693        597632.0          709
## 24    Mississippi      323214         7436        312956.0         2822
## 25       Missouri      626126        10114        562379.0        53633
## 26        Montana      114102         1671        112003.0          428
## 27       Nebraska      224873         2262        607724.5       100356
## 28         Nevada      336562         5705        315944.0        14913
## 29  New Hampshire       99652         1374         98083.0          195
## 30     New Jersey     1024748        26490        983195.0        15063
## 31     New Mexico      205996         4347        195187.0         6462
## 32       New York     2176123        54065       1992360.0       129698
## 33 North Carolina     1016262        13460        994472.0         8330
## 34   North Dakota      110779         1528        109127.0          124
## 35           Ohio     1113006        20366       1085985.0         6655
## 36       Oklahoma      459675         7406        449960.0         2309
## 37         Oregon      209764         2788        195932.0        11044
## 38   Pennsylvania     1217879        27821       1176921.0        13137
## 39    Puerto Rico      275539         2552        121227.0       151760
## 40 South Carolina      598229         9843        575173.0        13213
## 41   South Dakota      124641         2039        122424.0          178
## 42      Tennessee      868738        12583        853563.0         2592
## 43          Texas     3010445        52722       2903306.0        54417
## 44           Utah      417653         2387        407664.0         7602
## 45        Vermont       24440          258         24067.0          115
## 46       Virginia      681599        11436         57321.0       612842
## 47     Washington      456423         6029        227194.0       223200
## 48  West Virginia      164346         2901        160390.0         1055
## 49      Wisconsin      678232         8154        607724.5       100356
## 50        Wyoming       62737          751         61420.0          566
##    Total.Cases.1.mil.population Death.1.mil.population Total.Tests
## 1                        112437                    2316     2830286
## 2                         93875                     506     2395221
## 3                        123412                    2474     5126795
## 4                        117004                    1966     3808827
## 5                         96894                    1614    70392011
## 6                         97316                    1225     3190081
## 7                         98097                    2322     9645449
## 8                        112861                    1741      740119
## 9                        110951                    1769    31249599
## 10                       107141                    2022    12006950
## 11                        26924                     366     1754418
## 12                       109426                    1210     1413139
## 13                       110026                    2031    25989308
## 14                       112306                    2064    10918291
```

```
## 15                      128461                  1949     5216309
## 16                      109698                  1773     1455337
## 17                      104359                  1623     6941164
## 18                      104237                  2315     7810833
## 19                       51447                   641     2765484
## 20                       76540                  1614    10927231
## 21                      103086                  2613    23969707
## 22                      100223                  2106    14953233
## 23                      107460                  1364    10377218
## 24                      108601                  2499     2911438
## 25                      102018                  1648     7800545
## 26                      106759                  1563     1457325
## 27                      116249                  1169     3056982
## 28                      109268                  1852     3555730
## 29                       73289                  1011     2448734
## 30                      115371                  2982    14458068
## 31                       98242                  2073     3686555
## 32                      111862                  2779    59267467
## 33                       96897                  1283    13902865
## 34                      145367                  2005      447733
## 35                       95217                  1742    13728606
## 36                      116168                  1872     4040035
## 37                       49734                   661     5471841
## 38                       95132                  2173    14680614
## 39                       81353                   753      464073
## 40                      116190                  1912     8227548
## 41                      140892                  2305      490627
## 42                      127210                  1843     8227135
## 43                      103823                  1818    32192208
## 44                      130274                   745     5141040
## 45                       39167                   413     1741050
## 46                       79854                  1340    10293262
## 47                       59938                   792     7673465
## 48                       91703                  1619     3030600
## 49                      116486                  1400     3604344
## 50                      108399                  1298      791749
##    Tests.1.mil.population Population Percent_Death Percent.Recovered
## 1                  577234    4903185     2.0602288                NA
## 2                 3274195     731545     0.5387774          96.232927
## 3                  704354    7278717     2.0042681          96.522143
## 4                 1262119    3017804     1.6802843          96.828332
## 5                 1781525   39512223     1.6653594          54.265828
## 6                  553955    5758736     1.2590580          83.449883
## 7                 2705378    3565287     2.3668808          97.062414
## 8                  760060     973764     1.5423112          97.809827
## 9                 1454976   21477737     1.5940125          92.991381
## 10                1130872   10617423     1.8871093          92.865695
## 11                1239108    1415872     1.3588311                 NA
## 12                 790760    1787065     1.1055883          59.043119
## 13                2050953   12671821     1.8456716          97.414496
## 14                1621797    6732219     1.8373960          96.642507
## 15                1653310    3155070     1.5171366          90.442459
## 16                 499547    2913314     1.6164663          96.804303
## 17                1553642    4467673     1.5549798          11.505349
```

```
## 18                1680185    4648794     2.2211124               NA
## 19                2057327    1344212     1.2450113               NA
## 20                1807444    6045680     2.1081135         2.386026
## 21                3477649    6892503     2.5344854        97.275794
## 22                1497291    9986857     2.1011921        86.750630
## 23                1840052    5639632     1.2694007        98.613609
## 24                 978257    2976149     2.3006429        96.826251
## 25                1270979    6137428     1.6153298        89.818822
## 26                1363543    1068778     1.4644792        98.160418
## 27                1580319    1934408     1.0059011               NA
## 28                1154399    3080156     1.6950814        93.873937
## 29                1800922    1359711     1.3787982        98.425521
## 30                1627759    8882190     2.5850258        95.945052
## 31                1758157    2096829     2.1102352        94.752811
## 32                3046613   19453561     2.4844643        91.555487
## 33                1325587   10488084     1.3244616        97.855868
## 34                 587528     762062     1.3793228        98.508743
## 35                1174479   11689100     1.8298194        97.572250
## 36                1020992    3956971     1.6111383        97.886550
## 37                1297340    4217737     1.3291127        93.405923
## 38                1146745   12801989     2.2843813        96.636940
## 39                 137018    3386941     0.9261847        43.996313
## 40                1597981    5148714     1.6453565        96.145957
## 41                 554594     884659     1.6358983        98.221292
## 42                1204704    6829174     1.4484229        98.253213
## 43                1110234   28995881     1.7513025        96.441091
## 44                1603589    3205958     0.5715271        97.608302
## 45                2790193     623989     1.0556465        98.473813
## 46                1205933    8535519     1.6778194         8.409783
## 47                1007692    7614893     1.3209238        49.777071
## 48                1691044    1792147     1.7651783        97.592883
## 49                 619044    5822434     1.2022435               NA
## 50                1368012     578759     1.1970607        97.900760
```

Now we summarise our data using summary method, to check the max, min, mean, median etc values of different columns.

