Assessing the performance of a serological point-of-care test in measuring detectable antibodies against SARS-CoV-2

Peter V. Coyle, Reham Awni El Kahlout, Soha R. Dargham MPH, Hiam Chemaitelly, Mohamed Ali Ben Hadj Kacem, Naema Hassan Abdulla Al-Mawlawi, Imtiaz Gilliani, Nourah Younes, Zaina Al Kanaani, Abdullatif Al Khal, Einas Al Kuwari, Andrew Jeremijenko, Anvar Hassan Kaleeckal, Ali Nizar Latif, Riyazuddin Mohammad Shaik, Hanan F. Abdulrahim, Gheyath K. Nasrallah, Hadi M. Yassine, Mohamed G. Al Kuwari, Hamad Eid Al Romaihi, Patrick Tang, Roberto Bertollini, Mohamed H. Al-Thani, and Laith J. Abu-Raddad

1Hamad Medical Corporation, Doha, Qatar
2Infectious Disease Epidemiology Group, Weill Cornell Medicine-Qatar, Cornell University, Doha, Qatar
3World Health Organization Collaborating Centre for Disease Epidemiology Analytics on HIV/AIDS, Sexually Transmitted Infections, and Viral Hepatitis, Weill Cornell Medicine–Qatar, Cornell University, Qatar Foundation – Education City, Doha, Qatar
4College of Health Sciences, QU Health, Qatar University, Doha, Qatar
5Biomedical Research Center, Qatar University, Doha, Qatar
6Department of Biomedical Science, College of Health Sciences, Member of QU Health, Qatar University, Doha, Qatar
7Primary Health Care Corporation, Doha, Qatar
8Ministry of Public Health, Doha, Qatar
9Department of Pathology, Sidra Medicine, Doha, Qatar
10Department of Population Health Sciences, Weill Cornell Medicine, Cornell University, New York, New York, USA

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*Correspondence:
Dr. Peter V. Coyle, Virology Department, Hamad Medical Corporation, Doha, Qatar. Email: pcoyle@hamad.qa.

Professor Laith J. Abu-Raddad, Infectious Disease Epidemiology Group, Weill Cornell Medicine - Qatar, Qatar Foundation - Education City, P.O. Box 24144, Doha, Qatar. Telephone: +(974) 4492-8321. Fax: +(974) 4492-8333. E-mail: ljia2002@qatar-med.cornell.edu.

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Abstract

Objective: To investigate the performance of a rapid point-of-care antibody test, the BioMedomics COVID-19 IgM/IgG Rapid Test, in comparison with a high-quality, validated, laboratory-based platform, the Roche Elecsys Anti-SARS-CoV-2 assay.

Methods: Serological testing was conducted on 708 individuals. Concordance metrics were estimated. Logistic regression was used to assess associations with seropositivity.

Results: SARS-CoV-2 seroprevalence was 63.4% (449/708; 95% CI 59.8%-66.9%) using the BioMedomics assay and 71.9% (509/708; 95% CI 68.5%-75.1%) using the Elecsys assay. There were 62 discordant results between the two assays. One specimen was seropositive in the BioMedomics assay, but seronegative in the Elecsys assay, while 61 specimens were seropositive in the Elecsys assay, but seronegative in the BioMedomics assay. Positive, negative, and overall percent agreements between the two assays were 88.0% (95% CI 84.9%-90.6%), 99.5% (95% CI 97.2%-99.9%), and 91.2% (95% CI 88.9%-93.1%), respectively, with a Cohen’s kappa of 0.80 (95% CI 0.77-0.83), indicating excellent agreement. Excluding specimens with lower antibody titers, the agreement improved with positive, negative, and overall percent concordance of 91.2% (95% CI 88.2%-93.6%), 99.5% (95% CI 97.2%-99.9%), and 93.9% (95% CI 91.7%-95.5%), respectively, and a Cohen’s kappa of 0.87 (95% CI 0.84-0.89). Logistic regression confirmed better agreement with higher antibody titers.

Conclusion: The BioMedomics COVID-19 IgM/IgG Rapid Test demonstrated excellent performance in measuring detectable antibodies against SARS-CoV-2, supporting the utility of such rapid point-of-care serological testing to guide the public health responses and possible vaccine prioritization.
Introduction

Caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), coronavirus disease 2019 (COVID-19) continues to present a global challenge, causing severe health, social, and economic burdens [1, 2]. Qatar experienced a large SARS-CoV-2 epidemic with a high rate of laboratory-confirmed infections at >60,000 infections per million population (6%) [3-5]. As part of the national response, public health authorities expanded serological testing for SARS-CoV-2 antibodies, for both healthcare and research purposes [6-9]. Moreover, antibody status is being deliberated as one of the criteria for COVID-19 vaccine prioritization [10].

To achieve more efficient, cost-effective, and widescale serological testing, the objective of this study was to investigate the performance of a rapid point-of-care antibody test, the BioMedomics COVID-19 IgM/IgG Rapid Test [11], in comparison with a high-quality, validated, laboratory-based assay, the Roche Elecsys Anti SARS-CoV-2 platform [12, 13], one of the most extensively used and investigated commercial platforms, having a specificity ≥99.8% [14, 15] and a sensitivity ≥89% [3, 12, 15].

Methods

Samples included 708 residual blood serum specimens that were collected and stored between May 30 and November 18, 2020 from individuals receiving routine or other clinical care at Hamad Medical Corporation (HMC), the main provider of healthcare in Qatar, and the nationally-designated provider for COVID-19 healthcare needs.
Serological testing was performed using the Roche Elecsys Anti-SARS-CoV-2 (Roche, Switzerland) assay, a fully-automated electrochemiluminescent immunoassay [13], and the BioMedomics COVID-19 IgM/IgG Rapid Test (BioMedomics, Inc., United States of America), a lateral flow immunochromatographic assay [11].

The Roche Elecsys Anti-SARS-CoV-2 assay (hereafter “Elecsys”) uses a recombinant protein representing the nucleocapsid (N) antigen for determination of antibodies against SARS-CoV-2 [13]. Qualitative anti-SARS-CoV-2 results were generated following the manufacturer’s instructions (reactive for optical density (proxy for antibody titer [15]) cutoff index ≥1.0 vs. non-reactive for cutoff index <1.0) [13].

The BioMedomics COVID-19 IgM/IgG Rapid Test (hereafter “BioMedomics”) is a lateral flow immunoassay that contains a colloidal, gold-labeled, recombinant coronavirus antigen and a quality control antibody colloidal gold marker, two detection lines (IgG and IgM lines), and one quality control line (C) fixed on a nitrocellulose membrane [11]. Qualitative anti-SARS-CoV-2 results were generated by reading the detection line(s) [11].

Results of serological testing were subsequently linked to the national centralized SARS-CoV-2 polymerase chain reaction (PCR) testing and hospitalization database that includes records for all PCR testing and COVID-19 hospitalizations in Qatar since the start of the epidemic [16]. The database also includes the severity classification of hospitalized cases based on individual chart reviews completed by trained medical personnel using the World Health Organization (WHO) criteria [17].

Cross-tabulations of serological testing results were conducted using the Elecsys assay as the reference standard. Concordance metrics were estimated and included the positive, negative, and overall percent agreements. In addition, Cohen’s kappa statistic was estimated to measure the
level of agreement, beyond chance, between the two diagnostic approaches [18]. Ranging between 0 and 1, a kappa statistic <0.40 indicates poor agreement, a value between 0.40 and 0.75 denotes fair/good agreement, and a value >0.75 signifies excellent agreement [18]. Significance was set at 5% and a 95% confidence interval (CI) was estimated for each metric.

Univariable and multivariable logistic regression were conducted to assess associations between seropositivity using the BioMedomics assay and each of the following covariates: PCR Ct value, optical density value of the Elecsys assay result, and severity of infection. Covariates with p-values ≤0.2 in the univariable regression analysis were included in the multivariable model. Covariates with p-values ≤0.05 in the multivariable analysis were regarded as strong evidence for an association with the outcome. Analyses were performed using Microsoft Excel and IBM-SPSS version 26.0.

Research methods were approved by the ethics review boards at Hamad Medical Center (HMC) and Weill Cornell Medicine-Qatar.

**Results**

Seroprevalence of SARS-CoV-2-IgG in this sample was estimated at 63.4% (449/708; 95% CI 59.8%-66.9%) using the BioMedomics assay and at 71.9% (509/708; 95% CI 68.5%-75.1%) using the Elecsys assay. Seroprevalence of SARS-CoV-2-IgM was estimated at 8.5% (60/708; 95% CI 6.6%-10.8%), measured only using the BioMedomics assay. Results of serological testing for each of the 708 participants are tabulated in Table S1 (Supplementary Information).

Among those seropositive in the Elecsys assay, optical density values (antibody titers) ranged between 1.0 and 150.0 with a median of 46.4 (Figure 1). There were 62 discordant results
between the two assays. One specimen was seropositive in the BioMedomics assay, but seronegative in the Elecsys assay (0.1%). This specimen was drawn from a person who had no record of a prior SARS-CoV-2 diagnosis. However, there were 61 specimens seropositive in the Elecsys assay, but seronegative in the BioMedomics assay (8.6%).

The percentage of individuals who had a PCR-confirmed SARS-CoV-2 diagnosis prior to the serological testing was 37.0% (262/708; 95% CI 33.5%-40.6%) (Table S1 of SI). PCR cycle threshold (Ct) values ranged between 12.5 and 38.3 with a median of 21.9. Among those seropositive in the BioMedomics assay, 53.2% (239/449; 95% CI 48.6%-57.8%) had received a prior PCR-positive result. Ct values ranged between 12.5 and 38.3 with a median of 21.8.

