**Supplementary Table 1**. Peer-reviewed clinical performance reports of available antigen tests for the detection of SARS-CoV-2 globally.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Citation** | **Country** | **Antigen assay** | **Reference method** | **Specimen collection**  | **Cohort** | **Reference positive, n** | **Reference negative, n** | **Overall sensitivity**  | **Overall specificity** |
| Int J Infect Dis. 2020 Oct;99:397-402.  | Japan | LUMIPULSE  | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19 | 68 | 255 | 55% | 100% |
| J Clin Microbiol. 2020 Dec 17;59(1):e02338-20.  | USA | Sofia | Veritor | Parallel (N) | Patients with clinical suspicion of COVID-19 | 43 | 318 | 97% | 98% |
| Veritor | RT-PCR | Parallel (NP/OP for RT-PCR; N for Ag) | Patients with clinical suspicion of COVID-19 | 29 | 212 | 76% | 100% |
| MMWR Morb Mortal Wkly Rep. 2021 Jan 22;70(3):100-105.  | USA | BinaxNOW | RT-PCR | Parallel (NP for RT-PCR; NA for RDT) | Patients with clinical suspicion of COVID-19 | 176 | 651 | 64% | 100% |
| Asymptomatic individuals | 123 | 2469 | 36% | 100% |
| PLoS One. 2021 Feb 22;16(2):e0247606 | Serbia | Standard | RT-PCR | Same sample (PNP) | Patients with clinical suspicion of COVID-19 | 43 | 77 | 58% | 100% |
| Travel Med Infect Dis. 2021 Jan-Feb;39:101942.  | Chile | Biocredit | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19 | 79 | 30 | 62% | 100% |
| StrongStep | RT-PCR | Patients with clinical suspicion of COVID-19 | 9 | 10 | 0% | 90% |
| Huaketai | RT-PCR | Patients with clinical suspicion of COVID-19 | 78 | 31 | 17% | 100% |
| Bioeasy | RT-PCR | Patients with clinical suspicion of COVID-19 | 80 | 31 | 85% | 100% |
| Virol J. 2020 Nov 13;17(1):177.  | Thailand | Standard | RT-PCR | Same sample (NP and throat) | Patients with clinical suspicion of COVID-19 | 60 | 394 | 98% | 99% |
| Virol J. 2021 Feb 13;18(1):34.  | Pakistan | Lepu | RT-PCR | Parallel (NP for RTPCR; NP and saliva for Ag) | Patients with confirmed COVID-19 | 100 | NA | NP: 52%, Saliva: 21% | NA |
| J Clin Microbiol. 2020 Jul 23;58(8):e00977-20.  | France | Respi-Strip | RT-PCR | Same sample (NP)  | Patients with clinical suspicion of COVID-19 | 94 | 44 | 50% | 100% |
| J Clin Microbiol. 2020 Aug 24;58(9):e01438-20.  | Japan | Espline  | RT-PCR (7 methods) | Parallel (NP for RTPCR; saliva for Ag) | Hospitalized patients with confirmed COVID-19 | 113 | NA | 12% | NA |
| J Clin Microbiol. 2021 Jan 21;59(2):e02727-20.  | USA | Sofia | RT-PCR | Parallel (NP for RTPCR; N for Ag) | Patients with clinical suspicion of COVID-19 | 61 | 285 | 77% | 99.60% |
| J Clin Microbiol. 2021 Jan 21;59(2):e02589-20.  | France | Panbio -Care) | RT-PCR | Parallel NP Swabs | Patients with clinical suspicion of COVID-19 | 182 | 0 | 79% | NA |
| Asymptomatic individuals | 22 | 137 | 45% | 95% |
| J Clin Virol. 2020 Aug;129:104500.  | Hong Kong | Biocredit  | RT-PCR | Same sample (NPA & TS) | Patients with confirmed COVID-19 | 35 | NA | 34% | NA |
| Same sample (NP & TS) | Patients with confirmed COVID-19 | 35 | NA | 46% | NA |
| Same sample (sputum) | Patients with confirmed COVID-19 | 45 | NA | 11% | NA |
| Same sample (throat) | Patients with confirmed COVID-19 | 45 | NA | 40% | NA |
