EMERGENCY USE AUTHORIZATION (EUA) SUMMARY

Verily COVID-19 RT-PCR Test for use with the Verily COVID-19 Nasal Swab Kit

(Verily Life Sciences)

For *In vitro* Diagnostic Use
Rx Only
For use under Emergency Use Authorization (EUA) only

(The Verily COVID-19 RT-PCR Test will be performed at the Verily Life Sciences laboratory, located at 249 E Grand Avenue, South San Francisco, CA 94080, which is certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, and meets the requirements to perform high complexity tests, as described in the Laboratory Standard Operating Procedure that was reviewed by the FDA under this EUA.)

INTENDED USE

The Verily COVID-19 RT-PCR Test is a real-time reverse transcription polymerase chain reaction (rRT-PCR) test intended for the qualitative detection of nucleic acid from SARS-CoV-2 in anterior nasal, mid-turbinate nasal, nasopharyngeal, and oropharyngeal swab specimens collected from individuals suspected of COVID-19 by their healthcare provider (HCP).

This test is also for individually tested anterior nasal swab specimens that are self-collected at home (which includes in a community-based setting), without the supervision of a HCP, by individuals 18 years or older using the Verily COVID-19 Nasal Swab Kit when determined to be appropriate by a HCP.

This test is also for the qualitative detection of nucleic acid from SARS-CoV-2 in pooled samples containing up to 12 individual anterior nasal, mid-turbinate nasal, nasopharyngeal or oropharyngeal swabs specimens (collected by a HCP) or anterior nasal swab specimens (self-collected at home using the Verily COVID-19 Nasal Swab Kit) using either a standard Dorfman pooling strategy or a 2D pooling strategy, and where each specimen is collected using individual vials containing transport media. Negative results from pooled testing should not be treated as definitive. If a patient's clinical signs and symptoms are inconsistent with a negative result or results are necessary for patient management, then the patient should be considered for individual testing. Specimens included in pools with a positive, inconclusive, or invalid result must be tested individually prior to reporting a result. Specimens with low viral loads may not be detected in sample pools due to the decreased sensitivity of pooled testing.

Testing is limited to Verily Life Sciences laboratory, located at 249 E Grand Avenue, South San Francisco, CA 94080, which is certified under the Clinical Laboratory Improvement

Amendments of 1988 (CLIA), 42 U.S.C. §263a, and meets requirements to perform high complexity tests.

Results are for the identification of SARS-CoV-2 RNA. The SARS-CoV-2 RNA is generally detectable in respiratory specimens during the acute phase of infection. Positive results are indicative of the presence of SARS-CoV-2 RNA; clinical correlation with patient history and other diagnostic information is necessary to determine patient infection status. Positive results do not rule out bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities.

Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Negative results must be combined with clinical observations, patient history, and epidemiological information. Anterior nasal swab specimens that are self-collected may or may not be tested with an endogenous human specimen control to confirm that the specimen was properly collected. Self-collected specimens from SARS-CoV-2 positive individuals may yield negative results if the specimen was not collected properly.

The Verily COVID-19 RT-PCR Test is intended for use by qualified clinical laboratory personnel specifically instructed and trained in the techniques of real-time PCR and in vitro diagnostic procedures. The Verily COVID-19 RT-PCR Test is only for use under the Food and Drug Administration's Emergency Use Authorization.

DEVICE DESCRIPTION AND TEST PRINCIPLE

a. Verily COVID-19 Nasal Swab Kit

The Verily COVID-19 Nasal Swab Kit for home collected specimens collects virus from nasal swab specimens; it can also be used for the transportation and short-term room temperature storage of a sample. The Verily Nasal Swab Kit is a non-invasive alternative for self-collecting virus by/from by individuals 18 years or older who are suspected of COVID-19 by their healthcare provider for use in the Verily RT-PCR COVID. Self-collection can be done, either at home or on-site (e.g., workplace or school). The kit consists of the following components:

- Sterile polyester swab or sterile polyurethane foam swab with polypropylene shaft
- Sterile sample collection tube filled with 3 mL saline (0.9 % sodium chloride)
- Label sheet
- Instructional insert and tube holder
- Specimen biohazard bag & absorption sheet
- Shipping Box – Cardboard box
- FedEx return shipping envelope with prepaid return label

For the on-site self-collection kit the FedEx shipping envelope is not provided.

The Verily COVID-19 Nasal Swab Kit includes instructions, a pre-printed test requisition form, nasal swab, transport tube containing appropriate fluid (i.e., 0.9% saline), pre-printed tube label, zip-lock bag (with biohazard symbol) containing an absorbent pad, shipping box, and FedEx UN3373 shipping bag with pre-printed FedEx Shipping Label attached.

Users with approved tests pending have written and video instructions on the sample collection and return process available on the Verily website and sent to them by email, text message or other direct communication. Written instructions are also included in the kit to direct the home users how to appropriately collect the nasal swab specimen including the date/time of specimen collection (e.g., writing date/time on the label sheet or digital activation of the Verily COVID-19 Nasal Swab Kit with the activation code on the label sheet), place the specimen into the transport tube, properly package the specimen, and mail the specimen back to the laboratory using the pre-labeled FedEx return bag. Each Verily COVID-19 Nasal Swab Kit is intended to be returned via FedEx service at ambient conditions on the same day of collection.

Medical Oversight:
Medical oversight of the process is provided by the healthcare provider who is ordering the test. Verily Life Sciences will only distribute self-collection kits to patients suspected of respiratory viral infection consistent with COVID-19 when home collection is determined to be appropriate by a healthcare provider.

Specimen Transport:
The Verily COVID-19 Nasal Swab Kit was reviewed for adherence to the Department of Transportation's shipping requirements for hazardous materials. The kit was found to be acceptable and appropriate for shipping within the United States.

Inspection of Specimens:
Verily Life Sciences submitted an SOP for receipt and accessioning of samples collected with the Verily COVID-19 Nasal Swab Kit at Verily Life Sciences Laboratory. This protocol is summarized below. Home collected specimens received at the laboratory will undergo review for the following items prior to processing:

- Proper return of sample packaging: confirm that sample is present, test requisition is present, the sample tube is not broken or leaking,
- Verification that the tube barcode label is present and readable by a barcode scanner
- Verification of Patient Information: ensure the patient information on the sample container matches the information on test requisition
- Sample Acceptability: ensure swab is inserted the correct way, sample has sufficient sample volume, acceptable sample temperature, sample was received within 98 hours from the time of sample collection.

b. Verily COVID-19 RT-PCR Test

The Verily COVID-19 RT-PCR Test uses a modified version of the ThermoFisher Scientific TaqPath COVID-19 Combo Kit that was FDA authorized for emergency use (EUA) on March 13, 2020. The Verily Pooled COVID-19 Test is a real-time reverse transcription polymerase chain reaction (RT-PCR) test. The test detects three specific regions of the SARS-CoV-2 genome including the ORF1ab region, the N (nucleocapsid) gene, and the S (spike protein) gene. The assay also includes one primer and probe set to detect the MS2 phage internal control in both the negative extraction control and clinical samples.

c. 2D Matrix Pooling

Samples collected by a healthcare provider may be tested with the Verily COVID-19 RT-PCR Test using a matrix [2D]-pooling strategy for which samples are pooled in a 96-well plate across the rows (12-plex) and the columns (8-plex) as indicated in **Figure 1**; Pools are created prior to extraction using the Tecan Fluent GX automated liquid handler with the Tecan FluentControl v2.6 software. Each sample will be tested as part of the 8-plex pool and as part of the 12-plex pool and thereby identifies the individual positive sample/s or in some cases narrows the positive samples down to a few candidate samples. Positive samples and candidates are then retested individually.

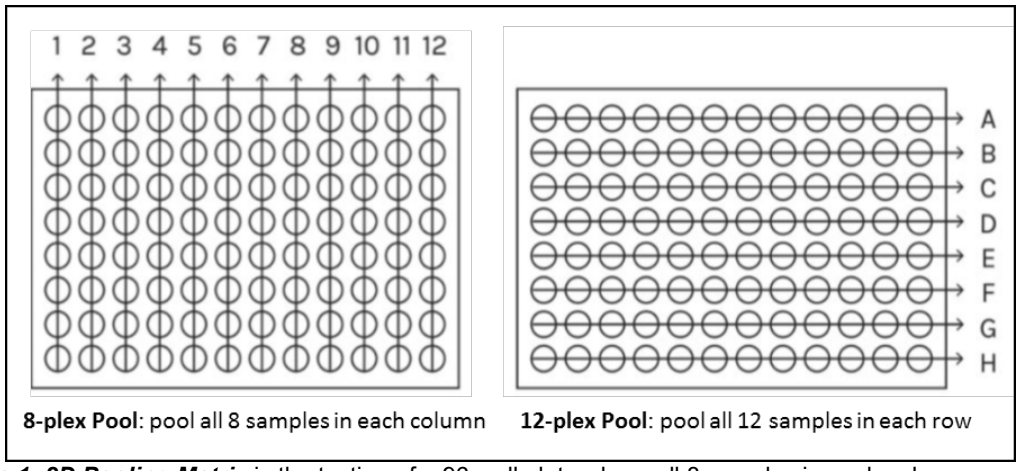

Figure 1: 2D Pooling Matrix is the testing of a 96-well plate where all 8 samples in each column are pooled (8-plex pool) and all 12 samples in each row are pooled (12-plex pool).