```
summary(f_data)
```

```
##     State            Total.Cases       Total.Deaths   Total.Recovered
##  Length:50          Min.   :  24440   Min.   :  258   Min.   :  11041
##  Class :character   1st Qu.: 206938   1st Qu.: 2428   1st Qu.: 131916
##  Mode  :character   Median : 461206   Median : 7421   Median : 458815
##                     Mean   : 675425   Mean   :12067   Mean   : 607725
##                     3rd Qu.: 840571   3rd Qu.:13784   3rd Qu.: 822844
##                     Max.   :3828483   Max.   :63758   Max.   :2903306
##
##   Active.Cases     Total.Cases.1.mil.population Death.1.mil.population
##  Min.   :    115   Min.   : 26924               Min.   : 366
##  1st Qu.:   2380   1st Qu.: 95636               1st Qu.:1287
##  Median :  13175   Median :106950               Median :1756
##  Mean   : 100356   Mean   :100993               Mean   :1663
##  3rd Qu.: 100356   3rd Qu.:112755               3rd Qu.:2056
```

```
##  Max.   :1687167   Max.   :145367               Max.   :2982
##
##   Total.Tests       Tests.1.mil.population   Population       Percent_Death
##  Min.   :  447733   Min.   : 137018        Min.   :  578759   Min.   :0.5388
##  1st Qu.: 2781684   1st Qu.:1043302        1st Qu.: 1975013   1st Qu.:1.3256
##  Median : 5178674   Median :1344565        Median : 4558234   Median :1.6159
##  Mean   : 9973373   Mean   :1439948        Mean   : 6597227   Mean   :1.6302
##  3rd Qu.:10924996   3rd Qu.:1688329        3rd Qu.: 7530849   3rd Qu.:1.8767
##  Max.   :70392011   Max.   :3477649        Max.   :39512223   Max.   :2.5850
##
##  Percent.Recovered
##  Min.   : 2.386
##  1st Qu.:91.277
##  Median :96.580
##  Mean   :85.658
##  3rd Qu.:97.659
##  Max.   :98.614
##  NA's   :6
```

We make important observations like mean death % is around 1.6 and over 85 % of all patients have recovered.

we now check the total cases, total active cases, total recovered cases and total deaths across USA

```
sum(f_data$Total.Cases)
```

```
## [1] 33771259
```

```
sum(f_data$Active.Cases)
```

```
## [1] 5017801
```

```
sum(f_data$Total.Recovered)
```

```
## [1] 30386227
```

```
sum(f_data$Total.Deaths)
```

```
## [1] 603373
```

Similarly, we now check the mean cases, mean active cases, mean recovered cases and mean deaths across USA.

```
mean(f_data$Total.Cases)
```

```
## [1] 675425.2
```

```
mean(f_data$Active.Cases)
```

```
## [1] 100356
```

```
mean(f_data$Total.Recovered)
```

```
## [1] 607724.5
```

```
mean(f_data$Total.Deaths)
```

```
## [1] 12067.46
```

We now check the top 5 and least 5 states in terms of active cases and total deaths.

```
f_data %>% rownames_to_column() %>% top_n(-5, Active.Cases) %>% pull("State","Active.Cases")
```

```
##             428             195             124             178             115
##       "Montana" "New Hampshire"  "North Dakota"  "South Dakota"       "Vermont"
```

```
f_data %>% rownames_to_column() %>% top_n(5, Active.Cases) %>% pull("State","Active.Cases")
```

```
##      1687167       405351       441940       612842       223200
## "California"   "Kentucky"   "Maryland"   "Virginia" "Washington"
```

```
f_data %>% rownames_to_column() %>% top_n(-5, Total.Deaths) %>% pull("State","Total.Deaths")
```

```
##       370       518       861       258       751
##  "Alaska"  "Hawaii"   "Maine" "Vermont" "Wyoming"
```

