



Abbott

Panbio Covid-19 Ag Rapid Test Device

October, 2020

Agenda

- **PRODUCT OVERVIEW**
- **CLINICAL RESULTS**
- **ACTIVE INFECTIONS AND ANTIGEN TESTING**
- **SUGGESTED IN-COUNTRY EVALUATION PROTOCOLS**

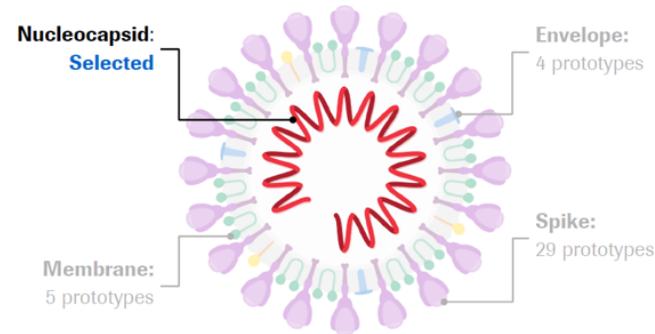
PANBIO COVID-19 AG RAPID TEST DEVICE

Product Overview

Panbio™ COVID-19 Rapid Test Device Specifications (WHO EUL)

- *In vitro* diagnostic rapid test for qualitative detection of SARS-CoV-2 antigen (Ag)
- Targeting Nucleocapsid Proteins from SARS-Cov-2
- Sensitivity: 91.4%* (n=140)
- Specificity: 99.8% (n=445)

- Storage: 2°C–30°C / 36°F-86°F
- WHO EUL
- CE Mark
- Sample Type: Nasopharyngeal swab
- Test time: 15–20 MINUTES



Abbott proprietary and confidential — do not distribute * Samples with Ct values ≤ 33 resulted in 94.1% sensitivity.

Intended Use (per Instructions for Use)

Panbio COVID-19 Ag Rapid Test Device is an *in vitro* diagnostic rapid test for the qualitative detection of SARS-CoV-2 antigen (Ag) in human nasopharyngeal swab specimens from individuals who meet COVID-19 clinical and/or epidemiological criteria.

Panbio COVID-19 Ag Rapid Test Device is for professional use only and is intended to be used as an aid in the diagnosis of SARS-CoV-2 infection. The product may be used in any laboratory and non-laboratory environment that meets the requirements specified in the Instructions for Use and local regulation.

The test provides preliminary test results. Negative results don't preclude SARS-CoV-2 infection and they cannot be used as the sole basis for treatment or other management decisions. Negative results must be combined with clinical observations, patient history, and epidemiological information. The test is not intended to be used as a donor screening test for SARS-CoV-2.

Kit Contents

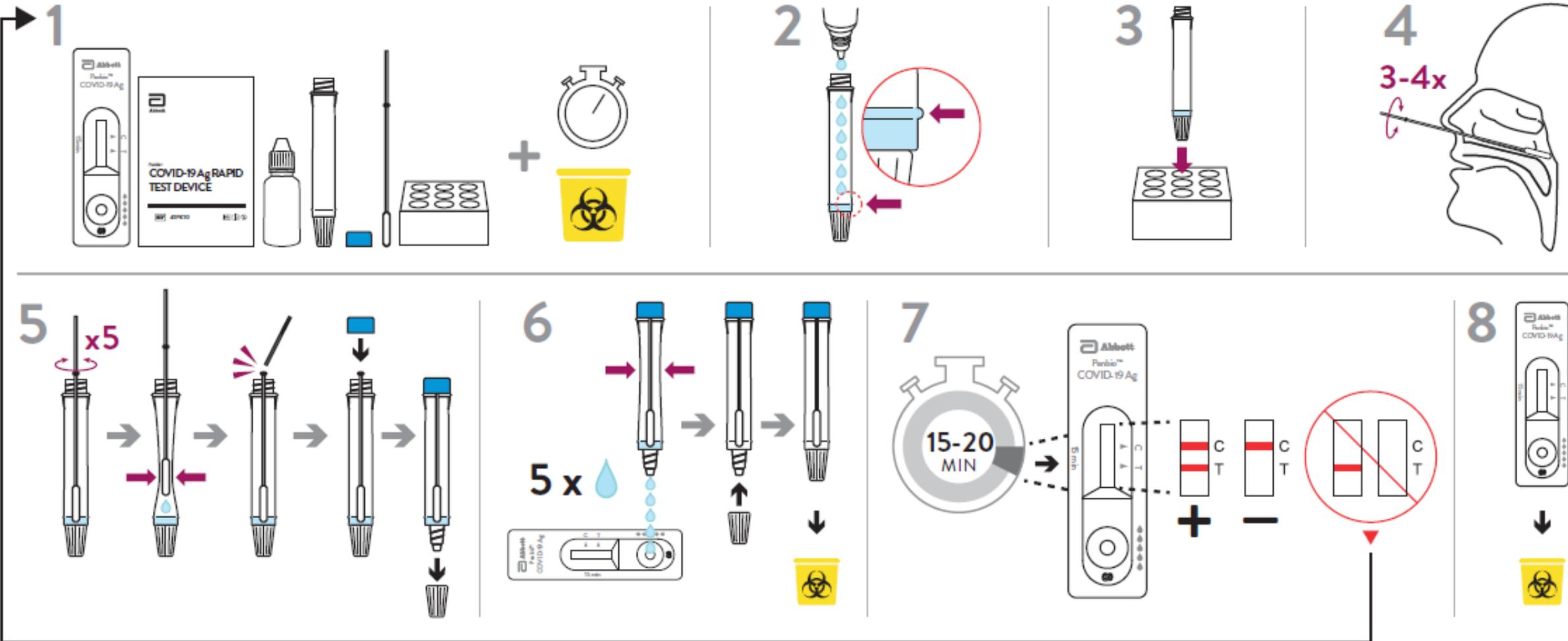
Included in Kit:

