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.

```
# Normality_Ratios.R
# A script to test the normality of measurements for the 40 qualitative analytes
    studied.
# By Brigitte Desharnais, last modification 2019-01-08.

# Set working directory.
setwd("E:/RECHERCHE/QUALITATIF")

# Load necessary packages.
library(dplyr)
library(nortest)

# Import data from an Excel table copied in the clipboard.
Data <- read.delim("clipboard", header = TRUE, sep = "\t", dec = ".")
Data <- tbl_df(Data)

# Import the list of analytes copied in the clipboard.
Analytes <- read.delim("clipboard", header = FALSE, sep = "\t", dec = ".")
Analytes <- as.character(Analytes$V1)
```

```r

# Create the empty results matrix.
Results <- matrix(nrow = 40, ncol = 1)

# Perform CVM test for each analyte and store result in the matrix.
for(i in 1:40){
  # Create a temporary data frame storing only results for the studied analyte.
  Temp <- Data %>% filter(Analyte == Analytes[i])

  # Perform the CVM test.
  CVM <- cvm.test(as.numeric(Temp$Area.Ratio))

  # Store p-value in results matrix.
  Results[i, 1] <- CVM$p.value
}

# Create final results matrix by appending analyte names.
Results <- cbind(Analytes, Results)
```

The following results were obtained.

Table 1: Cramer-von Mises normality test results

Analytes	***p*-value**
α-Hydroxyalprazolam	0.1059
Aripiprazole	0.1204
3-Hydroxy Bromazepam	0.8826
Buprenorphine	0.4012
Hydroxybupropion	0.4618
N-Desmethylcitalopram	0.2681
N-Desmethylclobazam	0.6332
Cocaethylene	0.5719
Norcodeine	0.1240

Table 1: Cramer-von Mises normality test results

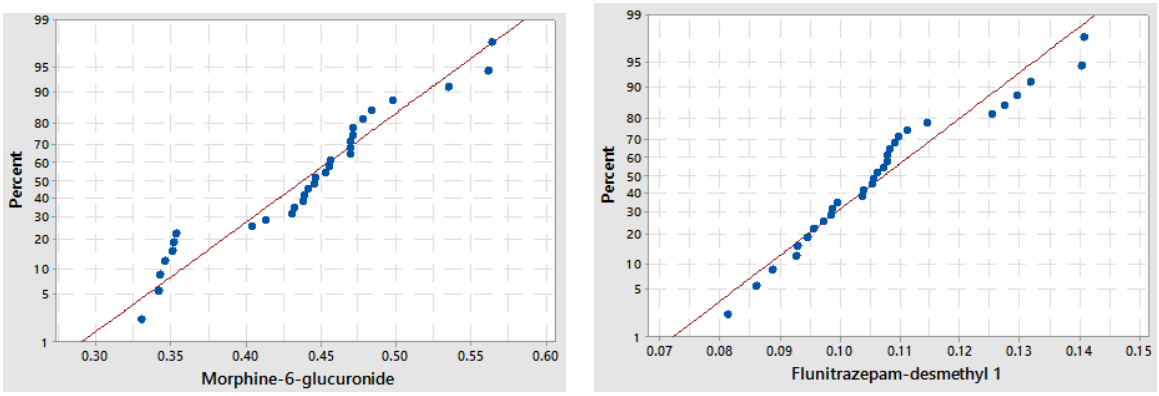
Analytes	p**-value**
N-Desmethylcyclobenzaprine	0.4606
Dextrorphan	0.4596
Nordiazepam	0.6851
N-Desmethyl diphenydramine	0.5524
Duloxetine	0.7734
Norfentanyl	0.8879
7-Aminoflunitrazepam	0.3235
N-Desmethylflunitrazepam	0.0321
Norfluoxetine	0.2267
2-Hydroxyethylflurazepam	0.5575
Norketamine	0.6207
Lorazepam-glucuronide	0.8237
mCPP	0.0749
MDEA	0.2117
MDPV metabolite	0.1189
Normeperidine	0.4355
α-Hydroxymidazolam	0.2231
N-desmethylmirtazapine	0.7960
6-Acetylmorphine	0.1912
Morphine-6β-D-glucuronide	0.0325
Naloxone	0.1174
Naltrexone	0.8822
Desmethylolanzapine	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-Desmethylflunitrazepam and Morphine-6β-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.



(a) Morphine-6β-D-glucuronide (b) N-Desmethylflunitrazepam

Figure 1: Normal quantile-quantile plots