The Verily COVID-19 RT-PCR Test includes procedural modifications that compensate for sample dilution during the pooled testing. RNA is isolated from upper respiratory specimens including nasal, mid-turbinate, nasopharyngeal, and oropharyngeal swab specimens using the MagMAX Viral/Pathogen Nucleic Acid Isolation Kit performed on the KingFisher Flex Magnetic Particle Processor with 96 Deep-Well Head (reagents are added in a different order to increase sensitivity). RNA is reverse transcribed to cDNA using the TaqPath 1-Step Multiplex Master Mix and subsequently amplified using the 7500 Dx Fast Real-Time PCR with SDS Software v1.4.1 or QuantStudio 5 Real-Time PCR Instrument 384-well block with QuantStudio Design and Analysis Desktop Software v1.5.1 (increased template volume for higher sensitivity).

During the amplification process, the probe anneals to the three specific target sequences located between the forward and reverse primers. During the extension phase of the PCR cycle, the 5' nuclease activity of Taq polymerase degrades the bound probe, causing the reporter dye (VIC, ABY, and FAM for the N gene, S gene, and ORF1ab targets, respectively) to separate from the quencher dye, generating a fluorescent signal.

d. Standard Dorfman Pooling

In addition to the 2D matrix pooling, standard Dorfman pooling (up to 12 samples) is implemented based on the previous 2D pooling validation for 12-sample pools. Interpretation of pooled results for both standard Dorfman Pooling and 2D Pooling workflows follow standard practices. Samples in negative pools will be presumed negative and samples in non-negative pools will be individually tested.

INSTRUMENTS USED WITH TEST

The Verily COVID-19 RT-PCR Test is to be used with the following instrumentation:

- Pools are created prior to extraction using the Tecan Fluent GX automated liquid handler with the Tecan FluentControl v2.6 software
- RNA Extraction is performed with the MagMAX Viral/Pathogen Nucleic Acid Isolation on the KingFisher Flex Magnetic Particle Processor with 96 Deep-Well Head
- RT-PCR is performed using one of the following realtime fluorescence PCR instruments:
    - 7500 Dx Fast Real-Time PCR with Sequence Detection System (SDS) Software v1.4.1
    - QuantStudio 5 Real-Time PCR Instrument 384-well block with QuantStudio Design and Analysis Desktop Software v1.5.1

EQUIPMENT, REAGENTS AND MATERIALS

The following equipment/reagents/materials are required to run this test in additional to common laboratory reagents and the consumables for the extraction and PCR process:

- Optional: Verily COVID-19 Nasal Swab Kit for self-collection
- Applied Biosystems 7500 Fast Dx Real-Time PCR Instrument
- Applied Biosystems QuantStudio 5 Real-Time PCR Instrument, 384-well Block
- Automated Liquid Handlers
- Centrifuge, with a rotor that accommodates standard and deepwell microplates
- KingFisher Flex 96 Deep-Well Heating Block
- KingFisher Flex Magnetic Particle Processor with 96 Deep-Well Head
- MicroAmp Adhesive Film Applicator
- Pipette Controller
- Single and multichannel adjustable pipettors (0.1 µL to 1,000 µL)
- Ethanol, Absolute, Molecular Biology Grade
- MagMAX Viral/Pathogen Nucleic Acid Isolation Kit
- TaqPath 1-Step Multiplex Master Mix (No ROX)
- TaqPath COVID-19 Control Kit

- TaqPath RT-PCR COVID-19 Kit
- COVID-19 Real Time PCR Assay Multiplex (ORF1ab, N gene, S gene, MS2)

VERILY COVID-19 NASAL SWAB KIT ACQUISITION, SAMPLE COLLECTION AND RESULTS PROCESSING

Contracting organizations first request that participants complete a detailed consent form prior to testing. The consent form is accessed through the Verily website (www.healthy.verily.com). Upon completion of the consent form, individuals who request the Verily COVID-19 Nasal Swab Kit for self-collection of nasal swabs complete an eligibility questionnaire (available on the Verily website) at home or on-site (e.g. workplace, school, etc.). The eligibility questionnaire collects information for the ordering physician and adheres to the CDC COVID-19 screening guidelines. In addition, the eligibility questionnaire collects necessary information on exposure, symptoms, and risk for reporting to relevant authorities. Individuals who are experiencing severe symptoms to the point of requiring medical attention are not eligible for testing but are advised to seek immediate medical assistance. The Verily COVID-19 Nasal Swab Kit can only be provided to the individual after completion of the questionnaire and subsequent consultation with the ordering physician. An individual has access to 2 different versions of the Verily COVID-19 Nasal Swab Kit with one version that allows the individual to write the date/time of specimen collection on the label sheet and with one version that automatically tracks the date/time of specimen collection when the individual digitally activates the kit with the activation code on the label sheet. Once an individual collects their sample, they ship their sample following the instructions for use in the Verily COVID-19 Nasal Swab Kit.

The Verily platform is integrated with PWNHealth (www.pwnhealth.com), a national Physician Network. While all laboratory processes are run by Verily, the medical interactions are handled by the physician. This includes clinician review and approval of each test ordered and clinical contact with patients after testing is completed. Test results from the Verily COVID-19 RT-PCR Test (including those that used the Verily COVID-19 Nasal Swab Kit) are communicated back to patients via electronic communication to the ordering physician, who will communicate results to the patient as appropriate. Test results can also be securely viewed by the patients via Verily's website (www.healthy.verily.com) or a comparable service that integrates with the laboratory or physician network.

CONTROLS TO BE USED WITH THE COVID-19 RT-PCR

Table 1. Assay Controls Run with Each Test

Control Type	Purpose	Frequency of Testing
Negative Control	To monitor for cross-contamination during RNA extraction and RT-PCR	Once per extraction plate
Positive Control	To monitor the integrity of the RT-PCR reagents and process	Once per run of RT-PCR
Internal (MS2 Phage)	To monitor the integrity of	Added to each specimen

Control	nucleic acid extraction and RT-PCR for each specimen	and the Negative Control prior to extraction
No Template Control (NTC)	To monitor for contamination of extraction and assay reagents	Once per run of RT-PCR

- **Negative Control:** The negative control monitors for any potential cross-contamination that could occur during the nucleic acid extraction process or RT-PCR assay. Molecular grade, nuclease free water is used in place of sample nucleic acid for this control. This control is added to each KingFisher extraction run and carried through RT-PCR.
- **Positive Control:** The TaqPath COVID-19 Control (1 x 10^4 copies/µL) is used as positive control and serves as an amplification control for the ORF1ab, N gene, and S gene amplicon sequences. This control is included in every PCR run and only included in the RT-PCR reaction. The positive control is used to verify proper assay set-up and SARS-CoV-2 reagent integrity. The positive control will be used to confirm near the test LoD.
- **Internal (MS2 Phage) Control:** The internal MS2 phage control serves as an internal process control for nucleic acid extraction to ensure that clinical samples and controls contain sufficient and acceptable quality RNA to be used in the RT-PCR reactions.
- **No Template Control (NTC):** The no template control is molecular-grade, nuclease-free water and is used to monitor non-specific amplification, cross-contamination during PCR setup, and nucleic acid contamination of PCR reagents. This control is included once in each RT-PCR run.

INTERPRETATION OF RESULTS

All test controls should be examined prior to interpretation of patient results. If the controls are not valid, the patient results cannot be interpreted. Result interpretation for patient samples was established based on a cutoff of Ct ≤37 for SARS-CoV-2 target.

a. Control Result Interpretation

Assess all test controls prior to interpretation of patient results. If the controls are not valid, the patient results cannot be interpreted. Any target with a Ct≤37 is positive and any target with a Ct>37 is negative. Refer to **Table 2** for a summary of control results.

Table 2. Expected Results of Controls

Control	**Ct Value**			
	N Gene	**S Gene**	**ORF1ab**	**MS2 Phage**
Negative Extraction Control	Undetermined [1]	Undetermined [1]	Undetermined [1]	≤37
Positive Control	≤37	≤37	≤37	Undetermined [2]

No Template Control	Undetermined [1]	Undetermined [1]	Undetermined [1]	Undetermined [2]
MS2 Internal Control	Any	Any	Any	≤37

[1] Undetermined (Not detectable Ct; negative)
[2] The MS2 Phage Internal Control is not added to the Positive Control or No Template Control and no signal should be obtained.

