ADT Report

```
options(warn = -1)
```

```
library(ggplot2)
# Read discharged_patients.txt into a dataframe

df <- read.table("discharged_patients.txt", header = TRUE, sep = ",", stringsAsFactors = FALS

total_rows <- nrow(df)
total_icu_admit <- sum(tolower(df$icuAdmit) == 'true')
total_ward_admit <- total_rows - total_icu_admit
df$los <- df$dischargeTime - df$admitTime
```

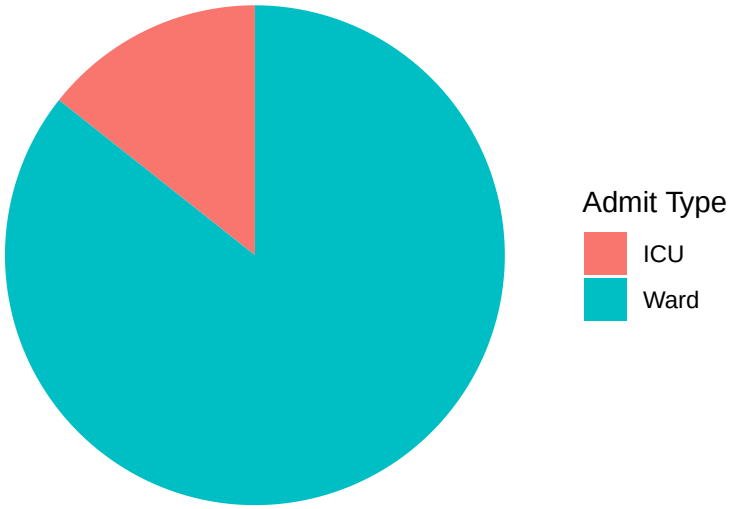
Total Patients: 3619

ICU admit %: 0.1434098

Icu-vs-Ward-Admits

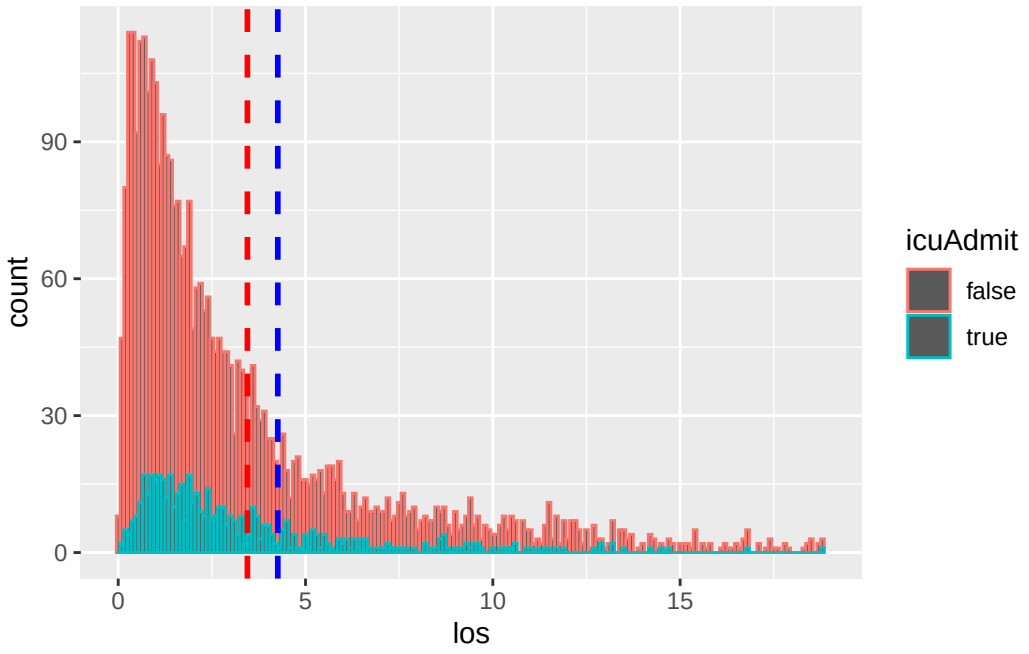
```
# Pie chart of ICU vs Ward admits

admit_counts <- data.frame(
  type = c("ICU", "Ward"),
  count = c(total_icu_admit, total_ward_admit)
)
ggplot(admit_counts, aes(x = "", y = count, fill = type)) +
  geom_bar(stat = "identity", width = 1) +
  coord_polar(theta = "y") +
  labs(title = "ICU vs Ward Admits", x = NULL, y = NULL, fill = "Admit Type") +
  theme_void()
```