Among those seropositive in the Elecsys assay, 51.1% (260/509; 95% CI 46.8%-55.4%) had received a prior PCR-positive result. Ct values ranged between 12.5 and 38.3 with a median of 22.0. Among the 62 discordant specimens, 33.9% (21/62; 95% CI 23.3%-46.3%) had a prior PCR-positive result. Ct values ranged between 13.7 and 36.8 with a median of 22.9.

Among those with a prior PCR-positive result and were seropositive in the Elecsys assay, 91.9% (239/260; 95% CI 88.0%-94.7%) were seropositive in the BioMedomics assay. Two individuals were seronegative in both antibody assays, but had a prior PCR-confirmed SARS-CoV-2 diagnosis (Table S1 of SI). The first individual was diagnosed on May 21, 2020 (Ct value was 35.7), 151 days prior to the blood collection date. With the high Ct value, one cannot exclude the possibility of a PCR false positive result. The second individual was diagnosed on October 19, 2020 (Ct value was 19.7), only one day prior to the blood collection date, and thus the blood was probably drawn too early to detect development of antibodies.

Data on COVID-19 disease severity per the WHO classification [17] (derived from the national COVID-19 hospitalization database [19]) were available for 47 persons: 7 individuals were
classified as mild, 19 were classified as moderate, 14 were classified as severe, and 7 were classified as critical (Table S1 of SI). For all other individuals no severity classification was conducted, due to absence of serious symptoms to require hospitalization and severity assessment, and thus the infection can be assumed to be asymptomatic or mild. No COVID-19 deaths were reported among study participants.

The positive, negative, and overall percent agreements between the two assays were estimated at 88.0% (95% CI 84.9%-90.6%), 99.5% (95% CI 97.2%-99.9%), and 91.2% (95% CI 88.9%-93.1%), respectively (Table 1). Cohen’s kappa statistic was estimated at 0.80 (95% CI 0.77-0.83) indicating excellent agreement between the two assays (Table 1).

Including only specimens with higher antibody titers in the comparison (i.e., excluding specimens with low Elecsys optical density values <10), the positive, negative, and overall percent agreements between the two assays were estimated at 91.2% (95% CI 88.2%-93.6%), 99.5% (95% CI 97.2%-99.9%), and 93.9% (95% CI 91.7%-95.5%), respectively (Table 1). Cohen’s kappa statistic was estimated at 0.87 (95% CI 0.84-0.89) indicating excellent and superior agreement between the two assays compared to the result for the full sample (Table 1). The cutoff at Elecsys optical density value of 10 (to indicate lower antibody titers) was informed by the distribution of the optical density values (Figure 1).

Including only specimens with low antibody titers in the comparison (i.e. excluding specimens with Elecsys optical density values ≥10), positive, negative, and overall percent agreements between the two assays were estimated at 72.4% (95% CI 62.2%-80.7%), 99.5% (95% CI 97.2%-99.9%), and 91.3% (95% CI 87.4%-94.0%), respectively (Table 1). Cohen’s kappa statistic was estimated at 0.78 (95% CI 0.72-0.83) indicating excellent agreement between the
two assays, but still an inferior agreement compared to the result for the subsample of higher antibody titers, and for the full sample (Table 1).

Multivariable logistic regression identified significant associations between seropositivity using the BioMedomics assay and both the Elecsys optical density value and the PCR Ct value or its absence (that is no prior PCR-confirmed infection), but no association with the severity of the infection (Table 2). The adjusted odds ratio (aOR) of seropositivity was 5.06 (95% CI 2.72-9.39, p<0.001) for those with higher antibody titers (Elecsys optical density values ≥10) compared to those with lower antibody titers (Elecsys optical density values <10), reflecting much higher agreement between the two measures for specimens with higher antibody titers. The aOR of seropositivity was 0.00 (95% CI 0.00-0.03, p<0.001) for those with a negative result in the Elecsys assay, indicating a very low likelihood of being negative in the Elecsys assay, but positive in the BioMedomics assay.

The aOR of seropositivity was 0.30 (95% CI 0.11-0.81, p=0.018) for those with a Ct value ≥30 compared to those with a Ct value <30, possibly because of some PCR false positivity measures for those with higher Ct values. The aOR of seropositivity was 0.28 (95% CI 0.14-0.57, p=0.001) for those with no Ct value (that is no prior PCR-confirmed infection), reflecting a low likelihood of having been exposed to the infection if they were never diagnosed with the infection.

Discussion

The above results document excellent performance of the BioMedomics rapid test in measuring detectable antibodies against SARS-CoV-2. An additional benefit is to help identify those with a PCR false positive result. The performance of this point-of-care test was also as expected for a
rapid test: it was optimal when antibody titers were high, but less optimal when they were low. Only one test result could have been a false positive, suggesting very high specificity for this rapid test. The specimen was seronegative in the Elecsys assay and there was no record of a PCR-positive test for this individual.

These findings demonstrate the utility of this assay to assess past SARS-CoV-2 infection and potential seropositivity as a marker of immunity against infection, particularly considering the growing evidence indicating that natural infection elicits strong protection against reinfection that lasts for at least a few months [20-22]. These findings also support the concept of using rapid antibody testing for more efficient, cost-effective, and widescale serological testing to guide vaccine prioritization, or possible issuance of immunity passports.

This study has a limitation. The performance of the rapid assay was compared to a laboratory-based assay, the Roche Elecsys Anti SARS-CoV-2 platform (and to PCR testing), but not to a gold standard test of seropositivity, as such a test was not available. Having so said, the Elecsys assay is one of the most extensively used and investigated commercial platforms, having a specificity ≥99.8% [13-15] and a sensitivity ≥89% [3, 12, 15]. Therefore, it is not likely that this limitation could have affected the findings.

In conclusion, the BioMedomics rapid point-of-care test demonstrated excellent performance in measuring detectable antibodies against SARS-CoV-2, with better performance for specimens with higher antibody titers, demonstrating the utility of such assays in mass expansion of serological testing to guide public health responses and possible vaccine prioritization.
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**Author contributions:** PVC and LJA conceived and designed the study. PVC led the laboratory testing. SRD conducted the statistical analyses and co-wrote the first draft of the manuscript. HC contributed to the statistical analyses. LJA led the data analyses and co-wrote the first draft of the manuscript. All authors contributed to data collection and acquisition, database development, discussions and interpretation of the results, and to the writing of the manuscript. All authors have read and approved the final manuscript.

**Conflicts of interests**

None.

**Data and material availability**

All relevant data are available in the main text and supplementary material.
**Table**

**Table 1.** Concordance metrics between two SARS-CoV-2 antibody assays: the BioMedomics COVID-19 IgM/IgG Rapid Test and the Roche Elecsys Anti-SARS-CoV-2 including A) all negative and positive specimens, B) negative specimens and specimens with higher antibody titers (excluding specimens with Elecsys optical density values <10), and C) negative specimens and specimens with lower antibody titers (excluding specimens with Elecsys optical density values ≥10).

A)

| BioMedomics COVID-19 IgM/IgG Rapid Test | Overall percent agreement | Positive percent agreement | Negative percent agreement | Cohen's kappa statistic |
|-----------------------------------------|---------------------------|---------------------------|---------------------------|------------------------|
| Positive                                | 91.2% (88.9%-93.1%)       | 88.0% (84.9%-90.6%)       | 99.5% (97.2%-99.9%)       | 0.80 (0.77-0.83)       |
| Negative                                |                           |                           |                           |                        |
| Total                                   | 91.2% (88.9%-93.1%)       | 88.0% (84.9%-90.6%)       | 99.5% (97.2%-99.9%)       | 0.80 (0.77-0.83)       |

B)

| BioMedomics COVID-19 IgM/IgG Rapid Test | Overall percent agreement | Positive percent agreement | Negative percent agreement | Cohen's kappa statistic |
|-----------------------------------------|---------------------------|---------------------------|---------------------------|------------------------|
| Positive                                | 93.9% (91.7%-95.5%)       | 91.2% (88.2%-93.6%)       | 99.5% (97.2%-99.9%)       | 0.87 (0.84-0.89)       |
| Negative                                |                           |                           |                           |                        |
| Total                                   | 93.9% (91.7%-95.5%)       | 91.2% (88.2%-93.6%)       | 99.5% (97.2%-99.9%)       | 0.87 (0.84-0.89)       |

C)

| BioMedomics COVID-19 IgM/IgG Rapid Test | Overall percent agreement | Positive percent agreement | Negative percent agreement | Cohen's kappa statistic |
|-----------------------------------------|---------------------------|---------------------------|---------------------------|------------------------|
| Positive                                | 91.3% (87.4%-94.0%)       | 72.4% (62.2%-80.7%)       | 99.5% (97.2%-99.9%)       | 0.78 (0.73-0.83)       |
| Negative                                |                           |                           |                           |                        |
| Total                                   | 91.3% (87.4%-94.0%)       | 72.4% (62.2%-80.7%)       | 99.5% (97.2%-99.9%)       | 0.78 (0.73-0.83)       |
**Table 2.** Results of univariable and multivariable logistic regression, assessing the association between seropositivity using the BioMedomics COVID-19 IgM/IgG Rapid Test and the following covariates: PCR Ct value, optical density from the Elecsys assay, and severity of infection.