- **Negative Extraction Control:** The negative extraction control is processed with each batch of samples. The negative control should only show an amplification curve for MS2 with a Ct≤37 but must be negative for all SARS-CoV-2 targets (Ct undetermined).
- **Positive Control:** The positive control must be positive for all three SARS-CoV-2 targets, i.e., the ORF1ab, the N Protein, and the S Protein genes and amplification must have a Ct≤37 in order for the test result to be valid. The positive control does not contain MS2.
- **No Template Control:** The negative control must be negative for all targets (undetermined; no detectable Ct value) for the test result to be valid.
- **MS2 Internal Control:** MS2 in a patient result indicates that PCR amplification occurred in the well. The presence of MS2 and no detectable SARS-CoV-2 during the analysis indicates that proper RNA extraction and amplification occurred, however, no SARS-CoV-2 is present. If the SARS-CoV-2 is present in the specimen, amplification of the target RNA may be reduced or abrogate MS2 amplification. In this case, the amplified SARS-CoV-2 targets indicate proper RNA extraction and amplification. Therefore, MS2 may or may not be detectable in a valid positive test on patient specimens.

b. Examination and Interpretation of Patient Specimen Results

Assessment of clinical specimen test results should be performed after the positive and negative controls have been examined and determined to be valid and acceptable. If the controls are not valid, the patient results cannot be interpreted.

The results of all samples from a given pooled sample plate will only be reported after all positive and/or inconclusive wells on the pooled sample plate have been deconvoluted per the 2D pooling matrix to identify any positive samples through individual testing - including any necessary follow-up testing per Table 3 and 4 below.

Pool Interpretation and Deconvolution:

As described below, the interpretation of the sample pools in the 2D pooling and the extent of the Deconvolution Testing depends on the results of the column-pooled vs. row-pooled samples as well as on the occurrence of individual invalid pools vs. entirely invalid plates. Refer to **Table 3** for guidance on interpretation of pooled sample results.

Interpretation and deconvolution testing of standard Dorfman pooling follows the same result interpretation outlined in **Table 3** below.

- Pooled sample wells for which all three SARS-CoV-2 specific targets (ORF1ab, N, and S) are negative (undetermined) and the MS2 control is also negative (undetermined), the result of the pool is invalid. Re-run all samples included in the invalid pool individually using the unpooled workflow starting from extraction.
- Pooled sample wells for which all three SARS-CoV-2 specific targets (ORF1ab, N, and S) are negative (undetermined) and the MS2 control is positive (Ct≤37), SARS-CoV-2 is not detected in the pooled samples and the following actions occur:
  - For 2D pooled sample plates with positive and/or inconclusive wells, a negative result is reported for all samples in the pool once deconvolution of all pools on the plate is complete.
  - For 2D pooled sample plates that are entirely negative, no deconvolution is needed, and the negative result is reported for all samples on the plate.
  - For standard Dorfman pooling, samples included in pools with negative results will be reported immediately
- Pooled sample wells for which only one of the SARS-CoV-2 specific targets (ORF1ab, N, or S) is positive (Ct≤37), and the MS2 control is positive (Ct≤37) or negative (undetermined), SARS-CoV-2 are SARS-CoV-2 inconclusive pools. All samples within that pool, in combination with other pools derived from the plate, will be retested individually to identify any positive, inconclusive and/or negative samples.
- For pooled sample wells with two or more positive (Ct≤37) SARS-CoV-2 specific target (ORF1ab, N, and S), and the MS2 control is positive (Ct≤37) or negative (undetermined), SARS-CoV-2 is detected in the pool. All samples within that pool, in combination with other pools derived from the plate, will be retested individually to identify any positive, inconclusive and/or negative samples.

Deconvolution Testing: Retest samples indicated by the pool or plate individually using the Verily COVID-19 RT-PCR Test to confirm any positive and/or inconclusive samples. Detailed deconvolution is described in **Figure 2**. If the pooled sample plate contains positive or inconclusive wells that cannot be confirmed, re-testing is performed as outlined below. Sample results for the entire plate are only reported after all deconvolution testing is complete.

Table 3. Interpretation of Pooled Sample Results

ORF1ab	N gene	S gene	MS2	Status	Pool Result	Deconvolution
NEG[1]	NEG[1]	NEG[1]	NEG[1]	Invalid	NA	Individually assay samples in the invalid pool.
NEG[1]	NEG[1]	NEG[1]	POS Ct ≤37	Valid	SARS-CoV-2 Not Detected in Pool	Deconvolution Testing not required for samples in this pool. Report as negative.
Only one SARS-CoV-2 target = POS (Ct≤37)			POS or	Valid	SARS-CoV-2	Deconvolution Testing by individually assaying

	NEG [1]		Inconclusive Pool	samples indicated by the inconclusive pool
Two or more SARS-CoV-2 targets = POS Ct≤37	POS or NEG [1]	Valid	SARS-CoV-2 Detected in Pool	Deconvolution Testing by individually assaying samples indicated by the positive pool

[1] NEG (Ct not detectable or >37, negative)

row pools \ column pools	⊖ ⊖ all pools are negative	⊕ ⊖ one pool positive	⊙ ⊖ one pool inconclusive	⊕ ⊕ multiple pools positive	⊙ ⊙ multiple pools inconclusive	⊕ ⊙ positive and inconcl. pools
⊖ ⊖ all pools are negative	**COMPLETE** no positive samples on plate	**INVALID** assay positive columns	**INVALID** assay inconclusive columns	**INVALID** assay positive columns	**INVALID** assay non-negative columns	**INVALID** assay non-negative columns
⊖ ⊕ one pool positive	**INVALID** assay positive row	**REFLEX** assay candidate	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates and inconclusive columns
⊖ ⊙ one pool inconclusive	**INVALID** assay inconclusive row	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates and inconclusive columns
⊕ ⊕ multiple pools positive	**INVALID** assay positive rows	**COMPLETE** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates and inconclusive columns
⊙ ⊙ multiple pools inconclusive	**INVALID** assay non-negative rows	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates and inconclusive columns
⊙ ⊕ positive and inconcl. pools	**INVALID** assay non-negative rows	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates	**REFLEX** assay candidates and inconclusive columns	**REFLEX** assay candidates and inconclusive columns

Figure 2: The Deconvolution of Pooled Testing (Interpretation Automated by Software) describes the next steps after the testing results of 2D pooling have been captured for both columns and rows. If all pools in the row and column are negative, then testing is complete. If a row or column indicates that all pools are negative, but the associated row or column indicates that one or more pools are either positive

or inconclusive (non-negative), then the pooled test is considered invalid and additional testing will be necessary as described in Table 3. If a row or column indicates that the pools are any mixture of negative, inconclusive or positive, and the associated row or column also indicates that the pools are any mixture of negative, inconclusive or positive, then those pools would be followed up with reflex testing, as described in Table 3.

Individual Sample Interpretation and Result Reporting:

Sample results for the entire plate are only reported after all deconvolution is completed and if all positive, and/or inconclusive wells are confirmed. Individual samples are reported as described in **Table 4** below.

Table 4. Interpretation of Sample Result and Individual Sample Reporting

ORF1ab	N gene	S gene	MS2	Status	Sample Result	Action
NEG[1]	NEG[1]	NEG[1]	NEG[1]	Invalid	NA	Samples that have tested invalid are retested once individually. If retest result is invalid, a new sample is requested.
NEG[1]	NEG[1]	NEG[1]	POS Ct≤37	Valid	SARS-CoV-2 Not Detected	All samples from a negative pool and all samples testing negative during Deconvolution Testing, are individually reported as negative.
Only one SARS-CoV-2 target = POS Ct≤37			POS or NEG[1]	Valid	SARS-CoV-2 Inconclusive	All samples that report an inconclusive result in individual testing will be retested once and if they are retested as inconclusive, they will be reported as inconclusive with the recommendation to obtain a new sample.
Two or more SARS-CoV-2 targets = POS Ct≤37			POS or NEG[1]	Valid	SARS-CoV-2 Detected	All samples that test positive after deconvolution of the pools are reported as positive

[1] NEG (Not detectable Ct or >Ct 37)

PERFORMANCE EVALUATION

1) Limit of Detection (LoD) - Analytical Sensitivity:

a. LoD for Verily COVID-19 RT-PCR Test (unpooled)

i. Tentative LoD Study:

The LoD of the Verily COVID-19 RT-PCR Test was determined using quantified, SARS-CoV-2 viral genomic RNA material obtained from American Type Culture Collection (ATCC, VR-1986D). After initial range titration the preliminary LoD was determined by testing a range of SARS-CoV-2 concentrations, between 90 GCE/mL and 50 GCE/mL, in 10 copy increments. Samples were prepared by spiking SARS-CoV-2 viral genomic RNA into pooled clinical negative, nasopharyngeal swab matrix, and were tested in triplicate. These replicates were individually processed according to the laboratory SOP and tested on both, the Applied Biosystems 7500 Fast Dx and QuantStudio 5 real-time PCR instruments. For both instruments, the initial LoD determination of the unpooled Verily COVID-19 RT-PCR Test was 60 GCE/mL.

ii. Confirmation of the LoD:

The LoD was verified by testing 20 additional extraction replicates consisting of pooled clinical negative, nasopharyngeal swab matrix spiked with SARS-CoV-2 viral genomic RNA at 60 GCE/mL. Samples were spiked with SARS-CoV-2 viral genomic RNA and replicates tested on both instruments according to the laboratory SOP. The LoD of the Verily COVID-19 RT-PCR Test (unpooled workflow) was confirmed at 60 GCE/mL (**Table 5**).

