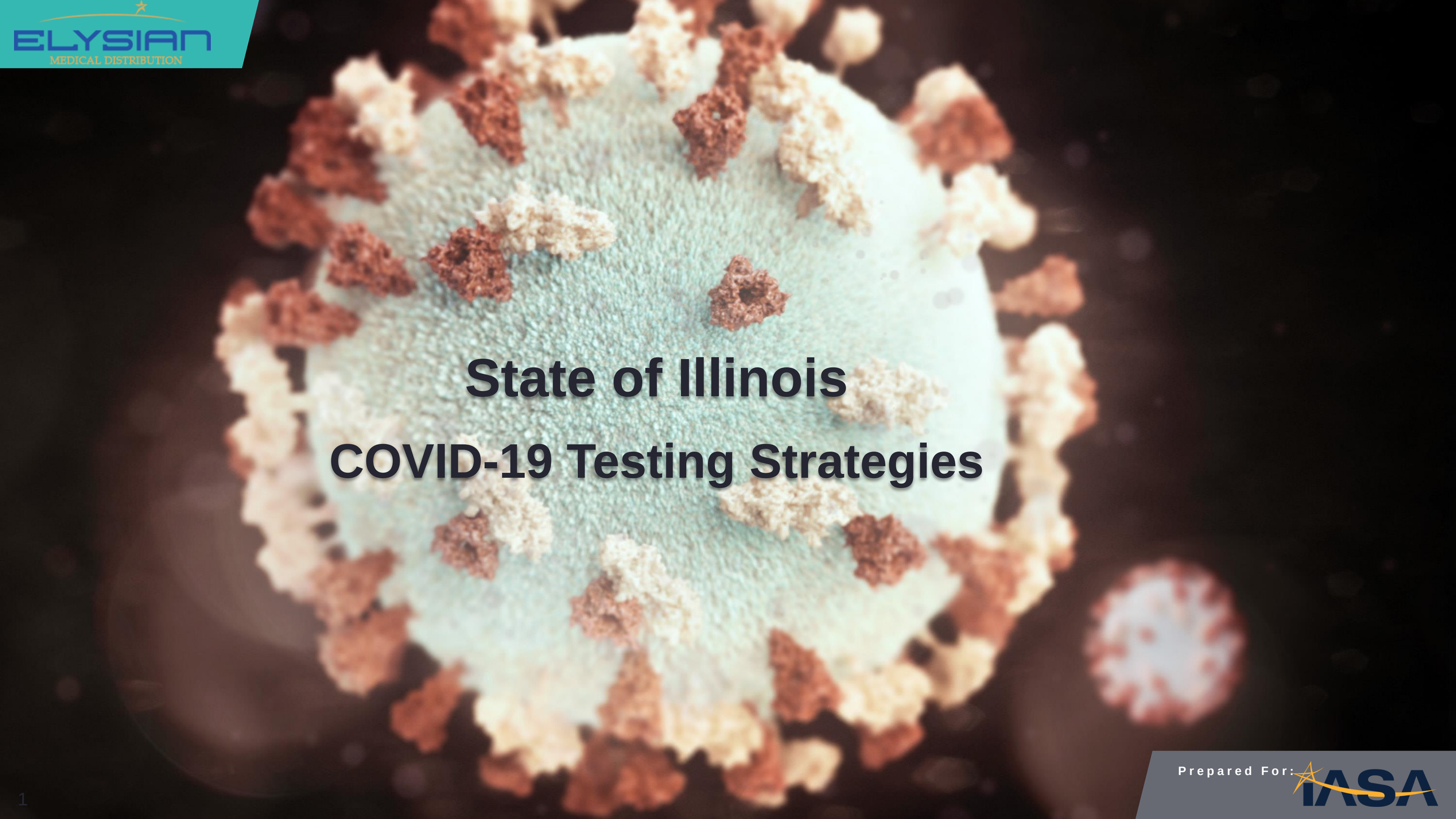

State of Illinois

COVID-19 Testing Strategies

Prepared For: IASA

COVID-19 Testing Options

Rapid Response Antibody Tests (Serology): Tests for the qualitative determination of COVID-19 IgM and IgG antibodies in human whole blood serum or plasma.

