SUPPLEMENTARY APPENDIX 1: FULL INCLUSION CRITERIA AND SEARCH STRATEGY

Table 1. Study selection criteria

	Inclusion criteria	Exclusion criteria
Population	People with suspected ongoing or recent SARS-CoV-2 infection	
Intervention	Any test that is designed to detect the presence of SARS-CoV-2, or antibodies to SARS-CoV-2, in people suspected of recent or ongoing infection.	We will not include evidence on the accuracy of diagnosing COVID-19 based on clinical information alone, e.g. signs and symptoms, chest imaging. We will however include studies if they compare these methods to virus or antibody detection. We will not include tools used for mass non-contact screening such as fever screening at airports or other transit hubs.
Comparisons	Where available, we will report comparisons of: • different tests or test protocols with each other • virus or antibody tests in comparison to clinical diagnosis	
Outcome measures	• Diagnostic performance (rates of true/false positive/negative results). We will report or calculate measures of diagnostic accuracy (sensitivity, specificity, positive/negative predictive value) where data is available to do so. We will consider any 'gold standard' method used to confirm test results, but will report different methods of calculating these separately. • Virus/antibody detection rates • Influence on/changes in patient management	
Study design	We will prioritise evidence according to its reliability and certainty using established methodology for rapid evidence reviews. We will only include evidence from "lower priority" evidence where outcomes are not reported by a "higher priority" source. We will include data from published sources and also any unpublished	

	data provided by test developers where available, but priority will be given to published, peer-reviewed sources of evidence. We will only include studies that studied 10 or more patients with known or suspected COVID-19. We will also search for economic evaluations or original research that can form the basis of an economic assessment. Where possible, we will obtain costs directly from test developers and use this information to carry out assessments of the economic impact of introducing the tests.	
Search limits	We will only include evidence published in English or that has an English translation available. We will search for evidence published from December 2019 onwards (the date when the first SARS-CoV-2 infections in humans were identified).	
Other factors	We will report evidence on virus and antibody tests separately. Where available, we will also compare or analyse outcomes separately for the factors listed below: • Timing of testing relative to first presentation/symptom onset • Point-of-care and laboratory testing methods • Quantitative or qualitative reporting of test results • Different sites or methods of tissue sampling • Any variations in test performance in different populations – a range of different genetic, ethnicity and demographic factors will be considered • Tests conducted in different clinical or community settings • Self-administered tests versus those administered and/or interpreted by a healthcare professional	

Summary of search strategy

Following initial scoping-level searches a single, peer-reviewed, search strategy was developed to answer both research questions.
The initial scoping-level searches were conducted using

- WHO Global research on coronavirus disease (COVID-19) database[1]
- COVID-19: a living systematic map of the evidence, produced by The NIHR Policy Research Programme Reviews Facility[2]
- LitCovid, Diagnostic set[3]
-

The databases which were searched for every update search were:

- Ovid Medline (including Epub Ahead of Print, In-Process & Other Non-Indexed Citations)
- Ovid Embase
- The Cochrane Library
- INAHTA HTA Database
- Open Grey
- WHO Global research on coronavirus disease (COVID-19) database[1]
- COVID-19: a living systematic map of the evidence[2]
- LitCovid, Diagnostic set[3]
-

Additionally, the sources included in the HTW COVID-19 Evidence Digest[4] were hand-searched for relevant evidence and key stakeholders in Wales contacted for any published or unpublished data of relevance to this review.

Table 2. Searches conducted and their dates.

Search	**Date Searched**
Initial scoping-level searches	
- WHO Global research on coronavirus disease (COVID-19) database	31 March 2020
- COVID-19: a living systematic map of the evidence	25 March 2020
- LitCovid, Diagnostic set	2 April 2020
Update search #1	14 April 2020
Update search #2	20 April 2020
Update search #3	27 April 2020
Update search #4	4 May 2020

Table 3. Search strategy for Ovid Medline.

Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily

COVID-19 stem	
1	Coronavirus Infections/
2	exp coronavirus/
3	((corona* or corono*) adj1 (virus* or viral* or virinae*)).ti,ab,kw.
4	(coronavirus* or coronovirus* or coronavirinae* or Coronavirus* or Coronovirus* or Wuhan* or Hubei* or Huanan or "2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or CoV or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese*).ti,ab,kw.
5	or/1-4
Molecular/virus tests	
6	((virus or viral or molecular or antigen*) adj3 (test* or detect*)).tw.
7	Nucleic Acid Amplification Techniques/
8	exp Polymerase Chain Reaction/
9	(polymerase chain reaction or PCR or RT-PCR or rtPCR).tw.
10	(nucleic acid amplification or NAAT*).tw.
11	RNA, Viral/
12	Virus Shedding/
13	((ribonucleic acid or RNA) adj3 (test* or detect*)).tw.
14	or/6-13
Antibody tests/immunoassays	
15	((antibod* or serology or serological) adj3 (test* or detect* or screen* or diagnos* or assay*)).tw.
16	exp Serologic Tests/
17	Antibodies, Viral/
18	((immunoglobulin or IgG or IgM or IgA or immunolog*) adj3 (test* or detect* or screen* or assay*)).tw.
19	exp Immunoglobulin M/
20	exp Immunoglobulin G/
21	exp Immunoglobulin A/
22	exp Immunologic Tests/
23	exp Hematologic Tests/
24	((blood or haematol* or hematol*) adj3 (test* or sampl*)).tw.
25	exp Enzyme-Linked Immunosorbent Assay/
26	(enzyme linked immunosorbent assay* or ELISA*).tw.
27	((immunosorbent adj3 (tech* or assay*)) or immunoassay*).tw.