- 25 Tests, each in an individual foil pouch with desiccant
- 25 Sterilized nasopharyngeal swabs for sample collection
- 25 Extraction tubes and tube caps
- Buffer (one 9mL bottle)
- 1 Positive control
- 1 Negative control (additional uncoated swab)
- 1 Tube rack
- 1 Instructions for use
- 1 Quick reference guide

Additional items needed but not included in kit:

- Personal protective equipment such as masks, eye protection, gloves, gowns
- Biohazard waste container and disinfectants
- Timer

Test Procedure



Test Procedure



[VIDEO LINK](#)

Biohazard Containment Feature Helps Protect Staff



Special “break off” swab stays contained in tube, minimizing staff exposure



Safely dispose the fully enclosed extraction tube

PANBIO COVID-19 AG RAPID TEST DEVICE

Clinical Results as per WHO EUL

WHO EUL Achieved on 2 October 2020

Positive and Negative Percent Agreement as per WHO EUL

Sensitivity and Specificity for Panbio COVID-19 Ag Test vs. PCR

		PCR Test Result		
		Positive	Negative	Total
Panbio COVID-19 Ag Test Result	Positive	128	1	129
	Negative	12	444	456
	Total	140	445	585
		Sensitivity	Specificity	Total Agreement
		91.4% [85.5%; 95.5%]	99.8% [98.8%; 100.0%]	97.8% [96.2%; 98.8%]

Note:

Based on the minimum Ct value of the N1 target region and the N2 target region, Panbio™ COVID-19 Ag Rapid Test has **94.1%** sensitivity on subjects with Ct values ≤ 33 (n=135) (Reference: La Scola, B. et al. Viral RNA load as determined by cell culture as a management tool for discharge of SARS-CoV-2 patients from infectious disease wards. Eur J Clin Microbiol Infect Dis 39, 1059-1061, doi:10.1007/s10096-020-03913-9 (2020))

Applying a ≤ 30 Ct Cut off we would detect 128/130 (98,5%)

Positive and Negative Percent Agreement as per WHO EUL Grouped by “days post onset of symptoms”

Days post onset symptoms	Total Agreement	Sensitivity	Specificity
0-3	170/172 - 98.8% [95.9%; 99.9%]	37/39 - 94.9% [82.7%; 99.4%]	133/133 - 100.0% [97.3%; 100.0%]
4-7	393/404 - 97.3% [95.2%; 98.6%]	91/101 - 90.1% [82.5%; 95.1%]	302/303 - 99.7% [98.2%; 100.0%]

Note: 9 study participants showed no symptoms and were negative on both PCR and Panbio Covid-19 Ag

Performance Data Meet or Exceed WHO Requirements

Requirement	Expectation
Intended Use Statement	In areas with confirmed SARS-CoV-2 community wide transmission or confirmed outbreaks in closed or semi-closed communities and in high risk groups for early detection where molecular/reference assays are not available or services are overloaded.
Target Population/Patient	Patients with acute or subacute respiratory symptoms or fever or other suspicious symptoms (diarrhea, anosmia) with known contact with a confirmed or probable COVID-19 patient or living in an area of cluster or community transmission, and close contacts (with or without symptoms) of index patients (confirmed Covid-19 patients)
Target Use Setting	Outside of laboratories including at routine and ad-hoc triage/screening points of health care facilities such as emergency units, mobile units and in the community (contact tracing) by HCPs or lab technicians with appropriate training in specimen collection, biosafety and test use.
Target Molecule	SARS-CoV-2 biomarker (RNA, protein/antigen(s) specific for acute (eg. First week after onset of symptoms/current infection
Analytical Sensitivity/LoD	Equivalent to 106 genomic copies/ml or Ct~25
Analytical Specificity	-Detects all SARS-CoV-2 viral strains -Does not cross react with common interfering substances or other human coronavirus or any other common human diseases
Sensitivity	≥80% based on minimum 100 positives
Specificity	>99% based on minimum 400 negatives to include patients/samples with other respiratory diseases that have common symptoms with Covid-19)
Specimen Preference	Nasopharyngeal , oropharyngeal, nasal or sputum
End User Profile	Trained staff in health care facilities
Time to Result	<20 min