```
f_data %>% rownames_to_column() %>% top_n(5, Total.Deaths) %>% pull("State","Total.Deaths")
```

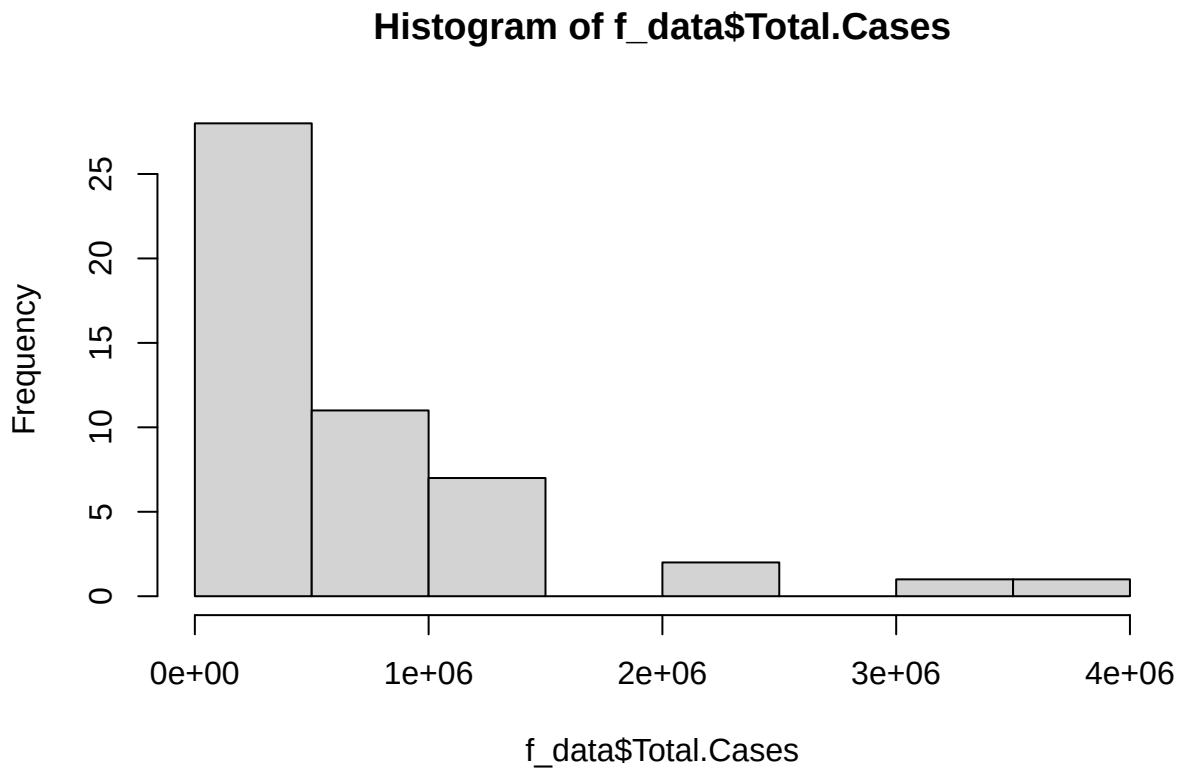
```
##          63758          37985          54065          27821          52722
##   "California"      "Florida"     "New York" "Pennsylvania"        "Texas"
```

Here we can observe that California has most number of active cases, and has had maximum deaths.While Montana has least no of active cases, and Alaska he least no of total deaths.

