# PMS '07 Sample Report

### Michelle K Jamieson

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### Introduction

Exploring a small section of the Psychiatric Morbidity Survey (2007).

```
knitr::opts_chunk$set(echo = TRUE)
library(gmodels)
## Warning: package 'gmodels' was built under R version 4.0.2
library(skimr)
## Warning: package 'skimr' was built under R version 4.0.2
library(knitr)
## Warning: package 'knitr' was built under R version 4.0.2
library(tidyverse)
## Warning: package 'tidyverse' was built under R version 4.0.2
## -- Attaching packages ----- tidyverse 1.3.0 --
## v ggplot2 3.3.1 v purrr 0.3.4

## v tibble 3.0.3 v dplyr 1.0.0

## v tidyr 1.1.0 v stringr 1.4.0

## v readr 1.3.1 v forcats 0.5.0
## Warning: package 'tibble' was built under R version 4.0.2
## Warning: package 'dplyr' was built under R version 4.0.2
## -- Conflicts ------ tidyverse conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag() masks stats::lag()
```

```
library(haven)
## Warning: package 'haven' was built under R version 4.0.2
library(sjlabelled)
## Warning: package 'sjlabelled' was built under R version 4.0.2
##
## Attaching package: 'sjlabelled'
## The following objects are masked from 'package:haven':
##
##
       as_factor, read_sas, read_spss, read_stata, write_sas, zap_labels
## The following object is masked from 'package:forcats':
##
##
       as_factor
## The following object is masked from 'package:dplyr':
##
##
       as_label
library(labelled)
## Attaching package: 'labelled'
## The following objects are masked from 'package:sjlabelled':
##
       copy_labels, remove_labels, to_character, to_factor, val_labels
##
library(sjPlot)
## Warning: package 'sjPlot' was built under R version 4.0.2
## Install package "strengejacke" from GitHub ('devtools::install_github("strengejacke/strengejacke")')
library(psych)
## Warning: package 'psych' was built under R version 4.0.2
## Attaching package: 'psych'
## The following objects are masked from 'package:ggplot2':
##
       %+%, alpha
##
```

#### #Read In and View

Read in the data via Haven package as only available in SPSS or SAS format. Take a look as this will usually need cleaning and sorting out of factor type levels to be useable.

```
# read in
source_pms07 <- haven::read_sav("pms07.sav")</pre>
# Subsetting to manage descriptive, work, and health variables
subset_pms07 <- source_pms07[,c("pserial", "ResSex", "ResAge", "SF1",</pre>
                                 "Happy", "Health6", "Everwk", "Psycdis")]
head(subset_pms07)
## # A tibble: 6 x 8
##
                 ResSex
                                          SF1
                                                                        Everwk Psycdis
      pserial
                           ResAge
                                                   Happy
                                                              Health6
     <dbl+lb> <dbl+lb1> <dbl+lb1> <dbl+lb1> <dbl+lb1>
                                                            <dbl+1b1> <dbl+1b> <dbl+1>
                               53 2 [very g~ 1 [Very h~ 1 [Mention~ NA
## 1 11103072 2 [Femal~
                                                                                 0 [No]
## 2 11103102 2 [Femal~
                               78 4 [fair]
                                             2 [Fairly~ 0 [Not men~ 1 [Yes]
                                                                                O [No]
## 3 11103112 2 [Femal~
                               52 3 [good]
                                              2 [Fairly~ 1 [Mention~ NA
                                                                                 0 [No]
                               58 5 [or, po~ 2 [Fairly~ 0 [Not men~ NA
## 4 11103132 2 [Femal~
                                                                                 0 [No]
## 5 11103162 1 [Male]
                               66 3 [good]
                                              2 [Fairly~ 0 [Not men~
                                                                       1 [Yes]
                                                                                O [No]
## 6 11103172 1 [Male]
                               86 3 [good]
                                              2 [Fairly~ 1 [Mention~ 1 [Yes]
                                                                                0 [No]
# view
subset_pms07 %>% sjPlot::view_df()
Data frame: .
ID
Name
Label
Values
Value Labels
1
pserial
Serial number of individual
-9-8-7-6-1
No answer/refusedDon't knowMissing dataProxyItem not applicable
2
ResSex
Sex of selected respondent
-9-8-7-6-112
No answer/refusedDon't knowMissing dataProxyItem not applicableMaleFemale
3
ResAge
```

```
Age of selected respondent (95+ merged)
```

-9-8-7-6-1

No answer/refusedDon't knowMissing dataProxyItem not applicable

4

SF1

SF: Health in general

-9-8-7-6-2-112345

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableExcellentvery goodgoodfairor, poor?