Sympheos System for Epidemiological Monitoring – Know What Happens: When & Where

Realtime reporting and visualization of Covid-19 hotspots, outbreaks, and epidemiologic statistics

Enables Country MOH to efficiently deploy and manage scarce resources

No personal data recorded

Tests locations & times, results, and demographics for broad epidemiological reporting

Asynchronous upload when connectivity is poor

Users: health professionals and MOH program leaders

Sympheos System: A suite of rapid testing and software tools for Covid-19 decentralized testing



Rapid Test



Sympheos™
Mobile



Sympheos™
Collect



Sympheos™
Insights

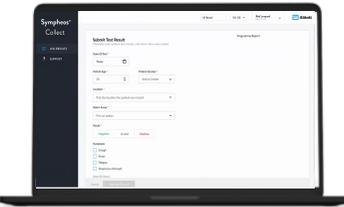
Sympheos System – Decentralized Covid-19 Data Collection & Visualization At Your Fingertips

Sympheos System

Sympheos Mobile:
collect Covid-19 test data via app



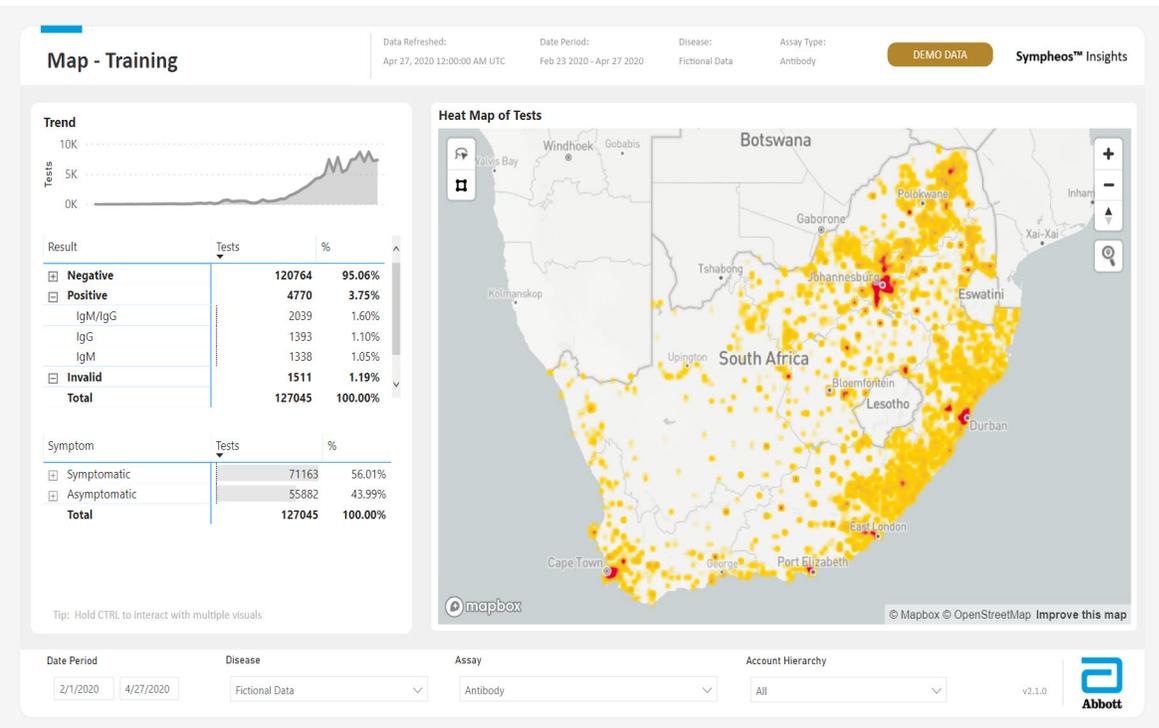
Sympheos Collect:
collect Covid-19 test data via web-based portal



