MCAR 45% missing - MICE

```
# sample MCAR dataset from PUMS
source("../../utils/sampleMCAR.R")
n = 10000
missing_col = c(1,3,7,9,10,11)
missing_prob = 0.45
set.seed(1)

output_list <- sampleMCAR(n, missing_prob)
df <- output_list[['df']]
df_observed <- output_list[['df_observed']]
```

MICE

Create 5 imputed dataset

```
library(mice)
```

```
##
## Attaching package: 'mice'
```

```
## The following objects are masked from 'package:base':
##
##     cbind, rbind
```

```
imputed_df <-  mice(df_observed,m=5,print=F)
```

```
## Warning: Number of logged events: 150
```

Extract the 5 imputed dataset

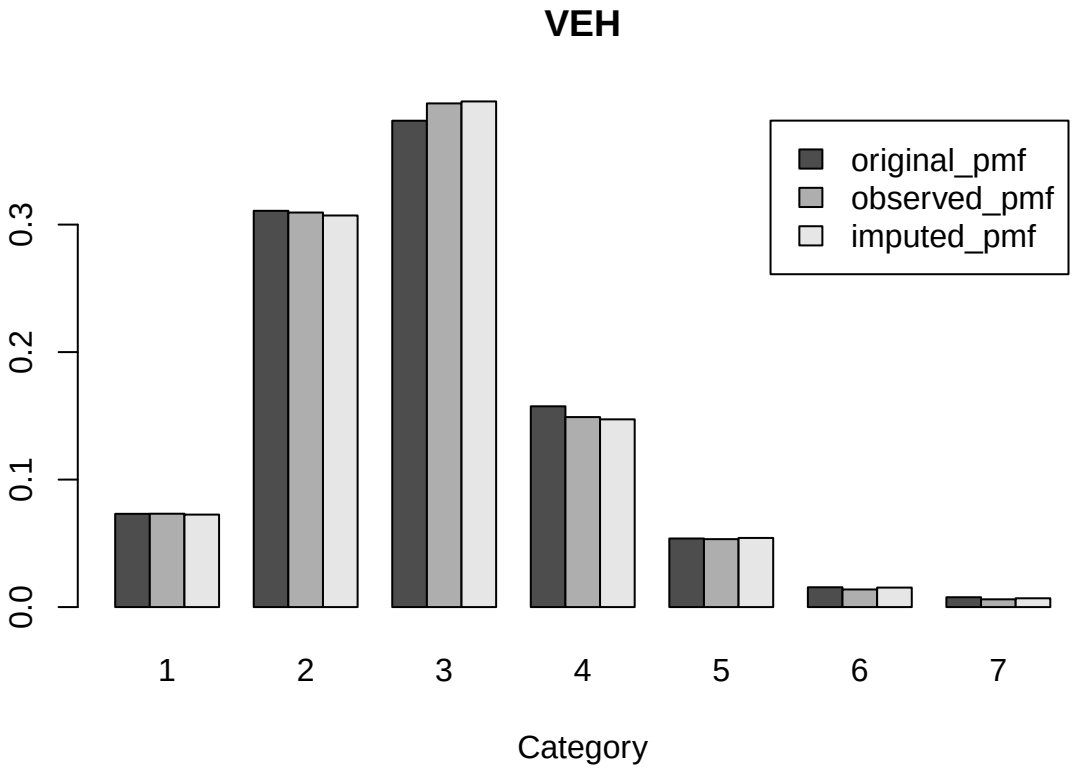
```
imputation_list = list()
for (i in 1:5) {
  imputation_list[[i]] = complete(imputed_df, i)
}
```