28	or/15-27
Testing sites	
29	((oropharyngeal or nasopharyngeal or nasal or oral or pharyngeal or anal or lingual or tongue*) adj3 (swab* or sampl* or test*)).tw.
30	((stool* or saliva or serum* or urine* or sputum*) adj3 (sampl* or test* or analys* or examin*)).tw.
31	lung* wash*.tw.
32	or/29-30
General diagnosis terms	
33	exp diagnosis/
34	diagnos*.ti.
35	diagnos*.ab. /freq=3
36	exp "sensitivity and specificity"/
37	false negative reactions/
38	false positive reactions/
39	(sensitivity or specificity).tw.
40	(false adj (negative$1 or positive$1)).tw.
41	((pre-test or pretest or post-test) adj probability).tw.
42	predictive value$.tw.
43	likelihood ratio$.tw.
44	or/33-43
Set combination	
45	5 and 14
46	5 and 28
47	5 and 32
48	5 and 44
49	or/45-48
50	202004*.dt.
51	49 and 50

Table 4. Search strategy for Ovid Embase.

Ovid Embase	
COVID-19 stem	
1	exp Coronavirus infection/
2	exp coronavirinae/
3	((corona* or corono*) adj1(virus* or viral* or virinae*)).ti,ab,kw.

4	(coronavirus* or coronovirus* or coronavirinae* or Coronavirus* or Coronovirus* or Wuhan* or Hubei* or Huanan or "2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or CoV or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese*).ti,ab,kw.
5	or/1-4
Molecular/virus tests	
6	((virus or viral or molecular or antigen*) adj3(test* or detect*)).tw.
7	nucleic acid amplification/
8	nucleic acid amplification system/
9	exp polymerase chain reaction/
10	(polymerase chain reaction or PCR or RT-PCR or rtPCR).tw.
11	(nucleic acid amplification or NAAT*).tw.
12	virus RNA/
13	virus shedding/
14	virus detection/
15	((ribonucleic acid or RNA) adj3 (test* or detect*)).tw.
16	or/6-15
Antibody tests/immunoassays	
17	((antibod* or serology or serological) adj3 (test* or detect* or screen* or diagnos* or assay*)).tw.
18	exp serology/
19	exp immunology test kit/
20	exp virus antibody/
21	((immunoglobulin or IgG or IgM or IgA or immunolog*) adj3 (test* or detect* or screen* or assay*)).tw.
22	exp immunoglobulin antibody/
23	immunoglobulin M/
24	immunoglobulin G/
25	immunoglobulin A/
26	exp immunological procedures/
27	blood sampling/
28	exp blood examination/
29	((blood or haematol* or hematol*) adj3 (test* or sampl*)).tw.
30	exp enzyme linked immunosorbent assay/
31	(enzyme linked immunosorbent assay* or ELISA*).tw.

32	((immunosorbent adj3 (tech* or assay*)) or immunoassay*).tw.
33	or/17-32
Testing sites	
34	((oropharyngeal or nasopharyngeal or nasal or oral or pharyngeal or anal or lingual or tongue*) adj3 (swab* or sampl* or test*)).tw.
35	nose smear/
36	throat culture/
37	exp sputum examination/
38	((stool* or saliva or serum* or urine* or sputum*) adj3 (sampl* or test* or analys* or examin*)).tw.
39	exp feces analysis/
40	urine sampling/
41	saliva analysis/
42	lung* wash*.tw.
43	or/34-42
General diagnosis terms	
44	exp diagnosis/
45	exp diagnostic test kit/
46	diagnos*.ti.
47	diagnos*.ab. /freq=3
48	exp "sensitivity and specificity"/
49	exp diagnostic error/
50	(sensitivity or specificity).tw.
51	(false adj (negative$1 or positive$1)).tw.
52	((pre-test or pretest or post-test) adj probability).tw.
53	predictive value$.tw.
54	likelihood ratio$.tw.
55	or/44-54
Set combination	
56	5 and 16
57	5 and 33
58	5 and 43
59	5 and 55
60	or/56-59
61	202004*.dc.
62	60 and 61

Table 5. Search strategy for Cochrane Library.

The Cochrane Library	
COVID-19 stem	
#1	MeSH descriptor: [Coronavirus Infections] this term only
#2	MeSH descriptor: [Coronavirus] explode all trees
#3	((corona* or corono*) near/1 (virus* or viral* or virinae*)):ti,ab,kw
#4	(coronavirus* or coronovirus* or coronavirinae* or Coronavirus* or Coronovirus* or Wuhan* or Hubei* or Huanan or "2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or CoV or "2019 novel*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona* or Ncorono* or NcovWuhan* or NcovHubei* or NcovChina* or NcovChinese*):ti,ab,kw
#5	#1 or #2 or #3 or #4
Molecular/virus tests	
#6	((virus or viral or molecular or antigen*) near/3 (test* or detect*)):ti,ab,kw
#7	MeSH descriptor: [Nucleic Acid Amplification Techniques] this term only
#8	MeSH descriptor: [Polymerase Chain Reaction] explode all trees
#9	(polymerase chain reaction or PCR or RT-PCR or rtPCR):ti,ab,kw
#10	(nucleic acid amplification or NAAT*):ti,ab,kw
#11	MeSH descriptor: [RNA, Viral] this term only
#12	MeSH descriptor: [Virus Shedding] this term only
#13	((ribonucleic acid or RNA) near/3 (test* or detect*)):ti,ab,kw
#14	{or #6-#13}
Antibody tests/immunoassays	
#15	((antibod* or serology or serological) near/3 (test* or detect* or screen* or diagnos* or assay*)):ti,ab,kw
#16	MeSH descriptor: [Serologic Tests] explode all trees
#17	MeSH descriptor: [Antibodies, Viral] this term only
#18	((immunoglobulin or IgG or IgM or IgA or immunolog*) near/3 (test* or detect* or screen* or assay*)):ti,ab,kw
#19	MeSH descriptor: [Immunoglobulin M] explode all trees
#20	MeSH descriptor: [Immunoglobulin G] explode all trees
#21	MeSH descriptor: [Immunoglobulin A] explode all trees
#22	MeSH descriptor: [Immunologic Tests] explode all trees
#23	MeSH descriptor: [Hematologic Tests] explode all trees
#24	((blood or hematol* or haematol*) near/3 (test* or sampl*)):ti,ab,kw

