Final Project Rmd

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Let's load libraries

```
library(tidyverse)
library(tableone)
library(dplyr)
library(knitr)
library(Publish)
```

Let's input the data

```
load('/home/nikd/Dropbox/tedsd_puf_2017.RData')
```

Let's look at the variables in the data set.

```
str(tedsd_puf_2017)
```

```
## tibble [1,661,207 x 76] (S3: tbl_df/tbl/data.frame)
##  $ DISYR                : num [1:1661207] 2017 2017 2017 2017 2017 ...
##   ..- attr(*, "label")= chr "Year of discharge"
##  $ CASEID               : num [1:1661207] 2.02e+10 2.02e+10 2.02e+10 2.02e+10 2.02e+10 ...
##   ..- attr(*, "label")= chr "Case identification number"
##  $ STFIPS               : num [1:1661207] 2 2 2 2 2 2 2 2 2 2 ...
##   ..- attr(*, "label")= chr "Census state FIPS code"
##  $ CBSA2010             : num [1:1661207] -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Metropolitan or micropolitan statistical area"
##  $ EDUC                 : num [1:1661207] 3 3 3 5 3 3 3 2 2 3 ...
##   ..- attr(*, "label")= chr "Education"
##  $ MARSTAT              : num [1:1661207] 1 4 4 1 4 1 2 2 2 1 ...
##   ..- attr(*, "label")= chr "Marital status"
##  $ SERVICES             : num [1:1661207] 7 7 7 7 7 7 7 7 7 7 ...
##   ..- attr(*, "label")= chr "Service setting at admission"
##  $ DETCRIM              : num [1:1661207] -9 -9 -9 2 3 1 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Detailed criminal justice referral"
```

```
##  $ LOS                  : num [1:1661207] 36 37 36 33 32 36 36 33 33 36 ...
##   ..- attr(*, "label")= chr "Length of stay in treatment (days)"
##  $ PSOURCE              : num [1:1661207] 6 1 3 7 7 7 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Treatment referral source"
##  $ NOPRIOR              : num [1:1661207] 1 1 1 0 1 0 0 0 0 1 ...
##   ..- attr(*, "label")= chr "Number of previous substance use treatment episodes"
##  $ ARRESTS              : num [1:1661207] 0 0 0 0 1 0 0 1 0 0 ...
##   ..- attr(*, "label")= chr "Number of arrests in the 30 days prior to admission"
##  $ EMPLOY               : num [1:1661207] 2 2 1 1 4 1 2 3 3 3 ...
##   ..- attr(*, "label")= chr "Employment status at admission"
##  $ METHUSE              : num [1:1661207] 2 2 2 2 2 2 2 2 2 2 ...
##   ..- attr(*, "label")= chr "Planned medication-assisted opioid therapy"
##  $ PSYPROB              : num [1:1661207] 1 1 2 2 1 2 1 2 1 1 ...
##   ..- attr(*, "label")= chr "Co-occurring mental and substance use disorders"
##  $ PREG                 : num [1:1661207] 2 2 2 -9 -9 -9 -9 2 2 2 ...
##   ..- attr(*, "label")= chr "Pregnant at admission"
##  $ GENDER               : num [1:1661207] 2 2 2 1 1 1 1 2 2 2 ...
##   ..- attr(*, "label")= chr "Biologic sex"
##  $ VET                  : num [1:1661207] 2 -9 2 2 2 -9 2 2 2 2 ...
##   ..- attr(*, "label")= chr "Veteran status"
##  $ LIVARAG              : num [1:1661207] 3 3 3 3 3 2 -9 3 3 3 ...
##   ..- attr(*, "label")= chr "Living arrangements at admission"
##  $ DAYWAIT              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Number of days waiting to enter treatment"
##  $ SERVICES_D           : num [1:1661207] 7 7 7 7 7 7 7 7 7 7 ...
##   ..- attr(*, "label")= chr "Service setting at discharge"
##  $ REASON               : num [1:1661207] 3 1 3 1 1 1 3 2 3 5 ...
##   ..- attr(*, "label")= chr "Reason for discharge or discontinuance of treatment"
##  $ EMPLOY_D             : num [1:1661207] 2 2 1 1 4 1 2 3 3 4 ...
##   ..- attr(*, "label")= chr "Employment status at discharge"
##  $ LIVARAG_D            : num [1:1661207] 3 3 3 3 3 3 -9 3 3 2 ...
##   ..- attr(*, "label")= chr "Living arrangements at discharge"
##  $ ARRESTS_D            : num [1:1661207] 0 0 0 0 0 0 0 0 0 1 ...
##   ..- attr(*, "label")= chr "Number of arrests in the 30 days prior to discharge"
##  $ DSMCRIT              : num [1:1661207] -9 4 15 9 4 4 14 4 4 19 ...
##   ..- attr(*, "label")= chr "DSM diagnosis (SuDS 4 or SuDS 19)"
##  $ AGE                  : num [1:1661207] 5 9 9 7 12 6 5 5 5 6 ...
##   ..- attr(*, "label")= chr "Age at admission"
##  $ RACE                 : num [1:1661207] 5 5 5 5 1 8 5 1 1 1 ...
##   ..- attr(*, "label")= chr "Race"
##  $ ETHNIC               : num [1:1661207] 4 4 4 4 4 4 4 4 4 4 ...
##   ..- attr(*, "label")= chr "Hispanic or Latino origin (ethnicity)"
##  $ DETNLF               : num [1:1661207] -9 -9 -9 -9 3 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Detailed \"not in labor force\" category at admission"
##  $ DETNLF_D             : num [1:1661207] -9 -9 -9 -9 3 -9 -9 -9 -9 4 ...
##   ..- attr(*, "label")= chr "Detailed \"not in labor force\" category at discharge"
##  $ PRIMINC              : num [1:1661207] 1 1 1 1 3 1 4 2 4 4 ...
##   ..- attr(*, "label")= chr "Source of income/support"
##  $ SUB1                 : num [1:1661207] 2 2 10 2 4 2 2 19 2 2 ...
##   ..- attr(*, "label")= chr "Substance use at admission (primary)"
##  $ SUB2                 : num [1:1661207] 1 19 7 1 2 4 1 2 1 4 ...
##   ..- attr(*, "label")= chr "Substance use at admission (secondary)"
##  $ SUB3                 : num [1:1661207] 1 7 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Substance use at admission (tertiary)"
```