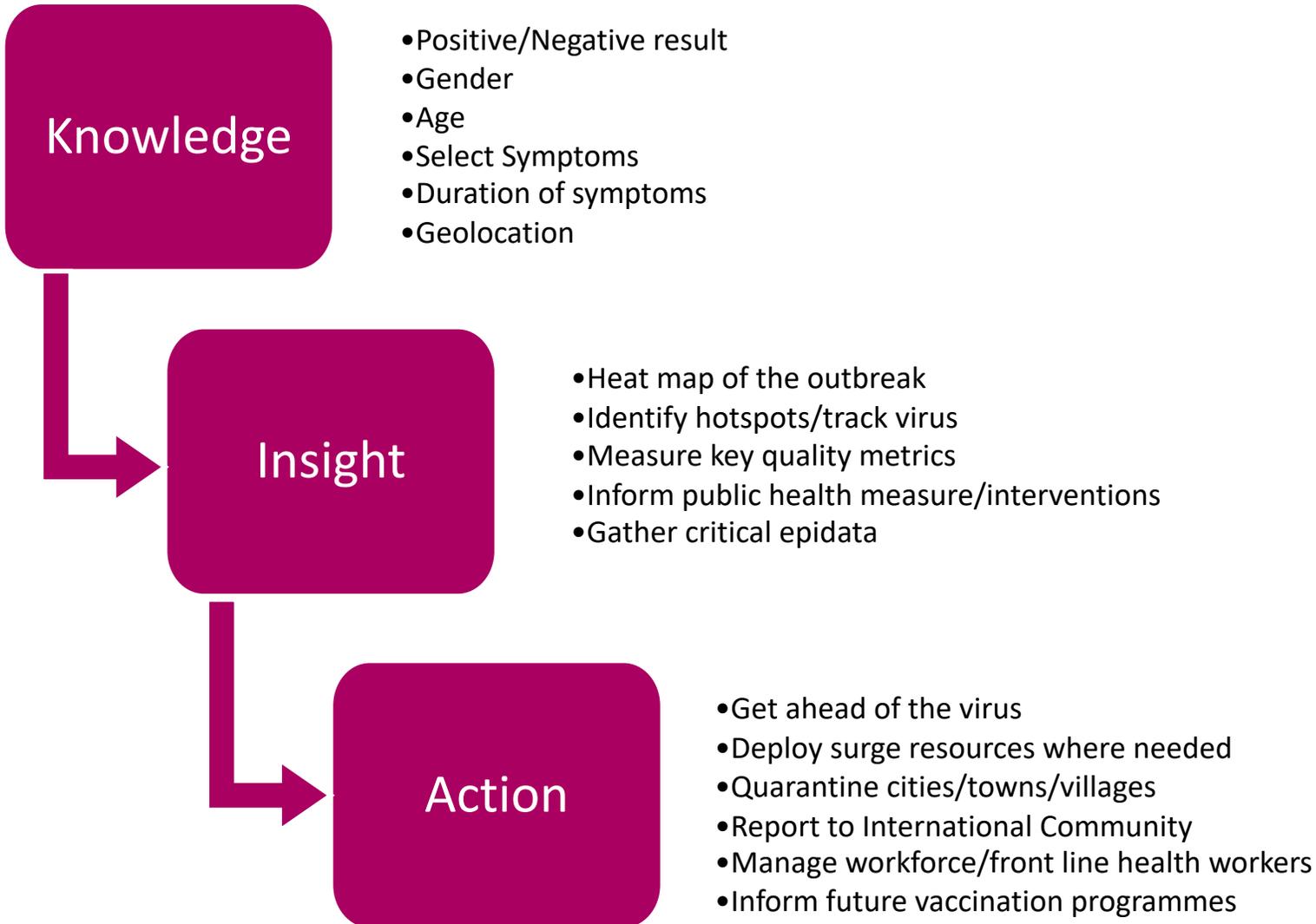
Sympheos Insights:
data visualization, trends & reporting for Covid-19 test data



Sympheos System: Insights Report



Sympheos System Summary – Turning Knowledge to Actions



PANBIO COVID-19 AG RAPID TEST DEVICE

Active Infections and Antigen Testing

Evidence strongly indicates that molecular detection above Ct 33 is from defective non-infectious virus

FINDINGS

- Studies from CDC (unpublished) are showing that from samples above Ct 33, infectious cultures cannot be developed (Fig. 1)
- Scola et al. also demonstrated non-viability of the virus in samples >33 Ct (Fig. 2)
- In another study (Bullard et al.*) no growth in samples with even a Ct count above 24 could be detected

INFERENCES

- RNA can readily be detected from defective or inactivated non-infectious viruses at high Ct counts
- While Molecular is a very useful tool, detection below very high Ct counts (33 and under) should be what matters when it comes to infectivity
- If there is viable virus in these high Ct count samples, it is likely that the dose is too far below the infectiousness threshold (median TCID₅₀)