#25	MeSH descriptor: [Enzyme-Linked Immunosorbent Assay] explode all trees
#26	(enzyme linked immunosorbent assay* or ELISA*):ti,ab,kw
#27	((immunosorbent near/3 (tech* or assay*)) or immunoassay*):ti,ab,kw
#28	{or #15-#27}
Testing sites	
#29	((oropharyngeal or nasopharyngeal or nasal or oral or pharyngeal or anal or lingual or tongue*) near/3 (swab* or sampl* or test*)):ti,ab,kw
#30	((stool* or saliva or serum* or urine* or sputum*) near/3 (sampl* or test*or analys* or examin*)):ti,ab,kw
#31	(lung* next wash*):ti,ab,kw
#32	{or #29-#31}
General diagnosis terms	
#33	MeSH descriptor: [Diagnosis] explode all trees
#34	(diagnos*):ti
#35	MeSH descriptor: [Sensitivity and Specificity] explode all trees
#36	MeSH descriptor: [False Negative Reactions] this term only
#37	MeSH descriptor: [False Positive Reactions] this term only
#38	(sensitivity or specificity):ti,ab,kw
#39	(false near/1 (negative* or positive*)):ti,ab,kw
#40	((pre-test or pretest or post-test) near/1 probability):ti,ab,kw
#41	(predictive next value*):ti,ab,kw
#42	(likelihood next ratio*):ti,ab,kw
#43	{or #33-#42}
Set combination	
#44	#5 and #14
#45	#5 and #28
#46	#5 and #32
#47	#5 and #43
#48	{or #44-#47}
#49	#48 with Cochrane Library publication date in The last month

SUPPLEMENTARY APPENDIX 2. QUADAS-2 SIGNALLING QUESTIONS AND JUDGEMENTS FOR EACH STUDY.

Table 1. QUADAS-2 signalling questions and judgements: virus tests evidence

Review question:	What is the clinical effectiveness and/or economic impact of tests that detect the presence of the SARS-CoV-2 virus to inform COVID-19 diagnosis?							
RISK OF BIAS:	**PATIENT SELECTION** *Consider: methods of patient selection; included patients' prior testing, presentation, intended use of index test and setting*	**INDEX TEST** *Consider how the index test was conducted and interpreted*	**REFERENCE STANDARD** *Consider how the ref standard was conducted and interpreted*	**FLOW AND TIMING** *Consider: any patients initially recruited/selected who were excluded from outcomes analysis; time interval between index test and ref standard, or between any relevant interventions*	**APPLIC ABILITY**	**PATIENT SELECTION**	**INDEX TEST**	**REFERENCE STANDARD**
Signalling Questions	Was a consecutive or random sample of patients enrolled?	Were the index test results interpreted without knowledge of the results of the reference standard?	Is the reference standard likely to correctly classify the target condition?	Was there an appropriate interval between index test(s) and reference standard?	Signalling Questions	Are there concerns that the included patients do not match the review question?	Are there concerns that the index test, its conduct, or interpretation differ from the review question?	Are there concerns that the target condition as defined by the reference standard does not match the review question?
	Was a case-control design avoided?	IS test protocol clear(ly reported) and consistent for all tests?	Were the reference standard results interpreted without knowledge of the results of the index test?	Did all patients receive a reference standard? Was it the same for all patients?				
	Did the study avoid inappropriate exclusions?	If a threshold was used, was it pre-specified?	X	Were all patients included in the analysis?				

Amrane, Travel Med Infect Dis	Low	Unclear	n/a	n/a		Low	Low	n/a
Azzi, J Infect	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Baek, Emerging Microbes & Infections	High	Unclear	Low	High		High	Low	Low
Chan, Journal of Clinical Microbiology	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Chen, Ann Intern Med	High	Low	n/a	n/a		Low	Low	n/a
Chen, Journal of Medical Virology	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Fang, Journal of Infection	Unclear	Low	Unclear	Unclear		Low	Low	Low
Fang, Radiology	Low	Low	Low	Low		Low	Low	Low
Guo, Clin Infect Dis	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Harrington, Journal of Clinical Microbiology	Low	Low	High	High		Low	Low	Low
He, Respiratory Medicine	Low	High	Low	High		Low	Low	Low

Huang, Am J Respir Crit Care Med	Low	Low	n/a	n/a		Low	Low	n/a
Hunter, The Lancet	Low	Unclear	n/a	n/a		Low	Low	n/a
Keeley, Eurosurveillance	Low	Low	n/a	n/a		Low	Low	n/a
Kong, Nat Microbiol	Low	Unclear	n/a	n/a		High	Low	n/a
Lee, Clin Infect Dis	Unclear	High	Low	High		Low	Low	Low
Lin, Clin Chem Lab Med	Unclear	Low	n/a	n/a		Low	Low	n/a
Liu, Clinica Chimica Acta	Unclear	Low	n/a	n/a		Low	Low	n/a
Long, European Journal of Radiology	Low	High	Low	Low		Low	Low	Low
Lu, International Journal of Molecular Sciences	Unclear	Low	Unclear	Low		Low	Low	Low
Pere, J Clin Microbiol	Unclear	Low	n/a	n/a		Low	Low	n/a
Shen, JCI Insight	Unclear	Unclear	Unclear	Low		Low	Low	Low
Spellberg, JAMA	High	Unclear	n/a	n/a		Low	Low	n/a
Sutton, New England Journal of Medicine	Low	Unclear	n/a	n/a		Low	Low	n/a

Tao Ai, Radiology	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Wang, Int J Inf Dis	Unclear	Low	n/a	n/a		Low	Low	n/a
Wang, JAMA	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Williams, J Clin Microbiol	Low	Unclear	n/a	n/a		Unclear	Low	n/a
Wu, The Lancet Gastroenterology & Hepatology	Unclear	Low	n/a	n/a		Low	Low	n/a
Xia, J Med Virol	Unclear	Low	n/a	n/a		Low	Low	n/a
Xie, Int J Infect Dis	Unclear	High	n/a	n/a		Low	Low	n/a
Yan,Clinical Microbiology & Infection	Unclear	Unclear	Unclear	Low		Low	Low	Low
Ye, Journal of Hospital Infection	Unclear	High	n/a	n/a		Low	Low	n/a
Zhang, Allergy	Unclear	Low	Low	Low		Low	Low	Low
Zhang, Journal of Medical Virology	Unclear	Unclear	n/a	n/a		Low	Low	n/a
Zhen, J Clin Microbiol	High	Low	Unclear	Low		Low	Low	Low
Zheng, Bmj	Low	Low	n/a	n/a		Low	Low	n/a

Table 2. QUADAS-2 signalling questions and judgements: antibody tests evidence.