- **Pros**
  - **Speed of Testing**: Results in <15 min
  - **Low Cost** to administer: **<$21/test**
  - **98.7% Accuracy** without the need for machines or lab to read
  - Can show “stage of infection” trimester
- **Cons**
  - Time lag for the body to produce antibodies
  - Subject can be infected and infectious before antibodies present

Antigen Tests: Tests for the direct qualitative detection of SARS-CoV-2 viral nucleoprotein antigens from human upper and/or lower respiratory secretions.

- **Pros**
  - **Speed of Testing**: Results in <15 min
  - **Low Cost** to administer: **<$21/test**
  - **Easy to Use**/no equipment required
- **Cons**
  - Sensitivity not as high at RT-PCR RNA tests; positive results should be verified via molecular test

Viral RT-PCR RNA Tests: The RT-PCR RNA test detects a current SARS-CoV-2 infection. It tests for SARS-CoV2 genetic material, also known as RNA. If the viral RNA is detected, then the virus is likely present.

- **Pros**
  - **Accuracy:** proven sensitivity and specificity of >95%
  - **Lab Verified Results**
  - “**Gold Standard**” for diagnosing COVID-19
- **Cons**
  - Higher cost to administer: >$100/test
  - Speed: results in 24-72 hrs
  - Requires CLIA lab to process specimen
  - Invasive collection process; usually uncomfortable

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COVID-19 Testing Scenarios

Potential Testing Scenarios	Tests Administered Per Person	Weeks to Community Control - Zero Positivity Rate	Cost Per Person Per Day
Twice Per Week 2x/Week – Rapid Antigen + PCR for positives	12	6	$2.79
Once Per Week 1x/Week – Rapid Antigen + PCR for positives	8	8	$1.86
Twice Per Month 2x/Month – Rapid Antigen + PCR for positives	6	12	$1.40

Key Assumptions

- Initial positivity rate after first test = 0.5%
- 2x/Week Testing - Positivity rate decreases by 85% after each testing period
- 1x/Week Testing - Positivity rate decreases by 75% after each testing period
- 2x/Month Testing - Positivity rate decreases by 50% after each testing period
- Cost Per Person based on analysis of 2.5M population; Unit estimate to be used for smaller population set.

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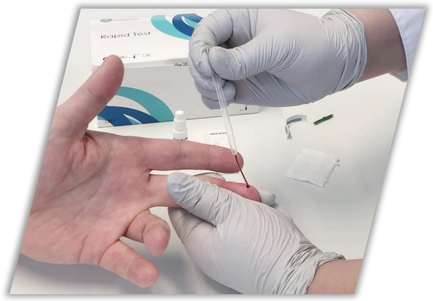
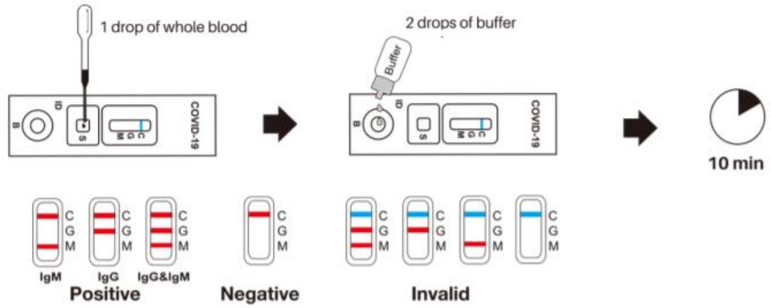
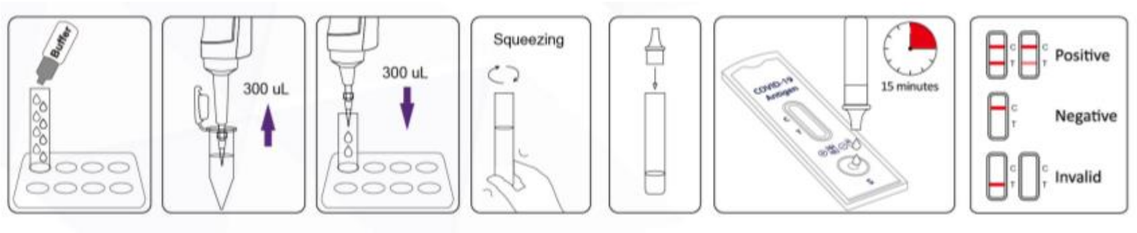
Implementation – As Easy As 1, 2, 3!