|                           | Crude OR (95% CI) | P-value | aOR (95% CI) | P-value |
|---------------------------|-------------------|---------|--------------|---------|
| **PCR cycle threshold (Ct) value** |                   |         |              |         |
| Low Ct value (<30)        | Ref               | Ref     |              |         |
| High Ct value (≥30)       | 0.32 (0.13-0.79)  | 0.013   | 0.30 (0.11-0.81) | 0.018   |
| No PCR/No Ct value        | 0.07 (0.04-0.13)  | <0.001  | 0.28 (0.14-0.57) | 0.001   |
| **Optical density value of the Roche Elecsys Anti SARS-CoV-2 assay** |                   |         |              |         |
| Lower antibody titers (optical density value <10.0) | Ref | Ref |              |         |
| Higher antibody titers (≥10.0) | 3.96 (2.22-7.07)  | <0.001  | 5.06 (2.72-9.39) | <0.001  |
| Negative result (no optical density value) | 0.00 (0.00-0.02)  | <0.001  | 0.00 (0.00-0.03) | <0.001  |
| **Severity**<sup>$</sup> |                   |         |              |         |
| Non-severe (asymptomatic, mild, or moderate infection) | Ref | Ref |              |         |
| Severe (severe or critical infection) | 5.68 (1.31-24.58)  | <0.020  | 1.31 (0.26-6.51) | 0.741   |

OR-odds ratio; aOR-adjusted odds ratio; CI-confidence interval

<sup>$</sup>Severity per WHO classification [17]. For individuals where no severity classification was conducted, due to absence of serious symptoms requiring hospitalization and severity assessment, infection was assumed to be asymptomatic or mild.
Figure

Figure 1. Distribution of optical density (antibody titer) values among 509 specimens that were seropositive in the Roche Elecsys Anti-SARS-CoV-2 test.
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Supplementary Information

Table S1. Characteristics of all specimens tested using the BioMedomics COVID-19 IgM/IgG Rapid Test and the Roche Elecsys Anti SARS-CoV-2 assay.

| Specimen Number a | Date of blood collection | BioMedomics COVID-19 IgM/IgG Rapid Test | Roche Elecsys Anti SARS-CoV-2 IgM/IgG | PCR testing prior to the serological test | Date of first PCR-positive test (if any) | Ct value | Severity |
|-------------------|--------------------------|------------------------------------------|---------------------------------------|------------------------------------------|------------------------------------------|---------|----------|
| 1                 | 13-Oct-20                | Negative Positive                        | 150 Positive                          | 1-May-20                                 | 19.23                                    |         | Severe   |
| 2                 | 30-Sep-20                | Negative Positive                        | 150 Positive                          | 16-Apr-20                                | 19.07                                    |         |          |
| 3                 | 12-Oct-20                | Negative Positive                        | 150 Positive                          | 5-Apr-20                                 | 5-Oct-20                                 |         |          |
| 4                 | 11-Oct-20                | Negative Positive                        | 150 Positive                          |                                          |                                          |         |          |
| 5                 | 15-Oct-20                | Negative Positive                        | 150 Positive                          |                                          |                                          |         |          |
| 6                 | 18-Oct-20                | Negative Positive                        | 150 Positive                          |                                          |                                          |         |          |
| 7                 | 18-Oct-20                | Negative Positive                        | 150 Positive                          |                                          |                                          |         |          |
| 8                 | 18-Oct-20                | Positive Positive                        | 150 Positive                          |                                          |                                          |         |          |
| 9                 | 6-Aug-20                 | Negative Positive                        | 148.8 Positive                       |                                          |                                          |         |          |
| 10                | 13-Oct-20                | Negative Positive                        | 148 Positive                          | 30-May-20                                | 17.38                                    |         |          |
| 11                | 18-Oct-20                | Negative Positive                        | 148 Positive                          |                                          |                                          |         |          |
| 12                | 18-Oct-20                | Negative Positive                        | 148 Positive                          |                                          |                                          |         |          |
| 13                | 18-Oct-20                | Negative Positive                        | 148 Positive                          |                                          |                                          |         |          |
| 14                | 19-Oct-20                | Negative Positive                        | 146 Positive                          |                                          |                                          |         |          |
| 15                | 18-Oct-20                | Negative Positive                        | 145 Positive                          |                                          |                                          |         |          |
| 16                | 15-Oct-20                | Positive Positive                        | 144 Positive                          | 20-May-20                                | 26.38                                    |         | Moderate |
| 17                | 19-Oct-20                | Negative Positive                        | 143 Positive                          | 3-Jul-20                                 | 18.56                                    |         |          |
| 18                | 21-Jul-20                | Negative Positive                        | 143 Positive                          | 2-May-20                                 | 17.93                                    |         |          |
| 19                | 11-Aug-20                | Negative Positive                        | 143 Positive                          |                                          |                                          |         |          |
| 20                | 18-Oct-20                | Negative Positive                        | 143 Positive                          |                                          |                                          |         |          |
| 21                | 19-Oct-20                | Negative Positive                        | 142 Positive                          |                                          |                                          |         |          |
| 22                | 18-Oct-20                | Negative Positive                        | 141 Positive                          | 18-Jun-20                                | 33.52                                    |         |          |
| 23                | 18-Oct-20                | Negative Positive                        | 141 Positive                          | 27-May-20                                | 22.8                                     |         |          |
| 24                | 28-Jul-20                | Negative Positive                        | 140.5 Positive                       |                                          |                                          |         |          |
| 25                | 16-Oct-20                | Negative Negative                       | 140 Positive                          |                                          |                                          |         |          |
| 26                | 18-Oct-20                | Negative Positive                        | 140 Positive                          | 25-Apr-20                                | 15.46                                    |         |          |
| 27                | 26-Jul-20                | Positive Positive                        | 140 Positive                          | 14-May-20                                | 22.14                                    |         |          |
| Date     | Test Date  | Status | Date     | Value |
|----------|------------|--------|----------|-------|
| 18-Oct-20| Negative   | Positive | 27-Jun-20| 24.77 |
| 18-Oct-20| Negative   | Positive | 13-Jul-20| 17.8  |
| 18-Oct-20| Negative   | Positive | 137      |       |
| 18-Oct-20| Negative   | Positive | 137      |       |
| 18-Oct-20| Negative   | Positive | 137      |       |
| 18-Oct-20| Negative   | Positive | 137      |       |
| 19-Oct-20| Negative   | Positive | 137      |       |
| 19-Oct-20| Negative   | Positive | 137      |       |
| 19-Oct-20| Positive   | Positive | 137      |       |
| 25-Aug-20| Negative   | Positive | 136      |       |
| 14-Oct-20| Positive   | Positive | 21-May-20| 18.78 |
| 18-Oct-20| Negative   | Positive | 135      |       |
| 3-Sep-20 | Positive   | Positive | 135      |       |
| 7-Jul-20 | Negative   | Positive | 134      |       |
| 18-Oct-20| Negative   | Positive | 134      |       |
| 18-Oct-20| Negative   | Positive | 134      |       |
| 16-Oct-20| Positive   | Positive | 134      |       |
| 19-Oct-20| Negative   | Positive | 133      |       |
| 19-Oct-20| Negative   | Positive | 133      |       |
| 18-Oct-20| Negative   | Positive | 132      |       |
| 12-Oct-20| Negative   | Positive | 132      |       |
| 22-Jul-20| Negative   | Positive | 131      |       |
| 18-Oct-20| Negative   | Positive | 131      |       |
| 13-Oct-20| Negative   | Positive | 131      |       |
| 19-Oct-20| Negative   | Positive | 130      |       |
| 18-Oct-20| Positive   | Positive | 130      |       |
| 25-Jul-20| Negative   | Positive | 129.2    |       |
| 19-Oct-20| Negative   | Positive | 129      |       |
| 18-Oct-20| Negative   | Positive | 129      |       |
| 13-Oct-20| Negative   | Positive | 129      |       |
| 23-Sep-20| Negative   | Positive | 128      |       |
| 19-Oct-20| Negative   | Positive | 128      |       |
| 19-Oct-20| Negative   | Positive | 128      |       |
| 19-Oct-20| Negative   | Positive | 128      |       |
| 18-Oct-20| Positive   | Positive | 128      |       |
| 18-Oct-20| Negative   | Positive | 127      |       |
| 19-Oct-20| Negative   | Positive | 127      |       |
| 17-Oct-20| Negative   | Positive | 126      |       |
| 18-Oct-20| Negative   | Positive | 126      |       |
| 18-Oct-20| Negative   | Positive | 125      |       |
| 19-Oct-20| Negative   | Positive | 125      |       |
| 17-Oct-20| Negative   | Positive | 125      |       |
| 18-Oct-20| Positive   | Positive | 125      |       |
| 31-Aug-20| Negative   | Positive | 124      |       |
| 18-Oct-20| Negative   | Positive | 10-Aug-20| 16.09 |
| 19-Oct-20| Negative   | Positive | 7-Jun-20 | 21.79 |
| 17-Oct-20| Negative   | Positive | 7-Jun-20 | 21.79 |
| 18-Oct-20| Positive   | Positive | 18-Jun-20| 18.8  |
| 31-Aug-20| Negative   | Positive | 23-Apr-20| 15.56 |
|    |  Date    | Status |  Value |  Date    |  Value |
|----|----------|--------|--------|----------|--------|
| 71 | 18-Oct-20 | Negative | Positive | 124 | Positive |
| 72 | 12-Oct-20 | Negative | Positive | 123 | Positive |
| 73 | 18-Oct-20 | Negative | Positive | 123 | Positive |
| 74 | 18-Oct-20 | Negative | Positive | 123 | Positive |
| 75 | 19-Oct-20 | Positive | Positive | 123 | Positive |
| 76 | 19-Oct-20 | Negative | Positive | 122 | Positive |
| 77 | 18-Oct-20 | Negative | Positive | 122 | Positive |
| 78 | 17-Oct-20 | Negative | Positive | 122 | Positive |
| 79 | 19-Oct-20 | Negative | Positive | 122 | Positive |
| 80 | 31-Aug-20 | Negative | Positive | 121 | Positive |
| 81 | 18-Oct-20 | Negative | Positive | 121 | Positive |
| 82 | 18-Oct-20 | Negative | Positive | 121 | Positive |
| 83 | 13-Oct-20 | Negative | Positive | 120 | Positive |
| 84 | 1-Sep-20 | Negative | Positive | 119 | Positive |
| 85 | 11-Oct-20 | Negative | Positive | 119 | Positive |
| 86 | 18-Oct-20 | Negative | Positive | 119 | Positive |
| 87 | 18-Oct-20 | Negative | Positive | 119 | Positive |
| 88 | 14-Oct-20 | Negative | Positive | 118 | Positive |
| 89 | 19-Oct-20 | Negative | Positive | 118 | Positive |
| 90 | 19-Oct-20 | Negative | Positive | 118 | Positive |
| 91 | 18-Oct-20 | Positive | Positive | 118 | Positive |
| 92 | 19-Aug-20 | Negative | Positive | 117 | Positive |
| 93 | 19-Oct-20 | Negative | Positive | 117 | Positive |
| 94 | 20-Aug-20 | Negative | Positive | 117 | Positive |
| 95 | 19-Oct-20 | Negative | Positive | 117 | Positive |
| 96 | 18-Oct-20 | Positive | Positive | 117 | Positive |
| 97 | 27-Jul-20 | Negative | Positive | 116.6 | Positive |
| 98 | 17-Oct-20 | Negative | Positive | 116 | Positive |
| 99 | 19-Oct-20 | Negative | Positive | 116 | Positive |
|100 | 18-Oct-20 | Negative | Positive | 114 | Positive |
|101 | 18-Oct-20 | Negative | Positive | 114 | Positive |
|102 | 18-Oct-20 | Negative | Positive | 114 | Positive |
|103 | 15-Oct-20 | Negative | Positive | 113 | Positive |
|104 | 18-Oct-20 | Negative | Positive | 113 | Positive |
|105 | 19-Oct-20 | Negative | Positive | 113 | Positive |
|106 | 21-Jul-20 | Positive | Positive | 112 | Positive |
|107 | 18-Oct-20 | Negative | Positive | 111 | Positive |
|108 | 17-Aug-20 | Negative | Positive | 111 | Positive |
|109 | 18-Oct-20 | Negative | Positive | 111 | Positive |
|110 | 18-Oct-20 | Negative | Positive | 111 | Positive |
|111 | 18-Oct-20 | Negative | Positive | 111 | Positive |
|112 | 19-Oct-20 | Negative | Positive | 111 | Positive |
|113 | 12-Oct-20 | Negative | Positive | 111 | Positive |
| Date      | Test Date | State     | Value  | Date       | Value  |
|-----------|-----------|-----------|--------|------------|--------|
| 114       | 19-Oct-20 | Negative  | Positive| 111        | Positive|
| 115       | 19-Oct-20 | Negative  | Negative| 110        | Positive|
| 116       | 19-Oct-20 | Negative  | Positive| 110        | Positive|
| 117       | 16-Oct-20 | Negative  | Positive| 110        | Positive|
| 118       | 12-Oct-20 | Negative  | Positive| 110        | Positive|
| 119       | 10-Sep-20 | Negative  | Negative| 108        | Positive|
| 120       | 13-Oct-20 | Negative  | Positive| 108        | Positive|
| 121       | 23-Sep-20 | Negative  | Positive| 108        | Positive|
| 122       | 12-Oct-20 | Negative  | Positive| 107        | Positive|
| 123       | 16-Oct-20 | Negative  | Positive| 107        | Positive|
| 124       | 21-Jul-20 | Negative  | Positive| 106.7      | Positive|
| 125       | 18-Oct-20 | Negative  | Positive| 106        | Positive|
| 126       | 23-Jul-20 | Negative  | Positive| 106        | Positive|
| 127       | 11-Oct-20 | Negative  | Positive| 106        | Positive|
| 128       | 18-Oct-20 | Positive  | Positive| 106        | Positive|
| 129       | 19-Oct-20 | Negative  | Positive| 105        | Positive|
| 130       | 19-Oct-20 | Negative  | Positive| 105        | Positive|
| 131       | 19-Oct-20 | Negative  | Positive| 104        | Positive|
| 132       | 19-Oct-20 | Negative  | Positive| 104        | Positive|
| 133       | 18-Oct-20 | Negative  | Positive| 104        | Positive|
| 134       | 16-Oct-20 | Negative  | Positive| 104        | Positive|
| 135       | 18-Oct-20 | Negative  | Positive| 104        | Positive|
| 136       | 19-Oct-20 | Positive  | Positive| 104        | Positive|
| 137       | 14-Oct-20 | Positive  | Positive| 104        | Positive|
| 138       | 18-Oct-20 | Positive  | Positive| 104        | Positive|
| 139       | 21-Jul-20 | Negative  | Positive| 103.5      | Positive|
| 140       | 18-Oct-20 | Negative  | Positive| 103        | Positive|
| 141       | 19-Oct-20 | Negative  | Positive| 103        | Positive|
| 142       | 18-Oct-20 | Negative  | Positive| 103        | Positive|
| 143       | 12-Oct-20 | Negative  | Positive| 102        | Positive|
| 144       | 19-Oct-20 | Negative  | Positive| 101        | Positive|
| 145       | 6-Sep-20  | Negative  | Positive| 101        | Positive|
| 146       | 19-Oct-20 | Negative  | Positive| 101        | Positive|
| 147       | 19-Oct-20 | Negative  | Positive| 101        | Positive|
| 148       | 15-Oct-20 | Negative  | Positive| 101        | Positive|
| 149       | 18-Oct-20 | Positive  | Positive| 101        | Positive|
| 150       | 14-Oct-20 | Positive  | Positive| 101        | Positive|
| 151       | 17-Oct-20 | Negative  | Positive| 100        | Positive|
| 152       | 24-Aug-20 | Negative  | Positive| 100        | Positive|
| 153       | 2-Jul-20  | Negative  | Positive| 98.9       | Positive|
| 154       | 16-Jul-20 | Negative  | Positive| 97.8       | Positive|
| 155       | 16-Oct-20 | Negative  | Positive| 97.6       | Positive|
| 156       | 15-Oct-20 | Negative  | Positive| 97.5       | Positive|