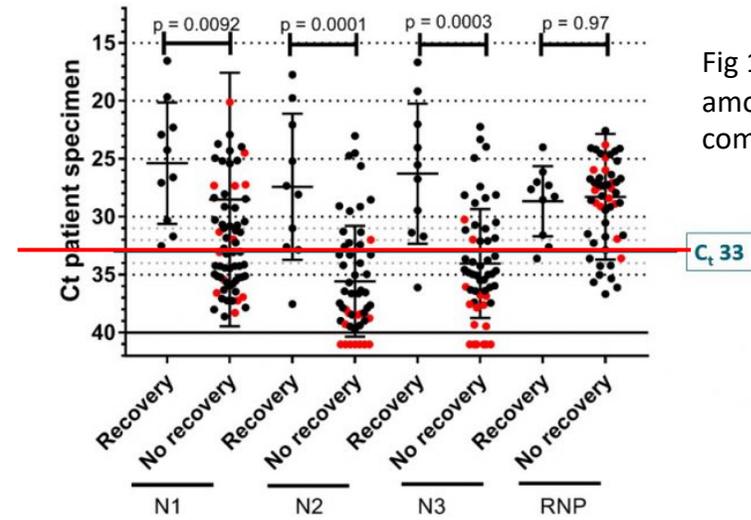
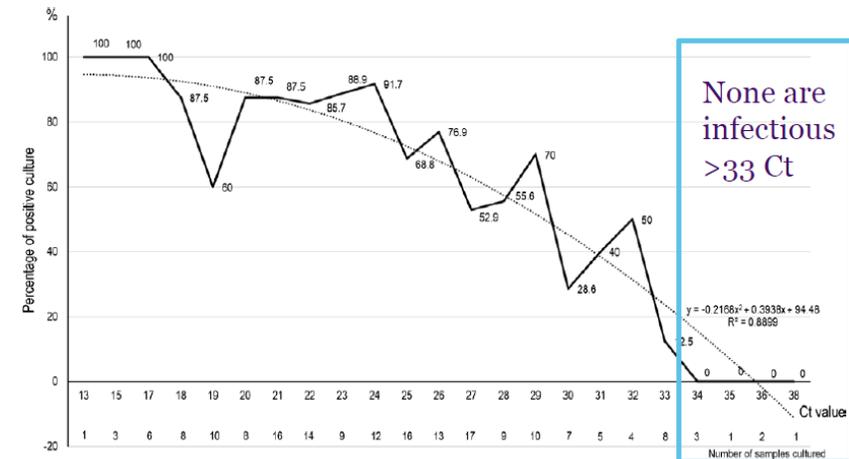


Fig 1: CDC data showing median Ct values among specimens from which replication-competent virus was recovered or not**

Fig. 2:



La Scola, B. *et al.* Viral RNA load as determined by cell culture as a management tool for discharge of SARS-CoV-2 patients from infectious disease wards. *Eur J Clin Microbiol Infect Dis* 39, 1059-1061 (2020).

* <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa638/5842165>

** <https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html#>

Time is also a key factor when considering active infections

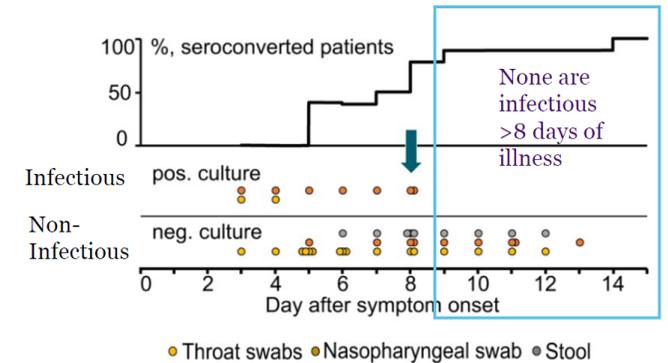
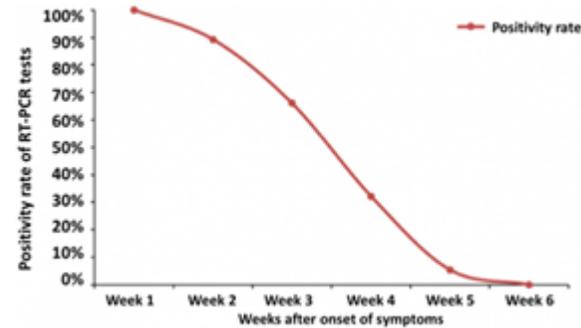
FINDINGS:

- Viral shedding peaks at time of onset of symptoms*
- Yet RT-PCR can remain positive for weeks**
- Beyond 8-9 days post symptoms positive cultures are difficult to develop (according to Wolfel et al. and CDC data – see right)
- When culture positivity persists beyond 9 days, it is associated with high viral loads***

