

MATH22707 Assignment 1

Turning Tables

Student Details

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Data Source

- Safe Work Australia (19 April 2018) *Number and incidence rate of work-related traumatic injury fatalities by Occupation – 2012-2016*. Retrieved from <https://www.safeworkaustralia.gov.au/doc/number-and-incidence-rate-work-related-traumatic-injury-fatalities-occupation-2012-2016>

Code and Visualisation

```
library(readxl)
library(openxlsx)
library(tidyr)
library(dplyr)

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##   filter, lag

## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

library(ggplot2)
library(reshape2)

##
## Attaching package: 'reshape2'

## The following object is masked from 'package:tidyr':
##
##   smiths

library(RColorBrewer)
library(cowplot)

## Warning: package 'cowplot' was built under R version 3.5.2

##
## Attaching package: 'cowplot'

## The following object is masked from 'package:ggplot2':
##
##   ggsave

library(gridExtra)

##
## Attaching package: 'gridExtra'
```

```

## The following object is masked from 'package:dplyr':
##
##      combine

library(knitr)

injuries <- read_excel("traumatic_injuries.xlsx", range = "A5:K57")
total_fatalities <- injuries[,1:6]
colnames(total_fatalities) <- c("Occupation", total_fatalities[1, 2:6])
total_fatalities <- total_fatalities[-1,]

#Take only last three years statistics and only the occupation groups
total_subset <- total_fatalities %>% select(Occupation, `2014`, `2015`, `2016`)
total_groups <- total_subset %>% filter(Occupation %in% c("Machinery Operators and Drivers", "Labourers", "Teachers"))

#Convert from wide to long format data
total_groups <- reshape2::melt(total_groups, id.vars = "Occupation", variable.name = "Year", value.name = "Fatalities")

#take last 3 years of incidence statistics
incidence <- injuries[,c(1, 9:11)]
colnames(incidence) <- c("Occupation", "2014", "2015", "2016")
incidence <- incidence[-1,]

#Take only the occupation groups
incidence <- incidence %>% filter(Occupation %in% c("Machinery Operators and Drivers", "Labourers", "Teachers"))