Note: The values in parentheses indicate the test results for the corresponding dates.
| Date    | Test Date | Status  | Result | Age | Gender | Days | Illness |
|---------|-----------|---------|--------|-----|--------|------|----------|
| 157     | 18-Oct-20 | Negative| Positive| 97.3| Positive| 9-May-20|18.57    |
| 158     | 15-Oct-20 | Negative| Positive| 96.9| Positive| 28-Mar-20|       |
| 159     | 14-Oct-20 | Negative| Positive| 96.9| Positive| 18-Aug-20|20.17    |
| 160     | 18-Oct-20 | Negative| Positive| 96.6| Positive| 1-Jul-20 |19.86    |
| 161     | 15-Oct-20 | Negative| Positive| 96.3| Positive| 25-May-20|15.64    |
| 162     | 16-Aug-20 | Negative| Positive| 96   | Positive| 4-May-20 |23.89    |
| 163     | 7-Sep-20  | Negative| Positive| 95.4| Positive| 30-May-20|22.79    |
| 164     | 16-Jul-20 | Negative| Positive| 95   | Positive|       |         |
| 165     | 14-Oct-20 | Negative| Positive| 94.7| Positive|       |         |
| 166     | 13-Oct-20 | Negative| Positive| 94.2| Positive|       |         |
| 167     | 15-Oct-20 | Negative| Positive| 94.2| Positive|       |         |
| 168     | 15-Oct-20 | Negative| Positive| 93.9| Positive| 2-May-20|28.85    |
| 169     | 18-Oct-20 | Negative| Positive| 90.8| Positive|       |         |
| 170     | 19-Oct-20 | Negative| Positive| 90.4| Positive|       |         |
| 171     | 10-Oct-20 | Negative| Positive| 92.8| Positive| 30-May-20|25.73    |
| 172     | 10-Oct-20 | Negative| Positive| 91.5| Positive|       |         |
| 173     | 15-Oct-20 | Negative| Positive| 91.3| Positive| 13-Aug-20|31.95    |
| 174     | 20-Aug-20 | Negative| Positive| 87.9| Positive| 8-Jul-20 |18       |
| 175     | 15-Oct-20 | Negative| Positive| 87.7| Positive| 25-Sep-20|29.38    |
| 176     | 11-Oct-20 | Negative| Positive| 87   | Positive| 7-Jul-20 |17.36    |
| 177     | 14-Oct-20 | Negative| Positive| 86.8| Positive| 27-Jul-20|16.18    |
| 178     | 13-Oct-20 | Negative| Positive| 86.2| Positive|       |         |
| 179     | 21-Jul-20 | Negative| Positive| 85.17|Positive| 11-May-20|       |
| 180     | 19-Oct-20 | Negative| Positive| 84.8| Positive| 15-Aug-20|19.63    |
| 181     | 31-Jul-20 | Negative| Positive| 83.4| Positive| 19-Jun-20|15.55    |
| 182     | 14-Oct-20 | Negative| Positive| 83   | Positive|       |         |
| 183     | 13-Oct-20 | Negative| Positive| 83   | Positive|       |         |
| 184     | 2-Jul-20  | Negative| Positive| 82.8| Positive|       |         |
| 185     | 15-Oct-20 | Negative| Positive| 82.1| Positive|       |         |
| 186     | 29-Jun-20 | Negative| Positive| 82   | Positive|       |         |
| 187     | 21-Jul-20 | Negative| Positive| 82.1| Positive|       |         |
| 188     | 20-Sep-20 | Negative| Positive| 79.4| Positive| 21-May-20|19.92    |
| 189     | 12-Oct-20 | Negative| Positive| 79.4| Positive|       |         |
| 190     | 13-Oct-20 | Negative| Positive| 78.5| Positive|       |         |
| 191     | 25-Jul-20 | Negative| Positive| 78.17|Positive|       |         |
| 192     | 12-Oct-20 | Negative| Positive| 78   | Positive|       |         |
| 193     | 12-Oct-20 | Negative| Positive| 75.2| Positive| 19-Apr-20|16.67    |
| 194     | 12-Oct-20 | Negative| Positive| 75.1| Positive| 19-Apr-20|26.54    |

