

table_operation_activity_levels

XI CHEN

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Aim

Create a clean and tidy table with pre and post operation activity levels.

Load Packages

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ----- tidyverse 2.0.0 --
## v dplyr      1.1.4      v readr      2.1.5
## v forcats    1.0.0      v stringr   1.5.1
## v ggplot2    3.5.1      v tibble    3.2.1
## v lubridate  1.9.3      v tidyr     1.3.1
## v purrr      1.0.2
## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

Read in Data

The data is in the file “Hip Replacement CCG 1819.csv”, and it contains patient reported outcomes for hip replacement procedures, from April 2018 to March 2019. It was downloaded from <https://digital.nhs.uk/data-and-information/publications/statistical/patient-reported-outcome-measures-proms/for-hip-and-knee-replacement-procedures-april-2018-to-march-2019> We also have the data dictionary for this dataset in “proms_data_dictionary.pdf”.

```
hip_data <- read.csv("Data/Hip Replacement CCG 1819.csv")
```

Prepare the Data

```
glimpse(hip_data)
```

```
## Rows: 28,920
## Columns: 81
## $ Provider.Code      <chr> "00C", "00C", "00C", "0~
## $ Procedure          <chr> "Hip Replacement", "Hip~
## $ Revision.Flag      <int> 0, 0, 1, 1, 0, 0, 0, 0,~
## $ Year               <chr> "2018/19", "2018/19", "~
## $ Age.Band           <chr> "*", "*", "*", "*", "~
## $ Gender             <chr> "*", "*", "*", "*", "~
## $ Pre.Op.Q.Assisted  <int> 2, 2, 1, 2, 2, 2, 2, ~
## $ Pre.Op.Q.Assisted.By <int> 0, 0, 0, 0, 0, 0, 0, ~
```