ICU vs Ward Admits



LOS

```
icu_patients <- df[tolower(df$icuAdmit) == "true", ]
ward_patients <- df[tolower(df$icuAdmit) == "false", ]
q3 <- quantile(df$los, 0.75, na.rm = TRUE)
ggplot(df, aes(x = los, color = icuAdmit)) +
  geom_histogram(binwidth = 0.1) +
  xlim(NA, q3*4) +
    geom_vline(aes(xintercept=mean(icu_patients$los)),
            color="red", linetype="dashed", size=1) +
            geom_vline(aes(xintercept=mean(ward_patients$los)),
            color="blue", linetype="dashed", size=1)
```




```
summary(icu_patients$los)
```

```
    Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
 0.09704  1.21531  2.27885  3.44887  4.11840 31.62659
```

```
summary(ward_patients$los)
```

```
    Min.  1st Qu.   Median     Mean  3rd Qu.     Max.
 0.01712  0.91091  2.11714  4.25993  4.82582 77.96607
```

```
total_ward_discharge <- sum(tolower(df$dischargeLocation) == 'ward')
total_icu_discharge <- sum(tolower(df$dischargeLocation) == 'icu')
total_transfers_ward <- sum(df$transferTime != -1 & tolower(df$admitLocation) == 'icu')
total_transfers_icu <- sum(df$transferTime != -1 & tolower(df$admitLocation) == 'ward')
```

ADT Summary Stats

key	value
Total Admissions	3619
Total to Ward	3100
Total to ICU	519
% icu/total	0.1434098
total discharges from ward	3326
total dicharges from icu	293
total transfers to ward	226
total transfers to icu	0
fraction of admissions with transfer to WARD	0.0624482
fraction of admissions with transfer to ICU	0
Average LOS	4.1436177
average LOS for ICU-admits	3.4488715
average length of stay on ICU (transfer or otherwise)	tbd

Transfer Time Percentage

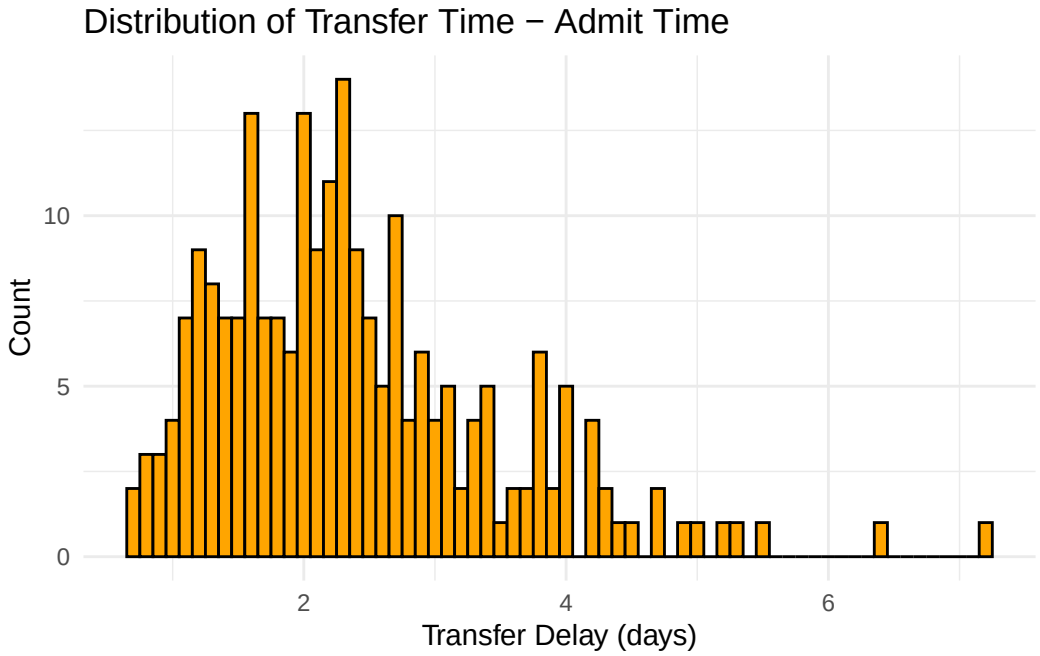
```
# Calculate percentage of patients with non-negative transferTime
num_transfers <- sum(df$transferTime >= 0)
percent_transfers <- 100 * num_transfers / nrow(df)
percent_transfers
```

```
[1] 6.244819
```