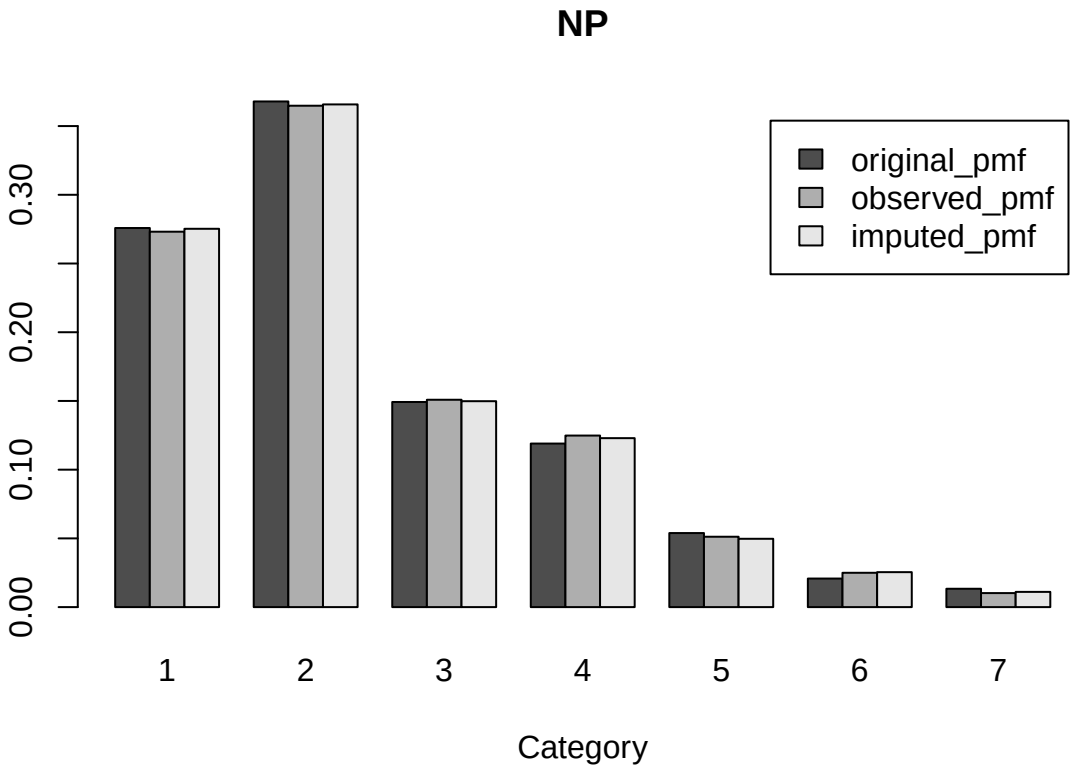
Diagnostics

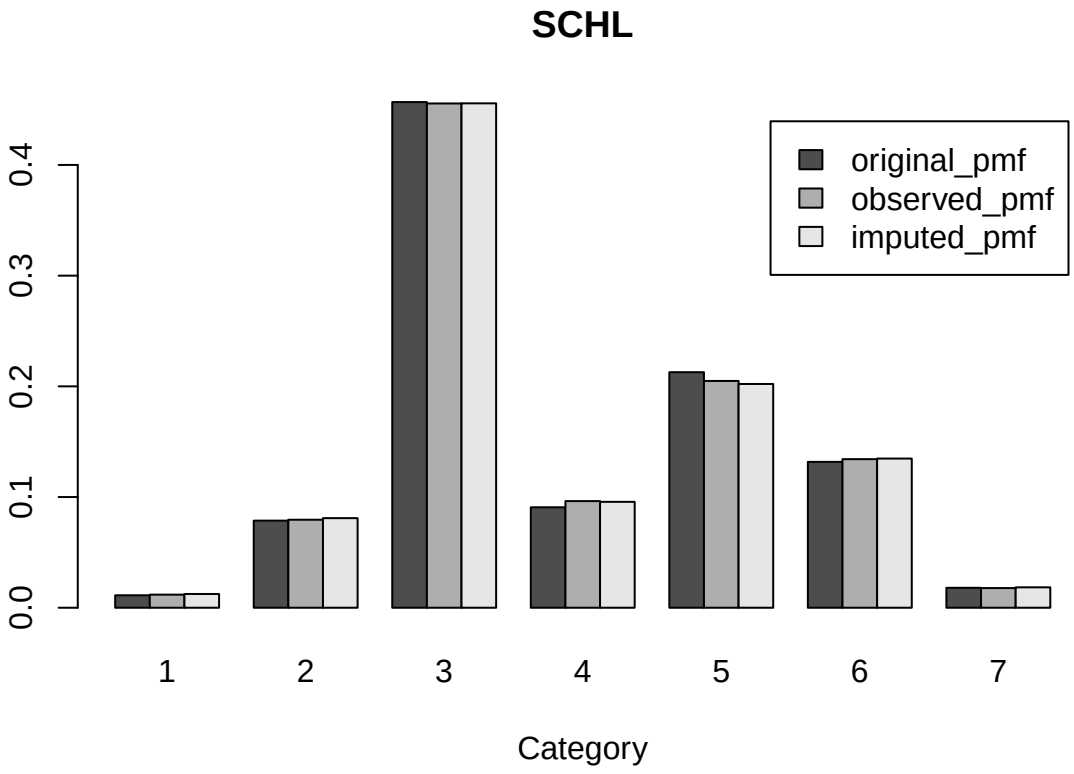
```
source("../../utils/create_report.R")
create_report(imputation_list, max_nway=4, missing_col, df_observed)
```

