Admissions Analysis

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Data Loading and Validation

```
library(dplyr)
library(ggplot2)
library(knitr)

# Read data
admissions_df <- read.table("../admission_data.txt",
                            header = TRUE,
                            sep = ",",
                            stringsAsFactors = FALSE)

# Validate required columns
required_cols <- c("admitTime", "icuAdmit", "importation")
if (!all(required_cols %in% names(admissions_df))) {
  stop("Missing required columns in admission_data.txt. Expected: ",
       paste(required_cols, collapse = ", "))
}

# Validate non-empty
if (nrow(admissions_df) == 0) {
  stop("No admission data found in admission_data.txt")
}

# Convert string booleans to logical
admissions_df <- admissions_df %>%
  mutate(
    icuAdmit = tolower(as.character(icuAdmit)) == "true",
```

```
    importation = tolower(as.character(importation)) == "true"
  )

# Preview
head(admissions_df)
```

```
  patientId   admitTime icuAdmit importation
1       192 0.000000000     TRUE       FALSE
2       193 0.009870782    FALSE       FALSE
3       194 0.090271267    FALSE       FALSE
4       195 0.105258296    FALSE       FALSE
5       197 0.208468535    FALSE       FALSE
6       198 0.230793551    FALSE       FALSE
```

Summary Statistics

```
# Calculate metrics once
n_total <- nrow(admissions_df)
n_icu <- sum(admissions_df$icuAdmit)
n_ward <- n_total - n_icu
max_time <- max(admissions_df$admitTime, na.rm = TRUE)

# Prevent division by zero
if (max_time == 0) {
  warning("Maximum admit time is 0, setting to 1 for calculations")
  max_time <- 1
}

# Admission counts table
admission_table <- data.frame(
  Category = c("Total", "ICU", "Ward"),
  Admissions = c(n_total, n_icu, n_ward),
  Mean_Daily = round(c(n_total, n_icu, n_ward) / max_time, 2)
)

kable(admission_table,
      col.names = c("Category", "Admissions", "Mean Daily"),
      caption = "Admission Counts Summary")
```

Table 1: Admission Counts Summary

Category	Admissions	Mean Daily
Total	28938	19.82
ICU	4321	2.96
Ward	24617	16.86

ICU admission percentage: 14.9%

Simulation duration: 1460 days

Importation Analysis

```
# Calculate importation rates by location
import_table <- admissions_df %>%
  group_by(Location = ifelse(icuAdmit, "ICU", "Ward")) %>%
  summarise(
    N_Admissions = n(),
    N_Importations = sum(importation),
    Pct_Importation = round(100 * mean(importation), 1),
    .groups = "drop"
  )

kable(import_table,
      col.names = c("Location", "N Admissions", "N Importations", "% Importation"),
      caption = "Importation by Admission Location")
```

Table 2: Importation by Admission Location

Location	N Admissions	N Importations	% Importation
ICU	4321	41	0.9
Ward	24617	243	1.0

```
sessionInfo()
```

```
R version 4.4.1 (2024-06-14 ucrt)
Platform: x86_64-w64-mingw32/x64
Running under: Windows 10 x64 (build 19045)
```

```
Matrix products: default


locale:
[1] LC_COLLATE=English_United States.utf8
[2] LC_CTYPE=English_United States.utf8
[3] LC_MONETARY=English_United States.utf8
[4] LC_NUMERIC=C
[5] LC_TIME=English_United States.utf8

time zone: America/Denver
tzcode source: internal

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] knitr_1.50    ggplot2_3.5.2 dplyr_1.1.4

loaded via a namespace (and not attached):
 [1] vctrs_0.6.5        cli_3.6.5          rlang_1.1.6        xfun_0.53
 [5] generics_0.1.4     jsonlite_2.0.0     glue_1.8.0         htmltools_0.5.8.1
 [9] tinytex_0.57       scales_1.4.0       rmarkdown_2.29     grid_4.4.1
[13] evaluate_1.0.4     tibble_3.2.1       fastmap_1.2.0      yaml_2.3.10
[17] lifecycle_1.0.4    compiler_4.4.1     RColorBrewer_1.1-3 pkgconfig_2.0.3
[21] farver_2.1.2       digest_0.6.37      R6_2.6.1           tidyselect_1.2.1
[25] pillar_1.11.0      magrittr_2.0.3     withr_3.0.2        tools_4.4.1
[29] gtable_0.3.6
```