```
##  $ SUB1_D               : num [1:1661207] 2 1 10 2 2 2 2 19 2 2 ...
##   ..- attr(*, "label")= chr "Substance use at discharge (primary)"
##  $ SUB2_D               : num [1:1661207] 1 1 7 1 4 4 1 2 1 4 ...
##   ..- attr(*, "label")= chr "Substance use at discharge (secondary)"
##  $ SUB3_D               : num [1:1661207] 1 1 1 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Substance use at discharge (tertiary)"
##  $ ROUTE1               : num [1:1661207] 1 1 2 1 2 1 1 2 1 1 ...
##   ..- attr(*, "label")= chr "Usual route of administration (primary substance)"
##  $ ROUTE2               : num [1:1661207] -9 2 1 -9 1 2 -9 1 -9 2 ...
##   ..- attr(*, "label")= chr "Usual route of administration (secondary substance)"
##  $ ROUTE3               : num [1:1661207] -9 1 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Usual route of administration (tertiary substance)"
##  $ FREQ1                : num [1:1661207] 2 3 1 2 3 2 2 3 2 1 ...
##   ..- attr(*, "label")= chr "Frequency of use at admission (primary substance)"
##  $ FREQ2                : num [1:1661207] -9 3 1 -9 3 3 -9 1 -9 1 ...
##   ..- attr(*, "label")= chr "Frequency of use at admission (secondary substance)"
##  $ FREQ3                : num [1:1661207] -9 3 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Frequency of use at admission (tertiary substance)"
##  $ FREQ1_D              : num [1:1661207] 1 -9 1 2 3 2 3 3 1 -9 ...
##   ..- attr(*, "label")= chr "Frequency of use at discharge (primary substance)"
##  $ FREQ2_D              : num [1:1661207] -9 -9 -9 -9 2 2 -9 2 -9 2 ...
##   ..- attr(*, "label")= chr "Frequency of use at discharge (secondary substance)"
##  $ FREQ3_D              : num [1:1661207] -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Frequency of use at discharge (tertiary substance)"
##  $ FRSTUSE1             : num [1:1661207] 3 -9 7 4 -9 1 5 4 2 2 ...
##   ..- attr(*, "label")= chr "Age at first use (primary substance)"
##  $ FRSTUSE2             : num [1:1661207] -9 -9 4 -9 -9 2 -9 4 -9 3 ...
##   ..- attr(*, "label")= chr "Age at first use (secondary substance)"
##  $ FRSTUSE3             : num [1:1661207] -9 -9 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Age at first use (tertiary substance)"
##  $ HLTHINS              : num [1:1661207] 2 2 4 3 2 4 4 2 2 3 ...
##   ..- attr(*, "label")= chr "Health insurance at admission"
##  $ PRIMPAY              : num [1:1661207] 4 4 4 2 7 4 1 4 4 7 ...
##   ..- attr(*, "label")= chr "Primary source of payment for treatment"
##  $ FREQ_ATND_SELF_HELP  : num [1:1661207] 1 1 4 1 1 1 1 1 1 2 ...
##   ..- attr(*, "label")= chr "Frequency of attendance at substance use self-help groups in the 30 days
##  $ FREQ_ATND_SELF_HELP_D: num [1:1661207] 1 1 1 1 1 1 1 1 1 -9 ...
##   ..- attr(*, "label")= chr "Frequency of attendance at substance use self-help groups in the 30 days
##  $ ALCFLG               : num [1:1661207] 1 1 0 1 1 1 1 1 1 1 ...
##   ..- attr(*, "label")= chr "Alcohol reported at admission"
##  $ COKEFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Cocaine/crack reported at admission"
##  $ MARFLG               : num [1:1661207] 0 0 0 0 1 1 0 0 0 1 ...
##   ..- attr(*, "label")= chr "Marijuana/hashish reported at admission"
##  $ HERFLG               : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Heroin reported at admission"
##  $ METHFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Non-Rx methadone reported at admission"
##  $ OPSYNFLG             : num [1:1661207] 0 1 1 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other opiates/synthetics reported at admission"
##  $ PCPFLG               : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "PCP reported at admission"
##  $ HALLFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other hallucinogens reported at admission"
```

```
##  $ MTHAMFLG             : num [1:1661207] 0 0 1 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Methamphetamine reported at admission"
##  $ AMPHFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other amphetamines reported at admission"
##  $ STIMFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other stimulants reported at admission"
##  $ BENZFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Benzodiazepines reported at admission"
##  $ TRNQFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other non-benzodiazepine tranquilizers reported at admission"
##  $ BARBFLG              : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Barbiturates reported at admission"
##  $ SEDHPFLG             : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Other non-barbiturate sedatives/hypnotics reported at admission"
##  $ INHFLG               : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Inhalants reported at admission"
##  $ OTCFLG               : num [1:1661207] 0 0 0 0 0 0 0 0 0 0 ...
##   ..- attr(*, "label")= chr "Over-the-counter medication reported at admission"
##  $ OTHERFLG             : num [1:1661207] 0 1 0 0 0 0 0 1 0 0 ...
##   ..- attr(*, "label")= chr "Other drug reported at admission"
##  $ DIVISION             : num [1:1661207] 9 9 9 9 9 9 9 9 9 9 ...
##   ..- attr(*, "label")= chr "Census division"
##  $ REGION               : num [1:1661207] 4 4 4 4 4 4 4 4 4 4 ...
##   ..- attr(*, "label")= chr "Census region"
##  $ IDU                  : num [1:1661207] -9 0 -9 -9 -9 -9 -9 -9 -9 -9 ...
##   ..- attr(*, "label")= chr "Current IV drug use reported at admission"
##  $ ALCDRUG              : num [1:1661207] 1 3 2 1 3 3 1 3 1 3 ...
##   ..- attr(*, "label")= chr "Substance use type"
##  - attr(*, "label")= chr "TEDSD_PUF_2017                  "
```

- Let's do some data analysis

Everything is significant!

