«Tit» «Name» «Fam_Nam»
«Organization»
«Address1»
«Address_2»
«PO_Box» «City». «Country»

Sevilla, August, 2017

Proficiency Test 2017-1

Laboratory Code: **«Lab_code»**

Dear participants,

Enclosed you will find the report of the Proficiency Test 2016-2 on Drugs of Abuse in Hair, organized by the Society of Hair Testing.

Each of the participating laboratories received an identifying code. Your particular code is **«Lab_code»**.

Sets of three samples were sent to fifty-four participating laboratories. Fifty three of them sent the report forms back.

Sample contents were as follows:

∗ Sample A contained opiates (6-MAM, morphine and traces of codeine), cocainics (cocaine, BE, norcocaine and cocaethylene) and cannabis (THC, CBD, CBN and THC-COOH). It also contained methadone, dihydrocodeine, diazepam, nordiazepam and tramadol.

∗ Sample B opiates (6-MAM, morphine and traces of codeine), cocainics (cocaine, BE and traces of cocaethylene and norcocaine) amphetamine compounds (amphetamine, methamphetamine, MDMA and MDA) and cannabis (THC, CBD, CBN and THC-COOH). It also contained methadone, diazepam, nordiazepam and tramadol.

∗ Sample C is a drug-free sample.

Z-score

Z-score has been calculated based on robust estimators (median instead of mean and interquartile instead of standard deviation).

Z-score has been calculated as follows:

$$\text{Z-score} = (x - \chi) / IQR$$

Where:

x: Concentration reported by the participant

χ: Median concentration obtained from the participating laboratories

IQR: Interquartile range: It is calculated as: Q3-Q1 (the upper quartile minus the lower quartile)

Q3: Third quartile (percentile 75)

Q1: First quartile (percentile 25)

Decision criteria

The following criteria have been adopted:

Satisfactory results: Z-score $\leq \pm 2$

Questionable results: $2 < $ Z-score ≤ 3

Unsatisfactory results: Z-score ≥ 3

Yours faithfully,

Carmen Jurado

QUALITATIVE RESULTS

Laboratory Code: **Lab**

	Sample A		
Substances	**A**	**T**	**F**
MAM		P	
Morphine		P	
Codeine*		P	
Cocaine		P	
BE		P	
THC**		P	
THC-COOH***		P	

	Sample B		
Substances	**A**	**T**	**F**
MAM		P	
Morphine		P	
Cocaine		P	
BE		P	
Amphetamine		P	
Methamphetamine		P	
MDMA		P	
THC		P	
THC-COOH		P	

	Sample C		
Substances	**A**	**T**	**F**
Drugs of abuse		N	

* The median concentration of Codeine in Sample A is 0.13 ng/mg, which is lower than the cut-off proposed by SoHT (0.2 ng/mg).

** The median concentration of THC in Sample A is 0.02 ng/mg, which is lower than the cut-off proposed by SoHT (0.05 ng/mg).

*** The median concentration of THC-COOH in Sample A is 0.1 pg/mg, which is lower than the cut-off proposed by SoHT (0.2 pg/mg).

A: Your answer	**P:** Positive	**NR:** Not reported	**FN:** False Negative
T: True answer	**N**: Negative	**NA:** Not analyzed	**FP:** False Positive
F: False answer			

Comments:

- Sample A contains methadone, norcocaine, cocaethylene, dihydrocodeine, diazepam, nordiazepam and tramadol and traces of codeine (0.13 ng/mg, median concentration).
- Sample B contains methadone, diazepam, nordiazepam and tramadol and traces of codeine (0.08 ng/mg, median concentration), norcocaine (0.015 ng/mg, median concentration) and cocaethylene (0.025 ng/mg, median concentration).

MAM- Sample A
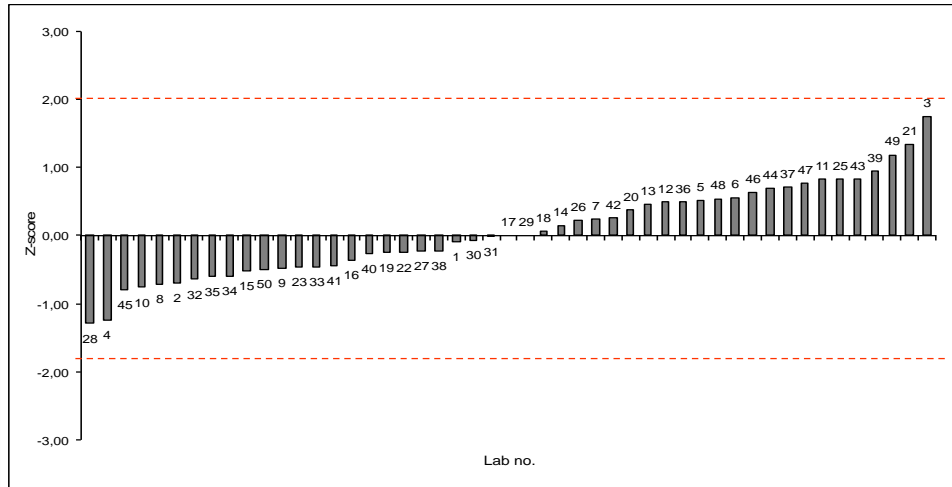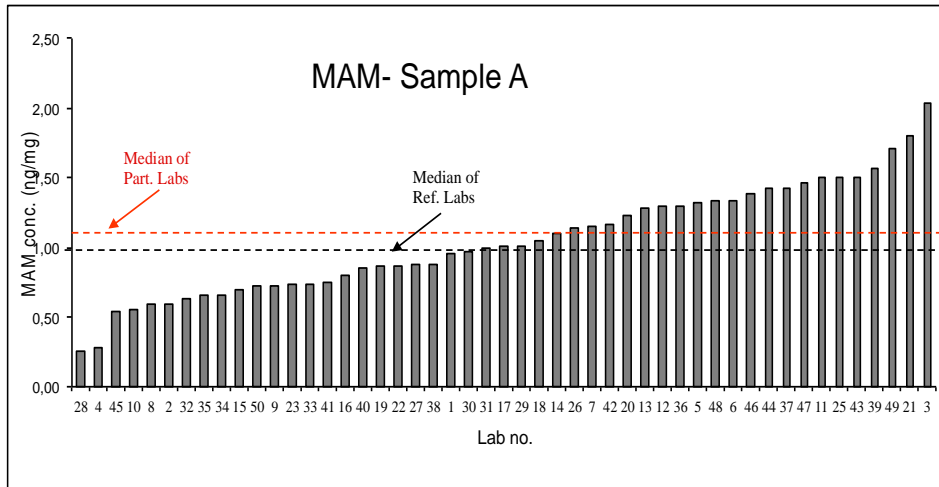
Lab.	MAM (ng/mg)	Z-score	Result
28	0,25	-1,29	Satisfactory
4	0,28	-1,24	Satisfactory
45	0,54	-0,80	Satisfactory
10	0,56	-0,76	Satisfactory
8	0,59	-0,71	Satisfactory
2	0,60	-0,69	Satisfactory
32	0,63	-0,64	Satisfactory
35	0,65	-0,60	Satisfactory
34	0,66	-0,59	Satisfactory
15	0,70	-0,53	Satisfactory
50	0,72	-0,49	Satisfactory
9	0,73	-0,47	Satisfactory
23	0,74	-0,46	Satisfactory
33	0,74	-0,46	Satisfactory
41	0,75	-0,44	Satisfactory
16	0,80	-0,36	Satisfactory
40	0,85	-0,27	Satisfactory
19	0,86	-0,25	Satisfactory
22	0,86	-0,25	Satisfactory
27	0,88	-0,22	Satisfactory
38	0,88	-0,22	Satisfactory
1	0,96	-0,08	Satisfactory
30	0,97	-0,07	Satisfactory
31	1,00	-0,02	Satisfactory
17	1,01	0,00	Satisfactory
29	1,01	0,00	Satisfactory

Lab.	MAM (ng/mg)	Z-score	Result
18	1,05	0,07	Satisfactory
14	1,10	0,15	Satisfactory
26	1,14	0,22	Satisfactory
7	1,15	0,24	Satisfactory
42	1,16	0,25	Satisfactory
20	1,23	0,37	Satisfactory
13	1,28	0,46	Satisfactory
12	1,30	0,49	Satisfactory
36	1,30	0,49	Satisfactory
5	1,32	0,53	Satisfactory
48	1,33	0,54	Satisfactory
6	1,34	0,56	Satisfactory
46	1,38	0,63	Satisfactory
44	1,42	0,69	Satisfactory
37	1,43	0,71	Satisfactory
47	1,47	0,77	Satisfactory
11	1,50	0,83	Satisfactory
25	1,50	0,83	Satisfactory
43	1,50	0,83	Satisfactory
39	1,57	0,94	Satisfactory
49	1,71	1,19	Satisfactory
21	1,80	1,34	Satisfactory
3	2,04	1,75	Satisfactory
24	N		Satisfactory