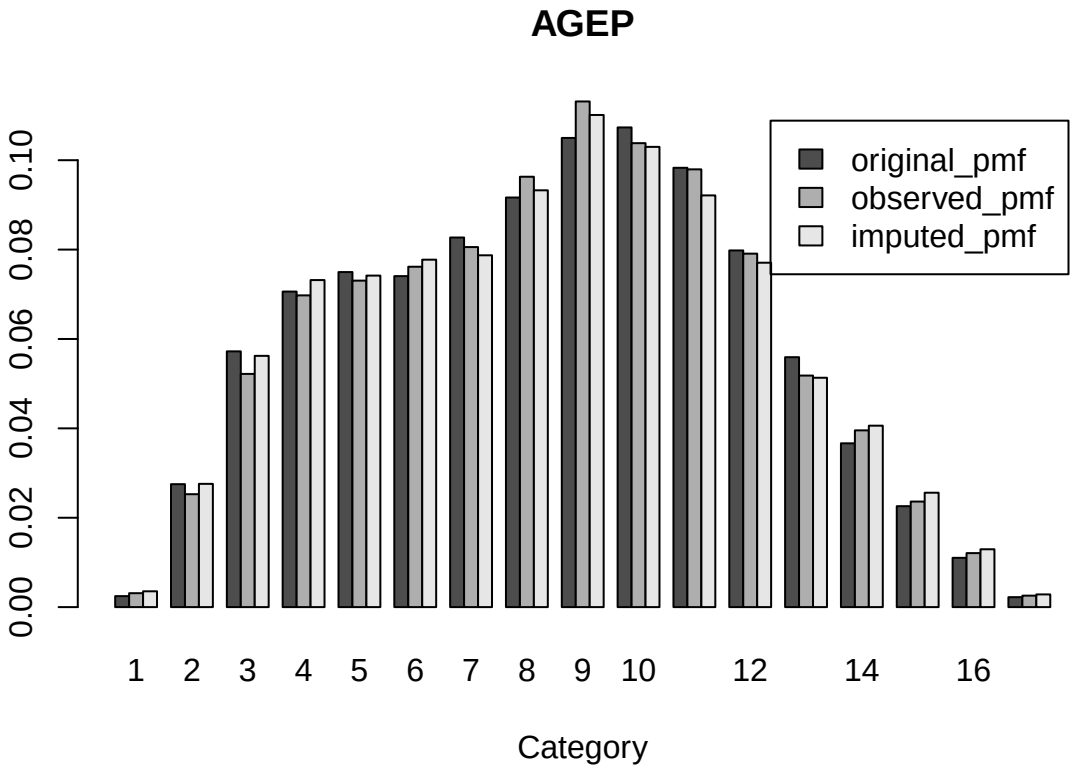
```
## ##### Coverage #####
## Coverage 1 way: 96.3 percent
## Coverage 2 way: 90.49 percent
## Coverage 3 way: 95.78 percent
## Coverage 4 way: 98.18 percent
##
## ##### RMSE #####
## RMSE 1 way: 0.003947
## RMSE 2 way: 0.00214
## RMSE 3 way: 0.000781
## RMSE 4 way: 0.000257
##
## ##### MAE #####
```

