



September 25, 2026

Cepheid
Sharmin Bhathena
Senior Manager, Regulatory Affairs, New Product Development
904 Caribbean Dr.
Sunnyvale, California 94089

Re: K261336

Trade/Device Name: Xpert Respiratory Panel

Regulation Number: 21 CFR 866.3981

Regulation Name: Device to detect and identify nucleic acid targets in respiratory specimens from microbial agents that cause the SARS-CoV-2 respiratory infection and other microbial agents when in a multi-target test

Regulatory Class: Class II

Product Code: QOF

Dated: April 22, 2026

Received: April 23, 2026

Dear Sharmin Bhathena:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm> identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Before making any change significantly affecting the safety or effectiveness of the device, you must submit a new premarket notification in accordance with 21 CFR 807.81. Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device" (<https://www.fda.gov/media/99812/download>) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (<https://www.fda.gov/media/99785/download>).

Your device is also subject to, among other requirements, the Quality Management System Regulation (QMSR) (21 CFR Part 820), which includes, but is not limited to, ISO 13485 clause 7.3 (Design controls), ISO 13485 clause 8.3 (Nonconforming product), ISO 13485 clause 8.5.2 (Corrective action), and ISO 13485 clause 8.5.3 (Preventative action). Please note that regardless of whether a change requires premarket review, the QMSR requires device manufacturers to review and approve changes to device design and production (ISO 13485 clause 7.3 and ISO 13485 clause 7.5) and document changes and approvals in the Medical Device File (ISO 13485 clause 4.2.3).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801 and Part 809); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see <https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products>); good manufacturing practice requirements as set forth in the Quality Management System Regulation (QMSR) (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

All medical devices, including Class I and unclassified devices and combination product device constituent parts are required to be in compliance with the final Unique Device Identification System rule ("UDI Rule"). The UDI Rule requires, among other things, that a device bear a unique device identifier (UDI) on its label and package (21 CFR 801.20(a)) unless an exception or alternative applies (21 CFR 801.20(b)) and that the dates on the device label be formatted in accordance with 21 CFR 801.18. The UDI Rule (21 CFR 830.300(a) and 830.320(b)) also requires that certain information be submitted to the Global Unique Device Identification Database (GUDID) (21 CFR Part 830 Subpart E). For additional information on these requirements, please see the UDI System webpage at <https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/unique-device-identification-system-udi-system>.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to <https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems>.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance>) and CDRH Learn (<https://www.fda.gov/training-and-continuing-education/cdrh-learn>). Additionally, you may contact the

Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (<https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice>) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

JOSEPH BRIGGS -S

Joseph Briggs, Ph.D.
Deputy Division Director
Division of Microbiology Devices
OHT7: Office of In Vitro Diagnostics
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

Indications for Use

510(k) Number (if known)

K261336

Device Name

Xpert Respiratory Panel

Indications for Use (Describe)

The Xpert Respiratory Panel test, performed on the GeneXpert Instrument Systems, is a qualitative multiplexed in vitro diagnostic test for the simultaneous detection and identification of DNA and RNA from multiple bacteria and/or viruses in nasopharyngeal swab (NPS) specimens obtained from individuals with clinical signs and symptoms of respiratory tract infection.

The following organism types and subtypes are identified using the Xpert Respiratory Panel test:

- Adenovirus (A-E)
- Coronavirus (HKU1, NL63, 229E, OC43)
- SARS-CoV-2
- Human Metapneumovirus
- Rhinovirus/Enterovirus
- Parainfluenza (1-4)
- Influenza A
- Influenza B
- Respiratory Syncytial Virus (A and B)
- Bordetella pertussis
- Bordetella parapertussis
- Mycoplasma pneumoniae
- Chlamydia pneumoniae

Nucleic acids from viral and bacterial organisms identified by this test are generally detectable in NPS specimens during the acute phase of infection. Detecting and identifying specific viral and bacterial nucleic acids from individuals presenting with signs and symptoms of a respiratory infection aids in the diagnosis of respiratory infection, if used in conjunction with other clinical, epidemiological and laboratory findings. The results of this test should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Negative results in the presence of a respiratory illness may be due to infection with pathogens that are not detected by the test, or due to lower respiratory tract infection that is not detected by a NPS specimen.

Conversely, positive results are indicative of the presence of the identified microorganism, but do not rule out co-infection with other pathogens not detected by the Xpert Respiratory Panel. The agent(s) detected by the Xpert Respiratory Panel may not be the definite cause of disease.

The use of additional laboratory testing (e.g., bacterial and viral culture, immunofluorescence, and radiography) may be necessary when evaluating a patient with possible respiratory tract infection.

Type of Use (Select one or both, as applicable)

☒ Prescription Use (Part 21 CFR 801 Subpart D)

☐ Over-The-Counter Use (21 CFR 801 Subpart C)

CONTINUE ON A SEPARATE PAGE IF NEEDED.

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510(k) Summary for Xpert Respiratory Panel

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1. 510(k) Summary

As required by 21 CFR Section 807.92(c).

Submitted by:	Cepheid 904 Caribbean Drive Sunnyvale, CA 94089 Phone Number: (925) 699-1361
Contact:	Sharmin Bhathena
Date of Preparation:	August 25 2026
Device:	
Trade name	Xpert® Respiratory Panel
Common name	Xpert Respiratory Panel
Type of Test	A multiplexed nucleic acid test intended for use with the GeneXpert Instrument Systems for the simultaneous qualitative detection of viral and bacterial pathogens in individuals suspected of having respiratory tract infection (RTI).
Regulation Number Classification Name Product Code	21 CFR 866.3981, Multi-Target Respiratory Specimen Nucleic Acid Test Including SARS-CoV-2 and Other Microbial Agents, QOF
Secondary Product Code	21 CFR 862.2570, Real Time Nucleic Acid Amplification System, OOI
Classification Advisory Panel	Microbiology (83)
Prescription Use	Yes
Predicate Device Assay	QIAstat-Dx® Respiratory Panel Plus (K233100)

1.1. Device Description

The Xpert Respiratory Panel test, performed on Cepheid GeneXpert® Instrument Systems, is an automated *in vitro* diagnostic test for qualitative detection and differentiation of multiple bacteria and/or viruses in nasopharyngeal swab (NPS) specimens collected from individuals suspected of having respiratory tract infection (RTI).

The Xpert Respiratory Panel test is performed on GeneXpert Instrument Systems (GeneXpert Dx System, GeneXpert Infinity System and GeneXpert System with Touchscreen), equipped with GeneXpert 10-color modules running Dx software version 6.6 and higher, Xpertise software version 7.2 or higher, and Cepheid OS software 2.3 or higher, respectively.