Average	1,05
SD	0,39
CV%	37,16
Median	1,01
Minimum	0,25
Quartile 25	0,74
Quartile 75	1,33
Maximum	2,04
Iqr	0,59

Morphine- Sample A
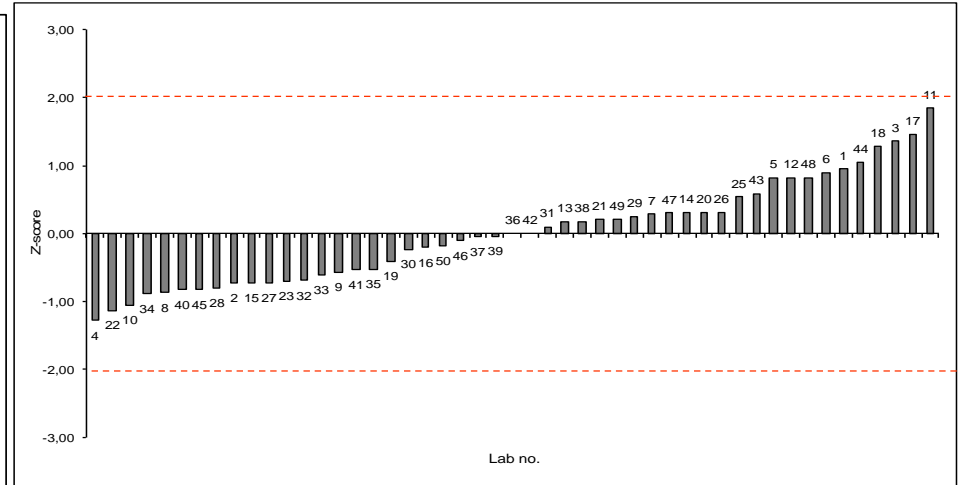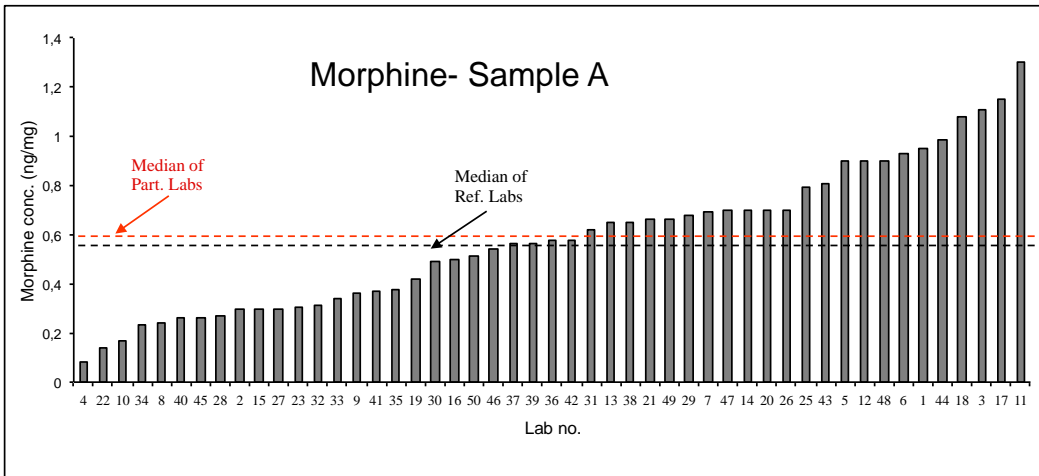
Lab.	Morphine (ng/mg)	Z-score	Result
4	0,08	-1,28	Satisfactory
22	0,14	-1,13	Satisfactory
10	0,17	-1,05	Satisfactory
34	0,24	-0,88	Satisfactory
8	0,24	-0,87	Satisfactory
40	0,26	-0,82	Satisfactory
45	0,26	-0,82	Satisfactory
28	0,27	-0,79	Satisfactory
2	0,30	-0,72	Satisfactory
15	0,30	-0,72	Satisfactory
27	0,30	-0,72	Satisfactory
23	0,31	-0,70	Satisfactory
32	0,31	-0,69	Satisfactory
33	0,34	-0,62	Satisfactory
9	0,36	-0,56	Satisfactory
41	0,37	-0,54	Satisfactory
35	0,38	-0,52	Satisfactory
19	0,42	-0,41	Satisfactory
30	0,49	-0,23	Satisfactory
16	0,50	-0,21	Satisfactory
50	0,51	-0,18	Satisfactory
46	0,54	-0,10	Satisfactory
37	0,56	-0,05	Satisfactory
39	0,56	-0,04	Satisfactory
36	0,58	0,00	Satisfactory
42	0,58	0,00	Satisfactory

Lab.	Morphine (ng/mg)	Z-score	Result
31	0,62	0,10	Satisfactory
13	0,65	0,18	Satisfactory
38	0,65	0,18	Satisfactory
21	0,66	0,21	Satisfactory
49	0,66	0,21	Satisfactory
29	0,68	0,26	Satisfactory
7	0,69	0,28	Satisfactory
47	0,70	0,30	Satisfactory
14	0,70	0,31	Satisfactory
20	0,70	0,31	Satisfactory
26	0,70	0,31	Satisfactory
25	0,79	0,54	Satisfactory
43	0,81	0,58	Satisfactory
5	0,90	0,82	Satisfactory
12	0,90	0,82	Satisfactory
48	0,90	0,82	Satisfactory
6	0,93	0,90	Satisfactory
1	0,95	0,95	Satisfactory
44	0,99	1,04	Satisfactory
18	1,08	1,28	Satisfactory
3	1,11	1,36	Satisfactory
17	1,15	1,46	Satisfactory
11	1,30	1,85	Satisfactory
24	N		

Average	0,58
SD	0,29
CV%	49,45
Median	0,58
Minimum	0,08
Quartile 25	0,31
Quartile 75	0,70
Maximum	1,30
Iqr	0,39

Codeine- Sample A
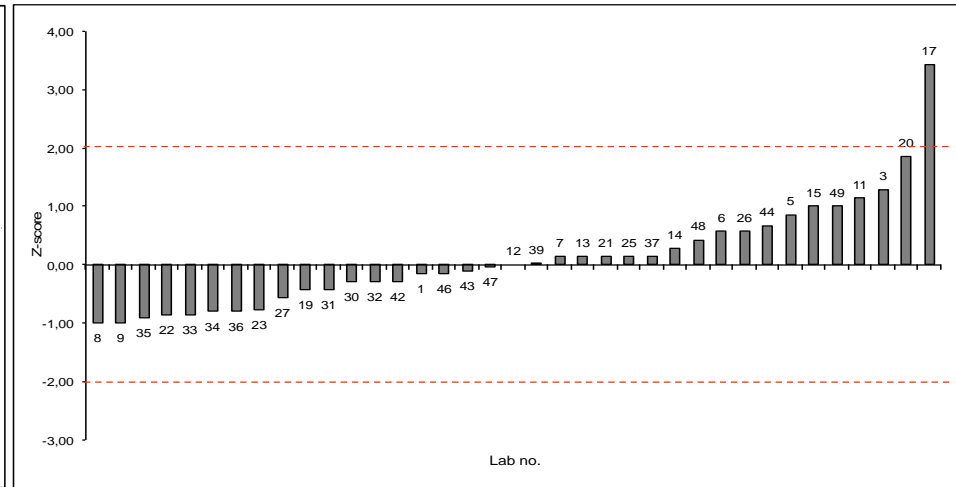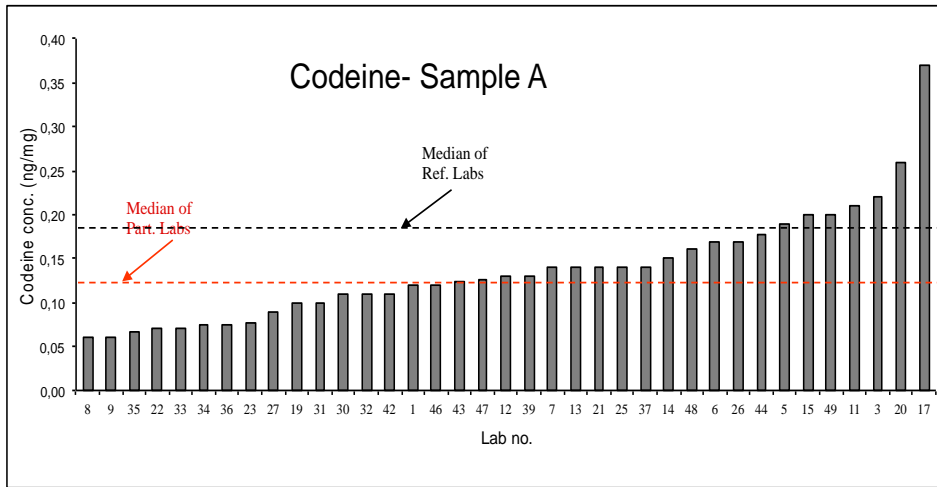
Lab.	Codeine (ng/mg)	Z-score	Result
8	0,06	-1,00	Satisfactory
9	0,06	-1,00	Satisfactory
35	0,07	-0,91	Satisfactory
22	0,07	-0,86	Satisfactory
33	0,07	-0,86	Satisfactory
34	0,07	-0,80	Satisfactory
36	0,07	-0,80	Satisfactory
23	0,08	-0,77	Satisfactory
27	0,09	-0,57	Satisfactory
19	0,10	-0,43	Satisfactory
31	0,10	-0,43	Satisfactory
30	0,11	-0,29	Satisfactory
32	0,11	-0,29	Satisfactory
42	0,11	-0,29	Satisfactory
1	0,12	-0,14	Satisfactory
46	0,12	-0,14	Satisfactory
43	0,12	-0,10	Satisfactory
47	0,13	-0,04	Satisfactory
12	0,13	0,00	Satisfactory
39	0,13	0,01	Satisfactory
7	0,14	0,14	Satisfactory
13	0,14	0,14	Satisfactory
21	0,14	0,14	Satisfactory
25	0,14	0,14	Satisfactory
37	0,14	0,14	Satisfactory
14	0,15	0,29	Satisfactory