Table 5. Confirmatory LoD Results for the Verily COVID-19 RT-PCR Test at 60 GCE/mL

Rep.	7500 Dx					QuantStudio 5				
	MS2	N Gene	S Gene	ORF1ab	Final Result*	MS2	N Gene	S Gene	ORF1ab	Final Result*
1	24.0	34.2	UND	UND	INC	23.6	33.8	UND	34.8	POS
2	24.0	32.9	UND	33.1	POS	24.0	33.5	37.0	34.6	POS
3	24.1	32.5	32.0	33.8	POS	24.4	33.7	34.4	UND	POS
4	24.1	32.2	32.0	32.1	POS	24.0	33.4	36.9	36.7	POS
5	24.1	32.7	34.2	32.7	POS	24.0	34.6	36.5	38.4	POS
6	24.3	33.0	33.6	32.7	POS	24.1	34.1	36.2	34.5	POS
7	24.1	32.1	UND	32.0	POS	24.1	33.5	37.0	35.2	POS
8	24.4	32.4	31.8	31.8	POS	24.1	33.4	35.0	36.6	POS
9	24.2	32.5	32.6	31.6	POS	23.0	32.8	36.2	34.2	POS
10	24.1	32.4	33.1	33.0	POS	23.9	32.9	34.8	35.5	POS
11	24.2	32.3	UND	33.7	POS	24.1	33.8	35.0	37.5	POS
12	24.2	31.7	34.7	32.3	POS	23.9	33.4	37.4	34.4	POS
13	24.2	33.1	33.0	32.9	POS	24.1	33.3	39.1	39.5	INC

14	24.3	31.9	UND	34.2	POS	24.0	34.0	36.6	36.0	POS
15	24.2	32.3	UND	33.1	POS	24.1	34.3	33.6	33.8	POS
16	24.3	32.2	33.9	33.1	POS	23.9	33.2	33.8	35.1	POS
17	24.0	31.8	32.1	32.5	POS	23.3	33.6	33.2	34.4	POS
18	24.2	32.3	33.6	31.6	POS	23.8	33.6	34.0	36.1	POS
19	24.2	32.5	34.2	31.8	POS	23.8	32.9	36.6	35.1	POS
20	24.3	32.2	UND	32.0	POS	23.8	33.2	37.3	36.2	POS
Mean	**24.2**	**32.5**	**33.1**	**32.6**	n/a	**23.9**	**33.5**	**35.8**	**35.7**	n/a
Positive/ Valid	**20/20**	**20/20**	**14/20**	**19/20**	**19/19**	**20/20**	**20/20**	**16/20**	**17/20**	**19/19**
Hitrate	**100 %**	**100 %**	**70%**	**95%**	**100%**	**100%**	**100 %**	**80%**	**85%**	**100%**

***Final result based on interpretation table (Table 7)**
UND: Undetermined Ct (no detectable Ct in any SARS-CoV-2 targets);
INC: Inconclusive (one target positive); and **POS**: Positive (two or more target positive)

b. LoD for the Verily COVID-19 Nasal Swab Kit

i. Tentative LoD Study:

The limit of detection of the Verily COVID-19 RT-PCR Test with specimens collected using the Verily COVID-19 Nasal Swab Kit was evaluated using a matrix of negative anterior nares swabs collected in 3 mL 0.9% saline, to match the site and transport solution used by this device. The limit of detection of the assay, when using a VTM matrix, was previously determined to be 60 GCE/mL, using both the ABI 7500 and QuantStudio 5.

ii. Confirmation of the LoD:

The LoD was confirmed by testing 20 extraction replicates consisting of pooled clinical negative anterior nares swabs collected in 0.9% saline spiked with SARS-CoV-2 viral genomic RNA at 60 GCE/mL. Samples were processed on the ABI 7500. The LoD of the Verily COVID-19 RT-PCR Test (unpooled workflow) was confirmed at 60 GCE/mL with saline matrix (**Table 6**).

Table 6. Confirmatory LoD in Saline Collected Nasal Swab Matrix

Replicate	MS2	N Gene	S Gene	ORF1ab	Final Result
Mean	21.8	31.8	33.7	31.4	n/a
Positive/Valid	20/20	20/20	20/20	20/20	20/20
Hitrate	100%	100%	100%	100%	100%

c. LoD for 2D and Standard Dorfman Pools(up to n=12) with Verily COVID-19 RT-PCR Test

When samples are in 8-plex pools, the LoD for any one sample is expected to be 8X higher (480 GCE/mL) and in 12-plex pools, the LoD for any one sample would be 12X

higher (720 GCE/mL). Accordingly, the LoDs as performed in Verily's laboratory for the modified and unmodified TaqPath COVID-19 Combo Kit compare as follows:

Table 7. LoD Comparison of the Unmodified and Verily Modified Workflows for the ThermoFisher TaqPath COVID-19 Combo Kit.

Test	Patient Sample Input into RNA extraction (µL)	Elution volume of RNA extraction (µL)	Extracted RNA Input into RT-PCR (µL)	LoD in patient sample (GCE/mL)
ThermoFisher TaqPath COVID-19 Combo Kit (SOP 1)	400	50	5	250
ThermoFisher TaqPath COVID-19 Combo Kit (SOP 2)	200	50	10	250
Verily Unpooled	400	50	17.5	60
Verily Pooled (8-plex column pools)	50 (400 ÷ 8)	50	17.5	480[1] (60×8)
Verily Pooled (12-plex row pools)	33 (400 ÷ 12)	50	17.5	720[1] (60×12)
[1] 480 and 720 GCE/mL were calculated values, not values generated from actual wet testing.				

The standard Dorfman pooling workflow is the 12-plex pools of the 2D pooling workflow but analyzed as Dorfman pools instead of 2D matrix pools. Hence, the LoD listed under the 2D matrix pooling (12-plex row pools) can be leveraged for standard Dorfman Pooling.

2) Analytical Inclusivity/Specificity:

a. Inclusivity

The Verily COVID -19 RT-PCR Test utilizes the primers and probes included in the ThermoFisher TaqPath COVID-19 Combo Kit. In silico testing of the SARS-CoV-2 assay was previously performed by ThermoFisher as part of their EUA authorization (EUA authorized March 13, 2020) and this information has been provided in the FDA authorized EUA granted to this manufacturer. ThermoFisher provided a Right-to-Reference letter to Verily allowing the reference to their EUA data package.

b. Cross-Reactivity

In silico testing of the SARS-CoV-2 assay was previously performed by ThermoFisher as part of their EUA authorization (EUA authorized March 13, 2020) and this information has been provided in the FDA authorized EUA granted to this manufacturer. ThermoFisher provided a Right-to-Reference letter to Verily allowing the reference to their EUA data package.

3) Clinical Evaluation:

a. Detection Study of Unpooled Workflow

The *Detection Study* establishes accurate detection of positive and negative nasopharyngeal swabs when samples are tested individually with the Verily COVID-19 RT-PCR Test (unpooled workflow). The performance of the Verily COVID-19 RT-PCR Test (unpooled workflow) was evaluated using:

- 35 unique positive patient clinical samples
- 30 unique negative patient clinical samples

All clinical samples were tested for SARS-Cov-2 with the ThermoFisher TaqPath COVID-19 Combo Kit (EUA authorized March 13, 2020) as the comparator using the standard EUA authorized workflow on both, the Applied Biosystems 7500 Fast Dx and QuantStudio 5 real-time PCR instruments. Note that one sample was positive on the 7500 Fast Dx, but inconclusive on the QuantStudio 5 tested with the comparator. Samples were tested randomized and blinded using the Verily COVID-19 RT-PCR (unpooled workflow). Testing was performed on both, the Applied Biosystems 7500 Fast Dx and QuantStudio 5 real-time PCR instruments.

