

## Summary statistics - quantitative results

(Groups: measurement principle)

Filter: Slovakia, minimal size of groups n = 5

## EQA round: AKS4/17 - Basic Clinical Chemistry - Serum

Dead line: 13.10.2017

RoM = robust average	AV = assigned value	Dmax = acceptable percent difference
SD = standard deviation	CRV = certified reference value	LL = lower limit
CV = coefficient of variation	RV = reference value	UL = upper limit
Ntot = total number of participants	CVE = consensus value from experts	Neva = number of evaluated participants
Nout = number of results excluded before calculation	CVP = consensus value from all participants	Nsuc = number of successful participants
	CVPG = consensus value from participants groups	Srel = success (relative)
	U <sub>AV</sub> = expanded uncertainty of the assigned value (k = 2)	

Test	[unit]	Comparability						Traceability															
		RoM	SD	CV [%]	N <sub>tot</sub>	N <sub>out</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	
<b>(1) Sodium</b>					71																71	69	97%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		131	2,1	1,6	71									CRV	130,9	2,0	5%	124	138	71	70	99%	
(2) Indirect ISE		131	1,8	1,4	56	0																56	
(3) Direct ISE		133	2,7	2,1	14	0																	14
Other					1	0																	1
														1x 99									
<b>Sample B</b>		139	2,0	1,4	71									CRV	139,1	2,1	5%	132	147	71	70	99%	
(2) Indirect ISE		139	1,8	1,3	56	0																	56
(3) Direct ISE		141	2,8	2,0	14	0																	14
Other					1	0																	1
														1x 99									
<b>(2) Potassium</b>					71																71	69	97%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		5,90	0,14	2,4	71									CRV	5,843	0,088	8%	5,37	6,32	71	70	99%	
(2) Indirect ISE		5,89	0,13	2,2	56	0																	56
(3) Direct ISE		5,99	0,21	3,5	14	0																	14
Other					1	0																	1
														1x 99									
<b>Sample B</b>		3,94	0,08	2,0	71									CRV	3,876	0,058	8%	3,56	4,19	71	70	99%	
(2) Indirect ISE		3,94	0,07	1,9	56	0																	56
(3) Direct ISE		3,99	0,12	2,9	14	0																	14
Other					1	0																	1
														1x 99									
<b>(3) Chloride</b>					71							71	69	97%									0
Samples and groups	[mmol/L]																						
<b>Sample A</b>		118	2,6	2,2	71		CVP	118	0,41	7%	109	127											0
(3) Indirect ISE		118	2,8	2,4	56	0																	56
(4) Direct ISE		118	2,0	1,7	13	0																	13
Other					2	0																	2
							1x 2, 1x 99																
<b>Sample B</b>		123	2,5	2,0	71		CVP	123	0,39	7%	114	132											0
(3) Indirect ISE		123	2,5	2,0	56	0																	56
(4) Direct ISE		123	2,8	2,3	13	0																	13
Other					2	0																	2
							1x 2, 1x 99																
<b>(4) Calcium</b>					68																		68
Samples and groups	[mmol/L]																						
<b>Sample A</b>		2,85	0,06	2,4	68									CRV	2,846	0,043	10%	2,56	3,14	68	68	100%	
(2) Phot. with o-cresolftalexon		2,87	0,05	1,8	10	0																	10
(3) Photom. with arsenazo III		2,83	0,07	2,7	39	0																	39