## \$ Pre.Op.Q.Symptom.Period	<int> 4, 2, 4, 1, 2, 1, 1, 2,~
## \$ Pre.Op.Q.Previous.Surgery	<int> 2, 1, 1, 1, 2, 2, 1, 2,~
## \$ Pre.Op.Q.Living.Arrangements	<int> 1, 1, 2, 2, 1, 2, 1, 2,~
## \$ Pre.Op.Q.Disability	<int> 9, 1, 1, 1, 2, 1, 2, 1,~
## \$ Heart.Disease	<int> 9, 9, 9, 9, 9, 9, 9, 1,~
## \$ High.Bp	<int> 9, 9, 9, 9, 9, 1, 9, 1,~
## \$ Stroke	<int> 9, 9, 9, 9, 9, 9, 1, 9,~
## \$ Circulation	<int> 9, 9, 9, 9, 1, 9, 9, 9,~
## \$ Lung.Disease	<int> 9, 9, 9, 9, 9, 9, 9, 9,~
## \$ Diabetes	<int> 9, 9, 9, 9, 9, 9, 9, 1,~
## \$ Kidney.Disease	<int> 9, 9, 9, 9, 9, 1, 9, 1,~
## \$ Nervous.System	<int> 9, 9, 9, 9, 9, 9, 9, 9,~
## \$ Liver.Disease	<int> 9, 9, 9, 9, 9, 9, 1, 9,~
## \$ Cancer	<int> 9, 9, 9, 9, 9, 9, 1, 9,~
## \$ Depression	<int> 9, 9, 9, 1, 9, 9, 9, 9,~
## \$ Arthritis	<int> 9, 1, 1, 1, 1, 1, 9, 9,~
## \$ Pre.Op.Q.Mobility	<int> 2, 2, 9, 2, 2, 2, 2, 1,~
## \$ Pre.Op.Q.Self.Care	<int> 1, 2, 9, 1, 2, 1, 1, 2,~
## \$ Pre.Op.Q.Activity	<int> 9, 3, 9, 3, 3, 2, 2, 2,~
## \$ Pre.Op.Q.Discomfort	<int> 9, 3, 9, 3, 3, 3, 2, 2,~
## \$ Pre.Op.Q.Anxiety	<int> 9, 1, 9, 2, 3, 1, 1, 2,~
## \$ Pre.Op.Q.EQ5D.Index.Profile	<int> 21999, 22331, 99999, 21~
## \$ Pre.Op.Q.EQ5D.Index	<dbl> NA, -0.003, NA, 0.030, ~
## \$ Post.Op.Q.Assisted	<int> 2, 2, 1, 2, 2, 2, 1, 2,~
## \$ Post.Op.Q.Assisted.By	<int> 9, 9, 1, 9, 9, 9, 1, 9,~
## \$ Post.Op.Q.Living.Arrangements	<int> 1, 1, 2, 2, 1, 2, 1, 9,~
## \$ Post.Op.Q.Disability	<int> 2, 9, 1, 2, 1, 2, 2, 1,~
## \$ Post.Op.Q.Mobility	<int> 2, 9, 2, 1, 2, 2, 1, 1,~
## \$ Post.Op.Q.Self.Care	<int> 2, 1, 2, 1, 1, 1, 1, 1,~
## \$ Post.Op.Q.Activity	<int> 2, 9, 3, 1, 2, 2, 1, 1,~
## \$ Post.Op.Q.Discomfort	<int> 2, 1, 3, 2, 2, 2, 1, 2,~
## \$ Post.Op.Q.Anxiety	<int> 2, 1, 2, 1, 2, 1, 1, 1,~
## \$ Post.Op.Q.Satisfaction	<int> 2, 3, 2, 1, 3, 1, 1, 9,~
## \$ Post.Op.Q.Sucess	<int> 1, 1, 1, 1, 2, 2, 1, 9,~
## \$ Post.Op.Q.Allergy	<int> 2, 2, 2, 2, 2, 9, 9, 9,~
## \$ Post.Op.Q.Bleeding	<int> 2, 2, 2, 2, 2, 9, 9, 9,~
## \$ Post.Op.Q.Wound	<int> 2, 2, 1, 2, 2, 9, 9, 9,~
## \$ Post.Op.Q.Urine	<int> 2, 2, 2, 2, 2, 1, 9, 9,~
## \$ Post.Op.Q.Further.Surgery	<int> 2, 2, 1, 2, 2, 2, 2, 9,~
## \$ Post.Op.Q.Readmitted	<int> 2, 2, 1, 2, 2, 2, 2, 9,~
## \$ Post.Op.Q.EQ5D.Index.Profile	<int> 22222, 91911, 22332, 11~
## \$ Post.Op.Q.EQ5D.Index	<dbl> 0.516, NA, -0.074, 0.79~
## \$ Hip.Replacement.EQ5D.Index.Post.Op.Q.Predicted	<dbl> NA, NA, NA, 0.5154424, ~
## \$ Pre.Op.Q.EQ.VAS	<int> 999, 999, 999, 50, 30, ~
## \$ Post.Op.Q.EQ.VAS	<int> 70, 999, 80, 90, 70, 60~
## \$ Hip.Replacement.EQ.VAS.Post.Op.Q.Predicted	<dbl> NA, NA, NA, 60.05266, 7~
## \$ Hip.Replacement.Pre.Op.Q.Pain	<int> 1, 0, 0, 0, 0, 0, 1, 2,~
## \$ Hip.Replacement.Pre.Op.Q.Sudden.Pain	<int> 0, 1, 0, 0, 0, 1, 4, 3,~
## \$ Hip.Replacement.Pre.Op.Q.Night.Pain	<int> 2, 0, 1, 0, 0, 1, 1, 4,~
## \$ Hip.Replacement.Pre.Op.Q.Washing	<int> 3, 1, 1, 2, 2, 4, 4, 0,~
## \$ Hip.Replacement.Pre.Op.Q.Transport	<int> 2, 1, 1, 0, 1, 2, 2, 3,~
## \$ Hip.Replacement.Pre.Op.Q.Dressing	<int> 1, 0, 1, 0, 1, 4, 2, 0,~
## \$ Hip.Replacement.Pre.Op.Q.Shopping	<int> 3, 2, 0, 0, 0, 0, 3, 0,~
## \$ Hip.Replacement.Pre.Op.Q.Walking	<int> 2, 0, 1, 1, 1, 3, 3, 4,~

```
## $ Hip.Replacement.Pre.Op.Q.Limping      <int> 2, 0, 0, 1, 0, 0, 0, 3,~
## $ Hip.Replacement.Pre.Op.Q.Stairs       <int> 2, 1, 1, 1, 1, 2, 4, 3,~
## $ Hip.Replacement.Pre.Op.Q.Standing     <int> 1, 1, 1, 2, 1, 1, 4, 4,~
## $ Hip.Replacement.Pre.Op.Q.Work         <int> 1, 1, 0, 1, 0, 0, 4, 2,~
## $ Hip.Replacement.Pre.Op.Q.Score        <int> 20, 8, 7, 8, 7, 18, 32,~
## $ Hip.Replacement.Post.Op.Q.Pain        <int> 3, 4, 2, 2, 4, 2, 2, 9,~
## $ Hip.Replacement.Post.Op.Q.Sudden.Pain <int> 4, 4, 4, 2, 2, 2, 4, 4,~
## $ Hip.Replacement.Post.Op.Q.Night.Pain  <int> 4, 4, 4, 1, 4, 2, 4, 4,~
## $ Hip.Replacement.Post.Op.Q.Washing     <int> 4, 3, 3, 4, 3, 4, 4, 9,~
## $ Hip.Replacement.Post.Op.Q.Transport   <int> 4, 4, 2, 3, 3, 2, 4, 3,~
## $ Hip.Replacement.Post.Op.Q.Dressing    <int> 2, 4, 3, 3, 4, 4, 3, 9,~
## $ Hip.Replacement.Post.Op.Q.Shopping    <int> 4, 2, 0, 3, 2, 0, 4, 0,~
## $ Hip.Replacement.Post.Op.Q.Walking     <int> 4, 3, 1, 4, 3, 2, 4, 4,~
## $ Hip.Replacement.Post.Op.Q.Limping     <int> 3, 1, 1, 4, 2, 0, 3, 4,~
## $ Hip.Replacement.Post.Op.Q.Stairs      <int> 4, 1, 1, 3, 2, 4, 4, 4,~
## $ Hip.Replacement.Post.Op.Q.Standing    <int> 3, 4, 3, 3, 4, 2, 4, 4,~
## $ Hip.Replacement.Post.Op.Q.Work        <int> 4, 4, 2, 4, 2, 2, 3, 4,~
## $ Hip.Replacement.Post.Op.Q.Score       <int> 43, 38, 26, 36, 35, 26,~
## $ Hip.Replacement.OHS.Post.Op.Q.Predicted <dbl> 42.20017, 35.29577, 23.~
```