The GeneXpert Instrument Systems automate and integrate sample preparation, nucleic acid extraction and amplification, and detection of multiple bacterial/viral target sequences in simple or complex samples using real-time reverse transcription (RT)-polymerase chain reaction (PCR) for RNA targets and PCR for DNA targets. Depending on the instrument, the GeneXpert Instrument Systems can have from 1 and up to 80 randomly accessible modules, each capable of performing separate sample preparation and real-time RT-PCR and PCR tests. Each module contains a syringe drive for dispensing fluids (*i.e.*, the syringe drive activates the plunger that works in concert with the rotary valve in the cartridge to move fluids between chambers), an ultrasonic horn for lysing cells or spores, and a proprietary I-CORE® thermocycler for performing real-time RT-PCR and PCR as well as detection. The systems require the use of single-use disposable cartridges that hold the RT-PCR reagents and host sample purification, nucleic acid amplification, and detection of the target sequences. Because the cartridges are self-contained, cross-contamination between samples is minimized.

The Xpert Respiratory Panel test includes reagents for the detection of DNA and RNA from Adenovirus, Coronavirus, SARS-CoV-2, Human Metapneumovirus, Rhinovirus/Enterovirus, Parainfluenza, Influenza A, Influenza B, RSV, *Bordetella pertussis*, *Bordetella parapertussis*, *Chlamydia pneumoniae* and *Mycoplasma pneumoniae* from nasopharyngeal swab (NPS) specimens. The primers and probes in the Xpert Respiratory Panel test are designed to amplify and detect unique genetic sequences for each on-panel analyte.

Sample Processing Control (SPC) and Probe Check Control (PCC) are also included in the cartridge utilized by the GeneXpert Instrument Systems. The SPC is present to control for adequate processing of the sample and to monitor for the presence of potential inhibitor(s) in the RT-PCR reaction. The SPC also ensures that the RT-PCR reaction conditions (temperature and time) are appropriate for the amplification reaction and that the RT-PCR reagents are functional. In addition, SPC also functions as a control for the melt curve analysis. The PCC verifies reagent rehydration, PCR tube filling, and confirms that all reaction components are present in the cartridge including monitoring for probe integrity and dye stability.

The Xpert Respiratory Panel test is designed for use with NPS specimens collected with nylon flocked swabs from the intended use population and placed into viral transport medium (VTM)/Universal Transport Medium (UTM) or eNAT®.

The ancillary specimen collection kits, swabs and transport media validated for use with the Xpert Respiratory Panel test included:

Nasopharyngeal Sample Collection Kit

- Copan UTM® 3C057N (Flexible Minitip Flocked Swab with UTM Medium)
- Copan eNAT® Molecular Collection and Preservation Medium P/N 6U074S01
- BD™ Becton Dickinson Specimen Collection and Transport System P/N 220531 (Flexible Minitip Flocked Swab with UVT Medium)

Alternatively, swabs and transport media can be obtained separately:

- Nylon flocked swab (Copan P/N 503CS01)
- Viral transport medium (Copan P/N 3C047N, Remel MicroTest™ M4RT, M5 and M6 Transport Medium, PrimeStore® Molecular Transport Medium)

1.2. Device Intended Use

The Xpert® Respiratory Panel test, performed on the GeneXpert Instrument Systems, is a qualitative multiplexed *in vitro* diagnostic test for the simultaneous detection and identification of DNA and RNA from multiple bacteria and/or viruses in nasopharyngeal swab (NPS) specimens obtained from individuals with clinical signs and symptoms of respiratory tract infection.

The following organism types and subtypes are detected and identified by the Xpert Respiratory Panel test:

- Adenovirus (A-E)
- Coronavirus (HKU1, NL63, 229E, OC43)
- SARS-CoV-2
- Human Metapneumovirus
- Rhinovirus/Enterovirus
- Parainfluenza (1-4)
- Influenza A
- Influenza B
- Respiratory Syncytial Virus (A and B)
- *Bordetella pertussis*
- *Bordetella parapertussis*
- *Mycoplasma pneumoniae*
- *Chlamydia pneumoniae*

Nucleic acids from viral and bacterial organisms identified by this test are generally detectable in NPS specimens during the acute phase of infection. Detecting and identifying specific viral and bacterial nucleic acids from individuals presenting with signs and symptoms of a respiratory infection aids in the diagnosis of respiratory infection, if used in conjunction with other clinical, epidemiological and laboratory findings. The results of this test should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Negative results in the presence of a respiratory illness may be due to infection with pathogens that are not detected by the test, or due to lower respiratory tract infection that is not detected by a NPS specimen.

Conversely, positive results are indicative of the presence of the identified microorganism, but do not rule out co-infection with other pathogens not detected by the Xpert Respiratory Panel. The agent(s) detected by the Xpert Respiratory Panel may not be the definite cause of disease.

The use of additional laboratory testing (e.g., bacterial and viral culture, immunofluorescence, and radiography) may be necessary when evaluating a patient with possible respiratory tract infection.

1.3. Substantial Equivalence

Table 1 shows the similarities and differences between the subject device to the previously cleared predicate device (K233100).

Table 1. Comparison of Similarities and Differences Between Subject Device and the Predicate Device

Attribute	Subject Device	Predicate Device
	Xpert® Respiratory Panel	QIAstat-Dx® Respiratory Panel Plus (K233100)
Regulation	Same	21 CFR 866.3981 Devices to detect and identify nucleic acid targets in respiratory samples from microbial agents that cause the SARS-CoV-2 respiratory infection and other microbial agents when in a multi-target test
Product Code	Same	QOF Multi-target respiratory specimen nucleic acid test including SARS-CoV-2 and other microbial agents
Device Class	Same	Class II (Special Controls)
Technology/Detection	Qualitative multiplex reverse transcription polymerase chain reaction (RT-PCR) with both amplification and melt detected targets	Nucleic acid extraction, nucleic acid amplification, and detection of amplified targets that use an increase in fluorescence to generate the assay results
Intended Use / Indications for Use	The Xpert® Respiratory Panel test, performed on the GeneXpert Instrument Systems, is a qualitative multiplexed <i>in vitro</i> diagnostic test for the simultaneous	The QIAstat-Dx Respiratory Panel Plus is a multiplexed nucleic acid test intended for use with the QIAstat-Dx system for the simultaneous <i>in vitro</i> qualitative