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Test	[unit]	Comparability					Traceability																
		RoM	SD	CV [%]	N <sub>tot</sub>	N <sub>out</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	
<b>(4) Calcium</b>					68							0									68	68	100%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		2,85	0,06	2,4	68							0		CRV	2,846	0,043	10%	2,56	3,14	68	68	100%	
(4) Complex Ca-NM-BAPTA		2,87	0,03	1,3	19	0														19			
<b>Sample B</b>		3,04	0,08	2,7	68							0		CRV	3,02	0,045	10%	2,71	3,33	68	68	100%	
(2) Phot. with o-cresolftalexon		3,06	0,07	2,4	10	0														10			
(3) Photom. with arsenazo III		3,02	0,08	2,7	39	0														39			
(4) Complex Ca-NM-BAPTA		3,08	0,06	2,2	19	0														19			
<b>(5) Inorganic phosphate</b>					67							67	65	97%							0		
Samples and groups	[mmol/L]																						
<b>Sample A</b>		1,36	0,04	3,6	67	CVP	1,36	,0061	10%	1,22	1,5	67	65	97%							0		
(1) UV-molybdate method		1,37	0,04	3,5	66	0						66											
Other					1	0						1											
<b>Sample B</b>		1,98	0,05	2,8	67	<sup>1x3</sup> CVP	1,97	,0079	10%	1,77	2,17	67	66	99%							0		
(1) UV-molybdate method		1,98	0,05	2,8	66	0						66											
Other					1	0						1											
<b>(6) Iron</b>					63							63	62	98%							0		
Samples and groups	[µmol/L]																						
<b>Sample A</b>		42,7	1,1	2,5	63	CVP	43	0,16	15%	36,5	49,5	63	63	100%							0		
(2) Method with ferrozine/ferene		42,8	1,1	2,6	44	0						44											
(4) Method with TPTZ		42,4	0,96	2,3	19	0						19											
<b>Sample B</b>		29,3	0,79	2,7	63	CVP	29,5	0,12	15%	25	34	63	62	98%							0		
(2) Method with ferrozine/ferene		29,5	0,71	2,4	44	0						44											
(4) Method with TPTZ		28,8	0,72	2,5	19	0						19											
<b>(7) Magnesium</b>					66							0									66	62	94%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		1,41	0,05	3,9	66							0		CRV	1,383	0,021	15%	1,17	1,6	66	65	98%	
(2) Photometry		1,41	0,05	3,9	65	0															65		
Other					1	0																1	
<b>Sample B</b>		1,96	0,08	4,1	66							0		<sup>1x4</sup> CRV	1,97	0,030	15%	1,67	2,27	66	62	94%	
(2) Photometry		1,96	0,08	4,2	65	0															65		
Other					1	0																1	
<b>(8) Lithium</b>					9							0									9	9	100%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		1,17	0,05	4,9	9							0		CRV	1,2	0,018	12%	1,05	1,35	9	9	100%	
(4) Photometry		1,16	0,04	3,6	5	0															5		
Other					4	0																4	
<b>Sample B</b>		1,85	0,08	4,4	9							0		<sup>3x3, 1x99</sup> CRV	1,853	0,028	12%	1,63	2,08	9	9	100%	
(4) Photometry		1,83	0,05	2,8	5	0															5		
Other					4	0																4	