- **Severe**
- **Critical**
- **Mild**
- **Moderate**

Note: The table above represents patient data, including test results, age, gender, illness days, and illness severity levels. The data is based on a preprint by the author/funder who has granted medRxiv a license to display the preprint in perpetuity. All rights reserved. No reuse allowed without permission.
|   | Date     | Test Result | Week  | Date     | Test Result | Week  |
|---|----------|-------------|-------|----------|-------------|-------|
| 200 | 10-Oct-20 | Negative Positive | 73.3  | Positive | 10-Sep-20 | 22.8  |
| 201 | 14-Oct-20 | Negative Positive | 73.2  | Positive | 17-May-20 | 17.76 |
| 202 | 12-Oct-20 | Negative Positive | 73   | Positive | 28-Apr-20 | 21.19 |
| 203 | 18-Oct-20 | Negative Positive | 71.9  | Positive | 13-May-20 | 21.79 |
| 204 | 15-Oct-20 | Negative Positive | 71.5  | Positive | 11-May-20 | 24.92 |
| 205 | 13-Oct-20 | Negative Positive | 70.3  | Positive | 8-Sep-20  | 15.98 |
| 206 | 21-Jul-20 | Negative Positive | 69.58 | Positive | 11-May-20 | 22.87 |
| 207 | 12-Oct-20 | Negative Positive | 69.4  | Positive | 23-Apr-20 | 22.15 |
| 208 | 17-Oct-20 | Negative Positive | 68.93 | Positive | 13-Sep-20 | 19.61 |
| 209 | 12-Oct-20 | Negative Positive | 68.8  | Positive | 4-May-20  | 15.74 |
| 210 | 14-Oct-20 | Negative Positive | 68.7  | Positive | 12-Aug-20 | 33.7  |
| 211 | 26-Jul-20 | Negative Positive | 67.08 | Positive | 11-May-20 | 16.3  |
| 212 | 14-Oct-20 | Negative Positive | 66.7  | Positive | 6-May-20  | 22.63 |
| 213 | 9-Sep-20  | Negative Positive | 66.6  | Positive | 15-Jun-20 | 20.1  |
| 214 | 13-Oct-20 | Negative Positive | 65.4  | Positive | 15-Jun-20 | 20.1  |
| 215 | 21-Jul-20 | Negative Positive | 65.38 | Positive | 15-Jun-20 | 20.1  |
| 216 | 12-Oct-20 | Negative Positive | 64.3  | Positive | 15-Jun-20 | 20.1  |
| 217 | 12-Oct-20 | Negative Positive | 63.4  | Positive | 15-Jun-20 | 20.1  |
| 218 | 18-Oct-20 | Negative Positive | 63.2  | Positive | 25-Jun-20 | 28.39 |
| 219 | 12-Oct-20 | Positive Positive | 63.2  | Positive | 2-Jul-20  | 30.14 |
| 220 | 31-Aug-20 | Positive Positive | 63.13 | Positive | 2-Jul-20  | 30.14 |
| 221 | 15-Oct-20 | Negative Positive | 62.7  | Positive | 2-Jul-20  | 30.14 |
| 222 | 12-Oct-20 | Negative Positive | 62.5  | Positive | 26-Apr-20 | 21.81 |
| 223 | 12-Oct-20 | Negative Positive | 61.9  | Positive | 26-Apr-20 | 21.81 |
| 224 | 12-Oct-20 | Negative Positive | 60.2  | Positive | 26-Apr-20 | 21.81 |
| 225 | 13-Oct-20 | Negative Positive | 59.6  | Positive | 26-Apr-20 | 21.81 |
| 226 | 13-Oct-20 | Negative Positive | 59.1  | Positive | 26-Apr-20 | 21.81 |
| 227 | 12-Oct-20 | Negative Positive | 59    | Positive | 26-Apr-20 | 21.81 |
| 228 | 19-Oct-20 | Negative Positive | 59    | Positive | 26-Apr-20 | 21.81 |
| 229 | 20-Jul-20 | Negative Positive | 56.9  | Positive | 26-Apr-20 | 21.81 |
| 230 | 19-Oct-20 | Negative Positive | 56.8  | Positive | 26-Apr-20 | 21.81 |
| 231 | 10-Oct-20 | Negative Positive | 56.7  | Positive | 26-Apr-20 | 21.81 |
| 232 | 18-Oct-20 | Negative Positive | 56.5  | Positive | 26-Apr-20 | 21.81 |
| 233 | 11-Aug-20 | Negative Positive | 56.4  | Positive | 26-Apr-20 | 21.81 |
| 234 | 12-Oct-20 | Negative Negative | 55.8  | Positive | 26-Apr-20 | 21.81 |
| 235 | 15-Oct-20 | Negative Positive | 55.6  | Positive | 26-Apr-20 | 21.81 |
| 236 | 23-Jul-20 | Negative Positive | 55.43 | Positive | 26-Apr-20 | 21.81 |
| 237 | 12-Oct-20 | Negative Positive | 55.3  | Positive | 9-May-20  | 28.23 |
| 238 | 21-Jul-20 | Negative Positive | 54.82 | Positive | 12-May-20 | 21.1  |
| 239 | 16-Aug-20 | Negative Positive | 53.5  | Positive | 12-May-20 | 21.1  |
| 240 | 19-Oct-20 | Negative Negative | 52.4  | Positive | 12-May-20 | 21.1  |
| 241 | 12-Oct-20 | Negative Negative | 51.3  | Positive | 12-May-20 | 21.1  |
| 242 | 18-Oct-20 | Negative Positive | 51.1  | Positive | 12-May-20 | 21.1  |
| Date     | Result 1   | Result 2   | Date     | Result 1   | Date     | Result 1   |
|----------|------------|------------|----------|------------|----------|------------|
| 3-Sep-20 | Negative   | Positive   | 50.9     | Positive   | 25-Jun-20 | 15.78      |
| 20-Jul-20| Negative   | Positive   | 50.3     | Positive   | 17-Jun-20 | 33.04      |
| 18-Oct-20| Negative   | Positive   | 49.3     | Positive   | 30-Apr-20 | 22.09      |
| 25-Aug-20| Negative   | Positive   | 49.21    | Positive   |          |            |
| 12-Oct-20| Negative   | Positive   | 49.1     | Positive   | 10-May-20 | 30.74      |
| 14-Oct-20| Negative   | Positive   | 49.1     | Positive   | 16-Aug-20 | 17.49      |
| 16-Oct-20| Negative   | Positive   | 48.5     | Positive   |          |            |
| 12-Oct-20| Negative   | Negative   | 48.2     | Positive   | 16-Aug-20 | 27.14      |
| 13-Sep-20| Negative   | Positive   | 47.7     | Positive   | 8-May-20  | 31.93      |
| 30-Aug-20| Negative   | Positive   | 47.6     | Positive   |          |            |
| 17-Oct-20| Positive   | Positive   | 47.4     | Positive   |          |            |
| 18-Oct-20| Negative   | Positive   | 46.4     | Positive   |          |            |
| 25-Jul-20| Negative   | Positive   | 46.24    | Positive   |          |            |
| 18-Oct-20| Negative   | Positive   | 46       | Positive   |          |            |
| 15-Oct-20| Negative   | Positive   | 45.4     | Positive   |          |            |
| 17-Oct-20| Negative   | Positive   | 45.3     | Positive   | 16-Oct-20 | 28.93      |
| 12-Oct-20| Negative   | Positive   | 44.5     | Positive   | 24-May-20 | 22.67      |
| 15-Oct-20| Negative   | Positive   | 43.8     | Positive   | 3-Jun-20  | 27.9       |
| 12-Oct-20| Negative   | Positive   | 43.7     | Positive   |          |            |
| 16-Oct-20| Negative   | Positive   | 43.4     | Positive   |          |            |
| 23-Jul-20| Negative   | Positive   | 43       | Positive   | 28-May-20 | 26.06      |
| 22-Jun-20| Negative   | Positive   | 42.8     | Positive   |          |            |
| 12-Oct-20| Negative   | Positive   | 42.6     | Positive   | 20-Jul-20 | 36.28      |
| 15-Oct-20| Negative   | Positive   | 42.5     | Positive   |          |            |
| 15-Oct-20| Positive   | Positive   | 42.4     | Positive   | 8-Aug-20  | 22.91      |
| 15-Oct-20| Negative   | Positive   | 41.8     | Positive   |          |            |
| 17-Oct-20| Negative   | Positive   | 41.7     | Positive   | 11-May-20 | 33.42      |
| 25-Jul-20| Negative   | Positive   | 40.07    | Positive   |          |            |
| 9-Jun-20 | Positive   | Positive   | 39.96    | Positive   |          |            |
| 16-Oct-20| Negative   | Positive   | 39.5     | Positive   | 6-Aug-20  | 24.09      |
| 15-Oct-20| Negative   | Positive   | 39.4     | Positive   |          |            |
| 14-Oct-20| Negative   | Positive   | 38.7     | Positive   | 11-May-20 | 33.42      |
| 20-Aug-20| Positive   | Positive   | 38.4     | Positive   | 30-May-20 | 22.87      |
| 15-Oct-20| Negative   | Positive   | 37.8     | Positive   | 9-May-20  | 16.83      |
| 15-Oct-20| Negative   | Positive   | 37.5     | Positive   | 30-Jul-20 | 33.92      |
| 15-Oct-20| Negative   | Positive   | 36.5     | Positive   |          |            |
| 15-Oct-20| Negative   | Positive   | 35.2     | Positive   |          |            |
| 14-Jul-20| Negative   | Positive   | 35.1     | Positive   | 7-Jul-20  | 25.32      |
| 15-Oct-20| Negative   | Positive   | 34.8     | Positive   | 14-Jul-20 | 33.1       |
| 15-Oct-20| Negative   | Positive   | 34.8     | Positive   | 22-May-20 | 21.06      |
| Date       | Test Date | Test Result | Score | Outcomes |
|------------|-----------|-------------|-------|----------|
| 23-Jul-20  | Negative  | Positive    | 33.66 | Positive |
| 19-Oct-20  | Negative  | Positive    | 33.3  | Positive |
| 12-Oct-20  | Negative  | Positive    | 32.7  | Positive |
| 23-Sep-20  | Negative  | Positive    | 32.5  | Positive |
| 16-Jul-20  | Negative  | Positive    | 32.3  | Positive |
| 14-Oct-20  | Negative  | Positive    | 31.9  | Positive |
| 26-Jul-20  | Negative  | Positive    | 31.63 | Positive |
| 9-Jul-20   | Negative  | Positive    | 30.8  | Positive |
| 21-Jul-20  | Negative  | Positive    | 30.75 | Positive |
| 6-Jul-20   | Negative  | Positive    | 30.7  | Positive |
| 12-Oct-20  | Negative  | Positive    | 30.3  | Positive |
| 12-Oct-20  | Negative  | Positive    | 30.2  | Positive |
| 10-Aug-20  | Negative  | Positive    | 29.9  | Positive |
| 2-Jun-20   | Positive  | Positive    | 29.15 | Positive |
| 17-Oct-20  | Negative  | Positive    | 29    | Positive |
| 15-Oct-20  | Negative  | Negative    | 27.9  | Positive |
| 17-Oct-20  | Negative  | Positive    | 27.5  | Positive |
| 6-Sep-20   | Negative  | Positive    | 27.2  | Positive |
| 19-Oct-20  | Negative  | Positive    | 27.2  | Positive |
| 18-Oct-20  | Positive  | Positive    | 27.2  | Positive |
| 13-Oct-20  | Negative  | Positive    | 27.1  | Positive |
| 16-Oct-20  | Negative  | Positive    | 26.9  | Positive |
| 12-Oct-20  | Negative  | Positive    | 26.2  | Positive |
| 26-Aug-20  | Negative  | Positive    | 26.1  | Positive |
| 14-Oct-20  | Negative  | Positive    | 25.7  | Positive |
| 15-Oct-20  | Negative  | Positive    | 25.4  | Positive |
| 18-Oct-20  | Negative  | Negative    | 25.1  | Positive |
| 16-Jul-20  | Negative  | Negative    | 24.9  | Positive |
| 12-Oct-20  | Negative  | Positive    | 24.6  | Positive |
| 19-Oct-20  | Negative  | Positive    | 24.5  | Positive |
| 15-Oct-20  | Negative  | Positive    | 23.6  | Positive |
| 14-Oct-20  | Negative  | Positive    | 23    | Positive |
| 5-Aug-20   | Negative  | Positive    | 22.6  | Positive |
| 15-Oct-20  | Negative  | Positive    | 22.1  | Positive |
| 19-Oct-20  | Negative  | Positive    | 22    | Positive |
| 22-Jul-20  | Negative  | Positive    | 21.47 | Positive |
| 14-Oct-20  | Negative  | Negative    | 21.2  | Positive |
| 14-Oct-20  | Positive  | Positive    | 20.6  | Positive |
| 18-Aug-20  | Negative  | Negative    | 20.3  | Positive |
| 21-Jul-20  | Negative  | Negative    | 19.94 | Positive |
| 10-Jul-20  | Positive  | Positive    | 19.8  | Positive |
| 16-Oct-20  | Positive  | Positive    | 19.6  | Positive |
| 7-Jul-20   | Negative  | Positive    | 19.4  | Positive |