Lab.	Codeine (ng/mg)	Z-score	Result
48	0,16	0,43	Satisfactory
6	0,17	0,57	Satisfactory
26	0,17	0,57	Satisfactory
44	0,18	0,67	Satisfactory
5	0,19	0,86	Satisfactory
15	0,20	1,00	Satisfactory
49	0,20	1,00	Satisfactory
11	0,21	1,14	Satisfactory
3	0,22	1,29	Satisfactory
20	0,26	1,86	Satisfactory
17	0,37	3,43	Unsatisfactory
2	N		
10	N		
16	N		
18	N		
24	N		
28	N		
29	N		
38	N		
40	N		
41	N		
45	N		
50	N		

Average	0,14
SD	0,06
CV%	45,04
Median	0,13
Minimum	0,06
Quartile 25	0,10
Quartile 75	0,17
Maximum	0,37
Iqr	0,07

The median Codeine concentration is below the cut-off proposed by SoHT (0.20 ng/mg)

Cocaine- Sample A
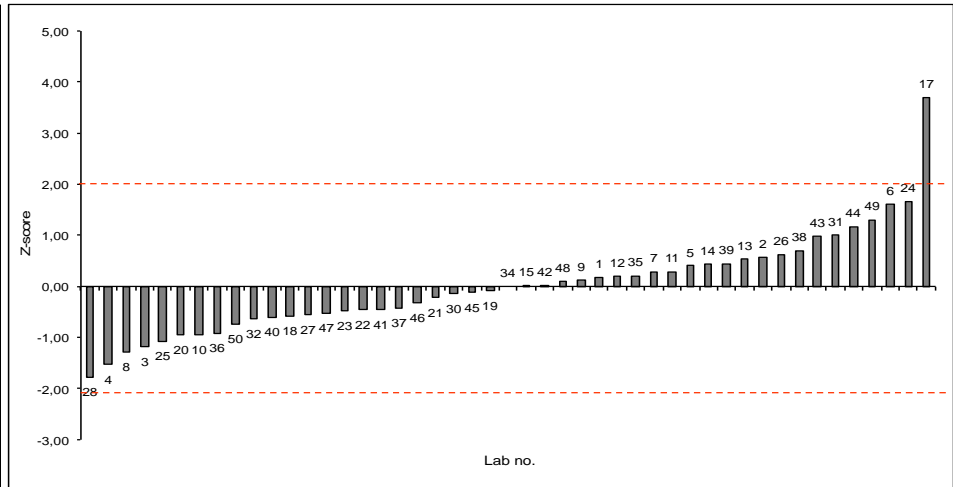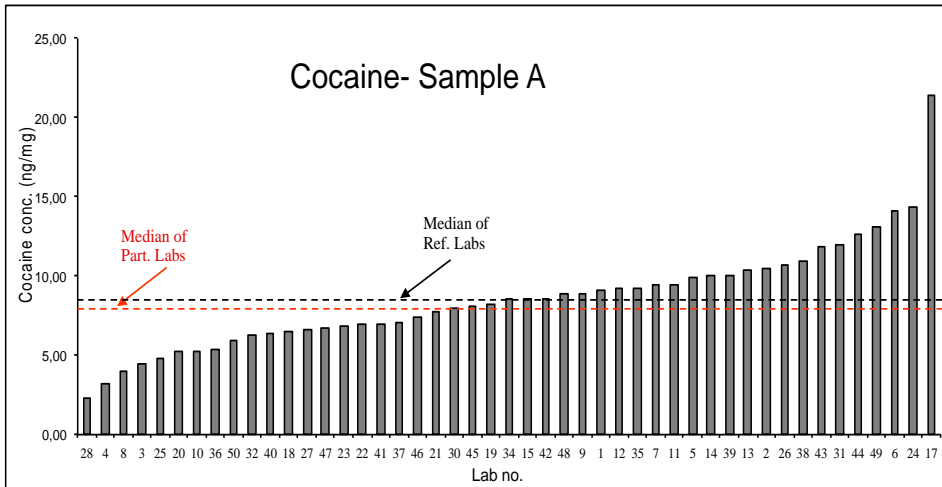
Lab.	Cocaine (ng/mg)	Z-score	Result
28	2,33	-1,78	Satisfactory
4	3,18	-1,53	Satisfactory
8	4,05	-1,28	Satisfactory
3	4,41	-1,18	Satisfactory
25	4,80	-1,07	Satisfactory
20	5,20	-0,95	Satisfactory
10	5,24	-0,94	Satisfactory
36	5,35	-0,91	Satisfactory
50	5,94	-0,74	Satisfactory
32	6,30	-0,64	Satisfactory
40	6,42	-0,60	Satisfactory
18	6,51	-0,57	Satisfactory
27	6,60	-0,55	Satisfactory
47	6,71	-0,52	Satisfactory
23	6,87	-0,47	Satisfactory
22	6,92	-0,46	Satisfactory
41	6,95	-0,45	Satisfactory
37	7,06	-0,42	Satisfactory
46	7,40	-0,32	Satisfactory
21	7,76	-0,22	Satisfactory
30	8,00	-0,15	Satisfactory
45	8,10	-0,12	Satisfactory
19	8,20	-0,09	Satisfactory
34	8,51	0,00	Satisfactory
15	8,60	0,03	Satisfactory
42	8,60	0,03	Satisfactory

Lab.	Cocaine (ng/mg)	Z-score	Result
48	8,84	0,09	Satisfactory
9	8,94	0,12	Satisfactory
1	9,15	0,18	Satisfactory
12	9,20	0,20	Satisfactory
35	9,24	0,21	Satisfactory
7	9,50	0,28	Satisfactory
11	9,50	0,28	Satisfactory
5	9,90	0,40	Satisfactory
14	10,00	0,43	Satisfactory
39	10,07	0,45	Satisfactory
13	10,38	0,54	Satisfactory
2	10,50	0,57	Satisfactory
26	10,70	0,63	Satisfactory
38	10,94	0,70	Satisfactory
43	11,90	0,97	Satisfactory
31	12,00	1,00	Satisfactory
44	12,60	1,18	Satisfactory
49	13,07	1,31	Satisfactory
6	14,07	1,60	Satisfactory
24	14,33	1,67	Satisfactory
17	21,40	3,70	Unsatisfactory
16	>5		
33	P		

Average	8,56
SD	3,29
CV%	38,41
Median	8,51
Minimum	2,33
Quartile 25	6,56
Quartile 75	10,04
Maximum	21,40
Iqr	3,48