5

Happy

RESILIENCE: How happy would you say you are thesedays?

-9-8-7-6-2-1123

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableVery happyFairly happyNot too happy

6

Health6

HEALTH: Anxiety, depression or other mental healthissue (ever had since age 16)

-9-8-7-6-2-101

 $No\ answer/refused Don't\ know Missing\ data Proxy Schedule\ not\ applicable Item\ not\ applicable Not\ mentioned-Mentioned$ 

7

Everwk

SOCIO DEMO RESP - Ever had a paid job

-9-8-7-6-2-112

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableYesNo

8

Psycdis

(D) Definitive psychotic disorder in past year using phase one and two. Use with psychdis\_wt. -9-8-7-6-101

No answer/refusedDon't knowMissing dataProxyItem not applicableNoYes

### glimpse(subset\_pms07)

# Cleaning subset of data

Cleaning has involved fixing labels, renaming variables, and importantly making sure levels are correct.

```
# Change Labels for easier reading
attr(subset_pms07$pserial, "label") <- "Serial Number"</pre>
attr(subset_pms07$ResSex, "label") <- "Respondant Sex"</pre>
attr(subset_pms07$ResAge, "label") <- "Respondant Age"</pre>
attr(subset_pms07$SF1, "label") <- "General Health"</pre>
attr(subset_pms07$Happy, "label") <- "How Happy Are You?"</pre>
attr(subset_pms07$Health6, "label") <- "Mental Health Condition Mentioned"
attr(subset pms07$Everwk, "label") <- "Ever Had a Paid Job"</pre>
attr(subset_pms07$Psycdis, "label") <- "Definitive Psychosis in Last Year"</pre>
# check it worked
subset_pms07 %>% sjPlot::view_df()
Data frame: .
ID
Name
Label
Values
Value Labels
1
pserial
Serial Number
-9-8-7-6-1
No answer/refusedDon't knowMissing dataProxyItem not applicable
ResSex
Respondant Sex
-9-8-7-6-112
No answer/refusedDon't knowMissing dataProxyItem not applicableMaleFemale
3
ResAge
Respondant Age
-9-8-7-6-1
```

No answer/refusedDon't knowMissing dataProxyItem not applicable

4

SF1

General Health

-9-8-7-6-2-112345

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableExcellentvery goodgoodfairor, poor?

5

Happy

How Happy Are You?

-9-8-7-6-2-1123

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableVery happyFairly happyNot too happy

6

Health6

Mental Health Condition Mentioned

-9-8-7-6-2-101

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableNot mentioned-Mentioned

7

Everwk

Ever Had a Paid Job

-9-8-7-6-2-112

No answer/refusedDon't knowMissing dataProxySchedule not applicableItem not applicableYesNo