Outcomes: Critical, Moderate, Severe
| Date       | Test Date  | Test Result 1 | Test Result 2 | Test Result 3 | Date       | Test Result 4 | Test Result 5 | Test Result 6 |
|------------|------------|---------------|---------------|---------------|------------|---------------|---------------|---------------|
| 16-Oct-20  | Positive   | Negative      | 19.4          | Positive      | 1-May-20   | 36.79         | Moderate      |               |
| 18-Oct-20  | Negative   | Negative      | 19.3          | Positive      | 29-Aug-20  | 21.96         |               |               |
| 17-Oct-20  | Positive   | Positive      | 19.14         | Positive      | 27-May-20  | 22.39         |               |               |
| 14-Oct-20  | Positive   | Positive      | 18.5          | Positive      | 11-May-20  | 15.94         |               |               |
| 17-Oct-20  | Negative   | Positive      | 18.3          | Positive      | 3-Sep-20   | 27.53         |               |               |
| 19-Oct-20  | Negative   | Negative      | 18            | Positive      | 2-Jul-20   | 17.98         |               |               |
| 18-Oct-20  | Negative   | Positive      | 17.8          | Positive      | 2-May-20   | 18.25         |               |               |
| 27-Jul-20  | Positive   | Negative      | 17.59         | Positive      | 27-Sep-20  | 19.9          |               |               |
| 15-Oct-20  | Negative   | Positive      | 17.5          | Positive      | 5-Apr-20   | 19.9          |               |               |
| 19-Oct-20  | Negative   | Positive      | 17.3          | Positive      | 26-May-20  | 21.58         |               |               |
| 15-Oct-20  | Negative   | Positive      | 17            | Positive      | 6-May-20   | 33.66         |               |               |
| 12-Oct-20  | Negative   | Negative      | 16.9          | Positive      | 18-Jun-20  | 19.76         |               |               |
| 18-Oct-20  | Negative   | Positive      | 16.8          | Positive      | 21-May-20  | 16.53         |               |               |
| 17-Oct-20  | Positive   | Positive      | 16.7          | Positive      | 7-Jun-20   | 26.25         |               |               |
| 19-Oct-20  | Negative   | Positive      | 16.3          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 13-Oct-20  | Negative   | Positive      | 16.1          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 15-Oct-20  | Negative   | Positive      | 16.1          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 15-Oct-20  | Negative   | Positive      | 16            | Positive      | 3-Jun-20   | 26.25         |               |               |
| 11-Oct-20  | Negative   | Positive      | 15.8          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 18-Oct-20  | Negative   | Positive      | 15.6          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 19-Oct-20  | Negative   | Positive      | 15.39         | Positive      | 3-Jun-20   | 26.25         |               |               |
| 18-Oct-20  | Negative   | Positive      | 15.2          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 18-Oct-20  | Positive   | Positive      | 15.1          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 15-Oct-20  | Positive   | Positive      | 14.9          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 26-Jul-20  | Negative   | Positive      | 14.7          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 15-Oct-20  | Negative   | Positive      | 14.6          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 18-Oct-20  | Negative   | Positive      | 14.6          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 15-Oct-20  | Negative   | Positive      | 14.5          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 9-Sep-20   | Negative   | Negative      | 14.4          | Positive      | 3-Jun-20   | 26.25         |               |               |
| 18-Oct-20  | Positive   | Positive      | 14.4          | Positive      | 9-Oct-20   | 20.75         | Severe        |               |
| 19-Oct-20  | Negative   | Positive      | 14.3          | Positive      | 23-Apr-20  | 24.38         |               |               |
| 18-Oct-20  | Negative   | Positive      | 14.3          | Positive      | 23-Oct-20  | 24.38         |               |               |
| 18-Oct-20  | Negative   | Positive      | 14.3          | Positive      | 23-Oct-20  | 24.38         |               |               |
| 19-Oct-20  | Negative   | Positive      | 14.3          | Positive      | 23-Oct-20  | 24.38         |               |               |
| 19-Oct-20  | Negative   | Positive      | 14.2          | Positive      | 23-Oct-20  | 24.38         |               |               |
| 22-Jul-20  | Negative   | Positive      | 14.11         | Positive      | 8-May-20   | 24.15         |               |               |
| 12-Oct-20  | Negative   | Negative      | 14.1          | Positive      | 8-May-20   | 24.15         |               |               |
| 17-Jun-20  | Negative   | Positive      | 14.1          | Positive      | 8-May-20   | 24.15         |               |               |
| 19-Oct-20  | Negative   | Positive      | 13.9          | Positive      | 5-Jun-20   | 23.94         |               |               |
| 22-Jul-20  | Negative   | Positive      | 13.9          | Positive      | 28-Apr-20  | 28.63         |               |               |
| Date       | Outcome | Test Result | Temperature | Date       | Outcome | Test Result | Temperature |
|------------|---------|-------------|-------------|------------|---------|-------------|-------------|
| 19-Oct-20  | Negative| Positive    | 13.9        | 10-Jul-20  | Positive| Positive    | 19.4        |
| 20-Jul-20  | Negative| Positive    | 13.8        | 12-Oct-20  | Positive| Positive    | 24.38       |
| 18-Oct-20  | Negative| Negative    | 13.6        | 1-Jul-20   | Positive| Positive    | 15.8        |
| 19-Oct-20  | Negative| Positive    | 13.5        | 5-May-20   | Positive| Positive    | 21.81       |
| 17-Oct-20  | Negative| Positive    | 13.4        | 18-Oct-20  | Negative| Positive    | 13.4        |
| 15-Oct-20  | Negative| Positive    | 13.4        | 12-Oct-20  | Positive| Positive    | 23.82       |
| 19-Oct-20  | Negative| Positive    | 13.3        | 19-Oct-20  | Positive| Positive    | 30.72       |
| 19-Oct-20  | Negative| Positive    | 13.2        | 19-Oct-20  | Negative| Positive    | 13.1        |
| 18-Oct-20  | Negative| Positive    | 13.1        | 18-Oct-20  | Negative| Positive    | 13          |
| 17-Oct-20  | Negative| Positive    | 12.9        | 4-Oct-20   | Positive| Positive    | 15.44       |
| 15-Oct-20  | Negative| Positive    | 12.9        | 18-Aug-20  | Positive| Positive    | 29.98       |
| 19-Oct-20  | Negative| Positive    | 12.9        | 12-Oct-20  | Positive| Positive    | 12.7        |
| 19-Oct-20  | Negative| Positive    | 12.6        | 16-Oct-20  | Negative| Negative    | 12.6        |
| 19-Oct-20  | Negative| Positive    | 12.6        | 19-Oct-20  | Negative| Positive    | 12.6        |
| 18-Oct-20  | Negative| Positive    | 12.6        | 18-Oct-20  | Negative| Positive    | 12.5        |
| 19-Oct-20  | Negative| Positive    | 12.5        | 4-Jul-20   | Positive| Positive    | 17.87       |
| 19-Oct-20  | Negative| Positive    | 12.5        | 19-Oct-20  | Negative| Positive    | 12.4        |
| 19-Oct-20  | Negative| Positive    | 12.3        | 2-Oct-20   | Positive| Positive    | 17.72       |
| 15-Oct-20  | Negative| Negative    | 12.3        | 28-Sep-20  | Negative| Positive    | 12.3        |
| 15-Oct-20  | Negative| Negative    | 12.2        | 9-Sep-20   | Positive| Positive    | 20.95       |
| 11-Oct-20  | Negative| Positive    | 12.2        | 15-Oct-20  | Negative| Negative    | 12.2        |
| 17-Oct-20  | Negative| Negative    | 12.13       | 11-Oct-20  | Negative| Positive    | 12.2        |
| 15-Oct-20  | Negative| Positive    | 12           | 19-Oct-20  | Negative| Positive    | 11.7        |
| 19-Oct-20  | Negative| Positive    | 11.7         | 19-Oct-20  | Negative| Positive    | 11.6        |
| 19-Oct-20  | Negative| Positive    | 11.4         | 19-Oct-20  | Negative| Positive    | 11.3        |
| 12-Oct-20  | Negative| Negative    | 11.3         | 14-Oct-20  | Negative| Positive    | 11.3        |
| 19-Oct-20  | Negative| Negative    | 11.2         | 19-Oct-20  | Negative| Positive    | 10.9        |
| 18-Oct-20  | Negative| Negative    | 10.9         | 18-Oct-20  | Positive| Positive    | 10.9        |
| 15-Oct-20  | Positive| Positive    | 10.9         | 15-Oct-20  | Positive| Positive    | 10.8        |
| 13-Oct-20  | Negative| Negative    | 10.8         | 13-Oct-20  | Negative| Positive    | 10.8        |