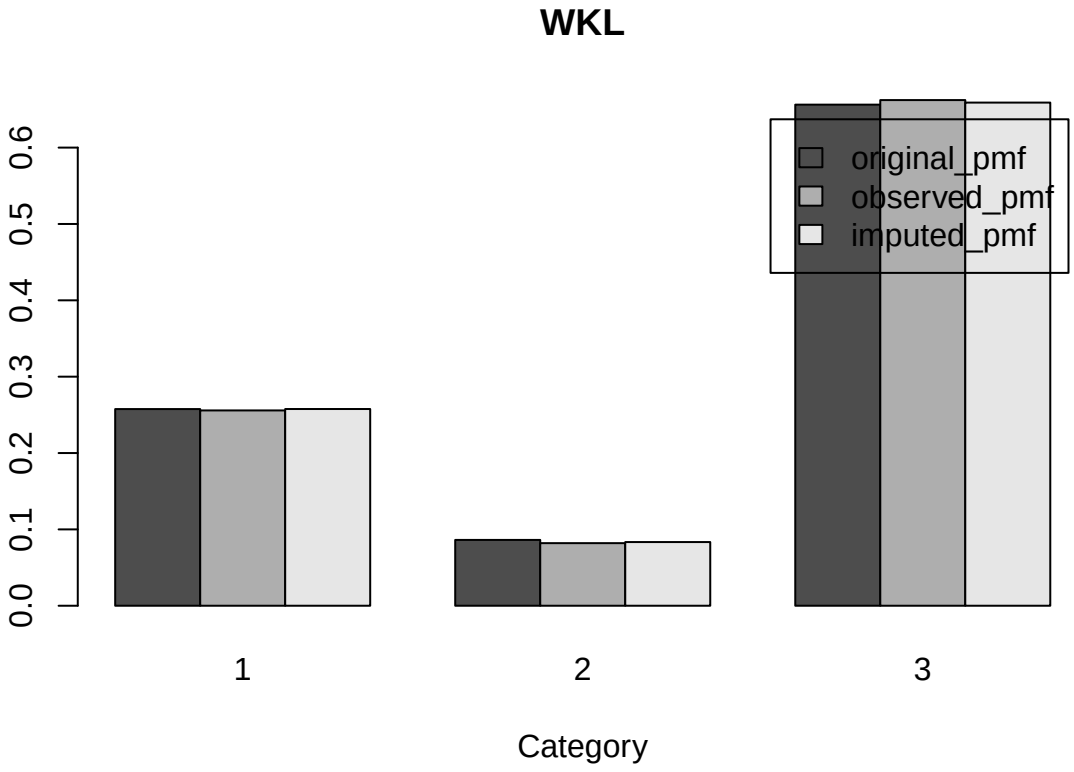
```
## MAE 1 way: 0.002801
## MAE 2 way: 0.001077
## MAE 3 way: 0.000276
## MAE 4 way: 6.5e-05
```