8

Psycdis

Definitive Psychosis in Last Year

-9-8-7-6-101

No answer/refusedDon't knowMissing dataProxyItem not applicableNoYes

```
## [1] "SerNum"
                  "Sex"
                              "Age"
                                         "GenHeal" "HowHap"
                                                                "MenHeal" "PaidJob"
## [8] "DefPsych"
# Apart from the age variable which was set to factor, the rest of the
#variables will need to be set to the right type/class.
#As a general rule for survey analysis, respondent IDs should be set as
#character, and categorical variables as factor. Here's what we'll do:
subset_pms07$SerNum <- as.character(subset_pms07$SerNum)</pre>
# check
glimpse(subset_pms07$SerNum)
## chr [1:7403] "11103072" "11103102" "11103112" "11103132" "11103162" ...
# change variables to right type/class
subset_pms07$Sex <- factor(subset_pms07$Sex)</pre>
#subset_pms07$Age <- factor(subset_pms07$Age)</pre>
subset_pms07$GenHeal <- factor(subset_pms07$GenHeal)</pre>
subset_pms07$HowHap <- factor(subset_pms07$HowHap)</pre>
subset_pms07$MenHeal <- factor(subset_pms07$MenHeal)</pre>
subset_pms07$PaidJob <- factor(subset_pms07$PaidJob)</pre>
subset_pms07$DefPsych <- factor(subset_pms07$DefPsych)</pre>
# check for tranformation and amount of levels for all variables
glimpse(subset_pms07$Sex)
## Factor w/ 2 levels "1","2": 2 2 2 2 1 1 2 1 2 2 ...
glimpse(subset_pms07$Age)
## dbl+lbl [1:7403] 53, 78, 52, 58, 66, 86, 88, 41, 68, 56, 30, 36, 77, 79, 5...
## @ label
                 : chr "Respondant Age"
## @ format.spss: chr "F2.0"
                 : Named num [1:5] -9 -8 -7 -6 -1
## @ labels
     ..- attr(*, "names")= chr [1:5] "No answer/refused" "Don't know" "Missing data" "Proxy" ...
glimpse(subset_pms07$GenHeal)
## Factor w/ 5 levels "1", "2", "3", "4", ...: 2 4 3 5 3 3 4 2 2 3 ...
glimpse(subset_pms07$HowHap)
## Factor w/ 3 levels "1","2","3": 1 2 2 2 2 2 2 2 2 2 ...
glimpse(subset_pms07$MenHeal)
## Factor w/ 2 levels "0", "1": 2 1 2 1 1 2 1 1 2 1 ...
```

```
glimpse(subset_pms07$PaidJob)
## Factor w/ 2 levels "1", "2": NA 1 NA NA 1 1 1 NA NA NA ...
glimpse(subset pms07$DefPsych)
## Factor w/ 2 levels "0", "1": 1 1 1 1 1 1 1 1 1 1 ...
# fix levels of factors and Rename levels of factor for easy reading
#Sex has 2 levels
levels(subset_pms07$Sex) <-c("Male", "Female")</pre>
#General Health has 5 levels
levels(subset pms07$GenHeal) <-c("NA", "Excellent", "Very Good",</pre>
                                "Good", "Fair/Poor")
#How Happy has 3 levels
levels(subset_pms07$HowHap) <- c("NA", "Very Happy",</pre>
                                "Fairly/Not too Happy")
#Mental Health Condition has 2 levels
levels(subset_pms07$MenHeal) <-c("Not Mentioned", "Mentioned")</pre>
#Paid Job has 2 levels
levels(subset_pms07$PaidJob) <-c("No", "Yes")</pre>
#Definitive Psychosis has 2 levels
levels(subset_pms07$DefPsych) <- c("No", "Yes")</pre>
# Age has 80 levels? #
# make Age into groups
subset_pms07$Agegroup <-cut(subset_pms07$Age,</pre>
                           breaks=c(0, 10, 20, 30, 40, 50, 60, 70, 80, 90),
                           right = FALSE)
# Make NAs explicit
subset_pms07 = subset_pms07 %>% mutate_if(is.factor,
                                         fct_explicit_na,
                                         na_level = "No Answer")
# check it worked
glimpse(subset_pms07)
## Rows: 7,403
## Columns: 9
## $ SerNum <chr> "11103072", "11103102", "11103112", "11103132", "11103162"...
             <fct> Female, Female, Female, Male, Male, Female, Male, ...
## $ Sex
             <dbl+lbl> 53, 78, 52, 58, 66, 86, 88, 41, 68, 56, 30, 36, 77, 79...
## $ Age
## $ GenHeal <fct> Excellent, Good, Very Good, Fair/Poor, Very Good, Very Goo...
## $ HowHap <fct> NA, Very Happy, Very Happy, Very Happy, Very Happy, Very H...
## $ MenHeal <fct> Mentioned, Not Mentioned, Mentioned, Not Mentioned, Not Me...
## $ PaidJob <fct> No Answer, No, No Answer, No Answer, No, No, No, No Answer...
## $ Agegroup <fct> "[50,60)", "[70,80)", "[50,60)", "[50,60)", "[60,70)", "[8...
```

```
summary(subset_pms07)
```

```
##
      SerNum
                                                          GenHeal
                          Sex
                                          Age
##
  Length:7403
                      Male :3197
                                    Min.
                                           :16.00
                                                              :1271
  Class : character
                      Female:4206
                                     1st Qu.:36.00
                                                    Excellent:2354
  Mode :character
                                     Median :50.00
                                                     Very Good:2079
##
                                            :51.12
                                     Mean
                                                     Good
                                                             :1183
##
                                     3rd Qu.:66.00
                                                     Fair/Poor: 513
##
                                    Max.
                                            :95.00
                                                    No Answer:
##
##
                     HowHap
                                        MenHeal
                                                          PaidJob
                               Not Mentioned: 5686
                                                              :3073
##
  NA
                        :2746
                                                    No
                        :3956
                                            :1714
                                                              : 296
##
   Very Happy
                               Mentioned
                                                     Yes
  Fairly/Not too Happy: 697
                               No Answer
                                            : 3
                                                    No Answer: 4034
## No Answer
##
##
##
##
        DefPsych
                       Agegroup
##
  No
            :7266
                     [40,50):1291
            : 23
                     [30,40):1262
  No Answer: 114
                     [60,70):1190
##
##
                     [50,60):1161
##
                     [70,80): 940
##
                     [20,30): 810
##
                     (Other): 749
```