1 Determine Testing Method	2 Collect Specimen	3 Analyze Specimen & Get Results
Rapid Response Antibody Test		
Rapid Response Antigen Test		
Viral RT-PCR RNA Test		

Ship sample to lab via overnight package; get results in 24-72 hrs.

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Appendix 1 – Comparison of COVID-19 Tests

	Also known as	How the sample is taken and processed	How long it takes to get results	Is another test needed	What it shows	What it can't do
Rapid Antibody Test	Serological test, serology, blood test	Finger prick or blood draw; apply sample to lateral flow devise for analysis	<15 minutes	A second antibody test is recommended for confirmation of positive results.	Shows if you have been infected by coronavirus in the recent past	Diagnose active coronavirus infection at the time of the test or show that you do not have COVID-19
Rapid Antigen Test	Rapid diagnostic test (some molecular tests are also rapid tests.)	Nasal swab, throat swab or sputum; apply sample to lateral flow devise for analysis	<30 minutes	Positive results are usually highly accurate but negative results may need to be confirmed with a molecular test.	Diagnoses active coronavirus infection	Definitively rule out active coronavirus infection, can miss an active coronavirus infection.
Lab Confirmed Molecular Test	Diagnostic test, viral test, molecular test, nucleic acid amplification test (NAAT), RT-PCR test, LAMP test	Nasal or throat swab (most tests) Saliva (a few tests); submit sample via return overnight shipping to lab for processing	24-72 hours	This test is typically highly accurate and usually does not need to be confirmed.	Diagnoses active coronavirus infection or the absence thereof	Shows if you ever had COVID-19 or were infected with the coronavirus in the past

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Appendix 2 – Price Sheet

COVID-19 Testing Products

Manufacturer	Product Code	Test Kit Type	Test Administered	FDA Status	Tier 1 Price	Tier 2 Price	Tier 3 Price	Notes
Biohit	EB-20082401	Rapid Response Antibody Test / Serology Test	Blood; rapid response lateral flow cassette; results in < 15 minutes	EUA	$21.95	$21.21	$20.91	Tiered pricing applies to following volumes: Tier 1: 1,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
Healgen	EH-20082402	Rapid Response Antibody Test / Serology Test	Blood; rapid response lateral flow cassette; results in < 15 minutes	EUA	$21.95	$21.21	$20.91	Tiered pricing applies to following volumes: Tier 1: 1,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
GIC	EG-20082403	Rapid Response Antibody Test / Serology Test	Blood; rapid response lateral flow cassette; results in < 15 minutes	FDA Registered; Pending EUA	$21.95	$21.21	$20.91	Tiered pricing applies to following volumes: Tier 1: 1,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
Megna	EM-20082405	Rapid Response Antibody Test / Serology Test	Blood; rapid response lateral flow cassette; results in < 15 minutes	EUA	$29.95	$28.95	$27.95	Tiered pricing applies to following volumes: Tier 1: 1,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
Megna	EM-20082406	Rapid Response Antigen Test	Blood; rapid response nasal swab lateral flow cassette; results in < 30 minutes	FDA Registered; Pending EUA	$44.95	$43.45	$40.95	Tiered pricing applies to following volumes: Tier 1: 1,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
FaStep	EF-20082407	Rapid Response Antigen Test	Sputum; Nasopharyngeal swab; Oropharyngeal swab	FDA Registered; Pending EUA	$21.95	$21.21	$20.91	Tiered pricing applies to following volumes: Tier 1: 10,000-500,000, Tier 2: 500,001-999,999, Tier 3: >1,000,000
SDI	ES-20082404	RT-PCR RNA Test	Back of throat swab; submit to SDI CLIA lab for 24-72 hr processing	EUA	$125.00	$123.00	$121.00	Tiered pricing applies to following volumes: Tier 1: 1,000-50,000, Tier 2: 50,001-99,999, Tier 3: >100,000

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Appendix 3 - FAQs

Q - What is COVID-19?