BE- Sample A
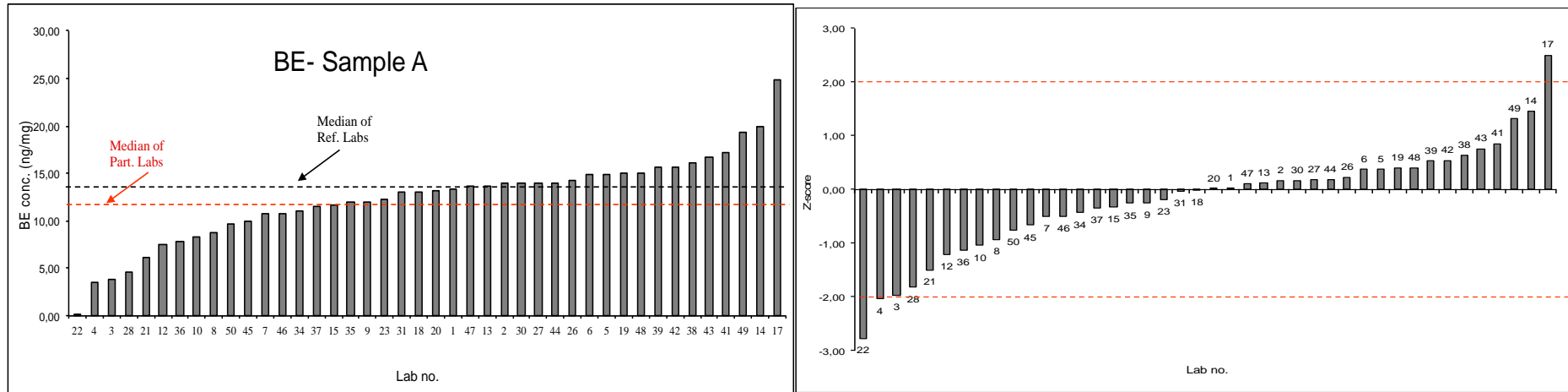
Lab.	BE (ng/mg)	Z-score	Result
22	0,12	-2,77	Questionable
4	3,57	-2,03	Questionable
3	3,89	-1,97	Satisfactory
28	4,60	-1,81	Satisfactory
21	6,09	-1,50	Satisfactory
12	7,50	-1,20	Satisfactory
36	7,80	-1,13	Satisfactory
10	8,24	-1,04	Satisfactory
8	8,78	-0,93	Satisfactory
50	9,60	-0,75	Satisfactory
45	10,00	-0,67	Satisfactory
7	10,80	-0,50	Satisfactory
46	10,80	-0,50	Satisfactory
34	11,10	-0,43	Satisfactory
37	11,49	-0,35	Satisfactory
15	11,60	-0,33	Satisfactory
35	11,93	-0,26	Satisfactory
9	12,00	-0,24	Satisfactory
23	12,29	-0,18	Satisfactory
31	13,00	-0,03	Satisfactory
18	13,11	0,00	Satisfactory
20	13,15	0,00	Satisfactory
1	13,28	0,03	Satisfactory
47	13,64	0,11	Satisfactory
13	13,69	0,12	Satisfactory
2	13,91	0,17	Satisfactory

Lab.	BE (ng/mg)	Z-score	Result
30	13,95	0,17	Satisfactory
27	14,00	0,19	Satisfactory
44	14,00	0,19	Satisfactory
26	14,20	0,23	Satisfactory
6	14,89	0,37	Satisfactory
5	14,90	0,38	Satisfactory
19	15,00	0,40	Satisfactory
48	15,00	0,40	Satisfactory
39	15,63	0,53	Satisfactory
42	15,70	0,55	Satisfactory
38	16,15	0,64	Satisfactory
43	16,70	0,76	Satisfactory
41	17,16	0,86	Satisfactory
49	19,30	1,31	Satisfactory
14	20,00	1,46	Satisfactory
17	24,90	2,50	Questionable
11	>10		
32	>10		
16	>5		
25	>5		
33	>5.0		
40	P		

Average	12,32
SD	4,58
CV%	37,19
Median	13,13
Minimum	0,12
Quartile 25	10,20
Quartile 75	14,90
Maximum	24,90
Iqr	4,70

THC- Sample A
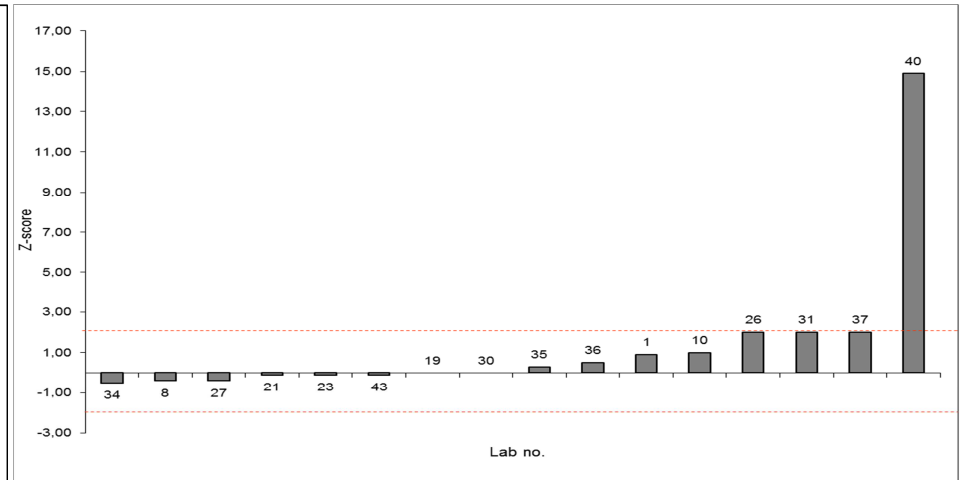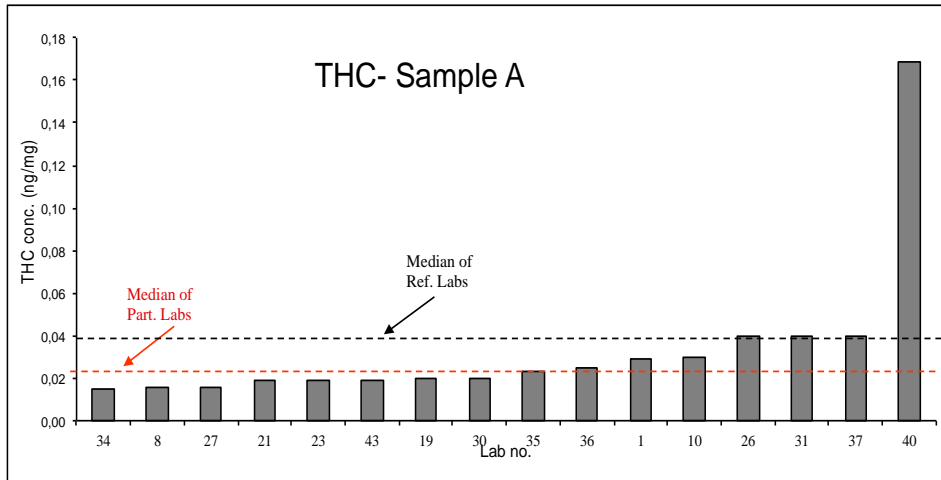
Lab	THC	Z-score	Result
34	0,02	-0,50	Satisfactory
8	0,02	-0,40	Satisfactory
27	0,02	-0,40	Satisfactory
21	0,02	-0,10	Satisfactory
23	0,02	-0,10	Satisfactory
43	0,02	-0,10	Satisfactory
19	0,02	0,00	Satisfactory
30	0,02	0,00	Satisfactory
35	0,02	0,30	Satisfactory
36	0,03	0,50	Satisfactory
1	0,03	0,90	Satisfactory
10	0,03	1,00	Satisfactory
26	0,04	2,00	Questionable
31	0,04	2,00	Questionable
37	0,04	2,00	Questionable
40	0,17	14,90	Unsatisfactory
22	N		
47	N		
45	N		
2	N		
4	N		
7	N		
11	N		
12	N		
15	N		
16	N		

Lab.	THC (ng/mg)	Z-score	Result
17	N		
20	N		
28	N		
32	N		
33	N		
38	N		
41	N		
49	N		
50	N		

Average	0,03
SD	0,04
CV%	106,45
Median	0,02
Minimum	0,02
Quartile 25	0,02
Quartile 75	0,03
Maximum	0,17
Iqr	0,01