Attribute	Subject Device	Predicate Device
	Xpert® Respiratory Panel	QIAstat-Dx® Respiratory Panel Plus (K233100)
	detection and identification of DNA and RNA from multiple bacteria and/or viruses in nasopharyngeal swab (NPS) specimens obtained from individuals with clinical signs and symptoms of respiratory tract infection. The following organism types and subtypes are detected and identified by the Xpert Respiratory Panel test: • Adenovirus (A-E) • Coronavirus (HKU1, NL63, 229E, OC43) • SARS-CoV-2 • Human Metapneumovirus • Rhinovirus/Enterovirus • Parainfluenza (1-4) • Influenza A • Influenza B • Respiratory Syncytial Virus (A and B) • <i>Bordetella pertussis</i> • <i>Bordetella parapertussis</i> • <i>Mycoplasma pneumoniae</i> • <i>Chlamydia pneumoniae</i> Nucleic acids from viral and bacterial organisms identified by this test are generally detectable in NPS specimens during the acute phase of infection. Detecting and identifying specific viral and bacterial nucleic acids from individuals presenting with signs and symptoms of a respiratory infection aids in the diagnosis of respiratory infection, if used in conjunction with other clinical, epidemiological and laboratory findings. The results of this test should not be used as the sole basis for diagnosis, treatment or other patient management decisions. Negative results in the presence of a respiratory illness may be due to infection with pathogens that are not detected by the test, or due to lower respiratory tract infection that is not detected by a NPS specimen.	detection and identification of multiple respiratory viral and bacterial nucleic acids in nasopharyngeal swabs (NPS) obtained from individuals with clinical signs and symptoms of respiratory tract infection, including SARS-CoV-2. The following organism types and subtypes are identified using the QIAstat-Dx Respiratory Panel Plus: Adenovirus, Human Coronavirus 229E, Human Coronavirus HKU1, Human Coronavirus NL63, Human Coronavirus OC43, Human Metapneumovirus, Influenza A, Influenza A H1N1 pdm09, Influenza A H3, Influenza B, Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, Respiratory Syncytial Virus, Human Rhinovirus/Enterovirus (not differentiated), Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2), <i>Bordetella pertussis</i>, <i>Chlamydia pneumoniae</i>, <i>Mycoplasma pneumoniae</i> Nucleic acids from viral and bacterial organisms identified by this test are generally detectable in NPS specimens during the acute phase of infection. Detecting and identifying specific viral and bacterial nucleic acids from individuals presenting with signs and symptoms of a respiratory infection aids in the diagnosis of respiratory infection, if used in conjunction with other clinical, epidemiological and laboratory findings. The results of this test should not be used as the sole basis for diagnosis, treatment or other patient management decisions.

Attribute	Subject Device	Predicate Device
	Xpert® Respiratory Panel	QIAstat-Dx® Respiratory Panel Plus (K233100)
	Conversely, positive results are indicative of the presence of the identified microorganism, but do not rule out co-infection with other pathogens not detected by the Xpert Respiratory Panel. The agent(s) detected by the Xpert Respiratory Panel may not be the definite cause of disease. The use of additional laboratory testing (e.g., bacterial and viral culture, immunofluorescence, and radiography) may be necessary when evaluating a patient with possible respiratory tract infection.	Negative results in the presence of a respiratory illness may be due to infection with pathogens that are not detected by the test or due to lower respiratory tract infection that is not detected by a NPS specimen. Conversely, positive results are indicative of the presence of the identified microorganism, but do not rule out co-infection with other pathogens not detected by the QIAstat-Dx Respiratory Panel Plus. The agent(s) detected by the QIAstat-Dx Respiratory Panel Plus may not be the definite cause of disease. The use of additional laboratory testing (e.g., bacterial and viral culture, immunofluorescence and radiography) may be necessary when evaluating a patient with possible respiratory tract infection.
Intended User / Environment	The Xpert Respiratory Panel test is intended to be performed by laboratory and healthcare professionals trained on the use of the test. This test is for use in a laboratory environment.	The QIAstat-Dx Respiratory Panel Plus is to be used by laboratory professionals trained in the use of the QIAstat-Dx Analyzer 1.0, QIAstat-Dx Analyzer 2.0, or QIAstat-Dx Rise.
Specimen Type	Same	Nasopharyngeal swab (NPS)
Transport Media	- Universal Transport Medium (UTM)/ Viral Transport Medium (VTM) - eNAT	Universal Transport Medium (UTM)
Test Automation	Same	Automated Nucleic Acid Extraction, Detection and Results Interpretation
Test Format	Same	Single Use
Internal Controls	- Sample Processing Control (SPC) - Probe Check Control (PCC)	Titered MS2 bacteriophage that provides verification that all steps of the analysis process
Assay Targets	- Adenovirus (A-E) - Coronavirus (HKU1, NL63, 229E, OC43) - SARS-CoV-2 - Human Metapneumovirus - Rhinovirus/Enterovirus - Parainfluenza (1-4) - Influenza A - Influenza B - Respiratory Syncytial Virus (A and B)	- Adenovirus - Human Coronavirus 229E, Human Coronavirus HKU1, Human Coronavirus NL63, Human Coronavirus OC43, - Human Metapneumovirus - Influenza A - Influenza A H1 - Influenza A H1N1 pdm09 - Influenza A H3 - Influenza B

Attribute	Subject Device	Predicate Device
	Xpert® Respiratory Panel	QIAstat-Dx® Respiratory Panel Plus (K233100)
	<i>Bordetella pertussis</i> <i>Bordetella parapertussis</i> <i>Mycoplasma pneumoniae</i> <i>Chlamydia pneumoniae</i>	- Parainfluenza virus 1, Parainfluenza virus 2, Parainfluenza virus 3, Parainfluenza virus 4, - Respiratory Syncytial Virus, - Human Rhinovirus/Enterovirus (not differentiated) - Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) <i>Bordetella pertussis</i> <i>Chlamydia pneumoniae</i> <i>Mycoplasma pneumoniae</i>
Assay Results	Same	Qualitative
Test Access	Same	Prescription Use Only
Time to Result	~56 minutes	~60 minutes
Instrument Systems	GeneXpert Instrument Systems: - GeneXpert Dx System - GeneXpert Infinity Systems (48s and 80) - GeneXpert System with Touchscreen	- QIAstat-Dx Analyzer 1.0 - QIAstat-Dx Analyzer 2.0 - QIAstat-Dx Rise
Systems Software for Instrument Family	- GeneXpert Dx software version 6.6 or higher - GeneXpert Xpertise software 7.2 or higher - Cepheid OS software version 2.3 or higher	- For QIAstat-Dx Analyzer 1.0, use software version 1.4 or 1.5 - For QIAstat-Dx Analyzer 2.0, use software version 1.6 or later - For QIAstat-Dx Rise, use software version 2.4 or later

The following performance data (analytical and clinical) were provided in support of the substantial equivalence determination.

