

[Supplemental material - EQA Panel characteristics and assays performed by the participating laboratories](#)

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Table S1. Tests and outcomes of pre-distribution panel characterisation of EQA panels by WHO COVID-19 reference laboratories, INMI and RIVM.

WHO COVID-19 reference laboratory	Type of test	Type of antibody	Test information	Unit	cut-off value	A -	D -	H -	B - mild	G - mild	C - negative	F - negative	E -
						hospitalised	hospitalised	hospitalised	A+/G+/M+	A+/G+/M+	A+/G+/M+	A+/G+/M+	A+/G+/M+ ^{low}
INMI	ELISA	IgA	DIESSE Diagnostica Senese Spa - ENZY-WELL SARS-CoV-2 IgA	ratio	≥1.1	9.6	3.4	4	4.8	7.2	0.6	0.6	1.4
	ELISA	IgM	DIESSE Diagnostica Senese Spa - ENZY-WELL SARS-CoV-2 IgM	ratio	≥1.1	2.5	3.2	1.2	3.4	0.6	0.3	0.4	0.5
	ELISA	IgG	DIESSE Diagnostica Senese Spa - ENZY-WELL SARS-CoV-2 IgG	ratio	≥1.1	7.1	8.1	7.6	9.6	5.2	0.5	0.3	1
	CLIA	IgG	Diasorin Inc. - LIAISON SARS-CoV-2 S1/S2 IgG	AU/ml	≥14	122	125	182	114	108	7.71	8.99	24.7
	CMIA	IgM	Abbott - SARS-CoV-2 IgG II Quant	AU/ml	≥50	7215.4	13166.8	5215.7	4844	2837.9	13.9	6.9	14.6
	CMIA	IgG	Abbott - SARS-CoV-2 anti-N IgG (CMIA)	ratio	≥1.4	5.46	7.43	5.97	6.68	4.48	0.23	0.37	0.63
	VNT90	neutralising antibodies	in-house - virus microneutralisation (VNT90)	titer	≥10	320	160	80	>640	40	<10	<10	<10
RIVM	ELISA	Total Ig	Beijing Wantai Biological - SARS-CoV-2 Ab ELISA	ratio	≥1	22.47	25.34	23.02	21.01	31.36	0.01	0.01	0.01
	ELISA	IgM	Beijing Wantai Biological - SARS-CoV-2 IgM ELISA	ratio	≥1	21.31	9.29	6.53	26.50	2.30	0.09	0.43	0.00
	ELISA	IgA	Euroimmun - Anti-SARS-CoV-2 ELISA IgA	ratio	≥1.1	11.10	10.12	10.42	11.33	8.85	0.44	0.64	0.46
	ELISA	IgG	Euroimmun - Anti-SARS-CoV-2 ELISA IgG	ratio	≥1.1	8.10	7.86	8.64	7.38	7.21	0.27	0.69	0.14
	sVNT	neutralising antibodies	GenScript - SARS-CoV-2 Surrogate Virus Neutralisation Test Kit	Percentage of inhibition	30.0	99.99	99.99	100.00	99.99	100.00	5.18	0.81	5.59

Table S1 Continued. Tests and outcomes of pre-distribution panel characterisation of EQA panels by WHO COVID-19 reference laboratories, INMI and RIVM.

WHO COVID-19 reference laboratory	Type of test	Type of antibody	Test information	Unit	cut-off value	A -	D -	H -	B - mild	G - mild	C - negative	F - negative	E -
						hospitalised A+/G+/M+	hospitalised A+/G+/M+	hospitalised A+/G+/M+	A+/G+/M+	A+/G+/M+low	pre-pandemic	pre-pandemic	acute EBV/CMV infection
	VNT50	neutralising antibodies	in-house - virus microneutralisation (VNT50)	titer	≥10	>640	400	480	>640	140	<10	<10	<10
	Micro-array	IgG	in-house - protein micro-array SARS-CoV-2-S-T	titer	≥10	>14580	8800	5016	6908	2754	10	10	10
			in-house - protein micro-array SARS-CoV-2-S1	titer	≥10	3470	2330	2398	1808	1397	25	51	10
			in-house - protein micro-array SARS-CoV-2-N	titer	≥10	10206	3532	4006	>14580	276	10	40	10
			in-house - protein micro-array 229E-S-T	titer	≥10	1603	862	816	1382	1460	1227	1005	768
			in-house - protein micro-array HKU1-S-T	titer	≥10	9775	4202	4198	5271	1716	570	487	547
			in-house - protein micro-array HKU1-S1	titer	≥10	874	458	457	356	490	572	479	405
			in-house - protein micro-array OC43-S-T	titer	≥10	7101	6496	3783	3740	1786	1272	1019	730
			in-house - protein micro-array OC43-S1	titer	≥10	656	2114	468	778	888	1408	1278	1016
			in-house - protein micro-array NL63-S-T	titer	≥10	2302	1640	1597	1753	1823	1264	1075	1247
			in-house - protein micro-array NL63-S1	titer	≥10	387	418	195	339	395	514	508	504

Table S2. Commercial and in-house tests assessed by EQA participants.