Review question:	*What is the clinical effectiveness and/or economic impact of tests that detect the presence of antibodies to the SARS-CoV-2 virus to inform COVID-19 diagnosis?*							
RISK OF BIAS	**PATIENT SELECTION** *Consider: methods of patient selection; included patients' prior testing, presentation, intended use of index test and setting*	**INDEX TEST** *Consider how the index test was conducted and interpreted*	**REFERENCE STANDARD** *Consider how the ref standard was conducted and interpreted*	**FLOW AND TIMING** *Consider: any patients initially recruited/selected who were excluded from outcomes analysis; time interval between index test and ref standard, or between any relevant interventions*	**APPLIC ABILITY**	**PATIENT SELECTION**	**INDEX TEST**	**REFERENCE STANDARD**
Signalling Questions	Was a consecutive or random sample of patients enrolled?	Were the index test results interpreted without knowledge of the results of the reference standard?	Is the reference standard likely to correctly classify the target condition?	Was there an appropriate interval between index test(s) and reference standard?	Signalling Questions	Are there concerns that the included patients do not match the review question?	Are there concerns that the index test, its conduct, or interpretation differ from the review question?	Are there concerns that the target condition as defined by the reference standard does not match the review question?
	Was a case-control design avoided?	If a threshold was used, was it pre-specified?	Were the reference standard results interpreted without knowledge of the results of the index test?	Did all patients receive a reference standard? Was it the same for all patients?				
	Did the study avoid inappropriate exclusions?			Were all patients included in the analysis?				
Cassaniti, Journal of Medical Virology	Unclear	Unclear	Unclear	***unclear***		Unclear	Low	Low

Dohla 2020, Public Health	Low	***Low***	Low	Low		Low	Low	Low
Gao, Chinese medical journal	***high***	***Unclear***	(n/a)	(n/a)		Low	Low	(n/a)
Guo, Clin Infect Dis	***High***	***Unclear***	(n/a)	(n/a)		Low	Low	(n/a)
Hoffman 2020, Infection Ecology & Epidemiology	***High***	***High***	***Low***	Unclear		Low	Low	***Low***
Jin 2020, International Journal of Infectious Diseases	Unclear	Low	Unclear	High		Low	Low	Low
Lee 2020, Journal of Infection	***high***	Unclear	Unclear	High		Low	High	Low
Li H, Chinese Journal of Infectious Diseases	Unclear	Unclear	High	High		***Unclear***	Low	Unclear
Li Z, Journal of Medical Virology	Unclear	Unclear	Unclear	High		Low	Low	Low
Lippi, G. 2020, Clin Chem Lab Med	Low	Unclear	***high***	***unclear***		Low	Low	Low
Liu, Journal of Clinical	***High***	***high***	***low***	Low		***high***	Low	Low

Microbiology								
Long 2020, Nature Med	Unclear	***unclear***	***low***	***unclear***		Low	Low	Low
Pan, Y. 2020, Journal of Infection	Unclear	Unclear	Unclear	High		Unclear	Low	Low
Shen 2020, Am J Transl	Low	Low	***unclear***	***low***		Low	Low	Low
Spicuzza 2020, Journal of Infection	***high***	***unclear***	***low***	High		Unclear	Low	***low***
Sun 2020, Emerging Microbes & Infections	***high***	***unclear***	(n/a)	***unclear***		***high***	Low	***(n/a)***
Wu 2020 Journal of Med Vir	Unclear	Unclear	***(n/a)***	Unclear		Unclear	Low	***(n/a)***
Xiang 2020, Clin Ifect Dis.	***high***	***unclear***	Low	***high***		***high***	Low	Low
Xie 2020, Journal of Med Vir	Unclear	Low	Unclear	Unclear		Low	Low	Low
Xu, Chinese Journal of Laboratory Medicine	Unclear	Unclear	High	High		Low	Low	***high***
Yong, 2020, Journal of Med Vir	***high***	***unclear***	Unclear	Unclear		***low***	Low	Unclear
Yongchen 2020, Emerging	***high***	Unclear	***low***	High		Low	Low	Low

Microbes & Infections								
Zeng, Z 2020, Journal of Infection	High	***High***	(n/a)	***unclear***		***High***	Unclear	***(n/a)***
Zhang 2020, J infect dis	***high***	Unclear	***(n/a)***	Unclear		Low	Low	***(n/a)***
Zhao, Clin Infect Dis	***high***	***unclear***	Low	High		***high***	Low	Low

SUPPLEMENTARY APPENDIX 3. OUTCOME DATA FOR STUDIES OTHER THAN DIAGNOSTIC ACCURACY.

Table 1. SARS-CoV-2 virus tests: outcomes (other than diagnostic accuracy) for all studies