1.4. Performance Studies

1.4.1. Analytical Performance

Analytical Sensitivity / Limit of Detection (LoD)

The analytical sensitivity of the Xpert Respiratory Panel test was estimated using two reagent lots per strain and testing limiting dilutions of on-panel viruses and bacteria (4 Adenovirus strains, 4 Human Coronavirus strains, 2 SARS-CoV-2 strains, 1 Human Metapneumovirus strain, 1 human Rhinovirus strain, 1 Enterovirus strain, 4 Parainfluenza subtypes, 1 Influenza A strain, 2 Influenza B strains [1 Yamagata and 1 Victoria lineage], one strain each of Respiratory Syncytial Virus A and B, one *Bordetella pertussis* strain, one *Bordetella parapertussis* strain, one *Mycoplasma pneumoniae* strain, and one *Chlamydia pneumoniae* strain) in pooled negative clinical nasopharyngeal swab (NPS) Universal Transport Media (UTM) matrix, following the guidance in Clinical and Laboratory Standards Institute (CLSI) document EP17-A2, with the

exception that nine replicates were tested at each level in the LoD estimation. The higher of the two estimated LoD values, as determined by Probit regression analysis, were verified by testing at the LoD Probit point estimate as well as one level below and one level above the Probit point estimate, as defined by the 95% lower confidence interval (LCI) and 95% upper confidence interval (UCI), respectively. The LoD was verified when the level below the LoD point estimate reported positivity rate of < 95% and the level above the LoD point estimate resulted in a positivity rate of 100%. The verified LoD values for the viruses and bacteria tested are summarized in **Table 2**.

Table 2. Xpert Respiratory Panel Limit of Detection in Clinical NPS-UTM Matrix

Virus/Bacteria Strain	LoD Concentration
Adenovirus B, Wan	3.0 TCID ₅₀ /mL
Adenovirus 1C	3.5 TCID ₅₀ /mL
Adenovirus 4(E)	0.62 TCID ₅₀ /mL
First WHO International Standard for human Adenovirus DNA for nucleic acid amplification techniques (NIBSC code: 16/324)	1,345 IU/mL
Coronavirus 229E	0.015 TCID ₅₀ /mL
Coronavirus HKU1	133.2 Cp/mL
Coronavirus NL63	0.0057 TCID ₅₀ /mL
Coronavirus OC43	0.31 TCID ₅₀ /mL
Second WHO International Standard for SARS-CoV-2 RNA (NIBSC code: 22/252)	2,584 IU/mL
SARS-CoV-2 Hong Kong/VM20001061/2020	1.32 TCID ₅₀ /mL
Human Metapneumovirus (hMPV) 18 B2, IA18-2003	0.088 TCID ₅₀ /mL
Human Rhinovirus 3, FEB	10.2 TCID ₅₀ /mL (7.1 PFU/mL)
Enterovirus D68, US/MO/14-18947	11.2 TCID ₅₀ /mL
Parainfluenza 1, C35	5.2 TCID ₅₀ /mL
Parainfluenza 2, Greer	0.8 TCID ₅₀ /mL
Parainfluenza 3, C 243	11.7 TCID ₅₀ /mL
Parainfluenza 4A	1.2 TCID ₅₀ /mL
Influenza A/Wisconsin/04/2018 (H3N2)	104 CEID ₅₀ /mL
Influenza B/Missouri/12/2018 (NA D197E) (Victoria Lineage)	1.4 TCID ₅₀ /mL
Influenza B/Indiana/17/2017 (NA I221T) (Yamagata Lineage)	4.4 TCID ₅₀ /mL
Respiratory Syncytial Virus (RSV) A	0.2 TCID ₅₀ /mL
Respiratory Syncytial Virus (RSV) B, WV/14617/85	0.02 TCID ₅₀ /mL
<i>Bordetella pertussis</i> , A639	5.49 CFU/mL
<i>Bordetella parapertussis</i> , A747	0.2 CFU/mL
<i>Mycoplasma pneumoniae</i> , M129	50.8 CCU/mL
<i>Chlamydia pneumoniae</i> , CM-1	0.156 TCID ₅₀ /mL (43.97 IFU/mL)

Analytical Reactivity (Inclusivity)

SARS-CoV-2 In Silico Analyses

The inclusivity of the Xpert Respiratory Panel SARS-CoV-2 assay was evaluated using *in silico* analysis of the oligonucleotide sequences for the E, N2, and RdRP gene targets. Reference sequences were retrieved from NCBI GenBank, and SARS-CoV-2 sequence records were accessed using NCBI Datasets v18.9.0 January 4, 2026.

Only SARS-CoV-2 sequences containing the complete amplicon region were included for each gene target; therefore, the total number of sequences evaluated differs by target (E: 16,471,585; N2: 17,071,287; RdRP: 16,654,489).

Inclusivity was assessed by determining sequence identity and mismatch frequency across oligo binding sites. Because the assay reports a positive result if any of the three SARS-CoV-2 targets is detected, the multi-target design provides built-in redundancy, lowering the risk that sequence variation at a single locus will reduce overall detection. **Table 3** summarizes the predicted inclusivity for all SARS-CoV-2 oligonucleotides across the three targets.

Table 3. Predicted Inclusivity for Xpert Respiratory Panel SARS-CoV-2 E, N2 and RdRP Oligonucleotides

Target	Oligo Type	Total Sequences	100% Identity	≥95% Identity	≥90% Identity	≥80% Identity	1 Mismatch	2+ Mismatches
SARS-CoV-2 E	Forward	16,471,585	44.6%	92.7%	100%	100%	48.1%	7.3%
	Probe		99.9%	100%	100%	100%	0.1%	0.0%
	Reverse		99.9%	100%	100%	100%	0.1%	0.0%
SARS-CoV-2 N2	Forward	17,071,287	98.9%	100%	100%	100%	1.1%	0.0%
	Probe		99.4%	100%	100%	100%	0.6%	0.0%
	Reverse		0.0%	99.5%	100%	100%	99.5%	0.5%
SARS-CoV-2 RdRP	Forward	16,654,489	99.7%	100%	100%	100%	0.3%	0.0%
	Probe		98.7%	100%	100%	100%	1.3%	0.0%
	Reverse		99.9%	100%	100%	100%	0.1%	0.0%

Based on the built-in redundancy of the Xpert Respiratory Panel test's SARS-CoV-2 amplification system (i.e., 3 independent targets, only 1 of 3 must be detected to assign a positive result), it is not anticipated that any evaluated SARS-CoV-2 sequences would be missed.

