

# Hospital Length of Stays

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```
library(tidyverse)
library(NHSRdatasets)
library(knitr)
library(kableExtra)
```

## Load the data from the package

```
data("LOS_model")
```

## Inspect

```
str(LOS_model)
```

```
## tibble [300 x 5] (S3: tbl_df/tbl/data.frame)
##  $ ID          : int [1:300] 1 2 3 4 5 6 7 8 9 10 ...
##  $ Organisation: Ord.factor w/ 10 levels "Trust1"<"Trust2"<...: 1 2 3 4 5 6 7 8 9 10 ...
##  $ Age         : int [1:300] 55 27 93 45 70 60 25 48 51 81 ...
##  $ LOS         : int [1:300] 2 1 12 3 11 7 4 4 7 1 ...
##  $ Death       : int [1:300] 0 0 0 1 0 0 0 0 1 0 ...
```

```
head(LOS_model)
```

```
## # A tibble: 6 x 5
##   ID Organisation   Age  LOS Death
##   <int> <ord>         <int> <int> <int>
## 1     1 Trust1         55     2     0
## 2     2 Trust2         27     1     0
## 3     3 Trust3         93    12     0
## 4     4 Trust4         45     3     1
## 5     5 Trust5         70    11     0
## 6     6 Trust6         60     7     0
```

## Make Death a factor

```
#0 is survived, 1 is died
hospital_data <- LOS_model %>%
  mutate(Death = factor(Death))
hospital_data
```

```
## # A tibble: 300 x 5
##       ID Organisation   Age   LOS Death
##   <int> <ord>         <int> <int> <fct>
## 1     1     Trust1         55     2 0
## 2     2     Trust2         27     1 0
## 3     3     Trust3         93    12 0
## 4     4     Trust4         45     3 1
## 5     5     Trust5         70    11 0
## 6     6     Trust6         60     7 0
## 7     7     Trust7         25     4 0
## 8     8     Trust8         48     4 0
## 9     9     Trust9         51     7 1
## 10    10    Trust10         81     1 0
## # i 290 more rows
```

```
#When you print, it says <fct> under Death instead of <int>
```

## Recode Death levels

```
hospital_data <- hospital_data %>%
  mutate(Death = Death %>%
    fct_recode("Survived" = "0",
              "Died" = "1"))
#The new name must be on the left and old must be on the right
```

Create a summary table where each combination of Organisation and Death gets a count (n).

```
hospital_data_summary <- hospital_data %>%
  group_by(Organisation, Death) %>%
  tally()
hospital_data_summary
```

```
## # A tibble: 20 x 3
## # Groups:   Organisation [10]
##   Organisation Death      n
##   <ord>         <fct> <int>
## 1 Trust1      Survived    23
```

```
## 2 Trust1      Died      7
## 3 Trust2      Survived   25
## 4 Trust2      Died       5
## 5 Trust3      Survived   24
## 6 Trust3      Died       6
## 7 Trust4      Survived   26
## 8 Trust4      Died       4
## 9 Trust5      Survived   23
## 10 Trust5     Died       7
## 11 Trust6     Survived   26
## 12 Trust6     Died       4
## 13 Trust7     Survived   22
## 14 Trust7     Died       8
## 15 Trust8     Survived   25
## 16 Trust8     Died       5
## 17 Trust9     Survived   27
## 18 Trust9     Died       3
## 19 Trust10    Survived   26
## 20 Trust10    Died       4
```

Make a wide table with Dead and Survived as rows with a column for each Trust

```
hospital_data_wide <- hospital_data_summary %>%
  pivot_wider(
    names_from = Organisation,
    values_from = n
  )
hospital_data_wide
```

```
## # A tibble: 2 x 11
##   Death   Trust1 Trust2 Trust3 Trust4 Trust5 Trust6 Trust7 Trust8 Trust9 Trust10
##   <fct>   <int> <int> <int> <int> <int> <int> <int> <int> <int> <int>
## 1 Surviv~    23    25    24    26    23    26    22    25    27    26
## 2 Died       7     5     6     4     7     4     8     5     3     4
```

```
#Wider is from
#Longer is to
#Names from = column names
#Organisations are an ordered factor so that's why the pivot_wider function made them in order from Tru
```

Another pivot with Survived and Died as columns, Trusts as rows.

Also calculate the % survived for each Trust

```

hospital_data_wide_pretty <- hospital_data_summary %>%
  pivot_wider(
    names_from = Death,
    values_from = n
  ) %>%
  mutate(Total = Survived + Died,
         Percent_Survived = (Survived/Total) * 100)
hospital_data_wide_pretty

```

```

## # A tibble: 10 x 5
## # Groups:   Organisation [10]
##   Organisation Survived Died Total Percent_Survived
##   <ord>         <int> <int> <int>         <dbl>
## 1 Trust1         23     7    30         76.7
## 2 Trust2         25     5    30         83.3
## 3 Trust3         24     6    30         80
## 4 Trust4         26     4    30         86.7
## 5 Trust5         23     7    30         76.7
## 6 Trust6         26     4    30         86.7
## 7 Trust7         22     8    30         73.3
## 8 Trust8         25     5    30         83.3
## 9 Trust9         27     3    30         90
## 10 Trust10        26     4    30         86.7

```

## Make the wide table pretty with kable()

```

hospital_data_wide_pretty %>%
  kable(
    col.names = c("Trust", "Survived", "Died", "Total", "Percent Survived"),
    digits = 0,
    caption = "Hospital Length of Stages data: Percent Survived by Trust",
    align = "lcccc"
  ) %>%
  kable_styling("striped", full_width = FALSE) %>%
  footnote("Data from LOS_model")

```

Table 1: Hospital Length of Stages data: Percent Survived by Trust

Trust	Survived	Died	Total	Percent Survived
Trust1	23	7	30	77
Trust2	25	5	30	83
Trust3	24	6	30	80
Trust4	26	4	30	87
Trust5	23	7	30	77
Trust6	26	4	30	87
Trust7	22	8	30	73
Trust8	25	5	30	83
Trust9	27	3	30	90

Trust10	26	4	30	87
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*Note:*

Data from LOS\_model

```
hospital_data_wide_pretty
```

```
## # A tibble: 10 x 5
## # Groups:   Organisation [10]
##   Organisation Survived Died Total Percent_Survived
##   <ord>          <int> <int> <int>          <dbl>
## 1 Trust1         23     7    30          76.7
## 2 Trust2         25     5    30          83.3
## 3 Trust3         24     6    30           80
## 4 Trust4         26     4    30          86.7
## 5 Trust5         23     7    30          76.7
## 6 Trust6         26     4    30          86.7
## 7 Trust7         22     8    30          73.3
## 8 Trust8         25     5    30          83.3
## 9 Trust9         27     3    30           90
## 10 Trust10        26     4    30          86.7
```

```
#Digits function rounds the values
#Col.names renames the columns
```

Let's knit to PDF