All 30 clinically negative samples tested negative in the Verily COVID-19 RT-PCR unpooled workflow on both PCR instruments.
All 35 positive samples tested positive in the Verily COVID-19 RT-PCR unpooled workflow on both PCR instruments including the sample that was previously tested as *inconclusive* with the comparator on the QS5 (**Table 8**). Ct correlation plots between the comparator and the Verily COVID-19 RT-PCR unpooled workflow for the 35 positive samples on both 7500 Fast Dx and QuantStudio 5 are shown in **Figure 3**. Results from the unpooled detection study are summarized in **Tables 8-9**.

Table 8. Clinical Validation Verily COVID-19 RT-PCR Test Results Using the Unpooled Workflow Compared to an EUA Authorized Comparator Test.

		EUA authorized Comparator (matched instrument)			
		Positive	**Inconclusive**	**Negative**	**Total**
Verily	**Positive**	35	0	0	35

Unpooled ABI 7500	**Inconclusive**	0	0	0	0
	Negative	0	0	30	30
	Total	35	0	30	65
	PPA: 35/35 = 100% (95% CI: 90.1–100%)				
	NPA: 30/30 = 100% (95% CI: 88.7–100%)				
Verily Unpooled QS5	**Positive**	34	1*	0	35
	Inconclusive	0	0	0	0
	Negative	0	0	30	30
	Total	**34**	1	30	65
	PPA: 34/34 = 100% (95% CI: 89.9–100%)				
	NPA: 30/30 100% (95% CI: 88.7–100%)				

* Because this sample was positive for one target but negative for the other two targets, it was excluded from the performance calculation.

In total, 35 unique positive samples were tested through the unpooled workflow of the Verily COVID-19 RT-PCR Test. The percent positive agreement (PPA) of the Verily COVID-19 RT-PCR Test when compared to the EUA authorized comparator was 100% (95% CI: 90.1-100% for ABI 7500 and 89.9-100% for QS5) and the NPA was 100% (95% CI: 88.7-100%) on both instruments.

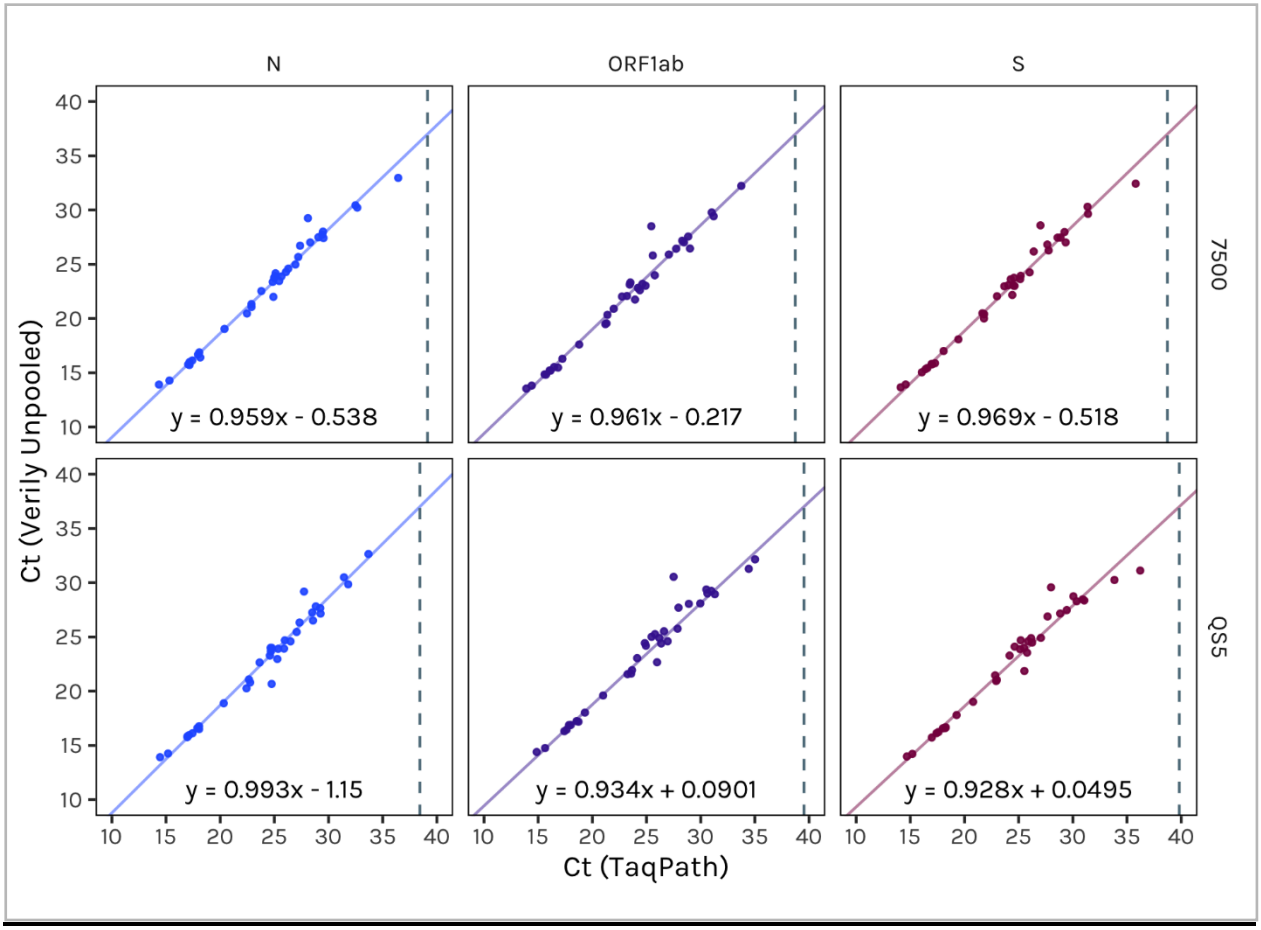

Figure 3. Clinical remnant samples analyzed by Comparator and Verily COVID-19 RT-PCR unpooled workflow on both the 7500 Fast Dx (7500 – top set of 3 graphs, one each for the N, ORF1ab, and S gene targets) and QuantStudio 5 (QS5 – bottom set of 3 graphs, one each for the N, ORF1ab, and S gene targets). Each Graph plots the Ct of the comparator (x-axis) against the Ct of the Verily COVID-19 RT-PCR for unpooled specimens. The diagonal line on each graph is the Passing-Bablok regression line; the vertical dashed line on each graph shows the equivalent Comparator Ct when the regression equation (displayed on chart) is solved for a Ct of 37.

Table 9. Passing-Bablok Regression of Verily COVID-19 RT-PCR Test (Unpooled) vs. Comparator

Instrument	Gene	Slope (95% CI)	Intercept (95% CI)	Equation	eqn solved for y=37	Ct shift
7500	N	0.959 (0.927, 0.997)	-0.538 (-1.429, 0.071)	y = 0.959x - 0.538	39.14	-2.14
	ORF1ab	0.961 (0.934, 0.984)	-0.217 (-0.811, 0.288)	y = 0.961x - 0.217	38.73	-1.73
	S	0.969 (0.927, 1.005)	-0.518 (-1.28, 0.342)	y = 0.969x - 0.518	38.73	-1.73

QS5	N	0.993 (0.949, 1.028)	-1.15 (-1.957, -0.235)	y = 0.993x - 1.15	38.43	-1.43
	ORF1ab	0.934 (0.899, 1.004)	0.09 (-1.299, 0.9)	y = 0.934x + 0.0901	39.53	-2.53
	S	0.928 (0.874, 0.997)	0.049 (-1.334, 1.185)	y = 0.928x + 0.0495	39.83	-2.83

b. Preliminary Clinical Sample Pooling Validation Study

Study Design:

The *Detection Study* of the -pooled workflow establishes accurate detection of positive and negative upper respiratory tract (URT) swab samples when samples are tested with the Verily COVID-19 RT-PCR Test using the pooled workflow, with pools containing up to 12 individual patient samples collected in saline or VTM. The performance of the Verily COVID-19 RT-PCR pooled workflow was evaluated using:

- 40 negative 12-plex pools (12 negative URT swab samples)
    - Due to sample limitations, 65 negative samples were used to construct the 40 combination-unique pools.
- 26 12-plex pools containing 1 positive URT swab sample and 11 negative URT swab samples in saline. Each of the negative samples used was unique thus 286 (11negativs x 26 pools) negatives were used with 26 unique positives to create the 26 independent positive pools.

All clinical samples were tested for COVID-19 individually with a highly sensitive EUA molecular assay (i.e., the Verily COVID-19 RT-PCR Test) using the standard (un-pooled) workflow. Twenty-six (26) positive samples, which included samples exhibiting a wide a range of viral loads, and of which at least 25% were weak positives (individual samples with a Ct value within 3 cycles of the average Ct at the LoD) were evaluated.

Pools were then created by one operator and a second operator performed the testing blinded to the sample composition in the pool according to the Laboratory SOP.

Results:

All 40 12-plex pools without any positive samples tested negative. All 12-plex pools that included one subject assay COVID-19 positive URT swab sample and 11 negative URT swab samples VTM tested positive by the Verily COVID-19 RT-PCR Test, except for four (4) pools, each of which contained a weak positive sample, as defined above. The results are presented in **Table 10**.