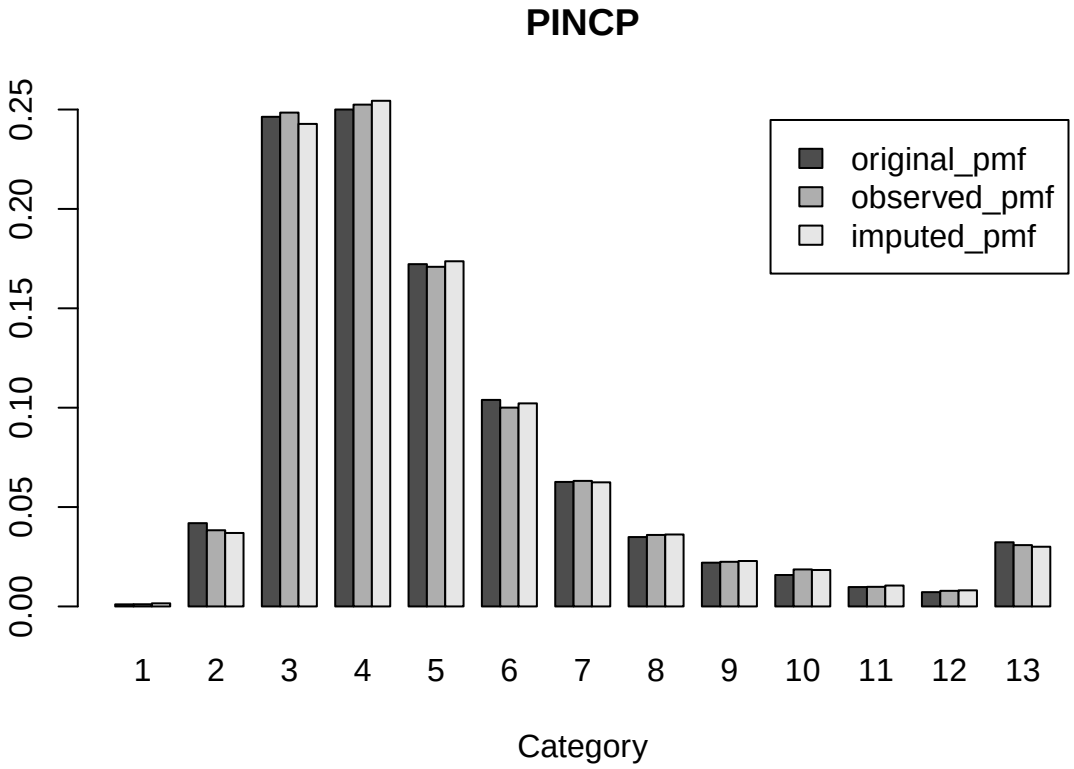


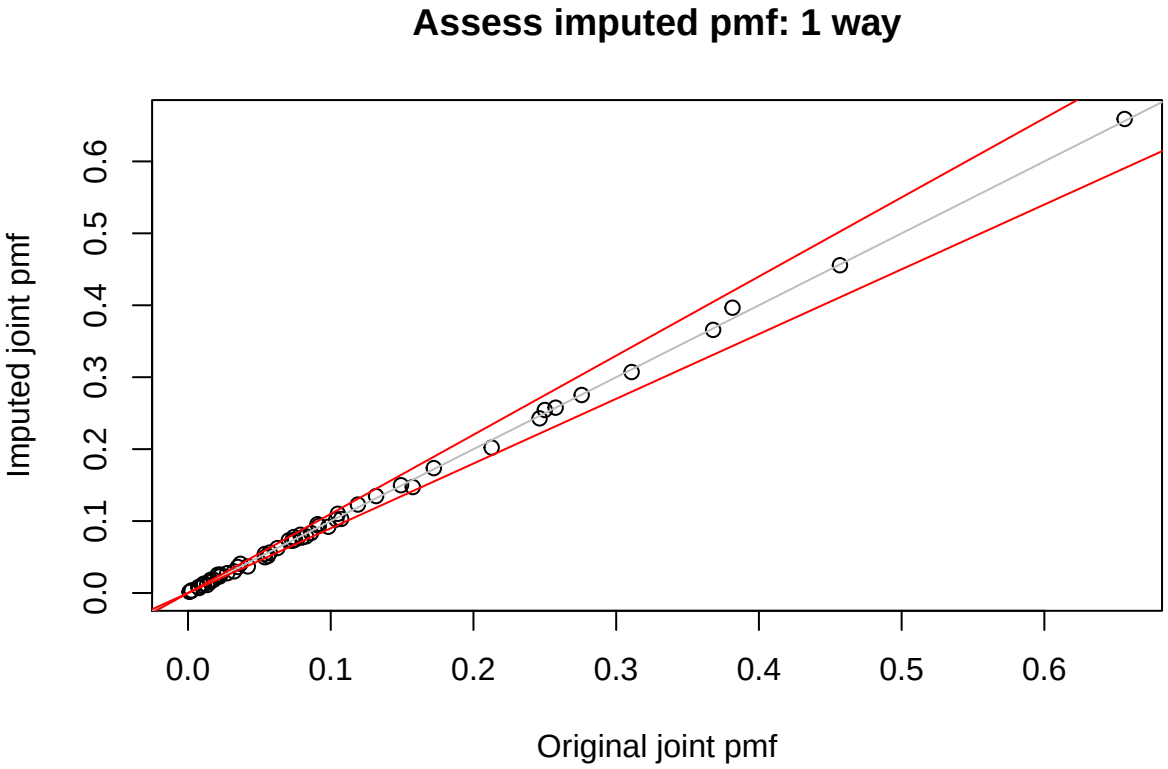

NP
original_pmf
observed_pmf
imputed_pmf
0.00
0.10
0.20
0.30
1
2
3
4
5
6
7
Category