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Test	[unit]	Comparability					Traceability																		
		RoM	SD	CV [%]	N <sub>tot</sub>	N <sub>out</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>			
<b>(9) Total protein</b>					71							0									71	69	97%		
Samples and groups	[g/L]																								
<b>Sample A</b>		82,8	2,4	3,0	71							0		CRV	84,94	0,99	9%	77,2	92,6	71	70	99%			
(1) Biuret		82,8	2,4	3,0	71	0															71				
<b>Sample B</b>		76,9	2,2	2,8	71							0		CRV	78,17	0,92	9%	71,1	85,3	71	70	99%			
(1) Biuret		76,9	2,2	2,8	71	0															71				
<b>(10) Albumin</b>					68							68	68	100%									0		
Samples and groups	[g/L]																								
<b>Sample A</b>		51,7	1,7	3,2	68	CVP	52,1	0,21	12%	45,8	58,4	68	68	100%									0		
(1) BCG		51,7	1,6	3,2	64	0						64													
Other					4	0						4													
<b>Sample B</b>		48,6	1,7	3,6	68	CVP	49	0,21	12%	43,1	54,9	68	68	100%									0		
(1) BCG		48,7	1,7	3,6	64	0						64													
Other					4	0						4													
<b>(11) Osmolality</b>					19							19	16	84%									0		
Samples and groups	[mmol/kg]																								
<b>Sample A</b>		298	4,9	1,7	19	CVP	296	1,4	5%	281	311	19	16	84%									0		
(1) Osmometer		299	3,9	1,3	17	0						17													
Other					2	0						2													
<b>Sample B</b>		312	6,3	2,0	19	CVP	312	1,4	5%	296	328	19	19	100%									0		
(1) Osmometer		313	5,3	1,7	17	0						17													
Other					2	0						2													
<b>(12) Lactate</b>					30							30	28	93%									0		
Samples and groups	[mmol/L]																								
<b>Sample A</b>		2,96	0,14	4,7	30	CVP	2,96	0,026	15%	2,51	3,41	30	28	93%									0		
(1) UV enzyme method		2,80	0,23	8,1	11	0						11													
(3) Photometric enzyme method		3,01	0,12	4,0	18	0						18													
Other					1	0						1													
<b>Sample B</b>		4,94	0,24	4,8	30	CVP	4,92	0,043	15%	4,18	5,66	30	28	93%									0		
(1) UV enzyme method		4,59	0,48	11	11	0						11													
(3) Photometric enzyme method		5,03	0,18	3,6	18	0						18													
Other					1	0						1													
<b>(13) Bilirubin total</b>					73							0											73	73	100%
Samples and groups	[µmol/L]																								
<b>Sample A</b>		81,0	4,5	5,5	73							0		CRV	82,8	2,0	21%	65,4	101	73	73	100%			
(1) Jendrassik-Gróf		83,0	5,9	7,1	13	0																	13		
(2) DCA, DPD		80,4	3,8	4,7	57	0																	57		
Other					3	0																	3		
<b>Sample B</b>		73,9	4,1	5,6	73							0		CRV	76	1,7	21%	60	92	73	73	100%			
(1) Jendrassik-Gróf		76,3	5,3	7,0	13	0																	13		
(2) DCA, DPD		73,4	3,5	4,8	57	0																	57		

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Test	[unit]	Comparability					Traceability																
		RoM	SD	CV [%]	N <sub>tot</sub>	N <sub>out</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	
<b>(13) Bilirubin total</b>					73							0									73	73	100%
Samples and groups	[µmol/L]																						
<b>Sample B</b>		73,9	4,1	5,6	73							0		CRV	76	1,7	21%	60	92	73	73	100%	
Other					3	0															3		
														2x 4, 1x 99									
<b>(15) Cholesterol</b>					68							1	1	100%							67	66	99%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		5,58	0,17	3,1	68							1	1	100%							67	67	100%
(1) Enzyme CHOD-PAP		5,58	0,17	3,0	66	0								CRV	5,672	0,057	9%	5,16	6,19		66		
Other					2	0						1										1	
														1x 1/149									
<b>Sample B</b>		4,66	0,14	3,1	68							1	1	100%							67	66	99%
(1) Enzyme CHOD-PAP		4,66	0,14	3,0	66	0								CRV	4,793	0,048	9%	4,36	5,23		66		
Other					2	0						1										1	
														1x 1/149, 1x 99									
<b>(16) Glucose</b>					74							0									74	71	96%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		5,37	0,15	2,8	74							0		CRV	5,411	0,054	9%	4,92	5,9		74	71	96%
(1) GOD photometry		5,41	0,18	3,3	29	0																29	
(3) Method with hexokinase		5,35	0,11	2,0	44	0																44	
Other					1	0																1	
<b>Sample B</b>		12,0	0,29	2,4	74							0		CRV	12,04	0,12	9%	10,9	13,2		74	72	97%
(1) GOD photometry		12,1	0,36	3,0	29	0																29	
(3) Method with hexokinase		12,0	0,22	1,8	44	0																44	
Other					1	0																1	
														1x 2									
<b>(17) Uric acid</b>					69							0									69	65	94%
Samples and groups	[µmol/L]																						
<b>Sample A</b>		467	13	2,9	69							0		CRV	471,6	4,7	12%	415	529		69	68	99%
(2) Enzyme-photomet. m.		467	13	2,9	69	0																69	
<b>Sample B</b>		315	10	3,2	69							0		CRV	316,5	3,2	12%	278	355		69	66	96%
(2) Enzyme-photomet. m.		315	10	3,2	69	0																69	
<b>(18) Urea</b>					73							0									73	73	100%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		14,7	0,57	3,9	73							0		CRV	14,93	0,15	15%	12,6	17,2		73	73	100%
(1) UV enzymatic m.(GMD)		14,7	0,57	3,9	71	0																71	
Other					2	0																2	
<b>Sample B</b>		9,88	0,41	4,1	73							0		CRV	10,09	0,100	15%	8,57	11,7		73	73	100%
(1) UV enzymatic m.(GMD)		9,87	0,41	4,1	71	0																71	
Other					2	0																2	
														1x 2, 1x 99									
<b>(19) Creatinine</b>					73							0									73	72	99%
Samples and groups	[µmol/L]																						
<b>Sample A</b>		342	15	4,4	73							0		CRV	351	3,5	15%	298	404		73	73	100%
(2) Jaffé without depro. (with corr.)		338	14	4,2	49	0																49	