Table 10. Results of Preliminary Clinical Sample Pooling Validation Study

		Verily COVID-19 Test (Individually Tested)		
		Positive	Inconclusive	Negative
Verily COVID-19 Test 12-plex pools	Positive	22	0	22
	Inconclusive	0	0	0
	Negative	4[1]	0	44
	PPA (95% CI)	**84.6% (66.5-93.9%)**		
	NPA (95% CI)	**100% (91.24-100%)**		

[1] The 4 false negative pools all contained a weak positive sample.

In total, 26 unique positive samples in pools and 40 unique negative sample pools were tested through the pooled workflow of the Verily COVID-19 RT-PCR Test. For 12-sample pools, this assay has a positive percent agreement (sensitivity) of 84.6% (95% CI: 66.5% to 93.9%) and a negative percent agreement (specificity) of 100% (95% CI: 91.24% to 100%).

c. *In silico* Analysis of Historical Data

To evaluate the potential effect of up to 12-sample pooling on clinical performance with the Verily COVID-19 RT-PCR Test, *in silico* analyses were conducted using historical data for individually tested, positive URT swab samples. In this analysis, a mean Ct shift for each target (N-gene target=3.81; S-gene target=4.46; ORF1ab-gene target=3.69) was calculated based on data generated from the preliminary clinical sample pooling validation study and additional wet testing of dilutions of a positive clinical sample, in replicates. Intervals (or zones) were then constructed using the mean Ct at LoD value and the Ct shift for each target to estimate the probability of detection of a sample in a n-1 sample pool, based on the Ct score of the sample when tested individually. These intervals/zones were applied to the individual sample positive results from a historical dataset to determine the percentage of individual sample positive results that would be expected to remain positive upon 12-sample pooling. A total of 961 historical individual sample positive results were used in this analysis to determine a conservative estimate of PPA at 86.0% (95% CI: 83.0% - 88.0%).

d. Sample Position Study

The *Sample Position Study* validates the correct identification of those individual 2D pools that require deconvolution and reflex testing of individual samples in order to identify positive samples. All clinical samples were tested individually for COVID-19

with the ThermoFisher TaqPath COVID-19 Combo Kit (EUA authorized March 13, 2020). Plates were set up by one operator and then transferred to a blinded second operator for testing so that the position of the positive samples on the plate was unknown to the operator. After the extraction, sample pools were created by pooling down a column of a 96 well plate (8-plex) and across a row of a 96 well plate (12-plex). See **Figure 2** for more details of the pooling process. When pooling down a column (8-plex), 50 µL of each sample are combined. When pooling across a row (12-plex) 33 µL of each sample are combined. The deconvolution performance of the Verily COVID-19 RT-PCR Test was evaluated by running four representative plate scenarios consisting of previously tested positive and negative clinical samples; testing was performed on both, the Applied Biosystems 7500 Fast Dx and QuantStudio 5 real-time PCR instruments using the same extracted RNA:

- Two positive samples in two different rows or columns (Plate 1, (**Figure 4**)
  The known positive sample well positions for Plate 1 were H1 and F6.
- Zero positive samples in a plate (Plate 2, **Figure 5**)
- Two positive samples in the same row or column (Plate 3; **Figure 6**)
  The known positive sample well positions for Plate 3 were E1 and E9
- One positive sample in a plate (Plate 4; **Figure 7**)
  The known positive well position for Plate 4 was G8

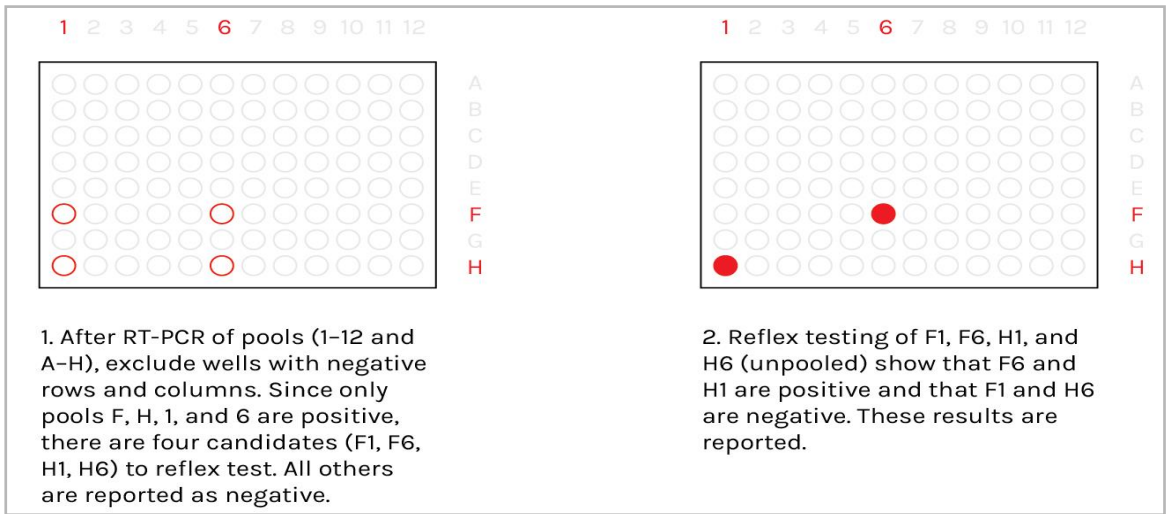

Figure 4. Illustration of a plate that contains two positive samples in two different rows or columns. Plate 1 is the RT-PCR results of pooled samples which include wells 1-12 (columns) and A-H (rows) of the 96 well plate. Since F, H, 1 and 6 are the only pools positive, there are only four wells (F1, F6, H1, H6) that are candidates for the reflex test. All others on the plate are reported as negative. Reflex testing of F1, F6, H1 and H6, all unpooled, show that F6 and H1 are positive and that F1 and H6 are negative. These results are reported.

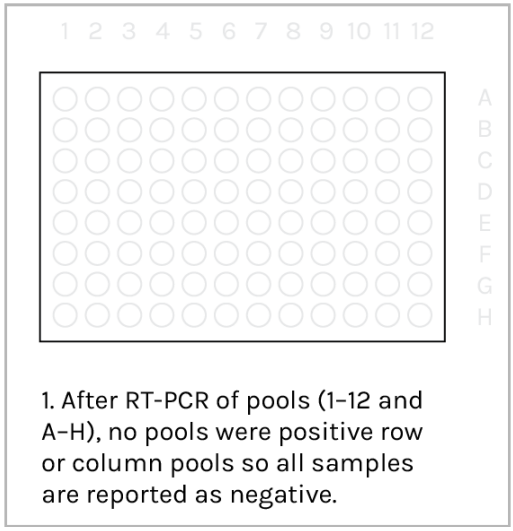

Figure 5. Illustration of a plate that contains zero positive samples in a plate. Plate 2 is the RT-PCR results of pooled samples which include wells 1-12 and A-H of the 96 well plate. This place contains no row or column pools that were positive so all samples are reported as negative.

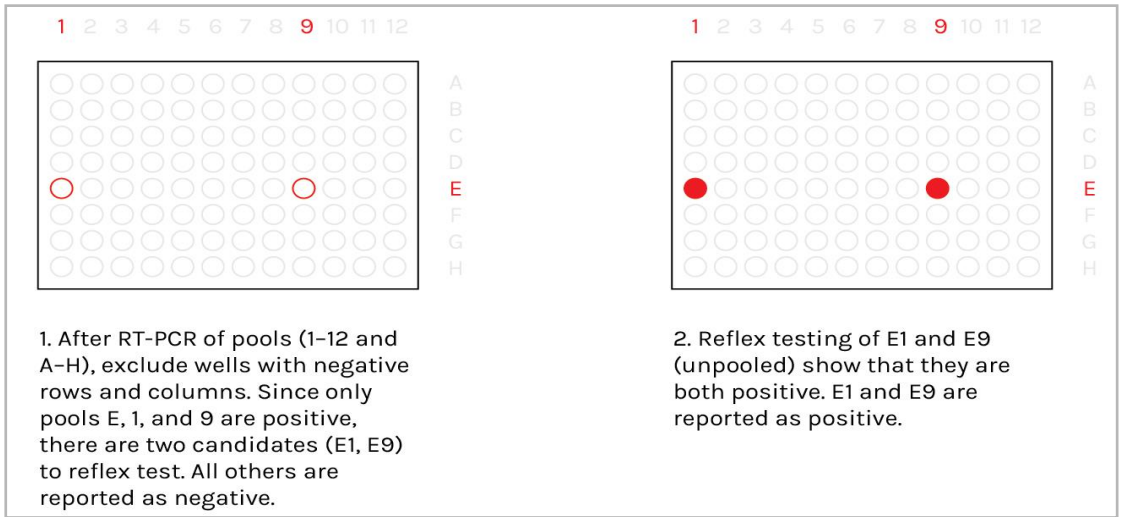

Figure 6. Illustration of a plate that contains two positive samples in the same row. Plate 3 is the RT-PCR results of pooled samples which include wells 1-12 and A-H of the 96 well plate. Since 1 and 9 in row E are the only pools positive, there are only two wells (E1, E9) that are candidates for the reflex test. All others on the plate are reported as negative. Reflex testing of E1 and E9, unpooled, show that E1 and E9 are both positive. These results are reported.