# **Exploring Data**

```
# overview of descriptives for df
#describe(subset_pms07)

#gender variable first

# prop
prop.table(table(subset_pms07$Sex))

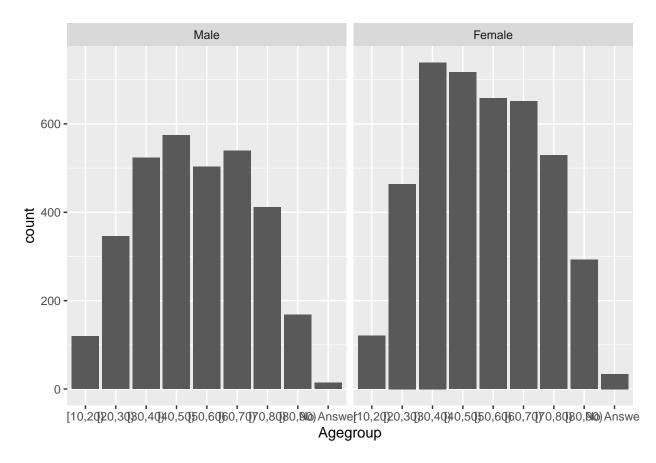
##
## Male Female
## 0.431852 0.568148

#So this table tells us that 43.1% and 56.8% of the sample are
#male and female respectively, which sounds pretty reasonable.

#The next step is to see if any age groups are over or under-represented
#in either of the genders. I'm going to use the package gmodels
#to produce these cross-tables:
```

```
##
##
   Cell Contents
        N / Col Total |
## |
## |-----|
## Total Observations in Table: 7403
##
##
##
               | subset_pms07$Sex
## subset_pms07$Agegroup | Male | Female | Row Total |
           [10,20) | 119 | 121 |
           0.037 | 0.029 |
##
                   346 | 464 |
           [20,30) |
##
                   0.108 |
                          0.110
                           739 |
           [30,40) |
                   523 |
                   523 | 739 |
0.164 | 0.176 |
          1
           -----|-----|-----|
           [40,50) | 574 |
                          717 |
##
           1
                    0.180 l
                            0.170 l
           [50,60) |
                            658 |
                    503 |
                    0.157 | 0.156 |
           1
##
                          651 | 1190 |
           [60,70) |
                   539 |
                    0.169 | 0.155 |
##
          1
           [70,80) |
                           529 |
##
                    411 |
                    0.129 |
                   168 | 293 |
0.053 | 0.070 |
           [80,90) |
                  14 | 34 |
       No Answer |
##
                    0.004 | 0.008 |
         1
 _____|___|___|
       Column Total |
                   3197 l
                           4206 l
         | 0.432 | 0.568 | |
  -----|-----|-----|
##
##
```

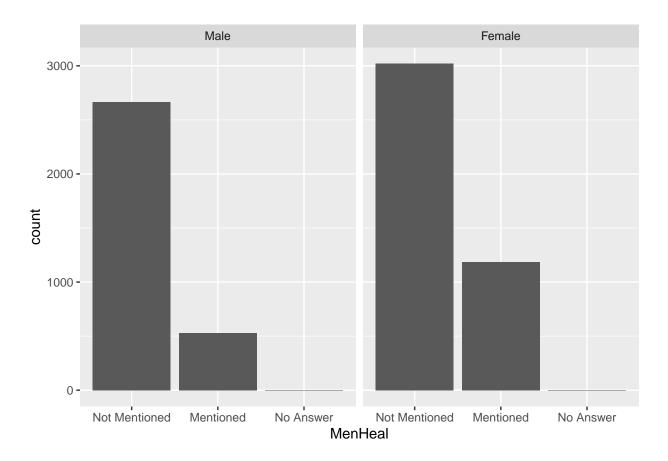
```
# largest group is males in the 40 - 50 age group
# visulisation
library(ggplot2)
ggplot(subset_pms07,aes(x=Agegroup))+
   geom_bar()+
   facet_grid(~Sex)
```



```
##
##
## Cell Contents
## |------|
## | N |
## | N / Col Total |
## |------|
##
##
##
##
Total Observations in Table: 7403
##
```