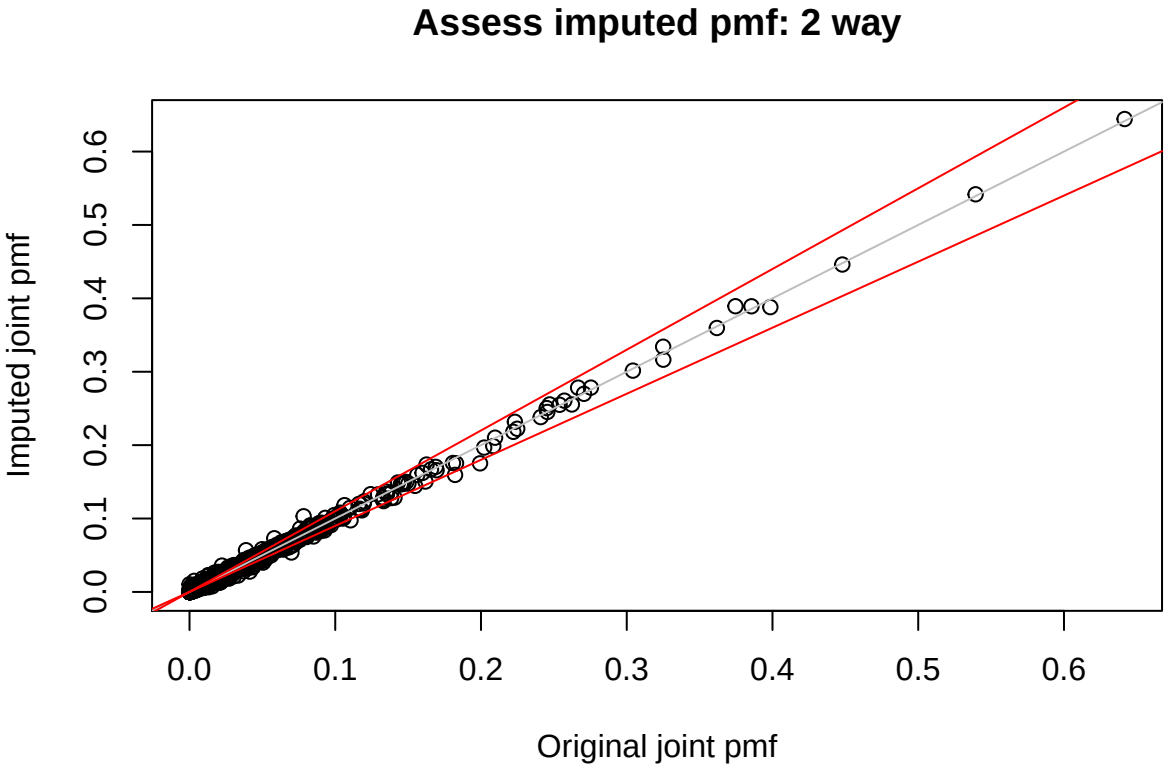

SCHL
original_pmf
observed_pmf
imputed_pmf
0.0
0.1
0.2
0.3
0.4
1
2
3
4
5
6
7
Category