The median THC concentration is below the cut-off proposed by SoHT (0.05 ng/mg)

MAM- Sample B
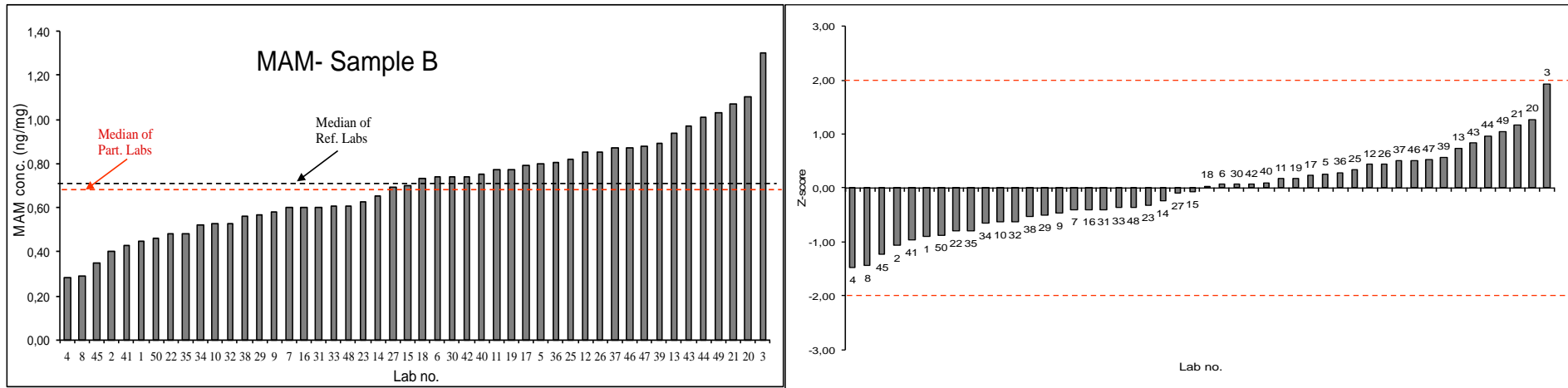
Lab.	MAM	Z-score	Result
4	0,28	-1,47	Satisfactory
8	0,29	-1,43	Satisfactory
45	0,35	-1,23	Satisfactory
2	0,40	-1,07	Satisfactory
41	0,43	-0,97	Satisfactory
1	0,45	-0,90	Satisfactory
50	0,46	-0,87	Satisfactory
22	0,48	-0,80	Satisfactory
35	0,48	-0,80	Satisfactory
34	0,52	-0,65	Satisfactory
10	0,53	-0,63	Satisfactory
32	0,53	-0,63	Satisfactory
38	0,56	-0,53	Satisfactory
29	0,57	-0,50	Satisfactory
9	0,58	-0,47	Satisfactory
7	0,60	-0,40	Satisfactory
16	0,60	-0,40	Satisfactory
31	0,60	-0,40	Satisfactory
33	0,61	-0,37	Satisfactory
48	0,61	-0,37	Satisfactory
23	0,63	-0,31	Satisfactory
14	0,65	-0,23	Satisfactory
27	0,69	-0,10	Satisfactory
15	0,70	-0,07	Satisfactory
18	0,73	0,03	Satisfactory
6	0,74	0,07	Satisfactory

Lab.	MAM	Z-score	Result
30	0,74	0,07	Satisfactory
42	0,74	0,07	Satisfactory
40	0,75	0,10	Satisfactory
11	0,77	0,17	Satisfactory
19	0,77	0,17	Satisfactory
17	0,79	0,23	Satisfactory
5	0,80	0,27	Satisfactory
36	0,81	0,28	Satisfactory
25	0,82	0,33	Satisfactory
12	0,85	0,43	Satisfactory
26	0,85	0,43	Satisfactory
37	0,87	0,50	Satisfactory
46	0,87	0,50	Satisfactory
47	0,88	0,52	Satisfactory
39	0,89	0,56	Satisfactory
13	0,94	0,73	Satisfactory
43	0,97	0,83	Satisfactory
44	1,01	0,97	Satisfactory
49	1,03	1,03	Satisfactory
21	1,07	1,17	Satisfactory
20	1,10	1,27	Satisfactory
3	1,30	1,93	Satisfactory
24	N		
28	N		

Average	0,70
SD	0,22
CV%	30,95
Median	0,72
Minimum	0,28
Quartile 25	0,55
Quartile 75	0,85
Maximum	1,30
Iqr	0,30
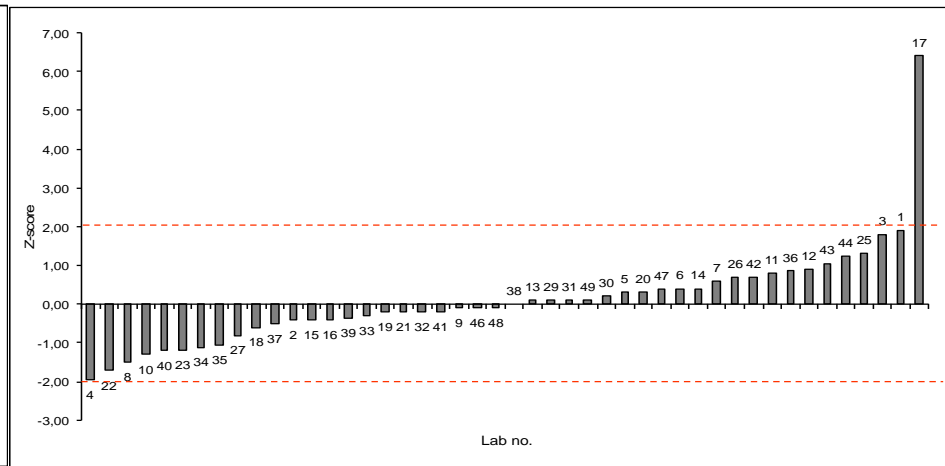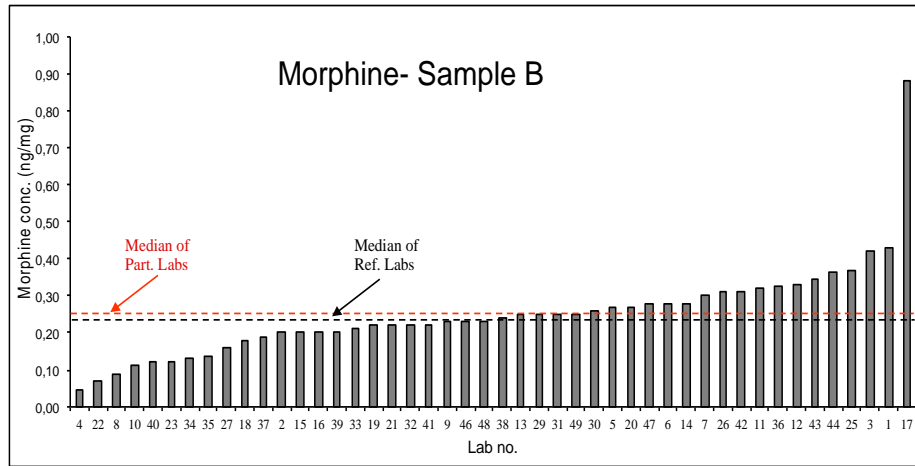
Lab.	Morphine	Z-score	Result
4	0,05	-1,95	Satisfactory
22	0,07	-1,72	Satisfactory
8	0,09	-1,50	Satisfactory
10	0,11	-1,30	Satisfactory
40	0,12	-1,21	Satisfactory
23	0,12	-1,19	Satisfactory
34	0,13	-1,11	Satisfactory
35	0,13	-1,06	Satisfactory
27	0,16	-0,80	Satisfactory
18	0,18	-0,60	Satisfactory
37	0,19	-0,50	Satisfactory
2	0,20	-0,40	Satisfactory
15	0,20	-0,40	Satisfactory
16	0,20	-0,40	Satisfactory
39	0,20	-0,36	Satisfactory
33	0,21	-0,30	Satisfactory
19	0,22	-0,20	Satisfactory
21	0,22	-0,20	Satisfactory
32	0,22	-0,20	Satisfactory
41	0,22	-0,20	Satisfactory
9	0,23	-0,10	Satisfactory
46	0,23	-0,10	Satisfactory
48	0,23	-0,10	Satisfactory
38	0,24	0,00	Satisfactory
13	0,25	0,10	Satisfactory
29	0,25	0,10	Satisfactory