| J Clin Virol. 2020 Aug;129:104455.  | Belgium | Respi-Strip  | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19 and unknown symptom information | 106 | 42 | 30% | 100% |
| J Clin Virol. 2021 Feb;135:104713.  | Germany | RIDA®QUICK | RT-PCR | Same sample (OP & NP) | No information | 68 | 9 | 78% | 100% |
| J Clin Virol. 2020 Nov;132:104654.  | Italy | Standard | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19  | 109 | 221 | 71% | 100% |
| J Clin Virol. 2020 Dec;133:104659.  | Spain | Panbio | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19  | 60 | 44 | 73% | 100% |
| J Clin Virol. 2021 Jan;134:104712.  | Hong Kong | Panbio | Standard | Same sample (NPS & TS) | Patients with confirmed COVID-19 | 24 | NA | 69% | NA |
| Same sample (NPS) | Patients with confirmed COVID-19 | 24 | NA | 69% | NA |
| Same sample (throat saliva) | Patients with confirmed COVID-19 | 24 | NA | 69% | NA |
| J Clin Virol. 2020 Dec;133:104684.  | Hong Kong | Respi-Strip  | RT-PCR | Sample sample (throat saliva) | Patients with confirmed COVID-19 | 35 | NA | 23% | NA |
| Same sample (NPA & TS) | Patients with confirmed COVID-19 | 35 | NA | 40% | NA |
| Same sample (NP) | Patients with confirmed COVID-19 | 35 | NA | 40% | NA |
| Same sample (NP & TS) | Patients with confirmed COVID-19 | 35 | NA | 31% | NA |
| NADAL  | RT-PCR | Same sample (throat saliva) | Patients with confirmed COVID-19 | 35 | NA | 31% | NA |
| Same sample (NPA & TS) | Patients with confirmed COVID-19 | 35 | NA | 34% | NA |
| Same sample (NP) | Patients with confirmed COVID-19 | 35 | NA | 51% | NA |
| Same sample (NP & TS) | Patients with confirmed COVID-19 | 35 | NA | 34% | NA |
| Standard | RT-PCR | Sample sample (throat saliva) | Patients with confirmed COVID-19 | 35 | NA | 71% | NA |
| Same sample (NPA & TS) | Patients with confirmed COVID-19 | 35 | NA | 60% | NA |
| Same sample (NP) | Patients with confirmed COVID-19 | 35 | NA | 66% | NA |
| Same sample (NP & TS) | Patients with confirmed COVID-19 | 35 | NA | 71% | NA |
| J Infect Chemother. 2021 Feb;27(2):319-322.  | Japan | Espline  | RT-PCR | Same sample (NPS) | Patients with confirmed COVID-19 | 63 | 66 | 40% | 97% |
| J Infect Chemother. 2021 Feb;27(2):384-386.  | Japan | Espline  | RT-PCR | Same sample (saliva) | Hospitalized patients with confirmed COVID-19 | 9 | NA | 79% | NA |
| J Virol Methods. 2021 Feb;288:114024.  | Germany | Roche | RT-PCR | Same sample (NPS) | Hospitalized patients with confirmed COVID-19 | 75 | 75 | 71% | 96% |
| Med Microbiol Immunol. 2021 Feb;210(1):65-72.  | Germany | Standard  | RT-PCR | Same sample (NP or OP) | Patients with clinical suspicion of COVID-19  | 381 | 360 | 45% | 98% |
| Roche | Same sample (NP or OP) | Patients with clinical suspicion of COVID-19 and unknown symptom information | 445 | 386 | 50% | 98% |
| MMWR Morb Mortal Wkly Rep. 2021 Jan 1;69(5152):1642-1647.  | USA | Sofia | RT-PCR | Parallel (NP) | Asymptomatic Individuals | 17 | 854 | 41% | 98% |
| Viruses. 2020 Dec 10;12(12):1420.  | Japan | Standard Q  | RT-PCR | Same sample (various types) | Patients with confirmed COVID-19 | 76 | NA | 34% | NA |
| Espline  | Patients with confirmed COVID-19 | 76 | NA | 36% | NA |
| QuickNavi  | Patients with confirmed COVID-19 | 76 | NA | 20% | NA |