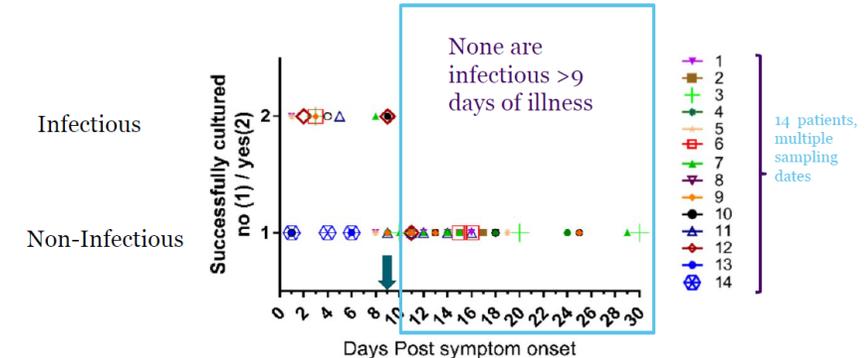
INFERENCES

- Infectious timeframe for patients seems highest within 0-7 days post symptoms
- PCR positivity after this seems tied to very low viral loads and/or defective (non infectious) virus
- Infectiousness beyond that timeframe, being associated with high viral loads, is also likely NOT associated with Ct >33

RT-PCR positivity over time, Lavezzo et al.**



Wolfel, R. et al. Virological assessment of hospitalized patients with COVID-2019. *Nature* 581, 465-469 (2020).



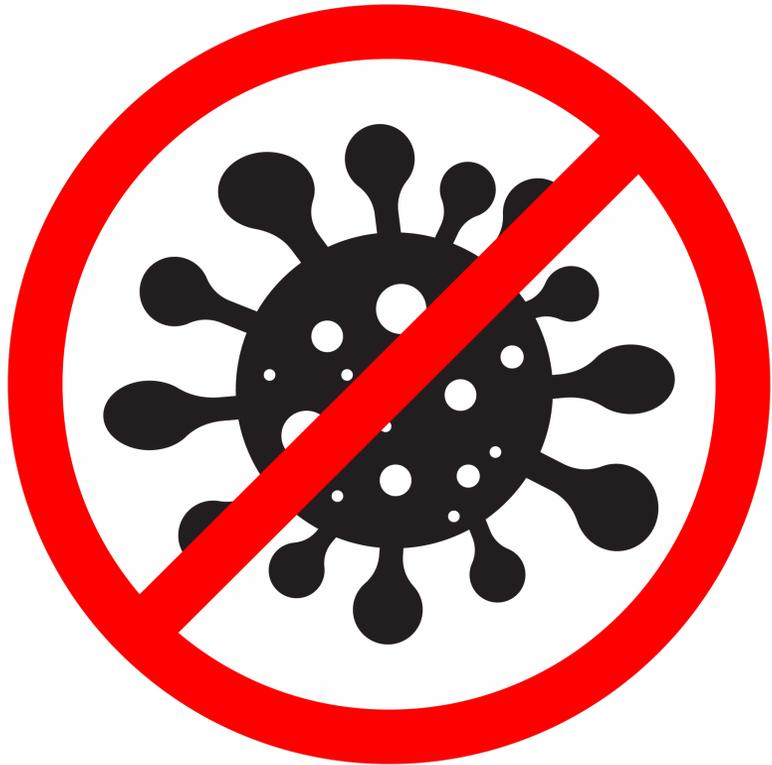
CDC: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/duration-isolation.html>

* He, X. et al. Temporal dynamics in viral shedding and transmissibility of COVID-19 <https://www.nature.com/articles/s41591-020-0869-5>

** Lavezzo, E. et al. Suppression of a SARS-CoV-2 outbreak in the Italian municipality of Vo'. <https://www.nature.com/articles/s41586-020-2488-1>

*** Shedding of infectious virus in hospitalized patients with coronavirus disease-2019 (COVID-19): duration and key determinants <https://www.medrxiv.org/content/10.1101/2020.06.08.20125310v1>

Panbio Covid-19 Ag tests for virus in infectious phase which is what matters most

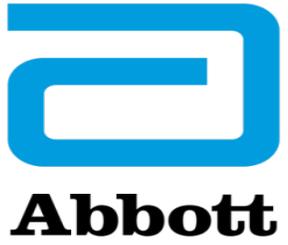


FINDINGS:

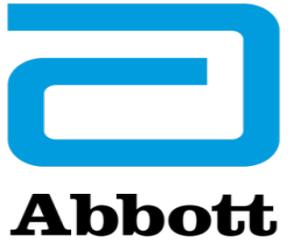
- Panbio Covid-19 Ag sensitivity was 94.1% per CE Mark for samples with Ct \leq 33, when infectious virus is likely present
- Panbio Covid-19 Ag targets the 0-7 days time-window post onset of symptoms (suspicion of infection)
- This early phase is what matters in terms of contagion and transmission.