Reference	Primer target	Number of patients/samples	Index test; Comparator (if applicable)
Detection rates			
Ai et al. (2020)[5]	Not specified	n = 1014 patients	RT-PCR: 601/1014 (59%; 95% CI 56% to 62%)
Amrane et al. (2020)[6]	E and spike assays	n = 280 patients	0/280 (0%)
Chan et al. (2020)[7]	RdRp/Hel	n = 273 samples	RT-PCR (RdRp/Hel): 119/273 (43.6%); RT-PCR (RdRp-P2): 77/273 (28.2%) p < 0.001
Hunter et al. (2020)[8]	RdRp	n = 1654 patients, 1,666 samples	RT-PCR: 240/1654 patients (14%); 241/1666 samples (14%)
Kong et al. (2020)[9]	Orf1ab, N	n = 640 samples	RT-PCR: 9/640 (1.4%)
Keeley et al. (2020)[10]	RdRp, E	n = 1533 patients, 1,553 samples	RT-PCR: 282/1533 patients (18%); 285/1553 samples (18%)
Liu et al. (2020)[11]	Orf1ab, N	n = 4880 patients	RT-PCR (Orf1ab AND N assay): 1875/4880 (38.42%)
Spellberg et al. (2020)[12]	NR	n = 131 samples	RT-PCR: 7/131 (5.3%)
Shen et al. (2020)[13]	Orf1ab, N	n = 5630 patients	RT-PCR: 1952/5,630 (34.7%)
Sutton et al. (2020)[14]	NR	n = 215 patients	RT-PCR: 33/215 (15.3%); Symptomatic cases: 4/4 (100%); Asymptomatic cases: 29/211 (13.7%)
Wang et al. (2020)[15]	NR	n = 1070 samples	273/1070 (25.5%)
Ye et al. (2020)[16]	NR	n = 91 patients	47/91 (51.6%)
Detection rates (in confirmed COVID-19 positive cases)			
*Fang et al. (2020)[17]**	NR	n = 51 patients	RT-PCR: 36/51 (71%, 95% CI 56% to 83%)
*Fang et al. (2020)[18]**	NR	n = 32 patients	RT-PCR: 29/32 (90.6%, 95% CI 75.0% to 98.0%)
Lee et al. (2020)[19]	N, Orf1ab	n= 70 patients	RT-PCR: 62/70 (88.6%, 95% CI 78.7% to 94.9%)
*Long et al. (2020a)[20]**	NR	n = 36 patients	RT-PCR: 30/36 (83.3%, 95% CI 67.2% to 93.6%)
He et al. (2020)[21]	NR	n = 82 patients	RT-PCR: 27/34 (79.4%,)
Shen et al. (2020)[13]	Orf1ab, N	n = 1952 patients	RT-PCR: 1721/1952 (88.2%)
*Zhang et al. (2020)[22]**	Orf1ab, N	n = 290	RT-PCR: 249/290 (85.9%)
Mean time to test result			

Amrane et al. (2020)[6]	E and spike assays	n = 22 patients	175 minutes (range 150 to 195 minutes)
Procedure time			
Won et al. (2020)[23]	NR	n = 12 healthy volunteers	230 minutes
Yan et al. (2020)[24]	Orf1ab and spike	n = 130 specimens	Mean 26.28 minutes ± SD 4.48 minutes

*All COVID-19 diagnoses assumed to be positive by the study authors based on positive RT-PCR results (after multiple tests in some cases)
CI: confidence interval; CT: computed tomography; SD: standard deviation; RT-PCR: reverse transcription polymerase chain reaction; NR: details not reported

Table 2. SARS-CoV-2 antibody tests: outcomes (other than diagnostic accuracy) for all studies

Reference	Index test assay	Number of patients/samples	Result
Detection rate			
Cassaniti et al. (2020)[25]	LFIA , VivaChek POC	n = 110 patients	Healthy volunteers 0/30 (0%); COVID-19 patients 19/30 (63.3%); Suspected cases 0/50 (0%)
Gao et al. (2020)[26]	CLIA/GICA/ELISA	n = 37 samples	IgM CLIA: 14/37; IgM ELISA: 11/37; IgM GICA: 19/37; IgG CLIA: 19/37; IgG ELISA: 24/37; IgG GICA: 19/27
Guo et al. (2020)[27]	IgM, IgG or IgA ELISA	n = 208 specimens	IgM: 188/208 (90.4%); IgA: 194/208 (93.3%); IgG: 162/208 (77.9%)
Li et al. (2020)[28]	IgM or IgG colloidal gold	n = 189	IgM: 113/189 (59.8%); IgG: 100/189 (52.9%); IgM/IgG: 125/189 (66.1%)
Jin et al. (2020)[29]	CLIA (N and spike proteins)	n = 34	IgM: 19/34 (55.9%); IgG: 32/34 (94.1%)
Wu et al. (2020)[30]	IgM or IgG colloidal gold	n = 381 patients	IgM 1/381; IgG: 40/381; RT-PCR: 1/381
Xiang et al. (2020)[31]	ELISA (NR)	n = 66 patients	IgM: 51/66; IgG: 55/66
Xie et al. (2020)[32]	CLIA (E and N)	n = 56	IgM: 49/56 (87.5%); IgG: 56/56 (100%); RT-PCR: 16/56 (28.57%)
Dohla et al. (2020)[33]	Point-of-care test	n = 49	IgM/IgG: 11/49; RT-PCR: 22/49
Lee et al. (2020)[34]	LFIA	n = 14	IgM: 4/12; IgG: 11/14
Spicuzza et al. (2020)[35]	LFIA (spike)	n = 30	IgG/IgM: 20/37; RT-PCR: 23/37
Long et al. (2020)[36]	MCLIA (N and spike)	n = 363 samples	IgM: 243/363 (66.9%); IgG: 287/363 (79.1%); IgM and/or IgG: 302/363 (83.2%)
Pan et al. (2020)[37]	Colloidal gold assay	n = 86 samples	IgM: 48/86 (55.8%, 95% CI 44.7–66.4); IgG: 47/86 (54.7%, 95% CI 43.6–65.3); IgM or IgG: 59/86 (68.6, 57.6–77.9)
Zeng et al. (2020)[38]	ELISA (target NR)	n = 27	IgM/IgG: 100%
Detection rate (in confirmed COVID-19 positive cases)			
Liu et al. (2020)[39]	ELISA (target: N-protein)	n = 214 patients	IgM: 146/214 (68.2); IgG: 150/214 (70.1%); IgM and/or IgG: 172/214 (80.4%)
Liu et al. (2020)[39]	ELISA (target: spike protein)	n = 214 patients	IgM: 165/214 (77.1%); IgG: 159/214 (74.3%); IgM and/or IgG: 176/214 (82.2%)
Yong et al. (2020)[40]	GICA (target NR)	n = 38 patients	IgM: 19/38 (50.0%); IgG: 35/38 (92.1%).
Yongchen et al. (2020)[41]	GICA (spike and N)	n = 21 patients	IgM/IgG: 17/21 (80.95%)
Hoffman et al. (2020)[42]	LFIA (NR)	n = 29	IgM: 20/29 (69%); IgG: 27/29 (93.1%)
Long et al. (2020)[36]	MCLIA (N and spike)	n = 63	IgM/IgG: 61/63 (96.8%)