Moderate: 4-Oct-20
Severe: 29-Apr-20
| ID  | Date     | Test Result 1 | Value 1 | Test Result 2 | Value 2 | Test Date | Value 3 |
|-----|----------|---------------|---------|---------------|---------|-----------|---------|
| 415 | 19-Oct-20| Negative      | 10.8    | Positive      | 2-Jun-20|           |         |
| 416 | 19-Oct-20| Negative      | 10.8    | Positive      | 2-Jun-20|           |         |
| 417 | 12-Oct-20| Negative      | 10.3    | Positive      | 2-Jun-20|           |         |
| 418 | 19-Oct-20| Negative      | 10.3    | Positive      | 2-Jun-20|           |         |
| 419 | 19-Oct-20| Negative      | 10.2    | Positive      | 2-Jun-20|           |         |
| 420 | 16-Oct-20| Negative      | 10.1    | Positive      | 2-Jun-20|           |         |
| 421 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 422 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 423 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 424 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 425 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 426 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 427 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 428 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 429 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 430 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 431 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 432 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 433 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 434 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 435 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 436 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 437 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 438 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 439 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 440 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 441 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 442 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 443 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 444 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 445 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 446 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 447 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 448 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 449 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 450 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 451 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 452 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 453 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 454 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 455 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 456 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| 457 | 8-Sep-20  | Positive      | 10.1    | Positive      | 2-Jun-20|           |         |
| Date       | Month | Status  | C19 Positivity | Date       | Month | C19 Positivity |
|------------|-------|---------|----------------|------------|-------|----------------|
| 10-Oct-20  | Sep   | Negative| Negative       | 4.94       | Positive| 21-Sep-20      | 28.08    |
| 13-Oct-20  | Oct   | Negative| Positive       | 4.9        | Positive| 6-May-20       | 20.53    |
| 17-Oct-20  | Oct   | Negative| Positive       | 4.84       | Positive| 5-Oct-20       | 17.48    |
| 10-Oct-20  | Oct   | Positive | Positive       | 4.83       | Positive| 22-Sep-20      | 29.53    |
| 12-Oct-20  | Oct   | Negative | Positive       | 4.78       | Positive|                |          |
| 17-Oct-20  | Oct   | Negative | Negative       | 4.7        | Positive| 13-Oct-20      | 19.41    |
| 16-Oct-20  | Oct   | Positive | Positive       | 4.55       | Positive| 30-Sep-20      | 32.58    |
| 15-Oct-20  | Oct   | Negative | Negative       | 4.47       | Positive|                |          |
| 17-Oct-20  | Oct   | Negative | Negative       | 4.36       | Positive|                |          |
| 17-Oct-20  | Oct   | Negative | Negative       | 4.29       | Positive| 12-Oct-20      | 23.26    |
| 17-Oct-20  | Oct   | Negative | Positive       | 4.16       | Positive| 16-Oct-20      | 35.71    |
| 17-Oct-20  | Oct   | Negative | Positive       | 4.14       | Positive| 14-Jun-20      | 16.94    |
| 10-Oct-20  | Oct   | Negative | Positive       | 4.1        | Positive|                |          |
| 16-Oct-20  | Oct   | Negative | Positive       | 3.94       | Positive| 15-Oct-20      | 29       |
| 17-Oct-20  | Oct   | Negative | Positive       | 3.92       | Positive|                |          |
| 17-Oct-20  | Oct   | Positive | Positive       | 3.63       | Positive| 15-Oct-20      | 26.61    |
| 13-Oct-20  | Oct   | Negative | Positive       | 3.6        | Positive| 28-Apr-20      | 15.24    |
| 14-Oct-20  | Oct   | Negative | Positive       | 3.5        | Positive| 18-Aug-20      | 12.5     |
| 19-Oct-20  | Oct   | Negative | Positive       | 3.32       | Positive| 25-Jun-20      | 21.62    |
| 10-Oct-20  | Oct   | Negative | Negative       | 3.16       | Positive| 23-Sep-20      | 19.1     |
| 18-Oct-20  | Oct   | Negative | Positive       | 3.15       | Positive|                |          |
| 24-Jun-20  | Jun   | Negative | Positive       | 3.15       | Positive| 24-Jun-20      | 32.5     |
| 16-Oct-20  | Oct   | Negative | Negative       | 3.14       | Positive|                |          |
| 22-Jul-20  | Jul   | Negative | Positive       | 3          | Positive| 20-Jul-20      | 23.21    |
| 8-Sep-20   | Sep   | Negative | Positive       | 2.97       | Positive| 3-Sep-20       | 30.41    |
| 13-Oct-20  | Oct   | Negative | Negative       | 2.95       | Positive| 28-Apr-20      | 17.55    |
| 16-Oct-20  | Oct   | Negative | Positive       | 2.62       | Positive| 20-Sep-20      | 15.9     |
| 15-Oct-20  | Oct   | Negative | Positive       | 2.59       | Positive| 11-Oct-20      | 18.55    |
| 19-Oct-20  | Oct   | Negative | Positive       | 2.45       | Positive|                |          |
| 15-Oct-20  | Oct   | Negative | Positive       | 2.42       | Positive| 6-Oct-20       | 15.29    |
| 17-Oct-20  | Oct   | Positive | Positive       | 2.39       | Positive|                |          |
| 15-Oct-20  | Oct   | Negative | Positive       | 2.23       | Positive|                |          |
| 16-Oct-20  | Oct   | Negative | Positive       | 2.2        | Positive| 5-Oct-20       | 23.7     |
| 15-Oct-20  | Oct   | Negative | Positive       | 2.18       | Positive|                |          |
| 8-Sep-20   | Sep   | Negative | Positive       | 2.1        | Positive| 3-Sep-20       | 30.04    |
| 15-Oct-20  | Oct   | Negative | Negative       | 2.01       | Positive|                |          |
| 17-Aug-20  | Aug   | Negative | Positive       | 1.87       | Positive| 29-Jul-20      | 28.09    |
| 18-Oct-20  | Oct   | Negative | Negative       | 1.86       | Positive| 13-Oct-20      | 15.64    |
| 4-Sep-20   | Sep   | Negative | Positive       | 1.82       | Positive| 31-Aug-20      | 28.92    |
| 16-Oct-20  | Oct   | Negative | Negative       | 1.66       | Positive|                |          |
| 12-Oct-20  | Oct   | Negative | Negative       | 1.63       | Positive|                |          |
| 19-Oct-20  | Oct   | Negative | Positive       | 1.57       | Positive| 9-Aug-20       | 20.25    |
| 18-Oct-20  | Oct   | Negative | Positive       | 1.54       | Positive| 29-Sep-20      | 22.78    |
| Date       | Test Date | Result 1 | Result 2 | Result 3 | Result 4 | Result 5 | Result 6 | Result 7 | Result 8 | Result 9 | Result 10 |
|------------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| 29-Jun-20  | 29-Jun-20 | Negative | Positive | 1.49     | Positive | 1-Jul-20 | 28.65    | Mild     |          |          |           |
| 16-Oct-20  | 16-Oct-20 | Positive | Positive | 1.49     | Positive | 16-Oct-20| 21.72    | Severe   |          |          |           |
| 16-Oct-20  | 16-Oct-20 | Negative | Negative | 1.47     | Positive |          |          |          |          |          |           |
| 18-Oct-20  | 18-Oct-20 | Negative | Negative | 1.45     | Positive |          |          |          |          |          |           |
| 16-Oct-20  | 16-Oct-20 | Positive | Positive | 1.42     | Positive | 14-Oct-20| 28.76    | Moderate  |          |          |           |
| 10-Oct-20  | 10-Oct-20 | Negative | Positive | 1.18     | Positive | 19-Sep-20| 17.55    |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 1.1      | Positive | 28-Oct-20| 22.94    |          |          |          |           |
| 10-Oct-20  | 10-Oct-20 | Negative | Negative | 1.01     | Positive |          |          |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.12     | Negative | 19-Oct-20| 19.69    |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.11     | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 15-Oct-20  | 15-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 29-Oct-20  | 29-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 26-Oct-20  | 26-Oct-20 | Negative | Negative | 0.1      | Negative |          |          |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.09     | Negative | 4-Nov-20 | 19       |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.09     | Negative | 21-May-20| 35.73    |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 21-Oct-20  | 21-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 21-Oct-20  | 21-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 4-Nov-20   | 4-Nov-20  | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 21-Oct-20  | 21-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 19-Oct-20  | 19-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| 20-Oct-20  | 20-Oct-20 | Negative | Negative | 0.09     | Negative |          |          |          |          |          |           |
| Date    | Test Result | Value | Result |
|---------|-------------|-------|--------|
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 20-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 20-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| 19-Oct-20 | Negative    | 0.09  | Negative  |
| 21-Oct-20 | Negative    | 0.09  | Negative  |
| ID | Date     | Status     | Value 1 | Status 2 |
|----|----------|------------|---------|----------|
| 587| 19-Oct-20| Negative   | 0.09    | Negative |
| 588| 19-Oct-20| Negative   | 0.09    | Negative |
| 589| 19-Oct-20| Negative   | 0.09    | Negative |
| 590| 19-Oct-20| Negative   | 0.09    | Negative |
| 591| 19-Oct-20| Negative   | 0.09    | Negative |
| 592| 21-Oct-20| Negative   | 0.09    | Negative |
| 593| 21-Oct-20| Negative   | 0.09    | Negative |
| 594| 19-Oct-20| Negative   | 0.09    | Negative |
| 595| 19-Oct-20| Negative   | 0.09    | Negative |
| 596| 21-Oct-20| Negative   | 0.09    | Negative |
| 597| 20-Oct-20| Negative   | 0.09    | Negative |
| 598| 21-Oct-20| Negative   | 0.09    | Negative |
| 599| 21-Oct-20| Negative   | 0.09    | Negative |
| 600| 21-Oct-20| Negative   | 0.09    | Negative |
| 601| 19-Oct-20| Negative   | 0.09    | Negative |
| 602| 21-Oct-20| Negative   | 0.09    | Negative |
| 603| 19-Oct-20| Negative   | 0.09    | Negative |
| 604| 19-Oct-20| Negative   | 0.09    | Negative |
| 605| 19-Oct-20| Negative   | 0.09    | Negative |
| 606| 19-Oct-20| Negative   | 0.09    | Negative |
| 607| 20-Oct-20| Negative   | 0.09    | Negative |
| 608| 21-Oct-20| Negative   | 0.09    | Negative |
| 609| 19-Oct-20| Negative   | 0.09    | Negative |
| 610| 21-Oct-20| Negative   | 0.09    | Negative |
| 611| 21-Oct-20| Negative   | 0.09    | Negative |
| 612| 20-Oct-20| Negative   | 0.09    | Negative |
| 613| 21-Oct-20| Negative   | 0.09    | Negative |
| 614| 21-Oct-20| Negative   | 0.09    | Negative |
| 615| 19-Oct-20| Negative   | 0.09    | Negative |
| 616| 21-Oct-20| Negative   | 0.09    | Negative |
| 617| 20-Oct-20| Negative   | 0.09    | Negative |
| 618| 21-Oct-20| Negative   | 0.09    | Negative |
| 619| 19-Oct-20| Negative   | 0.09    | Negative |
| 620| 21-Oct-20| Negative   | 0.09    | Negative |
| 621| 21-Oct-20| Negative   | 0.09    | Negative |
| 622| 19-Oct-20| Negative   | 0.09    | Negative |
| 623| 21-Oct-20| Negative   | 0.09    | Negative |
| 624| 19-Oct-20| Negative   | 0.09    | Negative |
| 625| 19-Oct-20| Negative   | 0.09    | Negative |
| 626| 19-Oct-20| Negative   | 0.09    | Negative |
| 627| 19-Oct-20| Negative   | 0.09    | Negative |
| 628| 19-Oct-20| Negative   | 0.09    | Negative |
| 629| 19-Oct-20| Negative   | 0.09    | Negative |
|日期     | 样本日期 | 测试日期 | 结果  | 0.09 | 结果  |
|--------|--------|--------|------|------|------|
|630     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|631     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|632     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|633     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|634     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|635     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|636     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|637     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|638     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|639     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|640     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|641     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|642     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|643     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|644     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|645     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|646     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|647     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|648     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|649     | 25-Oct-20 | Negative | Negative | 0.09 | Negative |
|650     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|651     | 15-Nov-20 | Negative | Negative | 0.09 | Negative |
|652     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|653     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|654     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|655     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|656     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|657     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|658     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|659     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|660     | 21-Oct-20 | Negative | Negative | 0.09 | Negative |
|661     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|662     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|663     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|664     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|665     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|666     | 19-Oct-20 | Negative | Negative | 0.09 | Negative |
|667     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|668     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|669     | 20-Oct-20 | Negative | Negative | 0.09 | Negative |
|670     | 9-Nov-20  | Negative | Negative | 0.09 | Negative |
|671     | 4-Nov-20  | Negative | Negative | 0.09 | Negative |
|672     | 6-Nov-20  | Negative | Negative | 0.09 | Negative |
| Specimen number | Ordered by symptoms to require hospitalization and severity assessment. |
|-----------------|---------------------------------------------------------------------|
| 15-Nov-20       | Negative Negative 0.09 Negative                                      |
| 27-Oct-20       | Negative Negative 0.08 Negative                                      |
| 18-Nov-20       | Negative Negative 0.08 Negative                                      |
| 29-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 19-Oct-20       | Negative Negative 0.08 Negative                                      |
| 19-Oct-20       | Negative Negative 0.08 Negative                                      |
| 20-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Negative Negative 0.08 Negative                                      |
| 21-Oct-20       | Positive Positive 0.08 Negative                                      |