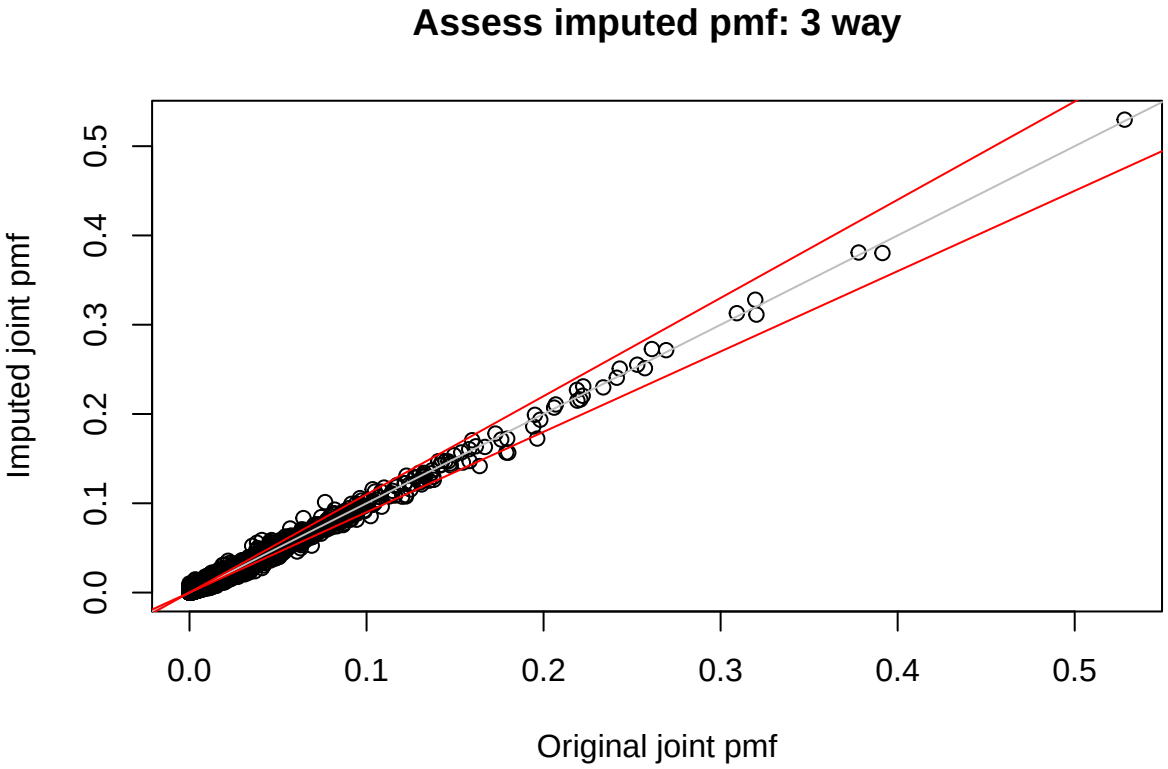

AGEP
original_pmf
observed_pmf
imputed_pmf
0.00
0.02
0.04
0.06
0.08
0.10
1
2
3
4
5
6
7
8
9
10
12
14
16
Category