```
catTable <- CreateCatTable(vars=names(tedsd_puf_2017)[5:16], strata=c("DAYWAIT"),data = tedsd_puf_2017)
print(catTable) %>% kable()
```

```
##                Stratified by DAYWAIT
##                 -9             0              1              2
##   n             759908         617870         179069         45904
##   EDUC (%)
##      -9          30507 ( 4.0)   14834 ( 2.4)    2475 ( 1.4)    697 ( 1.5)
##      1           44189 ( 5.8)   34391 ( 5.6)   12487 ( 7.0)   2062 ( 4.5)
##      2          153595 (20.2)  142401 (23.0)   34451 (19.2)   9683 (21.1)
##      3          328050 (43.2)  283867 (45.9)   86319 (48.2)  21451 (46.7)
##      4          158854 (20.9)  110449 (17.9)   32692 (18.3)   9378 (20.4)
##      5           44713 ( 5.9)   31928 ( 5.2)   10645 ( 5.9)   2633 ( 5.7)
##   MARSTAT (%)
##      -9         139701 (18.4)  189893 (30.7)   39816 (22.2)  10984 (23.9)
##      1          402078 (52.9)  281094 (45.5)   95240 (53.2)  22740 (49.5)
##      2           86268 (11.4)   51656 ( 8.4)   17065 ( 9.5)   4490 ( 9.8)
##      3           37892 ( 5.0)   24671 ( 4.0)    7285 ( 4.1)   2111 ( 4.6)
##      4           93969 (12.4)   70556 (11.4)   19663 (11.0)   5579 (12.2)
```

```
##   SERVICES (%)
##      1          38376 ( 5.1)    4351 ( 0.7)    1038 ( 0.6)    146 ( 0.3)
##      2          96228 (12.7)  128533 (20.8)   42157 (23.5)   5816 (12.7)
##      3           4108 ( 0.5)     296 ( 0.0)     177 ( 0.1)     34 ( 0.1)
##      4          84575 (11.1)   60474 ( 9.8)   16004 ( 8.9)   4605 (10.0)
##      5          56076 ( 7.4)   48750 ( 7.9)   21958 (12.3)   7090 (15.4)
##      6         109338 (14.4)   82704 (13.4)   28857 (16.1)   5944 (12.9)
##      7         367668 (48.4)  281997 (45.6)   68083 (38.0)  22128 (48.2)
##      8           3539 ( 0.5)   10765 ( 1.7)     795 ( 0.4)    141 ( 0.3)
##   DETCRIM (%)
##      -9        668582 (88.0)  444792 (72.0)  133255 (74.4)  29973 (65.3)
##      1          27885 ( 3.7)   21412 ( 3.5)    5050 ( 2.8)   2161 ( 4.7)
##      2           6810 ( 0.9)   25598 ( 4.1)    4407 ( 2.5)   1285 ( 2.8)
##      3          34116 ( 4.5)   63056 (10.2)   17998 (10.1)   6606 (14.4)
##      4           9332 ( 1.2)   10638 ( 1.7)    1553 ( 0.9)    543 ( 1.2)
##      5           1019 ( 0.1)    5295 ( 0.9)    5087 ( 2.8)    922 ( 2.0)
##      6           2262 ( 0.3)    3435 ( 0.6)    1135 ( 0.6)    271 ( 0.6)
##      7           6633 ( 0.9)   10411 ( 1.7)    5987 ( 3.3)   2331 ( 5.1)
##      8           3269 ( 0.4)   33233 ( 5.4)    4597 ( 2.6)   1812 ( 3.9)
##   LOS (%)
##      1         129950 (17.1)   49386 ( 8.0)    7552 ( 4.2)   1895 ( 4.1)
##      2          34472 ( 4.5)   31441 ( 5.1)    6301 ( 3.5)   1214 ( 2.6)
##      3          31491 ( 4.1)   24962 ( 4.0)    7160 ( 4.0)   1347 ( 2.9)
##      4          36076 ( 4.7)   21737 ( 3.5)    6766 ( 3.8)   1060 ( 2.3)
##      5          29299 ( 3.9)   16602 ( 2.7)    8141 ( 4.5)   1090 ( 2.4)
##      6          17893 ( 2.4)   13320 ( 2.2)    5841 ( 3.3)    759 ( 1.7)
##      7          12593 ( 1.7)   13515 ( 2.2)    5446 ( 3.0)    860 ( 1.9)
##      8          11212 ( 1.5)    8120 ( 1.3)    2974 ( 1.7)    679 ( 1.5)
##      9           6824 ( 0.9)    5943 ( 1.0)    2264 ( 1.3)    455 ( 1.0)
##      10          6410 ( 0.8)    5129 ( 0.8)    2146 ( 1.2)    414 ( 0.9)
##      11          5213 ( 0.7)    4406 ( 0.7)    1636 ( 0.9)    322 ( 0.7)
##      12          4962 ( 0.7)    4178 ( 0.7)    1532 ( 0.9)    316 ( 0.7)
##      13          8147 ( 1.1)    5060 ( 0.8)    1998 ( 1.1)    458 ( 1.0)
##      14         12284 ( 1.6)    6928 ( 1.1)    3244 ( 1.8)    711 ( 1.5)
##      15          8820 ( 1.2)    6865 ( 1.1)    2314 ( 1.3)    562 ( 1.2)
##      16          4746 ( 0.6)    4785 ( 0.8)    1375 ( 0.8)    308 ( 0.7)
##      17          4465 ( 0.6)    3951 ( 0.6)    1190 ( 0.7)    334 ( 0.7)
##      18          3761 ( 0.5)    3703 ( 0.6)    1025 ( 0.6)    268 ( 0.6)
##      19          3812 ( 0.5)    3785 ( 0.6)    1107 ( 0.6)    268 ( 0.6)
##      20          4991 ( 0.7)    5427 ( 0.9)    1440 ( 0.8)    368 ( 0.8)
##      21          7251 ( 1.0)    7536 ( 1.2)    1851 ( 1.0)    573 ( 1.2)
##      22          6507 ( 0.9)    4888 ( 0.8)    1540 ( 0.9)    419 ( 0.9)
##      23          3962 ( 0.5)    3906 ( 0.6)    1163 ( 0.6)    281 ( 0.6)
##      24          3853 ( 0.5)    3476 ( 0.6)    1173 ( 0.7)    264 ( 0.6)
##      25          3472 ( 0.5)    3129 ( 0.5)    1005 ( 0.6)    233 ( 0.5)
##      26          3409 ( 0.4)    3486 ( 0.6)    1048 ( 0.6)    259 ( 0.6)
##      27          5608 ( 0.7)    5595 ( 0.9)    1695 ( 0.9)    440 ( 1.0)
##      28         11265 ( 1.5)    8538 ( 1.4)    2594 ( 1.4)    698 ( 1.5)
##      29          7859 ( 1.0)    7381 ( 1.2)    2205 ( 1.2)    569 ( 1.2)
##      30          5074 ( 0.7)    6165 ( 1.0)    1757 ( 1.0)    428 ( 0.9)
##      31         44986 ( 5.9)   45726 ( 7.4)   12654 ( 7.1)   3576 ( 7.8)
##      32         34139 ( 4.5)   35953 ( 5.8)   10190 ( 5.7)   2953 ( 6.4)
##      33         54408 ( 7.2)   61227 ( 9.9)   17840 (10.0)   5517 (12.0)
##      34         41494 ( 5.5)   46934 ( 7.6)   13883 ( 7.8)   4345 ( 9.5)
```

```
##      35          51635 ( 6.8)   51062 ( 8.3)   15294 ( 8.5)   4967 (10.8)
##      36          64711 ( 8.5)   52221 ( 8.5)   14903 ( 8.3)   4709 (10.3)
##      37          32854 ( 4.3)   31404 ( 5.1)    6822 ( 3.8)   1985 ( 4.3)
##   PSOURCE (%)
##      -9          21702 ( 2.9)   11512 ( 1.9)    1655 ( 0.9)    667 ( 1.5)
##      1          329893 (43.4)  252659 (40.9)   80163 (44.8)  16473 (35.9)
##      2           74609 ( 9.8)   52018 ( 8.4)   21211 (11.8)   4532 ( 9.9)
##      3           66341 ( 8.7)   39072 ( 6.3)    8695 ( 4.9)   2066 ( 4.5)
##      4            1669 ( 0.2)    5853 ( 0.9)    2581 ( 1.4)    173 ( 0.4)
##      5            3856 ( 0.5)    1331 ( 0.2)     453 ( 0.3)    111 ( 0.2)
##      6           81712 (10.8)   60106 ( 9.7)   16125 ( 9.0)   4414 ( 9.6)
##      7          180126 (23.7)  195319 (31.6)   48186 (26.9)  17468 (38.1)
##   NOPRIOR (%)
##      -9         118424 (15.6)   17762 ( 2.9)    3525 ( 2.0)   1546 ( 3.4)
##      0          234247 (30.8)  240451 (38.9)   49934 (27.9)  15007 (32.7)
##      1          407237 (53.6)  359657 (58.2)  125610 (70.1)  29351 (63.9)
##   ARRESTS (%)
##      -9         107682 (14.2)   62842 (10.2)   15108 ( 8.4)   4299 ( 9.4)
##      0          608201 (80.0)  507298 (82.1)  150318 (83.9)  38127 (83.1)
##      1           37122 ( 4.9)   41100 ( 6.7)   11311 ( 6.3)   2932 ( 6.4)
##      2            6903 ( 0.9)    6630 ( 1.1)    2332 ( 1.3)    546 ( 1.2)
##   EMPLOY (%)
##      -9          28368 ( 3.7)   11128 ( 1.8)    1806 ( 1.0)    554 ( 1.2)
##      1          129109 (17.0)   94655 (15.3)   28384 (15.9)   8342 (18.2)
##      2           53007 ( 7.0)   44843 ( 7.3)   12584 ( 7.0)   3790 ( 8.3)
##      3          293803 (38.7)  243469 (39.4)   62983 (35.2)  16899 (36.8)
##      4          255621 (33.6)  223775 (36.2)   73312 (40.9)  16319 (35.6)
##   METHUSE (%)
##      -9           5462 ( 0.7)   30665 ( 5.0)   25456 (14.2)   7220 (15.7)
##      1           91836 (12.1)   69336 (11.2)   24090 (13.5)   5100 (11.1)
##      2          662610 (87.2)  517869 (83.8)  129523 (72.3)  33584 (73.2)
##   PSYPROB (%)
##      -9         181011 (23.8)   45221 ( 7.3)    1718 ( 1.0)    568 ( 1.2)
##      1          265461 (34.9)  192317 (31.1)   75223 (42.0)  18731 (40.8)
##      2          313436 (41.2)  380332 (61.6)  102128 (57.0)  26605 (58.0)
##   PREG (%)
##      -9         532756 (70.1)  413240 (66.9)  115707 (64.6)  29314 (63.9)
##      1            8261 ( 1.1)    9680 ( 1.6)    2859 ( 1.6)    662 ( 1.4)
##      2          218891 (28.8)  194950 (31.6)   60503 (33.8)  15928 (34.7)
##                Stratified by DAYWAIT
##                3             4             p      test
##   n            35791         22665
##   EDUC (%)                                 <0.001
##      -9          549 ( 1.5)   1243 ( 5.5)
##      1          1783 ( 5.0)   1227 ( 5.4)
##      2          7595 (21.2)   4863 (21.5)
##      3         16876 (47.2)  10125 (44.7)
##      4          7051 (19.7)   4138 (18.3)
##      5          1937 ( 5.4)   1069 ( 4.7)
##   MARSTAT (%)                              <0.001
##      -9          8744 (24.4)   6678 (29.5)
##      1         17795 (49.7)  10576 (46.7)
##      2          3471 ( 9.7)   2031 ( 9.0)
##      3          1565 ( 4.4)   1052 ( 4.6)
```

```
##      4          4216 (11.8)   2328 (10.3)
##   SERVICES (%)                              <0.001
##      1           100 ( 0.3)    110 ( 0.5)
##      2          3168 ( 8.9)    876 ( 3.9)
##      3            19 ( 0.1)     32 ( 0.1)
##      4          3502 ( 9.8)   1815 ( 8.0)
##      5          7315 (20.4)   5468 (24.1)
##      6          4549 (12.7)   2711 (12.0)
##      7         17030 (47.6)  11614 (51.2)
##      8           108 ( 0.3)     39 ( 0.2)
##   DETCRIM (%)                               <0.001
##      -9        22307 (62.3)  13476 (59.5)
##      1          1836 ( 5.1)   1505 ( 6.6)
##      2          1114 ( 3.1)    823 ( 3.6)
##      3          5648 (15.8)   3385 (14.9)
##      4           375 ( 1.0)    268 ( 1.2)
##      5           593 ( 1.7)    196 ( 0.9)
##      6           438 ( 1.2)    572 ( 2.5)
##      7          1841 ( 5.1)   1097 ( 4.8)
##      8          1639 ( 4.6)   1343 ( 5.9)
##   LOS (%)                                   <0.001
##      1          1379 ( 3.9)    661 ( 2.9)
##      2           945 ( 2.6)    333 ( 1.5)
##      3           915 ( 2.6)    251 ( 1.1)
##      4           609 ( 1.7)    220 ( 1.0)
##      5           575 ( 1.6)    202 ( 0.9)
##      6           401 ( 1.1)    198 ( 0.9)
##      7           484 ( 1.4)    201 ( 0.9)
##      8           396 ( 1.1)    206 ( 0.9)
##      9           317 ( 0.9)    137 ( 0.6)
##      10          263 ( 0.7)    130 ( 0.6)
##      11          227 ( 0.6)    123 ( 0.5)
##      12          211 ( 0.6)    109 ( 0.5)
##      13          339 ( 0.9)    126 ( 0.6)
##      14          407 ( 1.1)    153 ( 0.7)
##      15          365 ( 1.0)    148 ( 0.7)
##      16          226 ( 0.6)    104 ( 0.5)
##      17          216 ( 0.6)    113 ( 0.5)
##      18          152 ( 0.4)     99 ( 0.4)
##      19          174 ( 0.5)     94 ( 0.4)
##      20          272 ( 0.8)    211 ( 0.9)
##      21          386 ( 1.1)    186 ( 0.8)
##      22          304 ( 0.8)    148 ( 0.7)
##      23          229 ( 0.6)    117 ( 0.5)
##      24          204 ( 0.6)     88 ( 0.4)
##      25          166 ( 0.5)    103 ( 0.5)
##      26          180 ( 0.5)    102 ( 0.5)
##      27          323 ( 0.9)    155 ( 0.7)
##      28          620 ( 1.7)    312 ( 1.4)
##      29          422 ( 1.2)    224 ( 1.0)
##      30          397 ( 1.1)    229 ( 1.0)
##      31         2842 ( 7.9)   1725 ( 7.6)
##      32         2390 ( 6.7)   1542 ( 6.8)
##      33         4753 (13.3)   3213 (14.2)
```

