

Supplementary Data 3

Normality of Measurements

The area ratio (analyte peak area to internal standard peak area) was measured for 30 different matrices (ante-mortem and post-mortem blood) spiked at the cut-off concentration specified in Supplementary Data 1.

Following outlier removal subsequent to a Grubbs test for 3 analytes (buprenorphine, norcodeine and temazepam-glucuronide), normality testing using the Cramer-von Mises test was performed in RStudio.

```
1 # Normality_Ratios.R
2 # A script to test the normality of measurements for the 40 qualitative analytes
  studied.
3 # By Brigitte Desharnais, last modification 2019-01-08.
4
5 # Set working directory.
6 setwd("E:/RECHERCHE/QUALITATIF")
7
8 # Load necessary packages.
9 library(dplyr)
10 library(nortest)
11
12 # Import data from an Excel table copied in the clipboard.
13 Data <- read.delim("clipboard", header = TRUE, sep = "\t", dec = ".")
14 Data <- tbl_df(Data)
15
16 # Import the list of analytes copied in the clipboard.
17 Analytes <- read.delim("clipboard", header = FALSE, sep = "\t", dec = ".")
18 Analytes <- as.character(Analytes$V1)
```

```

19
20 # Create the empty results matrix.
21 Results <- matrix(nrow = 40, ncol = 1)
22
23 # Perform CVM test for each analyte and store result in the matrix.
24 for(i in 1:40){
25   # Create a temporary data frame storing only results for the studied analyte.
26   Temp <- Data %>% filter(Analyte == Analytes[i])
27
28   # Perform the CVM test.
29   CVM <- cvm.test(as.numeric(Temp$Area.Ratio))
30
31   # Store p-value in results matrix.
32   Results[i, 1] <- CVM$p.value
33 }
34
35 # Create final results matrix by appending analyte names.
36 Results <- cbind(Analytes, Results)

```

The following results were obtained.

Table 1: Cramer-von Mises normality test results

Analytes	<i>p</i>-value
α -Hydroxyalprazolam	0.1059
Aripiprazole	0.1204
3-Hydroxy Bromazepam	0.8826
Buprenorphine	0.4012
Hydroxybupropion	0.4618
N-Desmethycitalopram	0.2681
N-Desmethyloclobazam	0.6332
Cocaethylene	0.5719
Norcodeine	0.1240

Table 1: Cramer-von Mises normality test results

Analytes	<i>p</i> -value
N-Desmethylocyclobenzaprine	0.4606
Dextrorphan	0.4596
Nordiazepam	0.6851
N-Desmethyl diphenhydramine	0.5524
Duloxetine	0.7734
Norfentanyl	0.8879
7-Aminoflunitrazepam	0.3235
N-Desmethyflunitrazepam	0.0321
Norfluoxetine	0.2267
2-Hydroxyethylflurazepam	0.5575
Norketamine	0.6207
Lorazepam-glucuronide	0.8237
mCPP	0.0749
MDEA	0.2117
MDPV metabolite	0.1189
Normeperidine	0.4355
α -Hydroxymidazolam	0.2231
N-desmethylnortriptyline	0.7960
6-Acetylmorphine	0.1912
Morphine-6 β -D-glucuronide	0.0325
Naloxone	0.1174
Naltrexone	0.8822
Desmethyloanzapine	0.3207
Oxazepam-glucuronide	0.8373
Phenylpropanolamine	0.2928
Norpseudoephedrine	0.7128
Norquetiapine	0.3976

Table 1: Cramer-von Mises normality test results

Analytes	p -value
7-Hydroxyquetiapine	0.7979
Temazepam-glucuronide	0.2592
α -Hydroxytriazolam	0.9219
N-Desmethylzopiclone	0.8527

All but two analytes (N-Desmethyflunitrazepam and Morphine-6 β -D-glucuronide) have $p < 0.05$, indicating that there is no significant departure from normality for the vast majority of analytes.

For the two remaining analytes, quantile-quantile plots are shown in Figure 1.

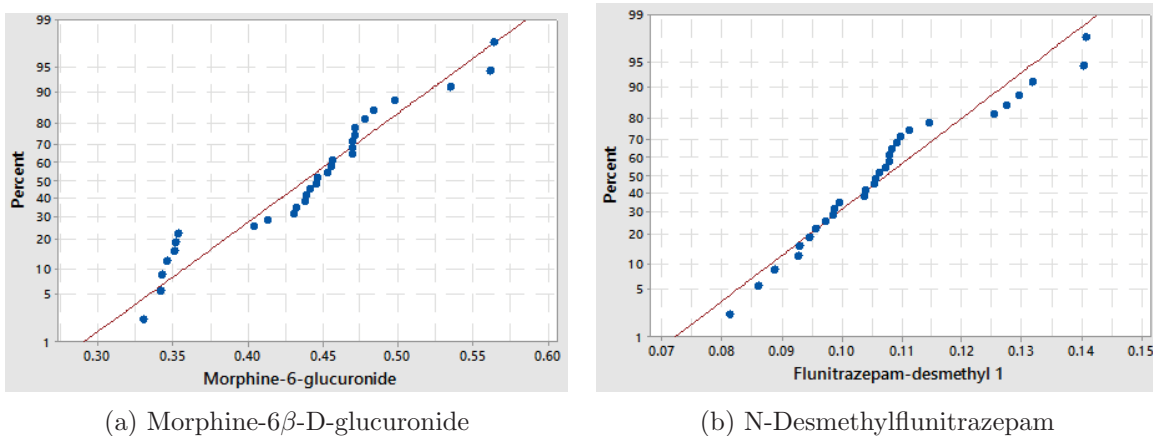


Figure 1: Normal quantile-quantile plots