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		RoM	SD	CV [%]	N <sub>tot</sub>	N <sub>out</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	AV	U <sub>AV</sub>	D <sub>max</sub>	LL	UL	N <sub>eva</sub>	N <sub>suc</sub>	S <sub>rel</sub>	
<b>(19) Creatinine</b>					73							0									73	72	99%
Samples and groups	[µmol/L]																						
<b>Sample A</b>		342	15	4,4	73							0		CRV	351	3,5	15%	298	404	73	73	100%	
(3) Enzyme		352	9,7	2,8	21	0															21		
Other					3	0																3	
<b>Sample B</b>		154	9,4	6,1	73							0		2x 1, 1x 4 CRV	151,1	1,5	15%	128	174	73	72	99%	
(2) Jaffé without depro. (with corr.)		156	10	6,4	49	0															49		
(3) Enzyme		149	4,2	2,8	21	0																21	
Other					3	0																3	
<b>(20) Triglycerides</b>					68							0									68	67	99%
Samples and groups	[mmol/L]																						
<b>Sample A</b>		2,32	0,09	3,9	68							0		CRV	2,412	0,024	15%	2,05	2,78	68	67	99%	
(1) GPO-PAP		2,32	0,08	3,8	67	0																67	
Other					1	0																1	
<b>Sample B</b>		1,93	0,07	3,7	68							0		1x 2 CRV	2,03	0,020	15%	1,72	2,34	68	68	100%	
(1) GPO-PAP		1,93	0,07	3,7	67	0																67	
Other					1	0																1	
<b>(21) ALP</b>					70							24	22	92%							46	43	93%
Samples and groups	[µkat/L]																						
<b>Sample A</b>		3,46	0,56	16	70							24	22	92%							46	45	98%
(3) IFCC method		3,69	0,45	12	45	0									CRV	3,582	0,082	24%	2,72	4,45	45		
(3) IFCC method; (60) Roche		2,96	0,14	4,8	24	0	CVPG	2,96	0,027	18%	2,42	3,5										24	
Other					1	0																1	
<b>Sample B</b>		6,75	1,3	19	70							24	22	92%							46	44	96%
(3) IFCC method		7,28	1,0	14	45	0									CRV	6,886	0,16	24%	5,23	8,54	45		
(3) IFCC method; (60) Roche		5,56	0,26	4,7	24	0	CVPG	5,55	0,049	18%	4,55	6,55										24	
Other					1	0																1	
<b>(22) alpha-amylase</b>					72							1	1	100%							71	69	97%
Samples and groups	[µkat/L]																						
<b>Sample A</b>		8,91	0,41	4,6	72							1	1	100%							71	69	97%
(1) IFCC method		8,90	0,40	4,5	71	0									CRV	9,01	0,25	15%	7,65	10,4	71		
Other					1	0																1	
<b>Sample B</b>		3,79	0,16	4,3	72							1	1	100%							71	70	99%
(1) IFCC method		3,79	0,16	4,1	71	0									CRV	3,811	0,11	15%	3,23	4,39	71		
Other					1	0																1	
<b>(23) AST</b>					73							0									73	65	89%
Samples and groups	[µkat/L]																						
<b>Sample A</b>		3,19	0,26	8,0	73							0		CRV	3,267	0,072	15%	2,77	3,76	73	65	89%	
(1) IFCC method		3,19	0,26	8,0	73	0																73	
<b>Sample B</b>		2,46	0,19	7,7	73							0		CRV	2,474	0,060	15%	2,1	2,85	73	69	95%	