```
##      34         3754 (10.5)   2366 (10.4)
##      35         4127 (11.5)   2736 (12.1)
##      36         4045 (11.3)   3388 (14.9)
##      37         1776 ( 5.0)   2212 ( 9.8)
##   PSOURCE (%)                              <0.001
##      -9          629 ( 1.8)    866 ( 3.8)
##      1         11617 (32.5)   6156 (27.2)
##      2          3557 ( 9.9)   1941 ( 8.6)
##      3          1490 ( 4.2)   1111 ( 4.9)
##      4            95 ( 0.3)     61 ( 0.3)
##      5            81 ( 0.2)     34 ( 0.2)
##      6          3377 ( 9.4)   1939 ( 8.6)
##      7         14945 (41.8)  10557 (46.6)
##   NOPRIOR (%)                              <0.001
##      -9         1174 ( 3.3)    883 ( 3.9)
##      0         11868 (33.2)   8258 (36.4)
##      1         22749 (63.6)  13524 (59.7)
##   ARRESTS (%)                              <0.001
##      -9         3287 ( 9.2)   2684 (11.8)
##      0         30019 (83.9)  18387 (81.1)
##      1          2015 ( 5.6)   1224 ( 5.4)
##      2           470 ( 1.3)    370 ( 1.6)
##   EMPLOY (%)                               <0.001
##      -9          435 ( 1.2)   1266 ( 5.6)
##      1          6590 (18.4)   3817 (16.8)
##      2          2942 ( 8.2)   1803 ( 8.0)
##      3         12966 (36.2)   7675 (33.9)
##      4         12858 (35.9)   8104 (35.8)
##   METHUSE (%)                              <0.001
##      -9         4290 (12.0)   1617 ( 7.1)
##      1          3732 (10.4)   1625 ( 7.2)
##      2         27769 (77.6)  19423 (85.7)
##   PSYPROB (%)                              <0.001
##      -9          518 ( 1.4)    403 ( 1.8)
##      1         14241 (39.8)   8302 (36.6)
##      2         21032 (58.8)  13960 (61.6)
##   PREG (%)                                 <0.001
##      -9        22891 (64.0)  14545 (64.2)
##      1           470 ( 1.3)    312 ( 1.4)
##      2         12430 (34.7)   7808 (34.4)
```

	-9	0	1	2	3	4	p	test
n	759908	617870	179069	45904	35791	22665		
EDUC (%)							<0.001	
-9	30507 (4.0)	14834 (2.4)	2475 (1.4)	697 (1.5)	549 (1.5)	1243 (5.5)		
1	44189 (5.8)	34391 (5.6)	12487 (7.0)	2062 (4.5)	1783 (5.0)	1227 (5.4)		
2	153595 (20.2)	142401 (23.0)	34451 (19.2)	9683 (21.1)	7595 (21.2)	4863 (21.5)		
3	328050 (43.2)	283867 (45.9)	86319 (48.2)	21451 (46.7)	16876 (47.2)	10125 (44.7)		
4	158854 (20.9)	110449 (17.9)	32692 (18.3)	9378 (20.4)	7051 (19.7)	4138 (18.3)		
5	44713 (5.9)	31928 (5.2)	10645 (5.9)	2633 (5.7)	1937 (5.4)	1069 (4.7)		

	-9	0	1	2	3	4	p	test
MARSTAT (%)							<0.001	
-9	139701 (18.4)	189893 (30.7)	39816 (22.2)	10984 (23.9)	8744 (24.4)	6678 (29.5)		
1	402078 (52.9)	281094 (45.5)	95240 (53.2)	22740 (49.5)	17795 (49.7)	10576 (46.7)		
2	86268 (11.4)	51656 (8.4)	17065 (9.5)	4490 (9.8)	3471 (9.7)	2031 (9.0)		
3	37892 (5.0)	24671 (4.0)	7285 (4.1)	2111 (4.6)	1565 (4.4)	1052 (4.6)		
4	93969 (12.4)	70556 (11.4)	19663 (11.0)	5579 (12.2)	4216 (11.8)	2328 (10.3)		
SERVICES (%)							<0.001	
1	38376 (5.1)	4351 (0.7)	1038 (0.6)	146 (0.3)	100 (0.3)	110 (0.5)		
2	96228 (12.7)	128533 (20.8)	42157 (23.5)	5816 (12.7)	3168 (8.9)	876 (3.9)		
3	4108 (0.5)	296 (0.0)	177 (0.1)	34 (0.1)	19 (0.1)	32 (0.1)		
4	84575 (11.1)	60474 (9.8)	16004 (8.9)	4605 (10.0)	3502 (9.8)	1815 (8.0)		
5	56076 (7.4)	48750 (7.9)	21958 (12.3)	7090 (15.4)	7315 (20.4)	5468 (24.1)		
6	109338 (14.4)	82704 (13.4)	28857 (16.1)	5944 (12.9)	4549 (12.7)	2711 (12.0)		
7	367668 (48.4)	281997 (45.6)	68083 (38.0)	22128 (48.2)	17030 (47.6)	11614 (51.2)		
8	3539 (0.5)	10765 (1.7)	795 (0.4)	141 (0.3)	108 (0.3)	39 (0.2)		