Zhang et al. (2020)[43]	assay NR (E and N)	n = 112	IgM: 59/112 (52.7%); IgG: 104/112 (92.9%); IgM and/or IgG: 105/112 (93.75%); IgM and IgG: 58/112 (51.79%)
PPV			
Cassaniti et al. (2020)[25]	LFIA , VivaChek POC	n = 50 (suspected cases only)	IgM/IgG: 87.5%
Xu et al. (2020)[44]	Fully-automated assay (NR)	n = 205 patients	IgM/IgG: 95.63%(197/206); RT-PCR: 100% (186/186)
Jin et al. (2020)[29]	CLIA (N and spike proteins)	n = 60	IgM: 70.2% (33/47); IgG: 90.9% (30/33)
Xiang et al. (2020)[31]	ELISA (NR)	n = 126	IgM: 100%; IgG: 94.8%
Dohla et al. (2020)[33]	IgM/IgG POC test	n = 49	IgM/IgG: 72.7% (95% CI 39.0; 94.0)
Spicuzza et al. (2020)[35]	LFIA (spike)	n = 37	IgG/IgM: 95.0%
Hoffman et al. (2020)[42]	LFIA (NR)	n = 153	IgM: 100% (20/20); IgG: 96.4% (27/28)
Shen et al. (2020)[45]	Colloidal gold (NR)	n = 150	IgM/IgG: 97.2% (95% CI 0.893 - 0.995)
NPV			
Cassaniti et al. (2020)[25]	LFIA , VivaChek POC	n = 50 (suspected cases only)	IgM/IgG: 26.2%,
Xu et al. (2020)[44]	Fully-automated assay (NR)	n = 79	IgM/IgG: 91.03% (71/78); RT-PCR: 80.61% (79/98)
Jin et al. (2020)[29]	CLIA (N and spike proteins)	n = 60	IgM: 100% (13/13); IgG: 88.9% (24/27)
Dohla et al. (2020)[33]	IgM/IgG POC test	n = 49	IgM/IgG: 63.2% (95% CI 46.0; 78.2)
Xiang et al. (2020)[31]	ELISA (NR)	n = 126	IgM: 80%; IgG: 83.8%
Spicuzza et al. (2020)[35]	LFIA (spike)	n = 37	IgG/IgM: 76.5%
Hoffman et al. (2020)[42]	LFIA (NR)	n = 153	IgM: 93.2% (124/133); IgG: 98.4% (123/125)
Shen et al. (2020)[45]	Colloidal gold (NR)	n = 150	IgM/IgG: 64.6% (95% CI 0.529-0.748)
Time to test result			
Dohla et al. (2020)[33]	IgM/IgG POC test	n = 49	IgM: 20 minutes; IgG: 15 minutes
Spicuzza et al. (2020)[35]	LFIA (spike)	n = 30	IgG/IgM: up to 15 minutes
Hoffman et al. (2020)[42]	LFIA (NR)	n = 29	10-15 minutes
Pan et al. (2020)[37]	colloidal gold	n = 105	Maximum 15 minutes
Cassaniti et al. (2020)[25]	LFIA (NR)	n = 110	Approximately 15 minutes

CLIA: Chemiluminescent immunoassay; ELISA: enzyme-linked immunosorbent assay; GICA: gold immunochromatography assay; IgA: Immunoglobulin A; IgG: Immunoglobulin G; IgM: Immunoglobulin M; LFIA: lateral flow immunoassay; NPV: negative predictive value; PPV: positive predictive value; RT-PCR: reverse transcription polymerase chain reaction; NR: details not reported.

Summary of findings: special populations

Two studies were identified that used RT-PCR to test for COVID-19 in UK healthcare workers (a mixture of patient-facing and other roles in both studies) with symptoms that were suggestive of COVID-19. These studies were conducted in March 2020, early stages of the UK peak of the COVID-19 outbreak. The studies reported detection rates of 14% in 1,654 patients[8] and 18% in 1,533 patients[10]. Neither included any information on the validation of test results, other than information on a small percentage of re-tested patients. Three studies were identified[9,12,13] that used RT-PCR to detect SARS-CoV-2 in people with mild, influenza-like symptoms. These studies reported SARS-CoV-2 detection rates of 1.4% (640 patients in Wuhan, China), 5.3% (131 patients in California) and 34.7% (5,630 patients in Wuhan, China). One study reported results in pregnant women who were routinely tested for SARS-CoV-2 on admission to hospital for delivery. Using RT-PCR, 33/215 (15.3%) of patients tested positive for COVID-19 and of these, four had symptoms suggestive of the disease but 29 were asymptomatic at the time of testing.[14]

Summary of findings: seroprevalence over time

Six studies grouped tests into weekly periods after disease onset. Within the first seven days, detection of SARS-CoV-2 antibodies ranged between 3.7% and 92.7%. Between 8-14 days, seropositivity ranged between 7.7% and 94.7%, and at 15 days or longer, seropositivity was between 42.9% and 100.0%. The wide ranges in detection rates may be in part due to the different reporting methods of seropositivity, which included the detection of a single antibody/target results (e.g. IgG positivity) or the detection of a combined result (e.g. IgM and/or IgG positivity). The reported rates of seropositivity appear to be higher in those studies that used combined antibody detection. For the four studies that did not use weekly reporting intervals, one study used 10 day intervals, two studies grouped the data into 5-day periods, while one study reported detection in periods of 3 days. Three studies reported median time to seroconversion, which ranged from 5 to 14 days. In addition, one study[36] reported the ‘peak’ detection of IgM antibodies at 20-22 days (94.1%) after disease onset, and IgG 17-19 days (100% detection) after onset.