A - COVID-19 is a respiratory disease so named because it was discovery in **2019**. It's caused by an infection from a new form of coronavirus, SARS-CoV-2.

Q - How does COVID-19 spread?

A - Covid-19 spreads easily from person-to-person, primarily through liquid respiratory droplets. However, sneezing and coughing aren't the only ways droplets can be transmitted. For instance, we release droplets when we speak, sing, and breathe.

Q - What are symptoms of COVID-19?

A - A wide range of symptoms have been reported by people with COVID-19, ranging from mild to severe. Symptoms may appear within two to 14 days after exposure to the virus. However, a substantial portion of individuals infected with COVID-19 have shown no symptoms at the time of testing or were asymptomatic.

According to the CDC, symptoms may include, but are not limited to the following:

- 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

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Appendix 3 - FAQs

Q - What do I need to know about asymptomatic COVID-19 carriers?

A - After contracting COVID-19, it takes between two to 14 days to begin experiencing symptoms. However, a substantial portion of individuals with the virus display no symptoms. Researchers have come to widely varied conclusions with estimates of 25 to 80% of individuals with COVID-19 having no symptoms of being infected. That's why widespread testing is vital for a healthy and safe workplace, educational, or recreational activity to resume.

Q - What tests do you have for COVID-19?

A - Currently, we provide Viral RT-PCR RNA tests, Rapid Antigen tests and Rapid Antibody tests.

Q - Why RNA testing?

A - RNA testing detects SARS-CoV-2 genetic material to identify if a patient is infected.

Q - What is Antibody testing?

A - Antibody testing uses a blood sample to detect two types of antibodies: IgM, which develops early on in an infection, and IgG, which are more likely to appear later in the infection and after an individual has recovered.

Q - What is the difference between a Viral RT-PCR RNA COVID-19 test and Antibody test?

A - A Viral RT-PCR RNA COVID-19 test detects an active SARS-CoV-2 virus. An Antibody test detects proteins the body usually makes if an individual has the virus or had the virus in the past.

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Appendix 4 – Terms to Know

Coronavirus - A coronavirus is a family of viruses that can cause a variety of illnesses. Coronaviruses cause one-third of common colds and sometimes respiratory infections. One coronavirus that causes COVID-19 is the SARS-CoV-2 virus.

Novel Coronavirus - A novel coronavirus is a *new* virus that has not been identified before. This is a general term used to describe any new coronavirus. In the context of the current pandemic, SARS-CoV-2 is a novel coronavirus that causes the COVID-19 disease.

SARS-CoV-2 - SARS-CoV-2 is the name of the novel coronavirus causing the current pandemic.

COVID-19 - COVID-19 is a new disease caused by the novel coronavirus SARS-CoV-2.

Asymptomatic - A person who is asymptomatic shows no signs of symptoms of the disease. In this case, COVID-19. However, just because they don't present any symptoms, they could still be infected and contagious. This makes them particularly dangerous as they may be unknowingly spreading the virus.

Symptomatic - A person who is symptomatic shows signs of symptoms. In terms of COVID-19, that means they may have a fever, dry cough, sore throat, shortness of breath, body aches or other symptoms.

Viral RT-PCR RNA test - The Viral RT-PCR RNA test determines if there is an active SARS-CoV-2 infection. It's a testing standard for active infection. As of right now, most Viral RT-PCR RNA testing takes about 24 to 72 hours.

Antibody (serology) test - Antibodies start developing within one to three weeks after infection. An Antibody test screens for signs of a past infection. It does not test for a current infection.

Antigen tests - Antigen tests are also known as rapid diagnostic tests. The sample is taken via a nasal or throat swab and the results are delivered within one hour. This test is used to detect an active coronavirus infection but cannot definitively rule out an active infection. Antigen tests are less accurate and negative results may need to be confirmed with molecular tests.

Sensitivity - The ability of a test to identify correctly all those who have the disease, that is "true-positive."

Specificity - The ability of a test to identify correctly those who do not have the disease, that is, "true-negatives."

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