Lab.	Morphine	Z-score	Result
31	0,25	0,10	Satisfactory
49	0,25	0,10	Satisfactory
30	0,26	0,20	Satisfactory
5	0,27	0,30	Satisfactory
20	0,27	0,30	Satisfactory
47	0,28	0,38	Satisfactory
6	0,28	0,40	Satisfactory
14	0,28	0,40	Satisfactory
7	0,30	0,60	Satisfactory
26	0,31	0,70	Satisfactory
42	0,31	0,70	Satisfactory
11	0,32	0,80	Satisfactory
36	0,33	0,85	Satisfactory
12	0,33	0,90	Satisfactory
43	0,34	1,04	Satisfactory
44	0,36	1,23	Satisfactory
25	0,37	1,30	Satisfactory
3	0,42	1,80	Satisfactory
1	0,43	1,90	Satisfactory
17	0,88	6,40	Unsatisfactory
24	N		
28	N		
45	N		
50	N		

Average	0,25
SD	0,13
CV%	50,66
Median	0,24
Minimum	0,05
Quartile 25	0,20
Quartile 75	0,30
Maximum	0,88
Iqr	0,10

Cocaine- Sample B
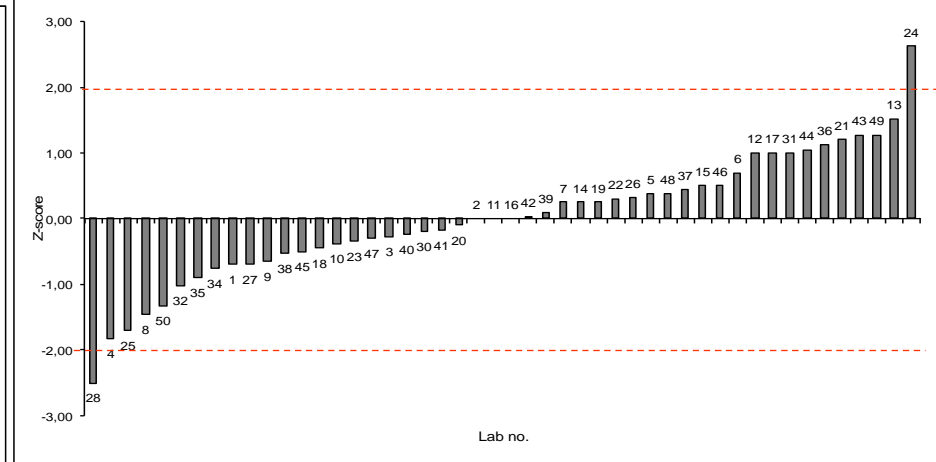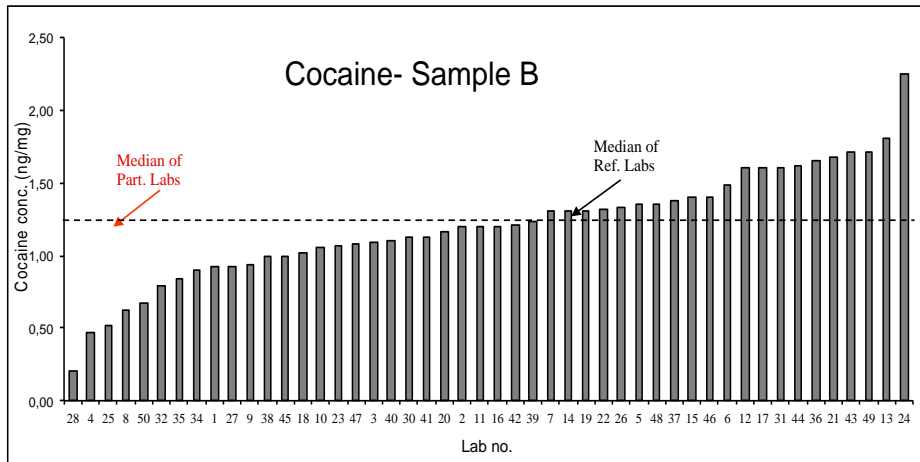
Lab.	Cocaine	Z-score	Result		Lab.	Cocaine	Z-score	Result
28	0,20	-2,50	Questionable		39	1,24	0,09	Satisfactory
4	0,47	-1,83	Satisfactory		7	1,30	0,25	Satisfactory
25	0,52	-1,70	Satisfactory		14	1,30	0,25	Satisfactory
8	0,62	-1,45	Satisfactory		19	1,30	0,25	Satisfactory
50	0,67	-1,33	Satisfactory		22	1,32	0,30	Satisfactory
32	0,79	-1,03	Satisfactory		26	1,33	0,33	Satisfactory
35	0,84	-0,90	Satisfactory		5	1,35	0,38	Satisfactory
34	0,90	-0,75	Satisfactory		48	1,35	0,38	Satisfactory
1	0,92	-0,70	Satisfactory		37	1,38	0,45	Satisfactory
27	0,92	-0,70	Satisfactory		15	1,40	0,50	Satisfactory
9	0,94	-0,65	Satisfactory		46	1,40	0,50	Satisfactory
38	0,99	-0,53	Satisfactory		6	1,48	0,70	Satisfactory
45	1,00	-0,50	Satisfactory		12	1,60	1,00	Satisfactory
18	1,02	-0,45	Satisfactory		17	1,60	1,00	Satisfactory
10	1,05	-0,38	Satisfactory		31	1,60	1,00	Satisfactory
23	1,06	-0,35	Satisfactory		44	1,62	1,05	Satisfactory
47	1,08	-0,30	Satisfactory		36	1,65	1,13	Satisfactory
3	1,09	-0,28	Satisfactory		21	1,68	1,20	Satisfactory
40	1,10	-0,24	Satisfactory		43	1,71	1,28	Satisfactory
30	1,12	-0,20	Satisfactory		49	1,71	1,28	Satisfactory
41	1,13	-0,18	Satisfactory		13	1,81	1,53	Satisfactory
20	1,16	-0,10	Satisfactory		24	2,25	2,63	Questionable
2	1,20	0,00	Satisfactory		33	P		
11	1,20	0,00	Satisfactory					
16	1,20	0,00	Satisfactory					
42	1,21	0,03	Satisfactory					

Average	1,20
SD	0,38
CV%	31,30
Median	1,20
Minimum	0,20
Quartile 25	1,00
Quartile 75	1,40
Maximum	2,25
Iqr	0,40

BE- Sample B
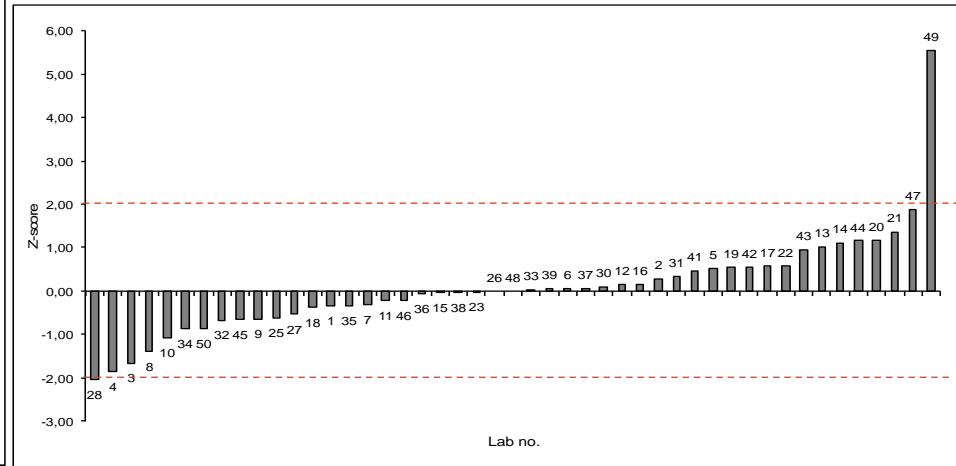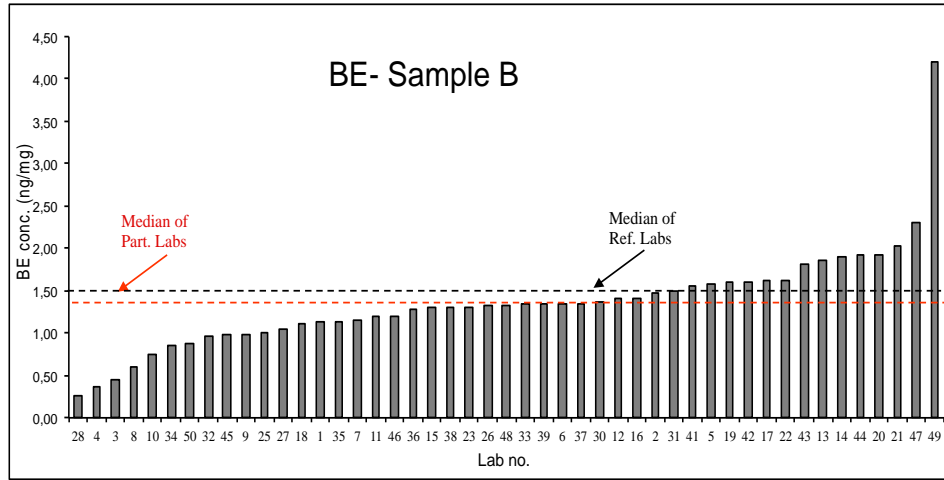
Lab.	BE	Z-score	Result
28	0,26	-2,04	Questionable
4	0,36	-1,85	Satisfactory
3	0,46	-1,65	Satisfactory
8	0,60	-1,38	Satisfactory
10	0,76	-1,08	Satisfactory
34	0,86	-0,88	Satisfactory
50	0,87	-0,87	Satisfactory
32	0,97	-0,67	Satisfactory
45	0,98	-0,65	Satisfactory
9	0,99	-0,63	Satisfactory
25	1,00	-0,62	Satisfactory
27	1,04	-0,54	Satisfactory
18	1,12	-0,38	Satisfactory
1	1,14	-0,35	Satisfactory
35	1,14	-0,35	Satisfactory
7	1,16	-0,31	Satisfactory
11	1,20	-0,23	Satisfactory
46	1,20	-0,23	Satisfactory
36	1,29	-0,06	Satisfactory
15	1,30	-0,04	Satisfactory
38	1,30	-0,04	Satisfactory
23	1,31	-0,01	Satisfactory
26	1,32	0,00	Satisfactory
48	1,32	0,00	Satisfactory
33	1,34	0,04	Satisfactory
39	1,35	0,05	Satisfactory