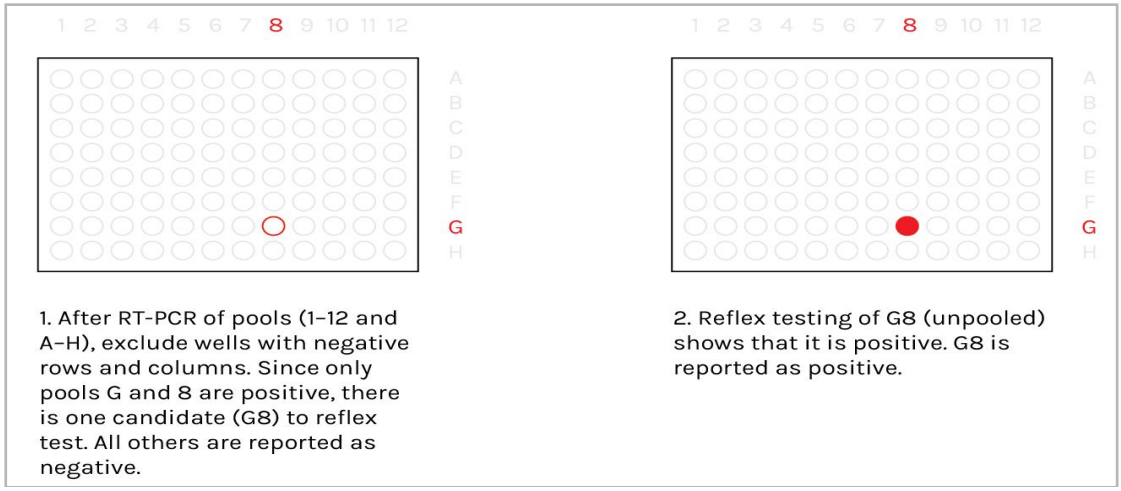

Figure 7. Illustration of a plate that contains one positive sample in the plate. Plate 4 is the RT-PCR results of pooled samples which include wells 1-12 and A-H of the 96 well plate. Since 8 in row G is the only positive pool, there is only one well (G8) that is a candidate for the reflex test. All others on the plate are reported as negative. Reflex testing of G8, show that G8 is positive. These results are reported.

Results are summarized in **Tables 11 and 12**.

Table 11. Sample Position Study: Sample Detection Pool Summary Results

Plate Number	Pool	7500 Dx Ct				QuantStudio 5 Ct			
		MS2	S gene	N gene	ORF1ab	MS2	S gene	N gene	ORF1ab
Plate 1	F	24.2	24.1	24.1	23.8	24.6	24.2	24.1	23.8
	H	24.2	21.9	22.0	21.8	24.2	22.1	22.0	21.8
	1	23.9	21.3	21.2	21.0	24.2	21.3	21.1	21.0
	6	24.2	23.5	23.5	23.3	24.1	23.5	23.4	23.2
	other pools[2]	24.2	UND[1]	UND[1]	UND[1]	24.4	UND[1]	UND[1]	UND[1]
Plate 2	all pools[2]	24.6	UND[1]	UND[1]	UND[1]	24.7	UND[1]	UND[1]	UND[1]
Plate 3	E	24.8	25.8	25.9	25.7	25.1	25.9	25.8	25.7
	1	24.8	27.4	28.6	27.3	25.1	27.5	28.3	27.3
	9	24.5	25.8	25.6	25.6	24.8	25.8	25.5	25.5
	other pools[2]	24.6	UND[1]	UND[1]	UND[1]	24.7	UND[1]	UND[1]	UND[1]
Plate 4	G	24.5	28.1	28.4	27.9	24.8	28.2	28.3	28.0
	8	24.2	26.5	26.6	25.3	24.5	26.6	26.6	25.4
	other pools[2]	24.4	UND[1]	UND[1]	UND[1]	24.6	UND[1]	UND[1]	UND[1]

[1] UND: Undetermined Ct (Not detectable Ct)
[2] Ct values in this row are means

Table 12. Sample Position Study: Sample Detection Reflex Summary Results

Plate Number	Known Positive Samples	Detected Positive Positions	7500 Dx Ct				QuantStudio 5 Ct			
			MS2	S gene	N gene	ORF1ab	MS2	S gene	N gene	ORF1ab
Plate 1	H1, F6	H1	25.1	13.1	15.0	13.5	25.0	13.7	15.9	15.6
		F6	24.6	14.6	16.3	15.0	24.3	15.4	17.4	17.5
Plate 2	None	None	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Plate 3	E1, E9	E1	24.3	18.2	22.5	19.7	24.3	19.1	23.2	22.4
		E9	23.8	17.2	18.9	17.5	24.0	17.9	19.8	19.7
Plate 4	G8	G8	24.2	19.4	21.5	20.2	24.2	20.2	22.5	22.0

e. Monitoring Plan for 2D and Standard Dorfman Pooling

A. Determine if pooling is appropriate

- At positivity rates less than 10%, the matrix pooling workflow employed by the Verily COVID-19 RT-PCR Test improves efficiency relative to the unpooled workflow.
- The historical positivity rate of individual samples P(individual) tested by the Verily lab is <1% (0.29%).
- The Lab Director is responsible for deciding the appropriate pooling workflow depending upon the ongoing positivity rate and operational factors. When considering pooling strategies, the Lab Director will consider the appropriateness of the pooling strategy based on the positivity rate in the testing population, efficiency of the pooling workflow, and Positive Percent Agreement (PPA) for the desired pool size. For Dorfman pooling, an appropriate pool size may be selected based on the positivity rate using **Table 13** as a guide.

Table 13. Dorfman Pooling Efficiency Guide (Example Calculation).

P, percent of positive subjects in the tested population	$n_{maxefficiency}$ (n corresponding to the maximal efficiency)	Efficiency of n-sample pooling (a maximum increase in the number of tested patients when Dorfman n-pooling strategy used)
1%	11	5.11
2%	8	3.65

3%	6	3.00
4%	6	2.60
5%	5	2.35
6%	5	2.15
7%	4	1.99
8%	4	1.87
9%	4	1.77
10%	4	1.68
11%	4	1.61
12%	4	1.54
13%	3	1.48
14%	3	1.43
15%	3	1.39
16%	3	1.35
17%	3	1.31
18%	3	1.28
19%	3	1.25
20%	3	1.22
21%	3	1.19
22%	3	1.16
23%	3	1.14
24%	3	1.12
25%	3	1.10

B. During application of pooling strategy

- The two-week moving (rolling) average of the positivity rate of samples through the pooling workflow P(pools) will be monitored.
- If P(pools) is >5% then a study to reassess pooling (Part D) will be performed.
- Every two weeks 20 diluted positive samples at 3x LoD (i.e., 750 copies/mL) will be tested through the pooling workflow (both, 8 plex and 12 plex, randomly tested

with Patient samples including deconvolution). Operators will be blinded to the identity of these positive samples. If less than 19 (95%) of the diluted positive samples are detected, then a re-assessment of pooling will occur (Part D).

C. Initial assessment of pooling

- Patient samples will be individually tested until at least 20 positives have been obtained or a total of 2000 patient samples have been tested individually. If after testing 2000 patient samples individually, 20 positives have not been obtained, then the most recent consecutively collected historical positives, identified through individual testing, will be used to supplement positive samples for a total of 20 total positives.
- If the P(individual) is >10% then pooling will be ceased until P(individual) decreases to ≤10%.
- If P(individual) is ≤10% then pooling can commence if the PPA requirements outlined below are achieved.
- The twenty individual samples with positive results, when tested individually, will each be pooled with 11 randomly selected negative samples. The resulting 20 pools, each consisting of 1 positive sample and 11 negative samples will be tested.
- If the PPA is ≥85% between the positive samples when assayed pooled and individually, then pooling will resume.
- If the PPA is <85% between positive samples when assayed pooled and individually, then samples will continue to be tested individually until at least 50 positive samples are obtained.
- After obtaining at least 50 positive samples, when tested individually, each positive sample will be pooled with 11 randomly selected negative samples. The resulting 50 pools, each consisting of 1 positive sample and 11 negative samples will be tested.
- If the PPA is ≥85% (positive samples tested pooled compared to their individual testing results) pooling will commence. If the PPA is <85%, pooling will not commence.