| ImmunoAce  | Patients with confirmed COVID-19 | 76 | NA | 28% | NA |
| J Clin Virol. 2021 Mar 5;137:104785.  | Finland | Sofia | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19  | 158 | 40 | 80% | 100% |
| Standard  | 158 | 40 | 83% | 100% |
| Panbio  | 158 | 40 | 86% | 100% |
| J Clin Virol. 2021 Apr;137:104789. | Norway | Panbio | RT-PCR | Parallel (combined NP and throat) | Patients with clinical suspicion of COVID-19 | 157 | 3741 | 79% | 100% |
| Asymptomatic Individuals | 21 | 55% |
| Individuals with COVID-19 exposure | 38 | 73% |
| J Infect. 2021 Mar;82(3):391-398. | Spain | Panbio | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19 | 140 | 1229 | 71% | 100% |
| Infect Control Hosp Epidemiol. 2021 Jan 25:1-3. | US | BinaxNOW | RT-PCR | Parallel (N) | Patients with clinical suspicion of COVID-19 | 24 | 91 | 83% | 100% |
| Asymptomatic Individuals | 128 | 2096 | 52% | 100% |
| J Med Virol. 2021 May;93(5):3152-3157. | France | COVID-VIRO | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19 & asymptomatic individuals | 121 | 127 | 98% | 100% |
| Lancet Infect Dis. 2021 Mar 25:S1473-3099(21)00132-8. | Cameroon | SD Biosensor | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19 | 198 | 799 | 69% | 94% |
| Asymptomatic Individuals | 89 | 37% |
| J Clin Microbiol. 2021 Feb 23:JCM.00083-21. | US | BinaxNOW | RT-PCR | Parallel (NPA) | Adults with clinical suspicion of COVID-19 | 85 | 270 | 97% | 100% |
| Children with clinical suspicion of COVID-19 | 26 | 65 | 85% | 100% |
| Asymptomatic Adults | 58 | 916 | 70% | 100% |
| Asymptomatic Children | 107 | 722 | 65% | 99% |
| lin Infect Dis. 2020 Dec 26:ciaa1890. | US | BinaxNOW | RT-PCR | Parallel (NPA) | Patients with clinical suspicion of COVID-19 | 130 | 551 | 95% | 100% |
| Asymptomatic Individuals or greater than & days PSO | 102 | 2323 | 81% | 100% |
| J Clin Microbiol. 2021 Jan 28:JCM.03282-20. | US | BinaxNOW | RT-PCR | Parallel (N, self swab)  | Asymptomatic Individuals | 45 | 2593 | 53% | 100% |
| J Infect. 2021 Feb 12:S0163-4453(21)00075-X. | Spain | CLINITEST | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19 | 91 | 87 | 80% | 100% |
| Asymptomatic Individuals | 25 | 67 | 60% | 100% |
| Clin Microbiol Infect. 2021 Jan 6;27(4):636.e1–4. | Spain | Panbio | RT-PCR | Parallel (NP) | Asymptomatic Individuals | 79 | 555 | 48% | 100% |
| J Infect. 2021 Mar;82(3):e14-e16. doi: 10.1016/j.jinf.2020.12.012 | Italy | Standard | RT-PCR | Parallel (NP) | Patients with clinical suspicion of COVID-19 | 17 | 802 | 90% | 98% |
| Asymptomatic Individuals | 27 | 2355 | 50% | 100% |
| J Infect Dis. 2021 Apr 8;223(7):1139-1144. | US | BinaxNOW | RT-PCR | Parallel (NPA) | Patients with clinical suspicion of COVID-19 & asymptomatic individuals | 15 | 856 | 93% | 100% |
| J Clin Med. 2021 Jan 13;10(2):265. doi: 10.3390/jcm10020265. | Belgium | Biotical | RT-PCR | Same sample (NP) | Patients with clinical suspicion of COVID-19 & asymptomatic individuals | 96 | 92 | 67% | 99% |
| Panbio | 68% | 100% |
| Roche | 70% | 97% |
| Coronavirus Ag | 77% | 100% |
| PLoS One. 2021 Apr 5;16(4):e0249710. | US | BinaxNOW | RT-PCR | NPA (antigen) Saliva (RT-PCR) | Patients with clinical suspicion of COVID-19 & asymptomatic individuals | 226 | 548 | 56% | 98% |