#Convert from wide to long format data
incidence_groups <- reshape2::melt(incidence, id.vars = "Occupation", variable.name = "Year", value.name = "Incidence")

merged_injuries <- cbind(total_groups, incidence = round(incidence_groups[,3], digits = 2))
merged_injuries$Occupation <- as.factor(merged_injuries$Occupation)
merged_injuries$Occupation <- factor(merged_injuries$Occupation, labels = c("Clerical", "Community workers", "Labourers", "Machinery Operators and Drivers", "Teachers"))

#Section 1: fatalities
Fatalities <- ggplot(data = merged_injuries, aes(x = Occupation, y = `Total fatalities`), fill = Year)
Fatalities2 <- Fatalities + geom_col(position = "dodge2", aes(fill = Year)) + theme(axis.text.x=element_text(angle = 45))
Fatalities3 <- Fatalities2 #+ scale_y_continuous(breaks=1:7*10)
Fatalities4 <- Fatalities3 + labs(title = "Total Fatalities across Occupations", x = "Occupation", y = "Total fatalities")

## Warning: Ignoring unknown parameters: face

#Section 2: incidence
Incidence <- ggplot(data = merged_injuries, aes(x = Occupation, y = incidence), fill = Year)
Incidence2 <- Incidence + geom_col(position = "dodge2", aes(fill = Year)) + theme(axis.text.x=element_text(angle = 45))
Incidence3 <- Incidence2 #+ scale_y_continuous(breaks=1*1:10)
Incidence4 <- Incidence3 + labs(title = "Incidence rate of Fatalities across Occupations", x = "Occupation", y = "Incidence rate")

## Warning: Ignoring unknown parameters: face

title_theme <- ggdraw() +
  draw_label("What occupation experienced the highest injury-related fatalities in Australia (2014-2016)")

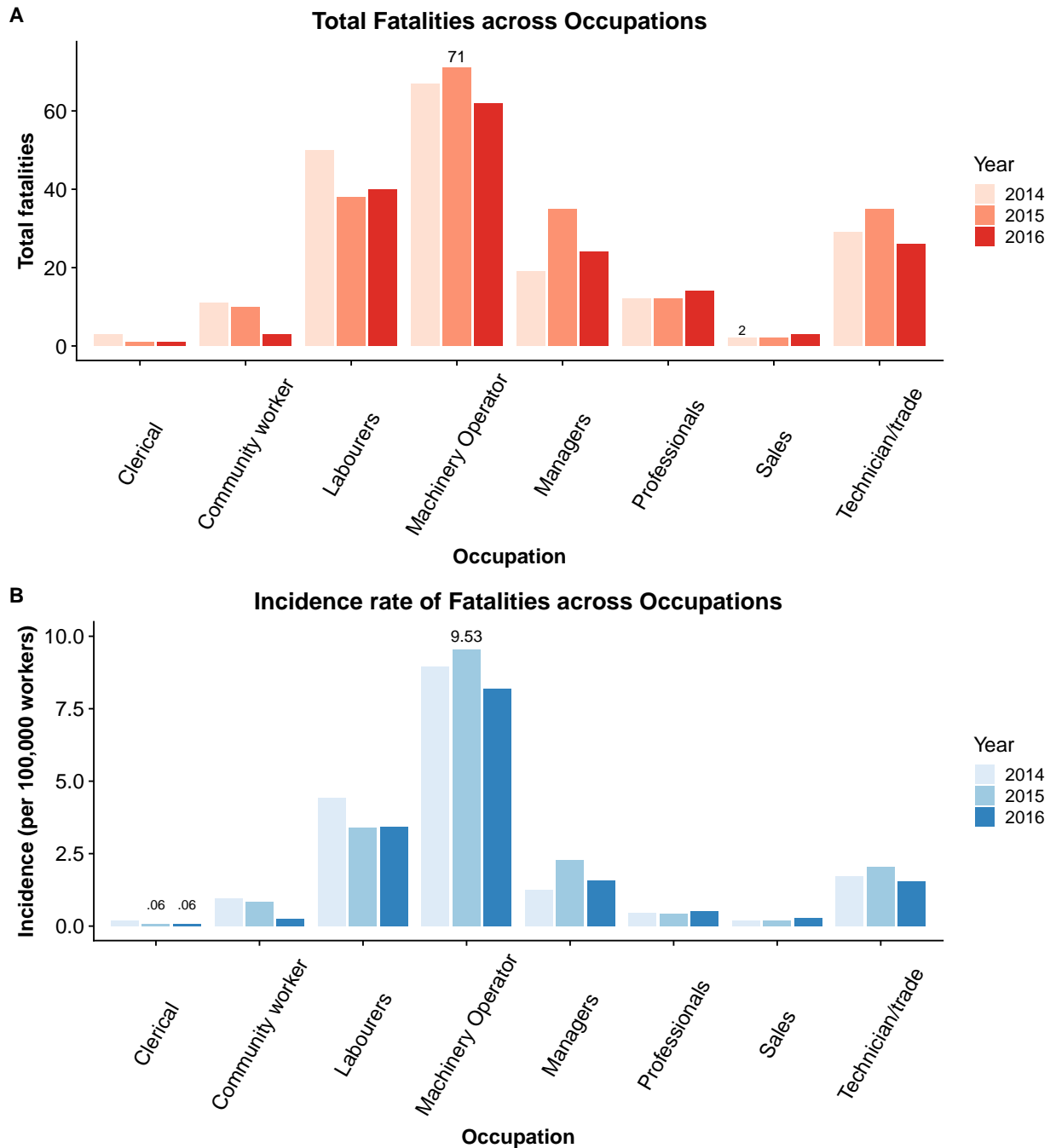
```

```
fontface = "bold", size = 16)

p <- plot_grid(Fatalities4,
               Incidence4,
               labels = c('A', 'B'),
               nrow = 2)

plot_grid(title_theme, p, ncol = 1, rel_heights = c(0.1,1))
```

What occupation experienced the highest injury-related fatalities in Australia (2014–2016)?



```
ggsave(plot = ggplot2::last_plot(), height = 12 , width = 7 * 2.5, filename = "cowplot.jpg")
grid.arrange(Fatalities4, Incidence4, nrow = 2, main= "Injuries")
```