DETCRIM (%)							<0.001	
-9	668582 (88.0)	444792 (72.0)	133255 (74.4)	29973 (65.3)	22307 (62.3)	13476 (59.5)		
1	27885 (3.7)	21412 (3.5)	5050 (2.8)	2161 (4.7)	1836 (5.1)	1505 (6.6)		
2	6810 (0.9)	25598 (4.1)	4407 (2.5)	1285 (2.8)	1114 (3.1)	823 (3.6)		
3	34116 (4.5)	63056 (10.2)	17998 (10.1)	6606 (14.4)	5648 (15.8)	3385 (14.9)		
4	9332 (1.2)	10638 (1.7)	1553 (0.9)	543 (1.2)	375 (1.0)	268 (1.2)		
5	1019 (0.1)	5295 (0.9)	5087 (2.8)	922 (2.0)	593 (1.7)	196 (0.9)		
6	2262 (0.3)	3435 (0.6)	1135 (0.6)	271 (0.6)	438 (1.2)	572 (2.5)		
7	6633 (0.9)	10411 (1.7)	5987 (3.3)	2331 (5.1)	1841 (5.1)	1097 (4.8)		
8	3269 (0.4)	33233 (5.4)	4597 (2.6)	1812 (3.9)	1639 (4.6)	1343 (5.9)		
LOS (%)							<0.001	
1	129950 (17.1)	49386 (8.0)	7552 (4.2)	1895 (4.1)	1379 (3.9)	661 (2.9)		
2	34472 (4.5)	31441 (5.1)	6301 (3.5)	1214 (2.6)	945 (2.6)	333 (1.5)		
3	31491 (4.1)	24962 (4.0)	7160 (4.0)	1347 (2.9)	915 (2.6)	251 (1.1)		
4	36076 (4.7)	21737 (3.5)	6766 (3.8)	1060 (2.3)	609 (1.7)	220 (1.0)		
5	29299 (3.9)	16602 (2.7)	8141 (4.5)	1090 (2.4)	575 (1.6)	202 (0.9)		
6	17893 (2.4)	13320 (2.2)	5841 (3.3)	759 (1.7)	401 (1.1)	198 (0.9)		
7	12593 (1.7)	13515 (2.2)	5446 (3.0)	860 (1.9)	484 (1.4)	201 (0.9)		
8	11212 (1.5)	8120 (1.3)	2974 (1.7)	679 (1.5)	396 (1.1)	206 (0.9)		
9	6824 (0.9)	5943 (1.0)	2264 (1.3)	455 (1.0)	317 (0.9)	137 (0.6)		
10	6410 (0.8)	5129 (0.8)	2146 (1.2)	414 (0.9)	263 (0.7)	130 (0.6)		
11	5213 (0.7)	4406 (0.7)	1636 (0.9)	322 (0.7)	227 (0.6)	123 (0.5)		
12	4962 (0.7)	4178 (0.7)	1532 (0.9)	316 (0.7)	211 (0.6)	109 (0.5)		
13	8147 (1.1)	5060 (0.8)	1998 (1.1)	458 (1.0)	339 (0.9)	126 (0.6)		
14	12284 (1.6)	6928 (1.1)	3244 (1.8)	711 (1.5)	407 (1.1)	153 (0.7)		
15	8820 (1.2)	6865 (1.1)	2314 (1.3)	562 (1.2)	365 (1.0)	148 (0.7)		
16	4746 (0.6)	4785 (0.8)	1375 (0.8)	308 (0.7)	226 (0.6)	104 (0.5)		

	-9	0	1	2	3	4	p	test
17	4465 (0.6)	3951 (0.6)	1190 (0.7)	334 (0.7)	216 (0.6)	113 (0.5)		
18	3761 (0.5)	3703 (0.6)	1025 (0.6)	268 (0.6)	152 (0.4)	99 (0.4)		
19	3812 (0.5)	3785 (0.6)	1107 (0.6)	268 (0.6)	174 (0.5)	94 (0.4)		
20	4991 (0.7)	5427 (0.9)	1440 (0.8)	368 (0.8)	272 (0.8)	211 (0.9)		
21	7251 (1.0)	7536 (1.2)	1851 (1.0)	573 (1.2)	386 (1.1)	186 (0.8)		
22	6507 (0.9)	4888 (0.8)	1540 (0.9)	419 (0.9)	304 (0.8)	148 (0.7)		
23	3962 (0.5)	3906 (0.6)	1163 (0.6)	281 (0.6)	229 (0.6)	117 (0.5)		
24	3853 (0.5)	3476 (0.6)	1173 (0.7)	264 (0.6)	204 (0.6)	88 (0.4)		
25	3472 (0.5)	3129 (0.5)	1005 (0.6)	233 (0.5)	166 (0.5)	103 (0.5)		
26	3409 (0.4)	3486 (0.6)	1048 (0.6)	259 (0.6)	180 (0.5)	102 (0.5)		
27	5608 (0.7)	5595 (0.9)	1695 (0.9)	440 (1.0)	323 (0.9)	155 (0.7)		
28	11265 (1.5)	8538 (1.4)	2594 (1.4)	698 (1.5)	620 (1.7)	312 (1.4)		
29	7859 (1.0)	7381 (1.2)	2205 (1.2)	569 (1.2)	422 (1.2)	224 (1.0)		
30	5074 (0.7)	6165 (1.0)	1757 (1.0)	428 (0.9)	397 (1.1)	229 (1.0)		
31	44986 (5.9)	45726 (7.4)	12654 (7.1)	3576 (7.8)	2842 (7.9)	1725 (7.6)		
32	34139 (4.5)	35953 (5.8)	10190 (5.7)	2953 (6.4)	2390 (6.7)	1542 (6.8)		
33	54408 (7.2)	61227 (9.9)	17840 (10.0)	5517 (12.0)	4753 (13.3)	3213 (14.2)		
34	41494 (5.5)	46934 (7.6)	13883 (7.8)	4345 (9.5)	3754 (10.5)	2366 (10.4)		
35	51635 (6.8)	51062 (8.3)	15294 (8.5)	4967 (10.8)	4127 (11.5)	2736 (12.1)		
36	64711 (8.5)	52221 (8.5)	14903 (8.3)	4709 (10.3)	4045 (11.3)	3388 (14.9)		
37	32854 (4.3)	31404 (5.1)	6822 (3.8)	1985 (4.3)	1776 (5.0)	2212 (9.8)		
PSOURCE (%)							<0.001	
-9	21702 (2.9)	11512 (1.9)	1655 (0.9)	667 (1.5)	629 (1.8)	866 (3.8)		
1	329893 (43.4)	252659 (40.9)	80163 (44.8)	16473 (35.9)	11617 (32.5)	6156 (27.2)		
2	74609 (9.8)	52018 (8.4)	21211 (11.8)	4532 (9.9)	3557 (9.9)	1941 (8.6)		
3	66341 (8.7)	39072 (6.3)	8695 (4.9)	2066 (4.5)	1490 (4.2)	1111 (4.9)		