Wet-Testing

In addition to the *in silico* analysis of the SARS-CoV-2 primers and probes for inclusivity, the inclusivity of the Xpert Respiratory Panel test was evaluated by bench testing against multiple strains of each target pathogen. A total of 169 respiratory strains were empirically tested at near LoD or challenging concentrations: 14 Adenovirus strains, 11 Coronavirus strains, 14 SARS-CoV-2 strains, 9 hMPV strains, 46 RV and EV strains, 11 PIV strains, 31 Influenza A virus

strains, 7 Influenza B virus strains, 5 RSV strains, 4 *Bordetella parapertussis* strains, 8 *Bordetella pertussis* strains, 3 *Chlamydia pneumoniae* strains, and 6 *Mycoplasma pneumoniae* strains. Five (5) replicates were tested for each strain. **Table 4** presents the lowest concentration of the viral or bacterial strain/isolate at which all 5 replicates reported positive results.

Table 4. Analytical Reactivity (Inclusivity) of the Xpert Respiratory Panel Test

Adenovirus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
A	12	ATCC	VR-863	544 Copies/mL
	18	ATCC	VR-19	272 Copies/mL
	31	ZeptoMetrix	0810073CF	544 Copies/mL
B	3	ZeptoMetrix	0810062CF	1,719 Copies/mL ^a
	7A	ZeptoMetrix	0810021CF	91 Copies/mL
	16	ATCC	VR-17	27.2 Copies/mL
	34	ATCC	VR-716	11,625 Copies/mL ^a
	35	ATCC	VR-718	3,913 Copies/mL ^a
C	2	ATCC	VR-846	272 Copies/mL
	5	ZeptoMetrix	0810020CF	897 Copies/mL
	6	ATCC	VR-6	30 Copies/mL
D	8	ZeptoMetrix	0810069CF	272 Copies/mL
	20	ZeptoMetrix	0810115CF	272 Copies/mL
	37	ZeptoMetrix	0810119CF	544 Copies/mL
Coronavirus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
229E	229E	ATCC	VR-740	0.2 TCID ₅₀ /mL
	229E	ZeptoMetrix	0810229CF	0.001 TCID ₅₀ /mL
	229E	Clinical Specimen	NA	991 Copies/mL
HKU1	HKU1	Clinical specimen	NA	50 Copies/mL
	HKU1	Clinical Specimen	NA	100 Copies/mL
NL63	NL63/Amsterdam/2003	BEI	NR-470	0.0006 TCID ₅₀ /mL
	NL63	ZeptoMetrix	0810228CF	0.002 TCID ₅₀ /mL
	NL63	Clinical Specimen	NA	248 Copies/mL
OC43	OC43	ATCC	VR-1558	0.03 TCID ₅₀ /mL
	OC43	ZeptoMetrix	0810024CF	0.5 TCID ₅₀ /mL
	OC43	Clinical Specimen	NA	495 Copies/mL
SARS-CoV-2	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
SARS-CoV-2	Italy-INMI1	ZeptoMetrix	0810589CFHI	12 TCID ₅₀ /mL
	USA-WA1/2020	ZeptoMetrix	0810587CFHI	0.6 TCID ₅₀ /mL

	Alpha	ZeptoMetrix	0810614CFHI	0.09 TCID ₅₀ /mL
	Beta	ZeptoMetrix	0810613CFHI	0.9 TCID ₅₀ /mL
	Delta	ZeptoMetrix	0810624CFHI	0.1 TCID ₅₀ /mL
	Gamma	ZeptoMetrix	0810616CFHI	0.2 TCID ₅₀ /mL
	Iota	ZeptoMetrix	0810620CFHI	0.7 TCID ₅₀ /mL
	Kappa	ZeptoMetrix	0810623CFHI	12 TCID ₅₀ /mL
	Zeta	ZeptoMetrix	0810618CFHI	0.3 TCID ₅₀ /mL
	SARS-CoV-2, Omicron- hCoV-19/USA/New York/ PV96109/2023	BEI	NR-59693	0.6 TCID ₅₀ /mL
	SARS-CoV-2, Omicron hCoV-19/USA/ CA- Stanford -165 S29/ 2023	BEI	NR-59709	0.2 TCID ₅₀ /mL
	SARS-CoV-2, Omicron hCoV-19/USA/MD- HP49152/2023	BEI	NR-59703	0.03 TCID ₅₀ /mL
	SARS-CoV-2, Omicron hCoV-19/USA/MD- HP47946/2023	BEI	NR-59503	0.6 TCID ₅₀ /mL
	SARS-CoV-2, Omicron	ZeptoMetrix	0810682CFHI	0.1 TCID ₅₀ /mL
Human Metapneumovirus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
A	A1, Strain 9	ZeptoMetrix	0810161CF	20 Copies/mL
	A1, Strain 16	ZeptoMetrix	0810160CF	39 Copies/mL
	A2, Strain 20	ZeptoMetrix	0810163CF	78 Copies/mL
	A2, Strain 27	ZeptoMetrix	0810164CF	20 Copies/mL
B	B1, Strain 3	ZeptoMetrix	0810156CF	78 Copies/mL
	B1, Strain 5	ZeptoMetrix	0810158CF	39 Copies/mL
	B1, PP947667 (Synthetic ssDNA)	IDT	NA	1,510 Copies/mL ^b
	B2, Strain 4	ZeptoMetrix	0810157CF	78.4 Copies/mL
	B2, Strain 8	ZeptoMetrix	0810159CF	78.4 Copies/mL
Rhinovirus/ Enterovirus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
Rhinovirus A	A1	ZeptoMetrix	0810012CFN	130 Copies/mL
	A2	ATCC	VR-482	130 Copies/mL
	A7	ATCC	VR-1601	130 Copies/mL
	A16	ATCC	VR-283	260 Copies/mL
	A57	ATCC	VR-1600	13,023 Copies/mL