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<b>(23) AST</b>					73									
Samples and groups	[µkat/L]													
<b>Sample B</b>		2,46	0,19	7,7	73									
(1) IFCC method		2,46	0,19	7,7	73	0			CRV	2,474	0,060	15%	2,1	2,85
													73	69
													73	65
													89%	
<b>(24) ALT</b>					73									
Samples and groups	[µkat/L]													
<b>Sample A</b>		1,27	0,08	6,4	73									
(1) IFCC method		1,27	0,08	6,4	73	0			CRV	1,259	0,030	15%	1,07	1,45
													73	70
													96%	
<b>Sample B</b>		2,36	0,13	5,7	73									
(1) IFCC method		2,36	0,13	5,7	73	0			CRV	2,355	0,052	15%	2	2,71
													73	73
													100%	
<b>(26) CK</b>					69									
Samples and groups	[µkat/L]													
<b>Sample A</b>		3,55	0,25	7,1	69									
(1) IFCC method		3,55	0,25	7,1	69	0			CRV	3,692	0,088	20%	2,95	4,44
													69	68
													99%	
<b>Sample B</b>		8,62	0,58	6,7	69									
(1) IFCC method		8,62	0,58	6,7	69	0			CRV	8,705	0,21	20%	6,96	10,5
													69	67
													97%	
<b>(27) gamma-GT</b>					72									
Samples and groups	[µkat/L]													
<b>Sample A</b>		3,43	0,13	3,9	72									
(1) IFCC method		3,43	0,13	3,9	72	0			CRV	3,454	0,085	15%	2,93	3,98
													72	71
													99%	
<b>Sample B</b>		3,15	0,12	3,7	72									
(1) IFCC method		3,15	0,12	3,7	72	0			CRV	3,181	0,078	15%	2,7	3,66
													72	71
													99%	
<b>(28) LD</b>					55									
Samples and groups	[µkat/L]													
<b>Sample A</b>		7,88	0,22	2,9	55									
(3) IFCC method		7,88	0,22	2,9	55	0			CRV	7,757	0,17	18%	6,36	9,16
													55	52
													95%	
<b>Sample B</b>		5,17	0,20	3,8	55									
(3) IFCC method		5,17	0,20	3,8	55	0			CRV	5,039	0,11	18%	4,13	5,95
													55	52
													95%	
<b>(29) Lipase</b>					29						24	23	96%	
Samples and groups	[µkat/L]													
<b>Sample A</b>		1,68	0,22	13	29						24	24	100%	
(1) Photometry; (58) Beckman Coulter (Olympus)		1,82	0,13	7,0	11	0	CVPG	1,78	0,031	24%	1,35	2,21		
(1) Photometry; (60) Roche		1,57	0,14	8,7	11	0	CVPG	1,54	0,034	24%	1,17	1,91		
Other					7	0								2
														2x 1/12, 1x 1/149, 3x 1/178, 1x 1/207
<b>Sample B</b>		2,46	0,44	18	29						24	23	96%	
(1) Photometry; (58) Beckman Coulter (Olympus)		2,75	0,15	5,5	11	0	CVPG	2,71	0,045	24%	2,05	3,37		
(1) Photometry; (60) Roche		2,17	0,20	9,3	11	0	CVPG	2,11	0,051	24%	1,6	2,62		
Other					7	0								2
														2x 1/12, 1x 1/149, 3x 1/178, 1x 1/207
<b>(30) Cholinesterase</b>					29						29	27	93%	
Samples and groups	[µkat/L]													
<b>Sample A</b>		147	6,5	4,4	29						29	27	93%	