2 PLOTS

2.1 Histograms

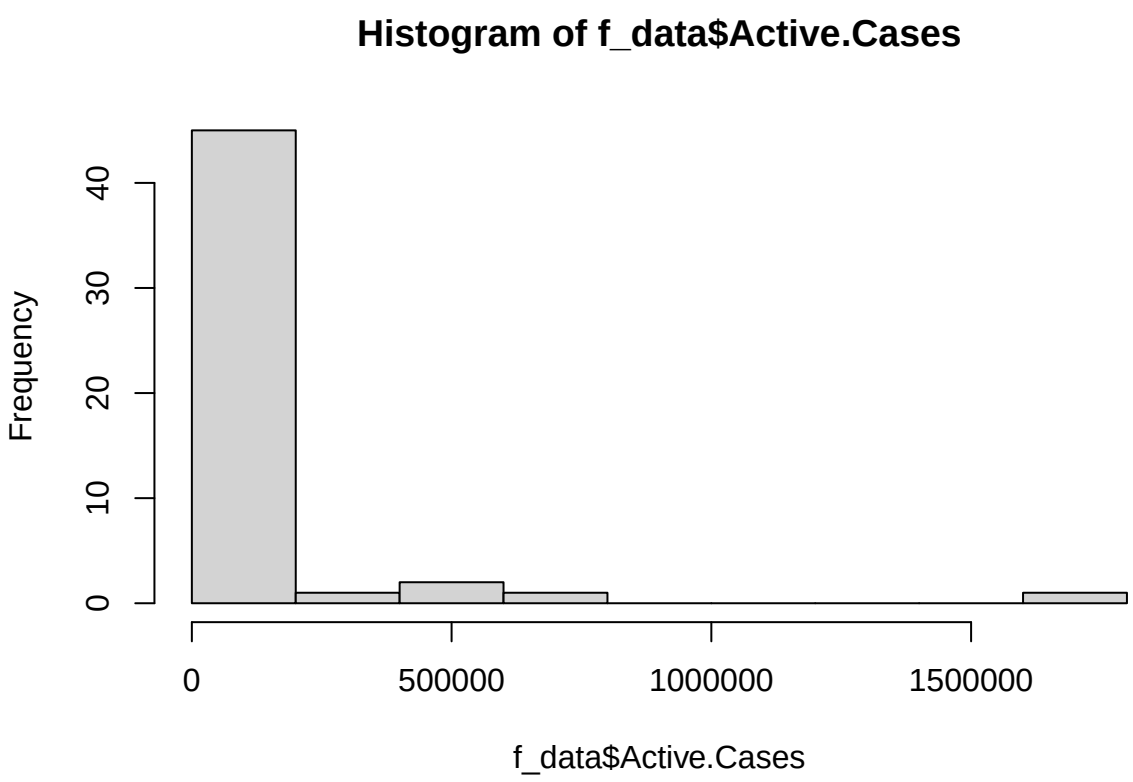
```
hist(f_data$Total.Cases)
```



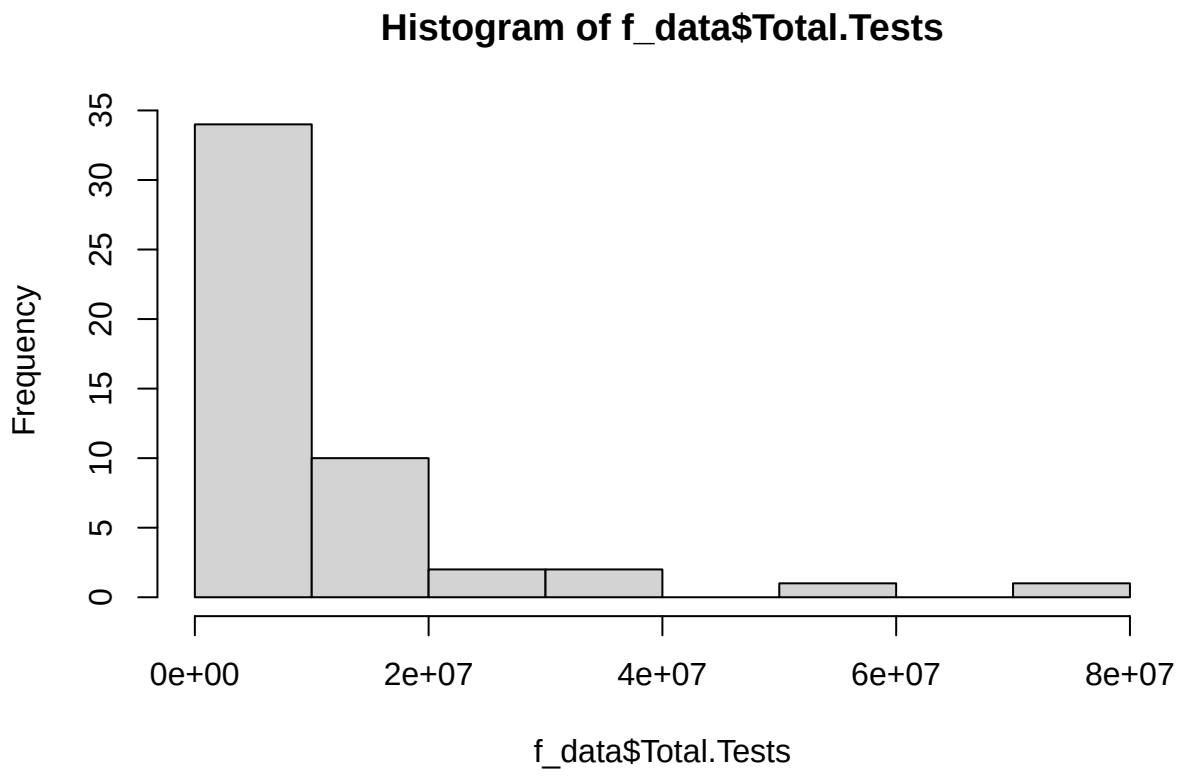
in the above figure we see frequency of states having total cases in distinct half million ranges. `NOTE`: 1e+06 = 1000000

we will now observe some other histograms on available stats.

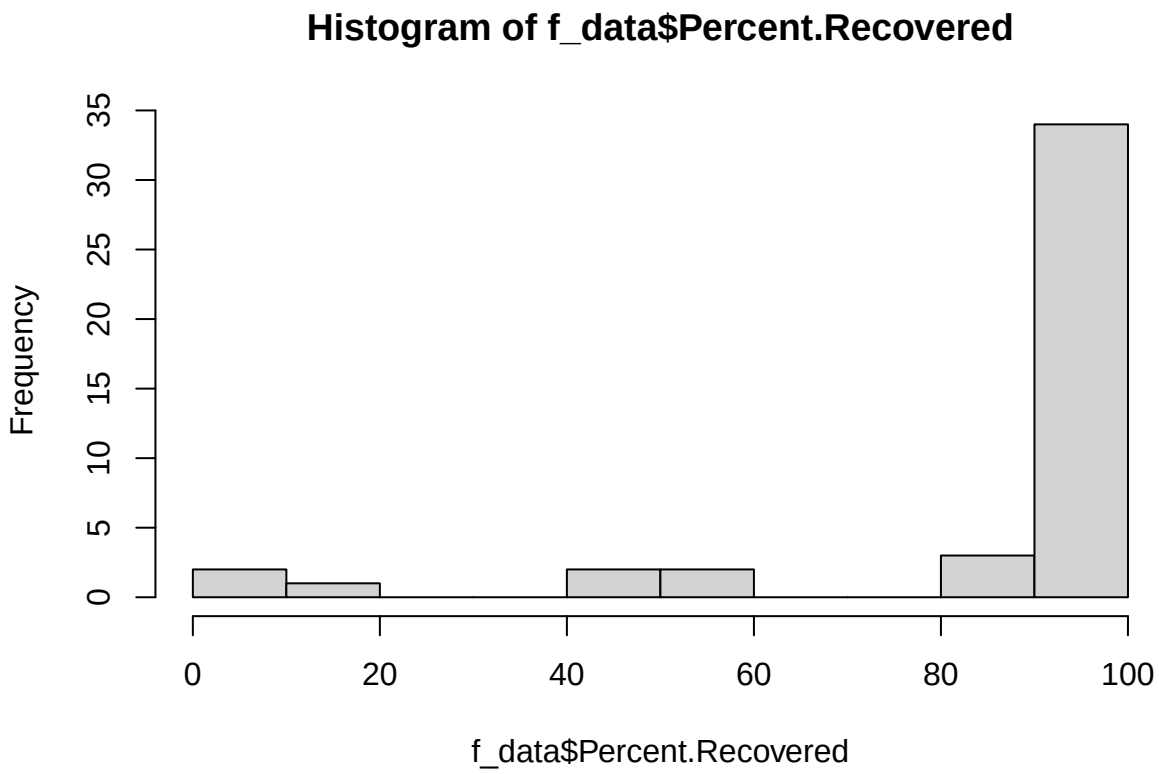
```
hist(f_data$Active.Cases)
```



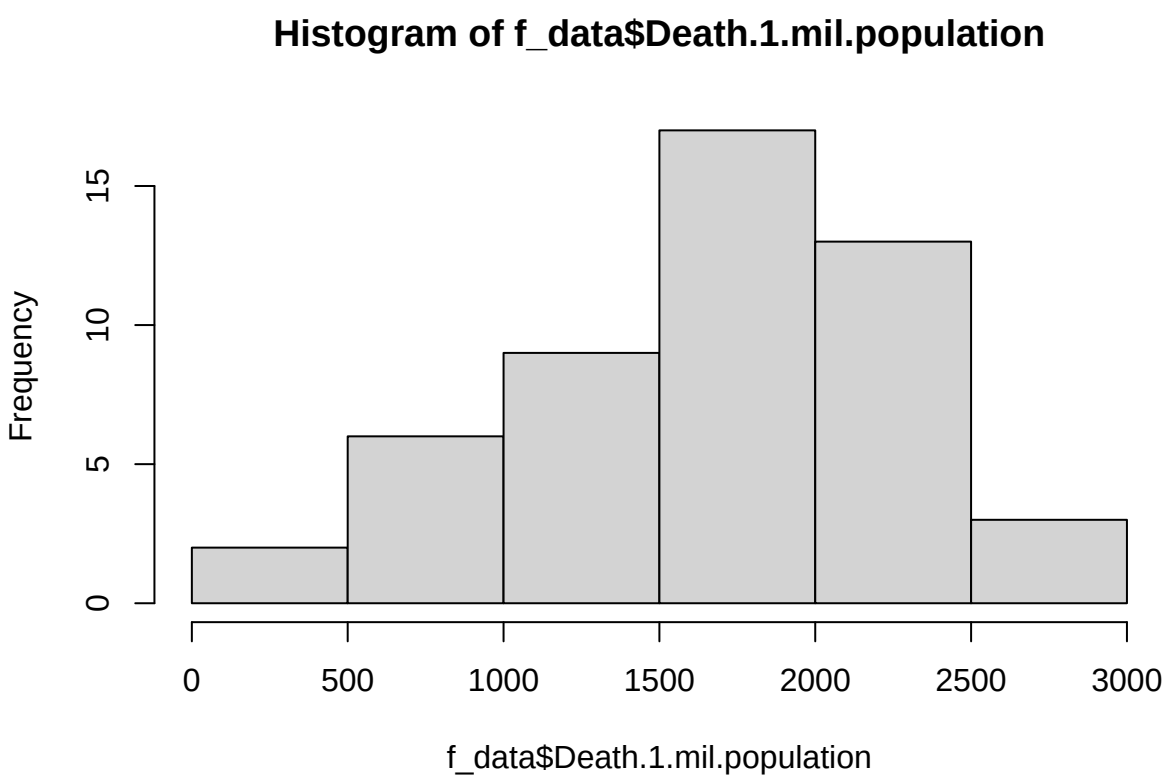

