EDA case B

Basic EDA for case study B

Telco

Updated EDA with Vivian's model

```
## 'data.frame':    916 obs. of  26 variables:
##  $ X                     : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Age                   : int  34 26 52 34 53 31 35 42 42 32 ...
##  $ L_O_S                 : num  56 53.4 51.1 28.3 23.2 ...
##  $ Dropped_Calls         : int  2 2 1 2 2 1 10 7 0 0 ...
##  $ Peak_calls_Sum        : int  301 193 203 290 244 365 213 262 259 254 ...
##  $ Peak_mins_Sum         : num  480 378 351 506 512 ...
##  $ OffPeak_calls_Sum     : int  117 140 109 78 125 86 39 29 116 110 ...
##  $ OffPeak_mins_Sum      : num  357 330 257 250 295 ...
##  $ Weekend_calls_Sum     : int  0 17 7 20 0 22 76 10 6 10 ...
##  $ Weekend_mins_Sum      : num  0 41 79.2 33 0 ...
##  $ International_mins_Sum: num  246 221 203 211 258 ...
##  $ Nat_call_cost_Sum     : num  25.78 15 8.77 21.54 23.53 ...
##  $ AvePeak               : num  1.59 1.96 1.73 1.74 2.1 ...
##  $ AveOffPeak            : num  3.05 2.36 2.35 3.2 2.36 ...
##  $ AveWeekend            : num  0 2.41 11.31 1.65 0 ...
##  $ National_calls        : int  418 350 319 388 369 473 328 301 381 374 ...
##  $ National_mins         : num  837 749 687 789 807 ...
##  $ AveNational           : num  2 2.14 2.15 2.03 2.19 ...
##  $ All_calls_mins        : num  1083 970 889 1000 1065 ...
##  $ Mins_charge           : num  236.7 149.3 86.7 188.7 206.7 ...
##  $ call_cost_per_min     : num  10.7 10 10.1 11.4 11.3 ...
##  $ actual.call.cost      : num  25.41 15 8.77 21.54 23.45 ...
##  $ Total_call_cost       : num  99.2 81.3 69.5 85 101 ...
##  $ Total_Cost            : num  204 186 175 190 206 ...
##  $ average_cost_min      : num  0.189 0.192 0.196 0.19 0.193 ...
##  $ group                 : Factor w/ 6 levels "1","2","3","4",..: 1 2 2 1 1 1 2 2 1 1 ...
```

```
##        X              Age            L_O_S        Dropped_Calls
##  Min.   :  1.0   Min.   :12.00   Min.   : 9.733   Min.   : 0.000
##  1st Qu.:229.8   1st Qu.:21.00   1st Qu.:20.625   1st Qu.: 1.000
##  Median :458.5   Median :30.00   Median :34.033   Median : 2.000
##  Mean   :458.5   Mean   :31.67   Mean   :33.922   Mean   : 3.386
##  3rd Qu.:687.2   3rd Qu.:41.00   3rd Qu.:47.058   3rd Qu.: 5.000
##  Max.   :916.0   Max.   :82.00   Max.   :58.200   Max.   :15.000
##  Peak_calls_Sum  Peak_mins_Sum    OffPeak_calls_Sum OffPeak_mins_Sum
##  Min.   :  0.0   Min.   :   0.0   Min.   :  3.0     Min.   : 21.3
##  1st Qu.: 65.0   1st Qu.: 274.6   1st Qu.: 47.0     1st Qu.:162.0
```

```
##  Median :139.5   Median : 434.1   Median : 89.0     Median :263.4
##  Mean   :192.6   Mean   : 492.9   Mean   :110.1     Mean   :275.3
##  3rd Qu.:271.0   3rd Qu.: 661.4   3rd Qu.:158.2     3rd Qu.:383.5
##  Max.   :890.0   Max.   :1583.4   Max.   :395.0     Max.   :673.2
##  Weekend_calls_Sum Weekend_mins_Sum International_mins_Sum Nat_call_cost_Sum
##  Min.   : 0.00     Min.   :  0.00   Min.   :  7.868        Min.   : 0.000
##  1st Qu.: 6.00     1st Qu.: 29.00   1st Qu.:120.313        1st Qu.: 6.847
##  Median :14.00     Median : 50.00   Median :167.371        Median :14.947
##  Mean   :17.84     Mean   : 53.67   Mean   :184.869        Mean   :15.466
##  3rd Qu.:26.00     3rd Qu.: 76.20   3rd Qu.:232.128        3rd Qu.:22.501
##  Max.   :79.00     Max.   :152.40   Max.   :493.742        Max.   :50.534
##     AvePeak         AveOffPeak       AveWeekend     National_calls
##  Min.   : 0.000   Min.   : 1.504   Min.   : 0.000   Min.   :  47.0
##  1st Qu.: 1.924   1st Qu.: 1.828   1st Qu.: 1.924   1st Qu.: 179.0
##  Median : 2.597   Median : 2.440   Median : 2.818   Median : 270.5
##  Mean   : 4.154   Mean   : 3.423   Mean   : 4.352   Mean   : 320.5
##  3rd Qu.: 4.595   3rd Qu.: 3.900   3rd Qu.: 5.341   3rd Qu.: 396.2
##  Max.   :38.215   Max.   :20.925   Max.   :31.200   Max.   :1009.0
##  National_mins     AveNational     All_calls_mins    Mins_charge
##  Min.   : 350.7   Min.   : 1.552   Min.   : 412.5   Min.   :-128.7
##  1st Qu.: 583.8   1st Qu.: 2.091   1st Qu.: 735.2   1st Qu.:  68.4
##  Median : 729.9   Median : 2.588   Median : 883.1   Median : 142.6
##  Mean   : 821.9   Mean   : 3.025   Mean   :1006.7   Mean   : 138.3
##  3rd Qu.: 859.5   3rd Qu.: 3.543   3rd Qu.:1065.5   3rd Qu.: 198.3
##  Max.   :1727.3   Max.   :10.245   Max.   :2156.0   Max.   : 527.3
##  call_cost_per_min actual.call.cost Total_call_cost    Total_Cost
##  Min.   : 5.000    Min.   : 0.000   Min.   : 17.57   Min.   : 93.13
##  1st Qu.: 8.821    1st Qu.: 6.802   1st Qu.: 52.81   1st Qu.:131.21
##  Median :10.977    Median :14.876   Median : 69.49   Median :161.69
##  Mean   :10.667    Mean   :15.419   Mean   : 74.56   Mean   :175.10
##  3rd Qu.:12.065    3rd Qu.:22.501   3rd Qu.: 91.75   3rd Qu.:202.95
##  Max.   :15.114    Max.   :50.534   Max.   :185.43   Max.   :335.43
##  average_cost_min group
##  Min.   :0.1327   1:169
##  1st Qu.:0.1589   2:276
##  Median :0.1778   3:122
##  Mean   :0.1819   4: 79
##  3rd Qu.:0.1927   5:123
##  Max.   :0.2630   6:147

##   X Age    L_O_S Dropped_Calls Peak_calls_Sum Peak_mins_Sum OffPeak_calls_Sum
## 1 1  34 56.03333             2            301           480                117
##   OffPeak_mins_Sum Weekend_calls_Sum Weekend_mins_Sum International_mins_Sum
## 1            356.7                 0                0               245.9991
##   Nat_call_cost_Sum  AvePeak AveOffPeak AveWeekend National_calls National_mins
## 1          25.78152 1.594684   3.048718          0            418         836.7
##   AveNational All_calls_mins Mins_charge call_cost_per_min actual.call.cost
## 1    2.001675       1082.699       236.7          10.73682         25.41406
##   Total_call_cost Total_Cost average_cost_min group
## 1        99.21379   204.2138         0.188615     1

##   [1] 1 2 2 1 1 1 2 2 1 1 2 2 2 1 2 1 1 1 1 1 1 1 2 1 1 1 1 1 2 2 1 2 1 1 1 1 1
##  [38] 1 1 1 2 1 1 1 1 2 1 1 1 2 2 1 1 2 2 1 1 1 2 1 1 1 2 1 2 1 1 1 2 1 2 1 1 1
##  [75] 2 1 1 1 2 1 1 3 3 3 3 3 3 3 3 3 4 3 4 3 3 4 3 3 3 3 3 3 3 4 3 4 3 3 3 3
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## [112] 3 4 3 3 3 3 3 3 4 3 3 3 3 3 3 3 3 3 4 3 3 3 4 3 3 3 4 3 3 3 4 3 4 3 3 3 3
## [149] 4 3 3 4 3 4 3 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 3 4 4
## [186] 4 4 4 4 4 4 4 5 5 2 2 2 5 2 2 2 5 5 2 2 2 5 2 2 2 2 2 5 2 5 2 2 2 2 1 1 1
## [223] 2 1 1 1 1 2 1 1 2 1 1 1 2 1 1 1 2 1 1 2 1 2 2 2 1 1 2 1 2 1 1 1 1 2 1 1 1
## [260] 2 2 2 1 2 1 1 1 2 2 1 1 1 2 1 1 3 3 4 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
## [297] 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 4 3 4 4 4 4 3 3 3 3 3 4 3 4 4 4 4 4 4 4 4
## [334] 4 3 4 3 4 4 4 4 4 4 4 3 4 3 4 5 2 2 2 5 2 2 2 5 5 2 5 5 2 2 2 2 5 5 2 1 2
## [371] 1 1 2 2 1 2 2 2 2 2 6 6 6 6 6 6 5 5 2 5 5 5 2 5 5 2 2 2 1 6 6 6 6 6 6 6 6
## [408] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 2 2 5 5 5 5 5 5 5 5 2 5 2 5 2 5 5 5 5
## [445] 5 5 2 5 5 5 5 5 5 5 5 2 5 5 2 2 5 2 2 5 5 2 2 5 5 5 2 5 5 5 2 5 5 5 5 2 5
## [482] 5 2 5 5 5 2 5 5 5 5 2 5 2 5 5 5 5 2 2 2 2 2 2 5 2 2 5 5 2 5 5 2 2 5 5 2 5 5
## [519] 5 2 2 2 5 2 5 5 2 5 5 5 5 5 5 5 2 5 2 2 2 2 2 2 2 5 2 5 5 5 2 5 5 5 2 5 5 5
## [556] 5 5 2 5 5 2 2 5 1 2 1 2 1 1 2 1 2 1 1 1 2 2 2 1 2 2 2 2 1 1 1 2 2 1 2 2 1
## [593] 1 1 2 2 1 2 1 2 2 2 2 1 2 2 1 2 2 2 1 2 2 1 2 2 2 2 1 2 2 1 1 2 1 2 1 1 2
## [630] 1 1 2 1 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [667] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 2 1 2 2 2 1 2 2 2 1 2 2 2 2 2 1 1 2 2 2 2 1
## [704] 2 2 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 1 1 1 1 2 2 2 2 2 2 2 1
## [741] 2 2 1 2 1 2 2 2 1 2 2 2 2 2 2 2 2 2 2 1 2 2 1 1 2 2 1 1 1 2 2 2 2 4 4 4
## [778] 4 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
## [815] 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 5 2 2 2 5 2 5 5 2 1 1 1 2 2 2
## [852] 1 2 2 1 1 2 2 1 1 1 1 1 2 1 1 2 2 1 1 1 1 1 2 1 2 2 3 3 3 3 3 4 3 3 4 4 4
## [889] 6 6 6 6 6 6 6 6 6 6 6 2 2 5 2 5 2 2 2 2 2 2 5 2 5 2 5 5 5 2
## Levels: 1 2 3 4 5 6
```

```
## 'data.frame':    916 obs. of  26 variables:
##  $ X                     : int  1 2 3 4 5 6 7 8 9 10 ...
##  $ Age                   : int  34 26 52 34 53 31 35 42 42 32 ...
##  $ L_O_S                 : num  56 53.4 51.1 28.3 23.2 ...
##  $ Dropped_Calls         : int  2 2 1 2 2 1 10 7 0 0 ...
##  $ Peak_calls_Sum        : int  301 193 203 290 244 365 213 262 259 254 ...
##  $ Peak_mins_Sum         : num  480 378 351 506 512 ...
##  $ OffPeak_calls_Sum     : int  117 140 109 78 125 86 39 29 116 110 ...
##  $ OffPeak_mins_Sum      : num  357 330 257 250 295 ...
##  $ Weekend_calls_Sum     : int  0 17 7 20 0 22 76 10 6 10 ...
##  $ Weekend_mins_Sum      : num  0 41 79.2 33 0 ...
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##  $ Total_call_cost       : num  99.2 81.3 69.5 85 101 ...
##  $ Total_Cost            : num  204 186 175 190 206 ...
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##  $ group                 : Factor w/ 6 levels "1","2","3","4",..: 1 2 2 1 1 1 2 2 1 1 ...
```

Cols:
1-2: basic customer info

3-19: call data (duration)
20-24: tariff schemes (cost)

All variables are numeric.

We have no NAs.

Overall

Can't see anything!

`Age` is not so special. No correlation. `L_O_S` is bimodal, 2 groups ?

`Nat_call_cost_Sum`, `National_mins`, `All_calls_mins` -> multinomial distrib?

`Peak_mins_Sum` together with `Nat_call_cost_Sum` -> 2 clusters

All variables multinomial, tariffs grouping?

Let's explore a subset of the interesting variables:

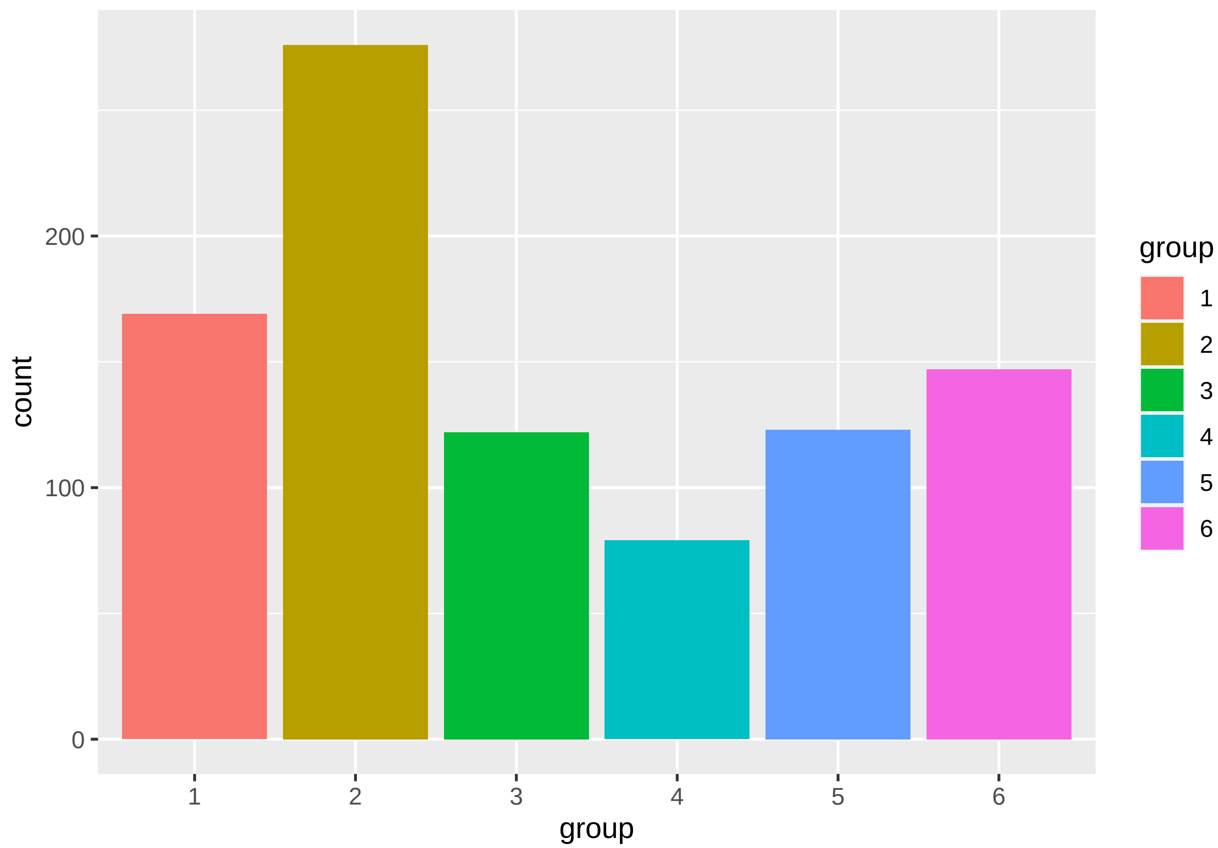
Misc

A few subsets to use.

Groups comparison

General

```
## Saving 6.5 x 4.5 in image
```



Histograms

Boxplots

```
## Saving 6.5 x 4.5 in image
## Saving 6.5 x 4.5 in image
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## Saving 6.5 x 4.5 in image
## Saving 6.5 x 4.5 in image
```

```
## Saving 6.5 x 4.5 in image
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## Saving 6.5 x 4.5 in image

## [[1]]
```
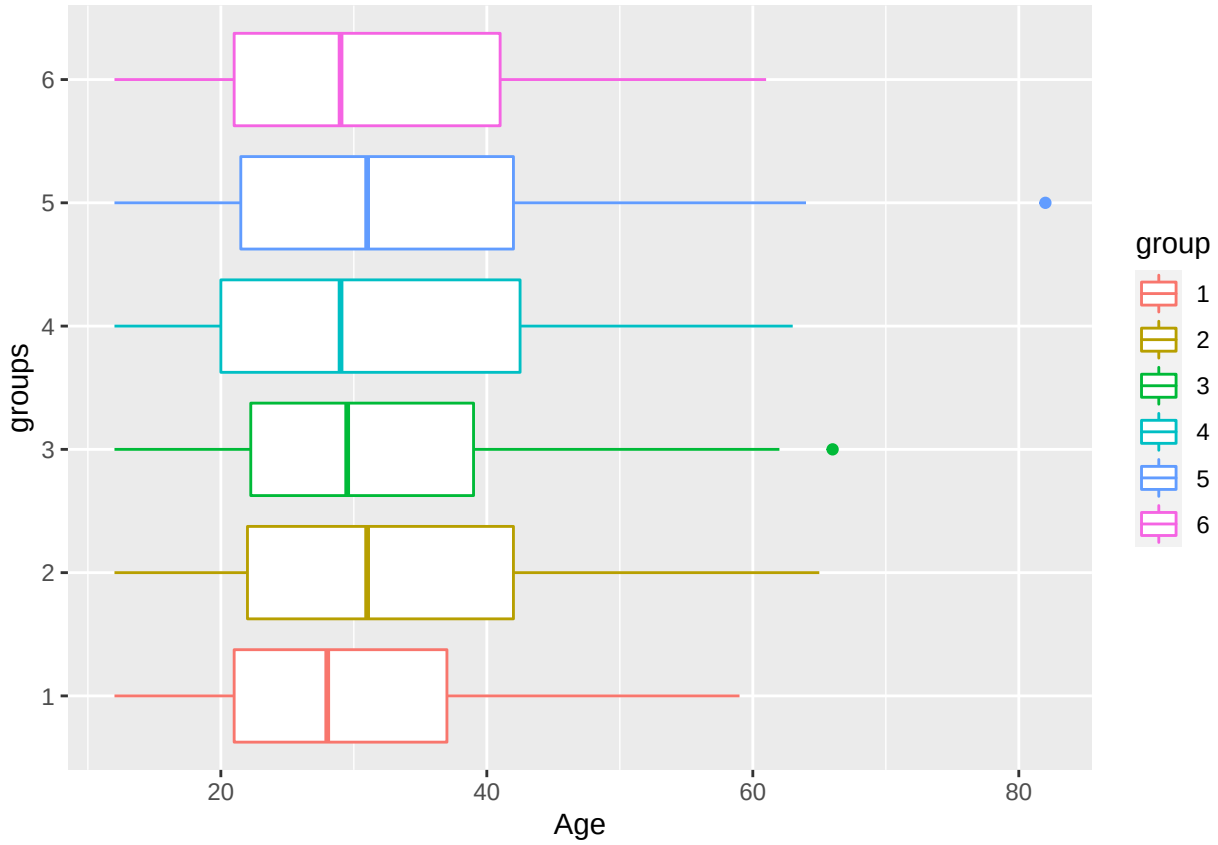
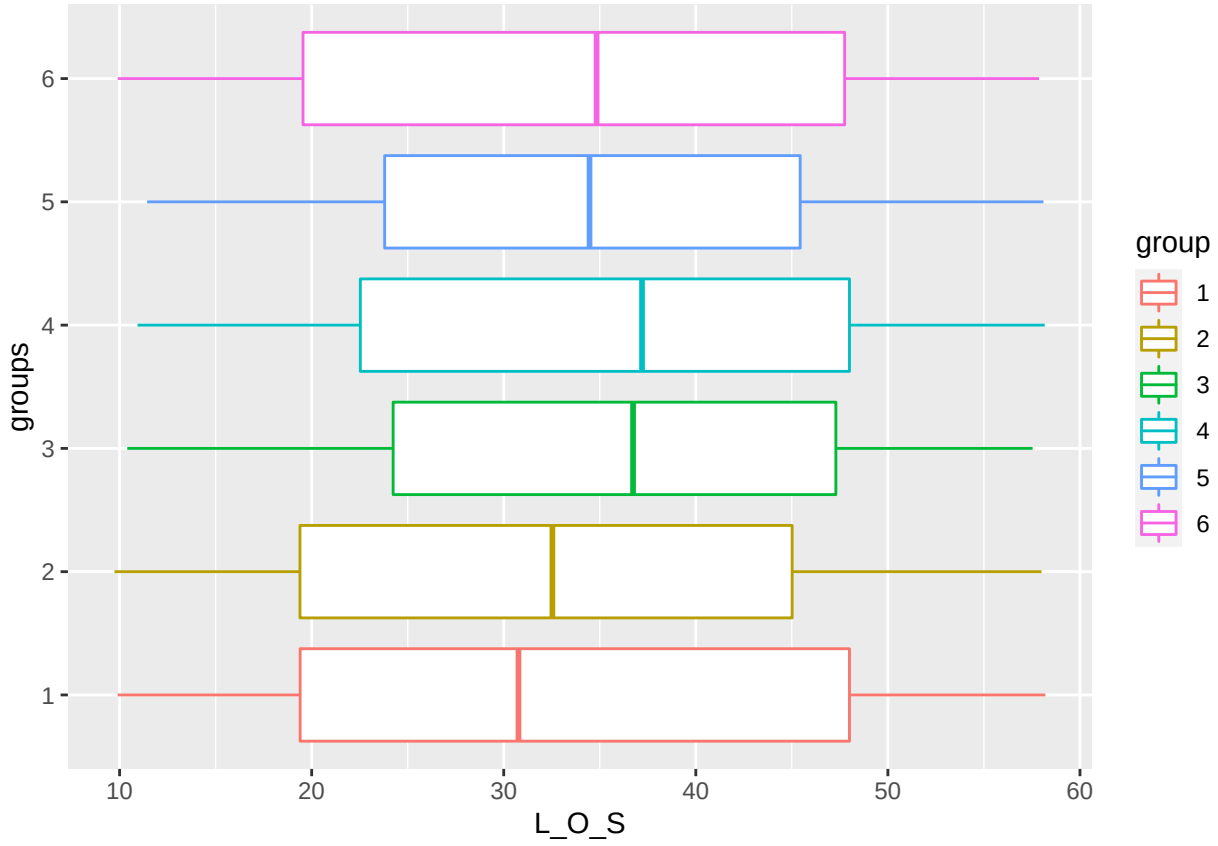
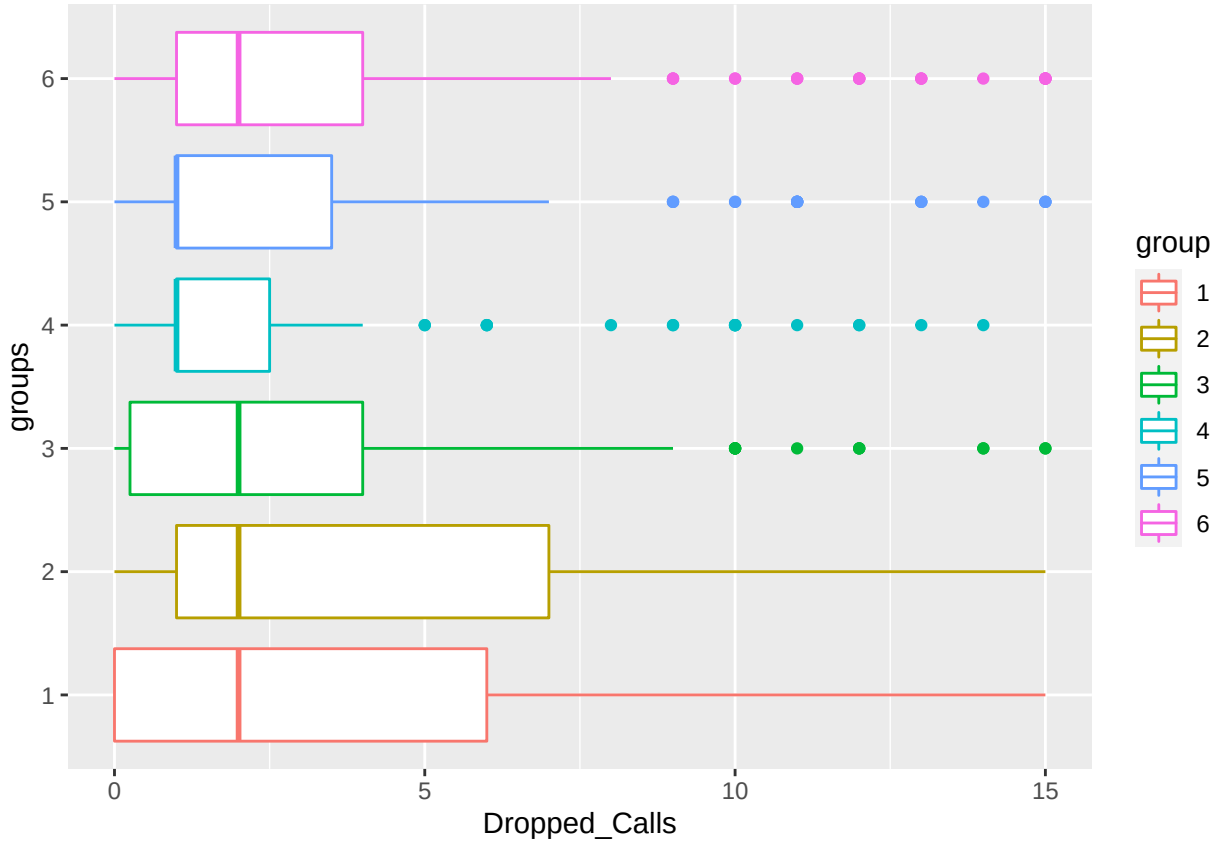



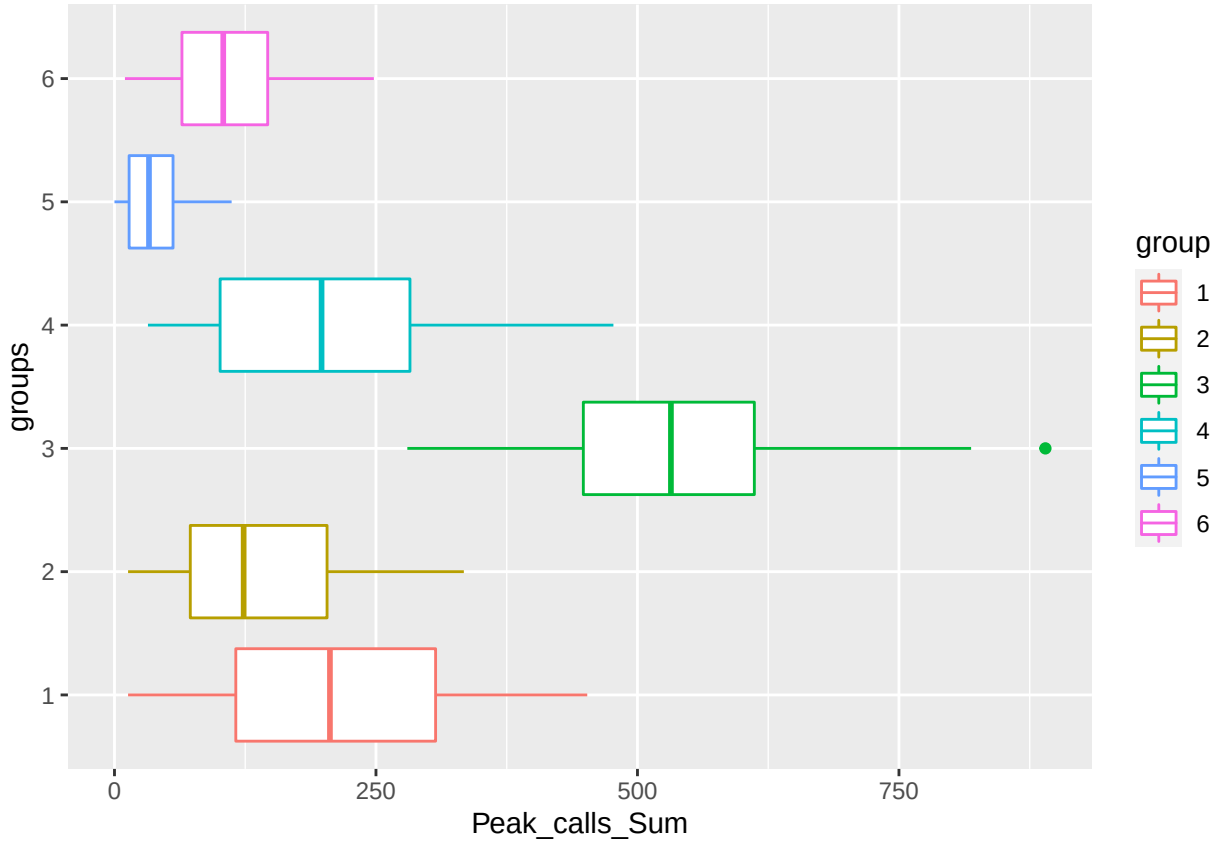

```
##
## [[2]]
```



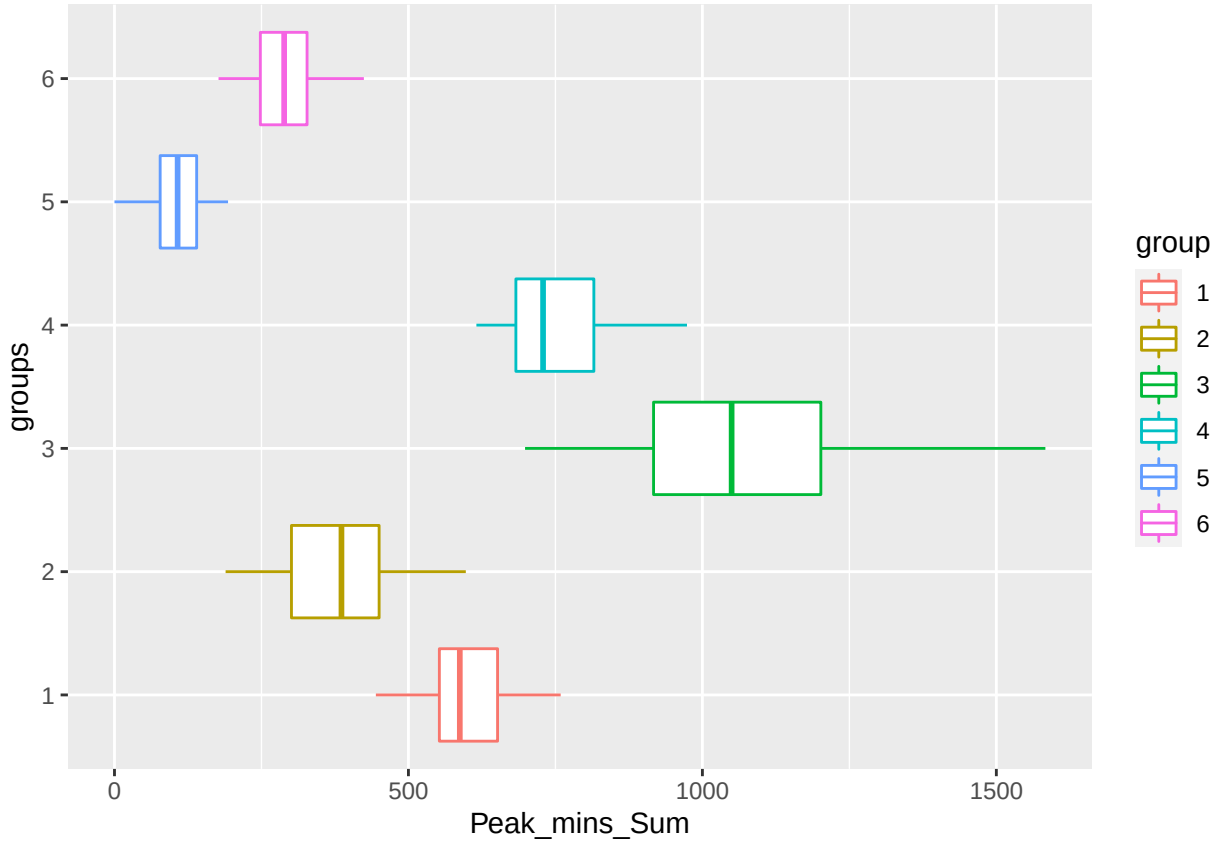

```
##
## [[3]]
```



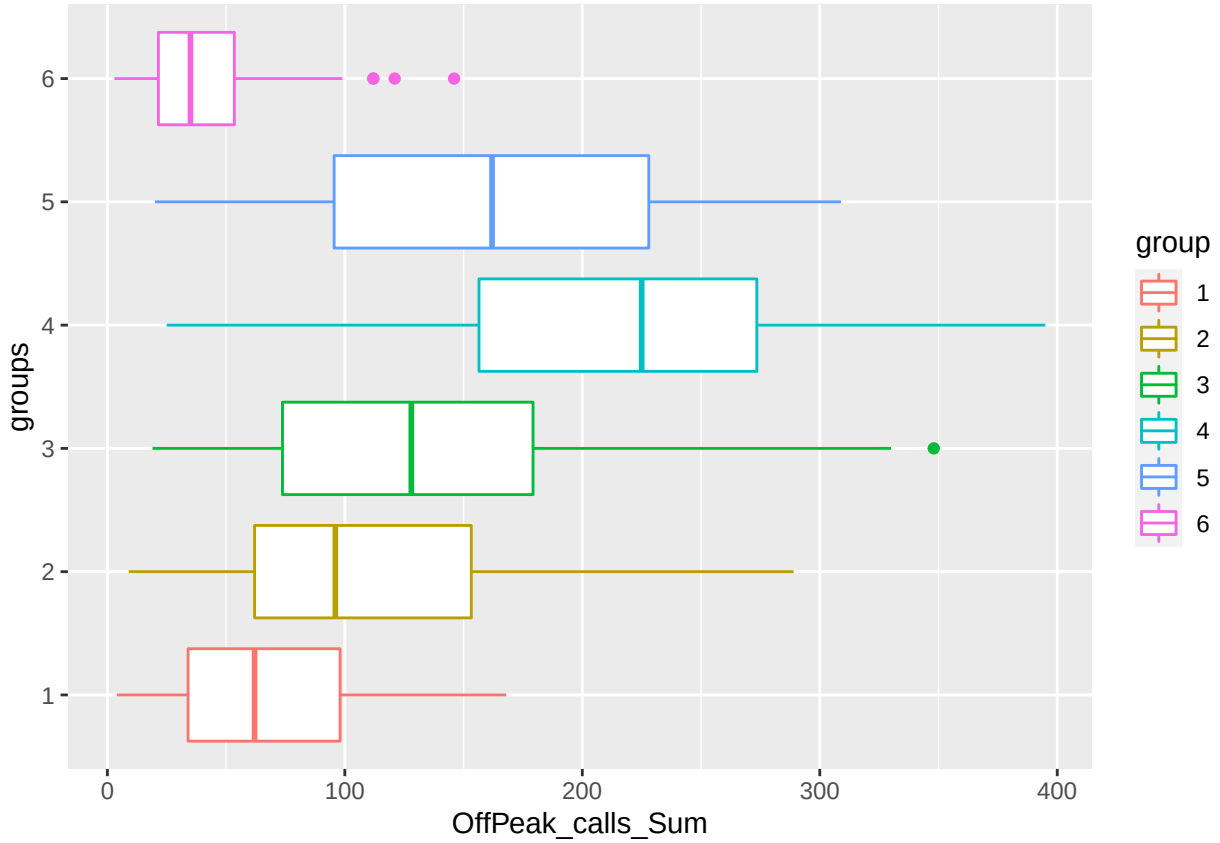

```
##
## [[4]]
```



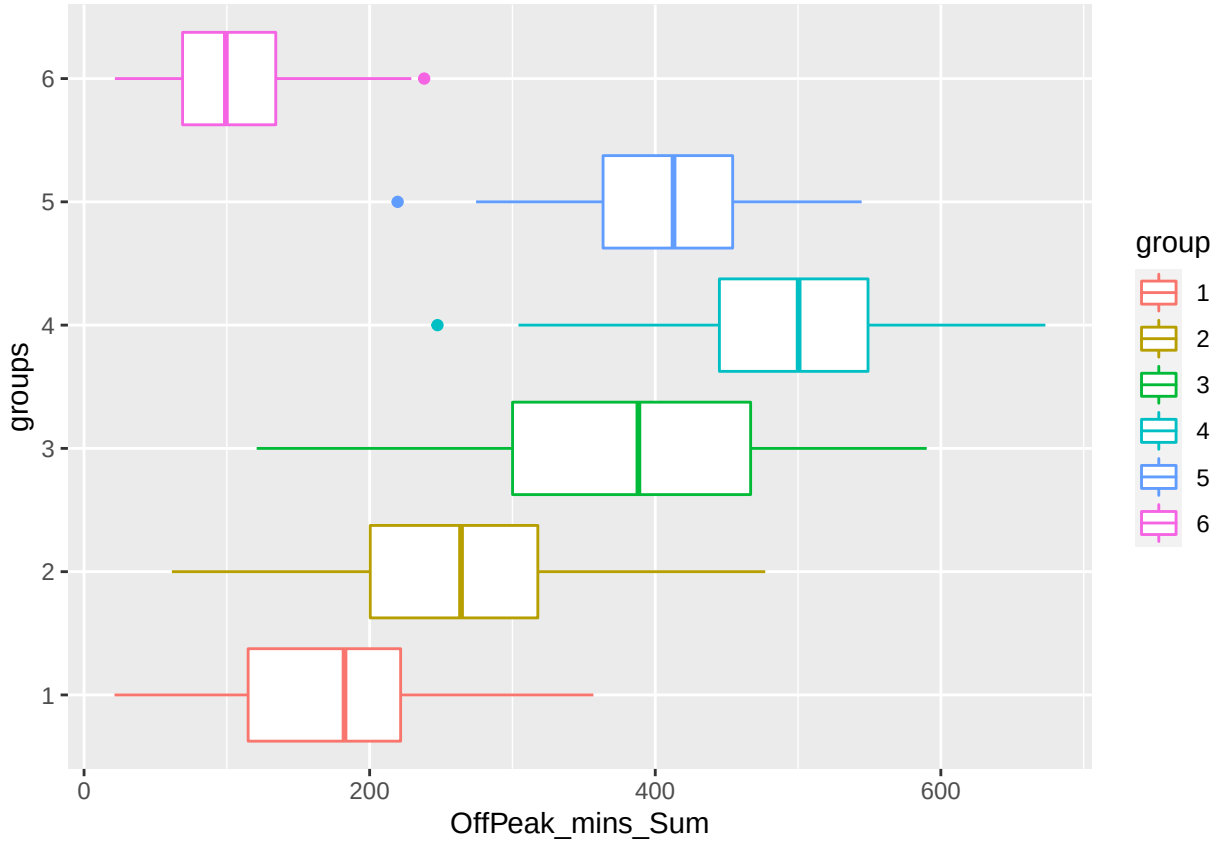

```
##
## [[5]]
```



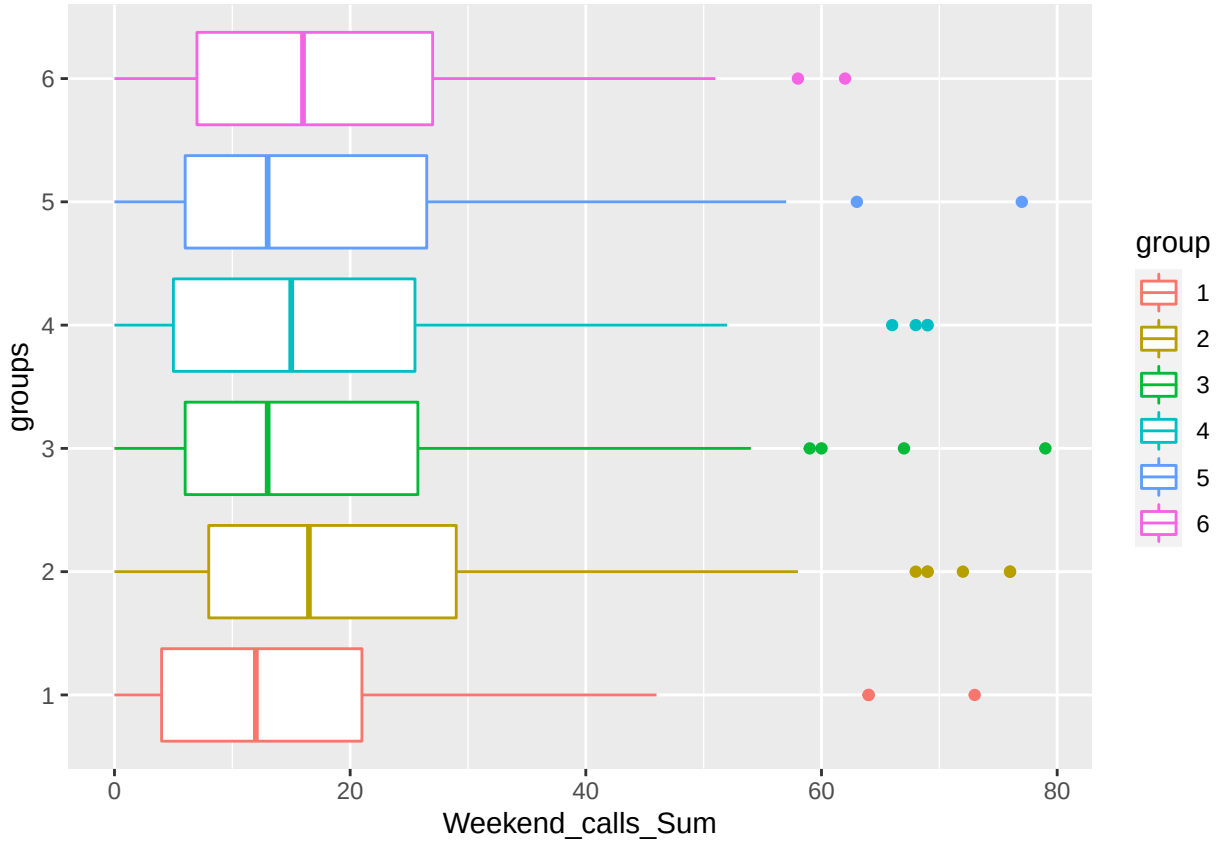

```
##
## [[6]]
```


groups
6
5
4
3
2
1
0
100
200
300
400
OffPeak_calls_Sum
group
1
2
3
4
5
6

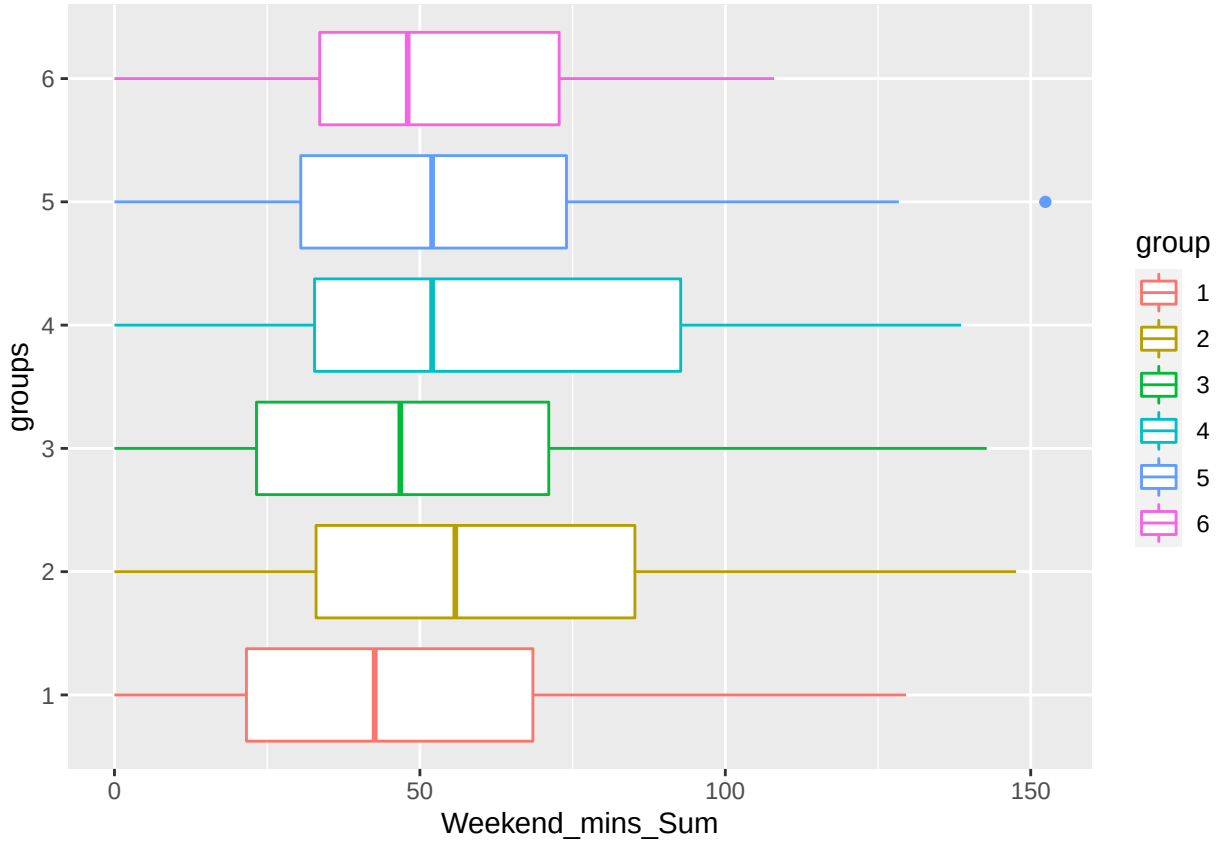
```
##
## [[7]]
```



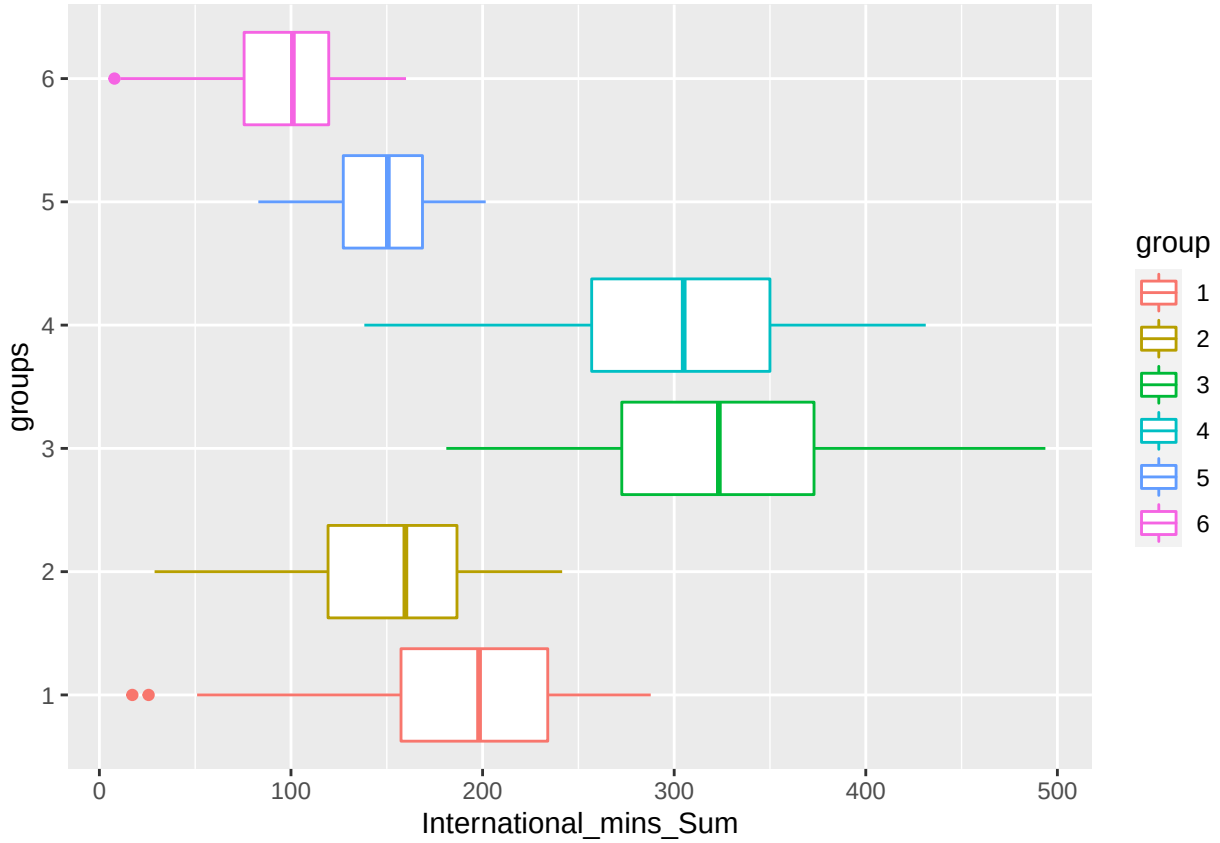

```
##
## [[8]]
```



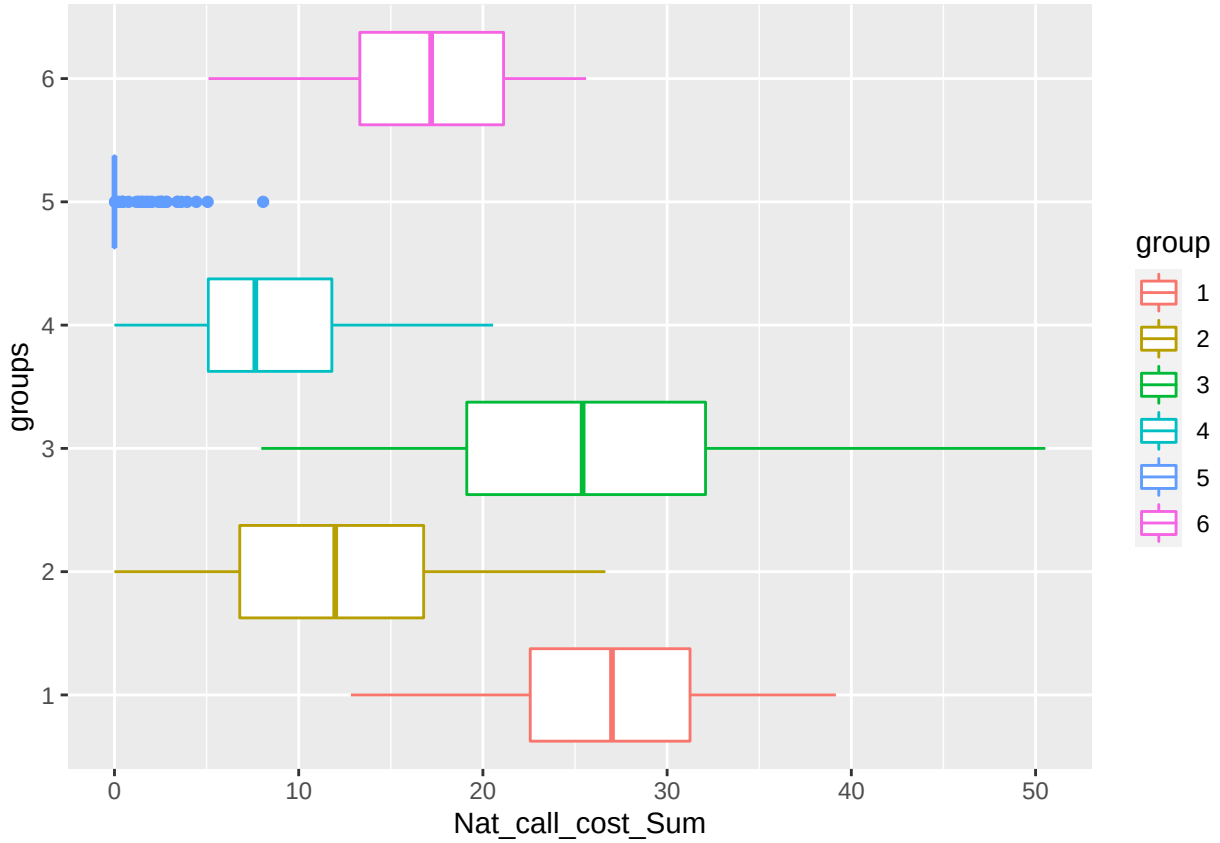

```
##
## [[9]]
```



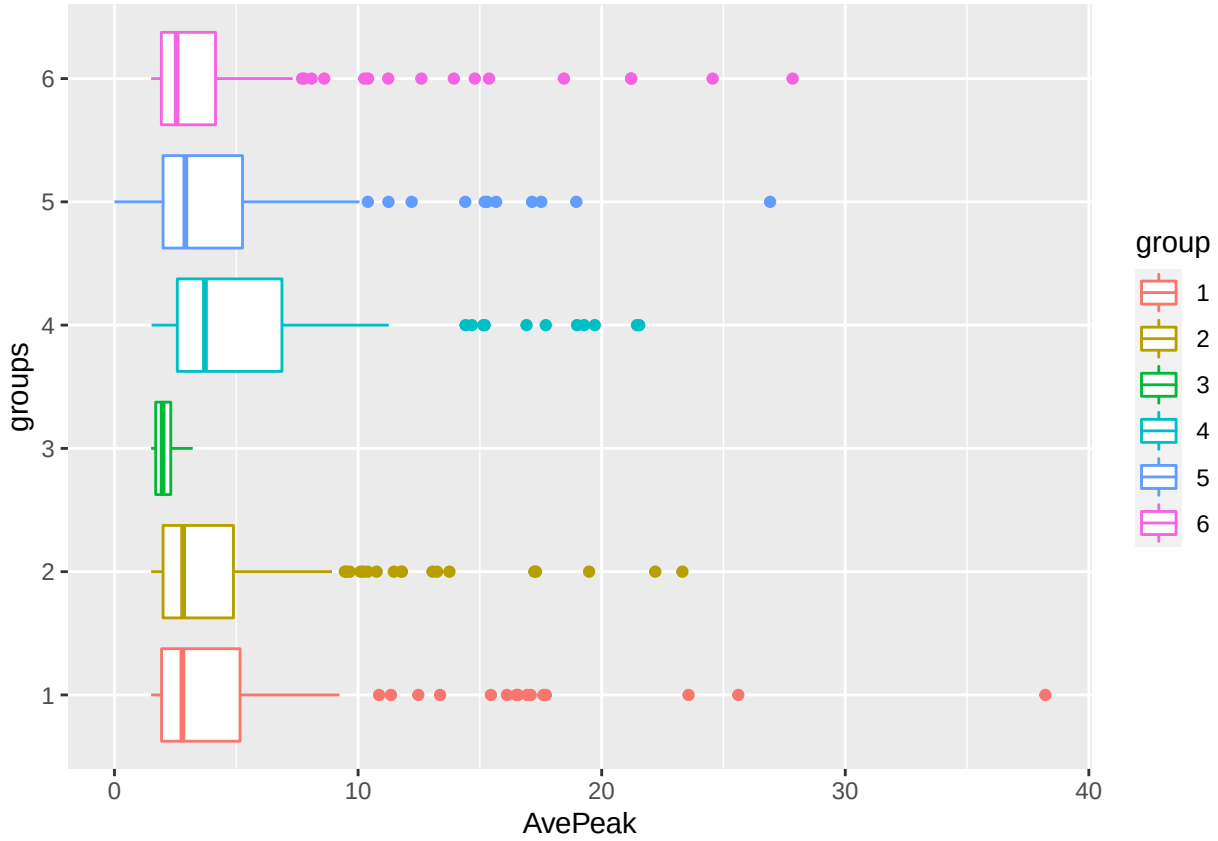

```
##
## [[10]]
```


groups
6
5
4
3
2
1
0
100
200
300
400
500
International_mins_Sum
group
1
2
3
4
5
6