4	1669 (0.2)	5853 (0.9)	2581 (1.4)	173 (0.4)	95 (0.3)	61 (0.3)		
5	3856 (0.5)	1331 (0.2)	453 (0.3)	111 (0.2)	81 (0.2)	34 (0.2)		
6	81712 (10.8)	60106 (9.7)	16125 (9.0)	4414 (9.6)	3377 (9.4)	1939 (8.6)		
7	180126 (23.7)	195319 (31.6)	48186 (26.9)	17468 (38.1)	14945 (41.8)	10557 (46.6)		
NOPRIOR (%)							<0.001	
-9	118424 (15.6)	17762 (2.9)	3525 (2.0)	1546 (3.4)	1174 (3.3)	883 (3.9)		
0	234247 (30.8)	240451 (38.9)	49934 (27.9)	15007 (32.7)	11868 (33.2)	8258 (36.4)		
1	407237 (53.6)	359657 (58.2)	125610 (70.1)	29351 (63.9)	22749 (63.6)	13524 (59.7)		
ARRESTS (%)							<0.001	
-9	107682 (14.2)	62842 (10.2)	15108 (8.4)	4299 (9.4)	3287 (9.2)	2684 (11.8)		
0	608201 (80.0)	507298 (82.1)	150318 (83.9)	38127 (83.1)	30019 (83.9)	18387 (81.1)		
1	37122 (4.9)	41100 (6.7)	11311 (6.3)	2932 (6.4)	2015 (5.6)	1224 (5.4)		
2	6903 (0.9)	6630 (1.1)	2332 (1.3)	546 (1.2)	470 (1.3)	370 (1.6)		
EMPLOY (%)							<0.001	
-9	28368 (3.7)	11128 (1.8)	1806 (1.0)	554 (1.2)	435 (1.2)	1266 (5.6)		

	-9	0	1	2	3	4	p	test
1	129109 (17.0)	94655 (15.3)	28384 (15.9)	8342 (18.2)	6590 (18.4)	3817 (16.8)		
2	53007 (7.0)	44843 (7.3)	12584 (7.0)	3790 (8.3)	2942 (8.2)	1803 (8.0)		
3	293803 (38.7)	243469 (39.4)	62983 (35.2)	16899 (36.8)	12966 (36.2)	7675 (33.9)		
4	255621 (33.6)	223775 (36.2)	73312 (40.9)	16319 (35.6)	12858 (35.9)	8104 (35.8)		
METHUSE (%)							<0.001	
-9	5462 (0.7)	30665 (5.0)	25456 (14.2)	7220 (15.7)	4290 (12.0)	1617 (7.1)		
1	91836 (12.1)	69336 (11.2)	24090 (13.5)	5100 (11.1)	3732 (10.4)	1625 (7.2)		
2	662610 (87.2)	517869 (83.8)	129523 (72.3)	33584 (73.2)	27769 (77.6)	19423 (85.7)		
PSYPROB (%)							<0.001	
-9	181011 (23.8)	45221 (7.3)	1718 (1.0)	568 (1.2)	518 (1.4)	403 (1.8)		
1	265461 (34.9)	192317 (31.1)	75223 (42.0)	18731 (40.8)	14241 (39.8)	8302 (36.6)		
2	313436 (41.2)	380332 (61.6)	102128 (57.0)	26605 (58.0)	21032 (58.8)	13960 (61.6)		
PREG (%)							<0.001	
-9	532756 (70.1)	413240 (66.9)	115707 (64.6)	29314 (63.9)	22891 (64.0)	14545 (64.2)		
1	8261 (1.1)	9680 (1.6)	2859 (1.6)	662 (1.4)	470 (1.3)	312 (1.4)		
2	218891 (28.8)	194950 (31.6)	60503 (33.8)	15928 (34.7)	12430 (34.7)	7808 (34.4)		

Let's find predictors of days waiting for treatment.

```
teds_puf_2017_cleaned <- filter(tedsd_puf_2017, tedsd_puf_2017$DAYWAIT > -1)
teds_puf_2017_cleaned <- filter(teds_puf_2017_cleaned, teds_puf_2017_cleaned$LOS > -1)
lmfit <- lm(LOS ~ DAYWAIT, data = teds_puf_2017_cleaned)
pubout <- publish(lmfit)
```

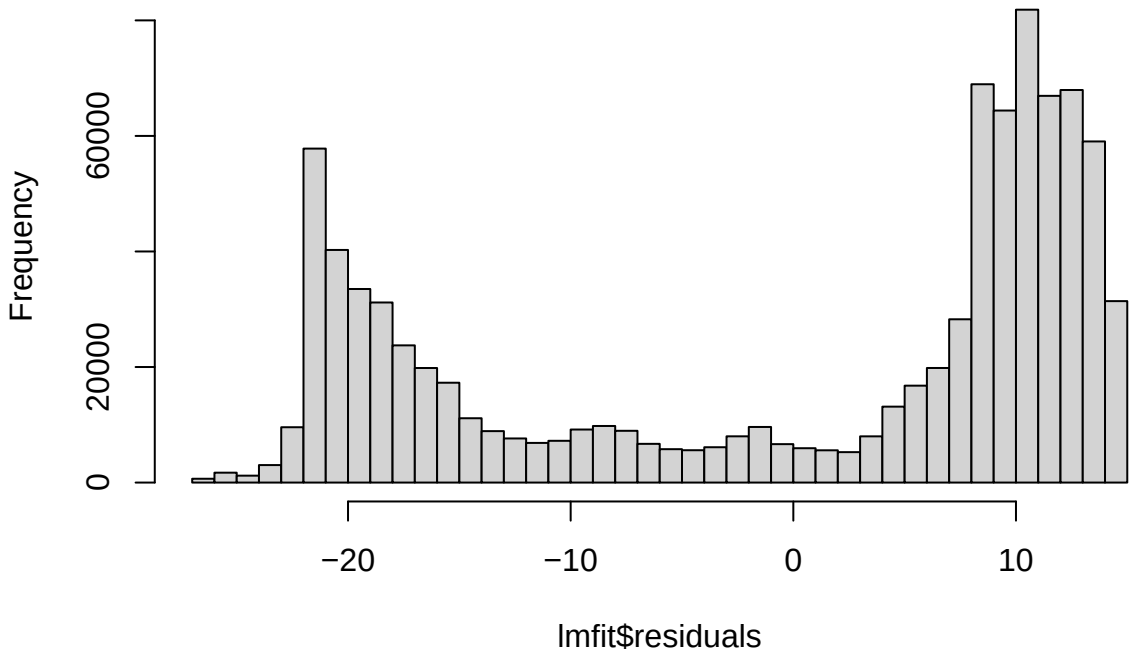
```
##     Variable Units Coefficient         CI.95 p-value
##  (Intercept)             22.21 [22.18;22.24] < 1e-04
##      DAYWAIT              1.38   [1.35;1.41] < 1e-04
```

```
with(teds_puf_2017_cleaned,cor.test(LOS,DAYWAIT))
```

```
##
##  Pearson's product-moment correlation
##
## data:  LOS and DAYWAIT
## t = 91.885, df = 901297, p-value < 2.2e-16
## alternative hypothesis: true correlation is not equal to 0
## 95 percent confidence interval:
```

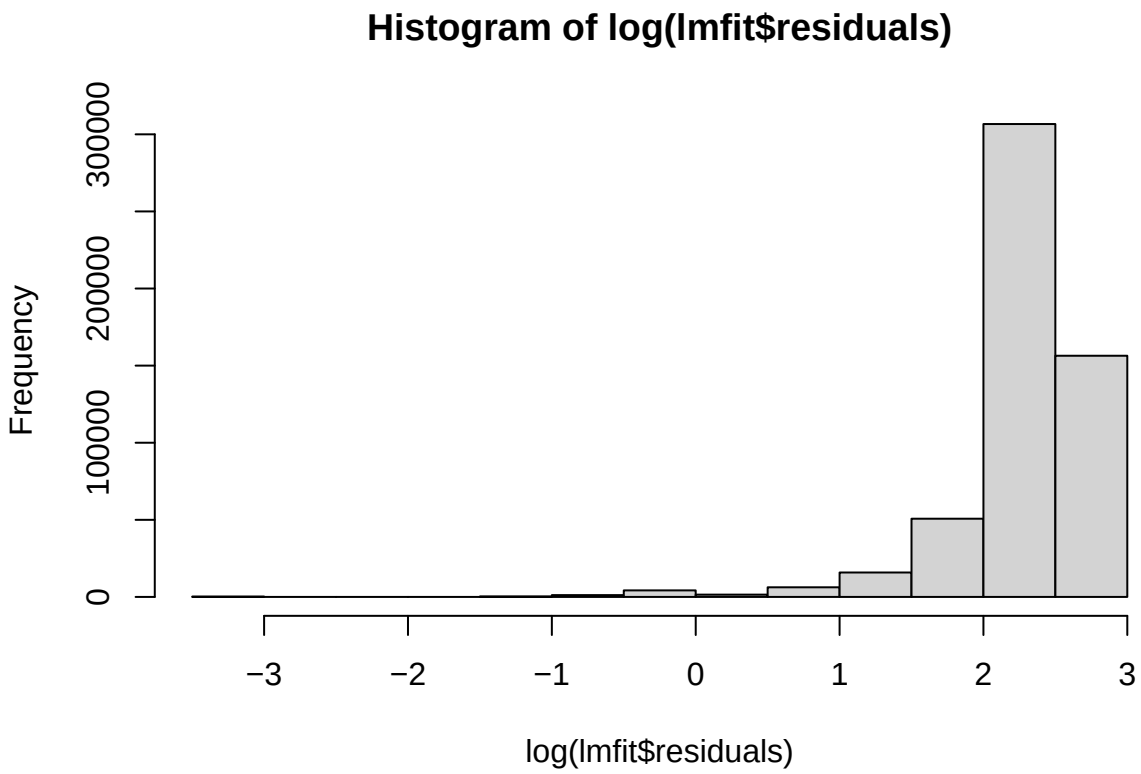
```
##  0.09428953 0.09838021
## sample estimates:
##        cor
## 0.09633528
```

```
hist(lmfit$residuals,breaks = 50)
```



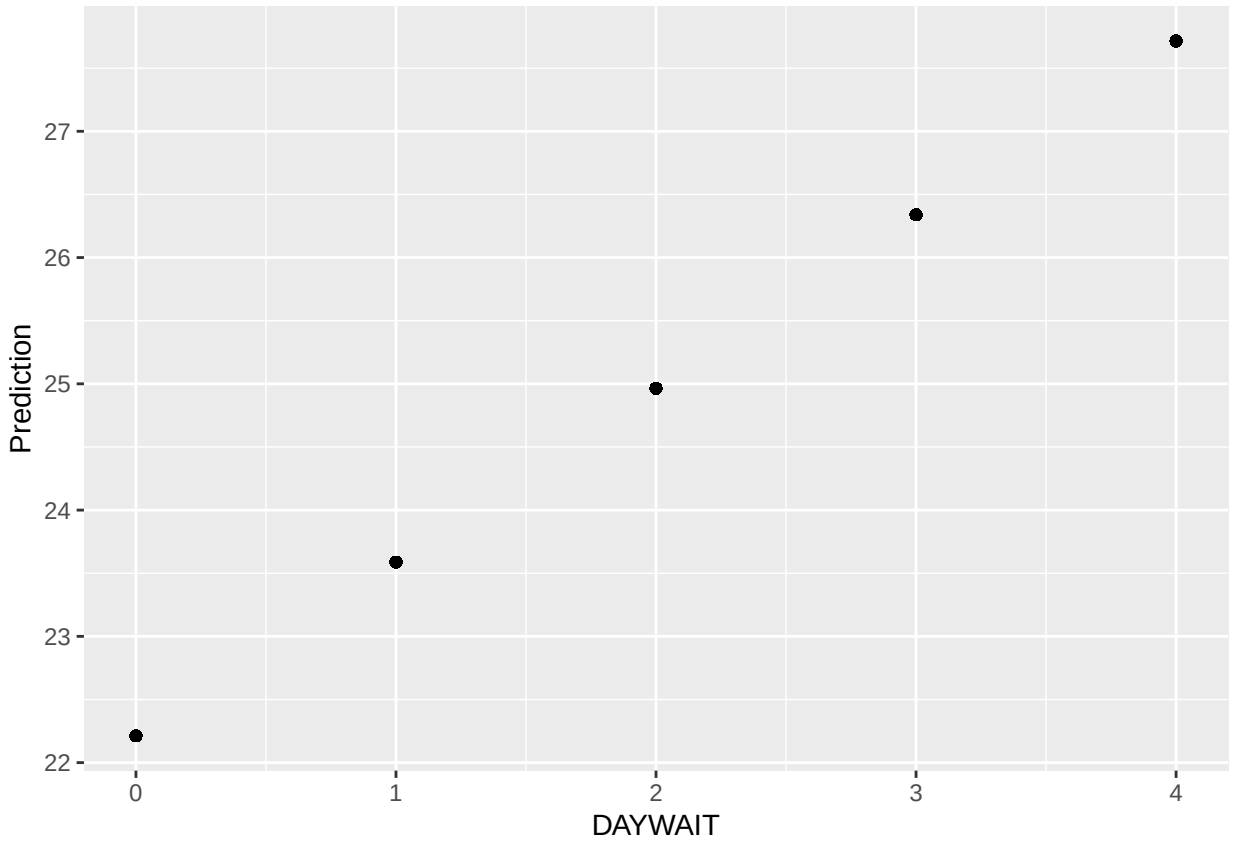

```
hist(log(lmfit$residuals))
```

```
## Warning in log(lmfit$residuals): NaNs produced
```




```
residsFitted <- data.frame(resid=lmfit$residuals,fitted=lmfit$fitted.values)
residsFitted$Prediction <- predict(lmfit,newdata = teds_puf_2017_cleaned)
residsFitted$DAYWAIT <- teds_puf_2017_cleaned$DAYWAIT

ggplot(residsFitted,aes(x=DAYWAIT,y=Prediction))+geom_point()
```


Prediction
27
26
25
24
23
22
0
1
2
3
4
DAYWAIT