D. Re-assessment of pooling

- Pooling will be reassessed when triggered by Part B and performed as in Part C, except that patient samples will be individually tested until at least 10 positives have been obtained or a total of 1000 patient samples have been tested individually. If after testing 1000 patient samples individually, 10 positives have not been obtained then the most recent consecutively collected historical positives, identified through individual testing, will be used to supplement positive samples for a total of 10 total positives. If the PPA is <85% (i.e., more than one sample is missed), individual testing will continue until another 10 positive samples are collected. PPA will be calculated for the combined total of 20 samples. If the PPA is <85% (i.e., more than two samples are missed), individual testing will continue until 50 positives are obtained. If after obtaining 50 samples the PPA is <85% pooled testing will be ceased.

4) Verily COVID-19 Nasal Swab Kit for Home Collection:

a. Stability of Samples Collected with the Verily COVID-19 Nasal Swab Kit

The Verily COVID-19 Nasal Swab Kit uses foam or wrapped polyester nasal swabs transported in 0.9% saline expected to be received back for processing within 98 hours from the time of sample collection. These claims are supported by the results of 20 negative, 40 contrived low positive (2x LoD) and 20 contrived high positive (10x LoD) upper respiratory samples exposed to both winter and summer temperature cycling and tested with the Verily COVID-19 RT-PCR Test. The results demonstrated stability of samples collected using the Verily COVID-19 Nasal Swab Kit up to 104 hours.

b. Usability Study

A usability study was performed to demonstrate that the Verily COVID-19 Nasal Swab Kit could be used safely and effectively by the intended users, for the intended uses, and in the intended use environments. A total of 35 participants were selected to represent the general adult population, including a mix of ages and education levels. All participants were over age 18.

Exclusion criteria included having prior medical or laboratory training, having prior experience with self-collection, having contact with people with known cases of COVID-19, having COVID-19 symptoms, and being an employee of Verily.

Overall, the results indicated that users could successfully complete safety-critical tasks associated with use of the kit. 35/35 participants successfully completed safety critical tasks associated with collecting a nasal swab. Samples for 35 participants were received in the lab. One sample was found to be low on saline solution (this was determined to have been an error in manufacturing) and another was found to have the wrong date on the label sheet (as a result of a participant error). As a result, 34/35 samples were analyzed in the lab and all 34 were found to have detectable levels of RNAse P which was run in duplicates to determine sufficient material was collected by the participants (See **Table 14**).

Table 14. RNase P Ct Values from Samples Collected During the Usability Study

Sample Number	**RNase P (reaction 1)**	**RNase P (reaction 2)**	**Positive RNase P call**
Ct Range	**21.6-32.0***	**21.2-32.4***	**34/34**
Ct Mean	**25.1**	**24.9**	
Ct Median	**25.0**	**24.9**	

* Only one sample of the 34 included samples in the study was detected with an RNase P value of 32 All other values were ≤ 26.9 Ct.

c. Testing of RNase P Control for Unobserved Self-Collection

RNase P testing is not part of the Verily COVID-19 RT-PCR test. Therefore, as a Condition of the Authorization received by Verily Life Sciences on December 18, 2020

self-collected samples were individually tested with the Verily COVID-19 RT-PCR test (unpooled workflow) and with a separately run RNase P test until a minimum of 5,000 self-collected specimens demonstrated a valid rate (due to a positive RNase P result) ≥ 99.90% or a 95% confidence interval of 99.44% to 99.98%.

Of the first 5,386 accessionable samples collected with the Verily COVID-19 Nasal Swab kit (without HCP supervision) and tested for the presence of RNase P, 5/5,386 (0.09%) had no detectable RNase P, which is less than the 0.1% threshold acceptance criterion. As a result, the adequacy of specimens collected with the Verily COVID-19 Nasal Swab kit was demonstrated and Verily Life Sciences can discontinue testing for RNase P with samples self-collected from home.

d. Human Usability Study (Digital Activation)

Two usability studies were conducted. Both studies were remote, moderated studies conducted over Google Meet. No samples were taken or returned; these were purely to test the online kit registration. For both studies, participants were shipped prototype kits with all physical components. Participants had access to a digital version of the Instructions For Use (IFU) on their computers. Participants also had access to a prototype version of the online portal used for activating the test kit. Participants were observed over video teleconference. For both studies, a total of five (5) participants were selected, including a mix of ages (from 18 to 74) and education levels. None of the participants had prior medical or laboratory training or prior experience with nasal swab/sample collection.

- ***Healthy@Work Online Activation Usability Study#1***. The purpose of the study was to assess the online registration/digital activation for the Verily COVID-19 Nasal Swab Kit. The study reviewed the usability and/or comprehension of the instructions for use and digital activation on the online portal. The study also reviewed if the participants were able to successfully fill out the label sheet, label the sample tube and activate the kit.
  Overall, participants found the online activation process to be clear and easy to complete. The participants were also able to successfully fill out the label sheet and label the sample tube using the instructions provided. The observations from this study triggered only minor changes to the language in the instructions for use and the online activation website's user interface.

- ***Healthy@Work Online Activation Usability Study #2***. The purpose of the study was to assess the updated instructions (after usability study #1) for online registration/digital activation for the Verily COVID-19 Nasal Swab Kit. The study reviewed the usability and/or comprehension of the instructions for use and digital activation on the online portal. The study also reviewed if the participants were able to successfully fill out the label sheet, label the sample tube and activate the kit.
  Overall, participants found the online activation process to be clear and easy to complete. The participants were also able to follow the updated IFU and their

screens to successfully fill out the label sheet and label the sample tube. The observations from this study triggered only minor updates to the IFU and the kit.

WARNINGS:

- For in vitro diagnostic Use.
- Prescription Use (Rx) only.
- For use under Emergency Use Authorization (EUA).
- Members of the infectious disease laboratory will be trained to perform this assay and competency will be assessed and documented per CAP regulations.
- This product has not been FDA cleared or approved, but has been authorized for emergency use by FDA under an EUA for use by the authorized laboratory;
- This product has been authorized only for the detection of nucleic acid from SARS-CoV-2, not for any other viruses or pathogens.
- The emergency use of this product is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Federal Food, Drug and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the declaration is terminated or authorization is revoked sooner.
- Laboratories within the United States and its territories are required to report all results to the appropriate public health authorities.
- Specimens should always be treated as if infectious and/or biohazardous in accordance with safe laboratory procedures.
- Follow necessary precautions when handling specimens. Use personal protective equipment (PPE) consistent with current guidelines for the handling of potentially infectious sample.
- Do not use reagents after the expiry date
- Dispose of waste in compliance with local, state, and federal regulations.
- Positive results are indicative of the presence of SARS-CoV-2 RNA.
- When considering pooling strategies, laboratories should consider the appropriateness of the pooling strategy based on the positivity rate in the testing population, efficiency of the pooling workflow, and Positive Percent Agreement (PPA) for the desired pool size.

LIMITATIONS:

- The pooling performance of this SARS-CoV-2 assay was clinically validated using nasopharyngeal and anterior nasal swab specimens. While, oropharyngeal and mid-turbinate nasal swabs are also considered acceptable specimen types for use with the Verily COVID-19 RT-PCR Test, clinical performance with pools including these specimen types has not been established.
- A false negative result may occur if a specimen is improperly collected, transported or handled. False negative results may also occur if amplification inhibitors are present in the specimen or if inadequate numbers of organisms are present in the specimen.

- Specimens that are collected at home will not be tested with an internal control to confirm that the specimen was properly collected. Specimens collected at home from SARS-CoV-2 positive individuals may yield negative results if the specimen was not collected properly.
  This test cannot rule out diseases caused by other bacterial or viral pathogens.
- Samples must be collected, transported, and stored using appropriate procedures and conditions. Improper collection, transport, or storage of specimens may hinder the ability of the assay to detect the target sequences.
- Results from pooled testing with the Verily COVID -19 RT-PCR Test should be used as an adjunct to clinical observations and other information available to the physician. The result is only for clinical reference, and the clinical management of patients should be considered in combination with their symptoms/signs, history, other laboratory tests and treatment responses.
- Although the detected target sequences of this kit are in conserved regions of the SARS-CoV-2 genome, rare mutations may lead to negative results.
- Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for treatment or other patient management decisions. Optimum specimen types and timing for peak viral levels during infections caused by SARS-CoV-2 have not been determined.
- Specimens with low SARS-CoV-2 RNA concentrations may not be detected in sample pools due to the decreased sensitivity of pooled testing.
- The performance of this test was established based on the evaluation of a limited number of clinical specimens. Clinical performance has not been established with all circulating variants but is anticipated to be reflective of the prevalent variants in circulation at the time and location of the clinical evaluation. Performance at the time of testing may vary depending on the variants circulating, including newly emerging strains of SARS-CoV-2 and their prevalence, which change over time.