	A63 OK649395 Synthetic ssDNA	IDT	NA	39,070 Copies/mL
	A77	ATCC	VR-1187	260 Copies/mL
Rhinovirus B	B14	ATCC	VR-284	203 Copies/mL
	B17	ATCC	VR-1663	33 Copies/mL
	B27	ATCC	VR-1137	130 Copies/mL
	B42	ATCC	VR-1950	65 Copies/mL
	B83	ATCC	VR3341	43 Copies/mL
	B85	ATCC	VR-1195	65 Copies/mL
Rhinovirus C	Clinical sample PC4S1GES50113	NA	NA	1,390 Copies/mL ^c
	Clinical sample PC4S1GES50210	NA	NA	10,000 Copies/mL ^c
	Clinical Sample PC4S1GES50258	NA	NA	1,000 Copies/mL ^c
	Clinical Sample PC4S1GES50332	NA	NA	861 Copies/mL ^c
	C7 OM001438 Synthetic ssDNA	IDT	NA	1,628 Copies/mL
	C20 MZ427502 Synthetic ssDNA	IDT	NA	1,736,000 Copies/mL ^d
	C36 PP158746 Synthetic ssDNA	IDT	NA	407 Copies/mL
Coxsackievirus	A1	ZeptoMetrix	0810140CF	1,884 Copies/mL
	A9	ZeptoMetrix	0810017CF	3,768 Copies/mL
	A15, strain 'G-19'	ZeptoMetrix	0810144CF	55,000 Copies/mL
	A21	ATCC	VR-850	3,768Copies/mL
	CoxA4 ON730810 Synthetic ssDNA	IDT	NA	5,652 Copies/mL
	CoxA10 PP078948 Synthetic ssDNA	IDT	NA	1,884 Copies/mL
	CoxB5 OQ408283 Synthetic ssDNA	IDT	NA	1,884 Copies/mL
Echovirus	Type 6	ZeptoMetrix	0810076CF	1,884 Copies/mL
	Type 9	ZeptoMetrix	0810077CF	3,768 Copies/mL
	Type 11	ZeptoMetrix	0810023CF	5,652 Copies/mL
	Type 13, H06368- 226	ZeptoMetrix	0810607CF	628 Copies/mL
	Type 14, H08330539	ZeptoMetrix	0810502CF	3,768 Copies/mL
	Type 18, H07218- 472	ZeptoMetrix	0810608CF	314 Copies/mL
	Type 30	ZeptoMetrix	0810078CF	1,884 Copies/mL
Enterovirus	A71	ZeptoMetrix	0810236CF	628 Copies/mL
	A71 OR791510 Synthetic ssDNA	IDT	NA	1,884 Copies/mL
	D68 Major Group, 9/ 2014 Isolate 3	ZeptoMetrix	0810303CF	1,884 Copies/mL

	HEV-D68/ Fermon	BEI	NR-51430	30,094 Copies/mL ^c
	D68/US/MO/14-18949	BEI	NR-49130	1,884 Copies/mL
	D68/US/IL/14-18952	BEI	NR-49131	940 Copies/mL
	D68/USA/2018-23089	BEI	NR-51998	3,762 Copies/mL
	D68/US/KY/14-18953	BEI	NR-49132	5,966 Copies/mL
	Sabin monovalent Polio vaccine type 1 (1st International Standard)	NIBSC	Code 16/196	188,390 Copies/mL ^f
	Poliovirus OPV reference mOPV 3	NIBSC	Code 16/202	56,517 Copies/mL ^f
	Poliovirus OP410429 Synthetic ssDNA	IDT	NA	31,398 Copies/mL ^f
	Poliovirus PV557050 Synthetic ssDNA	IDT	NA	NA ^f
Parainfluenza Virus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
PIV1	Type 1	ZeptoMetrix	0810014CF	275 Copies/mL
	Type 1, strain FRA/29221106/2009	BEI	NR-48680	1,240 Copies/mL
PIV2	Type 2	ZeptoMetrix	0810015CF	35 TCID ₅₀ /mL
	Type 2, strain Greer	BEI	NR-5994	0.04 TCID ₅₀ /mL
PIV3	Type 3	ZeptoMetrix	0810016CF	248 Copies/mL
	Type 3, NIH Wash/47885/57	BEI	NR-3233	6,614 Copies/mL
PIV4	Type 4A	ATCC	VR-1378	69 Copies/mL
	Type 4A, strain M-25	BEI	NR-3237	207 Copies/mL
	Type 4B CH19503	ATCC	VR-1377	69 Copies/mL
	Type 4B	ZeptoMetrix	0810060BCF	28 Copies/mL
	PV224554 Synthetic ssDNA	IDT	NA	411 Copies/mL
Influenza A	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
H3N2	A/New York/21/2020	IRR	FR-1761	4 FFU/mL
	A/Tasmania/503/2020	IRR	FR-1790	1 FFU/mL
	A/Darwin/06/2021	IRR	FR-1837	1.6 FFU/mL
	A/Darwin/9/2021	IRR	FR-1845	2.7 CEID ₅₀ /mL
	A/Massachusetts/18/2022	IRR	FR-1859	0.4 FFU/mL
	A/Florida/57/2022	IRR	FR-1861	0.05 TCID ₅₀ /mL
	A/New York/66/2022	IRR	FR-1868	1.3 FFU/mL
	A/Michigan/60/2022	IRR	FR-1871	1.5 FFU/mL

	A/Montana/08/2023	IRR	FR-1873	6.5 FFU/mL
	A/Macha/O1237/2021	BEI	NR-59461	0.2 FFU/mL
	A/Baltimore/JH-0586/2022	BEI	NR-59462	17 TCID ₅₀ /mL
H1N1-09	A/Indiana/02/2020	IRR	FR-1763	670 CEID ₅₀ /mL
	A/Macha/O1453/2021	BEI	NR-59464	40 TCID ₅₀ /mL
	A/Baltimore/JH-22377/2022	BEI	NR-59465	67 CEID ₅₀ /mL
	A/Baltimore/JH-22400/2022	BEI	NR-59466	9.6 CEID ₅₀ /mL
	Clinical specimen/2020	NA	NA	77 Copies/mL
	Clinical specimen/2020	NA	NA	77 Copies/mL
	Clinical specimen/2020	NA	NA	77 Copies/mL
	Clinical specimen/2020	NA	NA	77 Copies/mL
	Clinical specimen/2020	NA	NA	67 Copies/mL
	Clinical specimen/2020	NA	NA	168 Copies/mL
H1N1	Swine 1976/31	ATCC	VR-99	3 CEID ₅₀ /mL
	A/Texas/14/2008	IRR	FR-587	67 CEID ₅₀ /mL
H5N1	A/duck/Hunan/795/2002	IRR	FR-265 (219)	65 Copies/mL
	A/Japanese white eye/Hong Kong/1038/2006	IRR	FR-270	258 Copies/mL
	A/bovine/Ohio/B240 SU-439/2024 (genomic RNA)	BEI	NR-59885	65 Copies/mL
H5N2	A/pheasant/New Jersey/1355/1998-PR8-IBCDC-4	IRR	FR-729	59 CEID ₅₀ /mL
H7N2	A/turkey/Virginia/4529/2002-PR8-IBCDC-5	IRR	FR-730	36 CEID ₅₀ /mL
H7N7	A/mallard/Netherlands/12/2000/PR8-IBCDC-1	IRR	FR-731	8.2 CEID ₅₀ /mL
H7N9	A/Shanghai/2/2013-PR8-IDCDC-RG32A	IRR	FR-1389	7.7 CEID ₅₀ /mL
H9N2	A/chicken/Hong Kong/G9/1997-PR8-IBCDC-2	IRR	FR-732	104 CEID ₅₀ /mL
Influenza B	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)