Lab.	BE	Z-score	Result
6	1,35	0,06	Satisfactory
37	1,35	0,06	Satisfactory
30	1,37	0,10	Satisfactory
12	1,40	0,15	Satisfactory
16	1,40	0,15	Satisfactory
2	1,47	0,29	Satisfactory
31	1,50	0,35	Satisfactory
41	1,56	0,46	Satisfactory
5	1,59	0,52	Satisfactory
19	1,60	0,54	Satisfactory
42	1,61	0,56	Satisfactory
17	1,62	0,58	Satisfactory
22	1,62	0,58	Satisfactory
43	1,82	0,96	Satisfactory
13	1,85	1,02	Satisfactory
14	1,90	1,12	Satisfactory
44	1,92	1,15	Satisfactory
20	1,93	1,17	Satisfactory
21	2,03	1,37	Satisfactory
47	2,30	1,88	Satisfactory
49	4,20	5,54	Unsatisfactory
40	P		

Average	1,36
SD	0,59
CV%	43,54
Median	1,32
Minimum	0,26
Quartile 25	1,08
Quartile 75	1,60
Maximum	4,20
Iqr	0,52
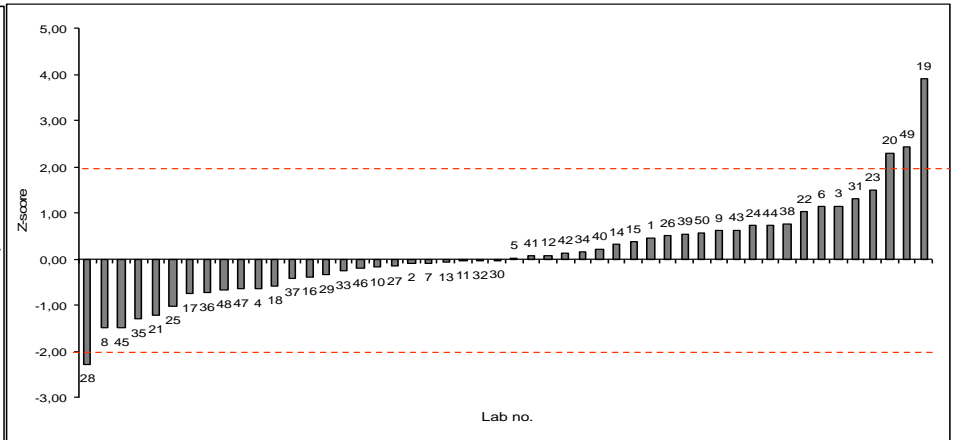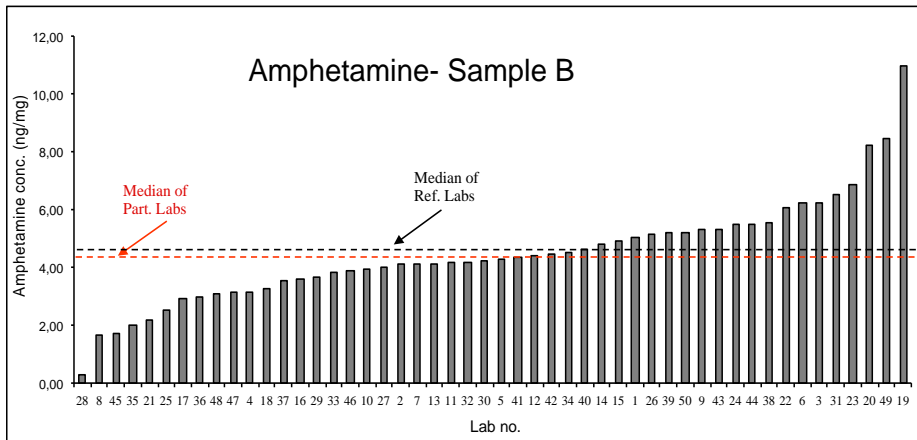
Lab.	Amphetamine	Z-score	Result
28	0,32	-2,27	Questionable
8	1,68	-1,49	Satisfactory
45	1,70	-1,47	Satisfactory
35	2,02	-1,29	Satisfactory
21	2,18	-1,20	Satisfactory
25	2,50	-1,01	Satisfactory
17	2,94	-0,76	Satisfactory
36	3,00	-0,72	Satisfactory
48	3,11	-0,66	Satisfactory
47	3,15	-0,63	Satisfactory
4	3,16	-0,63	Satisfactory
18	3,24	-0,58	Satisfactory
37	3,54	-0,41	Satisfactory
16	3,60	-0,38	Satisfactory
29	3,67	-0,34	Satisfactory
33	3,82	-0,25	Satisfactory
46	3,90	-0,20	Satisfactory
10	3,94	-0,18	Satisfactory
27	3,98	-0,16	Satisfactory
2	4,10	-0,09	Satisfactory
7	4,12	-0,08	Satisfactory
13	4,13	-0,07	Satisfactory
11	4,20	-0,03	Satisfactory
32	4,20	-0,03	Satisfactory
30	4,22	-0,02	Satisfactory
5	4,28	0,02	Satisfactory

Lab.	Amphetamine	Z-score	Result
41	4,36	0,06	Satisfactory
12	4,40	0,09	Satisfactory
42	4,49	0,14	Satisfactory
34	4,52	0,16	Satisfactory
40	4,62	0,21	Satisfactory
14	4,80	0,32	Satisfactory
15	4,90	0,38	Satisfactory
1	5,06	0,47	Satisfactory
26	5,14	0,51	Satisfactory
39	5,21	0,55	Satisfactory
50	5,22	0,56	Satisfactory
9	5,31	0,61	Satisfactory
43	5,33	0,62	Satisfactory
24	5,50	0,72	Satisfactory
44	5,50	0,72	Satisfactory
38	5,56	0,76	Satisfactory
22	6,04	1,03	Satisfactory
6	6,21	1,13	Satisfactory
3	6,25	1,16	Satisfactory
31	6,50	1,30	Satisfactory
23	6,84	1,50	Satisfactory
20	8,22	2,29	Questionable
49	8,44	2,42	Questionable
19	11,00	3,90	Unsatisfactory

Average	4,48
SD	1,80
CV%	40,05
Median	4,25
Minimum	0,32
Quartile 25	3,56
Quartile 75	5,29
Maximum	11,00
Iqr	1,73