Select Pre and Post Operation Activity Levels

```
activity_levels <- hip_data %>%
  select('Pre.Op.Q.Activity', 'Post.Op.Q.Activity') %>%
  rename(Pre = 'Pre.Op.Q.Activity',
         Post = 'Post.Op.Q.Activity',
         )
head(activity_levels)
```

```
##   Pre Post
## 1   9   2
## 2   3   9
## 3   9   3
## 4   3   1
## 5   3   2
## 6   2   2
```

Removing Missing Data

According to [proms_data_dictionary.pdf](#), the field of Activity, value equals to 9 means missing data.

```
activity_levels_noNA <- activity_levels %>%
  drop_na() %>%
  filter(Pre != '9', Post != '9' )
head(activity_levels_noNA)
```

```
##   Pre Post
## 1   3   1
## 2   3   2
## 3   2   2
## 4   2   1
## 5   2   1
## 6   2   1
```

Check the Data is Tidy

```
head(activity_levels_noNA)
```

```
##   Pre Post
## 1   3   1
## 2   3   2
## 3   2   2
## 4   2   1
## 5   2   1
## 6   2   1
```

```
tidy_activity_levels_noNA <- activity_levels_noNA %>%
  pivot_longer(c(Pre,Post),
               names_to = 'Time',
               names_prefix = 'Activity_',
               values_to = 'Activity'
  )
head(tidy_activity_levels_noNA)
```

```
## # A tibble: 6 x 2
##   Time Activity
##   <chr>   <int>
## 1 Pre         3
## 2 Post         1
## 3 Pre         3
## 4 Post         2
## 5 Pre         2
## 6 Post         2
```

Create a Table with Pre and Post Operation Activity Levels

```
table(tidy_activity_levels_noNA)
```

```
##           Activity
## Time          1      2      3
##   Post 15932 10477   825
##   Pre   1607 20241  5386
```