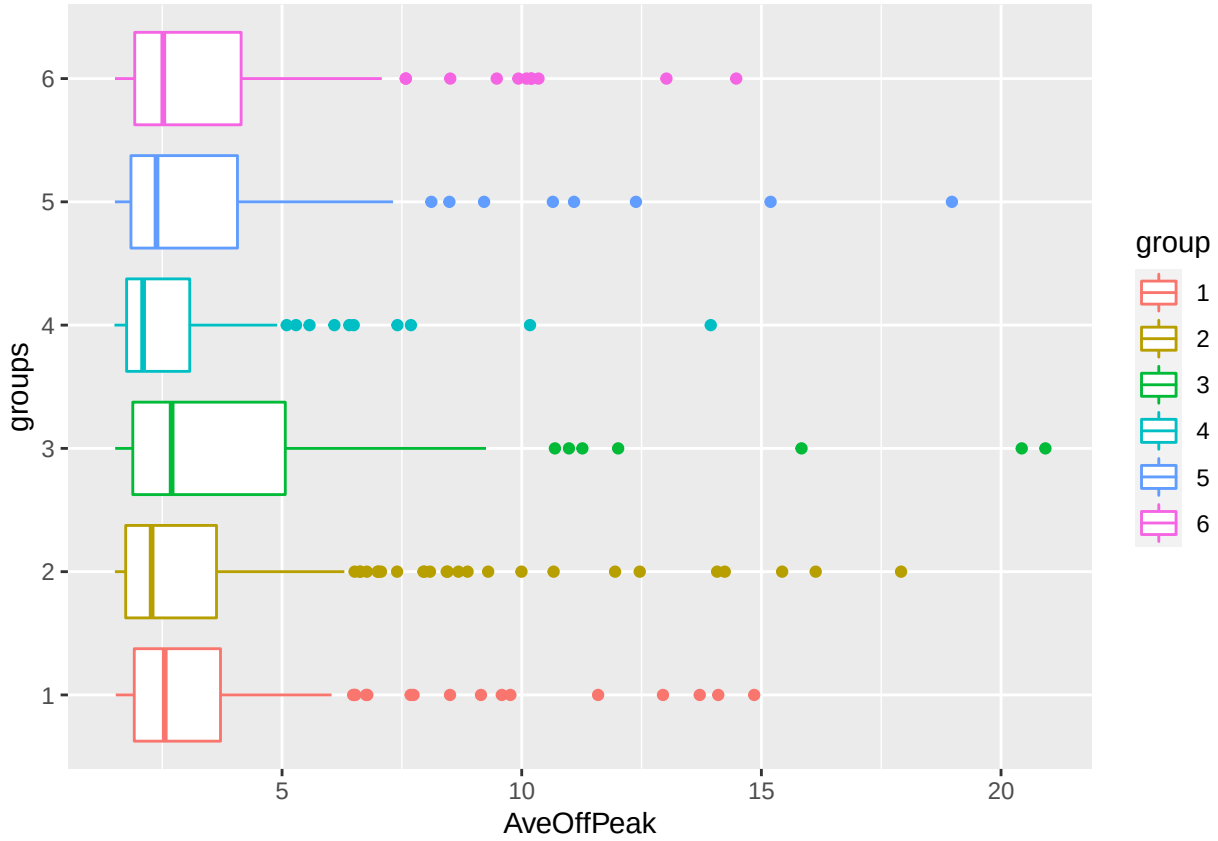
```
##
## [[11]]
```



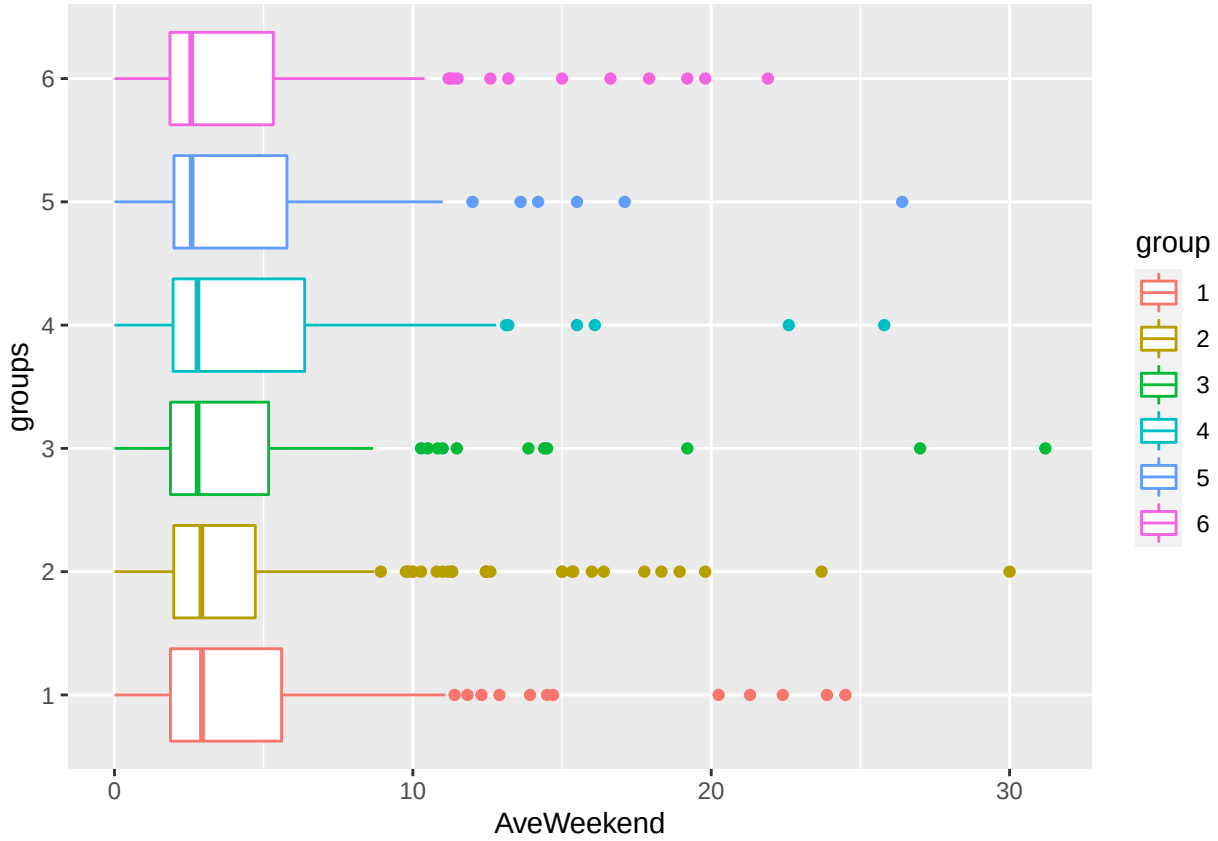

```
##
## [[12]]
```



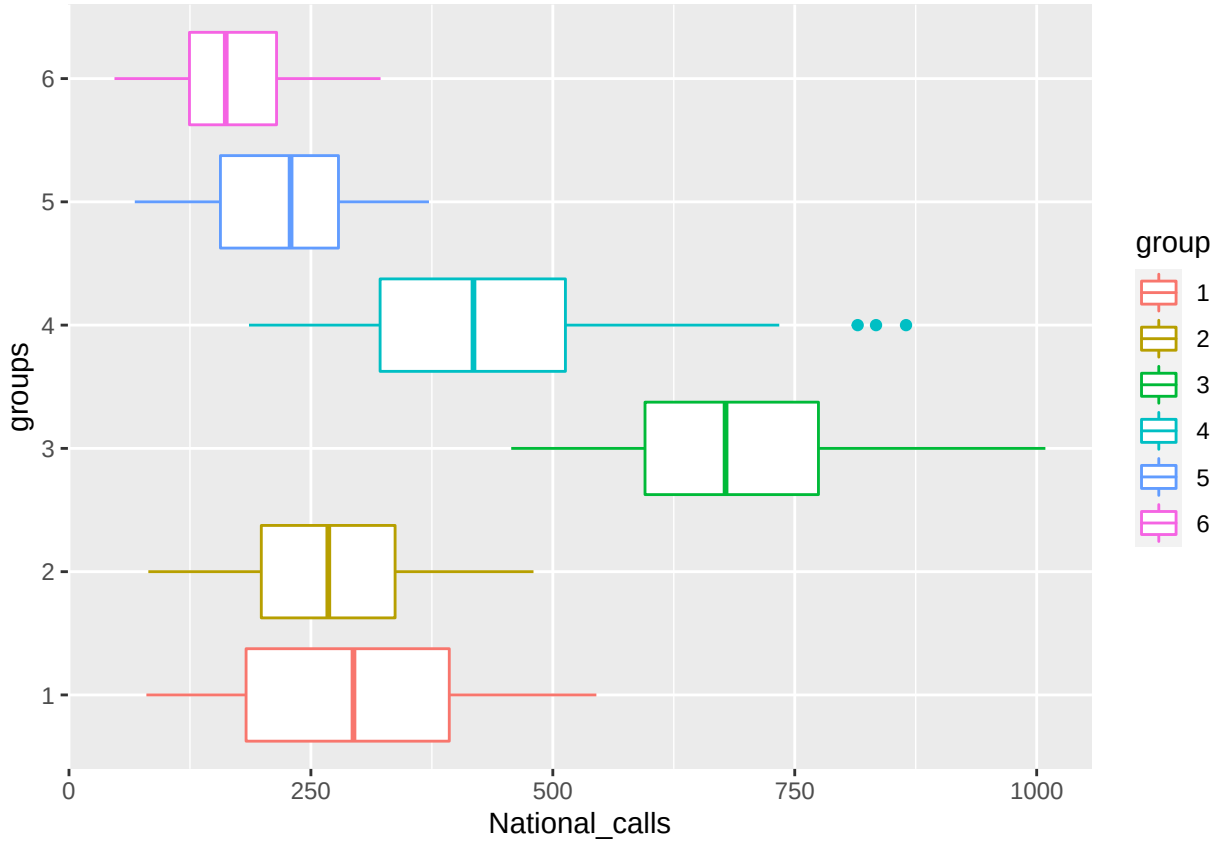

```
##
## [[13]]
```



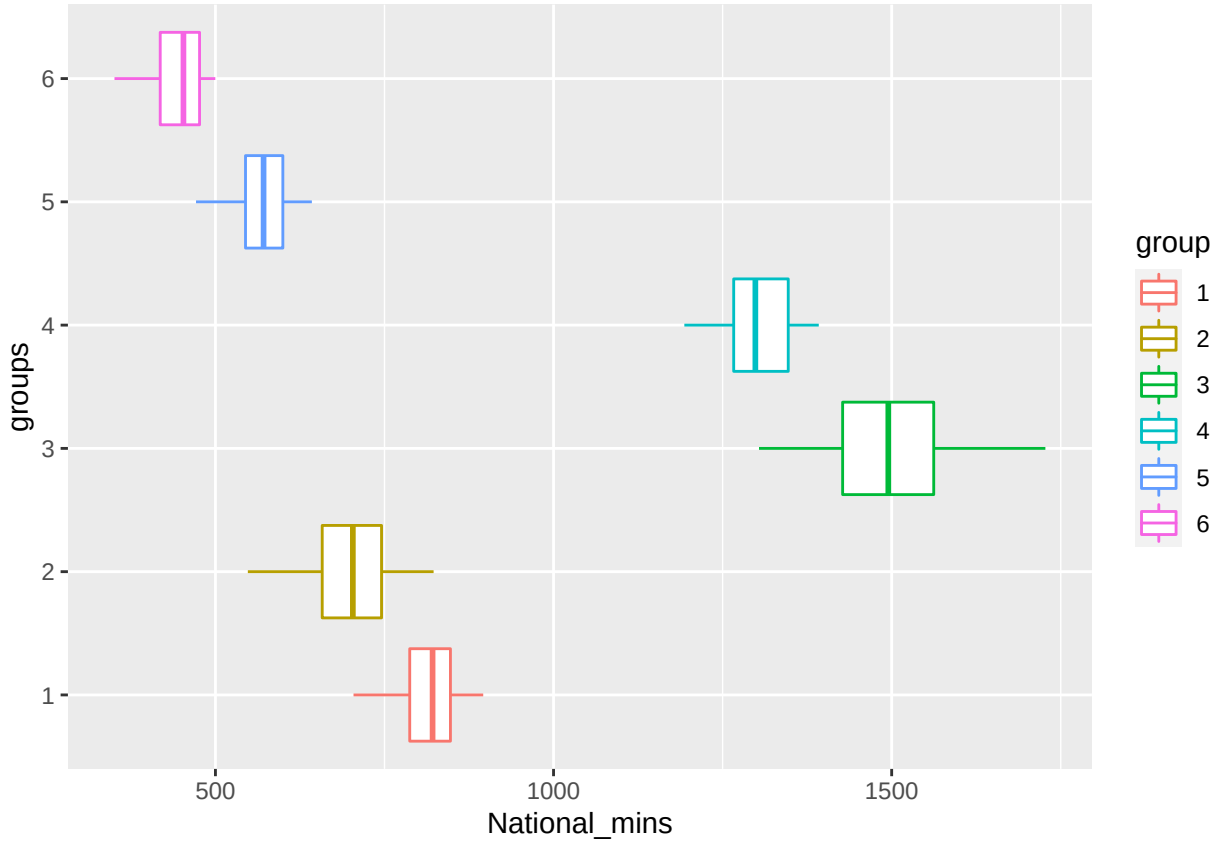

```
##
## [[14]]
```



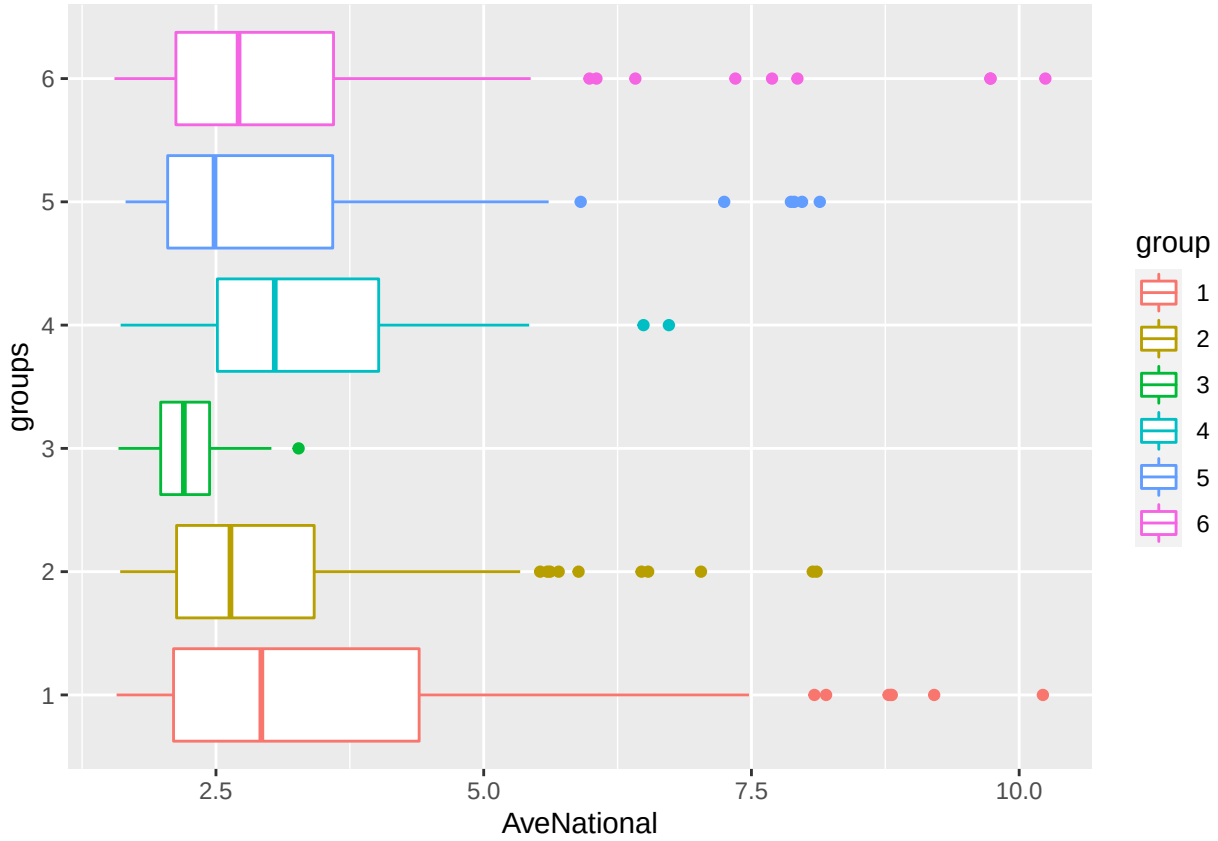

```
##
## [[15]]
```


groups
6
5
4
3
2
1
0
250
500
750
1000
National_calls
group
1
2
3
4
5
6

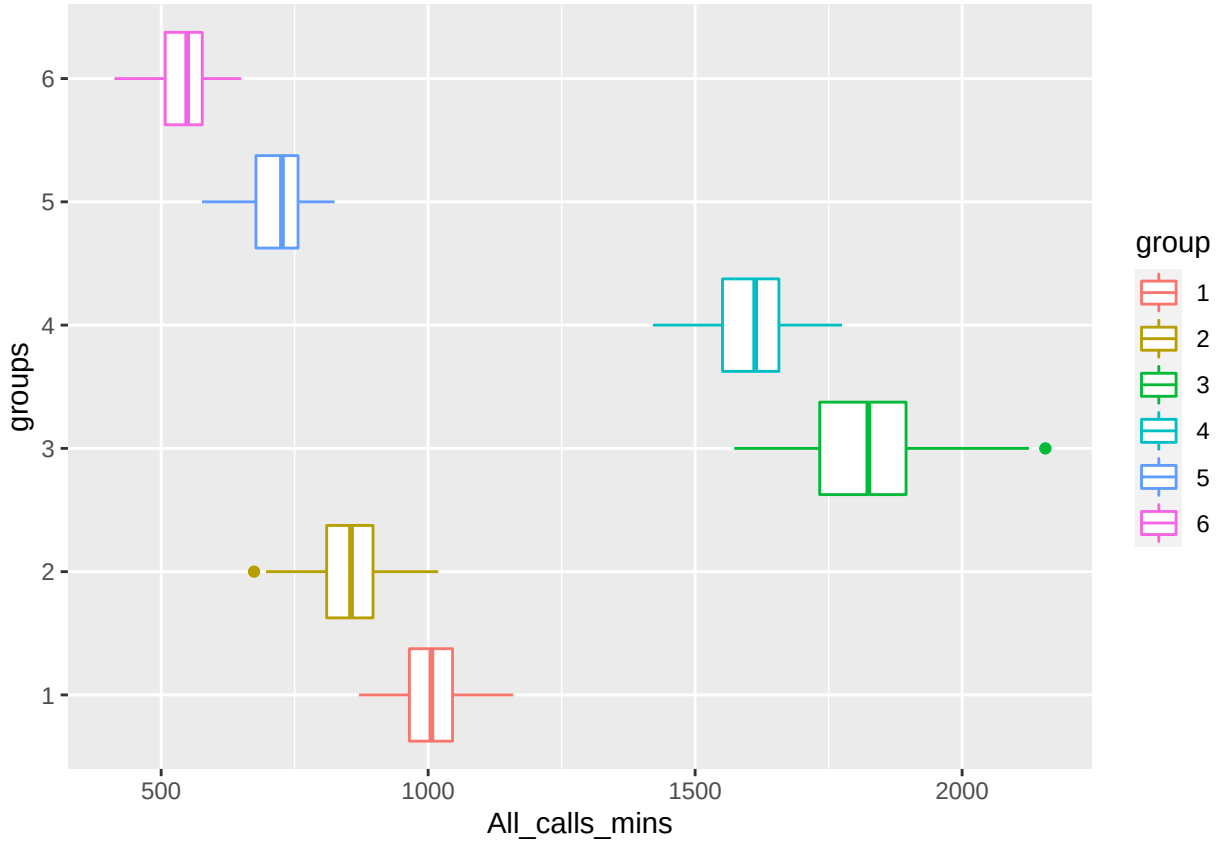
```
##
## [[16]]
```



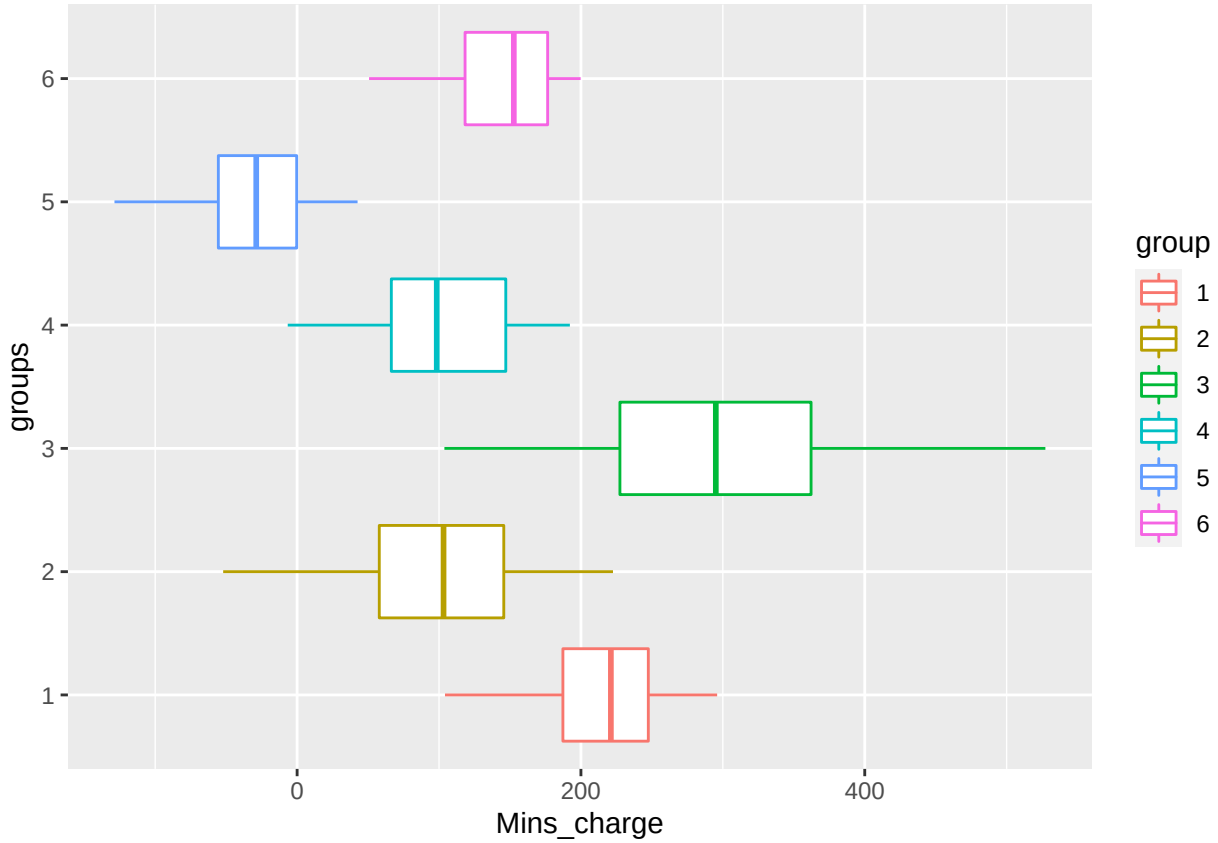

```
##
## [[17]]
```



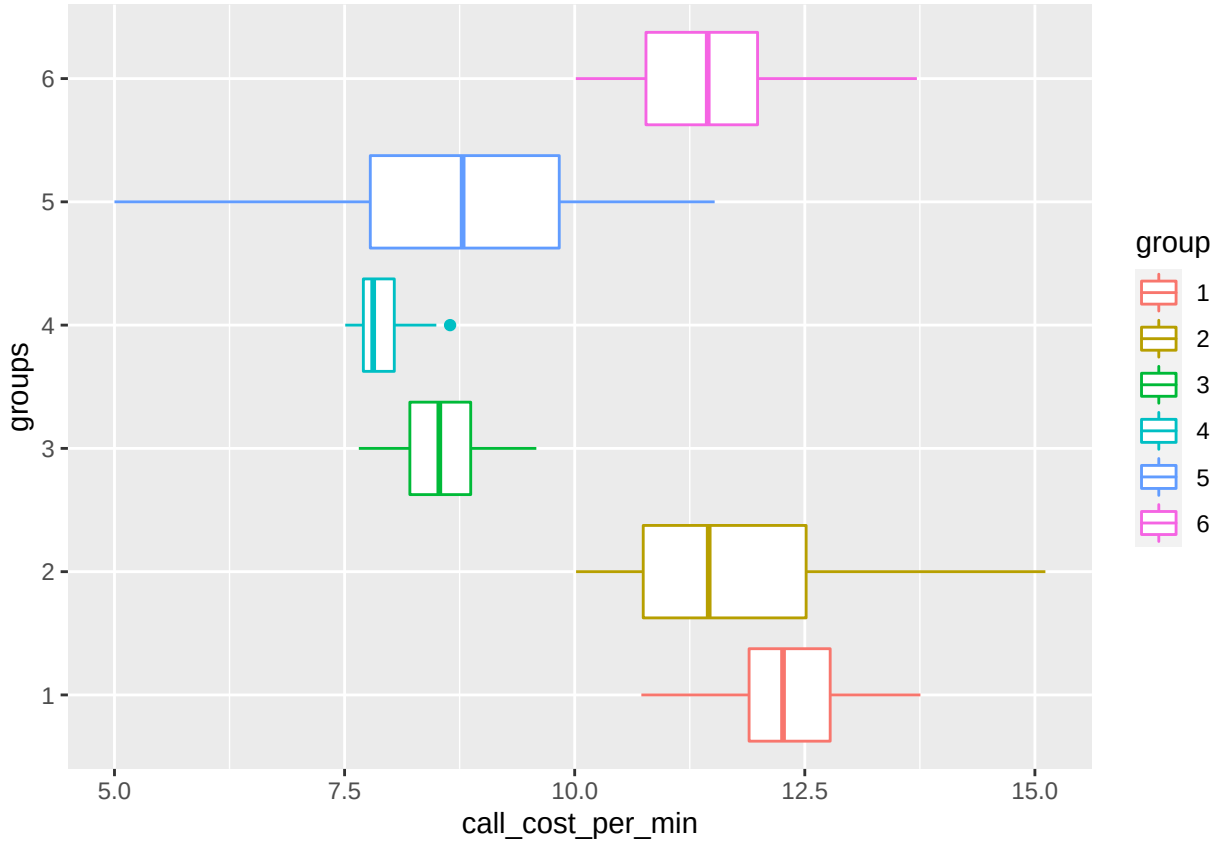

```
##
## [[18]]
```


groups
6
5
4
3
2
1
500
1000
1500
2000
All_calls_mins
group
1
2
3
4
5
6

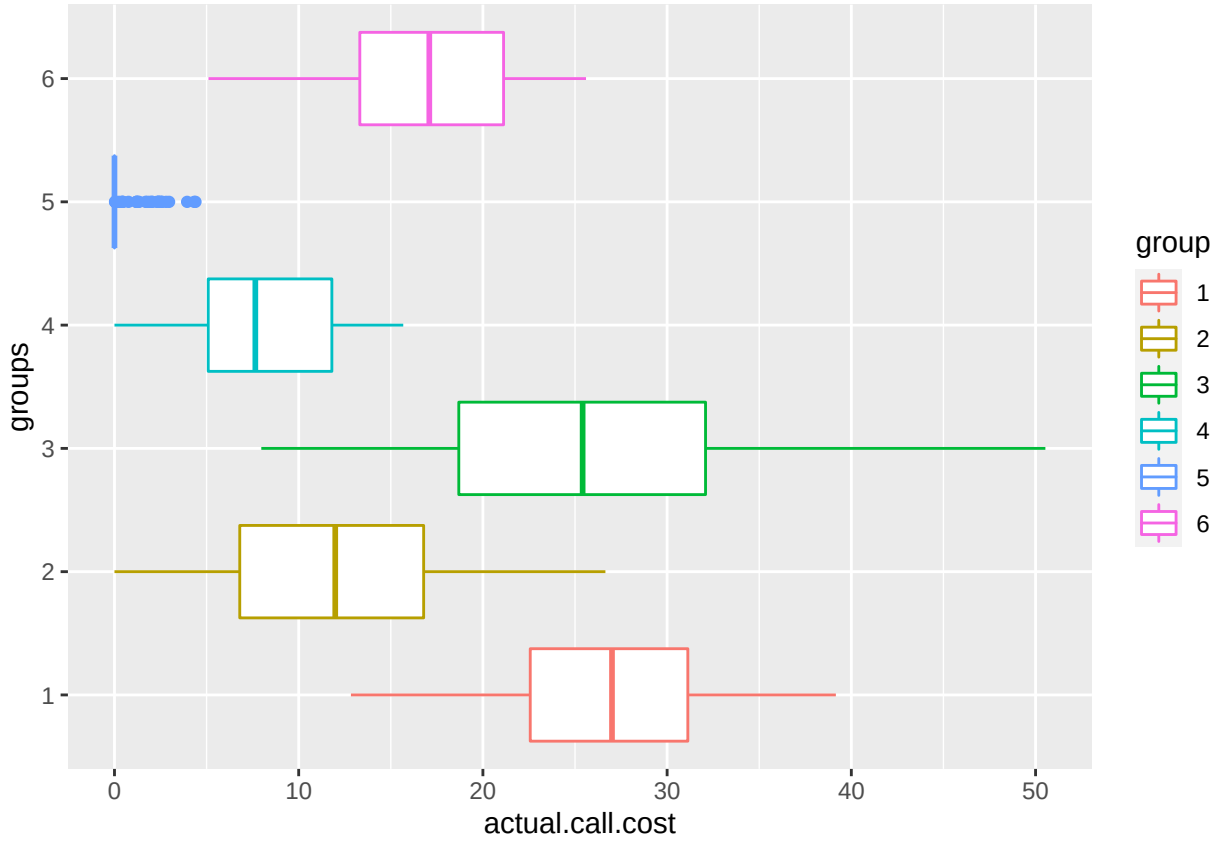
```
##
## [[19]]
```



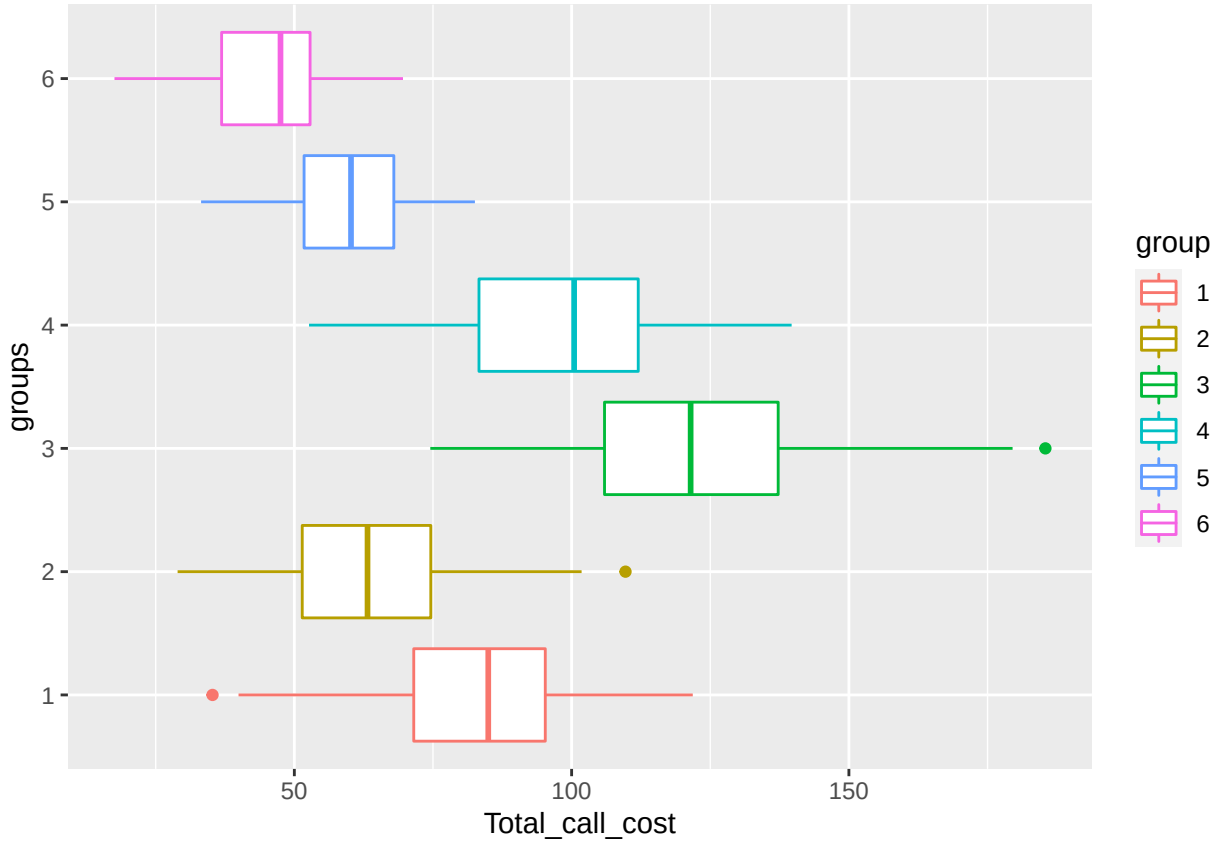

```
##
## [[20]]
```


groups
6
5
4
3
2
1
5.0
7.5
10.0
12.5
15.0
call_cost_per_min
group
1
2
3
4
5
6

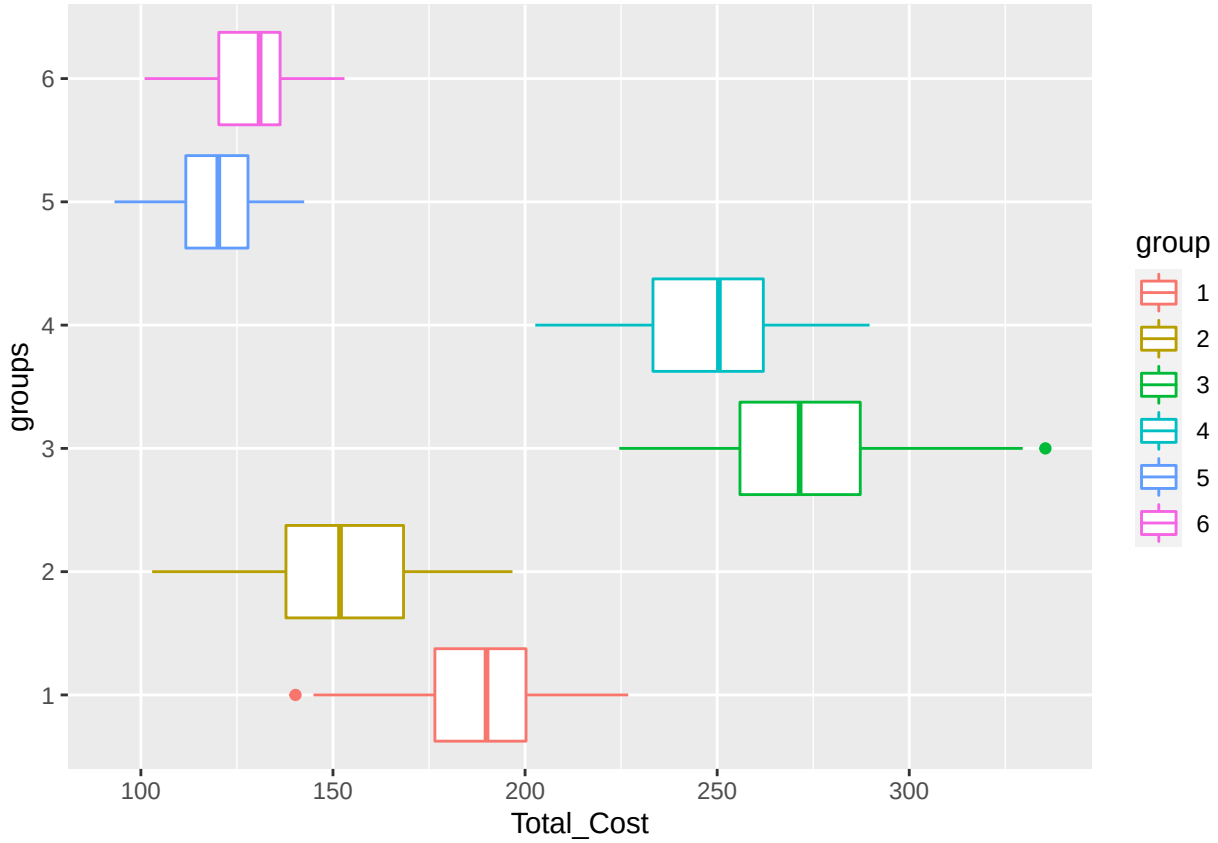
```
##
## [[21]]
```



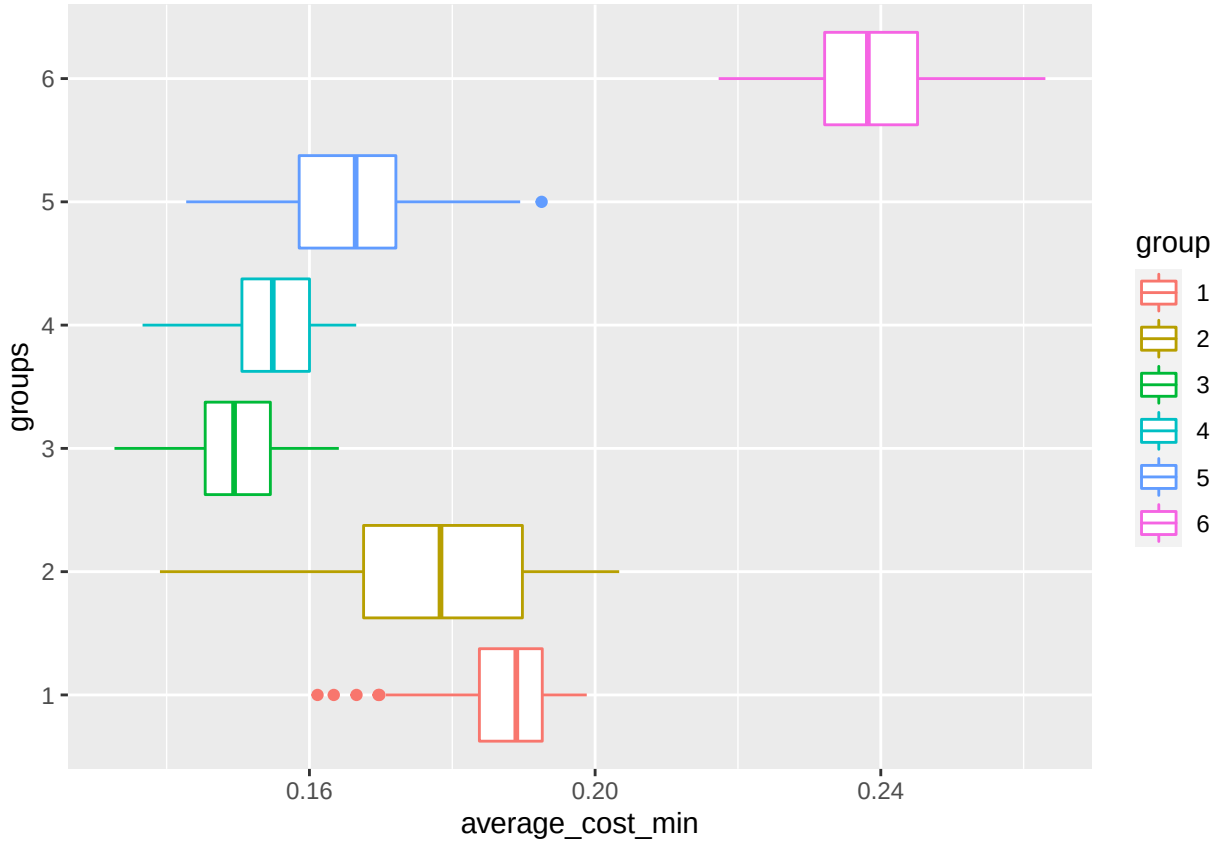

```
##
## [[22]]
```



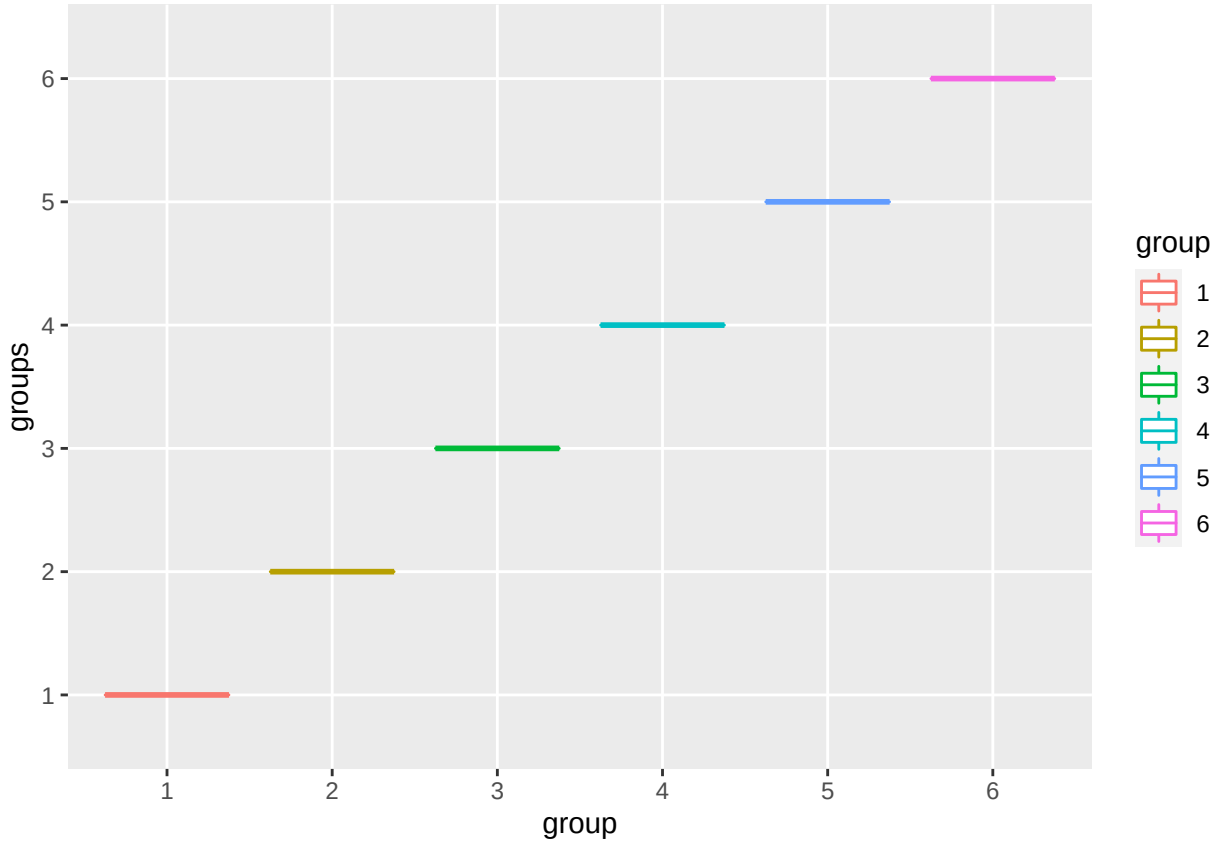

```
##
## [[23]]
```




```
##
## [[24]]
```




```
##
## [[25]]
```



Groupwise EDA

Perform a small EDA for each group to see if we can extract some obvious features.