Table 3. SARS-CoV-2 antibody tests: detection over time outcomes

Outcome	Reference	Index test assay	Number of patients/samples	Result
Detection during 7 day intervals				
Detection rate ≤ 7 days after onset	Yong et al. (2020)[40]	GICA (target NR)	n = 13	IgM: 3/13 (23.0%); IgG: 4/13 (53.8%); RT-PCR (throat swab): 9/13 (69.2%); RT-PCR (sputum): 12/13 (92.3%)
	Sun et al. (2020)[46]	ELISA (N and spike)	unclear	N-IgM: 41.7%; S-IgM: 41.7%; N-IgM/S-IgM: 58.3%; N-IgG: 41.7%; S-IgG: 58.3%; N-IgG/S-IgG: 66.7%; N-IgM/N-IgG: 58.3%; S-IgM/S-IgG: 66.7%; N-IgM/S-IgM/N-IgG/S-IgG: 75%.
	Pan et al. (2020)[37]	Colloidal gold strip (target NR)	n = 27 samples	IgM: 3/27 (11.1%, 95% CI 2.9–30.3); IgG: 1/27 (3.7%, 95% CI 0.2–20.9); IgM or IgG: 3/27 (11.1%, 95% CI 2.9–30.3)
	Gao et al. (2020)[26]	CLIA/ELISA/GICA	n = 10 patients	IgM CLIA: 4/10 (40%); IgM ELISA: 4/10 (40%); IgM GICA: 5/10 (50%); IgG CLIA: 4/10 (40.0%); IgG ELISA: 4/10 (40.0%); IgG GICA: 2/10 (20.0%)
	Guo et al. (2020)[27]	ELISA	n = 41 samples	IgM: 35/41 (85.4%); IgA: 38/31 (92.7%); IgG: NR
	Zhao et al. (2020)[47]	ELISA (spike for IgM and Ab; N for IgG)	n = 94 samples	IgM: 28.7% (27/94) [95% CI 19.9, 39.0]; IgG: 19.1% (18/94) [95% CI 11.8, 28.6]; Ab: 38.3% (36/94) [95% CI 28.5, 48.9]; RT-PCR*: 66.7% (58/87) [95% CI 55.7, 76.4]
Detection rate 8-14 days after onset	Yong et al. (2020)[40]	GICA (target NR)	n = 8	IgM: 4/8 (50.0%); IgG: 7/8 (87.5%); RT-PCR (throat swab): 3/8 (25.0%); RT-PCR (sputum): 3/8 (37.5%)
	Sun et al. (2020)[46]	ELISA (N and spike)	unclear	N-IgM: 73.7%; S-IgM: 68.4%; N-IgM/S-IgM: 84.2%; N-IgG: 84.2%; S-IgG: 78.9%; N-IgG/S-IgG: 94.7%; N-IgM/N-IgG: 94.7%; S-IgM/S-IgG: 89.5%; N-IgM/S-IgM/N-IgG/S-IgG: 94.7%.
	Pan et al. (2020)[37]	Colloidal gold strip (target NR)	n = 28 samples	IgM: 22/28 (78.6%, 95% CI 58.5–91.0); IgG: 16/28 (57.1%, 95% CI 37.4–75.0); IgM or IgG: 26/28 (92.9%, 95% CI 75.0–98.8)
	Gao et al. (2020)[26]	CLIA/ELISA/GICA	n = 13 patients	IgM CLIA: 4/13 (30.8%); IgM ELISA: 1/13 (7.7%); IgM GICA: 5/13 (38.5%) IgG CLIA: 6/13 (46.2%); IgG ELISA: 8/13 (61.5%); IgG GICA: 6/13 (46.2%)

	Zhao et al. (2020)[47]	ELISA (spike for IgM and Ab; N for IgG)	n = 135 samples	IgM: 73.3% (99/135) [95% CI 65.0, 80.6]; IgG: 54.1% (73/135) [95% CI 45.3, 62.7]; Ab: 89.6% (121/135) [95% CI 83.2, 94.2]; RT-PCR*: 54.0% (67/124) [95% CI 44.8, 63.0]
Detection rate ≥15 days after onset	Yong et al. (2020)[40]	GICA (target NR)	n = 23	IgM: 12/23 (52.2%); IgG: 21/23 (91.3%); RT-PCR (throat swab): 3/23 (13.0%); RT-PCR (sputum): 14/23 (60.8%)
	Sun et al. (2020)[46]	ELISA (N and spike)	unclear	N-IgM: 73.7%; S-IgM: 73.7%; N-IgM/S-IgM: 89.5%; N-IgG: 100.0%; S-IgG: 100.0%; N-IgG/S-IgG: 100.0%; N-IgM/N-IgG: 100.0%; S-IgM/S-IgG: 100.0%; N-IgM/S-IgM/N-IgG/S-IgG: 100.0%.
	Pan et al. (2020)[37]	Colloidal gold strip (target NR)	n = 31 samples	IgM: 23/31 (74.2%, 95% CI 55.1–87.5); IgG: 23/31 (74.2%, 95% CI 55.1–87.5); IgM or IgG: 30/31 (96.8%, 95% CI 81.5–99.8)
	Gao et al. (2020)[26]	CLIA/ELISA/GICA	n = 14 patients	IgM CLIA: 6/14 (42.9%); IgM ELISA: 6/14 (42.9%); IgM GICA: 9/14 (64.3%); IgG CLIA: 9/14 (64.3%); IgG ELISA: 12/14 (85.7%); IgG GICA: 11/14 (78.6%)
	Zhao et al. (2020)[47]	ELISA (spike for IgM and Ab; N for IgG)	n = 90 samples	IgM†: 94.3% (83/88) [95% CI 87.2, 98.1]; IgG‡: 79.8% (71/89) [95% CI 69.9, 87.6]; Ab: 100.0% (90/90) [95% CI 96.0, 100.0]; RT-PCR*: 45.5% (25/55) [95% CI 32.0, 59.5]
Detection during 10 day intervals				
Detection rate ≤10 days post disease onset	Zhang et al. (2020)[43]		n = 7	IgM/IgG: 57%
Detection rate 10-20 days post disease onset	Zhang et al. (2020)[43]		n = 10	IgM/IgG: 50%
Detection rate 20-30 days post disease onset	Zhang et al. (2020)[43]		n = 38	IgM/IgG: 44.7%
Detection rate 30-40 days post disease onset	Zhang et al. (2020)[43]		n = 49	IgM/IgG: 55.1%
Detection rate 40-50 days post disease onset	Zhang et al. (2020)[43]		n = 8	IgM/IgG: 50%
Detection during 5 day intervals				