Victoria Lineage	B/Washington/02/2019	IRR	FR-1709	6.7 CEID ₅₀ /mL
	B/Hawaii/01/2018 (NA D197N)	IRR	FR-1661	0.8 TCID ₅₀ /mL
	B/New Hampshire/01/2021	IRR	FR-1796	0.03 TCID ₅₀ /mL
	B/Michigan/01/2021	IRR	FR-1800	0.05 TCID ₅₀ /mL
Yamagata Lineage	B/Oklahoma/10/2018 (NA D197N)	IRR	FR-1660	1.7 TCID ₅₀ /mL
NA	Clinical specimen/2020	NA	NA	17 Copies/mL
	Clinical specimen/2020	NA	NA	25 Copies/mL
Respiratory Syncytial Virus	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
RSV A	Type A2	ATCC	VR1540	2 PFU/mL
	Type A Long	ATCC	VR-26	2 PFU/mL
RSV B	Type B WV/ 14617/ 85	ATCC	VR-1400	0.3 TCID ₅₀ /mL
	Type B 9320	ATCC	VR-955	0.2 PFU/mL
	Type B 18537	ATCC	VR-1580	0.01 PFU/mL
<i>Bordetella parapertussis</i>	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
<i>B. parapertussis</i>	E595	ZeptoMetrix	801462	118 CFU/mL
	508 and 344 (NCTC 10853)	ATCC	15237	29 CFU/mL
	NCTC 5952 (522)	ATCC	15311	88 CFU/mL
	12822	ATCC	BAA-587	24 CFU/mL
<i>Bordetella pertussis</i>	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
<i>B. pertussis</i>	E431	ZeptoMetrix	801460	275 CFU/mL
	F	ATCC	8467	2 CFU/mL
	5 (17921)	ATCC	9340	824 CFU/mL
	18323 (NCTC 10739)	ATCC	9797	0.5 CFU/mL
	10-536	ATCC	10380	8 CFU/mL
	CNCTC Hp 12/63 (623)	ATCC	51445	1 CFU/mL
	MN2531	ATCC	BAA-1335	2 CFU/mL
<i>Chlamydia pneumoniae</i>	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
<i>C. pneumoniae</i>	TW-183	ATCC	VR-2282	132 IFU/mL
	CWL-029	ATCC	VR-1310	66 IFU/mL
	AR-39	ATCC	53592	17 IFU/mL

<i>Mycoplasma pneumoniae</i>	Type/ Strain	Vendor	Part Number	Lowest Concentration With 100% Positivity (N=5)
<i>M. pneumoniae</i>	Type1 M129-B7	ATCC	29342	321 Copies/mL
	Type 2 Mac	ATCC	15492	321 Copies/mL
	M52	ATCC	15293	321 Copies/mL
	Bru	ATCC	15377	642 Copies/mL
	Mutant 22	ATCC	39505	321 Copies/mL
	UTMB-10P	ATCC	49894	642 Copies/mL

^a Adenovirus B3, B34, and B35 were detected at 19x, 128x, and 43x LoD, respectively. Adenovirus B34 and B35 are uncommonly recovered from humans with respiratory tract infection.

^b Human metapneumovirus B1 synthetic ssDNA was detected at 900x LoD. Infectious hMPV B1 was detected at <0.1x LoD.

^c Due to limited volume of Rhinovirus clinical specimen, this specimen was run in replicates of 3 instead of 5.

^d Rhinovirus C20 synthetic ssDNA was detected at 400x LoD. Rhinovirus C20 is uncommonly recovered from humans with respiratory tract infection.

^e Enterovirus D68 “Fermon” strain was detected at 48x LoD. This is an unknown clade. Known D68 clades A2/D, B1, B2, and B3 were all detected at ≤10x LoD.

^f Polioviruses and poliovirus synthetic ssDNA were detected at ≥50x LoD or not detected. Polioviruses are not associated with respiratory tract infection.

Analytical Specificity (Exclusivity)

In Silico Analysis

An *in silico* assessment was performed using the NCBI BLAST Core Nucleotide Database (January 9, 2026) to evaluate potential cross-reactivity of the Xpert Respiratory Panel primers and probes. All primer probe combinations across the multiplex panel were examined.

The predicted cross-reactivity was limited to a small number of non-target organisms with close genetic relatedness to the test’s intended targets, including non-human *Mastadenovirus*, embecoviruses related to Coronavirus OC43/HKU1, parainfluenza 3 and respirovirus, enteroviruses and other picornaviruses, and SARS-related coronaviruses. Additionally, cross-reactivity was predicted for human adenoviruses F and G, a few *Bordetella* species and *Achromobacter denitrificans*, which are known to infect humans (see limitation section). A summary of potential cross-reactivity is provided in **Table 5**.

Table 5. Summary of Predicted Cross-Reactivity

Oligonucleotide Target	Predicted Cross-Reactivity
Adenovirus	Non-human <i>Mastadenovirus</i> species (e.g., simian, bovine, porcine, lemur, bat) and enteric human adenoviruses (types 40, 41, 52)
Coronavirus OC43/HKU1	Non-human embecoviruses (e.g., bovine, canine respiratory, yak, dromedary camel, equine, and sambar deer coronaviruses)
SARS-CoV-2	SARS-related coronaviruses (e.g., bat SARS-like, bat SARS, civet SARS coronavirus, and other SARS-related betacoronaviruses)
Parainfluenza 1 / Parainfluenza 3	Non-human parainfluenza and respirovirus species (e.g., caprine parainfluenza virus 3, <i>Respirovirus bovis</i> , swine and wild boar parainfluenza virus 3)

Oligonucleotide Target	Predicted Cross-Reactivity
RSV A / RSV B	Bovine orthopneumovirus and bovine respiratory syncytial virus (did not meet primer mismatch criteria of no more than 4)
Rhinovirus/Enterovirus	Non-human enteroviruses and other picornaviruses (e.g., canine, porcine, simian, bat, and rodent associated sequences)
<i>Bordetella pertussis</i>	<i>Bordetella bronchiseptica</i> and <i>Bordetella holmesii</i>
<i>Bordetella parapertussis</i>	<i>Bordetella bronchiseptica</i> and <i>Achromobacter denitrificans</i>