```
hist(f_data$Total.Tests)
```




```
hist(f_data$Percent.Recovered)
```



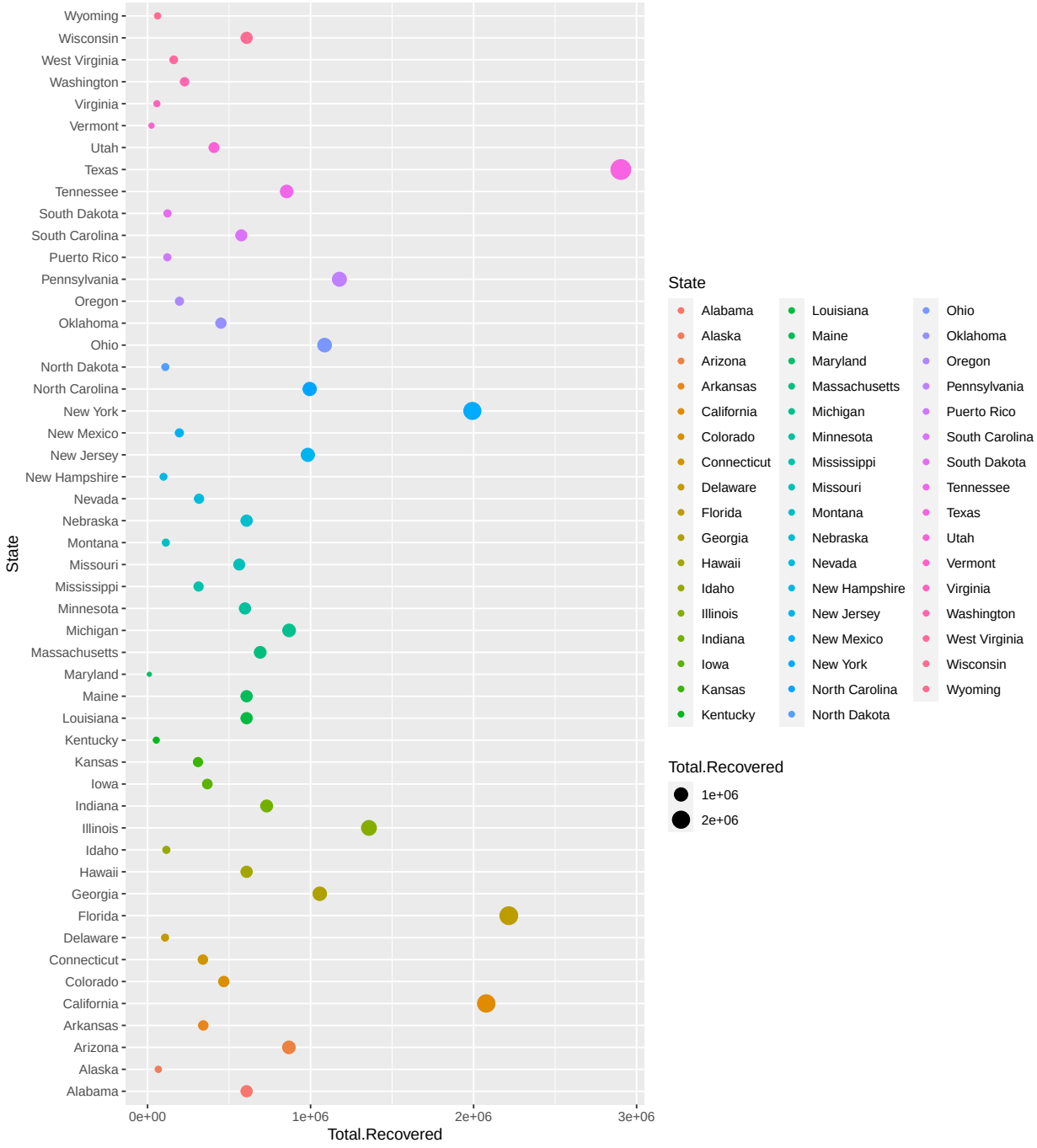