Detection rate ≤5 days post disease onset	Lippi et al. (2020)[48]	MAGLUMI (N and spike); Eurimmuno ELISA (NR)	n = 30	IgM CLIA: 1/30 (3.3%); IgG: 3/30 (10%); IgA ELISA: 1/30 (3.3%); IgG ELISA: 0/30 (0%)
	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 22 samples	N-IgM: 7 (31.8%); S-IgM: 8 (36.4%); N-IgG: 7 (31.8%); S-IgG: 9 (40.9%); N-IgM/N-IgG: 9 (40.9%); S-IgM/S-IgG: 10 (45.5%)
Detection rate 6-10 days post disease onset	Lippi et al. (2020)[48]	MAGLUMI (N and spike); Eurimmuno ELISA (NR)	n = 13	IgM CLIA: 2/13 (15.4%); IgG CLIA: 7/13 (53.8%); IgA ELISA: 4/13 (30.8%); IgG ELISA: 2/13 (15.4%)
	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 38 samples	N-IgM: 20 (52.6%); S-IgM: 19 (50.0%); N-IgG: 15 (39.5%); S-IgG: 19 (50.0%); N-IgM/N-IgG: 20 (52.6%); S-IgM/S-IgG: 23 (60.5%)
Detection 11-21 days post disease onset	Lippi et al. (2020)[48]	MAGLUMI (N and spike); Eurimmuno ELISA (NR)	n = 5	IgM CLIA: 3/5 (60%); IgG CLIA: 5/5 (100%); IgA ELISA: 5/5 (100%); IgG ELISA: 5/5 (100%)
Detection 11-15 days post disease onset	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 54 samples	N-IgM: 39 (72.2%); S-IgM: 45 (83.3%); N-IgG: 39 (72.2%); S-IgG: 41 (75.9%); N-IgM/N-IgG: 48 (88.9%); S-IgM/S-IgG: 49 (90.7%)
Detection 16-20 days post disease onset	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 55 samples	N-IgM: 45 (81.8%); S-IgM: 53 (96.4%); N-IgG: 48 (87.3%); S-IgG: 51 (92.7%); N-IgM/N-IgG: 52 (94.5%); S-IgM/S-IgG: 53 (96.4%)
Detection 21-30 days post disease onset	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 32 samples	N-IgM: 26 (81.3%); S-IgM: 28 (87.5%); N-IgG: 28 (87.5%); S-IgG: 27 (84.4%); N-IgM/N-IgG: 30 (93.8%); S-IgM/S-IgG: 28 (87.5%)
Detection 31-35 days post disease onset	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 6 samples	N-IgM: 5 (83.3%); S-IgM: 6 (100.0%); N-IgG: 6 (100.0%); S-IgG: 5 (83.3%); N-IgM/N-IgG: 6 (100.0%); S-IgM/S-IgG: 6 (100.0%)
Detection >35 days post disease onset	Liu et al. (2020)[39]	ELISA (N and spike [S])	n = 7 samples	N-IgM: 4 (57.1%); S-IgM: 6 (85.7%); N-IgG: 7 (100.0%); S-IgG: 7 (100.0%); N-IgM/N-IgG: 7 (100.0%); S-IgM/S-IgG: 7 (100.0%)
Detection during 3 day intervals				
Detection 2-4 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 22	IgM: 3/22; IgG: 7/22; IgM/IgG: 7/22
Detection 5-7 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 45	IgM: 18/45; IgG: 25/45; IgM/IgG: 47/45

Detection 8-10 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 70	IgM: 37/70; IgG: 48/70; IgM/IgG: 53/70
Detection 11-13 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 79	IgM: 60/79; IgG: 67/79; IgM/IgG: 71/79
Detection 14-16 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 70	IgM: 55/70; IgG: 63/70; IgM/IgG: 67/70
Detection 17-19 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 47	IgM: 42/47; IgG: 47/47; IgM/IgG: 47/47
Detection 20-22 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 17	IgM: 16/17; IgG: 17/17; IgM/IgG: 17/17
Detection 11-13 days post disease onset	Long et al. (2020)[36]	MCLIA (N and spike)	n = 13	IgM: 12/13; IgG: 13/13; IgM/IgG: 13/13
Other outcomes				
Median time to seroconversion (post symptom onset)	Long et al. (2020)[36]	MCLIA (N and spike)	n = 26	IgM and IgG: 13 days
	Shen et al. (2020)[45]	Colloidal gold (NR)	n = 97	IgM/IgG: 9 days (IQR 5-14.5 days)
	Guo et al. (2020)[27]	ELISA	n = 208	IgM: 5 days (IQR 3 to 6 days); IgA: 5 days (IQR 3 to 6 days); IgG: 14 days (IQR 10 to 18 days)
Peak detection of antibodies	Long et al. (2020)[36]	MCLIA (N and spike)	n = 363 samples	IgM: 94.1% at 20-22 days after onset; IgG: 100% detection at 17-19 days after onset

Table 4. Virus test detection rates from different swab sites within the upper respiratory tract.

Study	**Nasopharyngeal**	**Nasal**	**Oropharyngeal**
Huang et al. (2020)[49]*	n/a	13/16 (81%)	10/16 (62.5%)
Pere et al. (2020)[50]	37/44 (84.1%)	33/44 (75%)	n/a
Wang et al. (2020)[51]	67/353 (18.9%)	n/a	27/353 (7.6%)

n/a: not included in the study

***Methods not clearly described by the authors. Samples described as 'throat swabs' assumed to be oropharyngeal; samples described as 'nasal' assumed to refer specifically to the nasal cavity, but may include swabs of the nasopharynx.**

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