INFERENCES

- Early detection not only yields faster treatment decisions but also helps break the transmission cycle
- Sensitivity (91.4%, or 94.1% 93.3% at Ct \leq 33 per CE Mark) and specificity (99.8%) put Lateral Flow antigen on par with Molecular performance (for viable virus)
- Cost effectiveness and deploy ability at point of care can enable effective mass screening to stop the pandemic



Prospective fresh nasopharyngeal specimen guiding document



Prospective fresh nasopharyngeal specimen guiding document

Prospective (fresh nasopharyngeal specimen) guiding document

Objective:

- The primary objective of this document is to provide the minimal technical information to generate a protocol to evaluate clinical sensitivity and specificity of the Panbio™ COVID-19 Ag Rapid Test, using a freshly collected nasopharyngeal specimen, based on the results obtained from the reference molecular method, reported in the IFU of the product.

Background:

- WHO EUL has established minimal requirements of 80% sensitivity and 95% specificity for Ag tests for COVID-19.

Study Population:

- Subject is clinically suspected (symptomatic) of COVID-19 disease with less than 7 days from onset of symptoms.

Sample Size:

Minimal of 30 symptomatic subjects test positive for COVID-19 and 140 subjects test negative for COVID-19 via the reference method used by the Reference Labs or Standard of Care (SoC).

Prospective (fresh nasopharyngeal specimen) guiding document

Study Design:

- Operators will collect two (2) nasopharyngeal swabs from each subject, match the inclusion criteria, and following the instruction of the IFU, without any deviation.
- The first swab will be placed in viral transport medium (VTM) immediately following collection and sent to the Reference Laboratory, following their guidelines.
- The second swab will be tested, immediately after collection, on Panbio™ COVID-19 Ag, following the instruction of the IFU.
- Once the Nasopharyngeal swab is in the right position in the patients, minimal of 4 gently rotation will be need it, to secure the right amount of sample collected.
- Direct swab specimens should be tested immediately after collection. If immediate testing is not possible, the swab specimen can be kept in an extraction tube filled with extraction buffer (300µl) at room temperature (15-30 °C) for up to two hours prior to testing.
- Results from testing with the reference molecular method will be compared to the Panbio™ COVID-19 Ag Rapid Test results.
- ***Customers need to follow instructions without any deviation from IFU.***

Retrospective (Frozen VTM nasopharyngeal specimen) guiding document

Retrospective (Frozen VTM nasopharyngeal specimen) guiding document

The recommended Viral Transport Media are:

1. Puritan UniTranz-RT Collection and Transport System
2. Remel MicroTest™ M4RT® Multi-Microbe Media
3. Starplex Multitrans Transport System

Background:

Per the Panbio™ COVID-19 Ag Rapid Test Device IFU Performance Characteristic, the positive agreement of the test is higher on subjects with Ct values less or equal than 33.

Use of VTM samples adds an additional dilution of 1:20 (3000µl vs. 300µl = 1:10 plus 1:2 dilution using 150µl Extraction Buffer plus 150µl VTM, total of 1:20).

This would be equivalent to app. 4 additional cycles in RT-PCR (16-fold). Therefore, we are proposing to limit the evaluation of VTM samples to a Ct of <29 (vs. a 33 Ct)

Retrospective (Frozen VTM nasopharyngeal specimen) guiding document

Study Population:

- Pre-selected Frozen de-identified retrospective VTM specimens.
- Stored at -80 C for not more than 3 months
- Not have undergone up to 3 (not greater than) freeze-thaw.
- Samples collected from symptomatic patients with Ct <29.

For samples across the Ct range up to <29 Ct we are expecting a sensitivity of $\geq 90\%$.

Sample Size:

We recommend testing a minimum of >50 positive and a minimum of >50 negative specimens for COVID-19 based on the results obtained from a reference molecular method.