```
hist(f_data$Death.1.mil.population)
```


Histogram of f_data$Death.1.mil.population
Frequency
0
5
10
15
0
500
1000
1500
2000
2500
3000
f_data$Death.1.mil.population

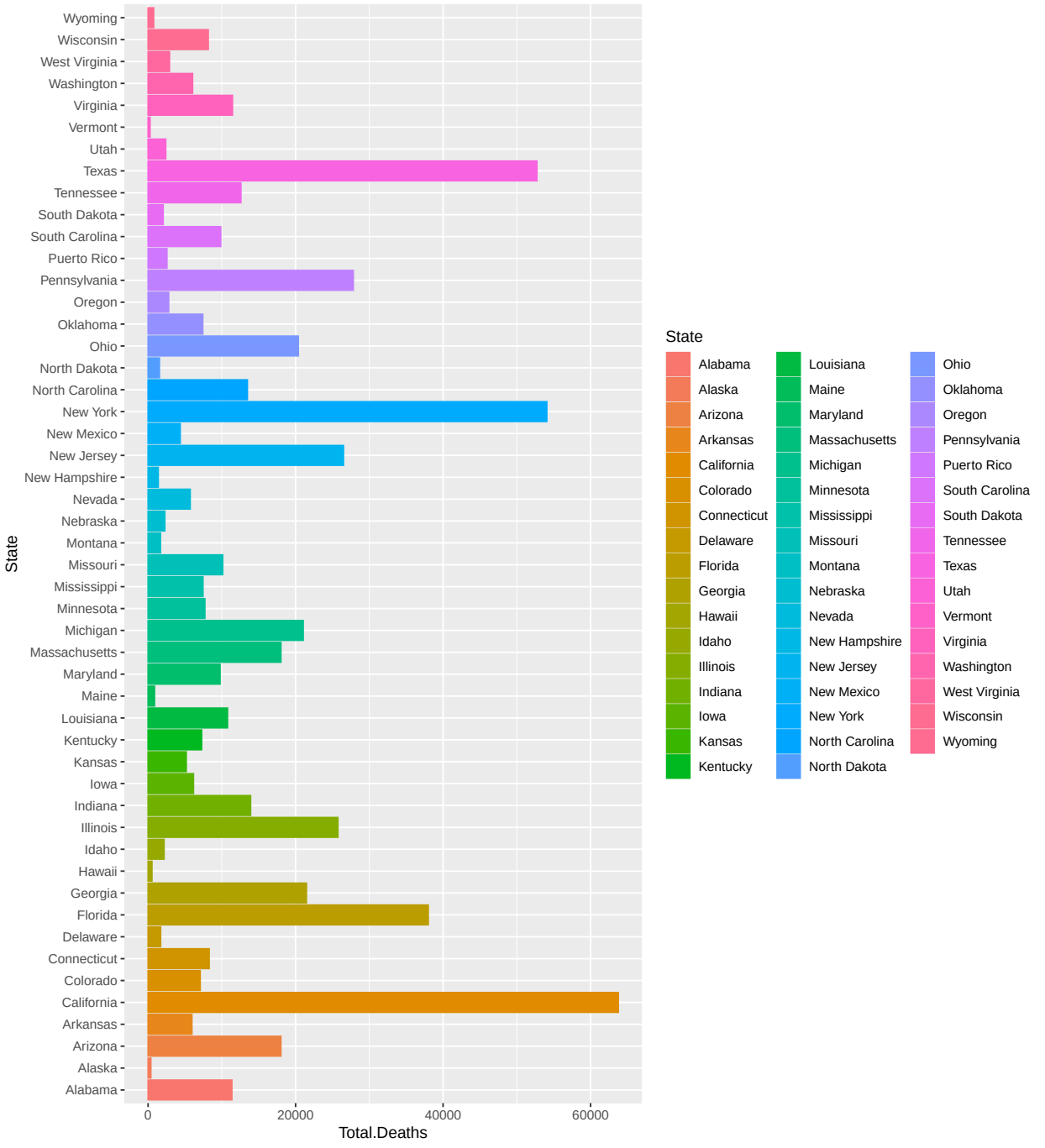
2.2 GGplots

Next we move on to observe several state wise stats using