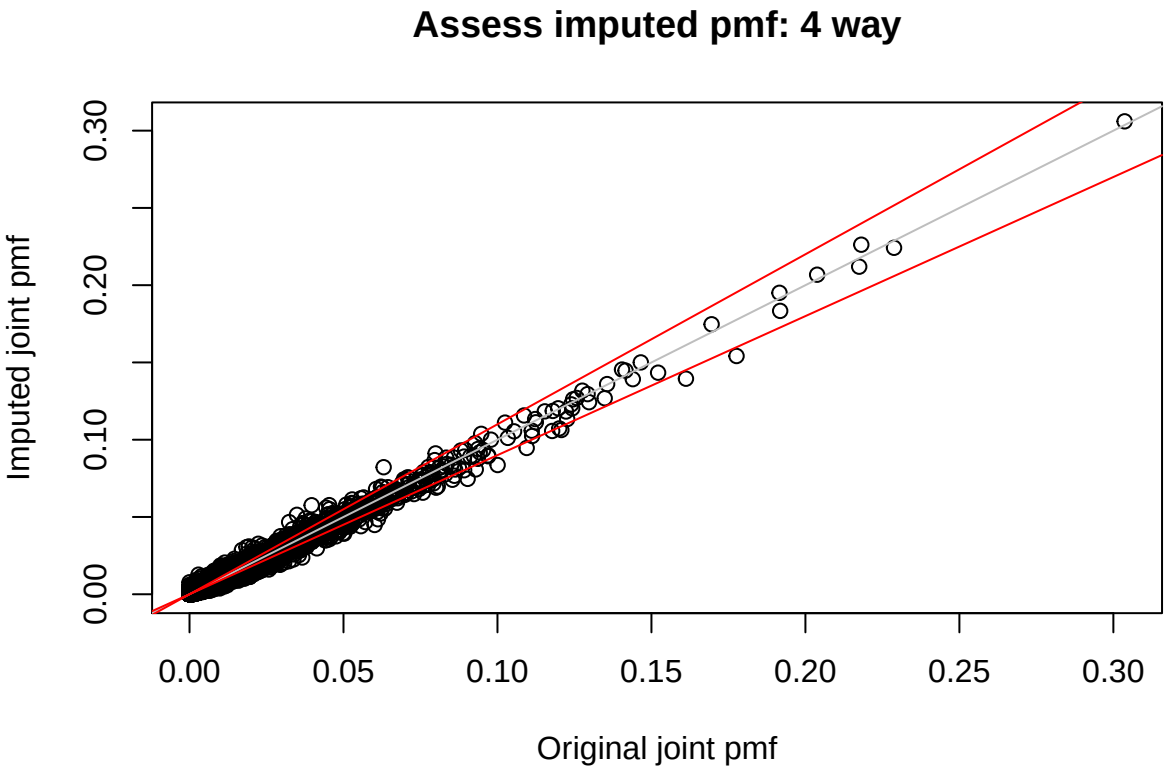

WKL
original_pmf
observed_pmf
imputed_pmf
0.0
0.1
0.2
0.3
0.4
0.5
0.6
1
2
3
Category


PINCP
original_pmf
observed_pmf
imputed_pmf
0.00
0.05
0.10
0.15
0.20
0.25
1
2
3
4
5
6
7
8
9
10
11
12
13
Category


Assess imputed pmf: 1 way
Imputed joint pmf
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Original joint pmf


Assess imputed pmf: 2 way
Imputed joint pmf
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Original joint pmf


Assess imputed pmf: 3 way
Imputed joint pmf
0.0
0.1
0.2
0.3
0.4
0.5
Original joint pmf


Assess imputed pmf: 4 way
Imputed joint pmf
0.00
0.10
0.20
0.30
0.00
0.05
0.10
0.15
0.20
0.25
0.30
Original joint pmf