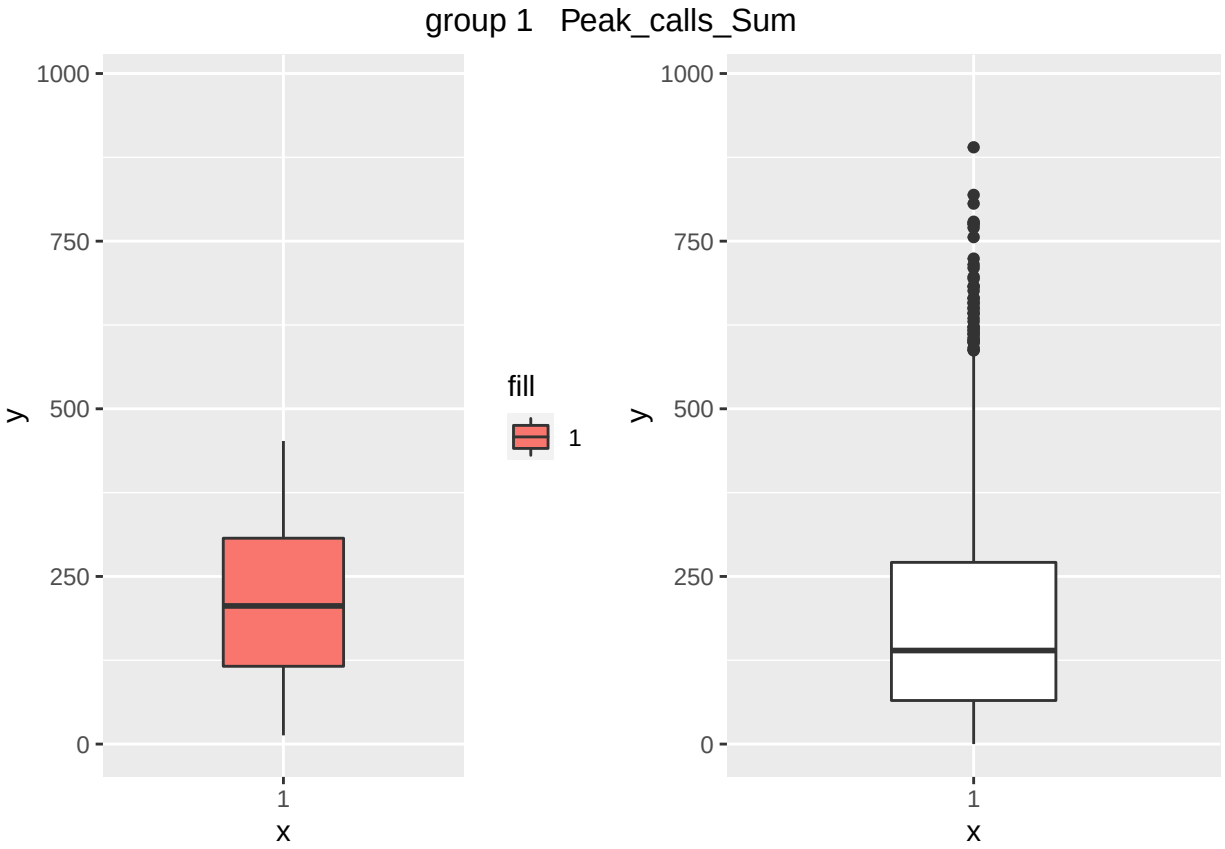
Let's recall the overall summary:

1.

For each variable, check the boxplot (`figures/boxplots`). Let's focus on the model variables.

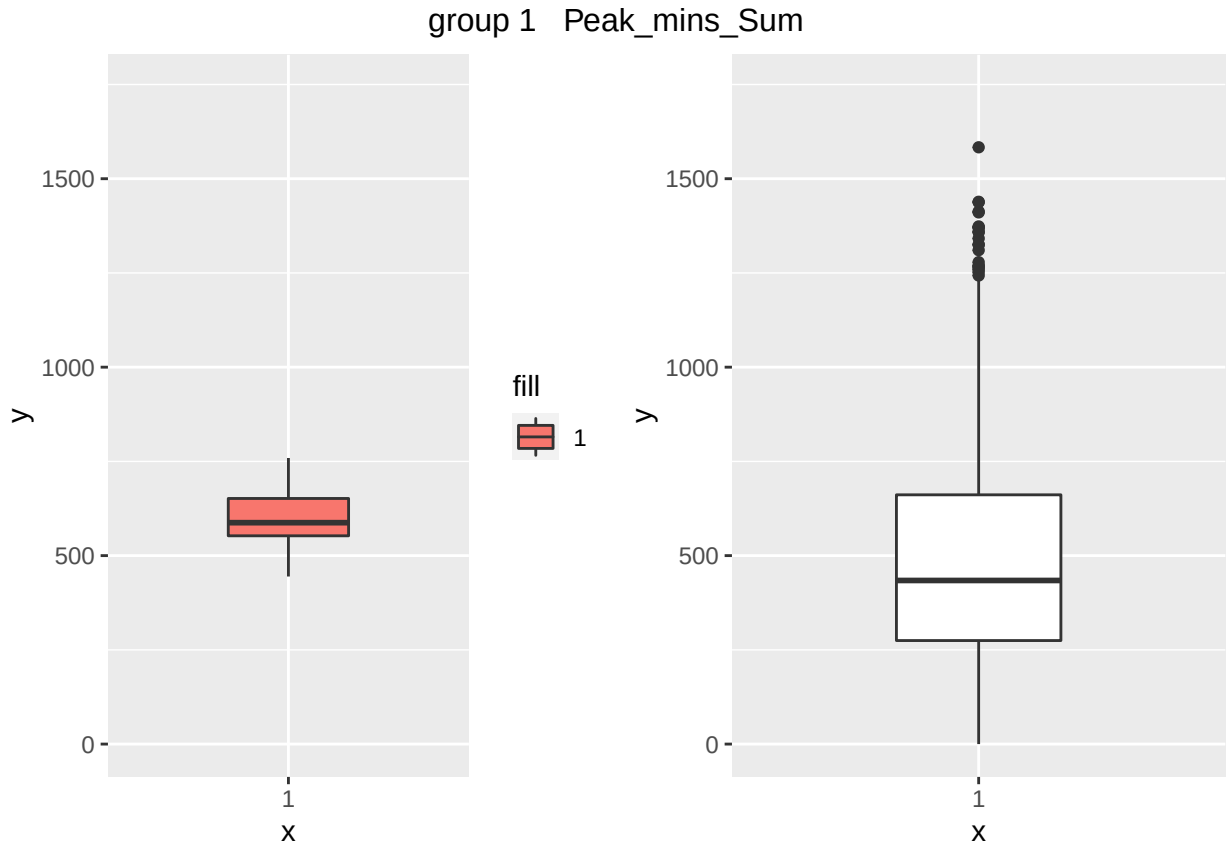
- Peak_calls_Sum:

```
## [1] "Bigger than base median"
```



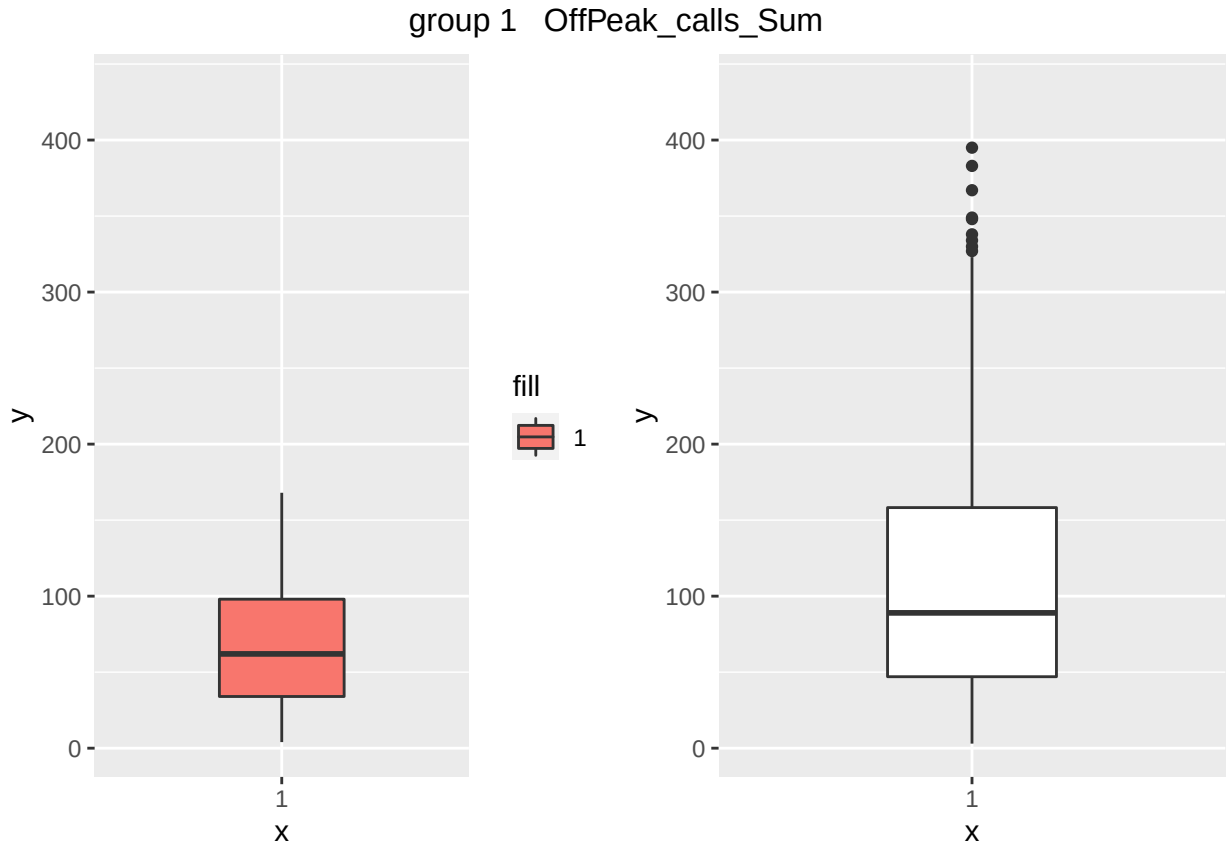
- Peak_mins_Sum:

```
## [1] "Bigger than base median"
```



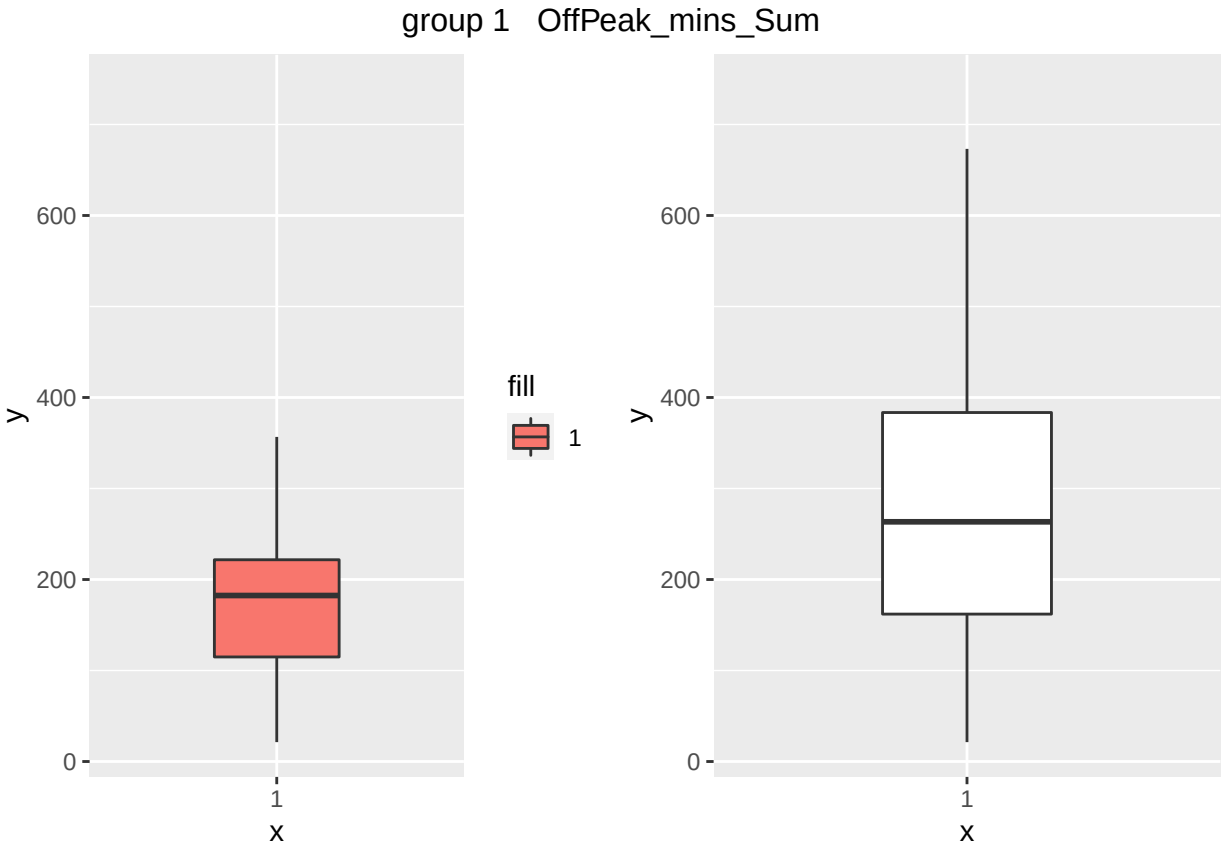
- OffPeak_calls_Sum:

```
## [1] "Smaller than base median"
```



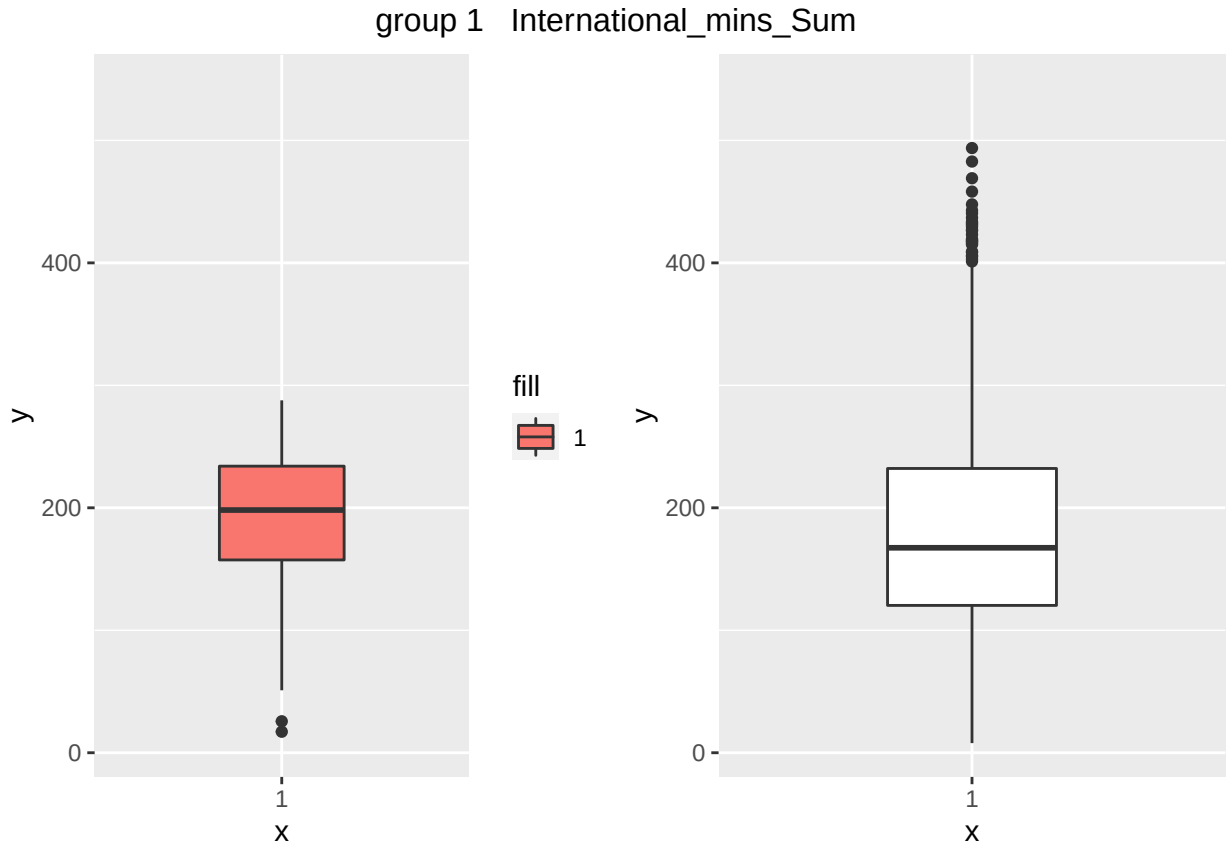
- OffPeak_mins_Sum:

```
## [1] "Smaller than base median"
```



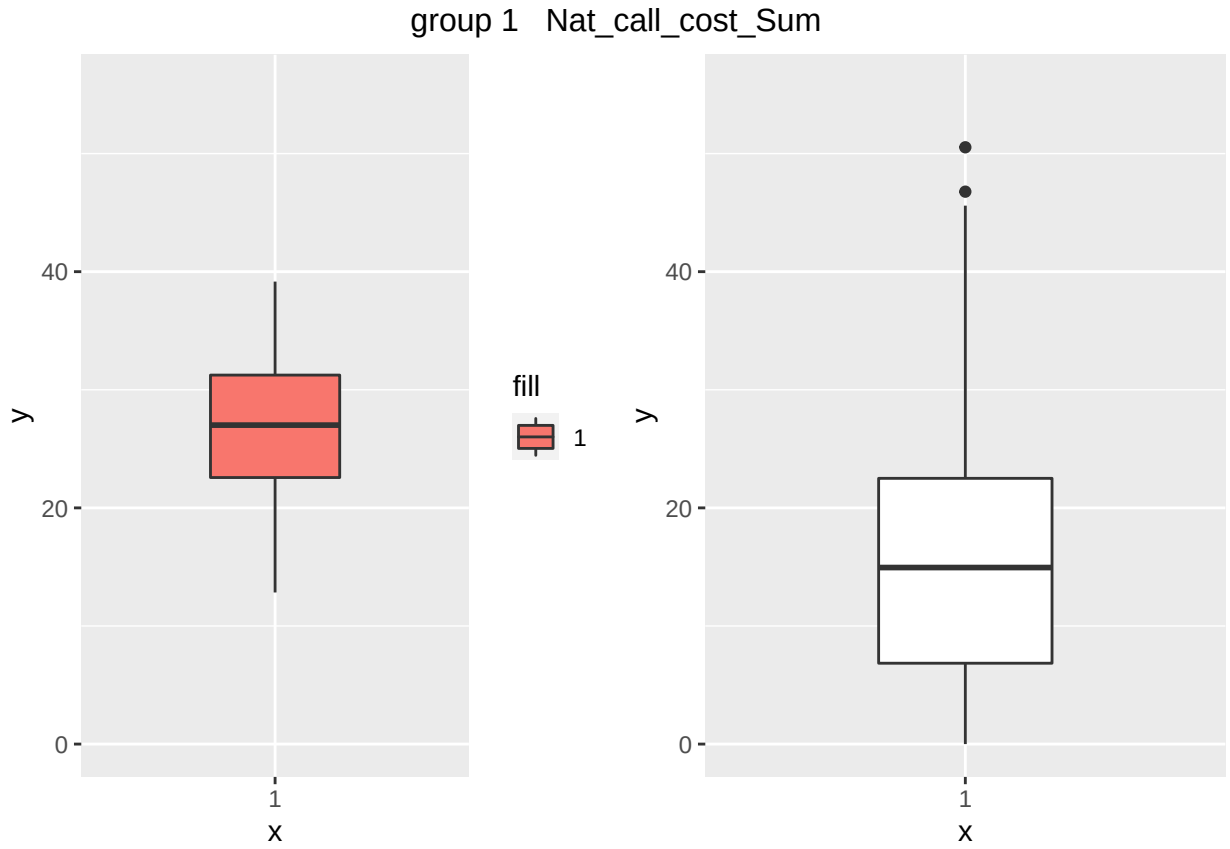
- International_mins_Sum:

```
## [1] "Bigger than base median"
```



- Nat_call_cost_Sum:

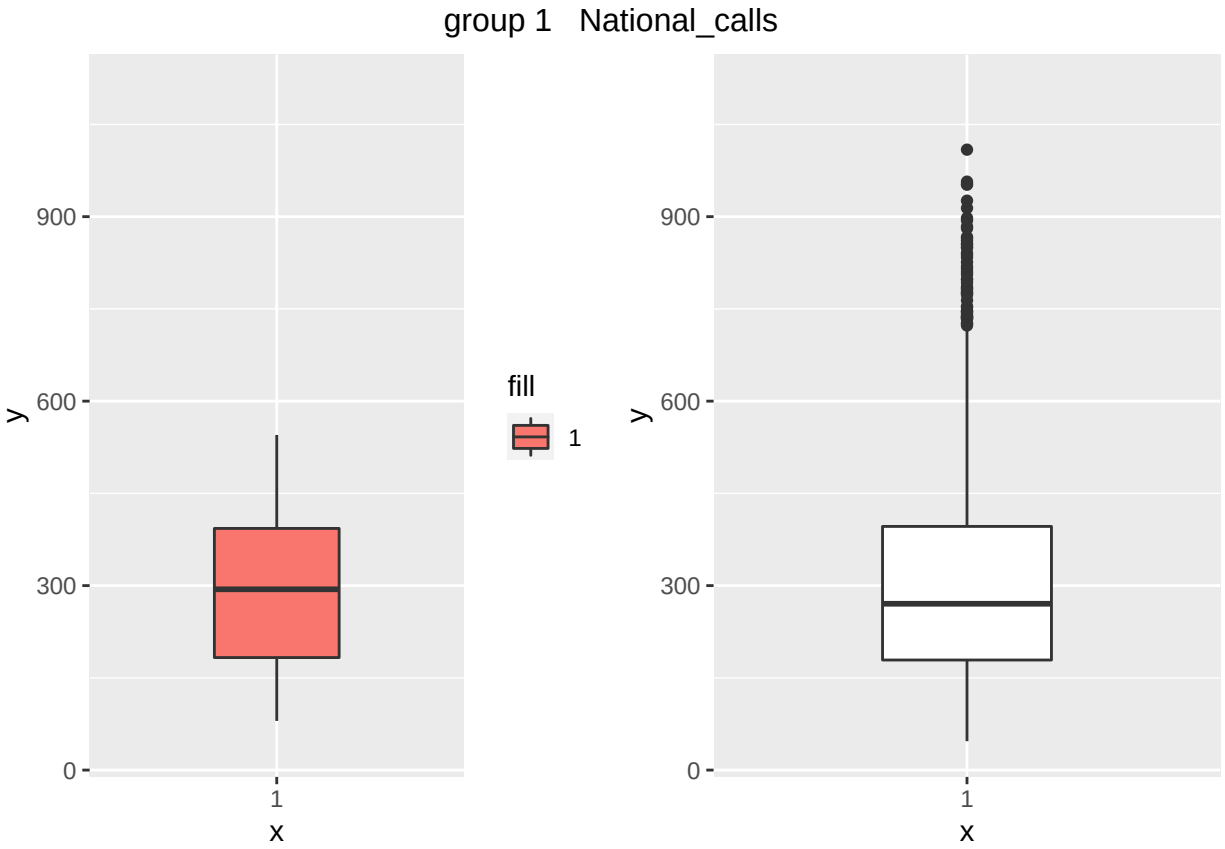
```
## [1] "Bigger than 3rd base quartile"
```



A lot higher than average. (High change of it being significantly bigger)

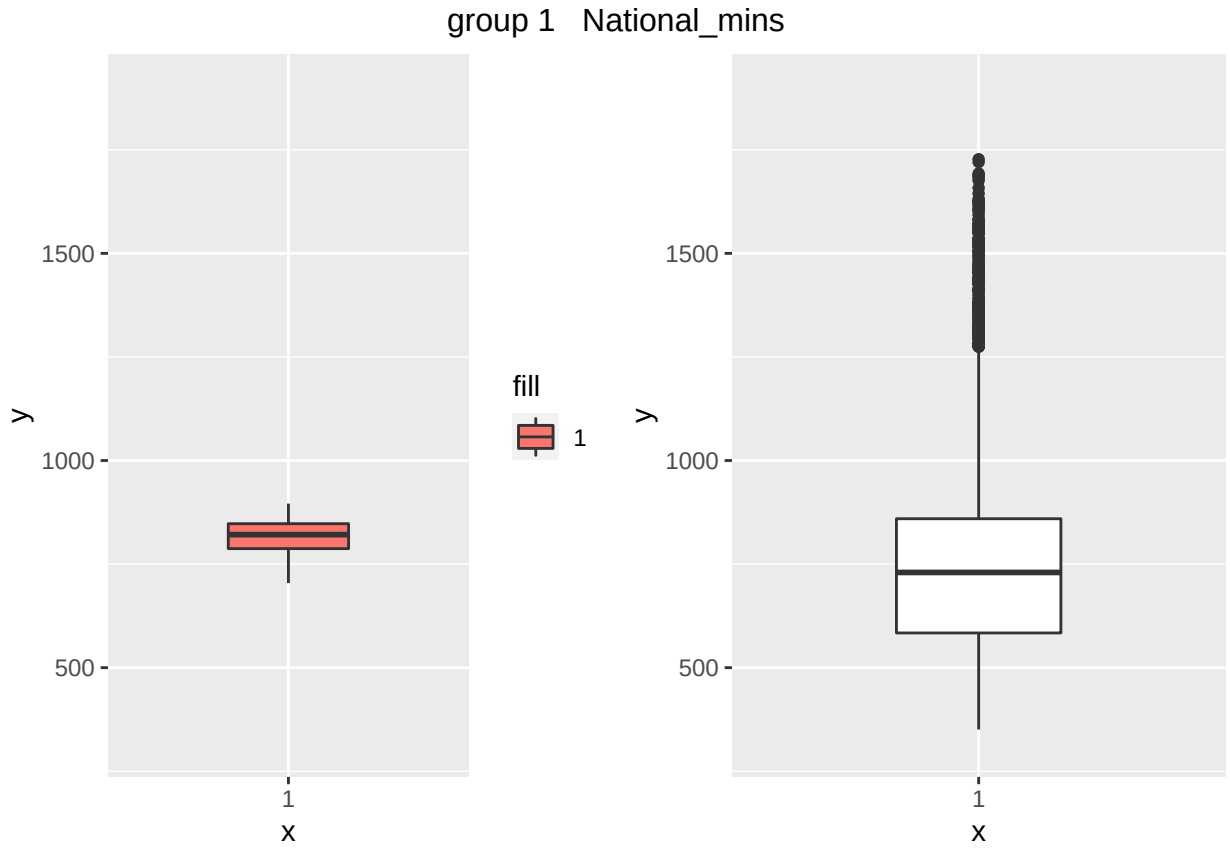
- National_calls:

```
## [1] "Bigger than base median"
```



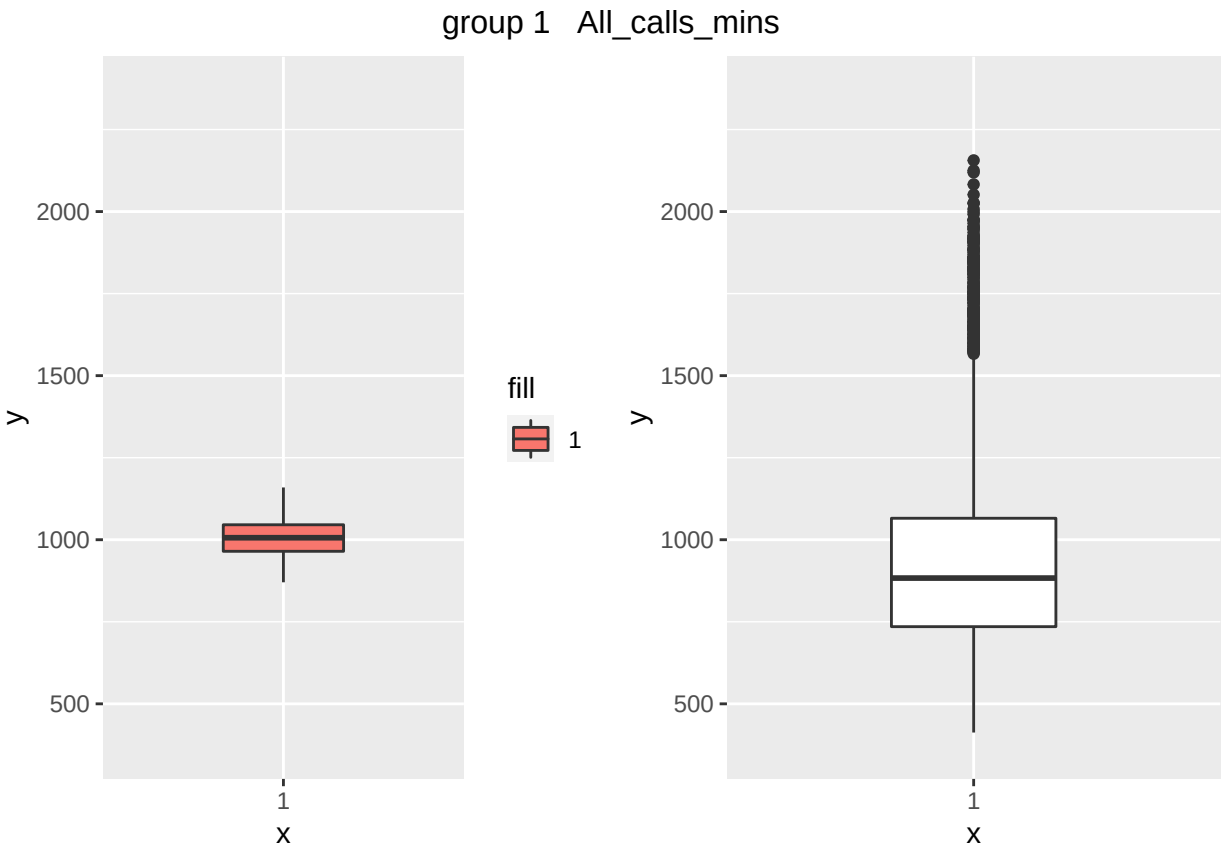
- National_mins:

```
## [1] "Bigger than base median"
```



- All_calls_mins:

```
## [1] "Bigger than base median"
```

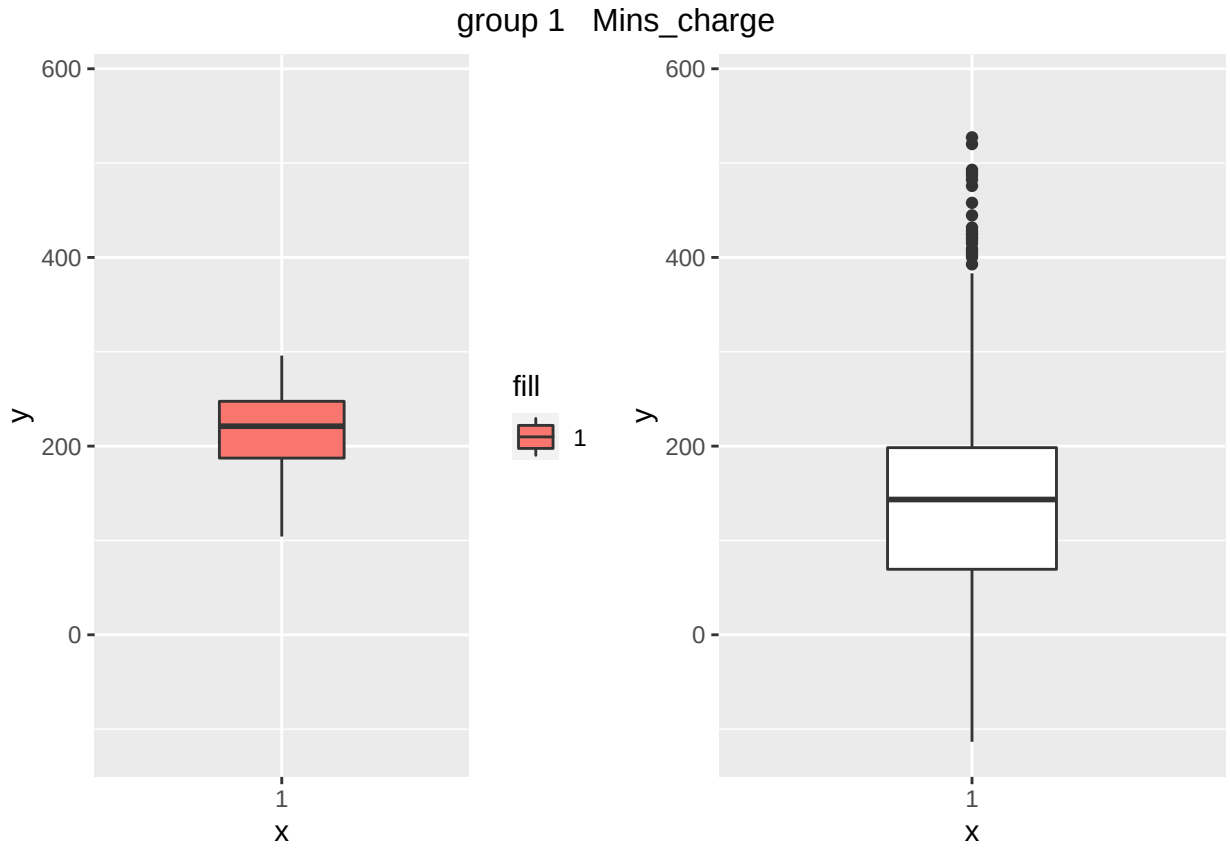


- Mins_charge:

```
## [1] "Bigger than 3rd base quartile"
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

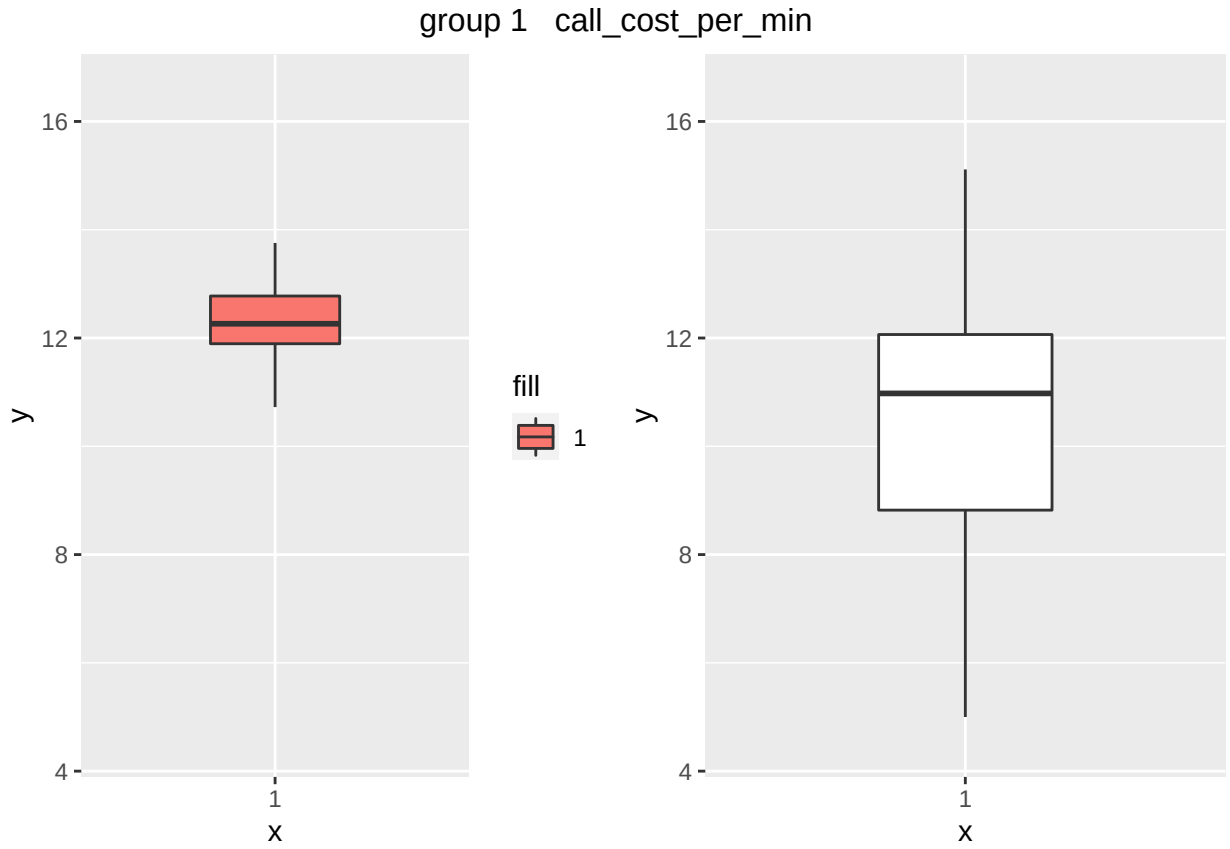
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



Negative values for the whole dataset.

- call_cost_per_min:

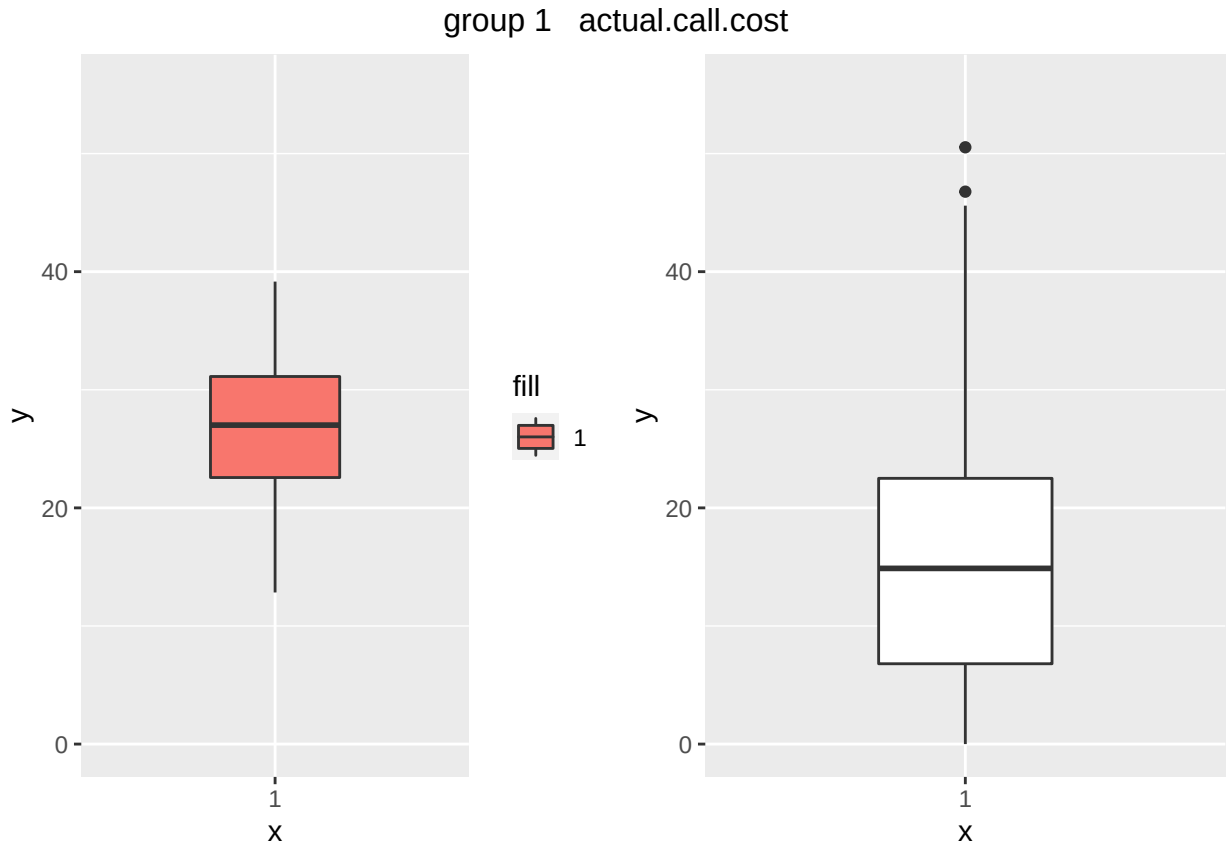
```
## [1] "Bigger than 3rd base quartile"
```



Higher than average.

- actual.call.cost:

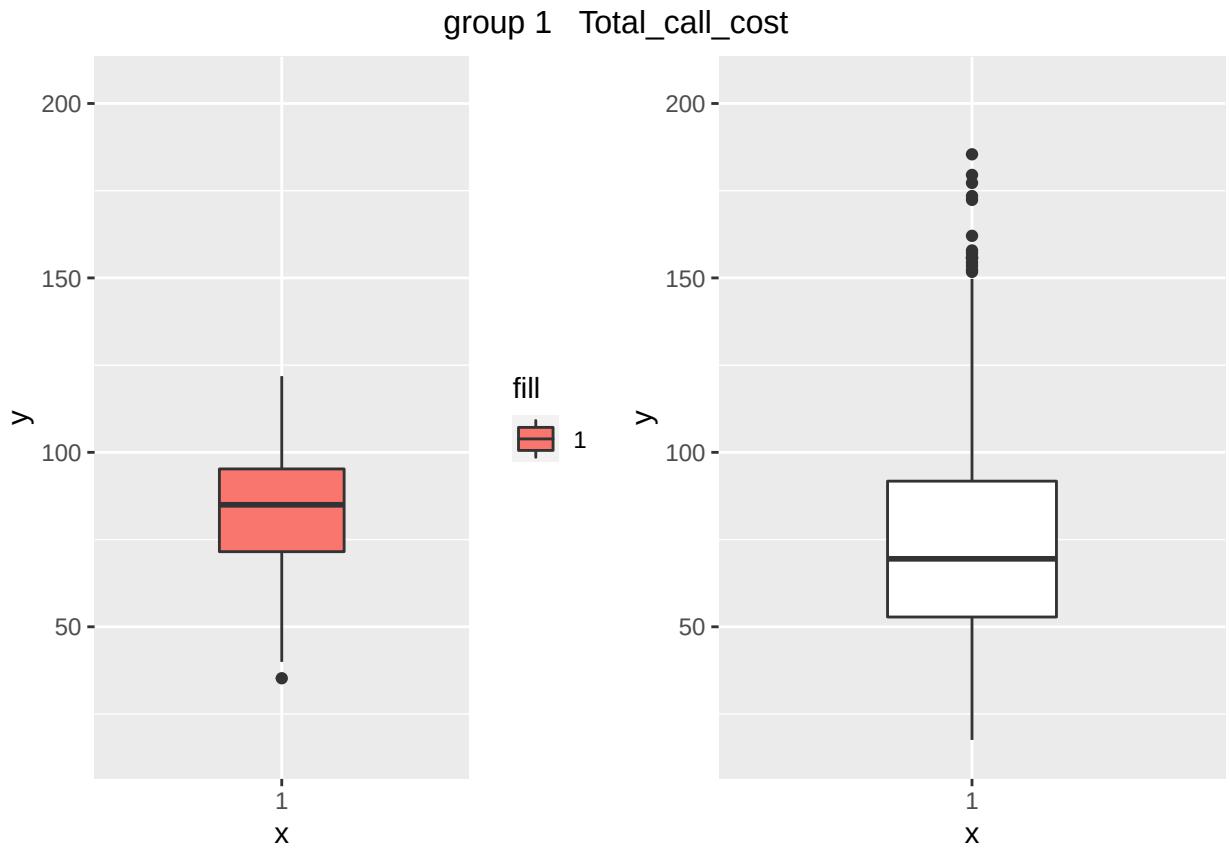
```
## [1] "Bigger than 3rd base quartile"
```



Higher than average.

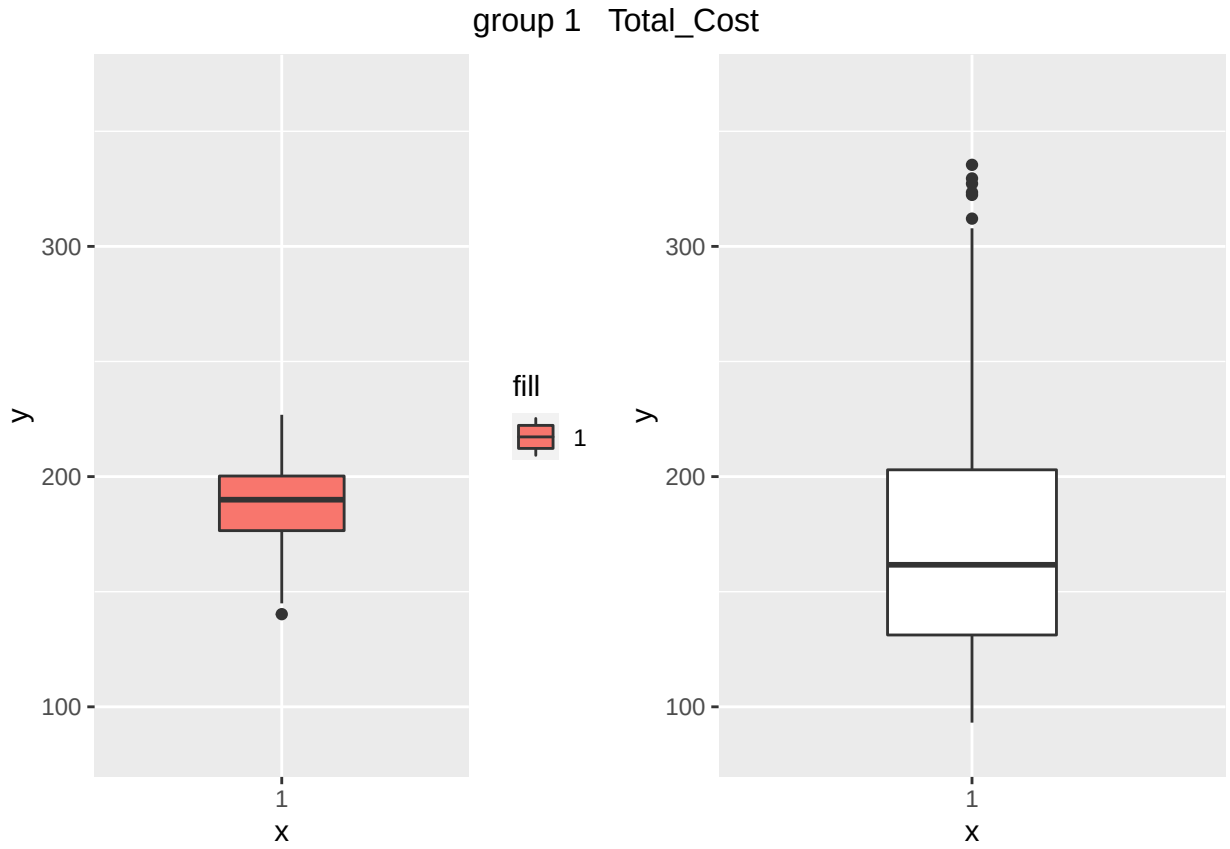
- Total_call_cost:

```
## [1] "Bigger than base median"
```



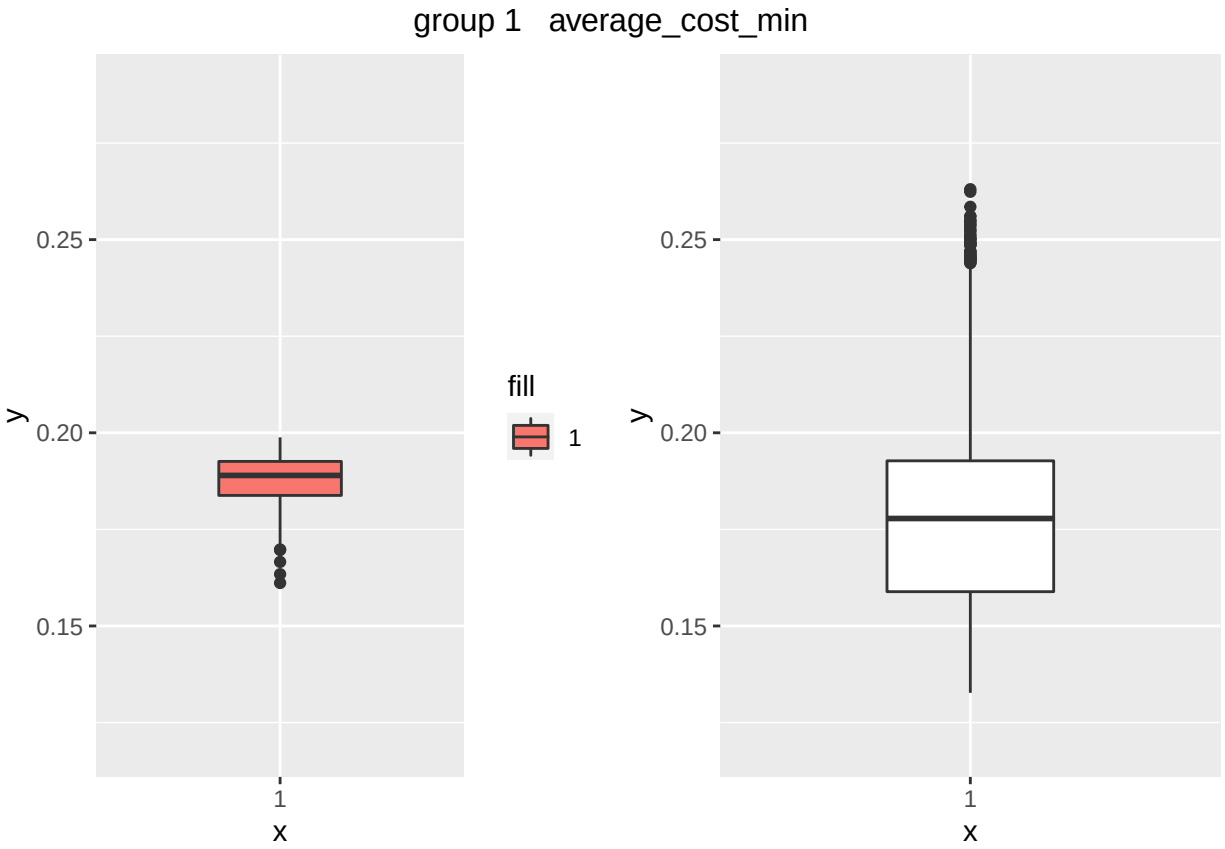
- Total_Cost:

```
## [1] "Bigger than base median"
```



- average_cost_min:

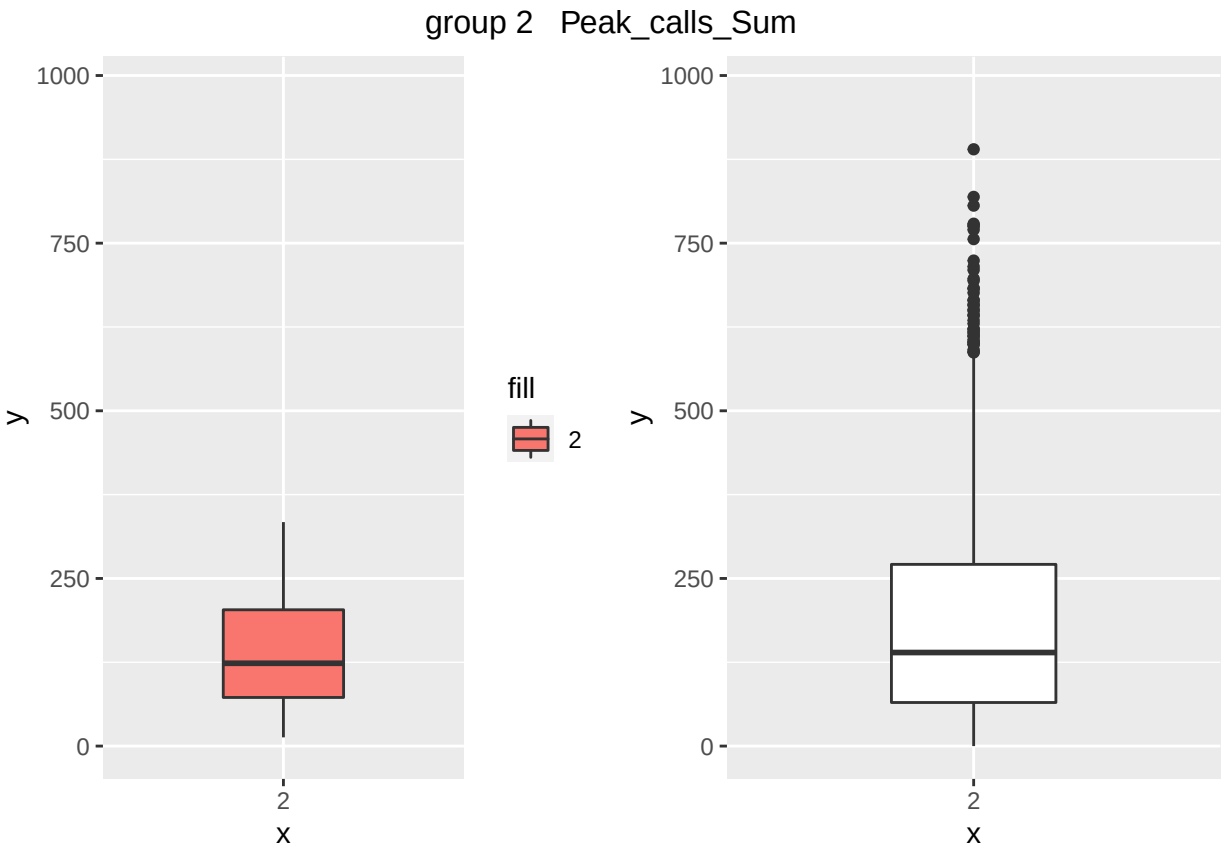
```
## [1] "Bigger than base median"
```



2.

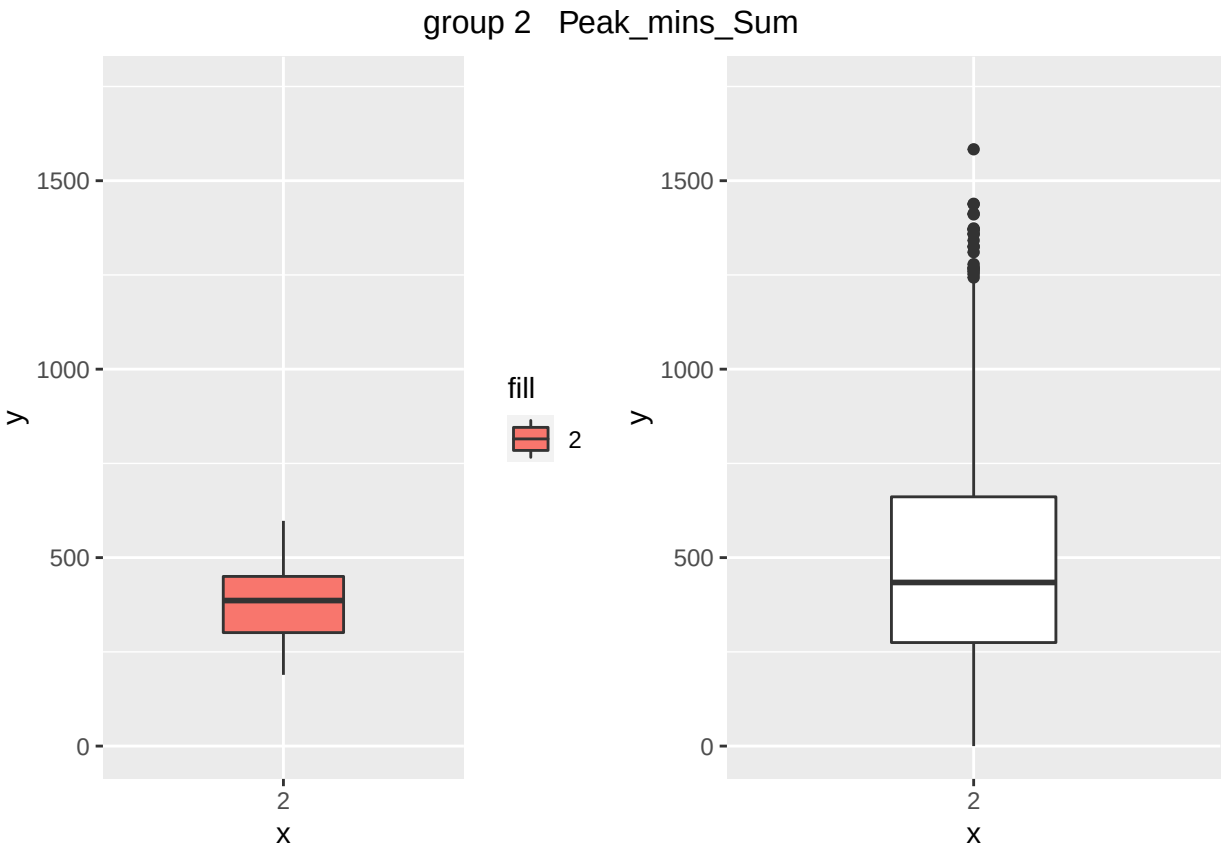
- Peak_calls_Sum:

```
## [1] "Smaller than base median"
```



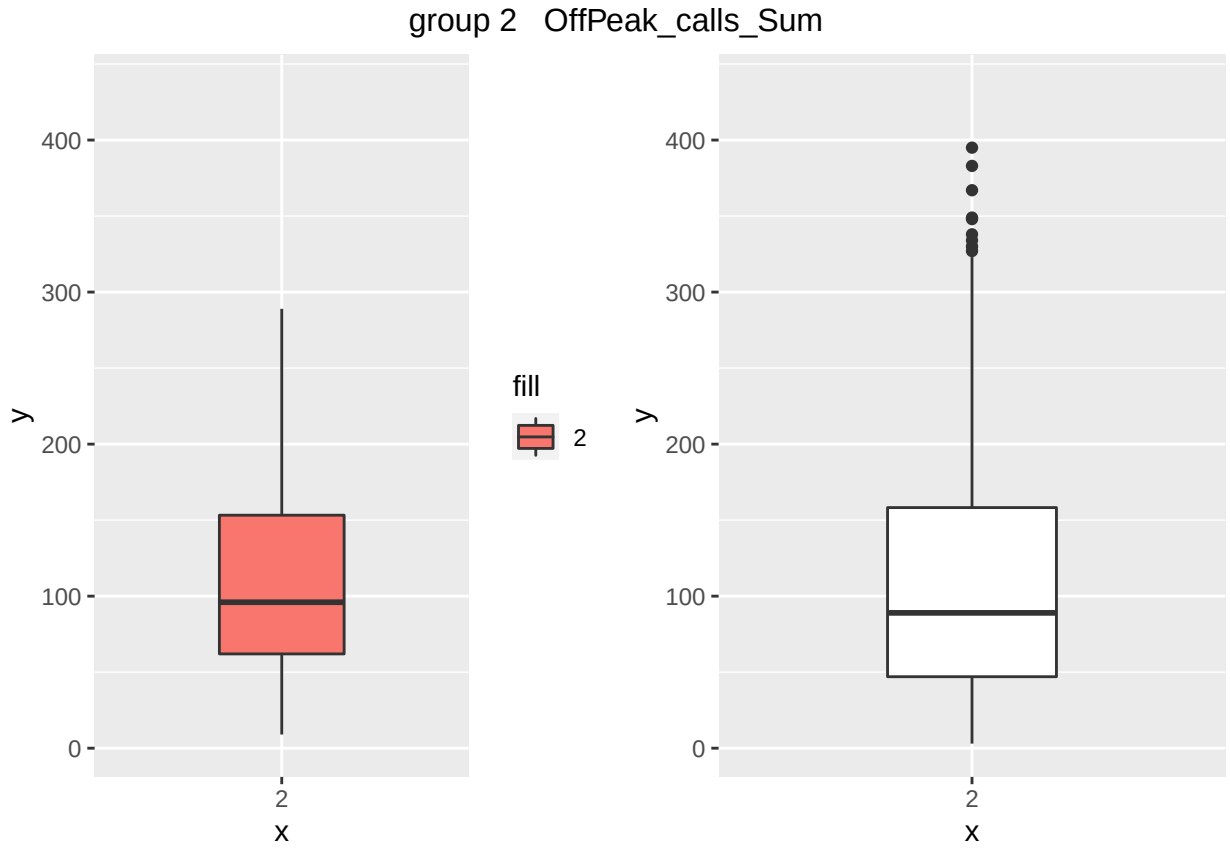
- Peak_mins_Sum:

```
## [1] "Smaller than base median"
```



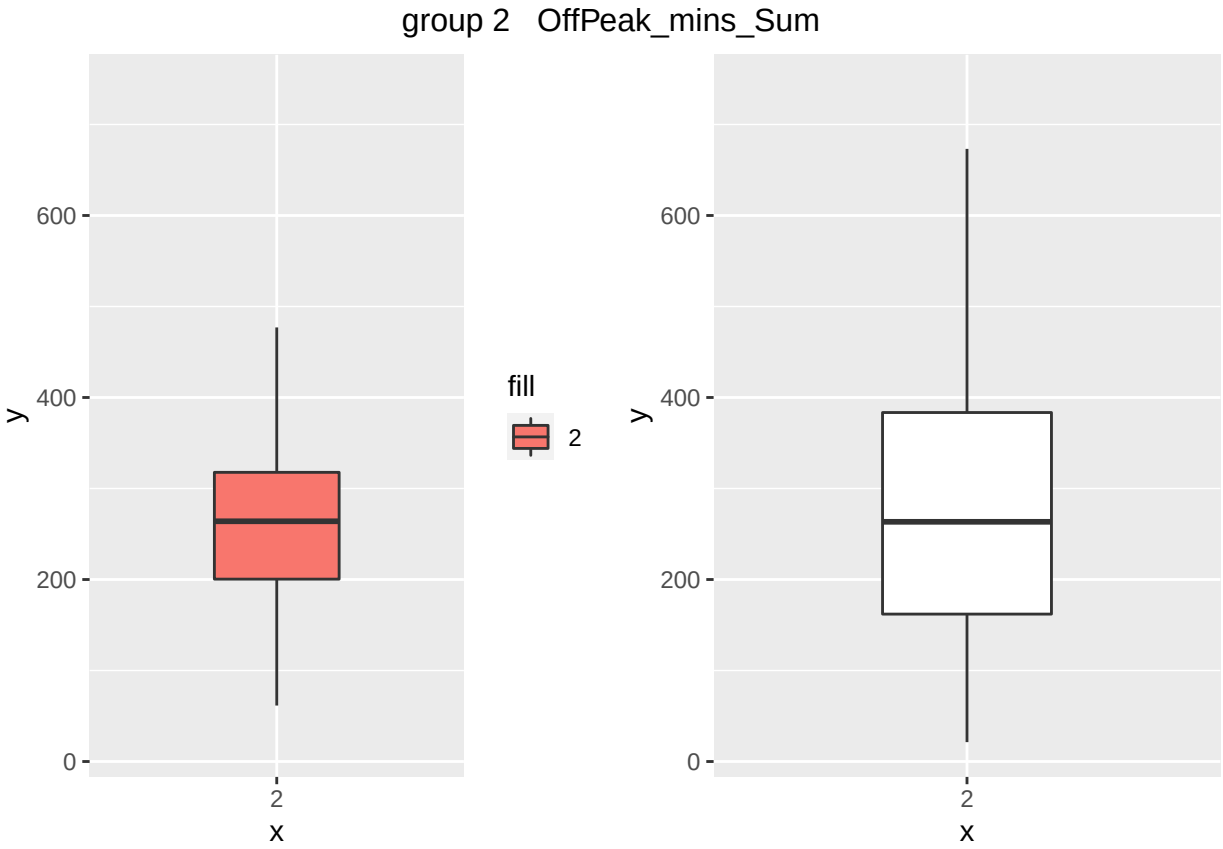
- OffPeak_calls_Sum:

```
## [1] "Bigger than base median"
```



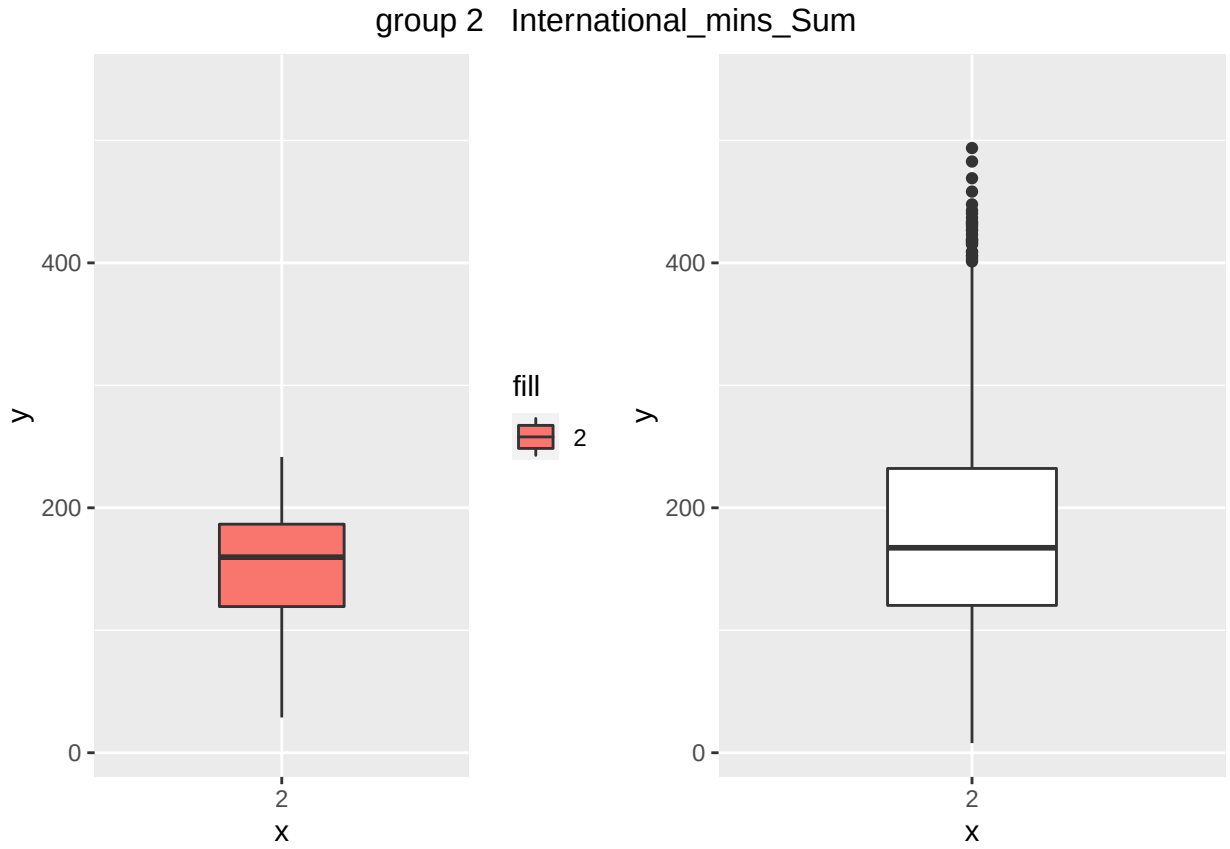
- OffPeak_mins_Sum:

```
## [1] "Bigger than base median"
```



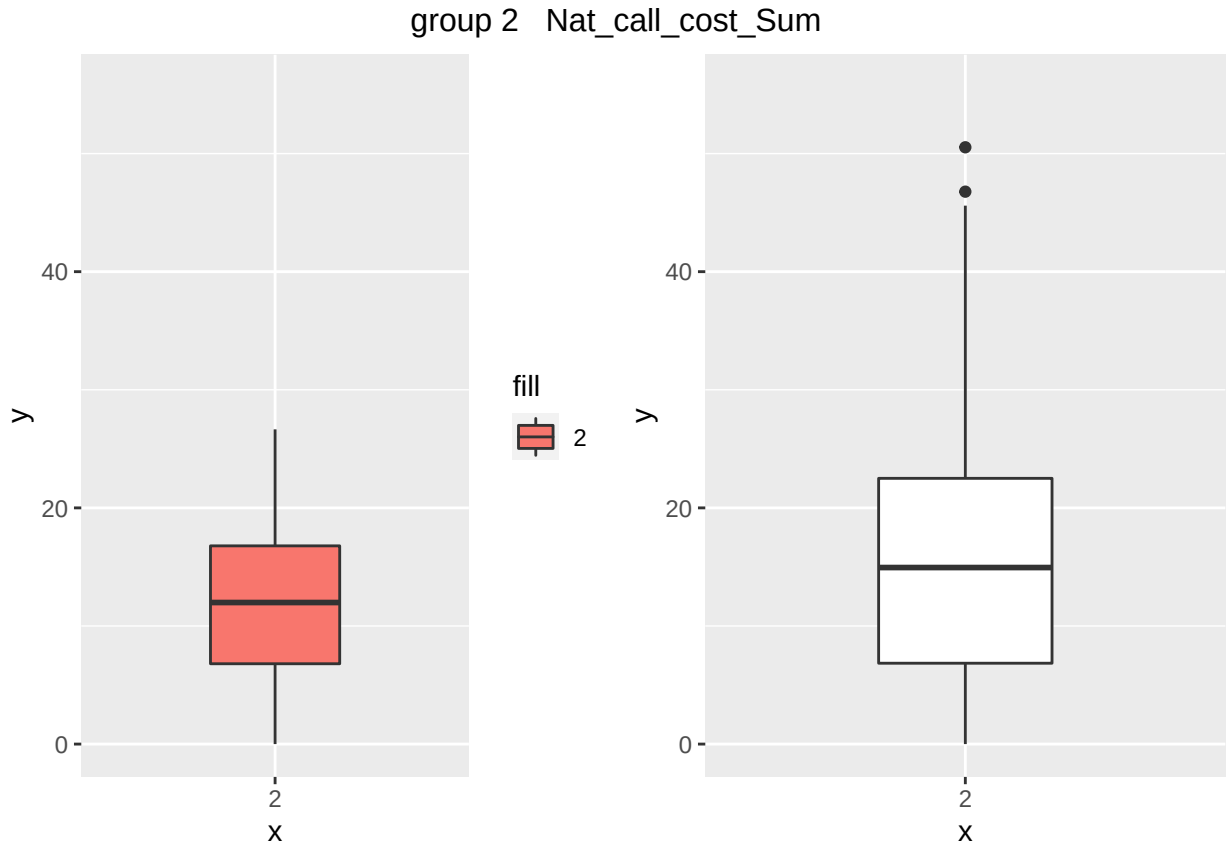
- International_mins_Sum:

```
## [1] "Smaller than base median"
```



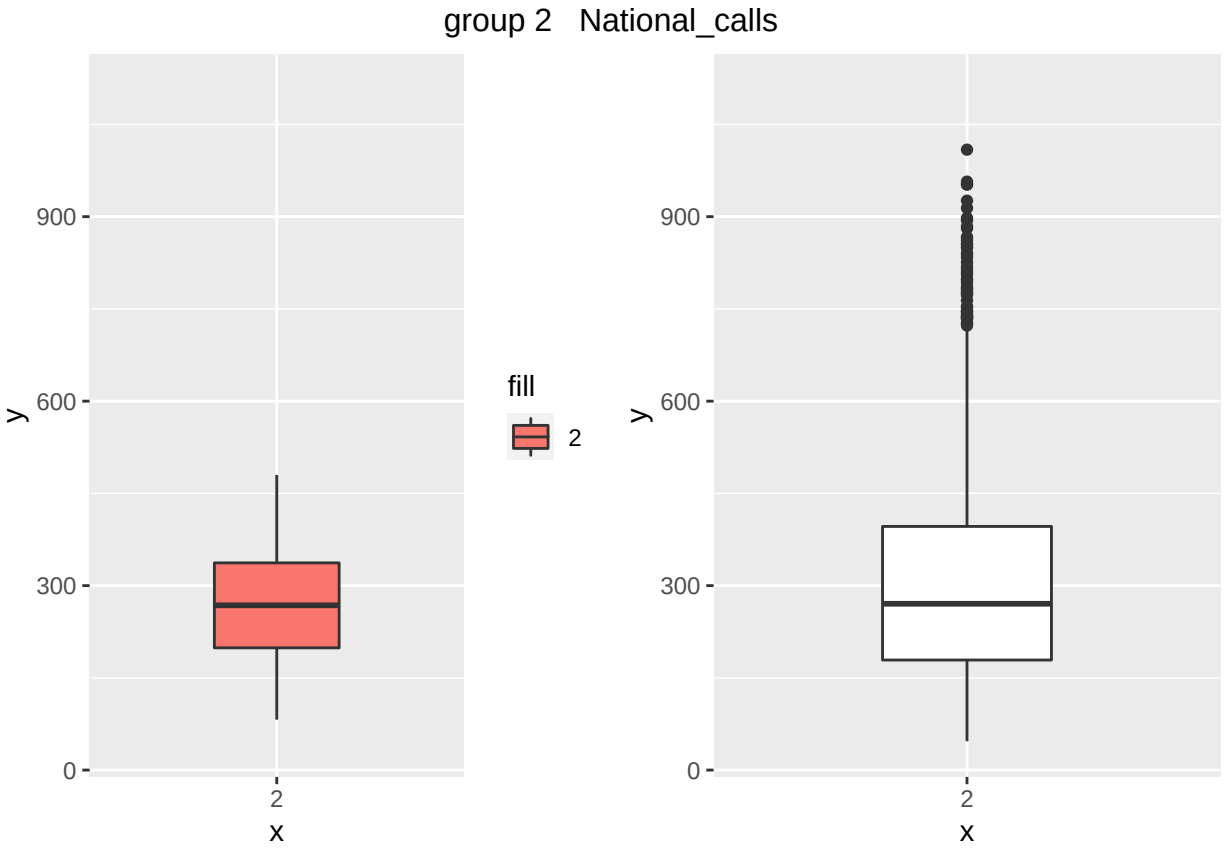
- Nat_call_cost_Sum:

```
## [1] "Smaller than base median"
```



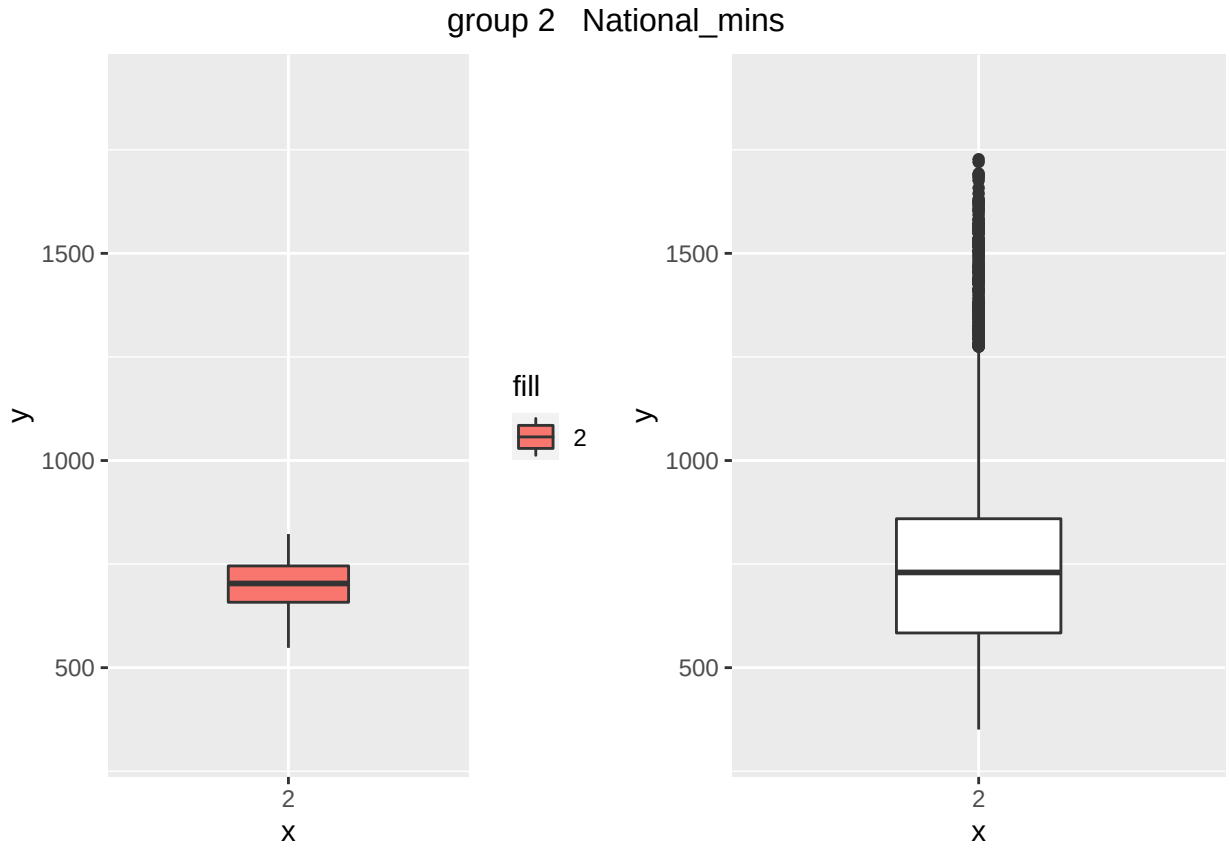
- National_calls:

```
## [1] "Smaller than base median"
```



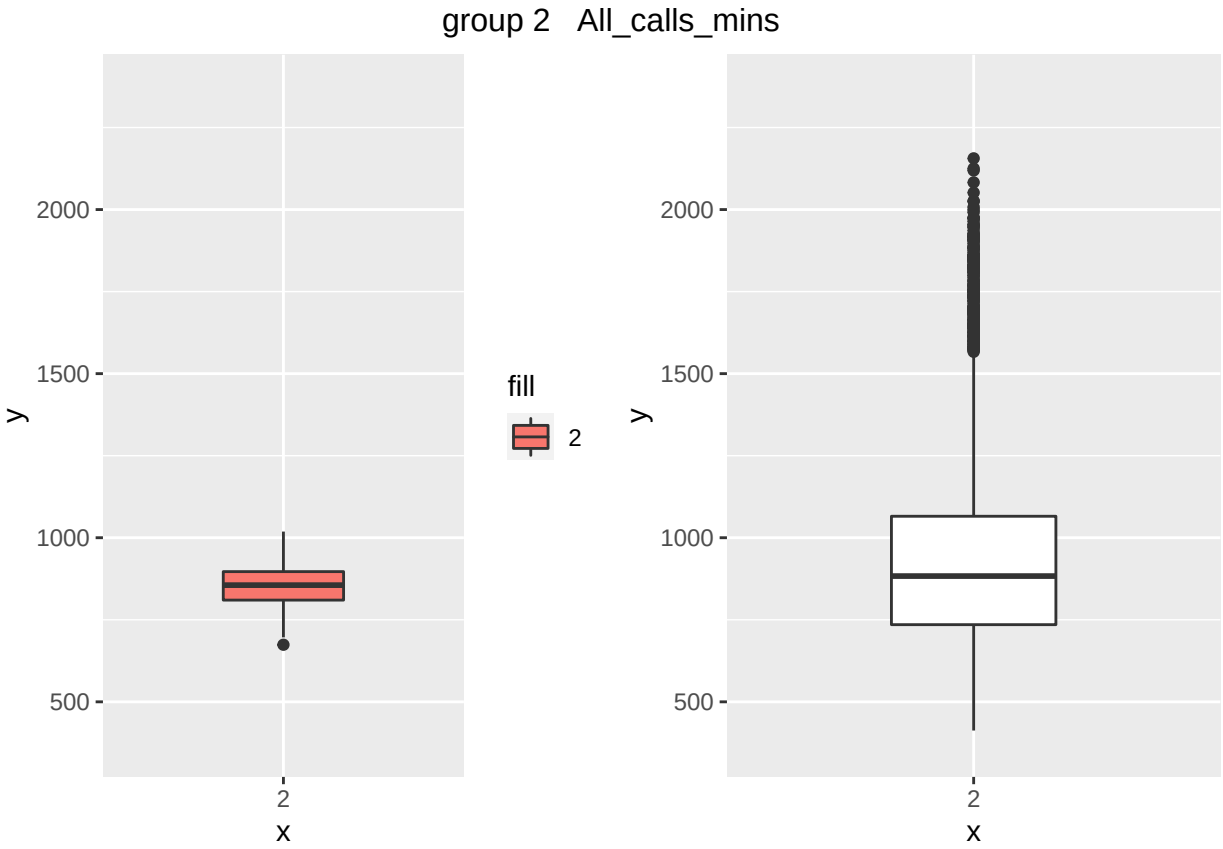
- National_mins:

```
## [1] "Smaller than base median"
```



- All_calls_mins:

```
## [1] "Smaller than base median"
```

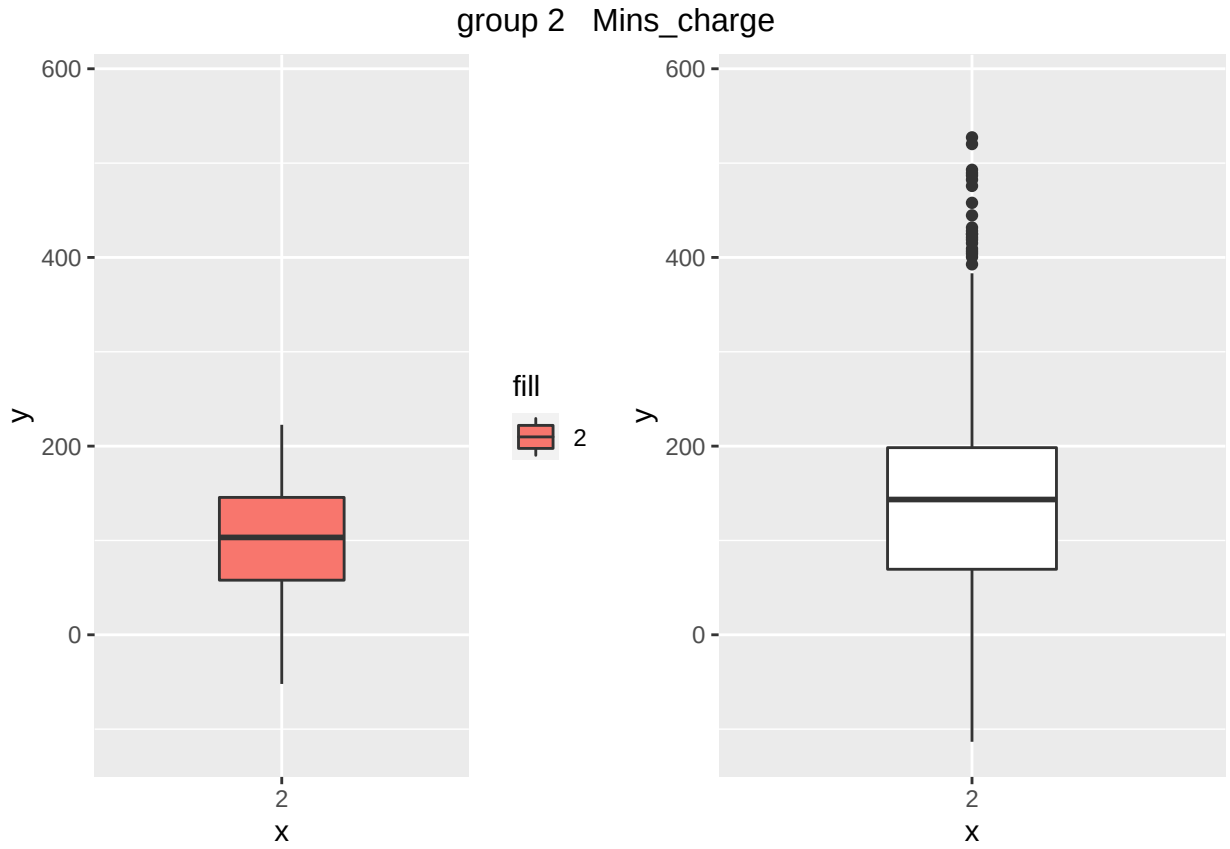


- Mins_charge:

```
## [1] "Smaller than base median"
```

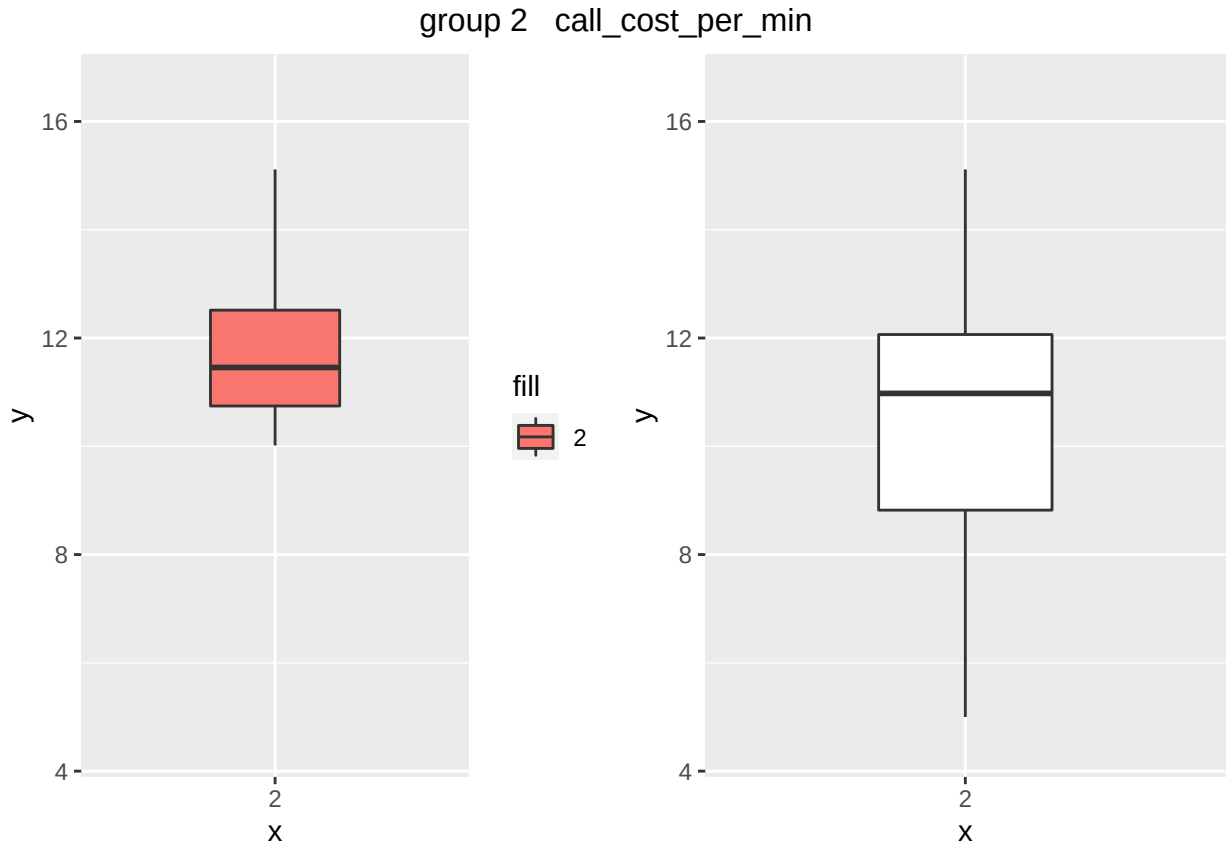
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



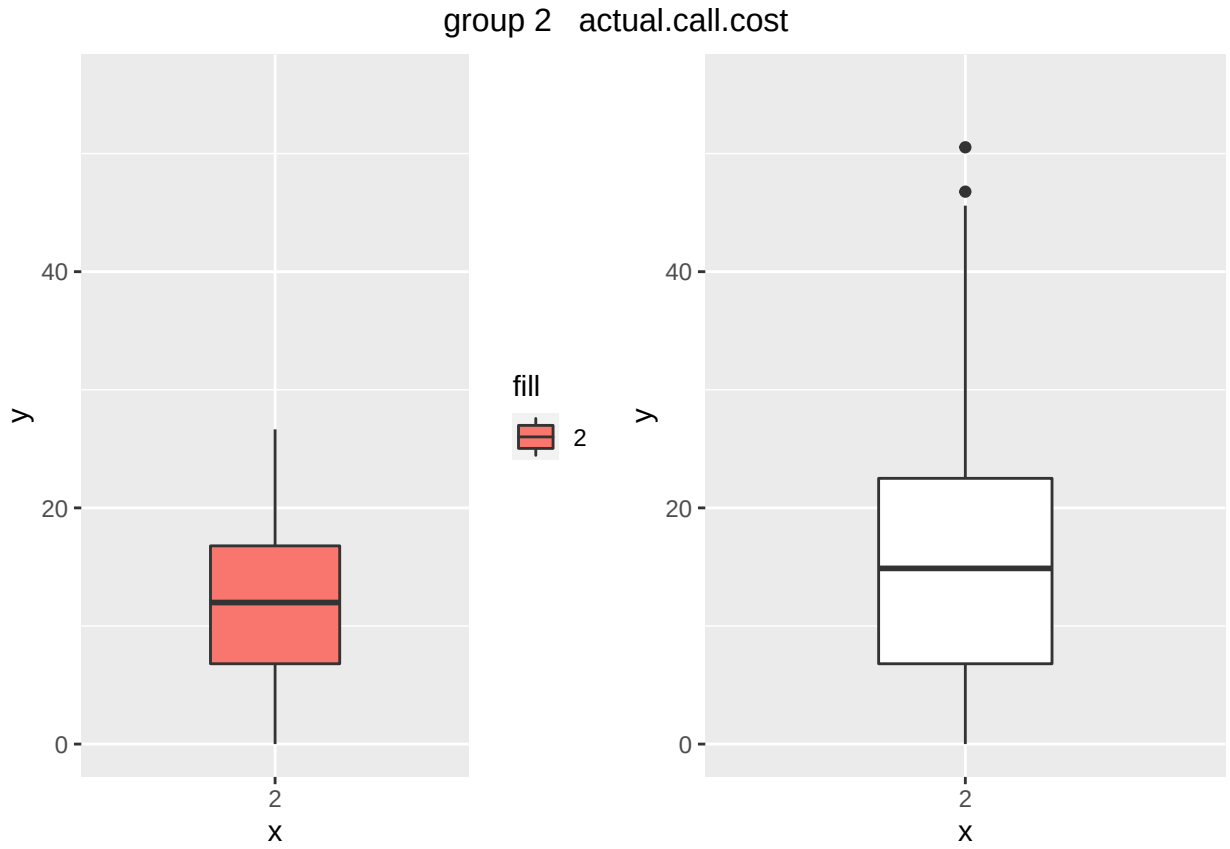
- call_cost_per_min:

```
## [1] "Bigger than base median"
```



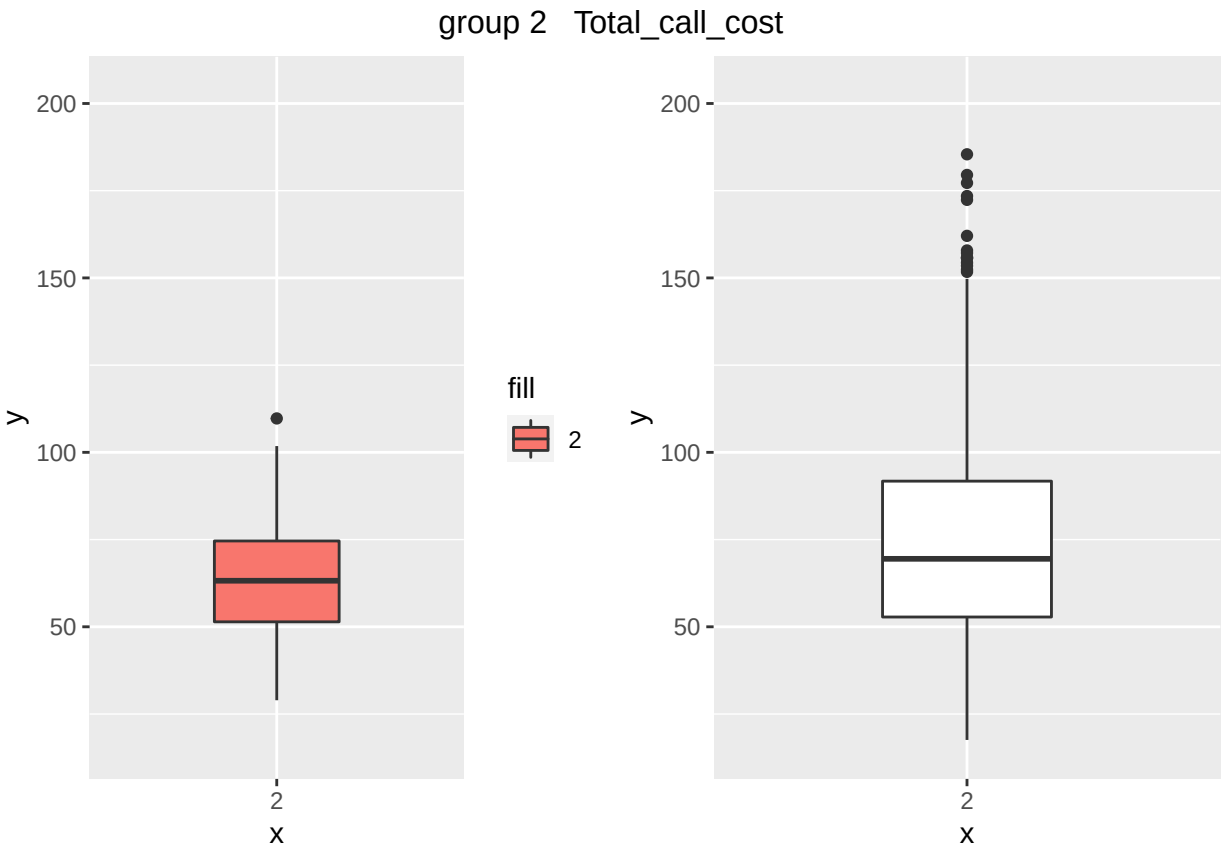
- actual.call.cost:

```
## [1] "Smaller than base median"
```



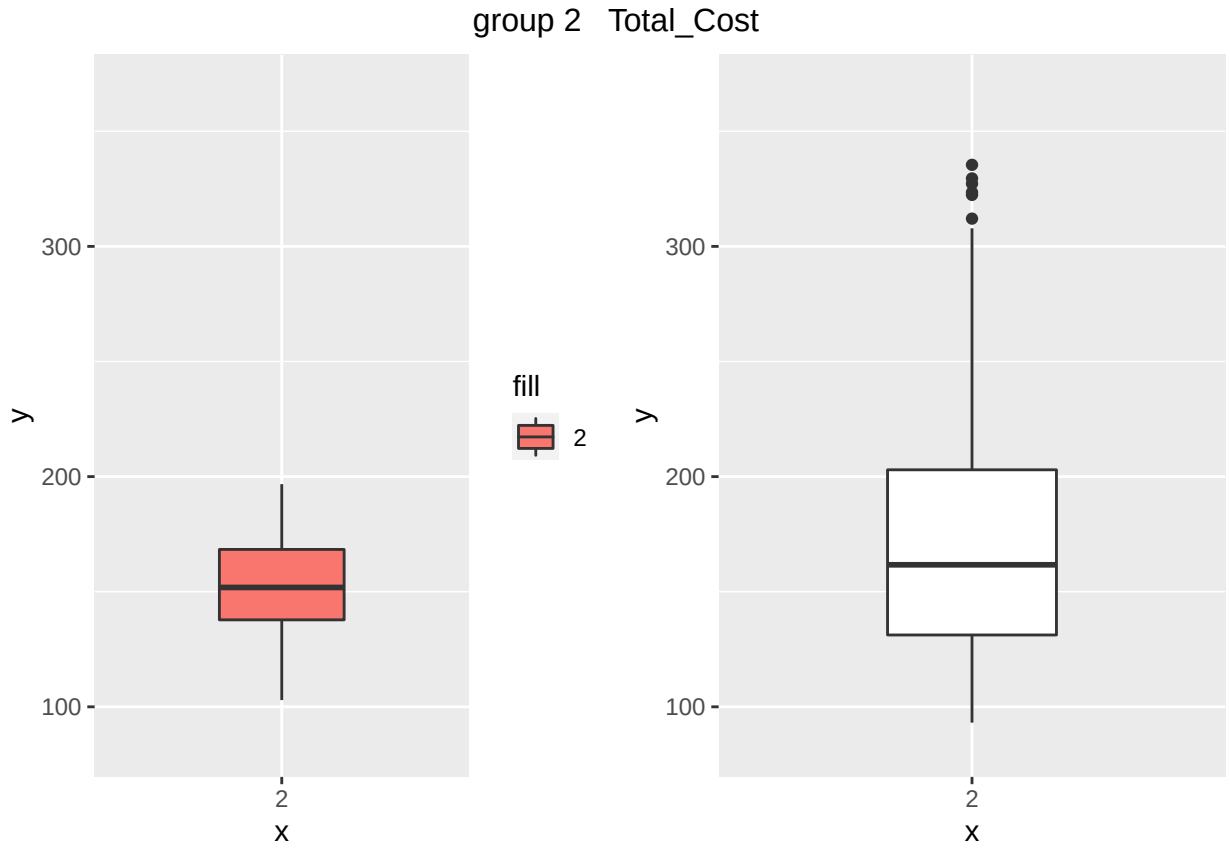
- Total_call_cost:

```
## [1] "Smaller than base median"
```



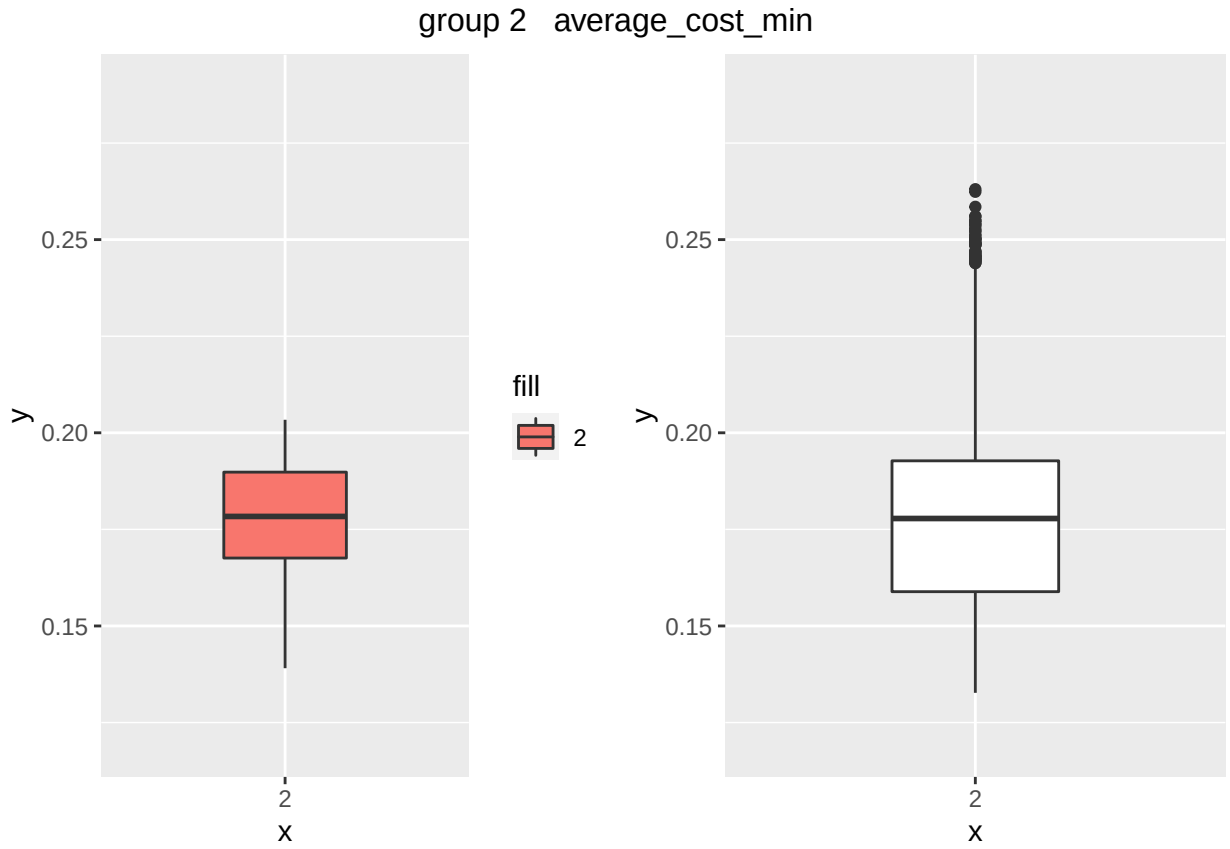
- Total_Cost:

```
## [1] "Smaller than base median"
```



- average_cost_min:

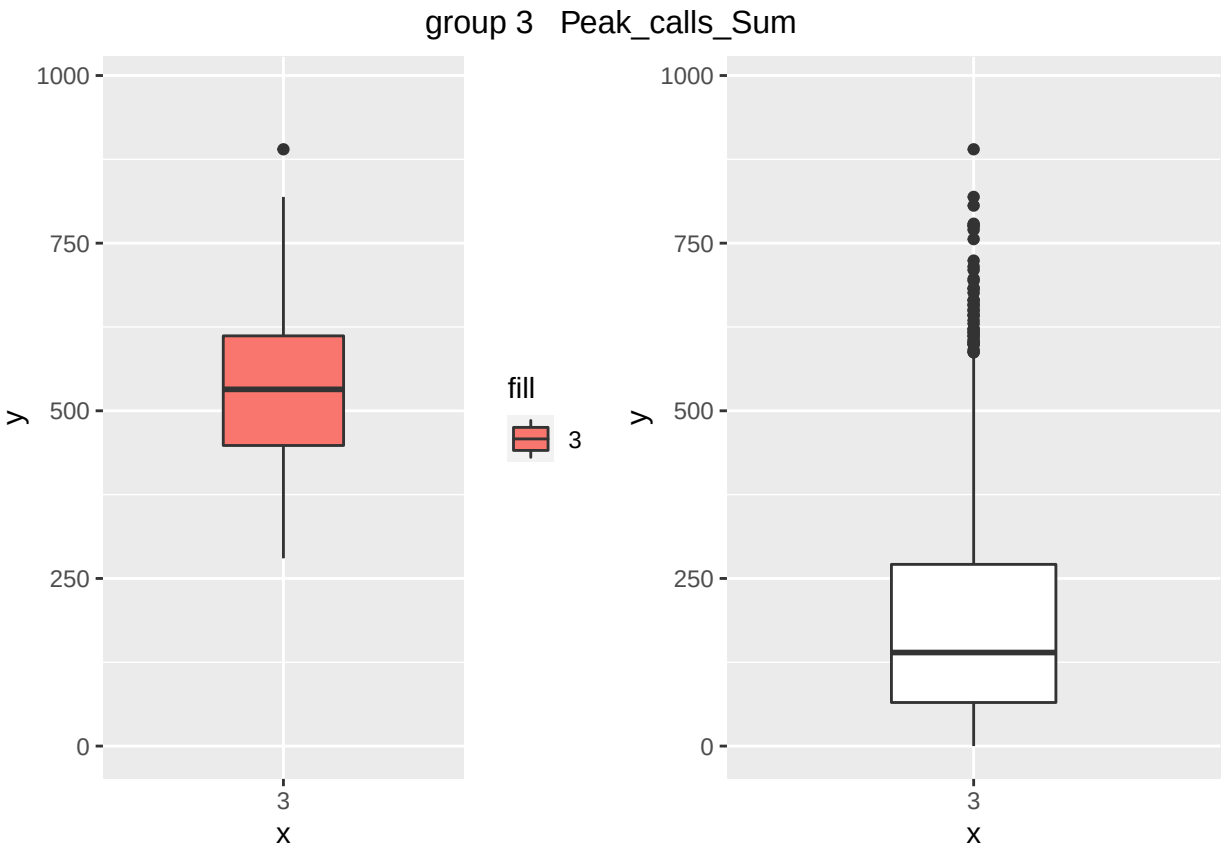
```
## [1] "Bigger than base median"
```



3.

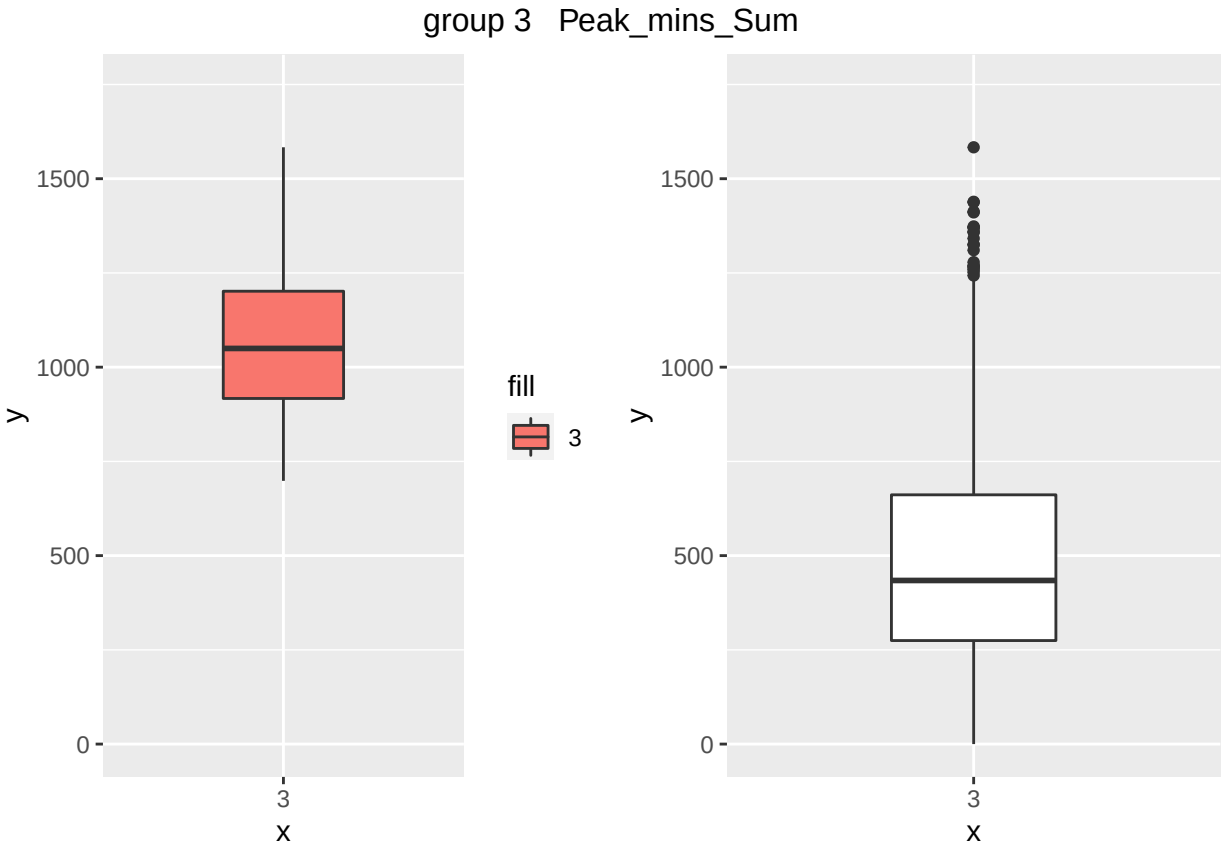
- Peak_calls_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



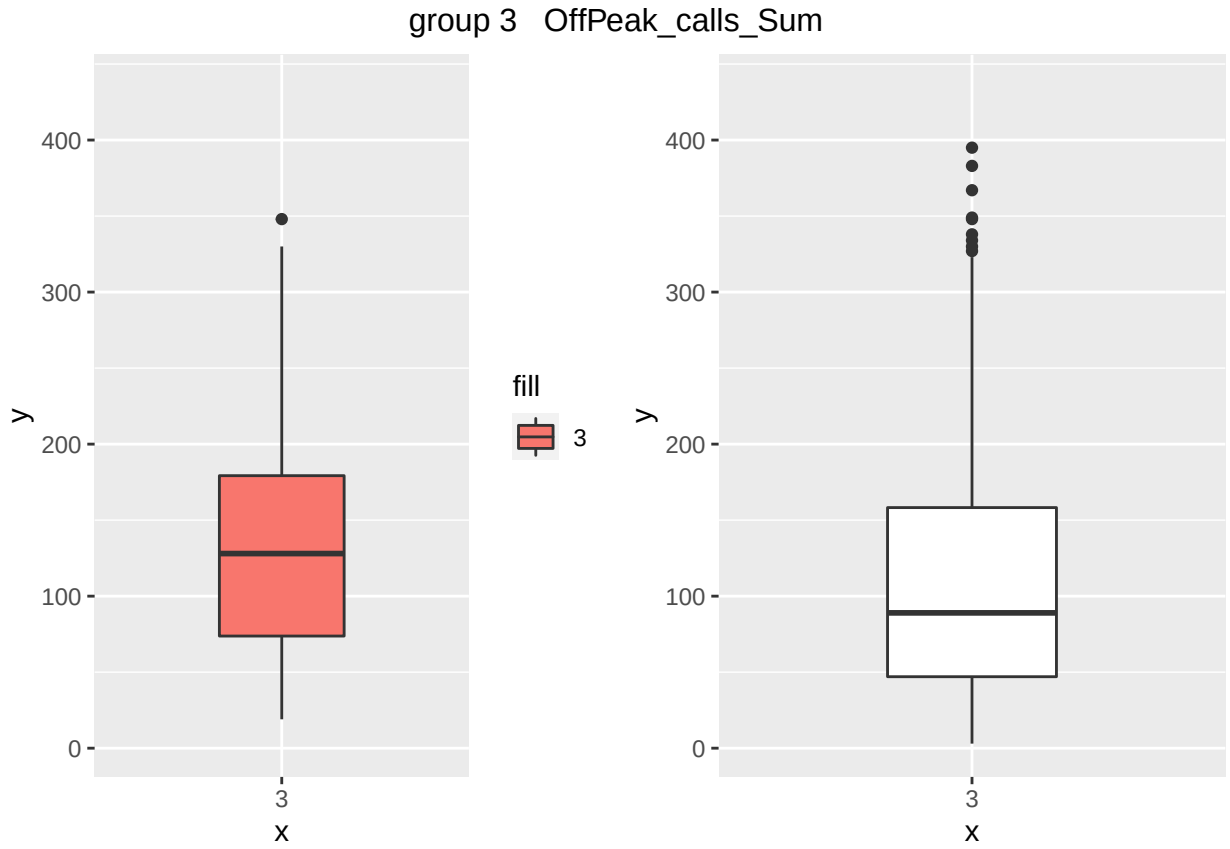
- Peak_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



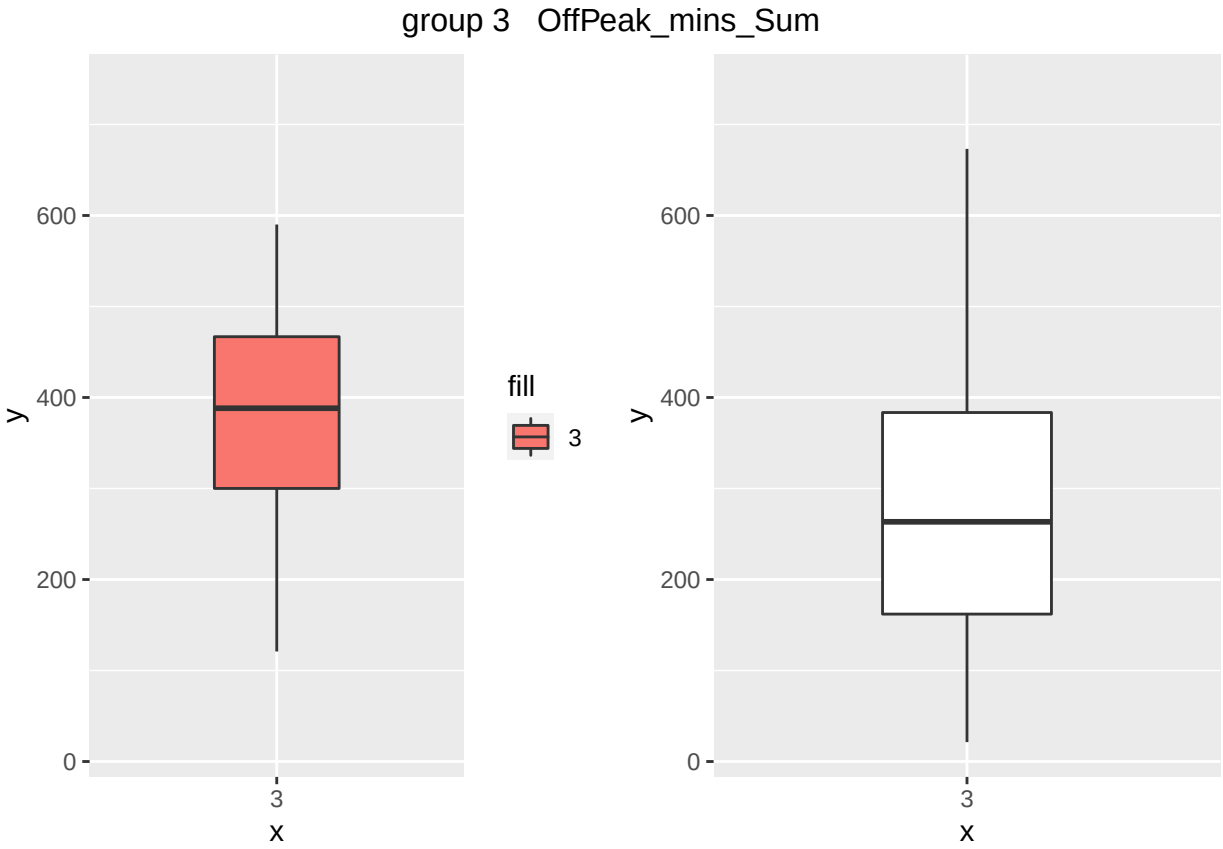
- OffPeak_calls_Sum:

```
## [1] "Bigger than base median"
```



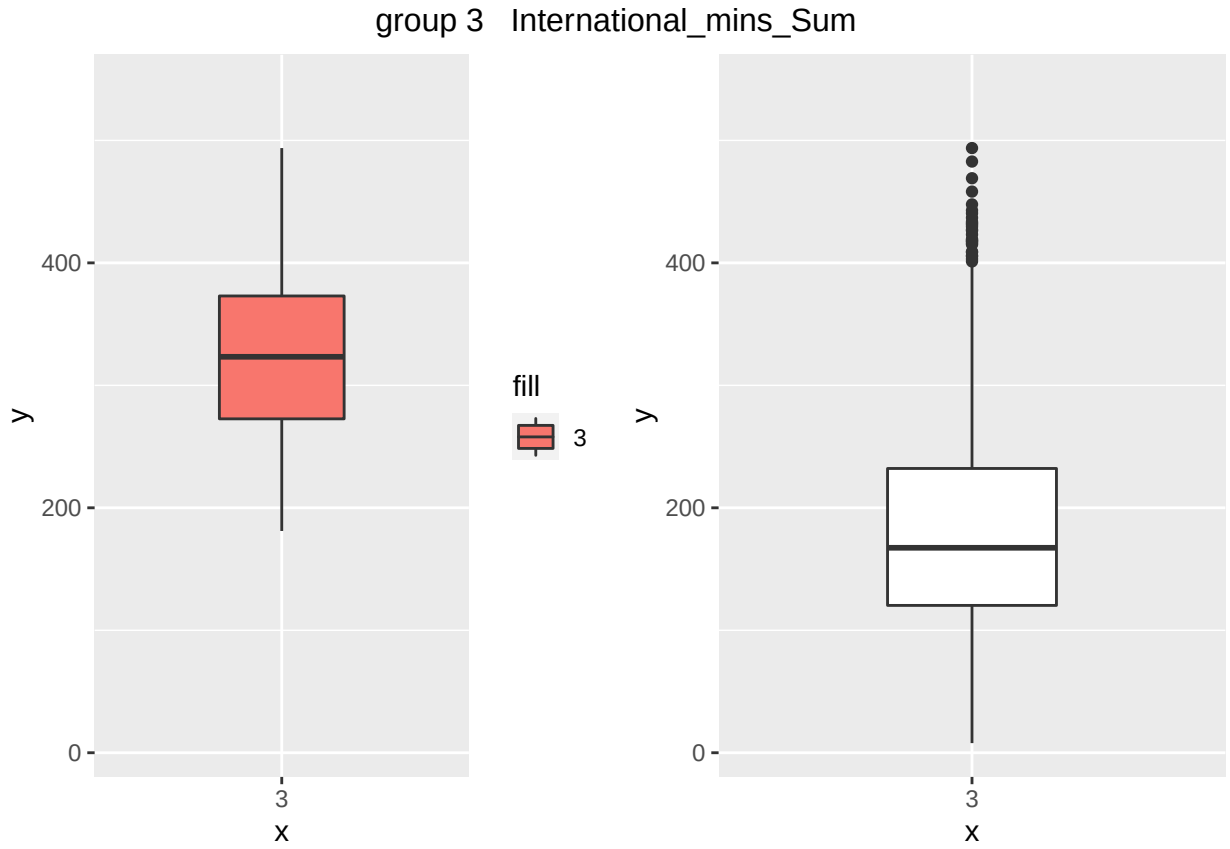
- OffPeak_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



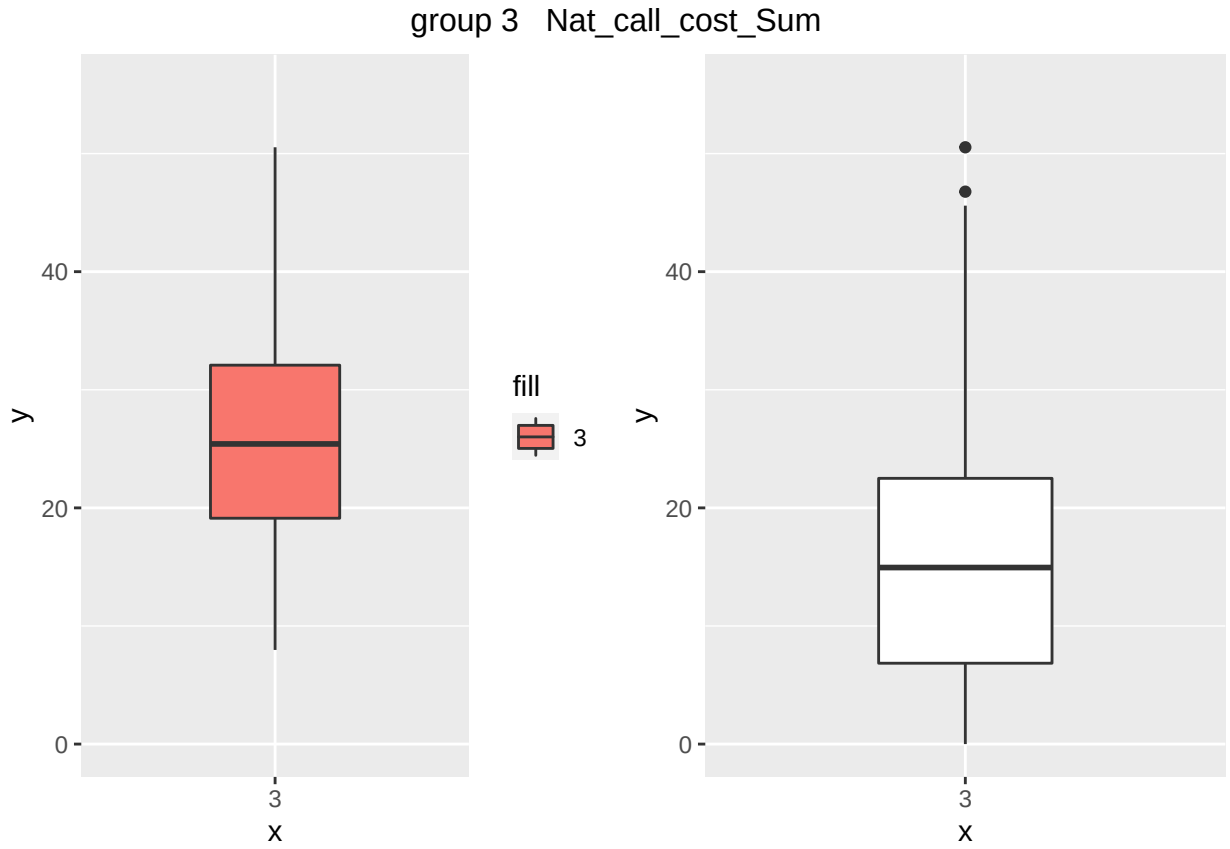
- International_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



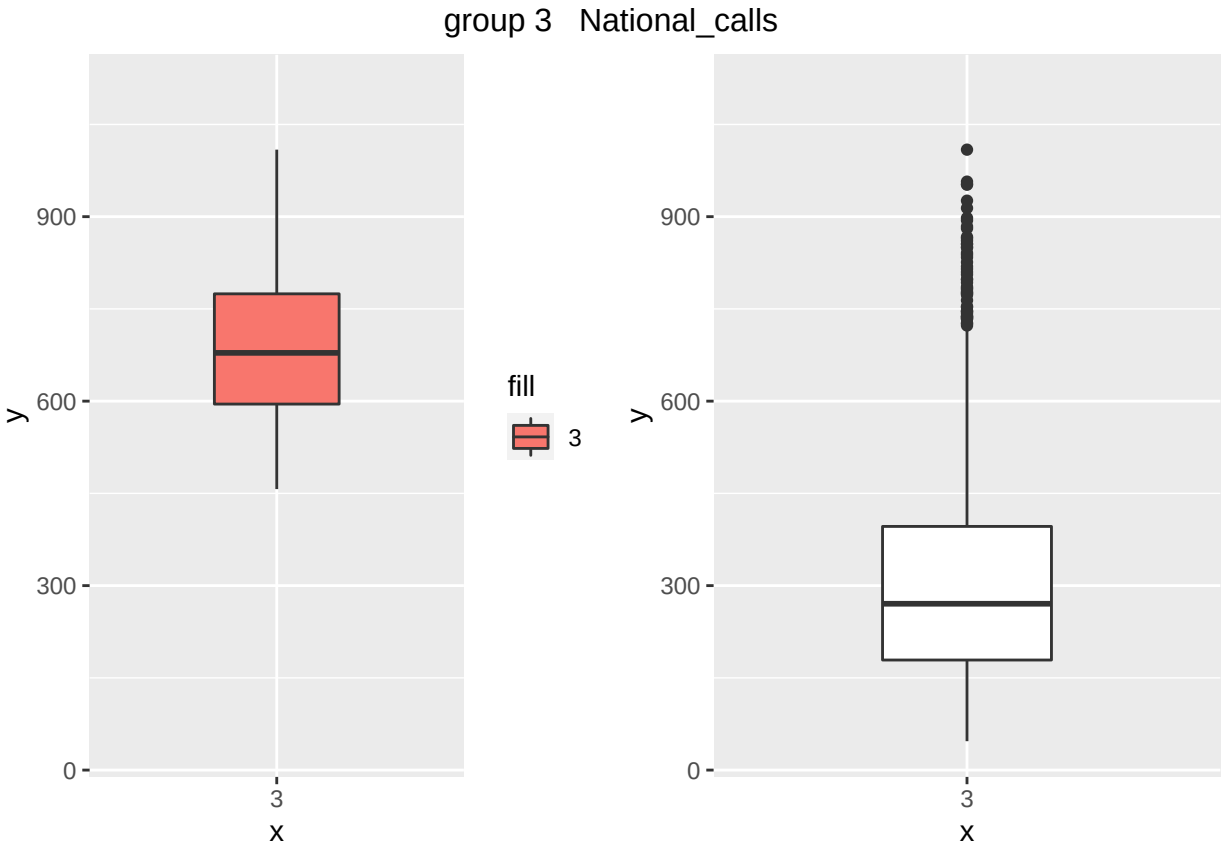
- Nat_call_cost_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



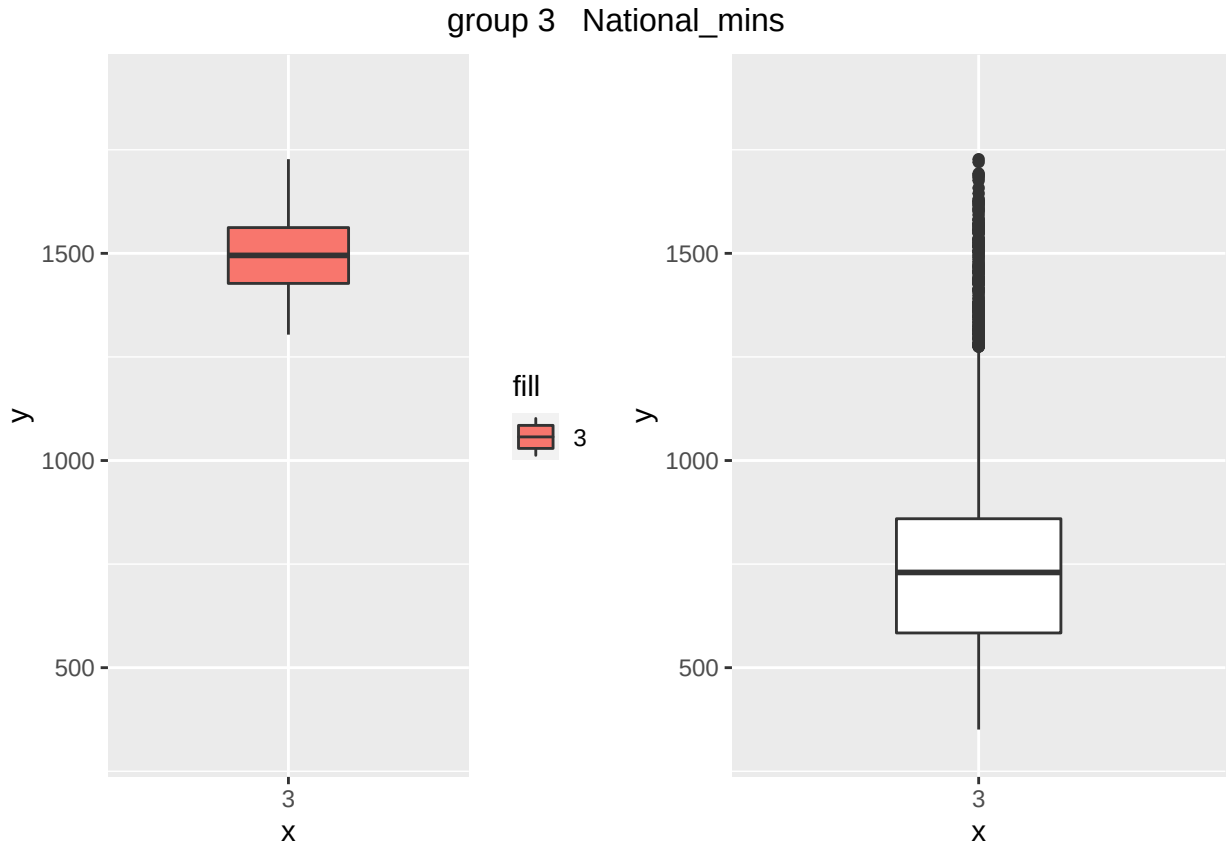
- National_calls:

```
## [1] "Bigger than 3rd base quartile"
```



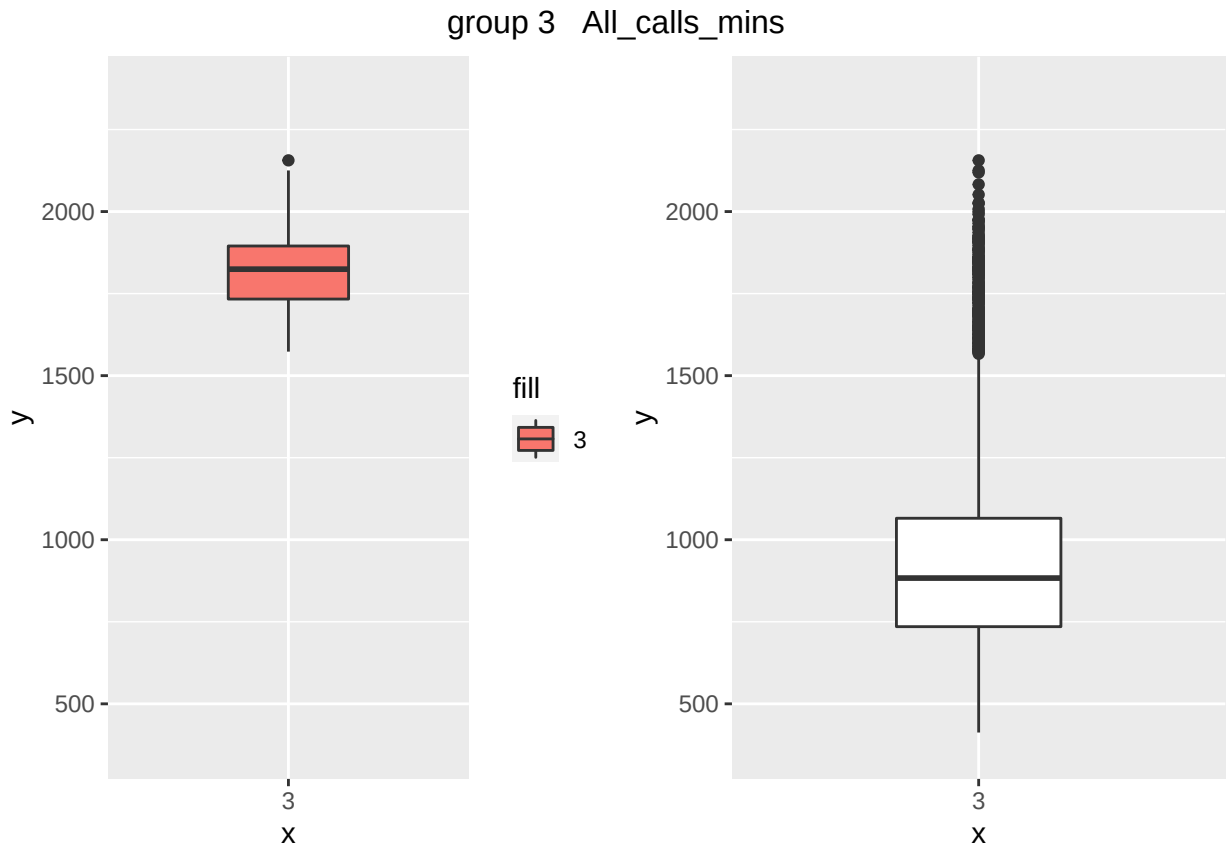
- National_mins:

```
## [1] "Bigger than 3rd base quartile"
```



- All_calls_mins:

```
## [1] "Bigger than 3rd base quartile"
```

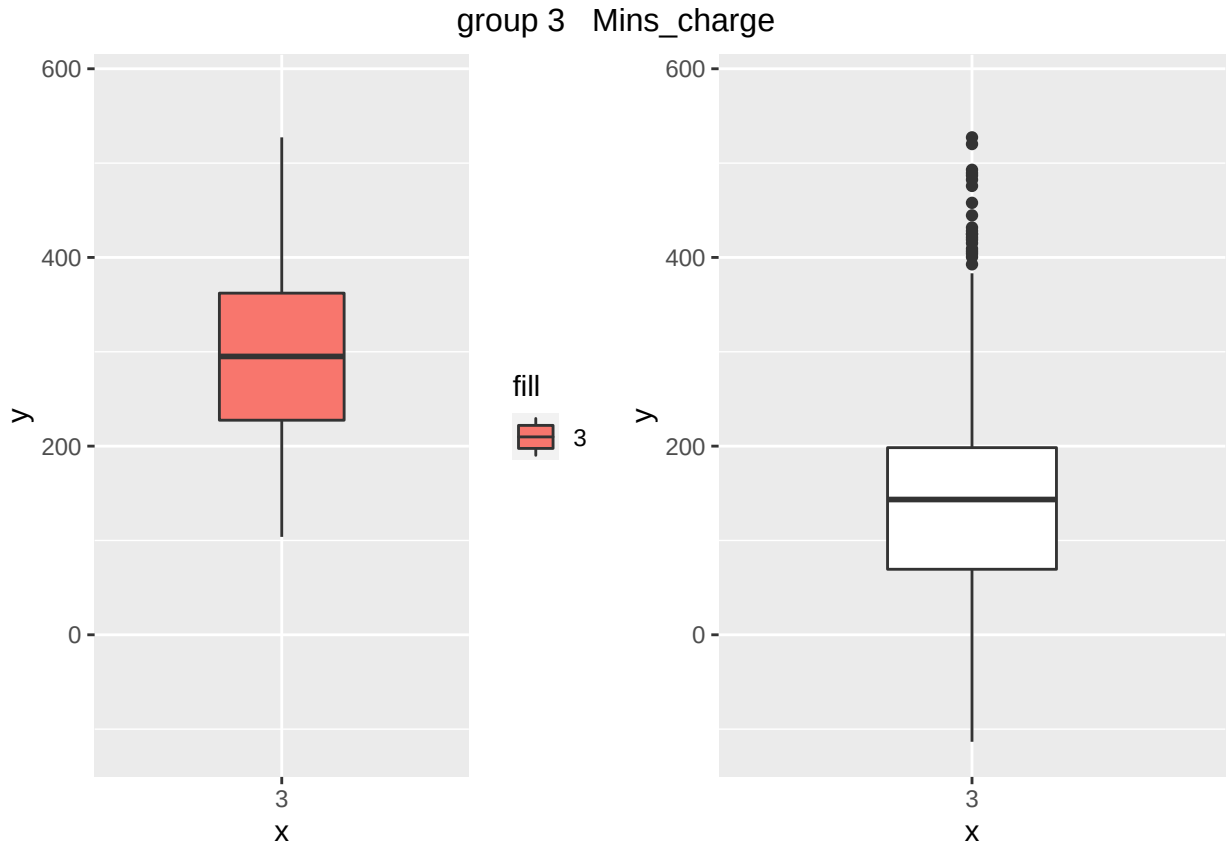


- Mins_charge:

```
## [1] "Bigger than 3rd base quartile"
```

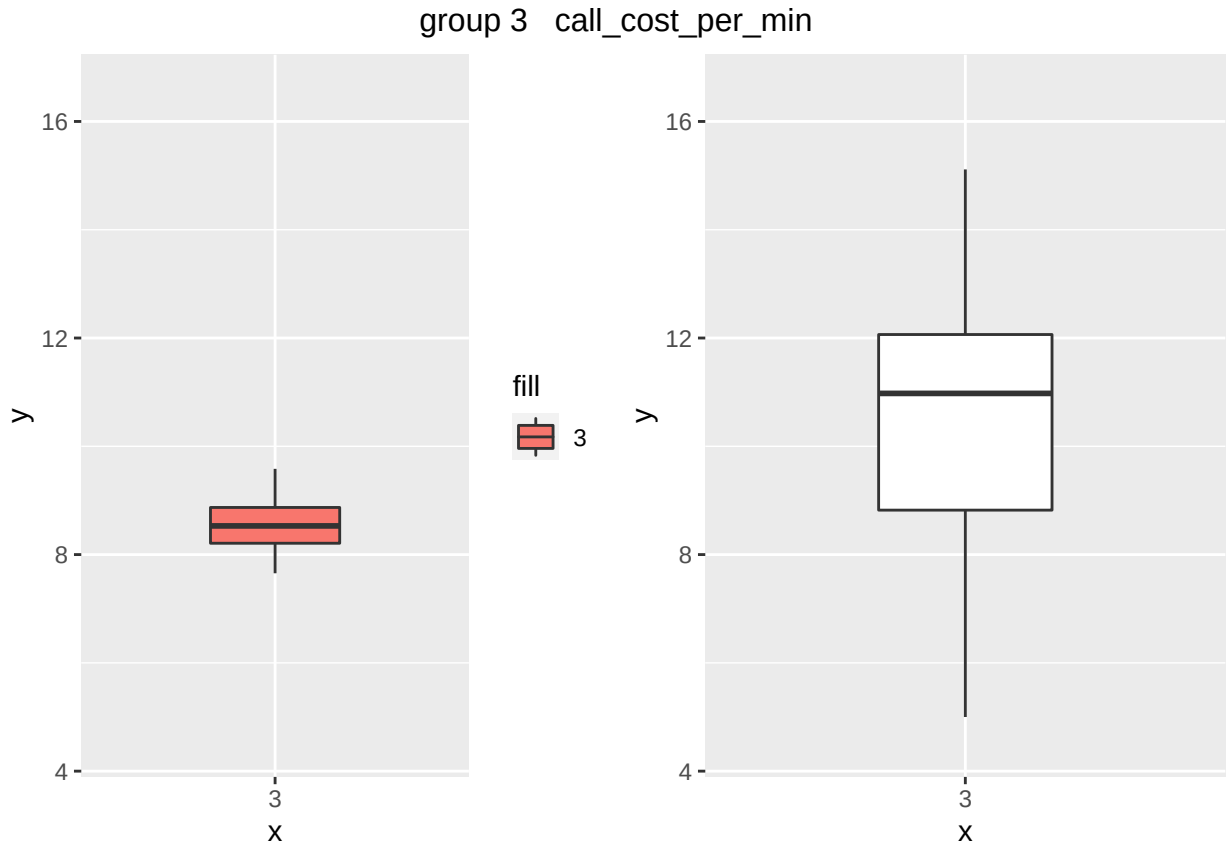
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



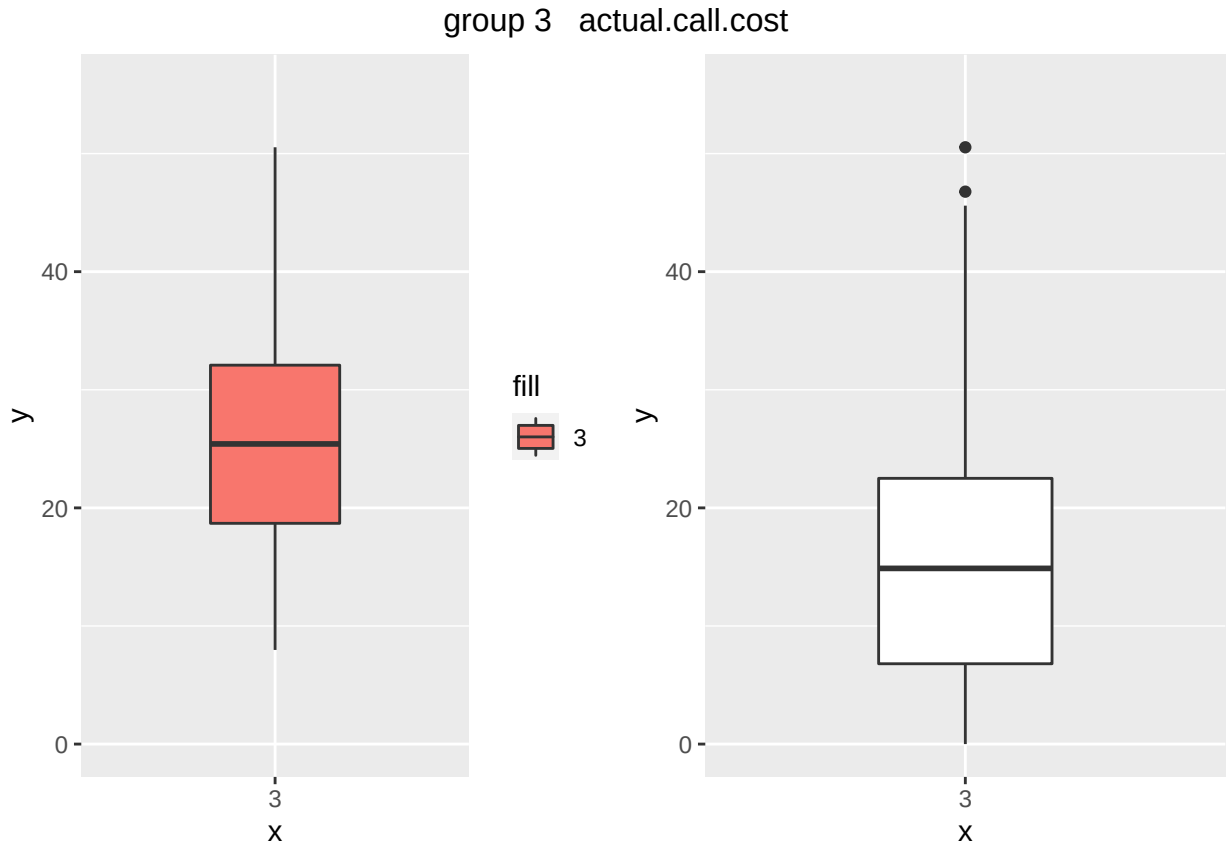
- call_cost_per_min:

```
## [1] "Smaller than base median"
```



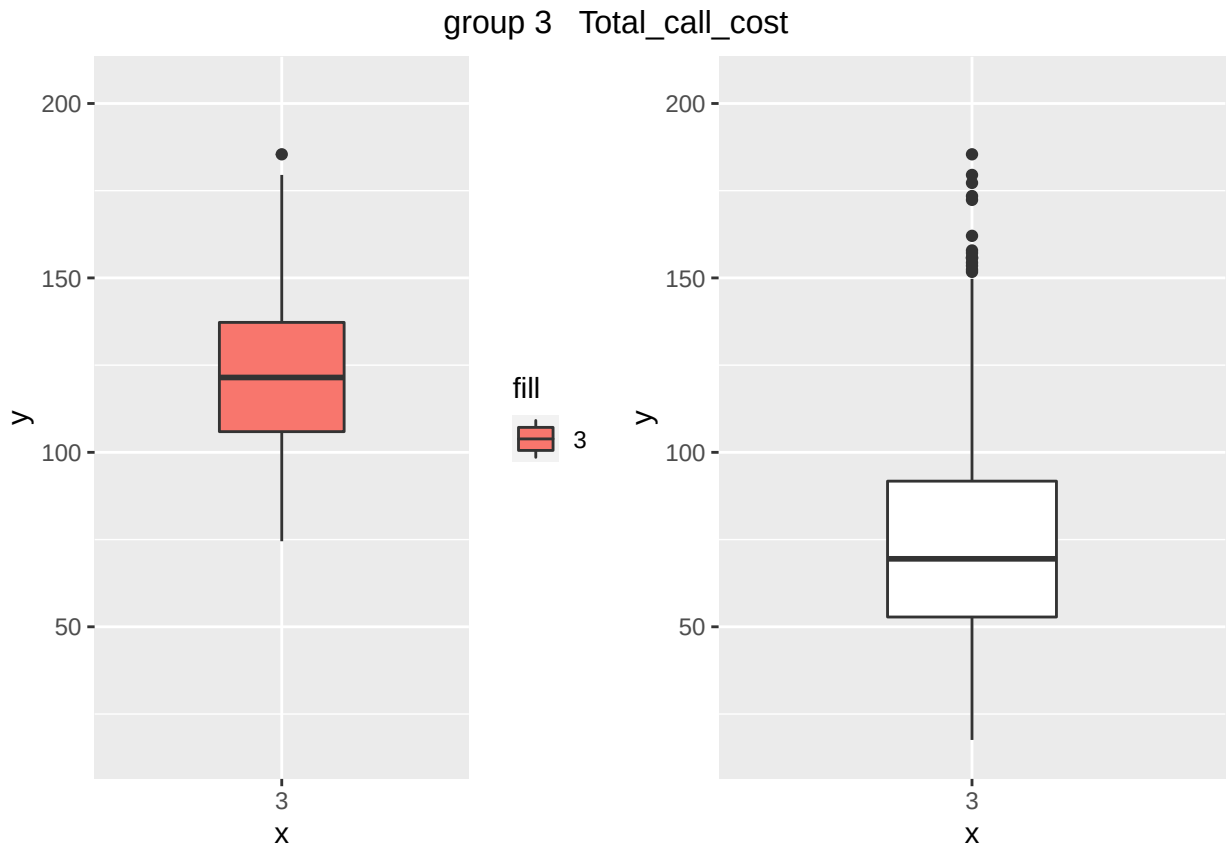
- actual.call.cost:

```
## [1] "Bigger than 3rd base quartile"
```



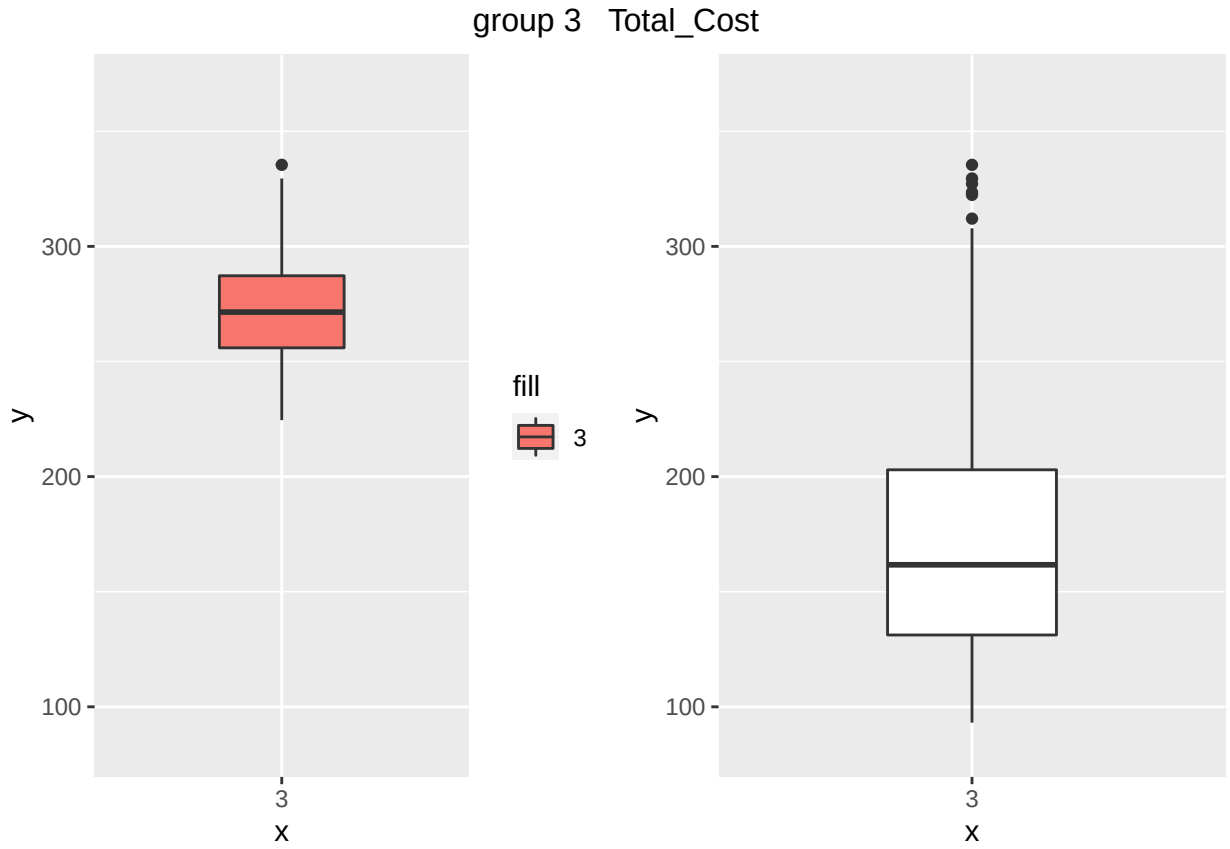
- Total_call_cost:

```
## [1] "Bigger than 3rd base quartile"
```



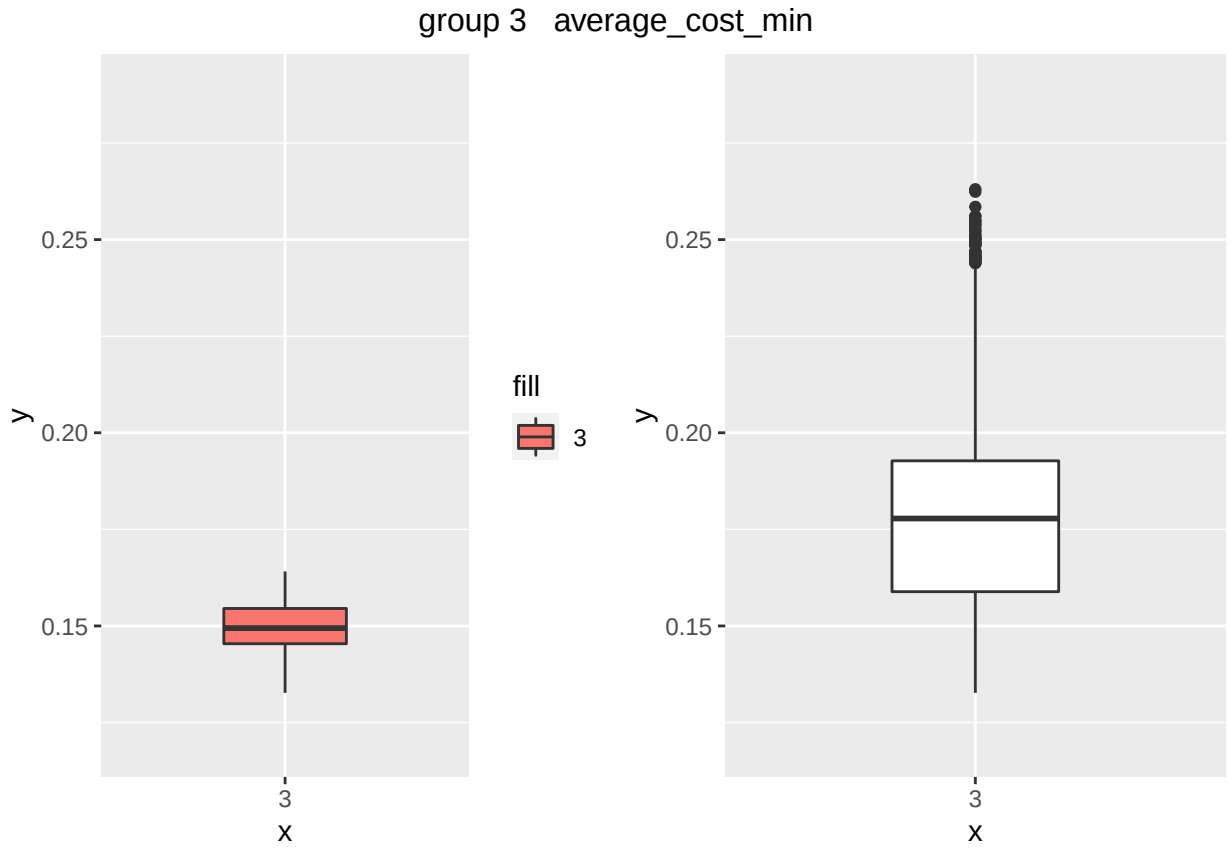
- Total_Cost:

```
## [1] "Bigger than 3rd base quartile"
```



- average_cost_min:

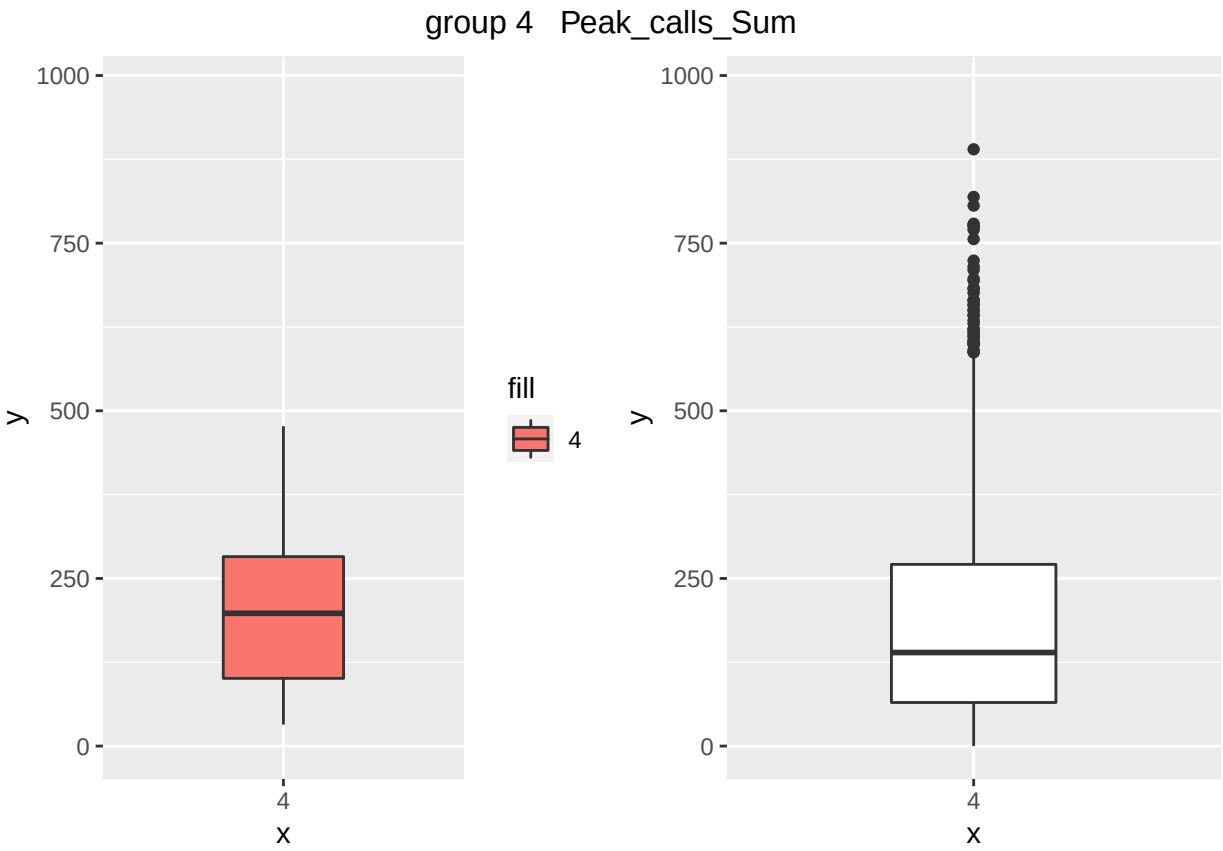
```
## [1] "Smaller than base median"
```



4.

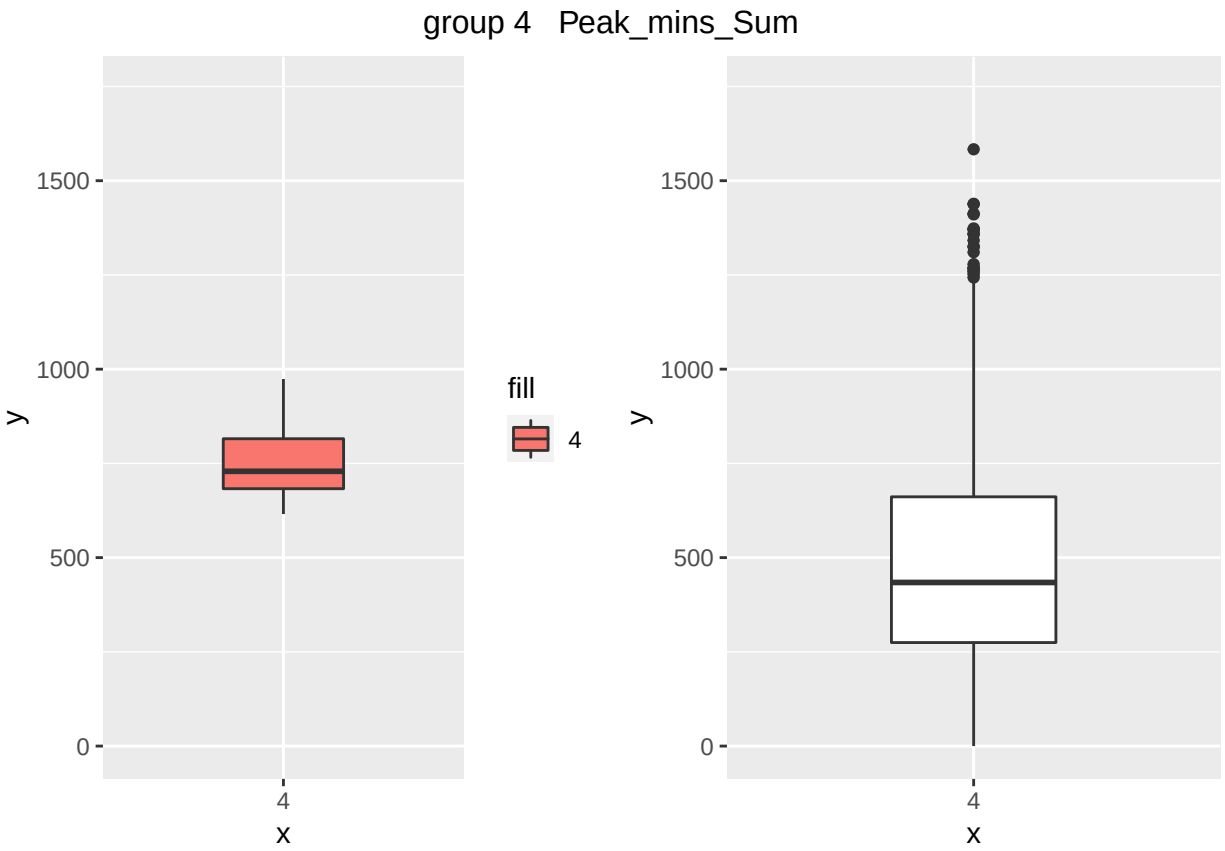
- Peak_calls_Sum:

```
## [1] "Bigger than base median"
```



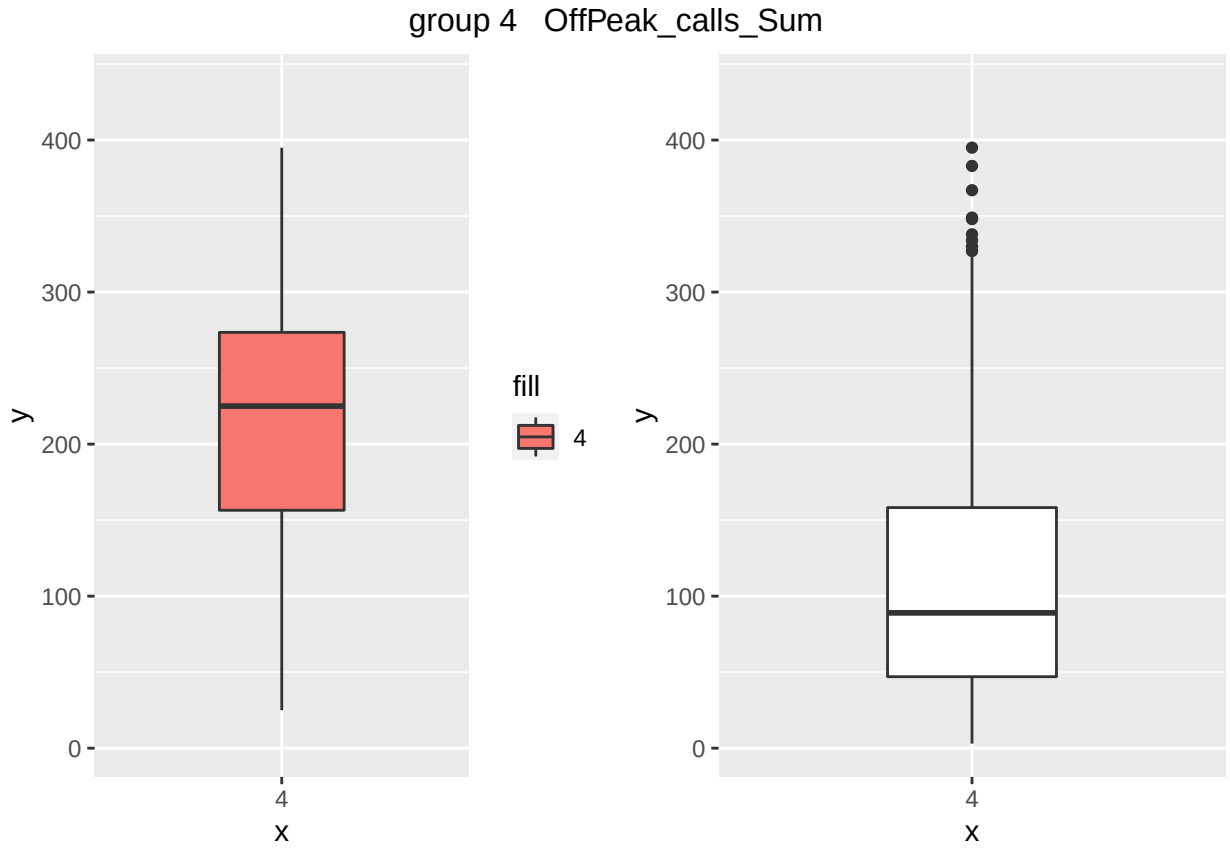
- Peak_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



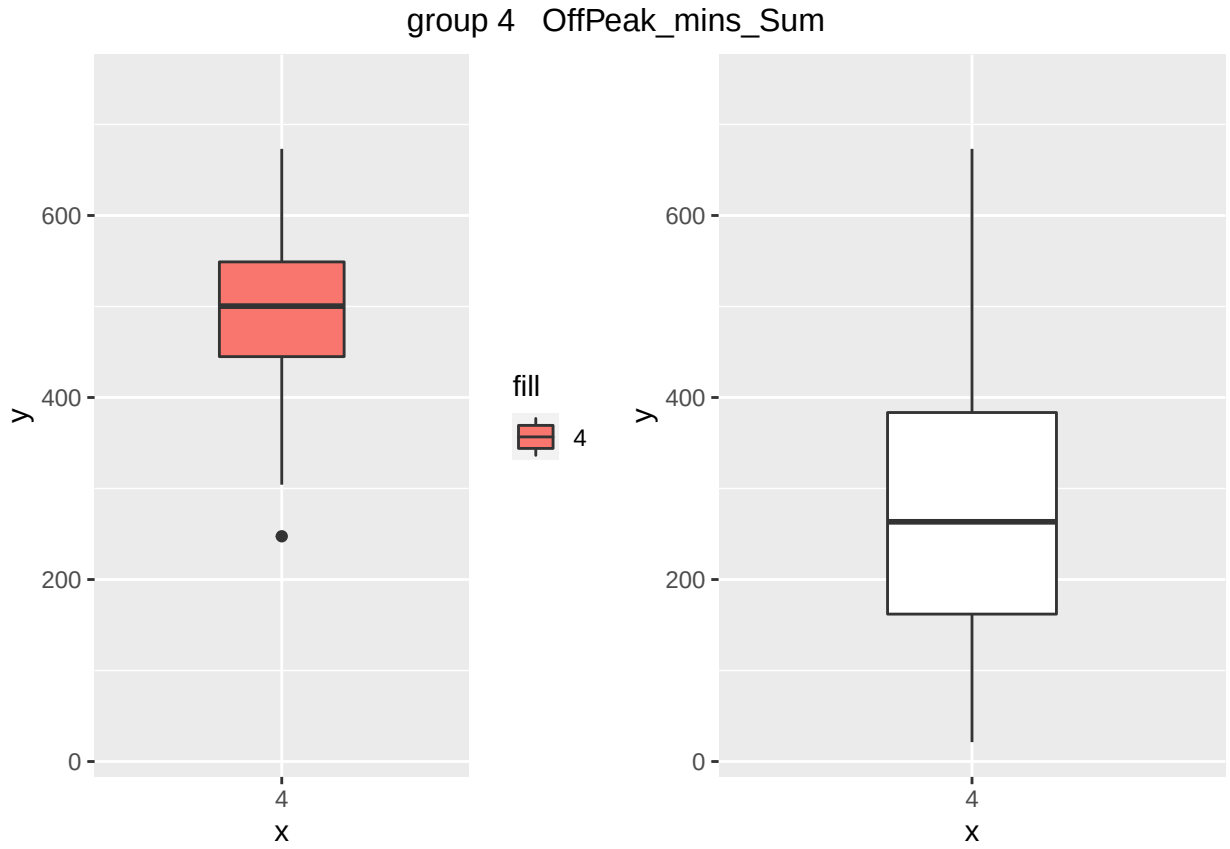
- OffPeak_calls_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



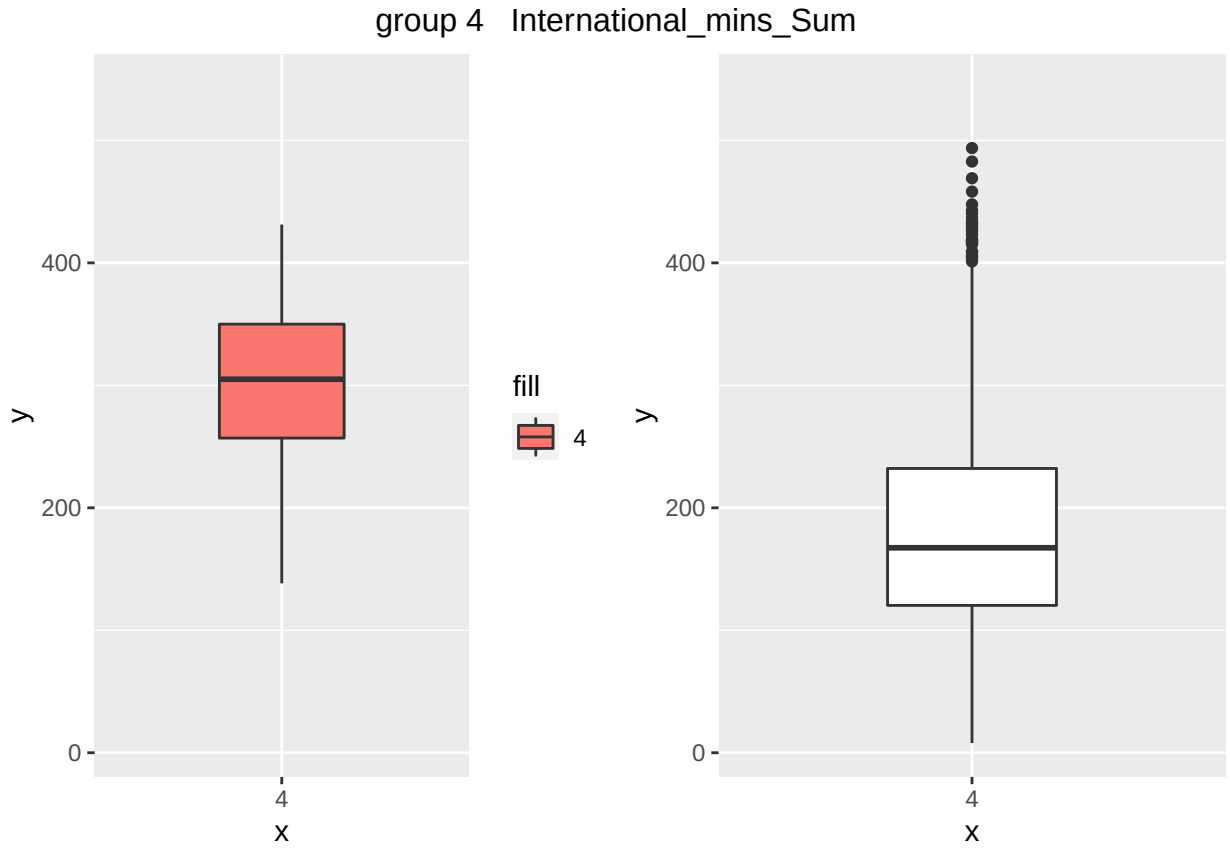
- OffPeak_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



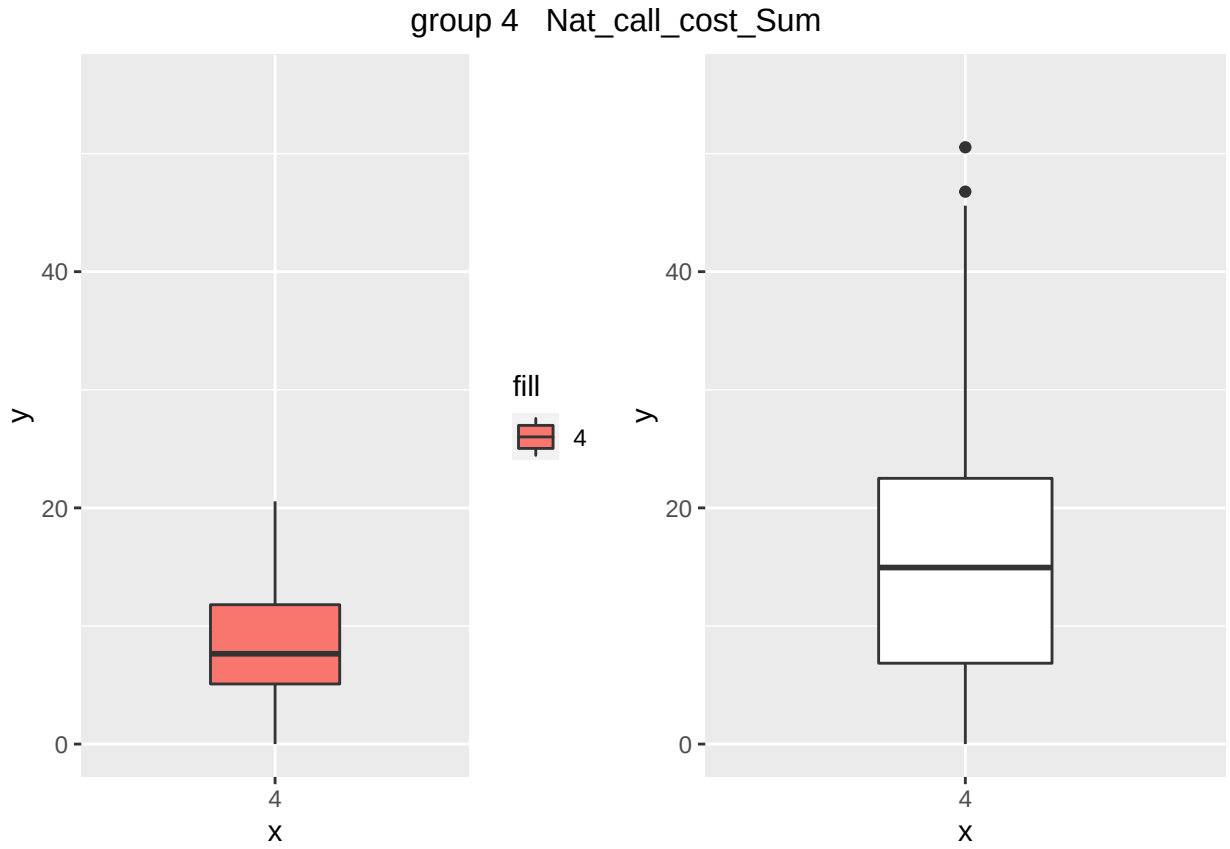
- International_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



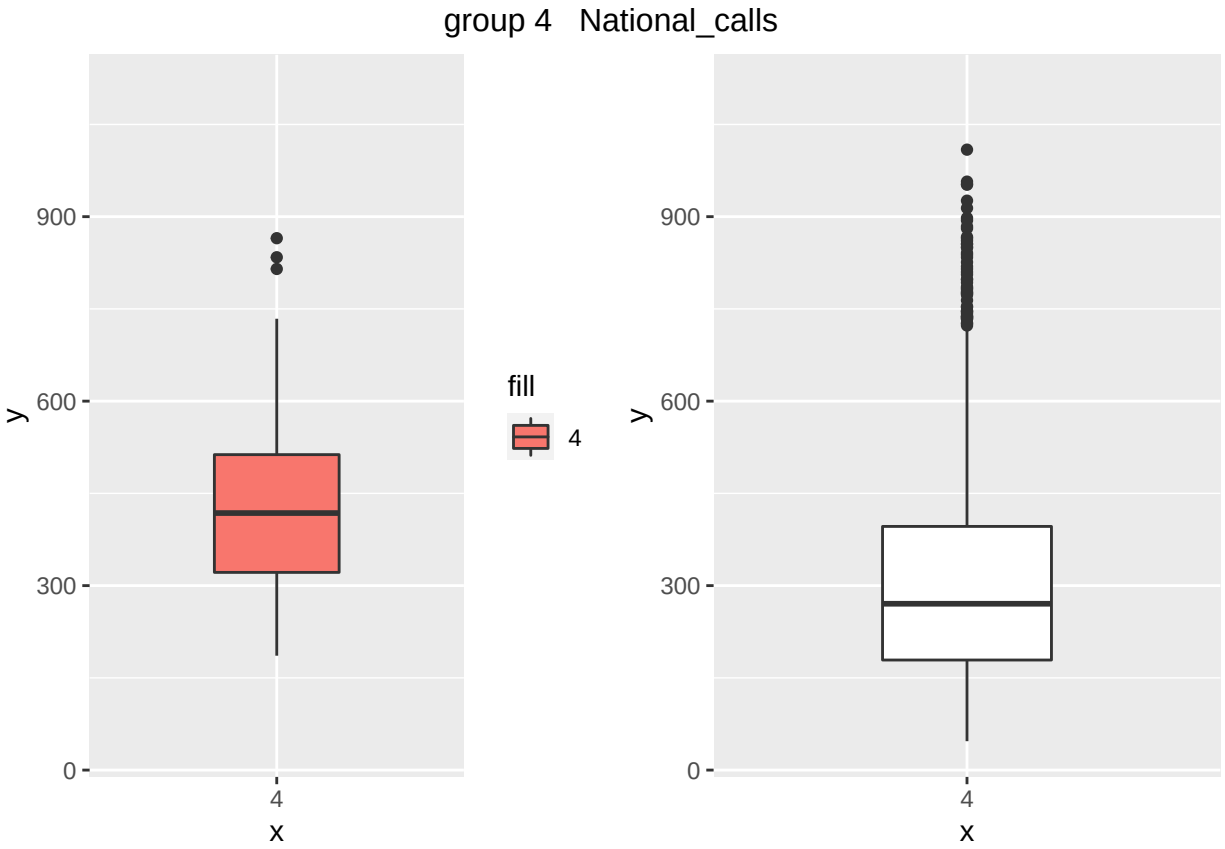
- Nat_call_cost_Sum:

```
## [1] "Smaller than base median"
```



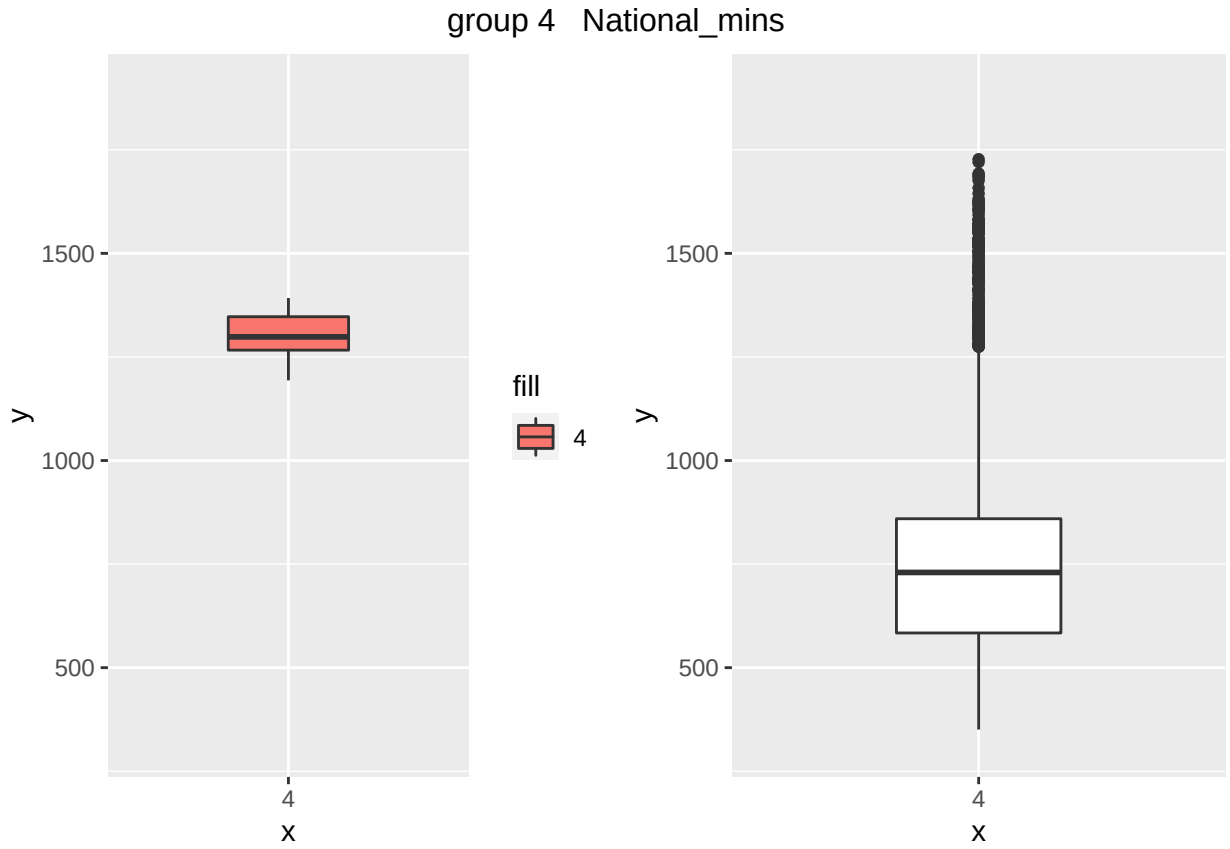
- National_calls:

```
## [1] "Bigger than 3rd base quartile"
```



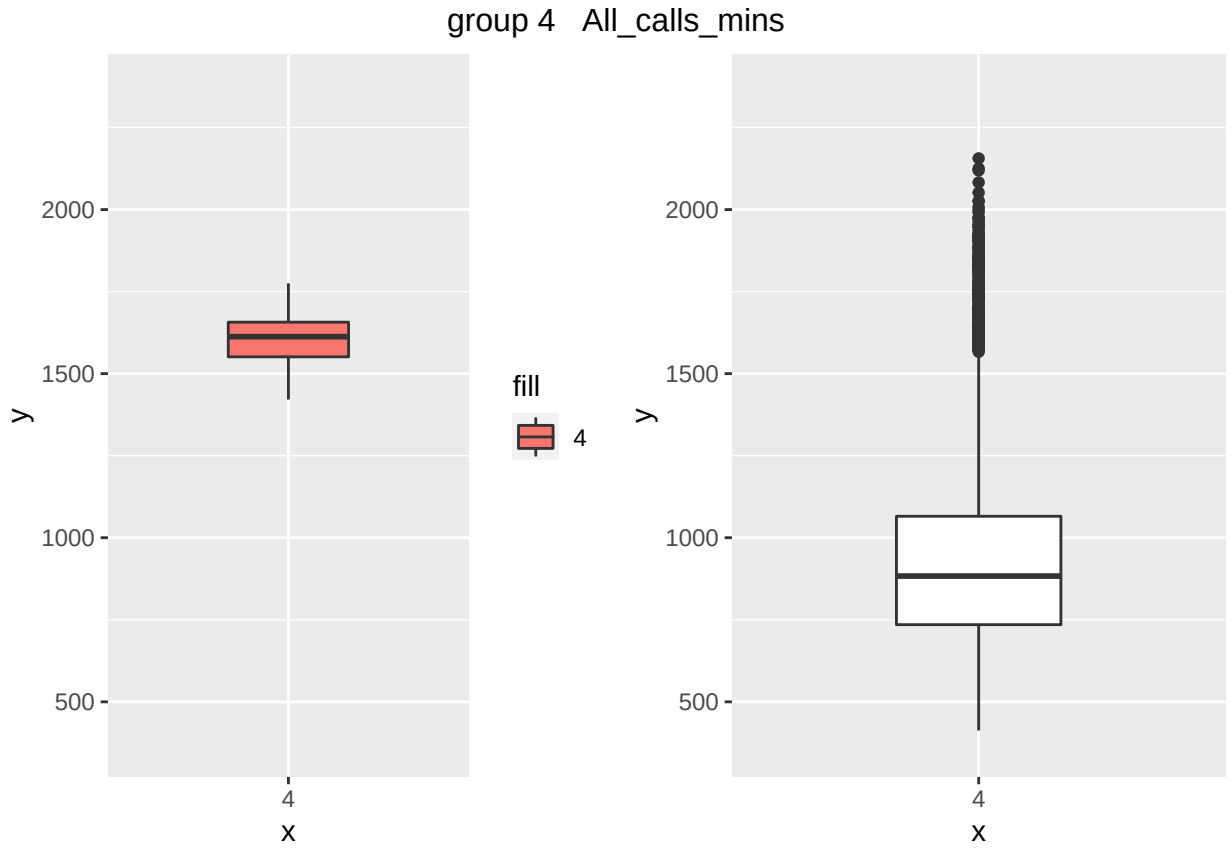
- National_mins:

```
## [1] "Bigger than 3rd base quartile"
```



- All_calls_mins:

```
## [1] "Bigger than 3rd base quartile"
```

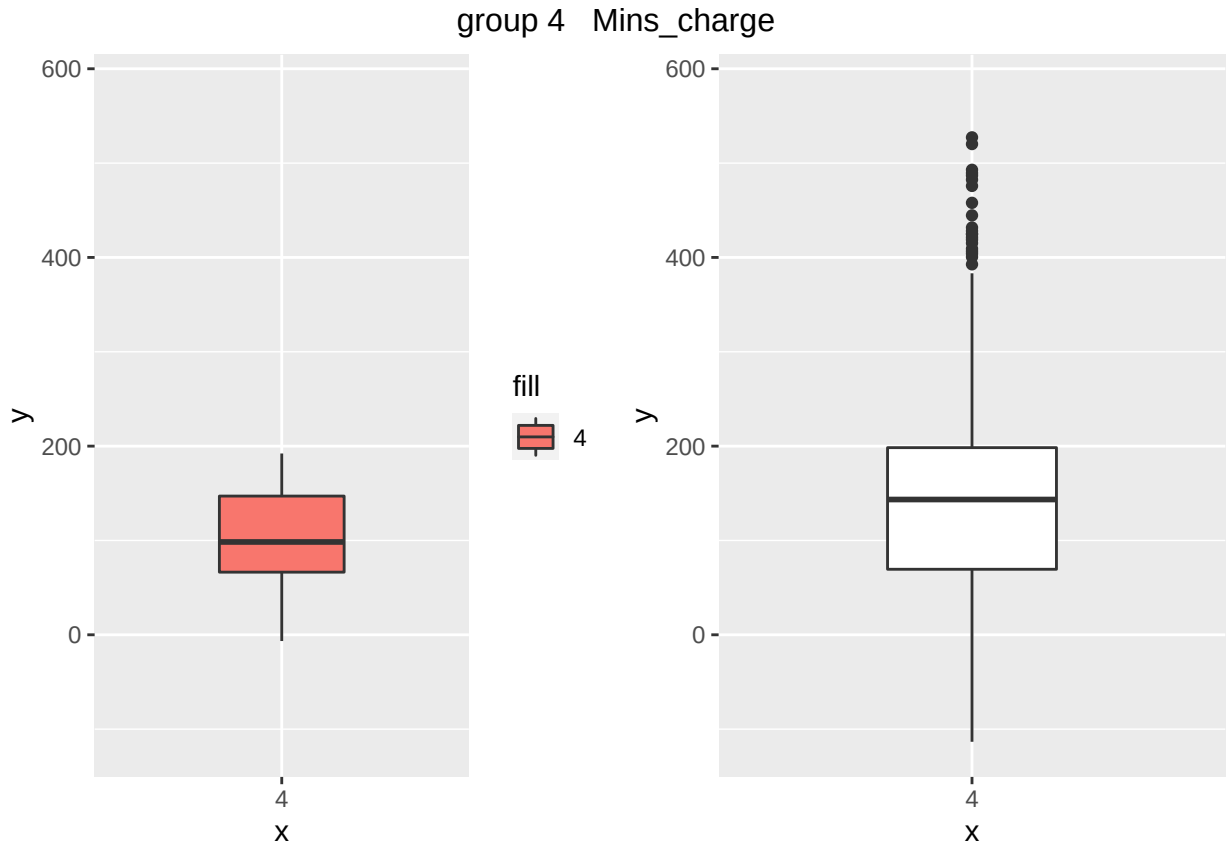


- Mins_charge:

```
## [1] "Smaller than base median"
```

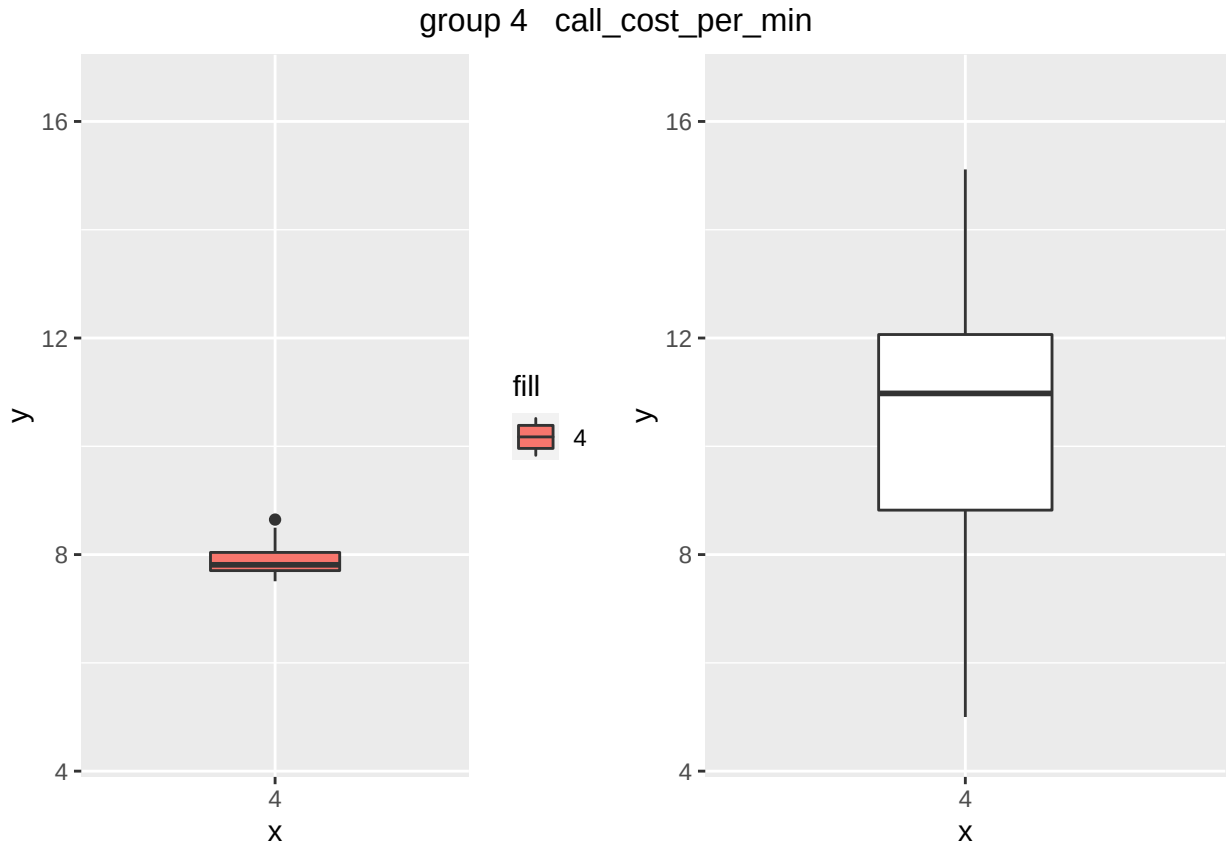
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



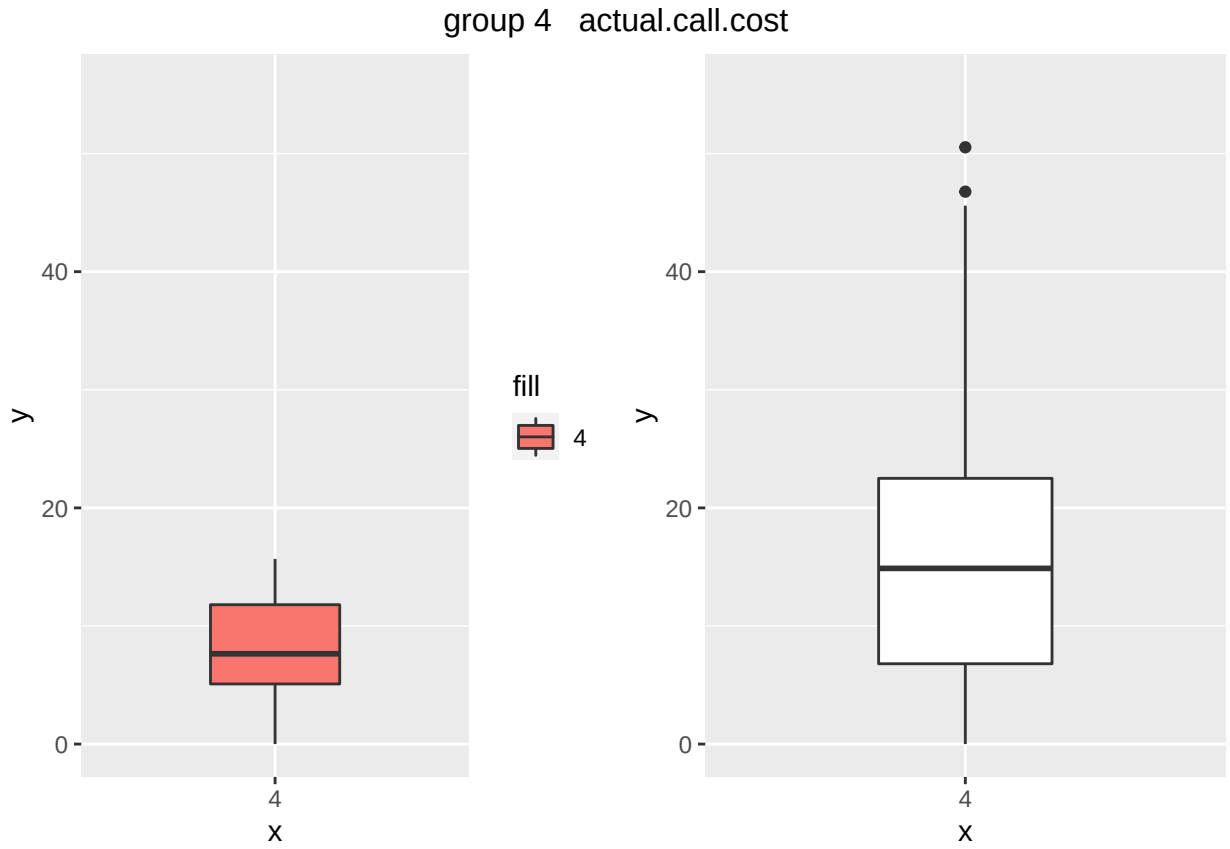
- call_cost_per_min:

```
## [1] "Smaller than base median"
```



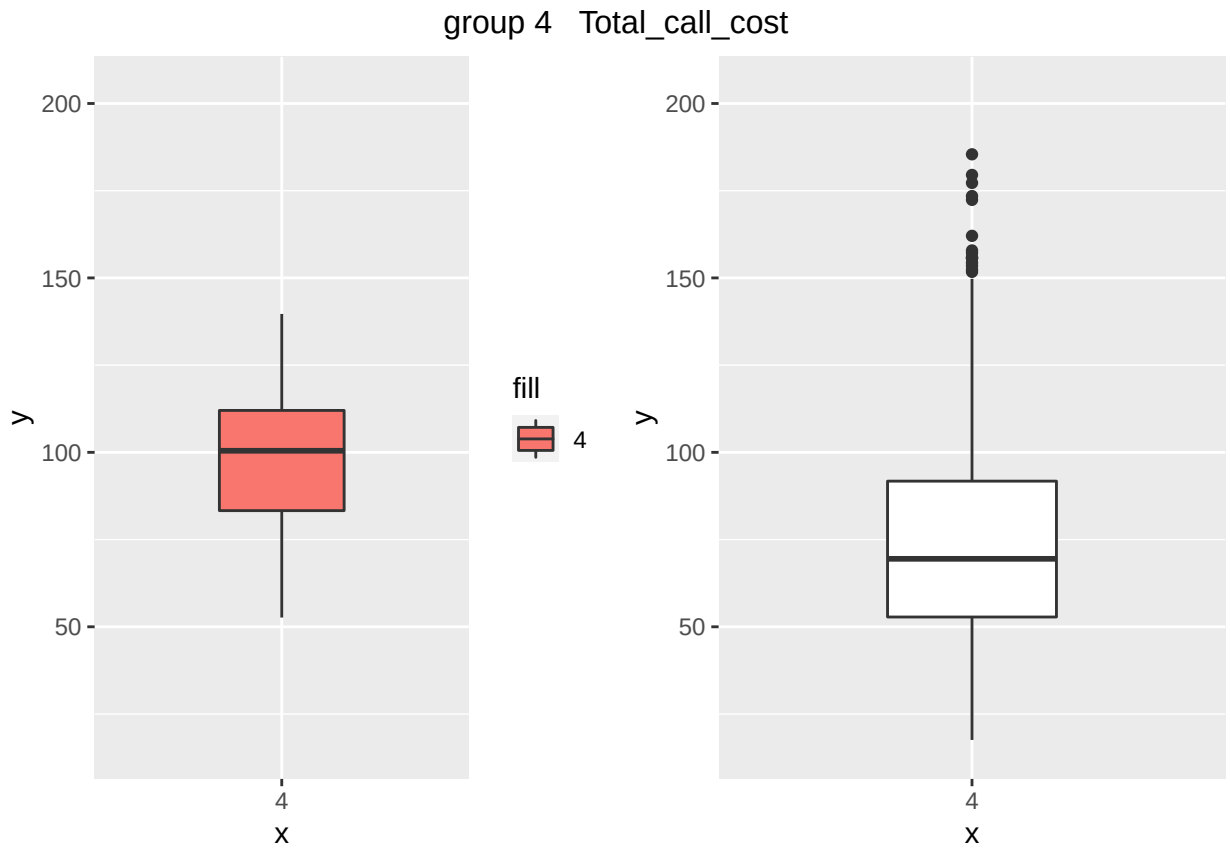
- actual.call.cost:

```
## [1] "Smaller than base median"
```



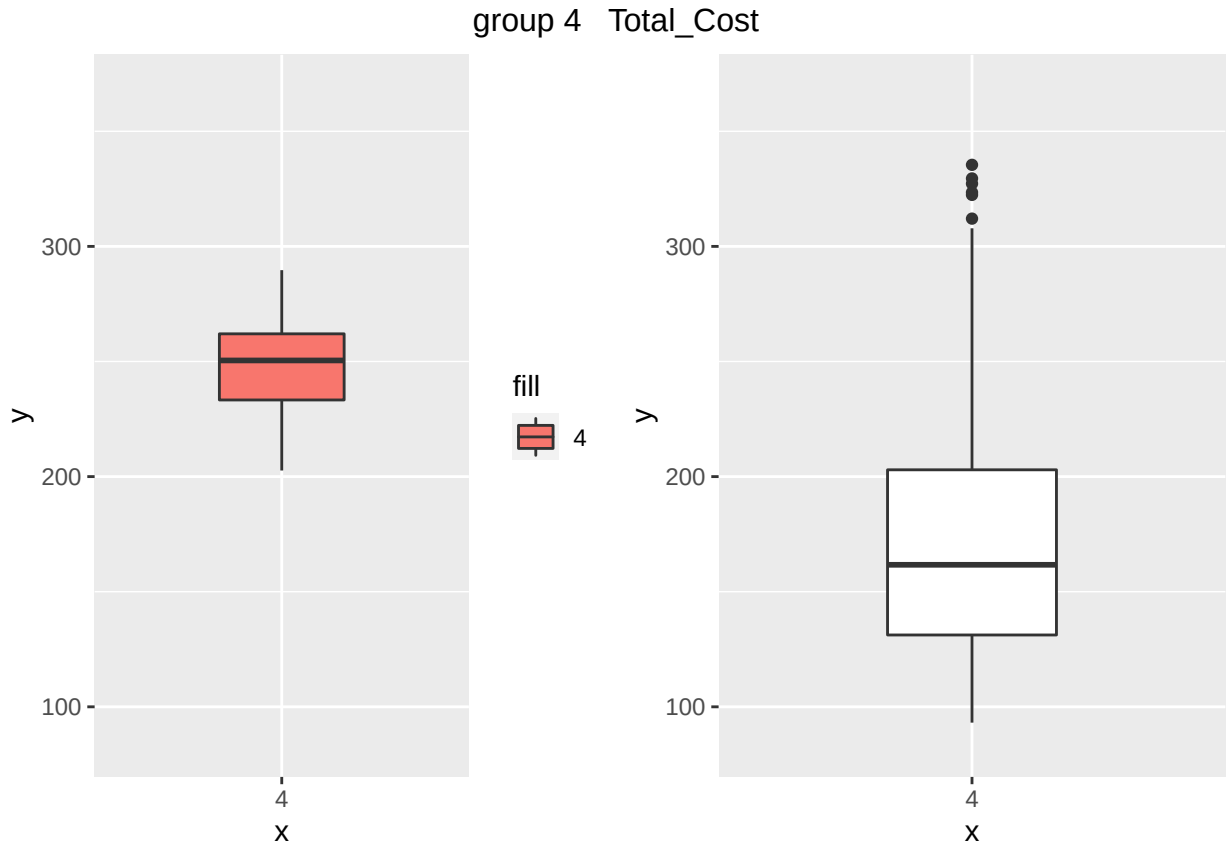
- Total_call_cost:

```
## [1] "Bigger than 3rd base quartile"
```



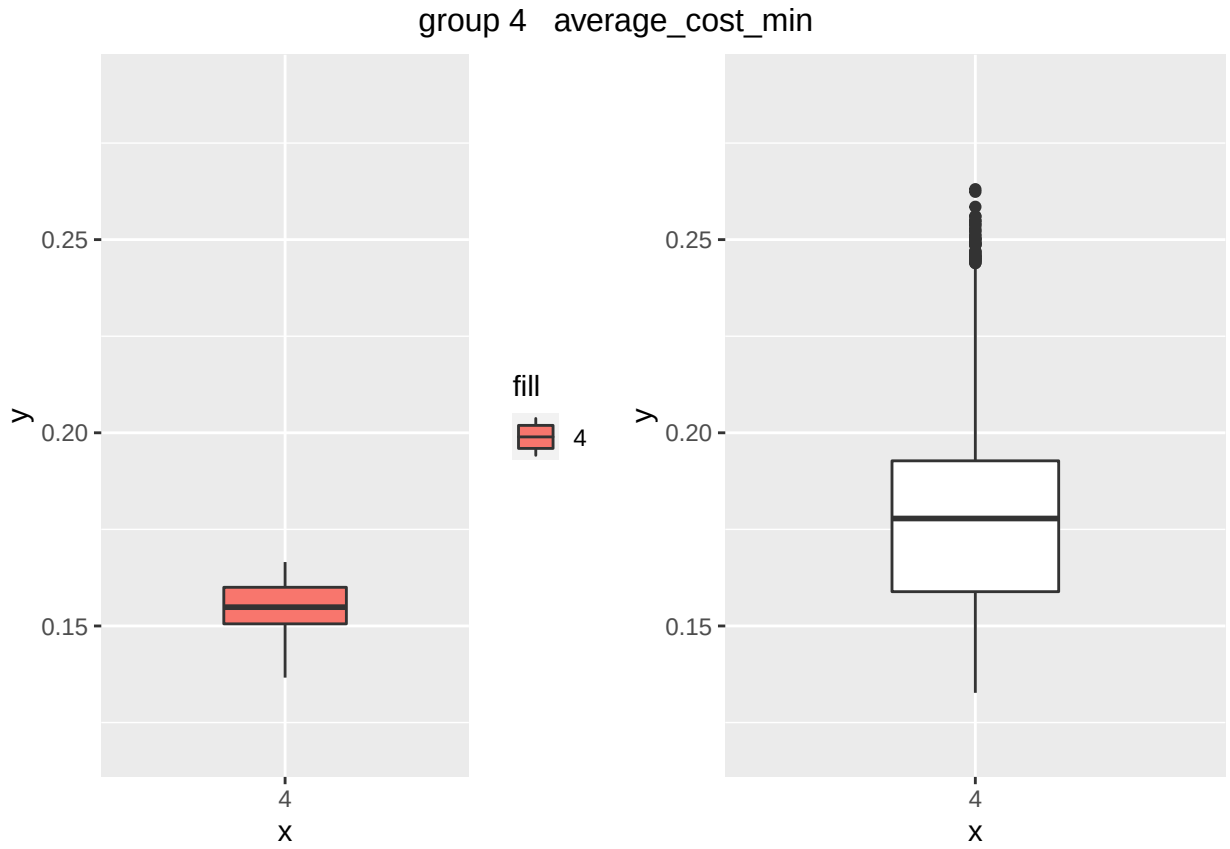
- Total_Cost:

```
## [1] "Bigger than 3rd base quartile"
```



- average_cost_min:

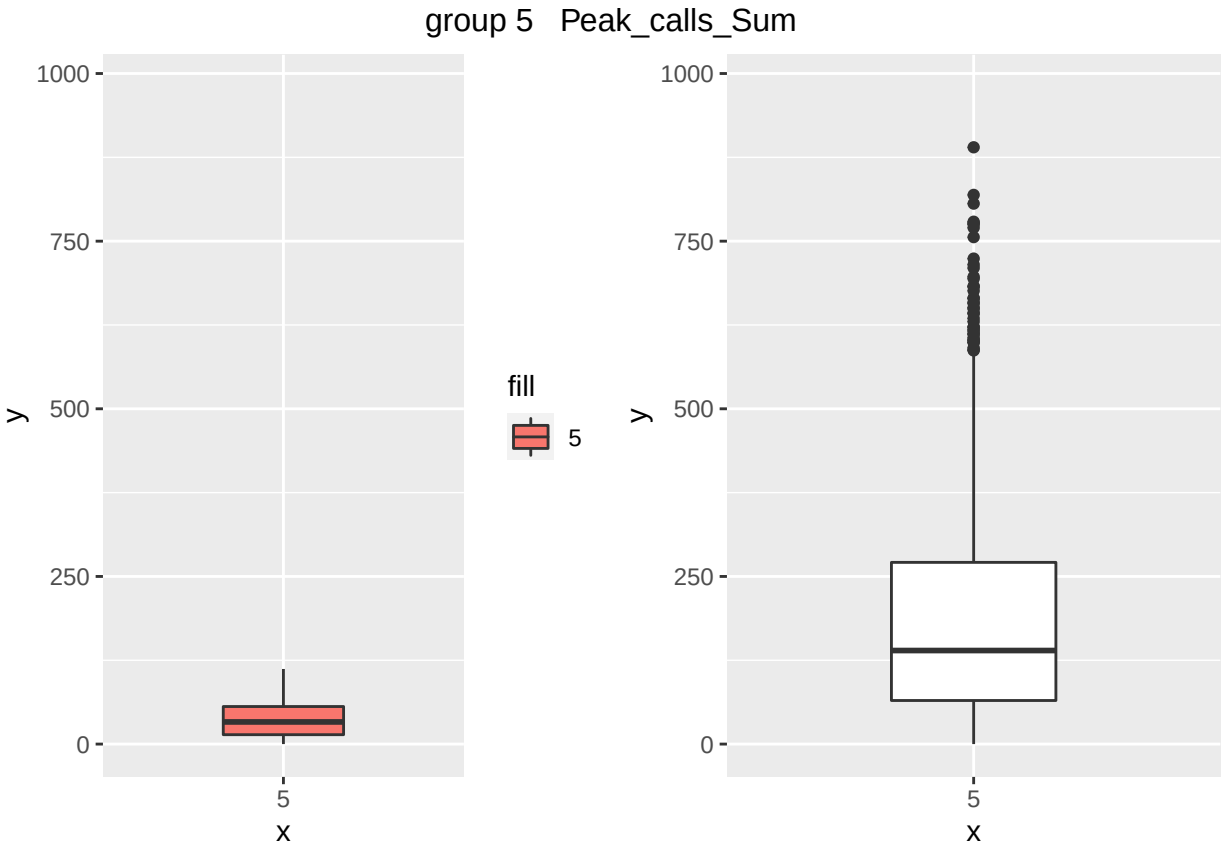
```
## [1] "Smaller than base median"
```



5.

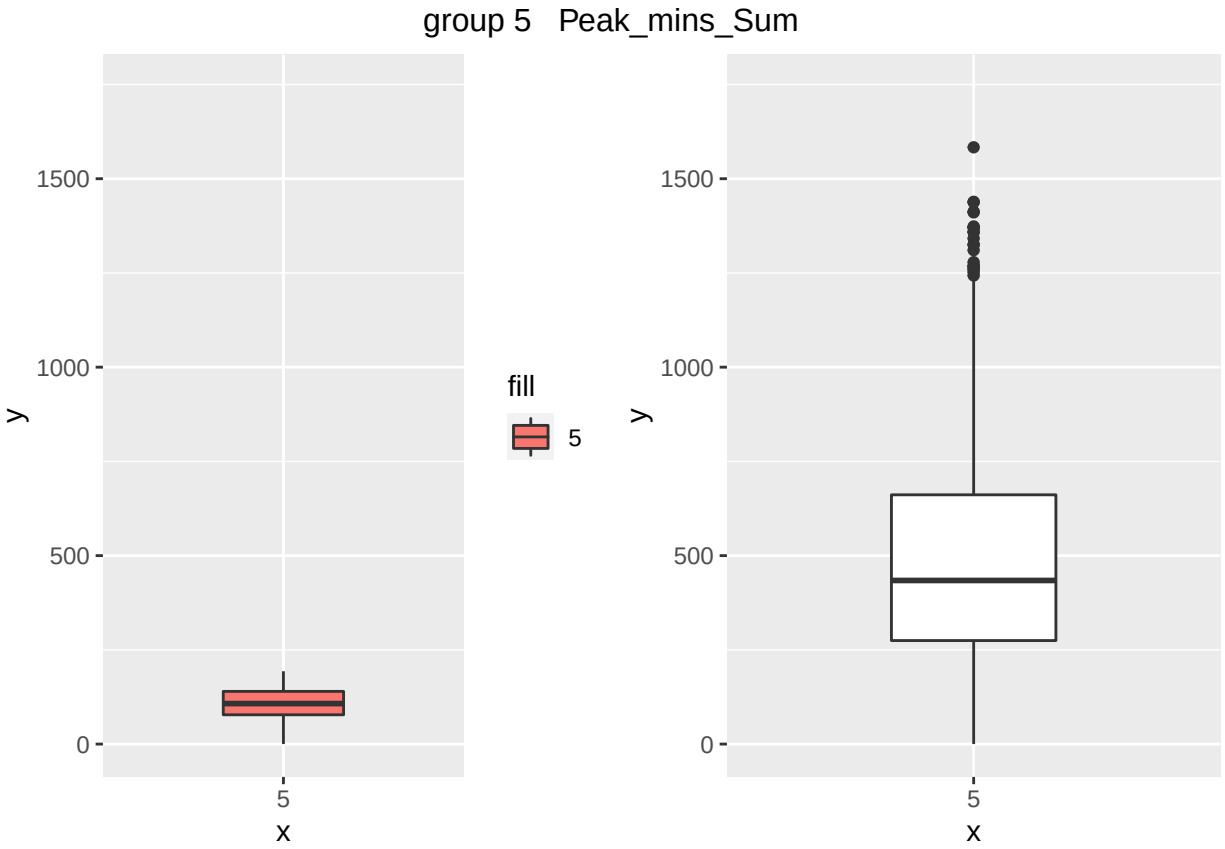
- Peak_calls_Sum:

```
## [1] "Smaller than base median"
```



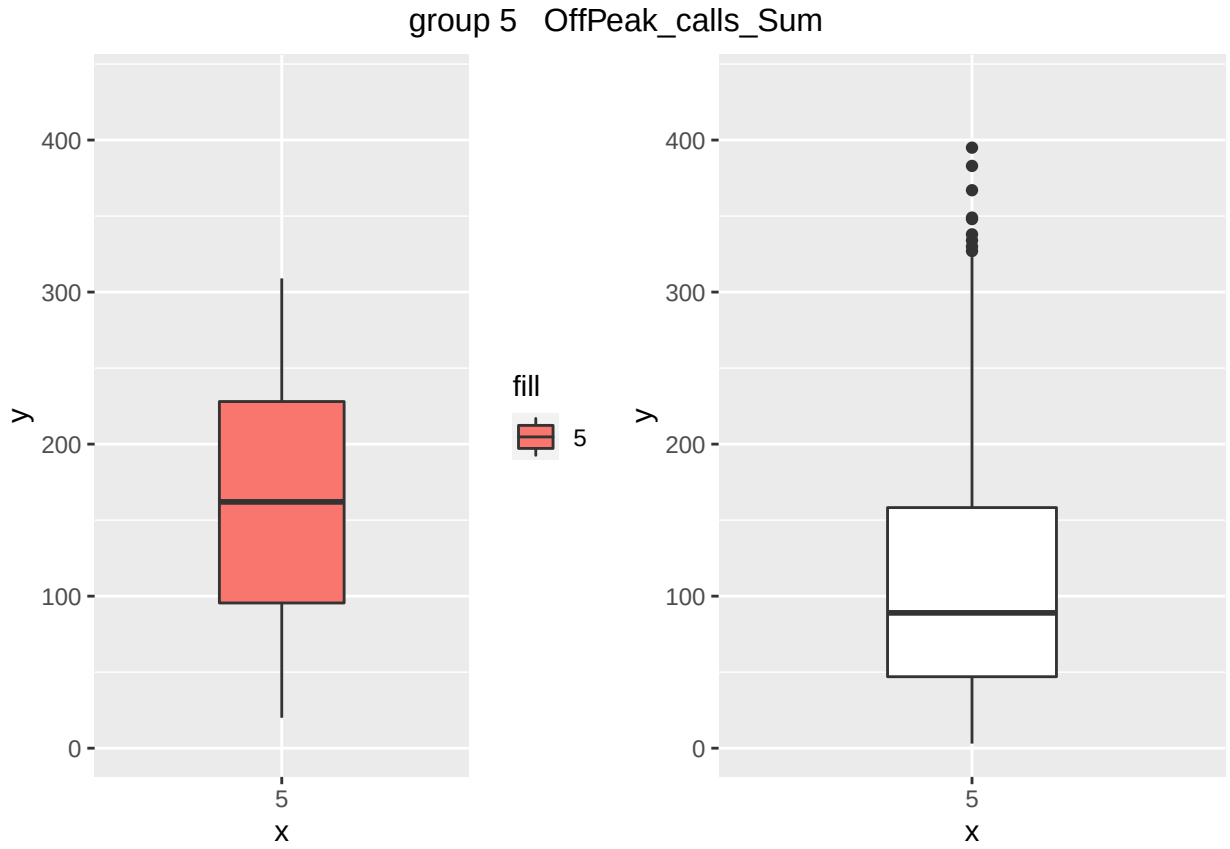
- Peak_mins_Sum:

```
## [1] "Smaller than base median"
```



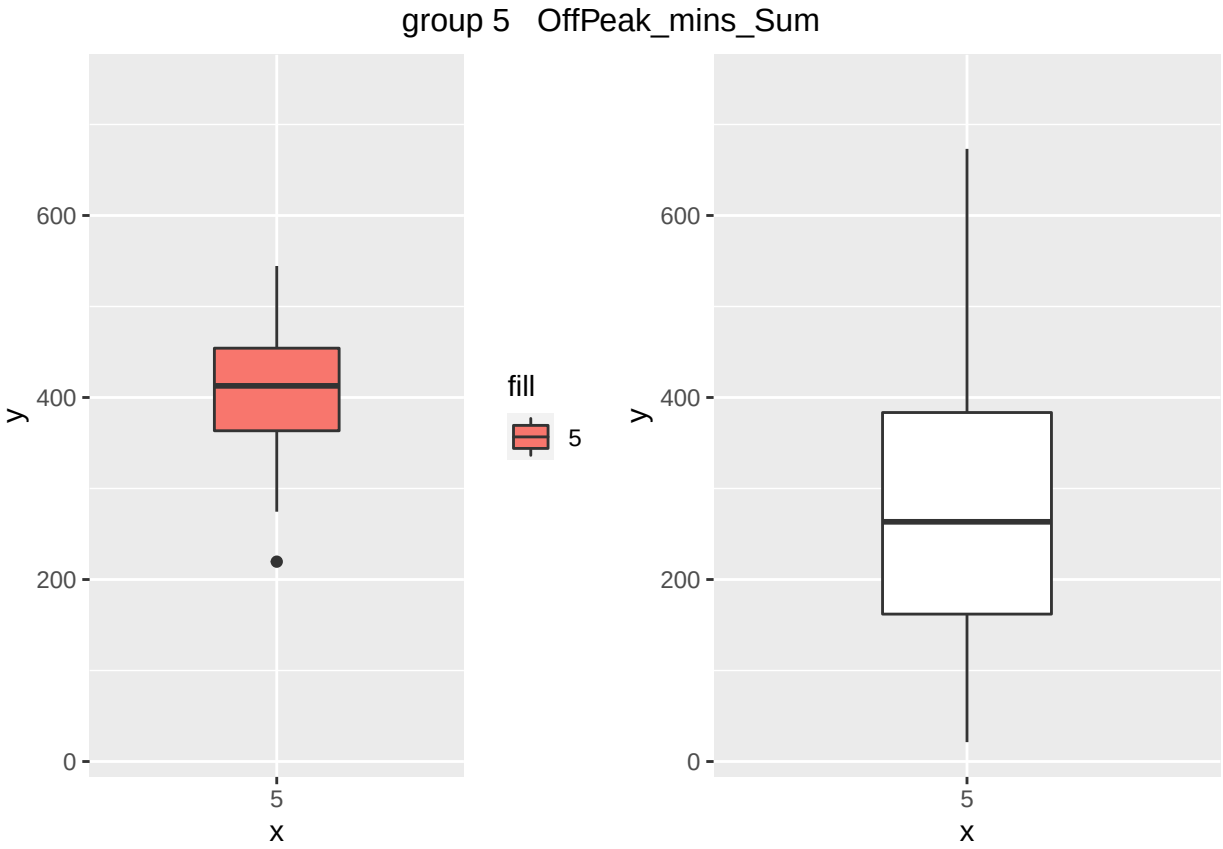
- OffPeak_calls_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



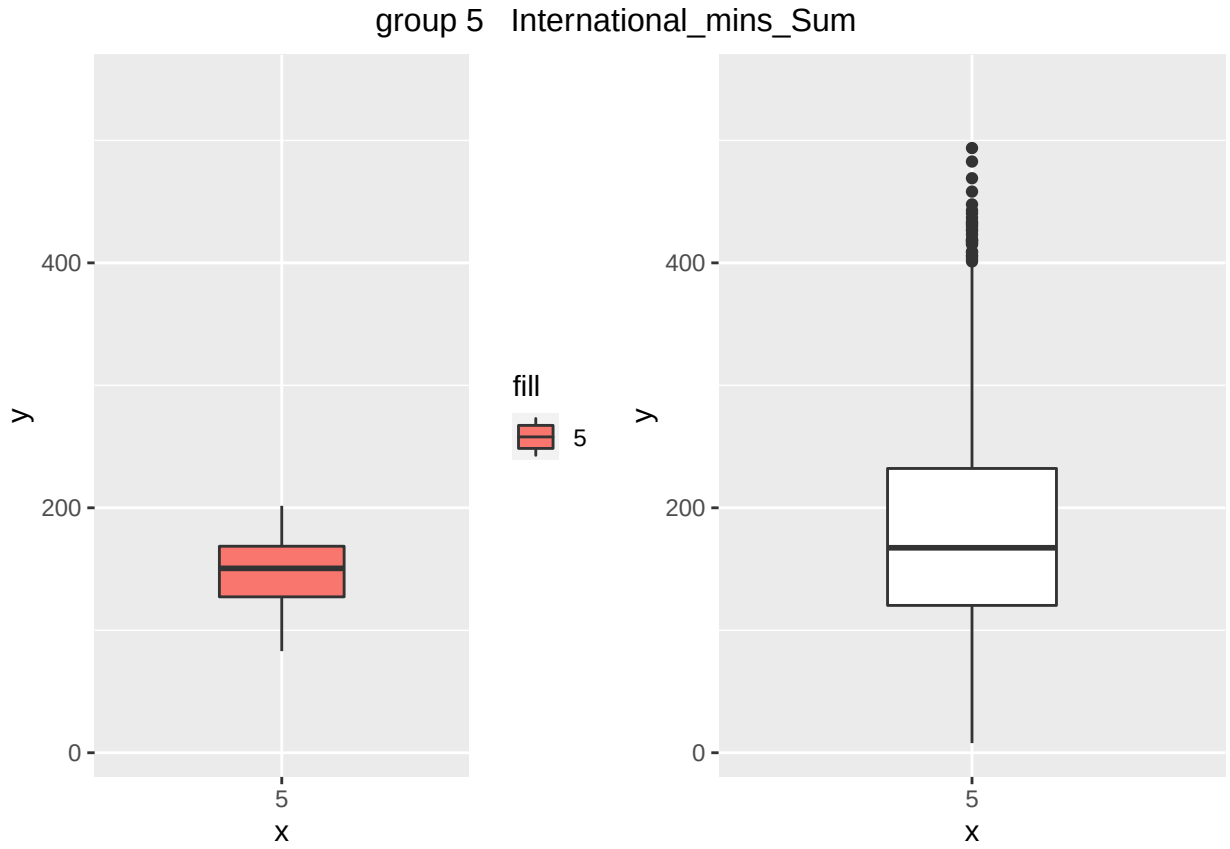
- OffPeak_mins_Sum:

```
## [1] "Bigger than 3rd base quartile"
```



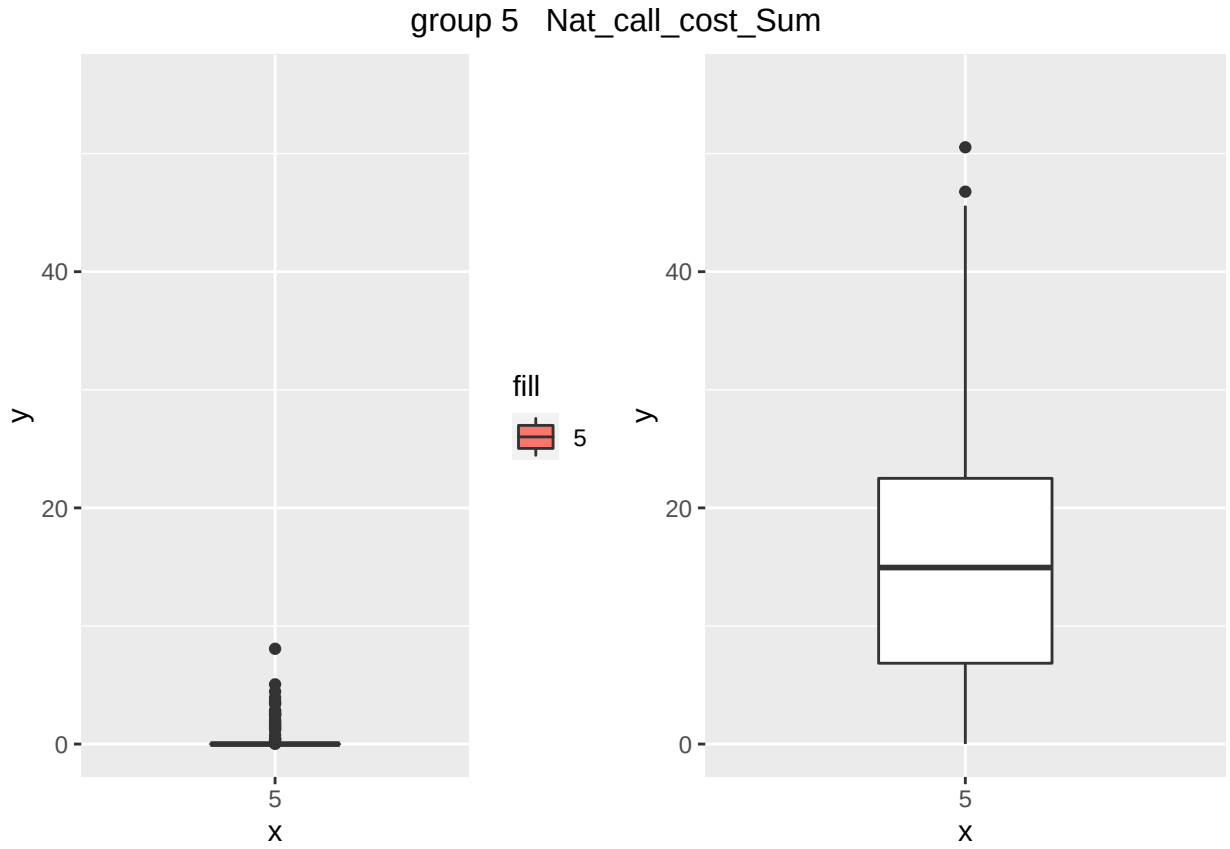
- International_mins_Sum:

```
## [1] "Smaller than base median"
```



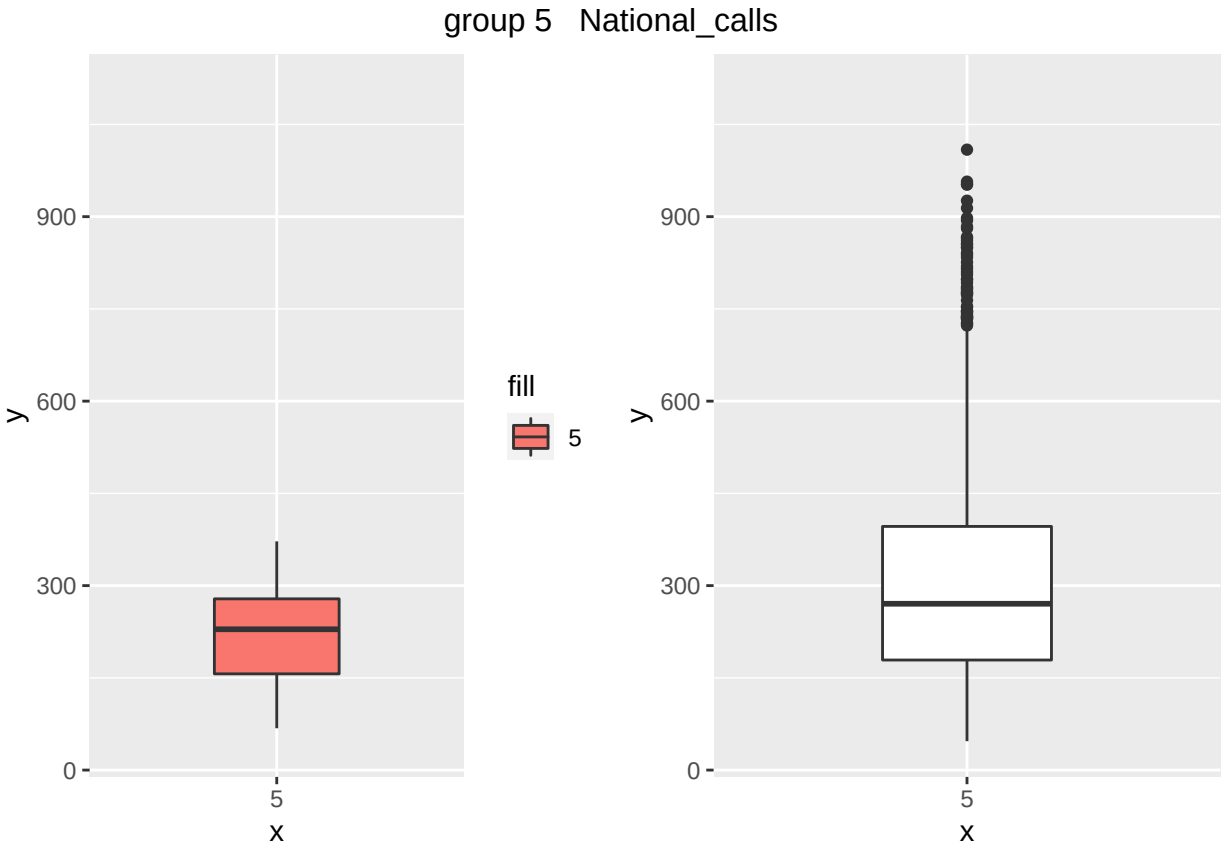
- Nat_call_cost_Sum:

```
## [1] "Smaller than base median"
```



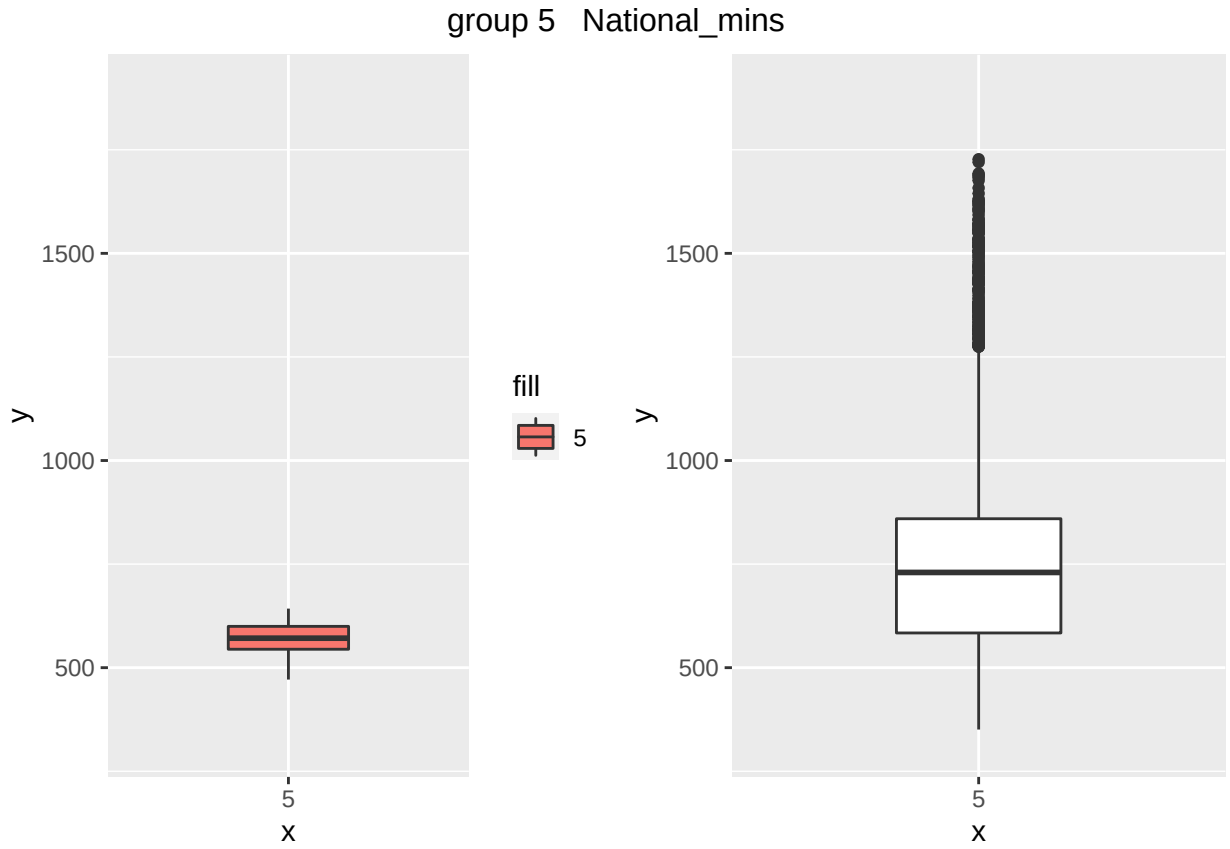
- National_calls:

```
## [1] "Smaller than base median"
```



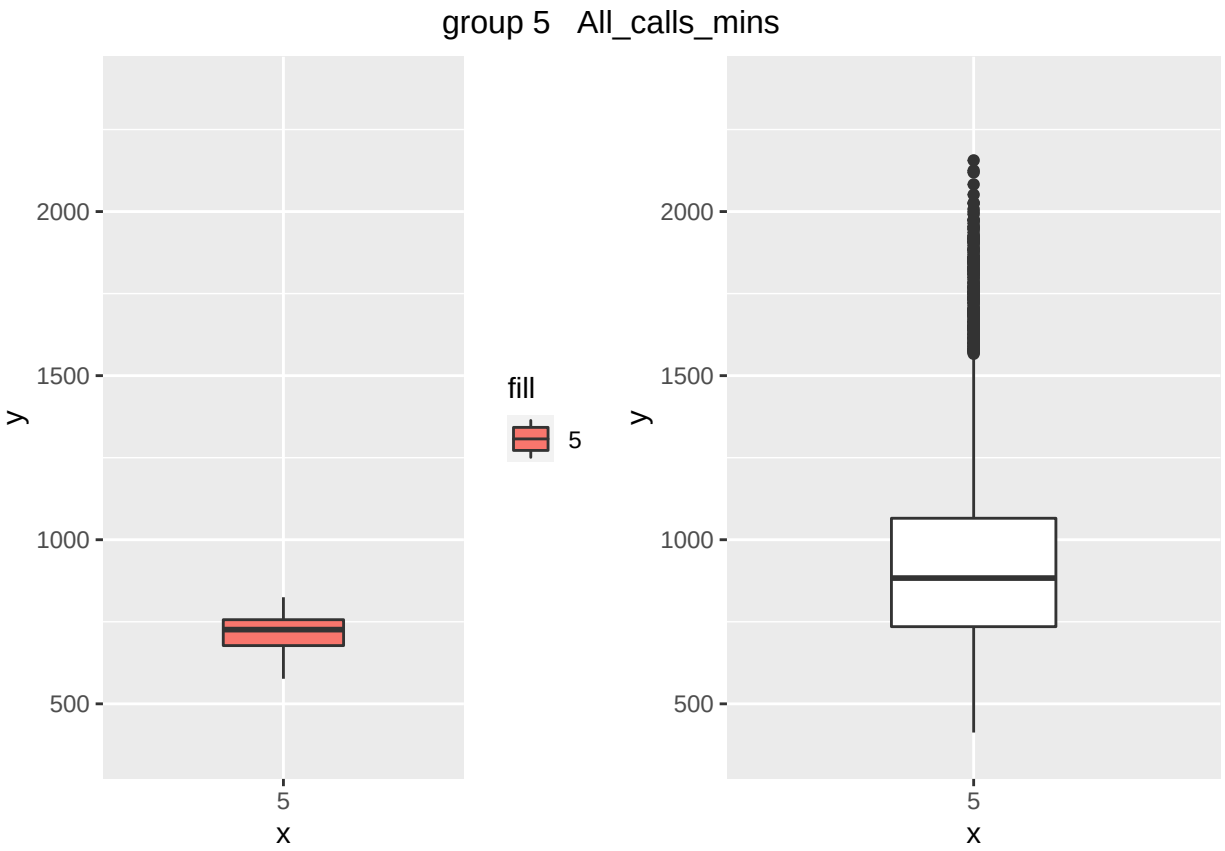
- National_mins:

```
## [1] "Smaller than base median"
```



- All_calls_mins:

```
## [1] "Smaller than base median"
```



- Mins_charge:

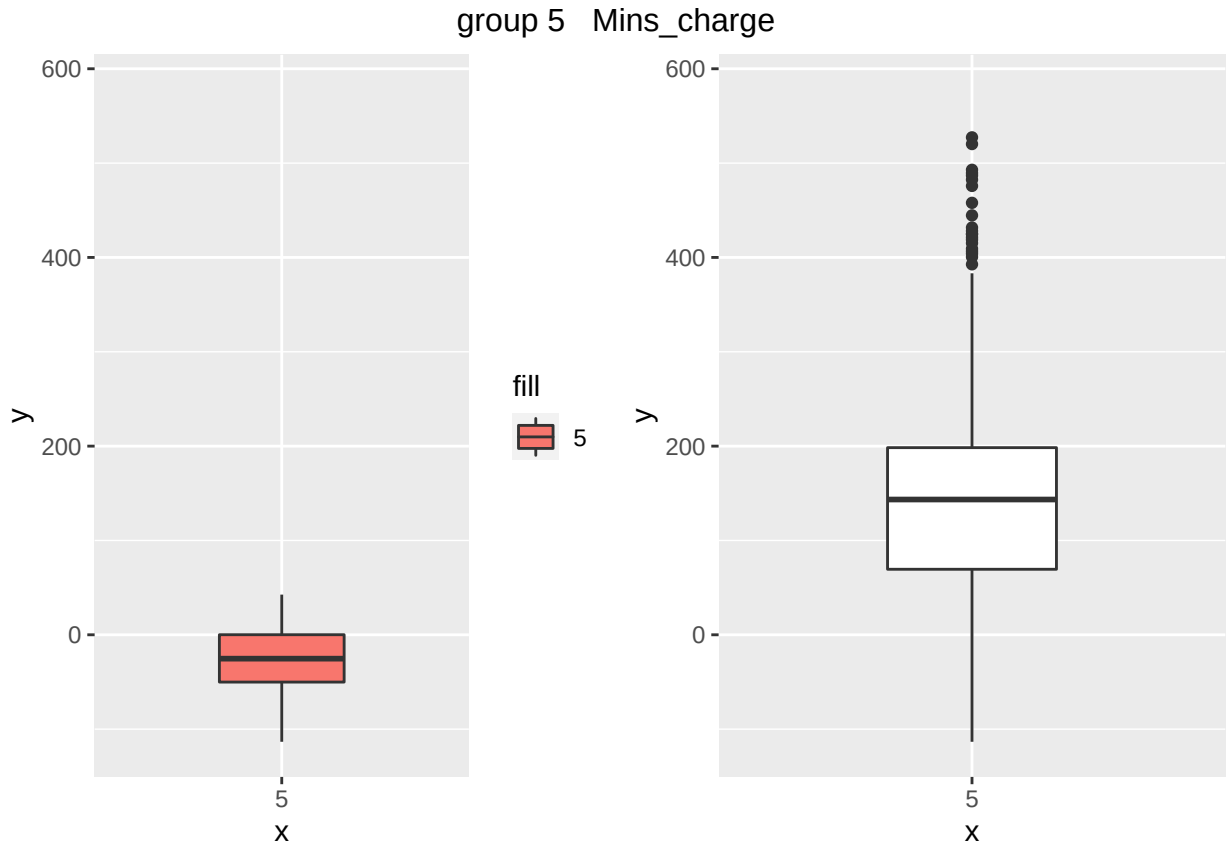
```
## [1] "Smaller than base median"
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

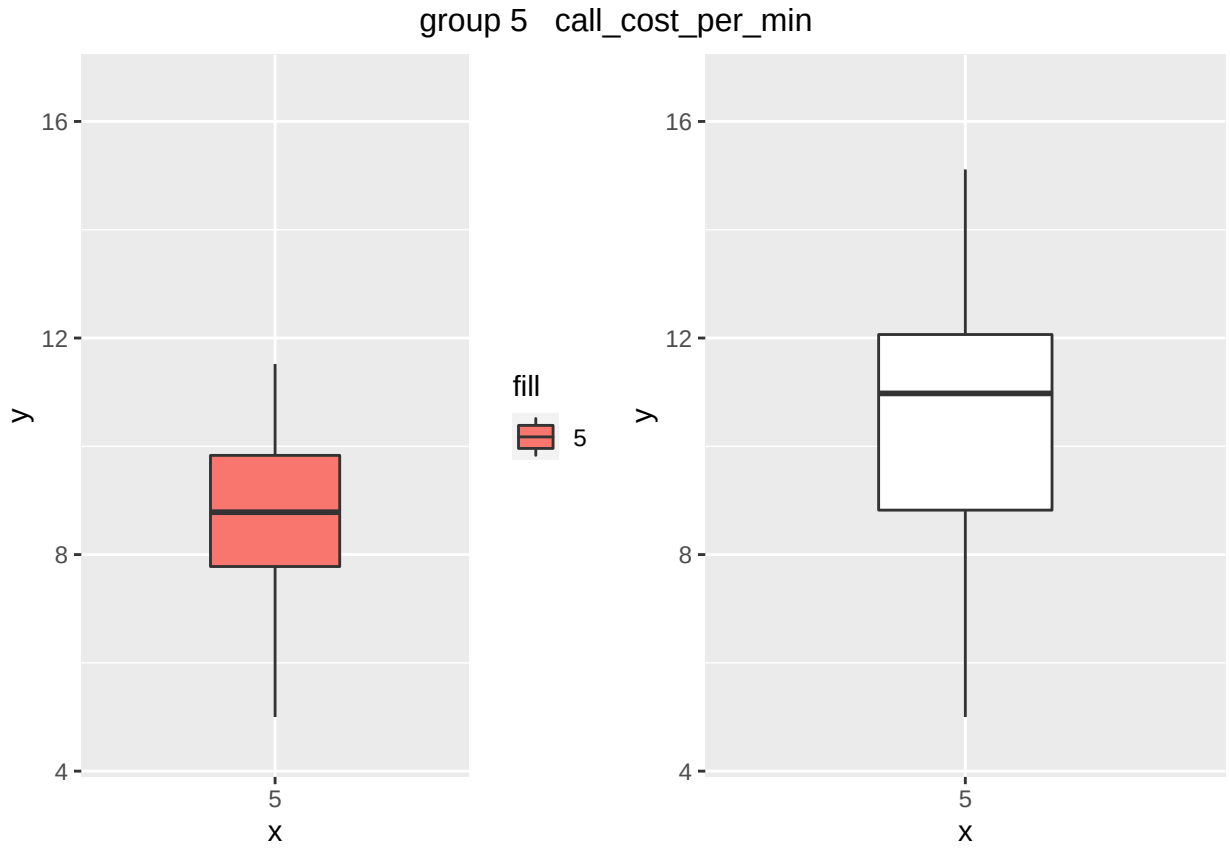
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



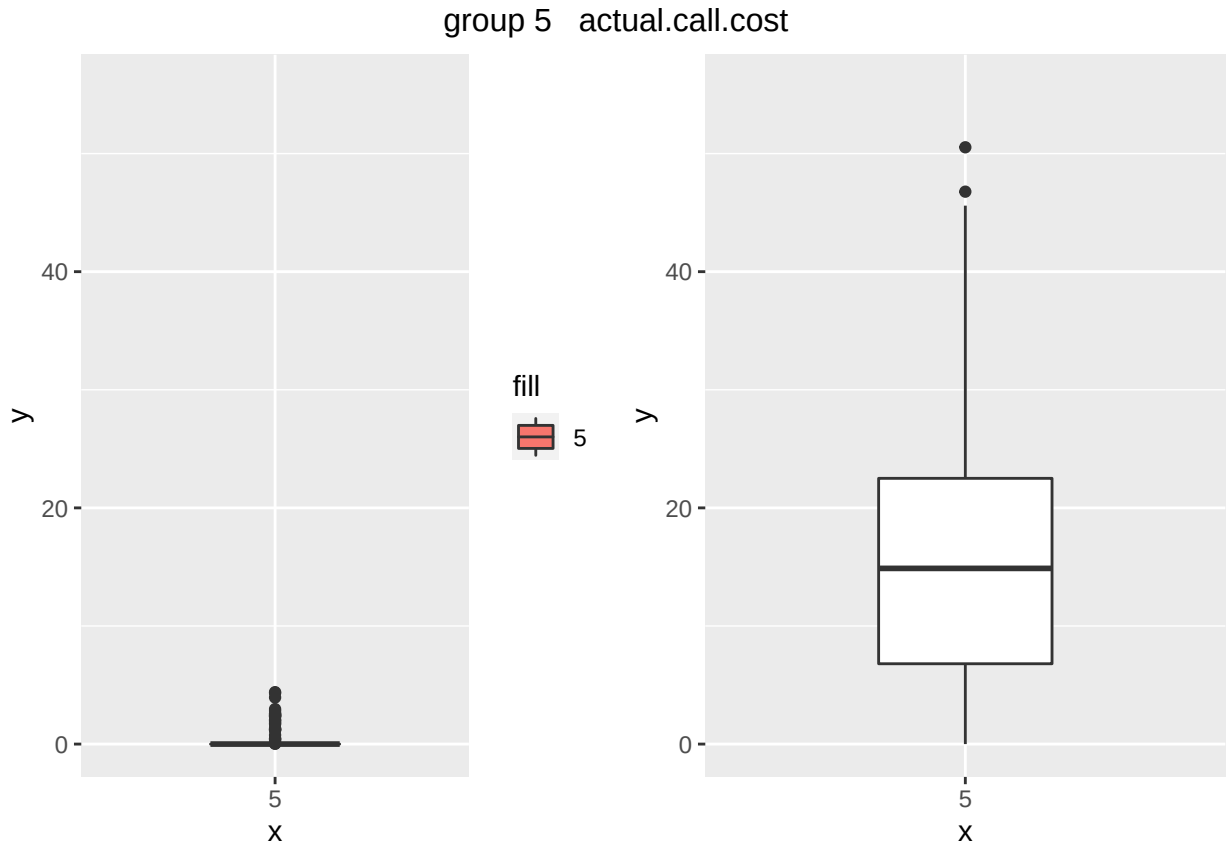
- call_cost_per_min:

```
## [1] "Smaller than base median"
```



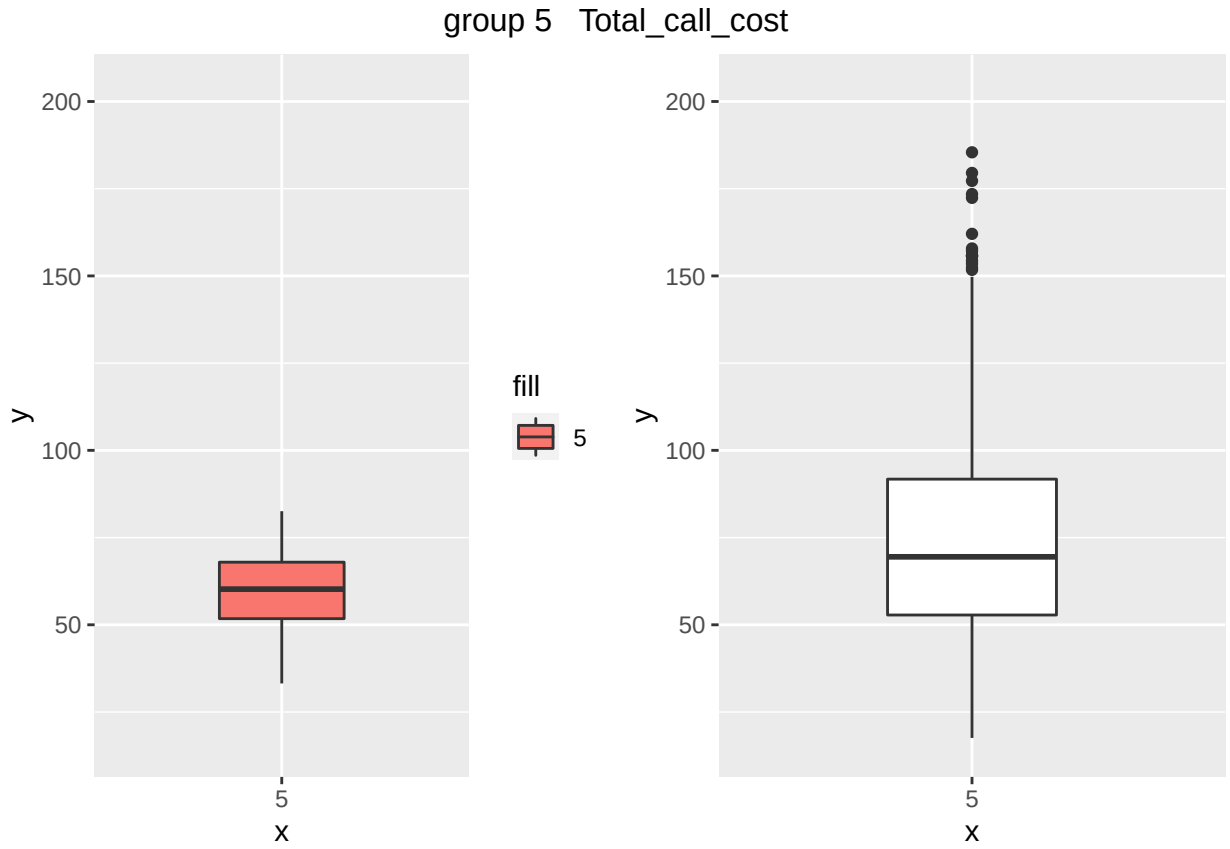
- actual.call.cost:

```
## [1] "Smaller than base median"
```



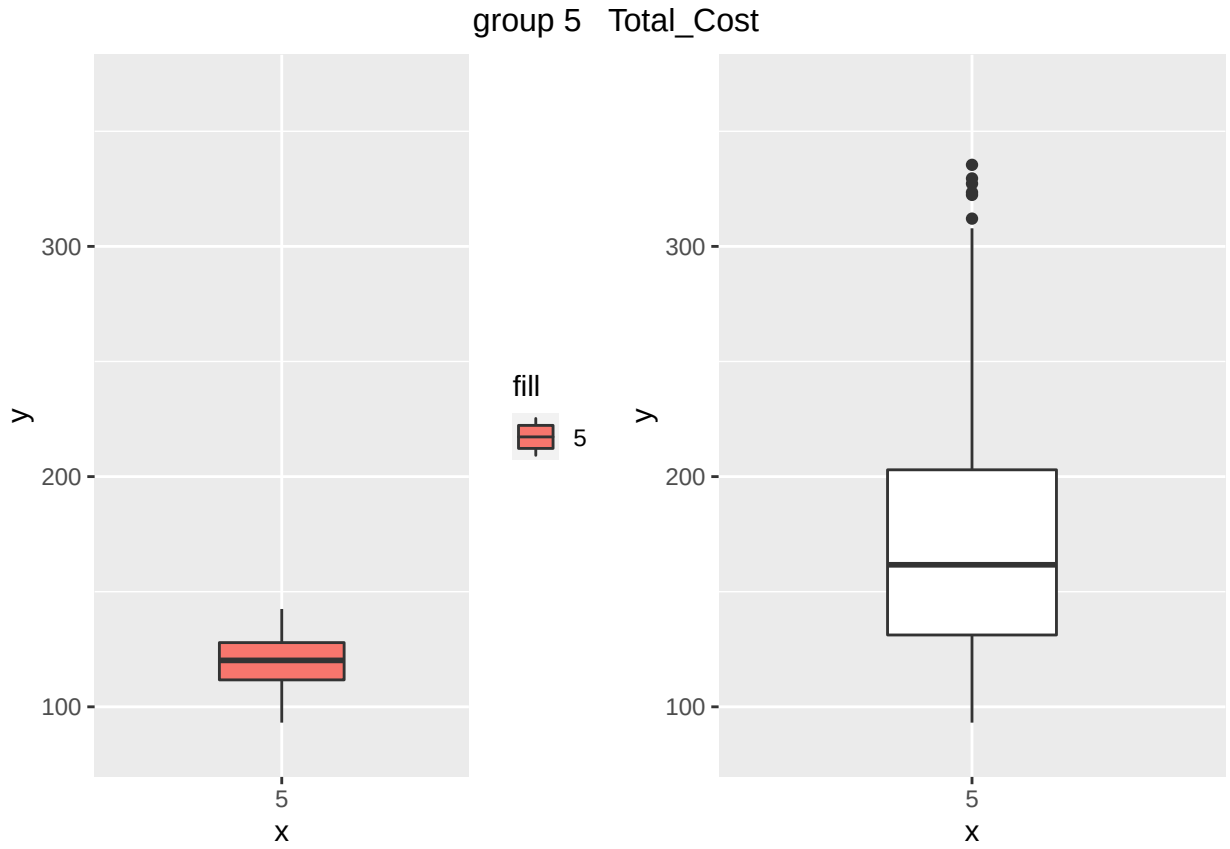
- Total_call_cost:

```
## [1] "Smaller than base median"
```



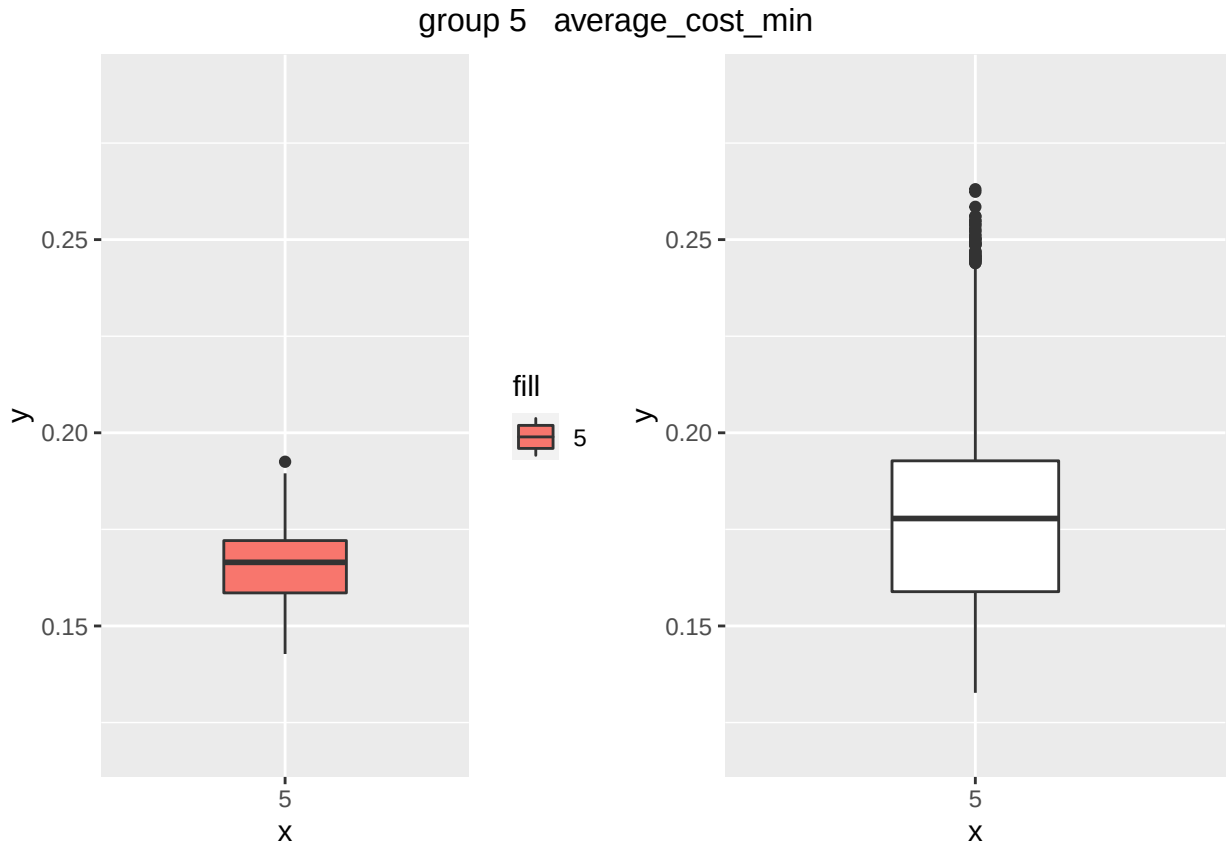
- Total_Cost:

```
## [1] "Smaller than base median"
```



- average_cost_min:

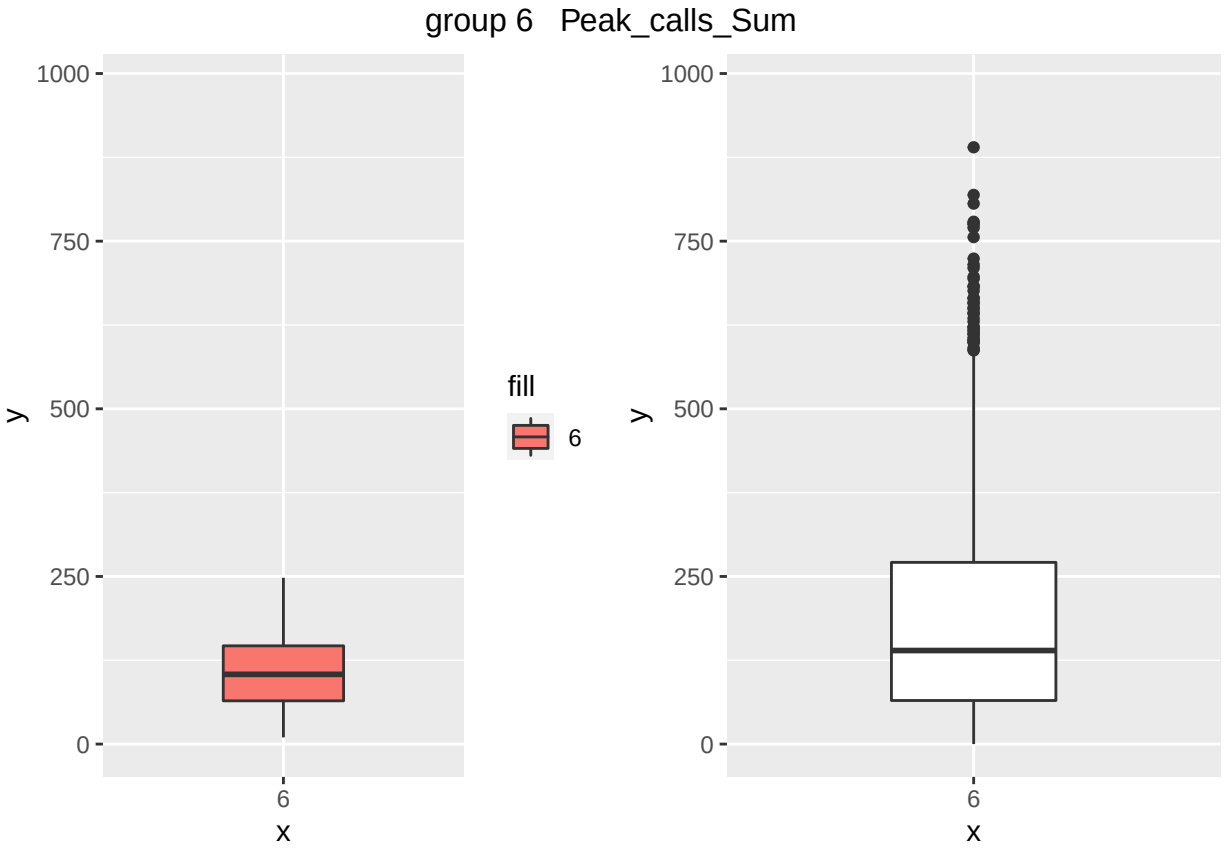
```
## [1] "Smaller than base median"
```



6.