Ct - cycle threshold; N/R - not reported; N/A - not applicable; PCR - polymerase chain reaction.

*BioMedomics COVID-19 IgM/IgG Rapid Test assay results were generated by reading the marked red detection line(s) [1].

**Roche Elecsys Anti SARS-CoV-2 assay results were generated using reactive for optical density cutoff index \( \geq 1.0 \) vs. non-reactive for cutoff index <1.0 [2].

*Specimen number ordered by descending optical density value (antibody titers) of the Roche Elecsys Anti SARS-CoV-2 assay.

*Severity per WHO classification [3]. If N/A, no severity classification was conducted due to absence of serious symptoms to require hospitalization and severity assessment.
References

1. BioMedomics I. COVID-19 IgM/IgG Rapid Test. 2020. [November 1, 2020]. Available from: https://www.biomedomics.com/products/infectious-disease/covid-19-rt/

2. The Roche Group. Roche’s COVID-19 antibody test receives FDA Emergency Use Authorization and is available in markets accepting the CE mark. 2020. [June 5, 2020]. Available from: https://www.roche.com/media/releases/med-cor-2020-05-03.htm.

3. World Health Organization. Clinical management of COVID-19. Available from: https://www.who.int/publications-detail/clinical-management-of-covid-19. Accessed on: May 31st 2020. 2020.