ggplot. we will use bar representation and point representation alternatively to observe.

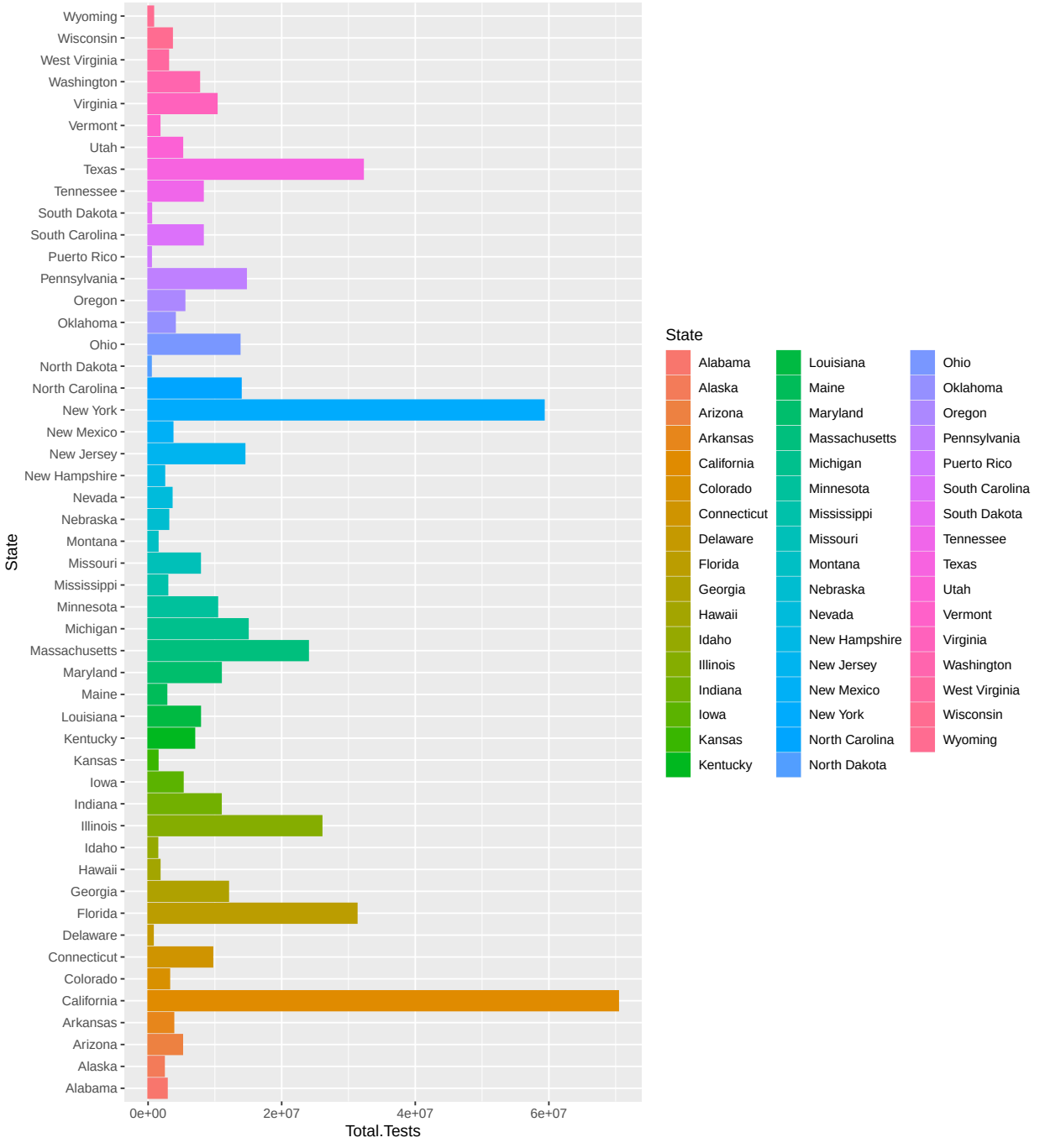
```
ggplot(f_data, aes(x = Total.Recovered, y = State, col = State, size = Total.Recovered)) + geom_point()
```



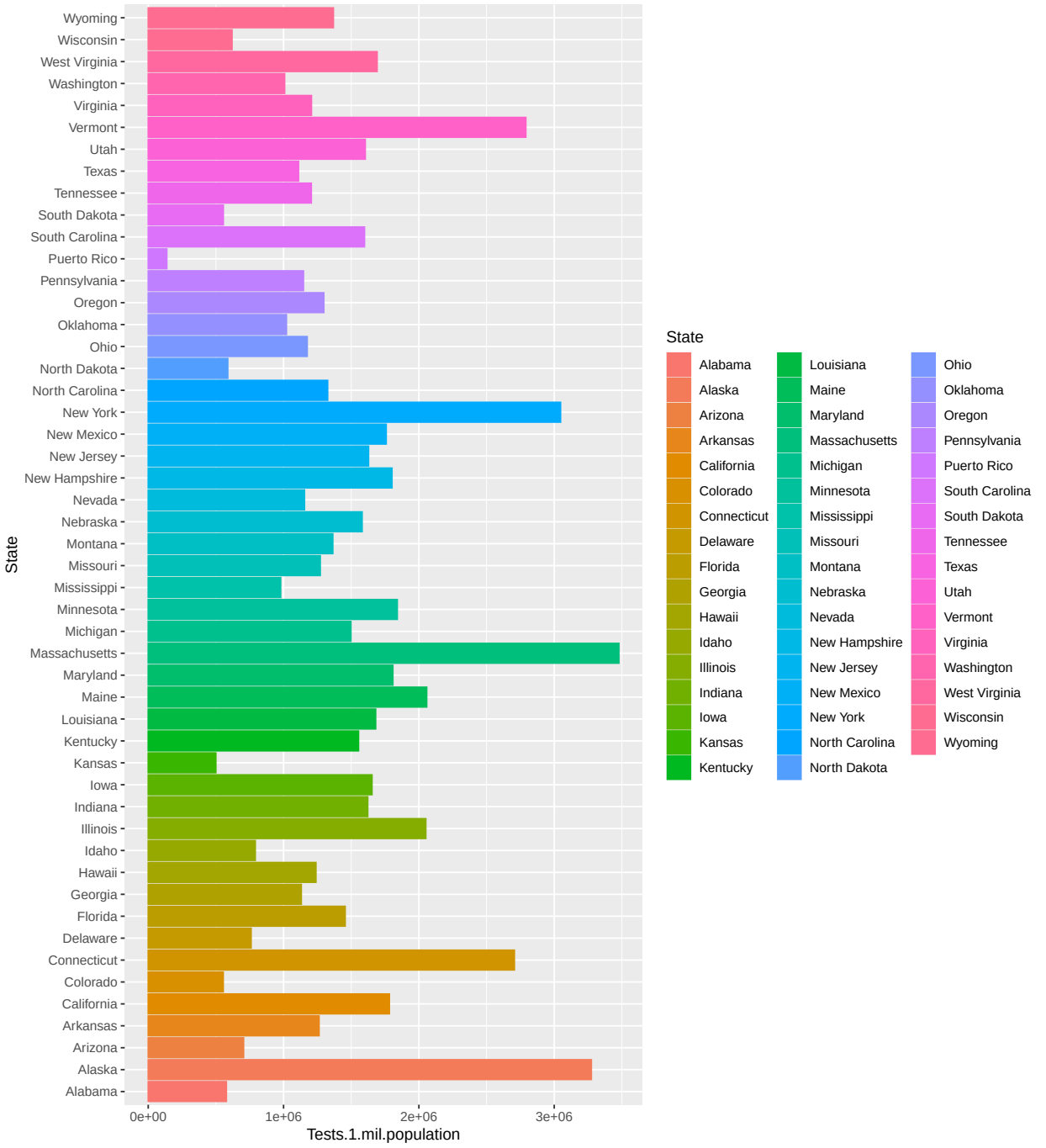