##						
##	subset_pms07\$Sex					
##	<pre>subset_pms07\$MenHeal  </pre>	Male	Female	Row Total		
##						
##	Not Mentioned	2666	3020	5686		
##	I	0.834	0.718	1		
##						
##	Mentioned	529	1185	1714		
##	I	0.165	0.282			
##						
##	No Answer	2	1	3		
##	l	0.001	0.000			
##						
##	Column Total	3197	4206	7403		
##	l	0.432	0.568			
##						
##						
##						

```
#
ggplot(subset_pms07,aes(x=MenHeal))+
geom_bar()+
facet_grid(~Sex)
```

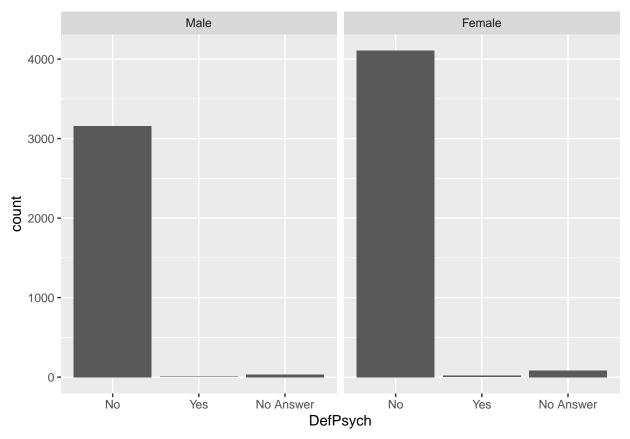


```
# Represention of psychosis in genders
CrossTable(subset pms07$DefPsych,
       subset_pms07$Sex,prop.r=FALSE,prop.t=FALSE,
       prop.chisq=FALSE)
##
##
##
   Cell Contents
## |-----|
## |
      N / Col Total |
## |
## |-----|
##
##
## Total Observations in Table: 7403
##
                | subset_pms07$Sex
##
## subset_pms07$DefPsych | Male | Female | Row Total |
## -----|----|-----|
        No | 3159 | 4107 |
##
                                    7266 I
                    0.988 | 0.976 |
             ## -----|-----|
            Yes | 6 | 17 | 23 |
##
            | 0.002 | 0.004 |
## -----|----|
       No Answer | 32 | 82 | 114 |
        0.010 | 0.019 |
##
## -----|----|
##
      Column Total | 3197 | 4206 | 7403 |
                   0.432 | 0.568 |
##
             ----|------|------|------|
##
##
# from this we can see that more females (17, .04%) than
#males (6, .02%) reported an episode of psychosis
#in the past year.
```

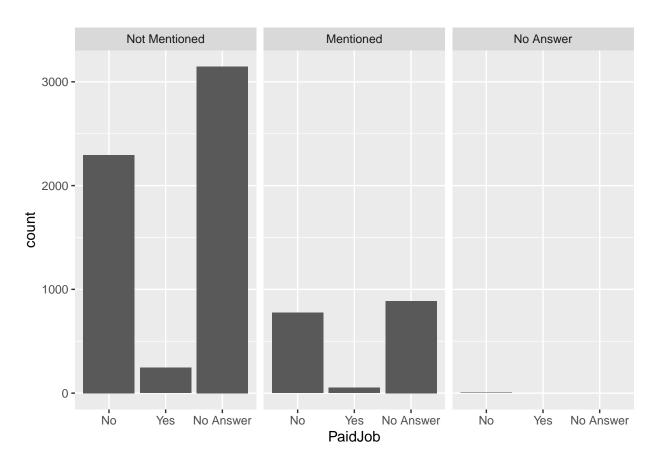
# visualisation

geom\_bar()+
facet\_grid(~Sex)

ggplot(subset\_pms07,aes(x=DefPsych))+



```
# exploring employment and mental health
prop.table(table(subset_pms07$PaidJob))
##
                     Yes No Answer
           No
## 0.41510199 0.03998379 0.54491422
prop.table(table(subset_pms07$MenHeal))
##
                                   No Answer
## Not Mentioned
                     Mentioned
## 0.7680669999 0.2315277590 0.0004052411
\# from this we can see of those who had a paid job
#(39.9%), 23.1% mentioned a mental health condition
# bar chart
ggplot(subset_pms07,aes(x=PaidJob))+
  geom_bar()+
  facet_grid(~MenHeal)
```