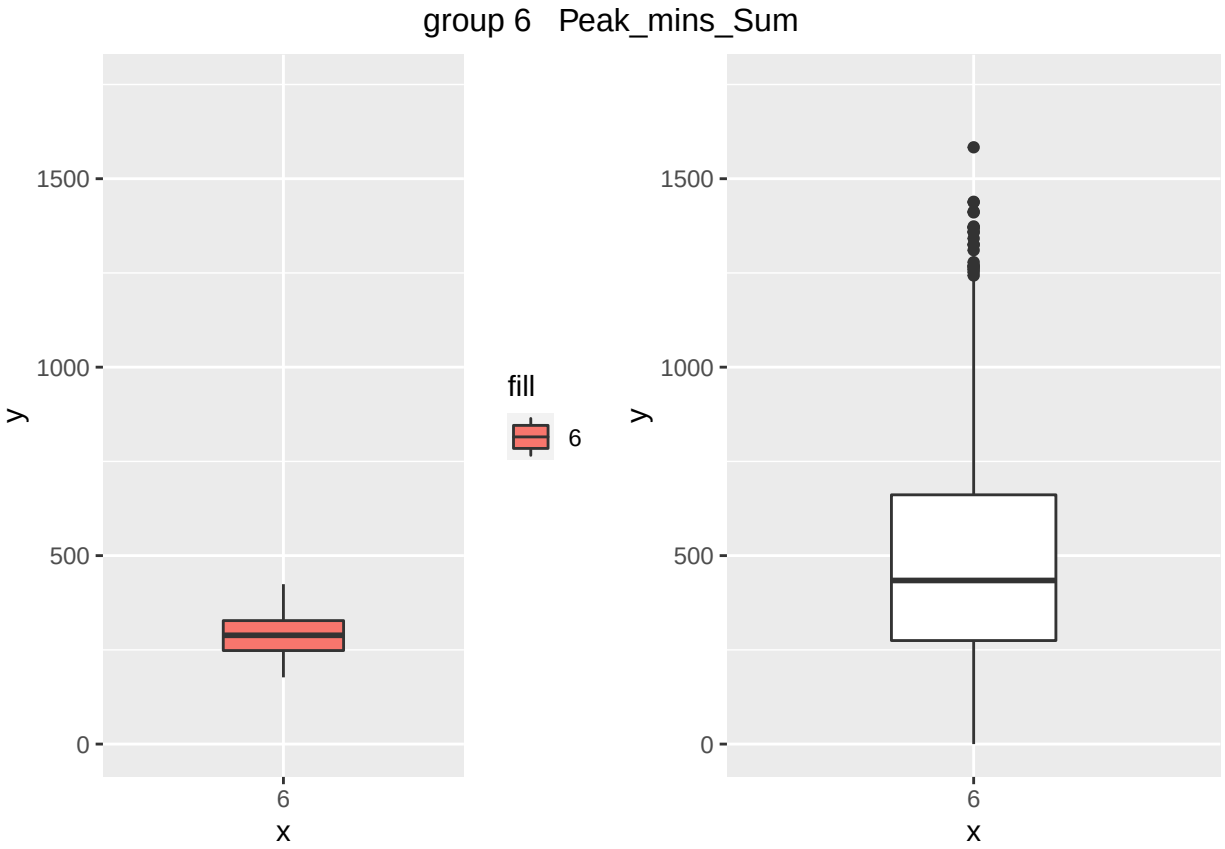
- Peak_calls_Sum:

```
## [1] "Smaller than base median"
```



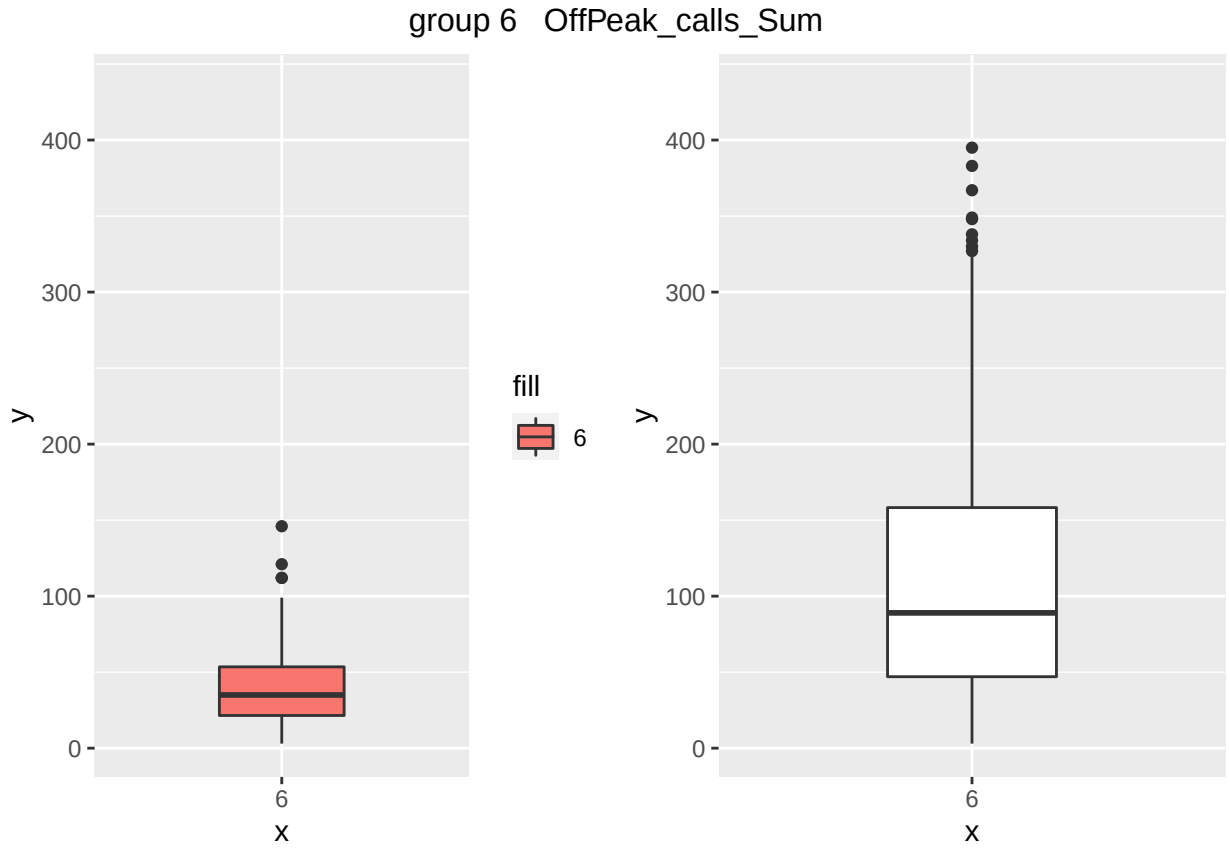
- Peak_mins_Sum:

```
## [1] "Smaller than base median"
```



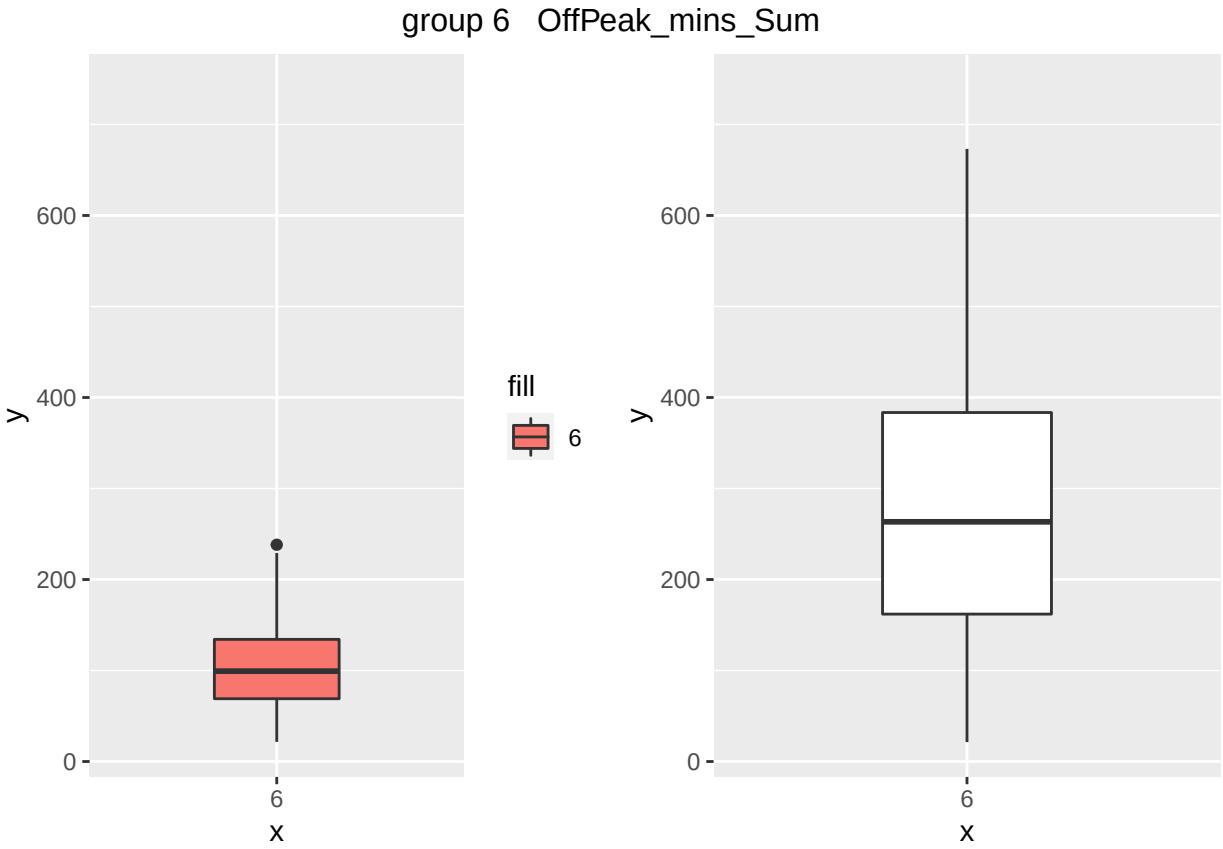
- OffPeak_calls_Sum:

```
## [1] "Smaller than base median"
```



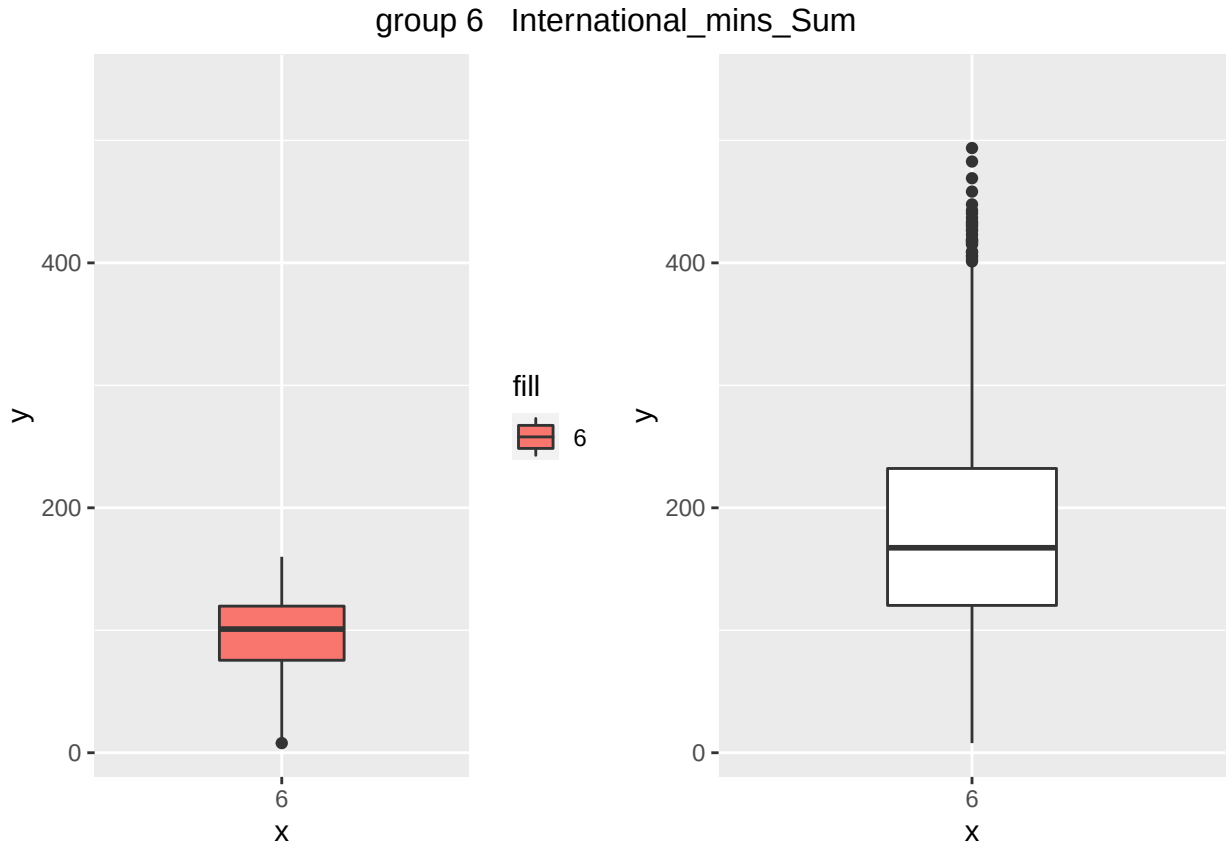
- OffPeak_mins_Sum:

```
## [1] "Smaller than base median"
```



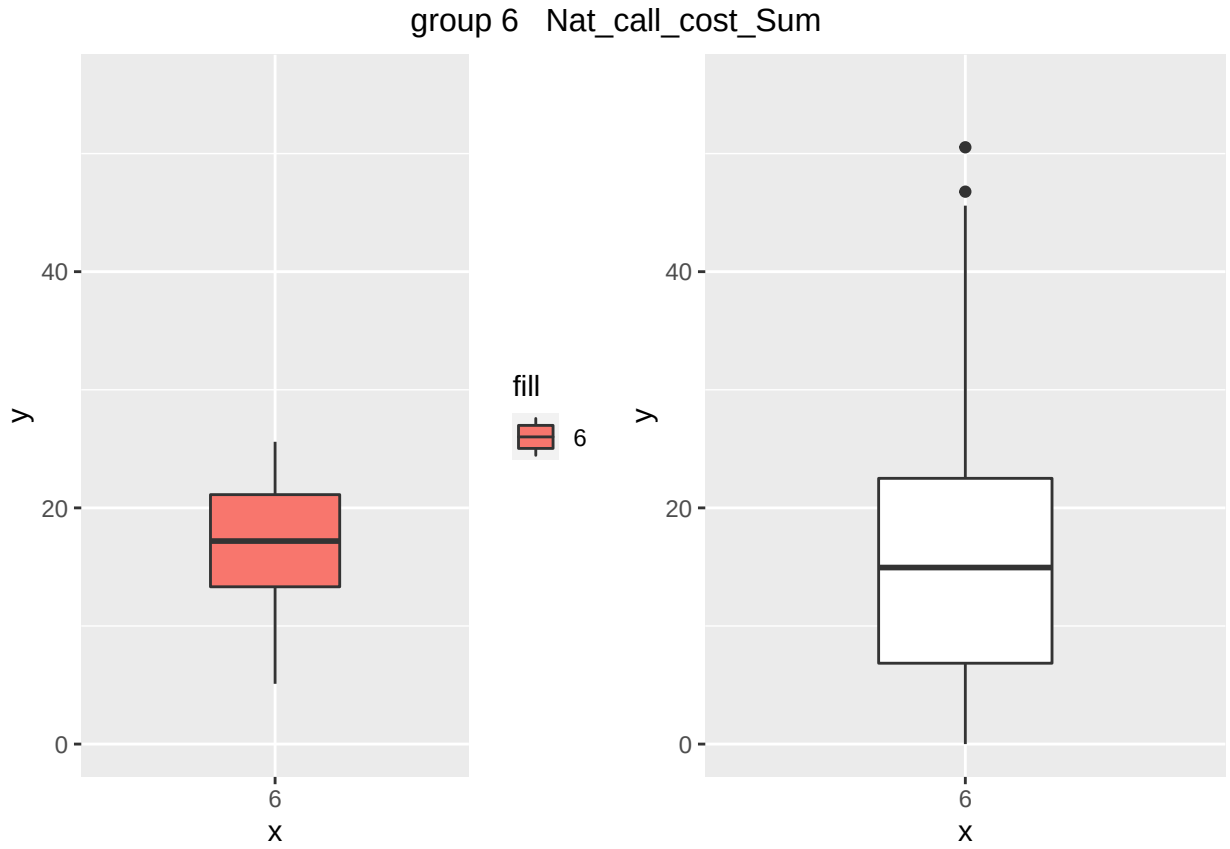
- International_mins_Sum:

```
## [1] "Smaller than base median"
```



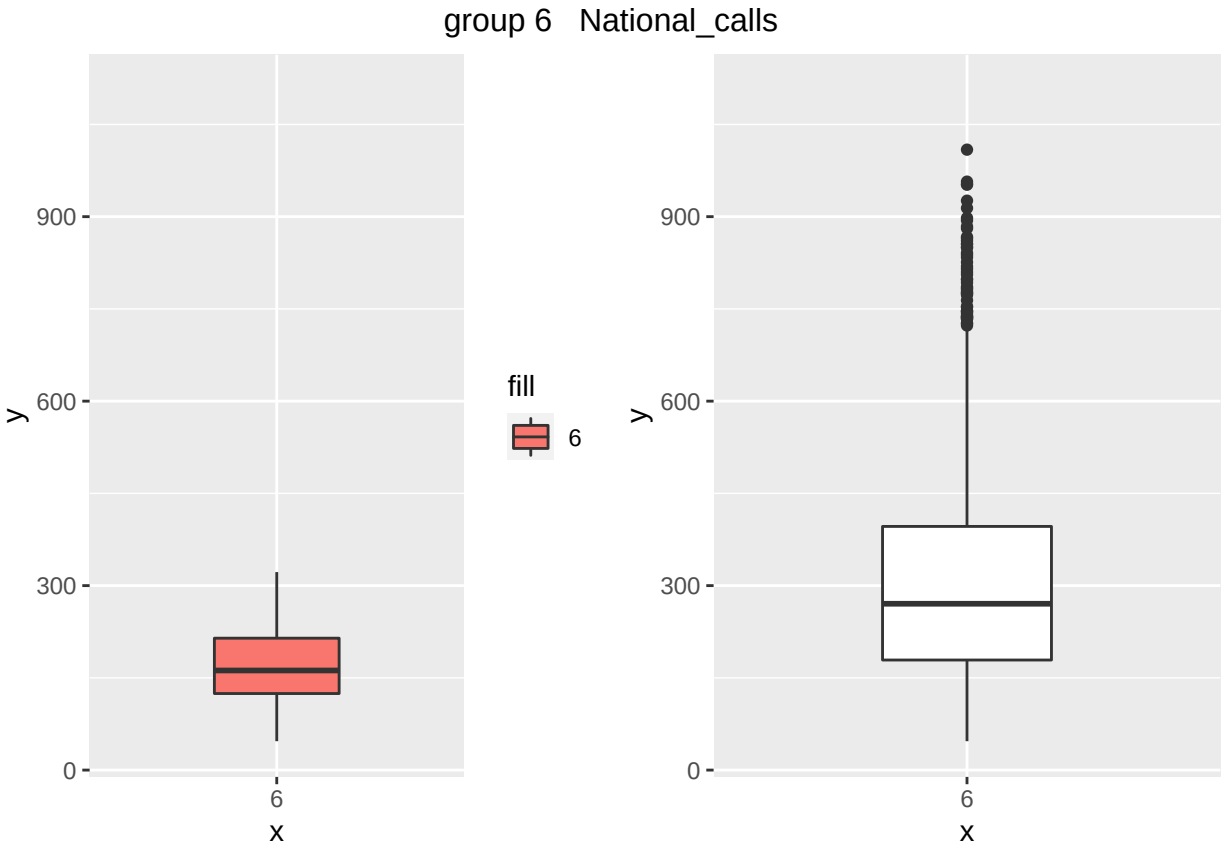
- Nat_call_cost_Sum:

```
## [1] "Bigger than base median"
```



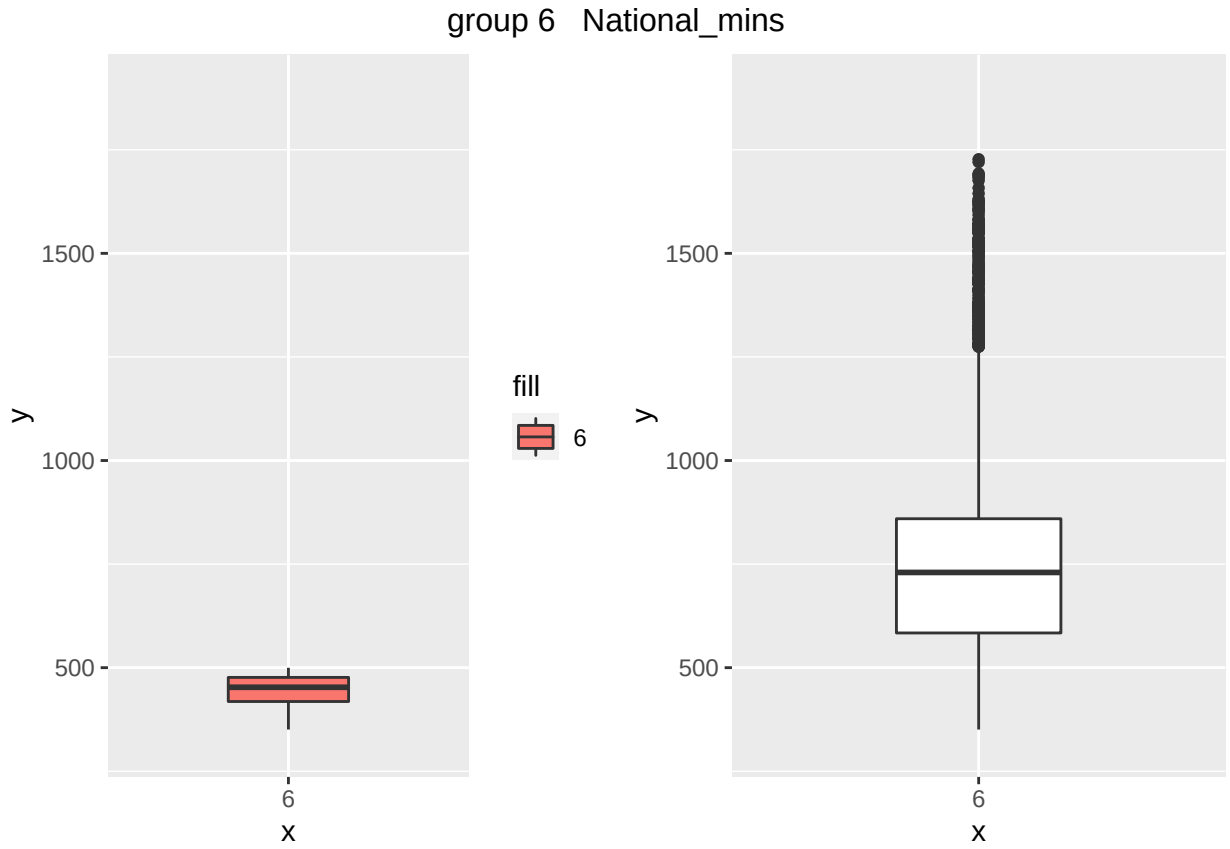
- National_calls:

```
## [1] "Smaller than base median"
```



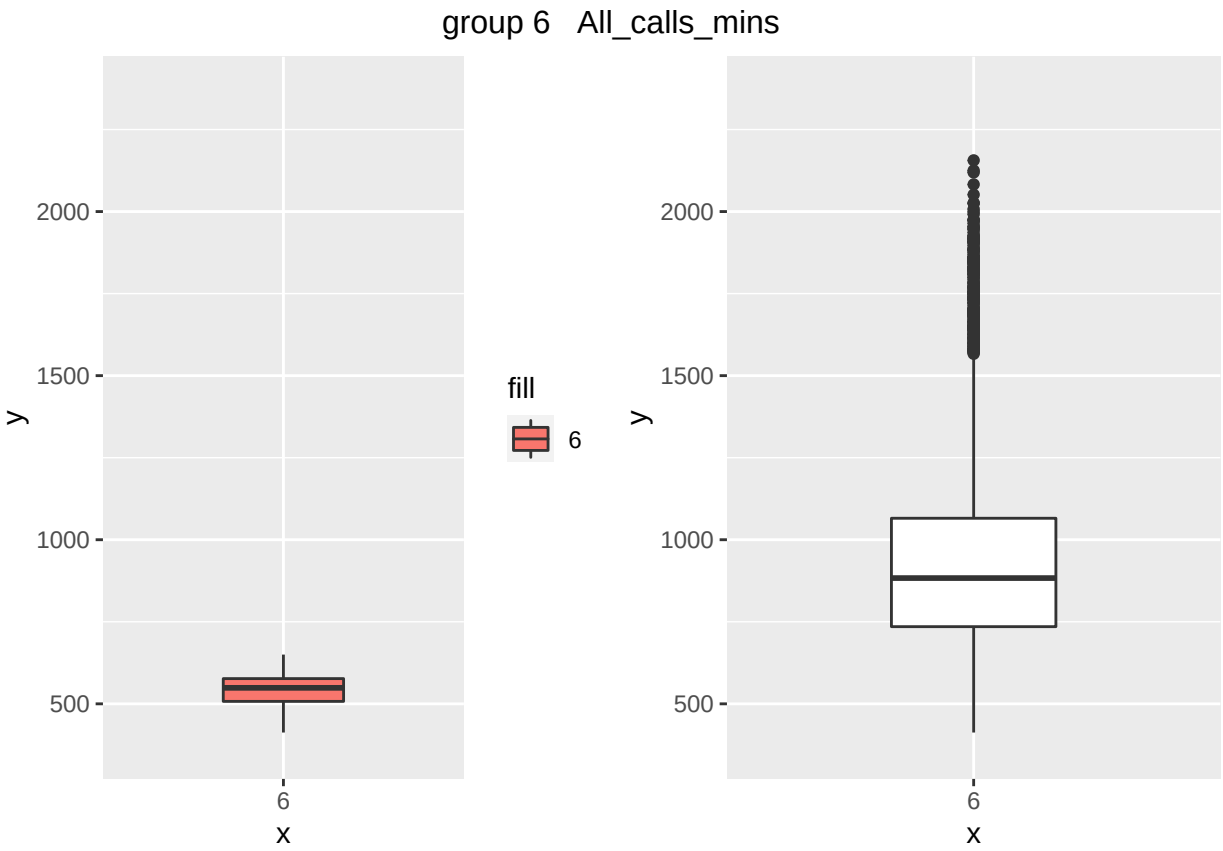
- National_mins:

```
## [1] "Smaller than base median"
```



- All_calls_mins:

```
## [1] "Smaller than base median"
```

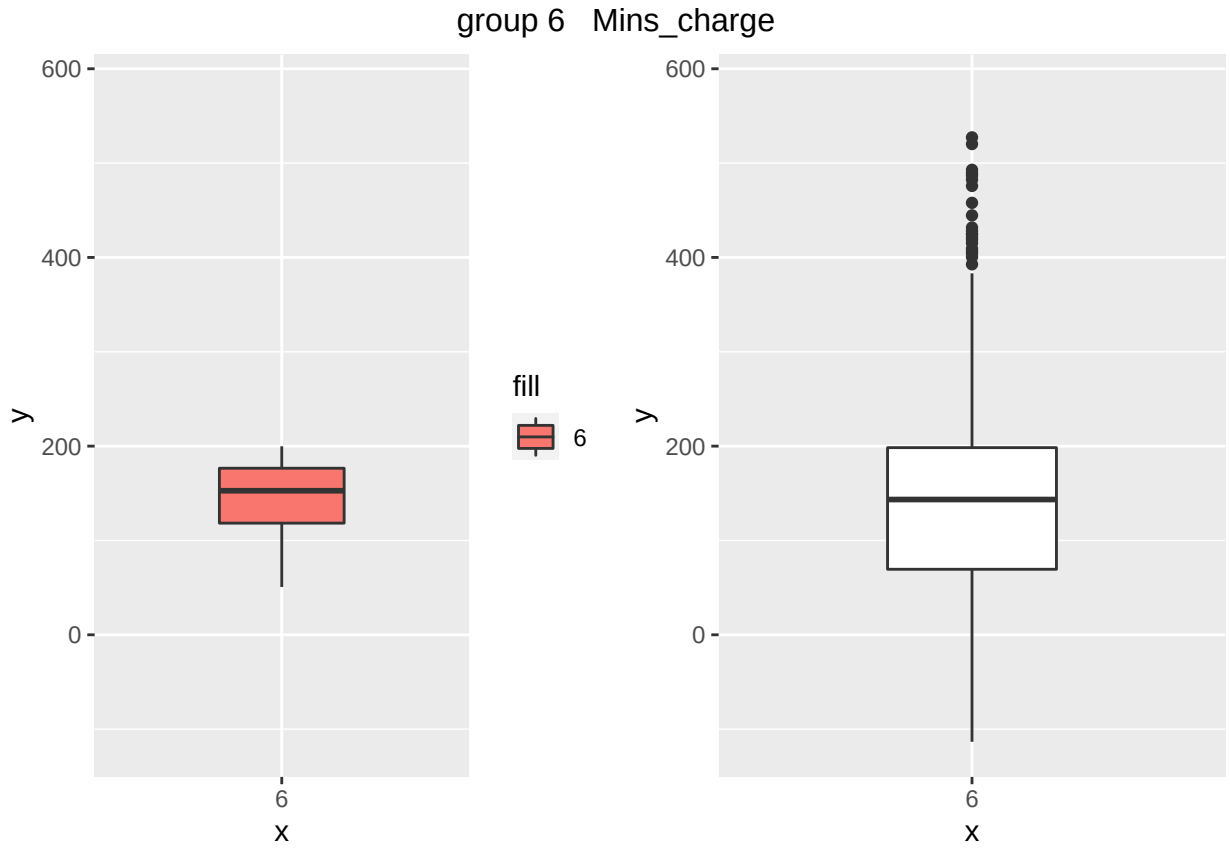


- Mins_charge:

```
## [1] "Bigger than base median"
```

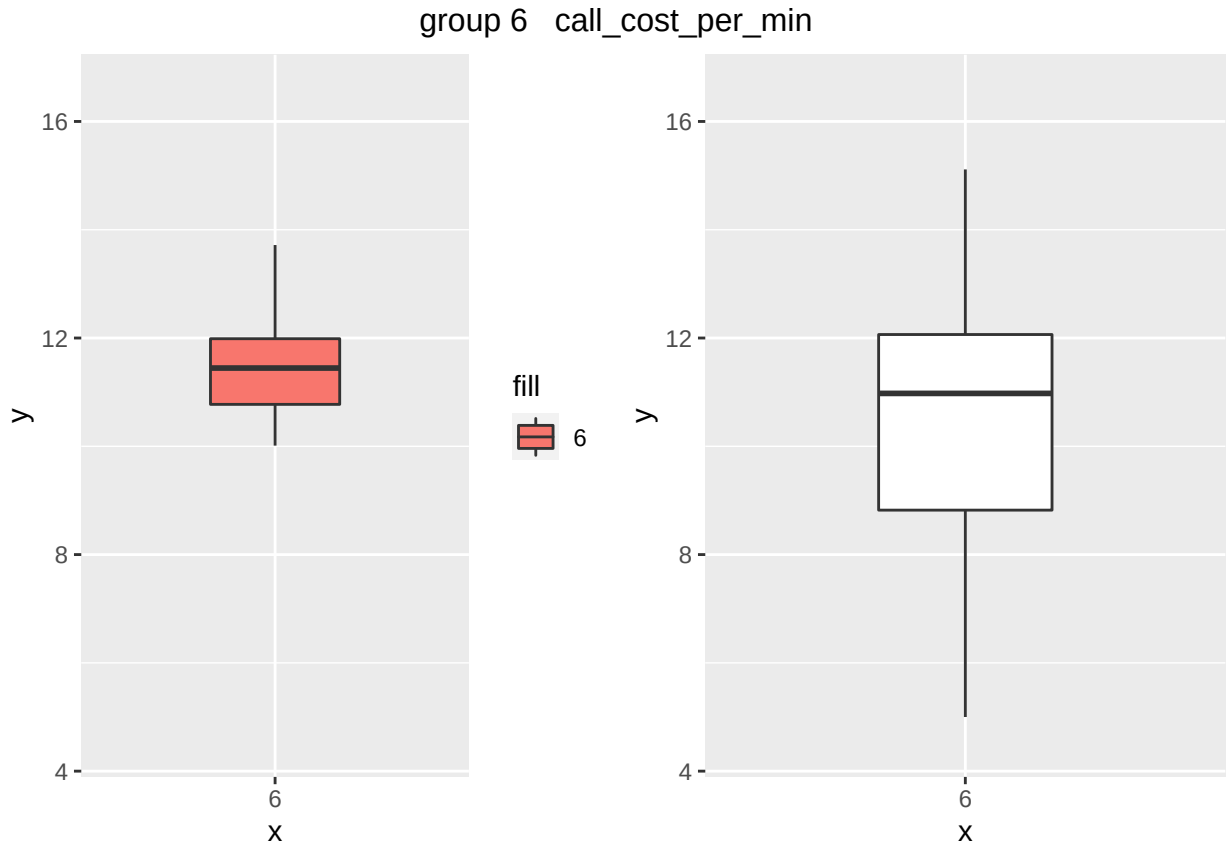
```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```



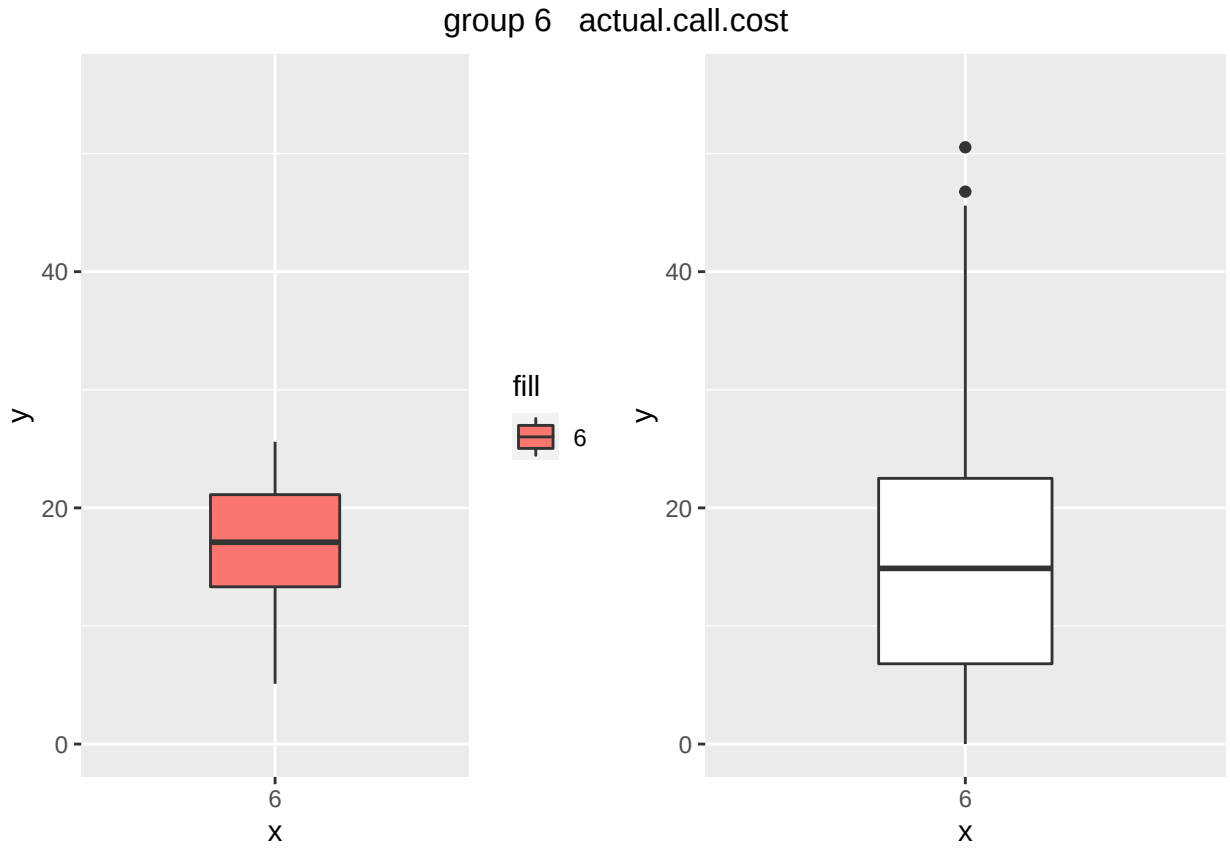
- call_cost_per_min:

```
## [1] "Bigger than base median"
```



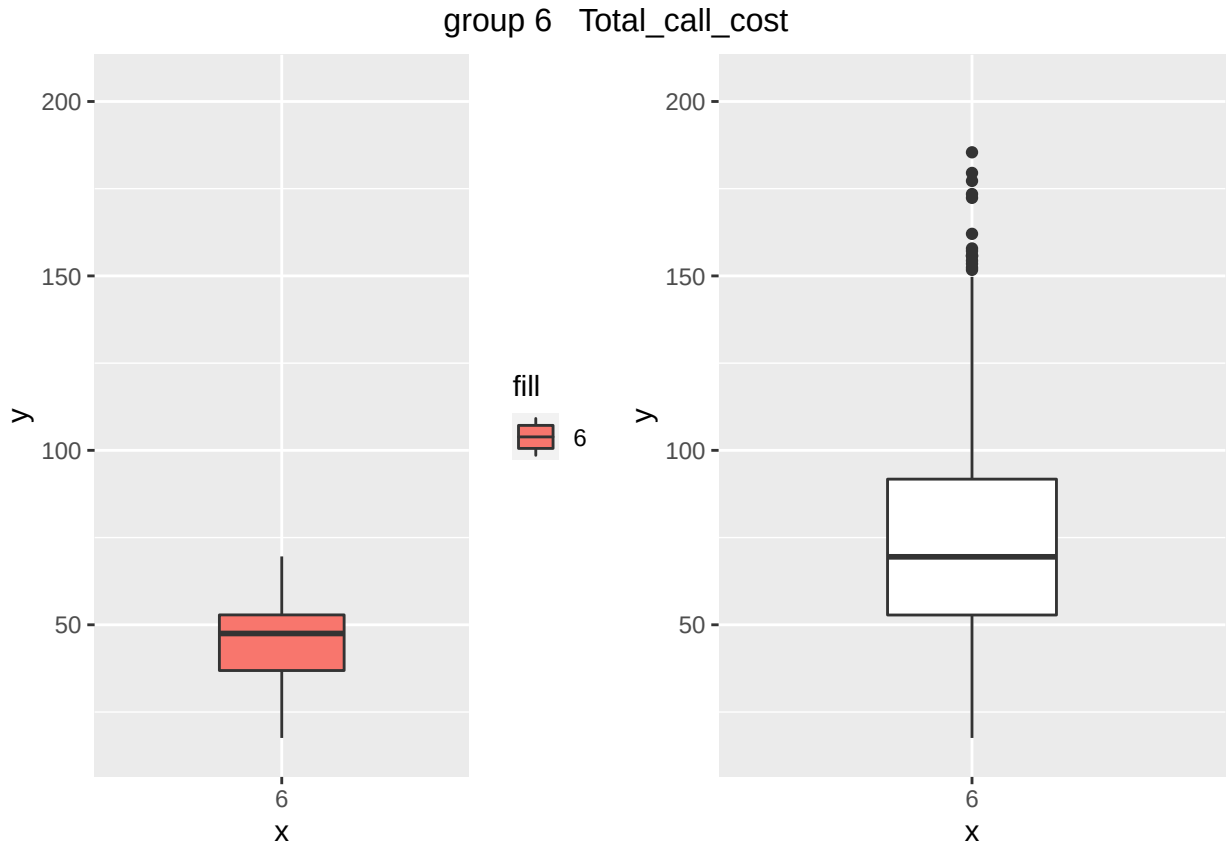
- actual.call.cost:

```
## [1] "Bigger than base median"
```



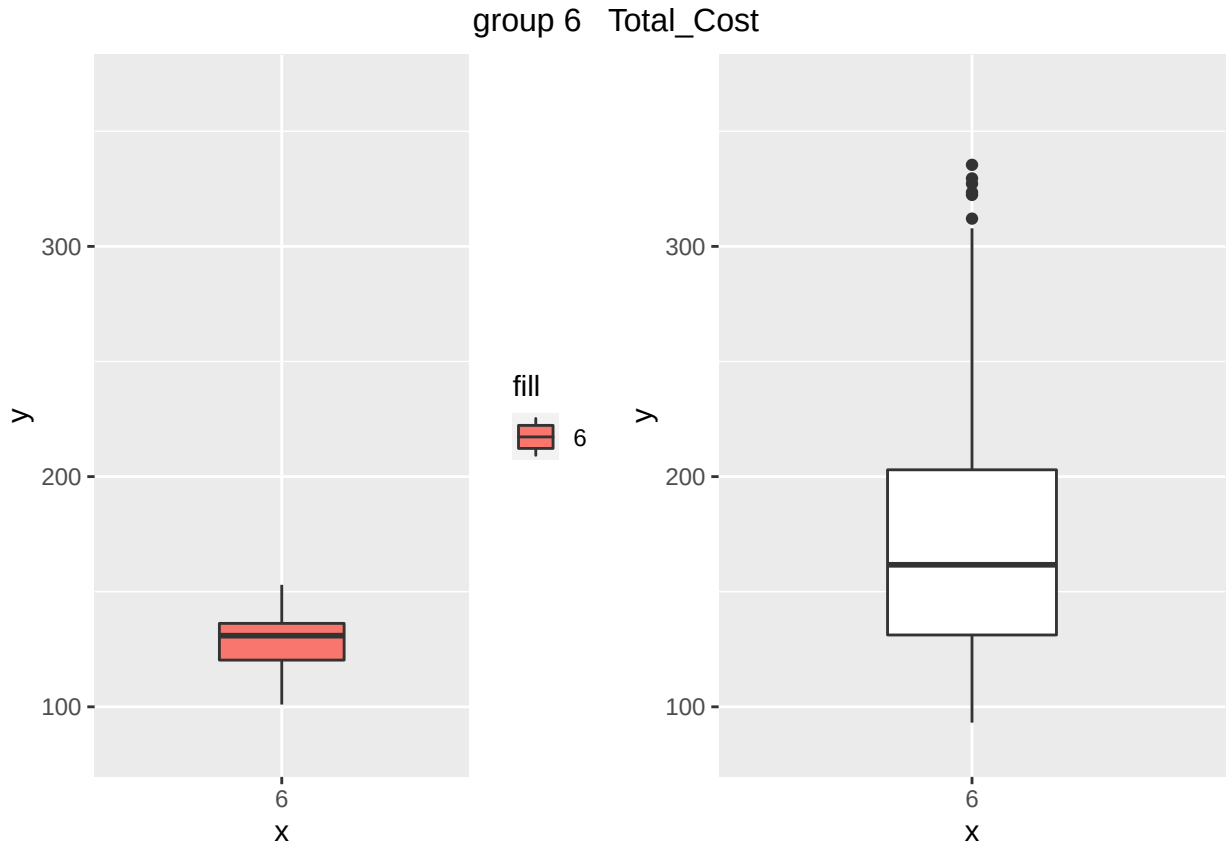
- Total_call_cost:

```
## [1] "Smaller than base median"
```



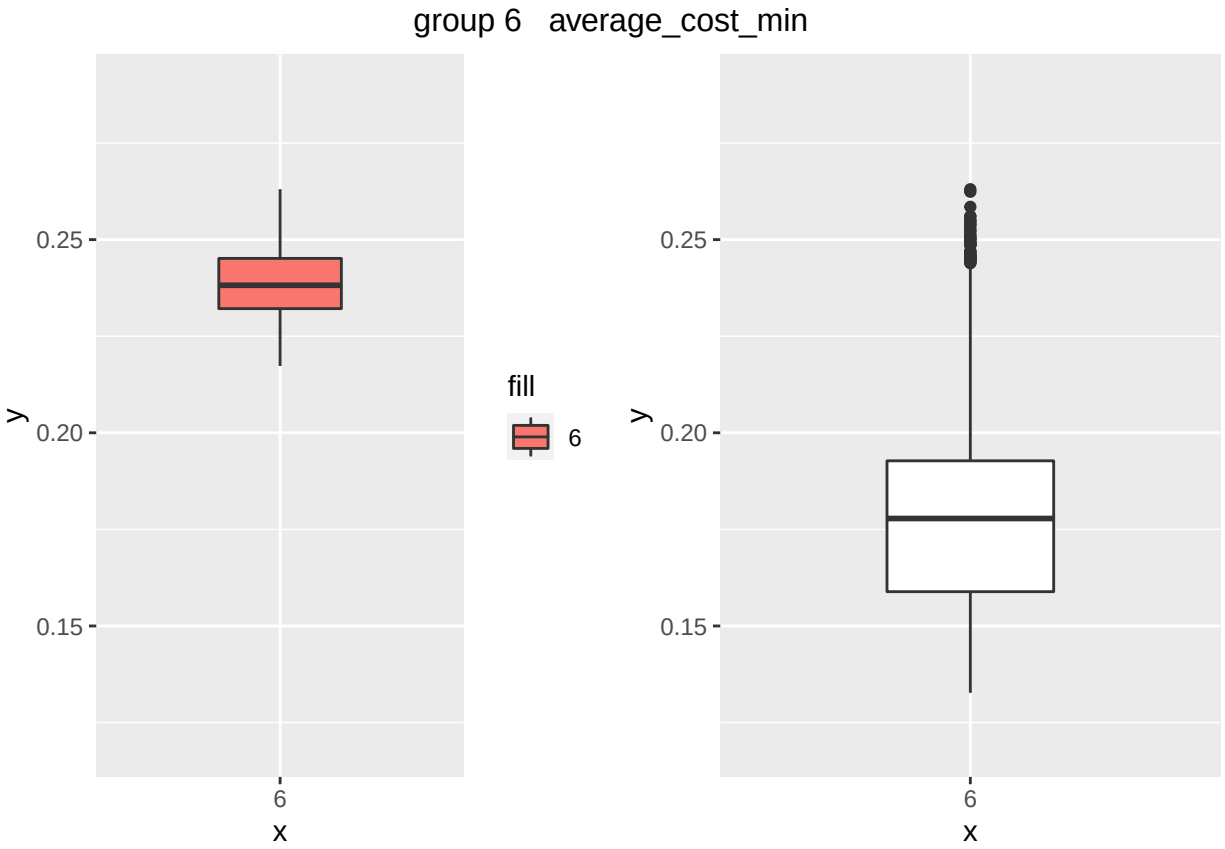
- Total_Cost:

```
## [1] "Smaller than base median"
```



- average_cost_min:

```
## [1] "Bigger than 3rd base quartile"
```


group 6 average_cost_min
0.25
0.20
0.15
y
6
x
fill
6
0.25
0.20
0.15
y
6
x