```
ggplot(f_data, aes(x = Total.Deaths, y = State, col = State, fill = State)) + geom_bar(stat = "identity
```




```
ggplot(f_data, aes(x = Total.Tests, y = State, col = State, fill = State)) + geom_bar(stat = "identity"
```

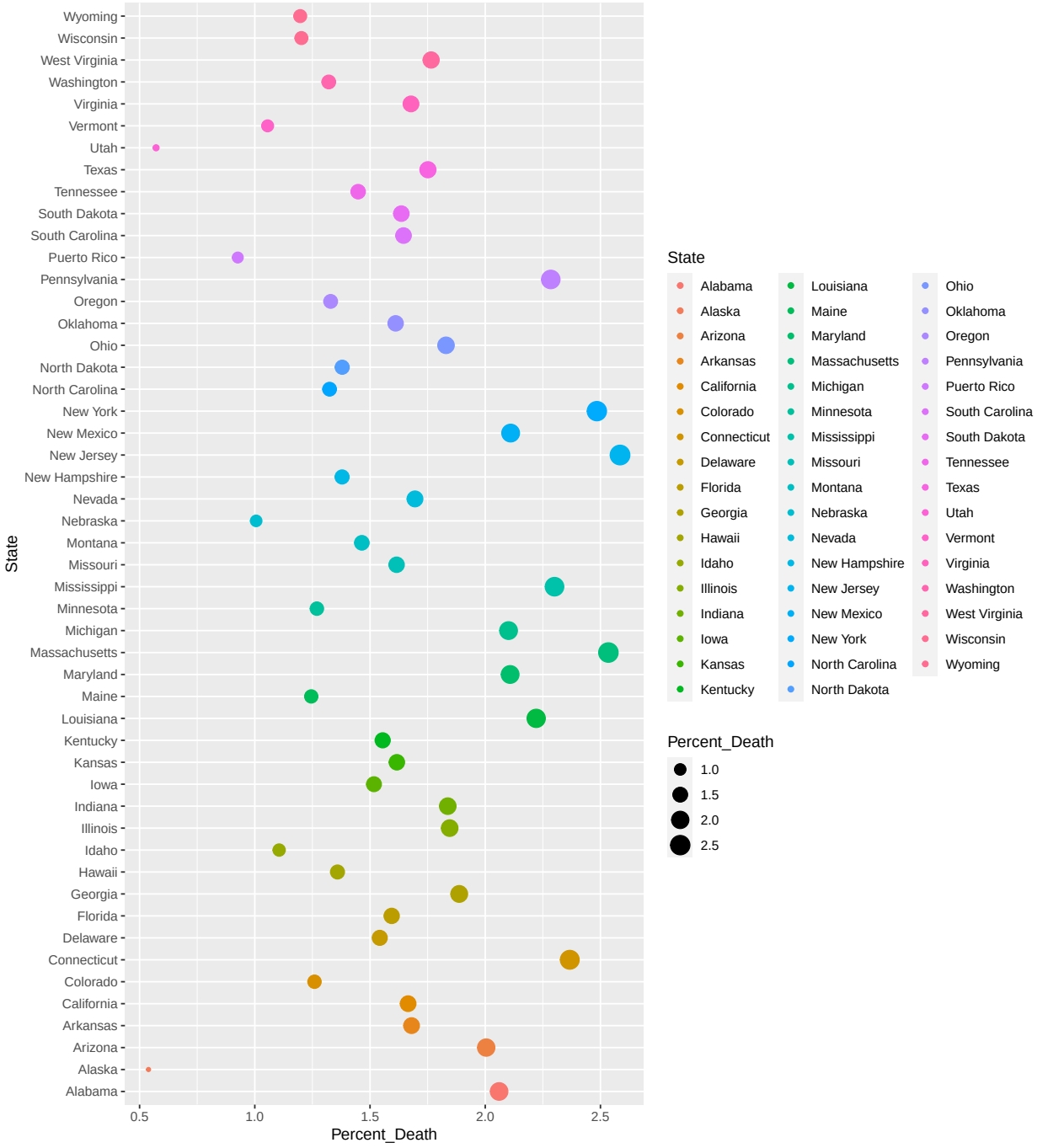



```
ggplot(f_data, aes(x = Tests.1.mil.population, y = State, col = State, fill = State)) + geom_bar(stat =
```



Next we see the percentage deaths and recovered in each state

```
ggplot(f_data, aes(x = Percent_Death, y = State, col = State, size = Percent_Death)) + geom_point()
```



3 GITHUB Links

3.1 Praveen Bhatt

https://github.com/1nt18is116/1NT18IS116_praveen_B_EDA

3.2 Rishina Sharma

https://github.com/1NT18IS125/EDA.git