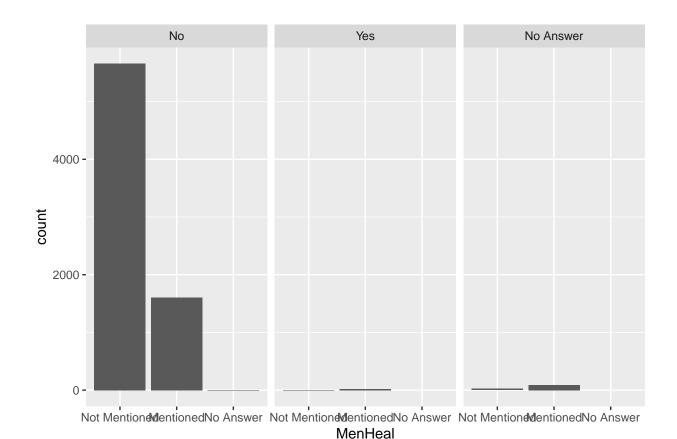
# 2-Way Cross Tabulation
CrossTable(subset\_pms07\$Sex, subset\_pms07\$MenHeal)

# # # # # # # # # # # # # # # # # # #	N / Co	ow Total   ol Total   .e Total   	3				
##	subset_pms07\$MenHeal						
##	subset_pms07\$Sex	Not Mentioned	Mentioned	No Answer	Row Total		
## ##	Male	2666	   529	2	3197		
##	riale	18.043	60.259	•			
##	i	0.834					
##	ĺ	0.469					
##	I	0.360	0.071	0.000	1		

```
3020 | 1185 | 1 | 4206 |
13.715 | 45.803 | 0.291 | |
0.718 | 0.282 | 0.000 | 0.568 |
0.531 | 0.691 | 0.333 |
##
         Female |
##
          ##
                ##
                ##
                1
                       0.408 |
                                  0.160 | 0.000 |
      5686 | 1714 | 3 |
0.768 | 0.232 | 0.000 |
     Column Total | 5686 |
                                                             7403 |
      ##
##
# 3-Way Frequency Table
# gender by ever having a paid job and mentioned
# having a mental health condition
mytable <- table(subset_pms07$Sex, subset_pms07$PaidJob,</pre>
              subset_pms07$MenHeal)
ftable(mytable)
##
                 Not Mentioned Mentioned No Answer
##
## Male
      No
                         915
                                  236
        Yes
                         85
                                  5
##
        No Answer
##
                       1666
                                 288
                                 539
## Female No
                        1380
                         159
                                 47
##
        Vag
                                            0
##
        No Answer
                         1481
                                  599
# from this we can see more females (47) than males (5) in a paid
# job mentioned having a mental health condition.
# More females who were not in a paid job (539) also mentioned
# having a mental health condition than men (236).
# quick way to pull together row/column
# frequencies and proportions mental health and
# psychosis conditions vars
table(subset_pms07$MenHeal, subset_pms07$DefPsych)
##
##
                 No Yes No Answer
##
   Not Mentioned 5659 2 25
   Mentioned 1604
##
                     21
                              89
              3 0
   No Answer
ggplot(subset_pms07,aes(x=MenHeal))+
```

geom\_bar()+

facet\_grid(~DefPsych)



```
# tests of independance
# chi
# E.g. Test the null hypothesis whether the respondants paid job
# status is independent of their psychosis dx at .05
# significance level.
chisq.test(subset_pms07$PaidJob, subset_pms07$DefPsych)
```

```
## Warning in chisq.test(subset_pms07$PaidJob, subset_pms07$DefPsych): Chi-squared
## approximation may be incorrect

##
## Pearson's Chi-squared test
##
## data: subset_pms07$PaidJob and subset_pms07$DefPsych
## X-squared = 47.392, df = 4, p-value = 1.263e-09
```

```
# As the p-value 1.263 is greater than the .05 significance
# level, we do not reject the null hypothesis that
# the respondants paid job status is independent of
# their psychosis diagnosis.
# correlations
# t-tests
```

```
# regressions

#library(synthpop)

#Describes features of variables in a data frame
#relevant for synthesis
#codebook.syn(subset_pms07)
```