Methamphetamine- Sample B

Lab.	Methamphetamine	Z-score	Result
28	0,78	-2,02	Questionable
17	1,11	-1,85	Satisfactory
9	2,09	-1,34	Satisfactory
8	2,19	-1,29	Satisfactory
4	2,20	-1,28	Satisfactory
36	2,85	-0,95	Satisfactory
10	3,14	-0,80	Satisfactory
2	3,30	-0,72	Satisfactory
25	3,30	-0,72	Satisfactory
27	3,46	-0,63	Satisfactory
34	3,49	-0,62	Satisfactory
47	3,59	-0,57	Satisfactory
7	3,67	-0,52	Satisfactory
16	3,70	-0,51	Satisfactory
45	3,80	-0,46	Satisfactory
32	3,90	-0,40	Satisfactory
18	3,93	-0,39	Satisfactory
38	4,03	-0,34	Satisfactory
24	4,12	-0,29	Satisfactory
40	4,24	-0,23	Satisfactory
15	4,50	-0,09	Satisfactory
37	4,50	-0,09	Satisfactory
46	4,50	-0,09	Satisfactory
30	4,51	-0,09	Satisfactory
44	4,68	0,00	Satisfactory
35	5,03	0,18	Satisfactory

Lab.	Methamphetamine	Z-score	Result
41	5,03	0,18	Satisfactory
42	5,09	0,21	Satisfactory
13	5,14	0,24	Satisfactory
33	5,17	0,25	Satisfactory
21	5,19	0,26	Satisfactory
39	5,23	0,29	Satisfactory
48	5,33	0,34	Satisfactory
23	5,47	0,41	Satisfactory
29	5,47	0,41	Satisfactory
22	5,47	0,41	Satisfactory
12	5,60	0,48	Satisfactory
50	5,79	0,58	Satisfactory
1	5,87	0,62	Satisfactory
26	6,33	0,85	Satisfactory
43	6,44	0,91	Satisfactory
5	6,48	0,93	Satisfactory
14	6,70	1,05	Satisfactory
6	6,86	1,13	Satisfactory
3	7,35	1,38	Satisfactory
31	8,00	1,72	Satisfactory
49	9,69	2,60	Questionable
20	9,94	2,73	Questionable
19	13,00	4,31	Unsatisfactory
11	>10		

Average	4,92
SD	2,16
CV%	43,81
Median	4,68
Minimum	0,78
Quartile 25	3,67
Quartile 75	5,60
Maximum	13,00
Iqr	1,93

Proficiency Test 2017-1 on Drugs of Abuse in hair

MDMA- Sample A
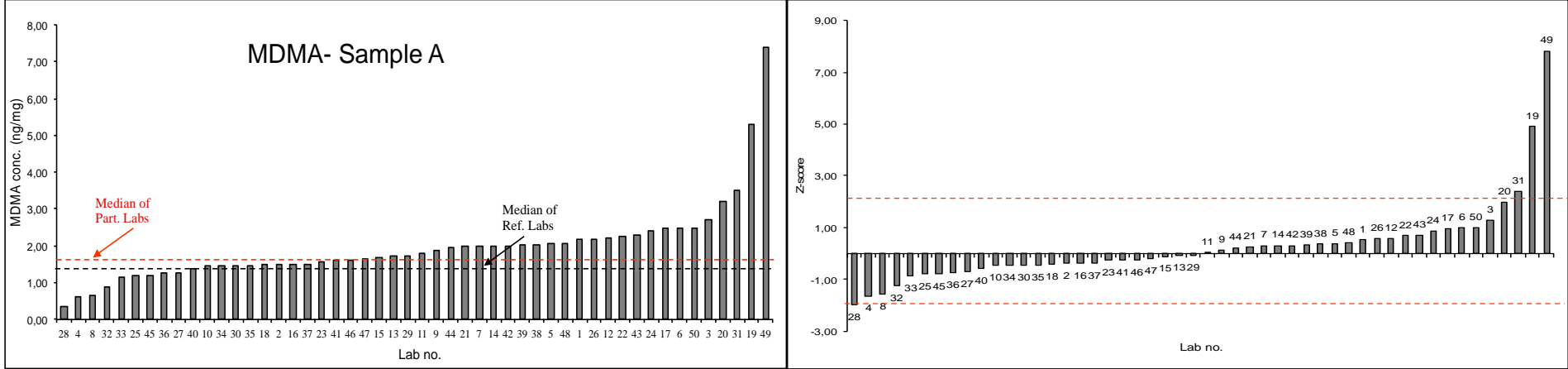
Lab.	MDMA	Z-score	Result
28	0,35	-1,97	Satisfactory
4	0,60	-1,63	Satisfactory
8	0,65	-1,56	Satisfactory
32	0,88	-1,24	Satisfactory
33	1,15	-0,86	Satisfactory
25	1,20	-0,79	Satisfactory
45	1,20	-0,79	Satisfactory
36	1,25	-0,72	Satisfactory
27	1,26	-0,71	Satisfactory
40	1,37	-0,56	Satisfactory
10	1,44	-0,46	Satisfactory
34	1,45	-0,44	Satisfactory
30	1,46	-0,43	Satisfactory
35	1,46	-0,43	Satisfactory
18	1,48	-0,40	Satisfactory
2	1,50	-0,38	Satisfactory
16	1,50	-0,38	Satisfactory
37	1,50	-0,38	Satisfactory
23	1,59	-0,26	Satisfactory
41	1,60	-0,24	Satisfactory
46	1,60	-0,24	Satisfactory
47	1,64	-0,18	Satisfactory
15	1,70	-0,10	Satisfactory
13	1,73	-0,06	Satisfactory
29	1,73	-0,06	Satisfactory
11	1,80	0,04	Satisfactory

Lab.	MDMA	Z-score	Result
9	1,88	0,15	Satisfactory
44	1,94	0,24	Satisfactory
21	1,97	0,28	Satisfactory
7	2,00	0,32	Satisfactory
14	2,00	0,32	Satisfactory
42	2,00	0,32	Satisfactory
39	2,01	0,33	Satisfactory
38	2,04	0,38	Satisfactory
5	2,05	0,39	Satisfactory
48	2,07	0,42	Satisfactory
1	2,16	0,54	Satisfactory
26	2,19	0,58	Satisfactory
12	2,20	0,60	Satisfactory
22	2,27	0,70	Satisfactory
43	2,28	0,71	Satisfactory
24	2,39	0,86	Satisfactory
17	2,47	0,97	Satisfactory
6	2,49	1,00	Satisfactory
50	2,50	1,01	Satisfactory
3	2,70	1,29	Satisfactory
20	3,20	1,99	Satisfactory
31	3,50	2,40	Questionable
19	5,30	4,90	Unsatisfactory
49	7,40	7,82	Unsatisfactory

Average	1,96
SD	1,09
CV%	55,69
Median	1,77
Minimum	0,35
Quartile 25	1,46
Quartile 75	2,18
Maximum	7,40
Iqr	0,72

THC- Sample B

Lab.	THC	Z-score	Result
12	0,03	-1,17	Satisfactory
49	0,03	-1,00	Satisfactory
2	0,04	-0,67	Satisfactory
27	0,04	-0,67	Satisfactory
34	0,05	-0,50	Satisfactory
7	0,05	-0,33	Satisfactory
32	0,05	-0,33	Satisfactory
33	0,05	-0,33	Satisfactory
50	0,05	-0,33	Satisfactory
35	0,05	-0,30	Satisfactory
8	0,05	-0,20	Satisfactory
4	0,06	-0,10	Satisfactory
23	0,06	-0,10	Satisfactory
10	0,06	0,00	Satisfactory
41	0,06	0,00	Satisfactory
43	0,06	0,00	Satisfactory
47	0,06	0,03	Satisfactory
40	0,06	0,10	Satisfactory
36	0,07	0,27	Satisfactory
15	0,07	0,33	Satisfactory
17	0,07	0,33	Satisfactory
30	0,07	0,33	Satisfactory
45	0,07	0,33	Satisfactory
21	0,08	0,50	Satisfactory
19	0,08	0,67	Satisfactory
37	0,09	1,00	Satisfactory

Lab.	THC	Z-score	Result
1	0,09	1,13	Satisfactory
22	0,10	1,20	Satisfactory
20	0,10	1,33	Satisfactory
26	0,10	1,33	Satisfactory
11	0,11	1,67	Satisfactory
31	0,15	3,00	Unsatisfactory
38	0,74	22,67	Unsatisfactory
16	N		
28	N		

Average	0,09
SD	0,12
CV%	134,93
Median	0,06
Minimum	0,03
Quartile 25	0,05
Quartile 75	0,08
Maximum	0,74
Iqr	0,03