Type of test	Test #	Test information	No. laboratories
commercial	1	Abbott - SARS-CoV- IgM (CMIA)	6
commercial	2	Abbott - SARS-CoV-2 IgG (CMIA)	12
commercial	3	Abbott - SARS-CoV-2 IgG II Quant	9
commercial	4	AESKU Diagnostics - AESKULISA SARS-CoV-2 S1 IgG	1
commercial	5	AESKU Diagnostics - AESKULISA SARS-CoV-2 S1 IgM	1
commercial	6	AMP diagnostics - AMP Rapid Test SARS-CoV-2 IgG/IgM	1
commercial	7	AAZ - COVID-PRESTO TROD IgG/IgM	1
commercial	8	Beckman Coulter - Access SARS-CoV-2 IgG II Assay	1
commercial	9	Beijing Wantai Biological - SARS-CoV-2 Ab ELISA	10
commercial	10	Beijing Wantai Biological - SARS-CoV-2 IgM ELISA	3
commercial	11	BioMerieux - VIDAS SARS-COV-2 IgG	2
commercial	12	BioMerieux - VIDAS SARS-COV-2 IgM	2
commercial	13	Diasorin Inc. - LIAISON SARS-CoV-2 S1/S2 IgG	5
commercial	14	Diasorin Inc. - LIAISON SARS-CoV-2 TrimericS IgG	2
commercial	15	Diasorin Inc. - LIAISON SARS-CoV-2 IgM	1
commercial	16	Euroimmun - Anti-SARS-CoV-2 ELISA IgA	14
commercial	17	Euroimmun - Anti-SARS-CoV-2 ELISA IgG	17
commercial	18	Euroimmun - Anti-SARS-CoV-2 NCP ELISA IgG	3
commercial	19	Euroimmun - Anti-SARS-CoV-2 NCP ELISA IgM	5
commercial	20	Euroimmun - Anti-SARS-CoV-2 QuantiVac ELISA IgG	4
commercial	21	Eurospital Diagnostic - ELISA SARS CoV-2 IgG	1
commercial	22	Generic assays - ELISA, GA CoV-2 IgG	1
commercial	23	Generic assays - ELISA, GA CoV-2 IgM	1
commercial	24	GenScript - cPass SARS CoV-2 Neutralisation Antibody Detection Kit	3
commercial	25	GenScript - SARS-CoV-2 Surrogate Virus Neutralisation Test Kit	5
commercial	26	Hangzhou Biotest Biotech - RightSign COVID-19 IgG/IgM Rapid Test Cassette	1

Table S2 continued. Commercial and in-house tests assessed by EQA participants.

Type of test	Test #	Test information	No. laboratories
commercial	27	ImmunoDiagnostics - SARS-CoV-2 NP IgG ELISA Kit	1
commercial	28	ImmunoDiagnostics - SARS-CoV-2 S1 IgG ELISA Kit	1
commercial	29	Maccura Biotechnology - SARS-CoV-2 IgM/IgG	1
commercial	30	Roche - Elecsys Anti-SARS-CoV-2	2
commercial	31	Roche - Elecsys Anti-SARS-CoV-2 S	3
commercial	32	Seramun Diagnostica GmbH - SeraSpot Anti-SARS-CoV-2 IgA	1
commercial	33	Seramun Diagnostica GmbH - SeraSpot Anti-SARS-CoV-2 IgG	1
commercial	34	Serion diagnostics - Serion Elisa agile SARS-CoV-2 IgA	1
commercial	35	Serion diagnostics - Serion Elisa agile SARS-CoV-2 IgG	1
commercial	36	Siemens - Atellica IM Analyzer - SARS-CoV-2 IgG (sCOVG)	1
commercial	37	TestLine Clinical Diagnostics - EIA COVID-19 RBD IgG	1
commercial	38	Vircell microbiologists - COVID-19 ELISA IgG	2
commercial	39	Vircell microbiologists - COVID-19 ELISA IgM+IgA	3
commercial	40	Vircell microbiologists - COVID-19 VIRCLIA IgG	1
commercial	41	Zhejiang Orient Gene Biotech Co - COVID-19 IgG/IgM Rapid Test	1
In-house	42	ELISA	2
In-house	43	ELISA SARS-CoV-2 IgG	1
In-house	44	ELISA SARS-CoV-2 IgM	1
In-house	45	IFA	1
In-house	46	L3 based NT assay	1
In-house	47	Luminex multiplex immunoassay	1 laboratory (3 different variations of the test)
In-house	48	Protein micro-array	1
In-house	49	PRNT	4
In-house	50	Pseudo-neutralisation assay	1
In-house	51	surrogate VNT	1
In-house	52	suspension immunoassay based on S1 including RBD	1
In-house	53	virus microneutralisation	12