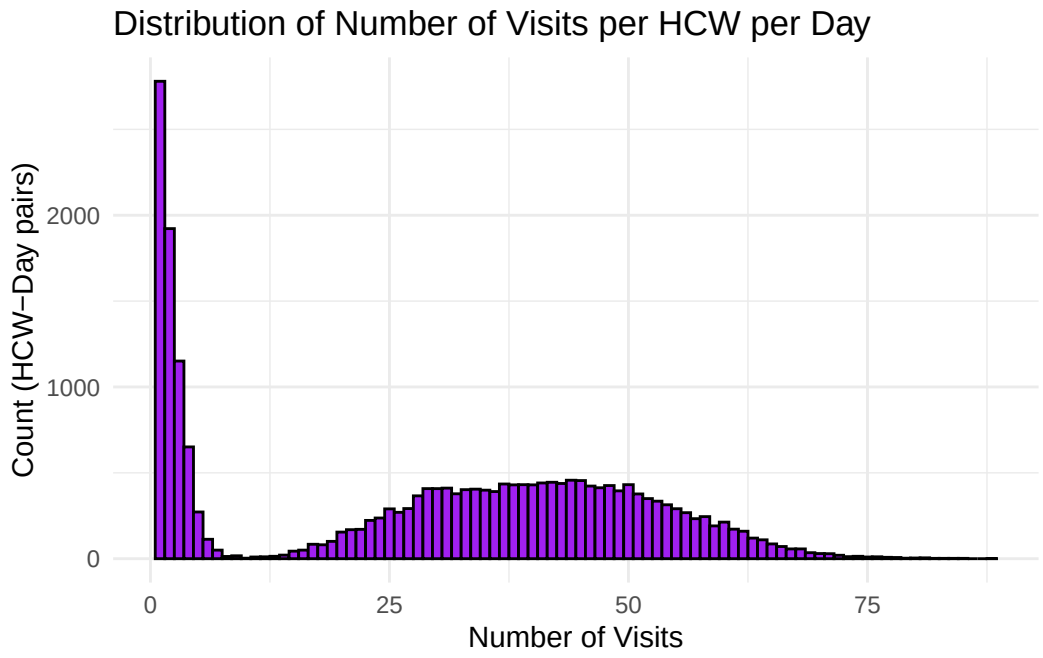
Percentage of patients with a non-negative transfer time: 6.244819%

Transfer Time Minus Admit Time

```
# Create new column for transferTime - admitTime
df$transfer_delay <- df$transferTime - df$admitTime

# Histogram of transfer_delay (only for non-negative transfer times)
ggplot(df[df$transferTime >= 0, ], aes(x = transfer_delay)) +
  geom_histogram(binwidth = 0.1, fill = "orange", color = "black") +
  labs(title = "Distribution of Transfer Time - Admit Time", x = "Transfer Delay (days)", y =
  theme_minimal()
```




```r
library(dplyr)

df2 <- read.table("visit_data.txt", header = TRUE, sep = ",", stringsAsFactors = FALSE)
df2$visitDay <- floor(df2$visitTime)

# Histogram: for each hcwId, each day, distribution of number of visits
library(dplyr)
visits_per_day <- df2 %>% group_by(hcwId, visitDay) %>% summarise(n_visits = n())
ggplot(visits_per_day, aes(x = n_visits)) +
  geom_histogram(binwidth = 1, fill = "purple", color = "black") +
  labs(title = "Distribution of Number of Visits per HCW per Day", x = "Number of Visits", y
  theme_minimal()
```




```
nvisits <- nrow(df2)

# Filter for nurse visits
df_nurse_visits <- df2[df2$hcwType == 'NURSE', ]
df_nurses <- distinct(df_nurse_visits, hcwType, hcwId)
nurse_count <- nrow(df_nurses)
# Filter for other HCW types
df_doctor_visits <- df2[df2$hcwType == 'DOCTOR', ]
df_doctors <- distinct(df_doctor_visits, hcwType, hcwId)
doctor_count <- nrow(df_doctors)
df_pt_visits     <- df2[df2$hcwType == 'PT', ]
df_pts <- distinct(df_pt_visits, hcwType, hcwId)
pt_count <- nrow(df_pts)

df_ot_visits     <- df2[df2$hcwType == 'OT', ]
df_ots <- distinct(df_ot_visits, hcwType, hcwId)
ot_count <- nrow(df_ots)

df_rt_visits     <- df2[df2$hcwType == 'RT', ]
df_rts <- distinct(df_rt_visits, hcwType, hcwId)
rt_count <- nrow(df_rts)
```

Total patient visits by hcw type

HCW Type	Total visits (365d)	mean/day
NURSE (26)	460551	48.530137
DOCTOR (17)	189022	30.4628525
OT (9)	6610	2.0121766
PT (9)	4881	1.4858447
RT (9)	3811	1.1601218

Average daily visits per patient per hcw per shift

! Important

Future Analysis to be completed:

- average daily visits per patient per hcw per shift
  - total and broken out by hcw type
- average distinct patients visited per shift
  - broken out by hcw type
- average time between visits per HCW by type
  - verify (intravisit time + duration of visit from Granular Model)
    - doctors mean = gamma(0.52, 90.7) + gamma(5.5, 1.2)
    - nurses mean = gamma(0.54, 55.7) + gamma(5.5, 1.2)
    - therapists mean = gamma(0.52, 61.7) + gamma(3.0, 1.8)
- average number of HCW visits per day/patient (total/{type}) val
- average time between visist by HCW per patient
- average distinct hcw visits per day by patient

Disease

- TBD

punchlist

- Fix the gamma() + gamma() hcw visit intra-event times
- Fix the HCW assignment procedure for nurse and doctor
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