Retrospective (Frozen VTM nasopharyngeal specimen) guiding document

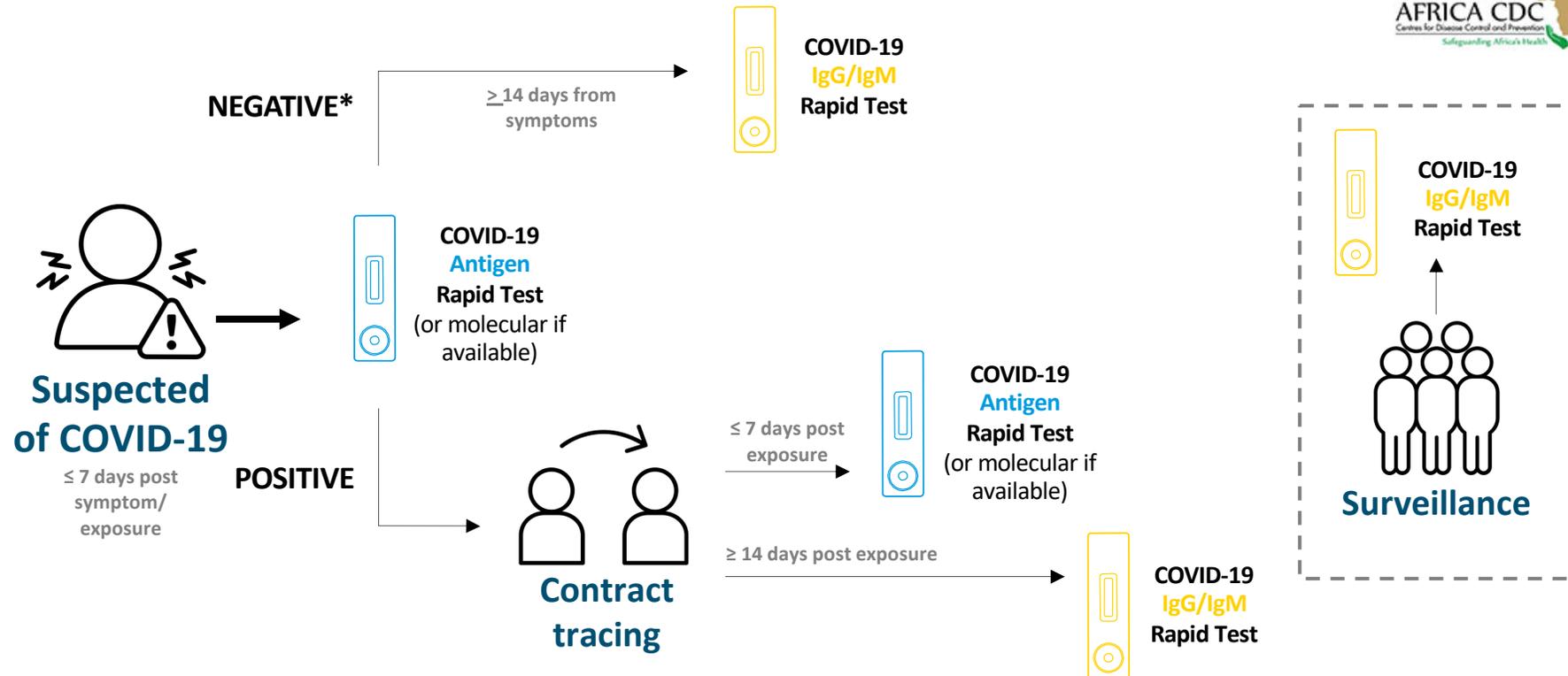
Test of Frozen VTM samples procedure:

The frozen VTM requirement is that specimen has been previously frozen at -80°C for < 3months (not greater than).

1. With a micro pipette, fill 150µl of the Extraction Buffer into the sample tube.
2. With a micro pipette, dispense 150µl of thawed VTM specimens into sample tube filled with the Extraction Buffer (Dilution ratio 1:1).
3. Mix - Ensure thorough mixing
4. Dispense 5 drops (130µl) of the mixed solution onto the device.
5. Record the results between 15 -20 minutes, per the Panbio™ COVID-19 Ag Rapid Test Device IFU.

Handling of samples and extraction buffer requires special laboratory precautions and safety procedures. Please follow your own laboratory and local guidelines and procedures

COVID-19 Testing of Suspected Individuals^{11,12,17}



* Note: Negative results must be combined with clinical observations, patient history, and epidemiological information. Can potentially consider Molecular testing, but this is NOT a requirement with the Panbio Covid-19 Ag Antigen test.

This illustration is adapted from guidelines published by FIND, Africa CDC, and IDSA and is intended for informational purpose only. Customers are solely responsible for designing and implementing testing strategies and for making any decisions based on test results.

11. FIND. Rapid Diagnostic Tests for COVID-19. (18 May 2020). https://www.finndx.org/wp-content/uploads/2020/05/FIND_COVID-19_RDTs_18.05.2020.pdf
12. Africa CDC Interim Guidance on use of Rapid Antibody Tests for COVID-19. (June 2020). <https://africacdc.org/download/interim-guidance-on-the-use-of-rapid-antibody-tests-for-covid-19-response>
17. Infectious Diseases Society of America Guidelines on the Diagnosis of COVID-19 Serologic testing. (18 August 2020). [https://www.idsociety.org/practice-guideline/covid-19-guideline-serology/#:~:text=s1%2Ds5\).-,Recommendation%201%3A%20Serologic%20testing%20during%20first%20two%20weeks%20after%20symptom,very%20low%20certainty%20of%20evidence\).](https://www.idsociety.org/practice-guideline/covid-19-guideline-serology/#:~:text=s1%2Ds5).-,Recommendation%201%3A%20Serologic%20testing%20during%20first%20two%20weeks%20after%20symptom,very%20low%20certainty%20of%20evidence).)



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