N, nasal; NP, nasopharyngeal; OP, oropharyngeal; NPA, anterior nasal; TS, throat sputum. Patients with clinical suspicion of COVID-19 include individuals with symptoms and known exposure – please see publications for more details [1–18], [21–28], [32–40]. See publications for more details on RT-PCR method [1–18], [20], [24], [29–31], [35–40] .

**Supplementary Table 2**. Antigen assay characteristics for the publications cited above.

|  |  |  |  |
| --- | --- | --- | --- |
| **Assay Abbreviation** | **Commercial Name** | **Method** | **Target** |
| BinaxNOW | BinaxNOW COVID-19 Ag Card (Abbott Diagnostics) | Chromatographic Immunoassay (POC) | Nucleocapsid antigen |
| Biocredit | Biocredit One Step SARS-CoV-2 Antigen Test (RapiGen Inc., Anyang-si, Gyeonggi-do, Rep. of Korea) | Chromatographic Immunoassay (POC) | Not specified |
| Bioeasy | Diagnostic Kit for 2019-Novel Coronavirus (2019-nCoV) Ag Test (FIA) (Bioeasy Biotechnology Co., Shenzhen, China) | Fluorescent Immunoassay (POC) | Not specified |
| Coronavirus Ag | Coronavirus Ag Rapid Test Cassette (Healgen Scientific, Houston, TX, USA) | Chromatographic Immunoassay (POC) | Nucleocapsid |
| Espline | Espline SARS-CoV-2 (Fuji Rebio Inc.) | Chromatographic Immunoassay (POC) | Not specified |
| Huaketai | Huaketai New Coronavirus (SARS-CoV-2) N Protein Detection Kit (FIA) (Savant Biotechnology Co., Beijing, China) | Fluorescent Immunoassay (POC) | Nucleocapsid antigen |
| ImmunoAce  | ImmunoAce SARS-CoV-2 (Tauns Laboratories) | Chromatographic Immunoassay (POC) | Not specified |
| Lepu | NSP-RDT (Lepu Medical China); Saliva-RDT (Lepu Medical China) | Chromatographic Immunoassay (POC) | Not specified |
| LUMIPULSE | LUMIPULSE SARS-CoV-2 Ag kit | Chemiluminescent immunoassay (lab-based) | Nucleocapsid antigen |
| NADAL  | NADAL COVID-19 Ag Test (Nal Von Minden GmbH, Germany) | Chromatographic Immunoassay (POC) | Nucleocapsid antigen |
| Panbio | Panbio™ COVID-19 Ag Rapid Test Device (Abbott Point-Of-Care) | Chromatographic Immunoassay (POC) | Nucleocapsid antigen |
| QuickNavi  | QuickNavi -COVID19 Ag (Denka Sieken) | Chromatographic Immunoassay (POC) | Not specified |
| Respi-Strip  | COVID-19 Ag Respi-Strip (Coris BioConcept, Gembloux, Belgium) | Chromatographic Immunoassay (POC) | Not specified |
| RIDA®QUICK | RIDA®QUICK SARS-CoV-2 Antigen (R-Biopharm) | Chromatographic Immunoassay (POC) | Not specified |
| Roche | SARS-CoV-2 Rapid Antigen Test (Roche) | Chromatographic Immunoassay (POC) | Nucleocapsid antigen |
| Sofia | Quidel Sofia SARS FIA (Quidel, San Diego, CA) | Fluorescent Immunoassay (POC) | Nucleocapsid antigen |
| Standard | Standard™ Q COVID-19 Ag kit (SD Biosensor®, Republic of Korea) | Chromatographic Immunoassay (POC) | Not specified |
| StrongStep | StrongStep® COVID-19 Antigen Test (Liming Bio-Products Co., Jiangsu, China) | Chromatographic Immunoassay (POC) | Not specified |
| Veritor | BD Veritor System for Rapid Detection of SARS-CoV-2 (Veritor test) | Chromatographic Digital Immunoassay (POC) | Nucleocapsid antigen |

Note: BinaxNOW and Panbio are similar tests from Abbott Diagnostics, but are marked differently in different countries.

**Supplementary Table 3**. IFCC definition of suggestive symptomatic COVID-19 cases.

|  |  |
| --- | --- |
| **Description** | **Definition** |
| Symptomatic (61) | Individuals with the following symptoms in the past 14 days:* Fever or chills
* Cough
* Shortness of breath or difficulty breathing
* Fatigue
* Muscle or body aches
* Headache
* New loss of taste or smell
* Sore throat
* Congestion or runny nose
* Nausea or vomiting
* Diarrhea
 |

Adapted from: Lippi G, Henry BM, Sanchis-Gomar F, Mattiuzzi C. Searching for a clinically validated definition of “asymptomatic” COVID-19 infection. Int J Clin Pract, 2021. In press.