Wet-Testing

In addition to the *in silico* exclusivity analysis, the analytical specificity of the Xpert Respiratory Panel test was evaluated by bench testing a panel of 52 microorganisms (8 viruses, 39 bacteria, 5 fungi) and a diverse microbial human flora, commonly found in the nasopharynx or pathogens phylogenetically related to the respiratory pathogens detected by the Xpert Respiratory Panel test. The panel was tested individually or in different pools of pathogens, in the absence of on-panel analytes. Each exclusivity test sample was tested with a minimum of 3 replicates. A sample was considered negative if all three replicates were negative for all analytes detected by the Xpert Respiratory Panel test. If an exclusivity microorganism was reported POSITIVE with the Xpert Respiratory Panel test, the test was repeated with a lower concentration of the exclusivity microorganisms and the highest concentration that did not produce a false positive result was recorded. The bacterial and yeast strains were tested at concentrations of $\geq 1\text{E}6$ units/mL (CFU/mL, IFU/mL, copies/mL or CCU/mL) and viral strains were tested at $\geq 1\text{E}5$ units/mL (TCID₅₀/mL or copies/mL) in simulated nasopharyngeal swab (NPS) matrix, except for *Ureaplasma urealyticum* which was tested at 2E4 copies/mL. As no quantified stock was available, SARS-CoV-1 was tested at a dilution of 1:100.

The results of the analytical specificity study demonstrated that the primer/probe sets do not cross-react with the nucleic acids from non-intended respiratory microorganisms or phylogenetically related respiratory pathogens detected by the Xpert Respiratory Panel test. The one exception was SARS-CoV-1 which yielded the expected SARS-CoV-2 POSITIVE test result. Based on the *in silico* analysis, cross-reactivity with the E gene target of SARS-CoV-1 was expected due to the highly conserved E gene target shared among coronaviruses in the B lineage *Betacoronavirus*. Although the nasal wash sample reported Parainfluenza POSITIVE results in all replicates tested, sequencing result confirmed the presence of Parainfluenza in this diverse microbial human flora. The results for the pathogens tested are presented in **Table 6**.

Table 6. Analytical Specificity (Exclusivity) of the Xpert Respiratory Panel Test

Count	Exclusivity Strain	Concentration Tested	Test Result
0	Negative Control	Not Applicable	NEG
1	<i>Escherichia coli</i>	2E6 CFU/mL	NEG
2	<i>Lactobacillus plantarum</i>	2E6 CFU/mL	NEG
3	<i>Legionella longbeacheae</i>	2E6 CFU/mL	NEG
4	<i>Pseudomonas aeruginosa</i>	2E6 CFU/mL	NEG
5	<i>Enterobacter aerogenes</i>	2E6 CFU/mL	NEG

Count	Exclusivity Strain	Concentration Tested	Test Result
6	<i>Legionella pneumophila</i>	2E6 CFU/mL	NEG
7	<i>Staphylococcus epidermidis</i>	2E6 CFU/mL	NEG
8	<i>Stenotrophomonas maltophilia</i>	2E6 CFU/mL	NEG
9	<i>Klebsiella oxytoca</i>	2E6 CFU/mL	NEG
10	<i>Neisseria elongata</i>	2E6 CFU/mL	NEG
11	<i>Serratia marcescens</i>	2E6 CFU/mL	NEG
12	<i>Streptococcus pyogenes</i>	2E6 CFU/mL	NEG
13	<i>Klebsiella pneumoniae</i>	2E6 CFU/mL	NEG
14	<i>Mycoplasma hominis</i>	2E6 CCU/mL	NEG
15	<i>Proteus mirabilis</i>	2E6 CFU/mL	NEG
16	<i>Streptococcus pneumoniae</i>	2E6 CFU/mL	NEG
17	<i>Candida albicans</i>	2E6 CFU/mL	NEG
18	<i>Mycoplasma orale</i>	2E6 CFU/mL	NEG
19	<i>Corynebacterium diphtheriae</i>	2E6 CFU/mL	NEG
20	<i>Streptococcus salivarius</i>	2E6 CFU/mL	NEG
21	<i>Neisseria gonorrhoeae</i>	2E6 CFU/mL	NEG
22	<i>Acinetobacter calcoaceticus</i>	2E6 CFU/mL	NEG
23	<i>Haemophilus influenzae</i>	2E6 CFU/mL	NEG
24	<i>Lactobacillus acidophilus</i>	2E6 CFU/mL	NEG
25	<i>Moraxella catarrhalis</i>	2E6 CFU/mL	NEG
26	<i>Neisseria meningitidis</i>	2E6 CFU/mL	NEG
27	<i>Streptococcus agalactiae</i>	2E6 CFU/mL	NEG
28	<i>Chlamydia trachomatis</i>	2E6 IFU/mL	NEG
29	<i>Aspergillus flavus</i>	2E6 CFU/mL	NEG
30	<i>Aspergillus fumigatus</i>	2E6 CFU/mL	NEG
31	<i>Cryptococcus neoformans</i>	2E6 CFU/mL	NEG
32	<i>Pneumocystis jirovecii</i>	2E6 CFU/mL	NEG
33	<i>Bordetella avium</i>	2E6 CFU/mL	NEG
34	<i>Bordetella hinzii</i>	2E6 CFU/mL	NEG
35	<i>Bordetella bronchiseptica</i>	2E6 CFU/mL	NEG
36	<i>Bordetella holmesii</i>	2E6 CFU/mL	NEG
37	Bocavirus	2E5 Cp/mL	NEG
38	Measles Virus	2E5 TCID ₅₀ /mL	NEG
39	Cytomegalovirus (CMV)	2E5 Cp/mL	NEG
40	Epstein-Barr Virus (EBV)	2E5 Cp/mL	NEG
41	<i>Mycobacterium tuberculosis</i>	2E6 Cp/mL	NEG
42	<i>Mycoplasma genitalium</i>	2E6 Cp/mL	NEG
43	<i>Ureaplasma urealyticum</i>	2E4 Cp/mL	NEG
44	<i>Staphylococcus aureus</i>	2E6 CFU/mL	NEG
45	Mumps	2E5 TCID ₅₀ /mL	NEG

Count	Exclusivity Strain	Concentration Tested	Test Result
46	Herpes Simplex Virus 1	1E6 TCID ₅₀ /mL	NEG
47	Middle East Respiratory (MERS)	2E5 Cp/mL	NEG
48	SARS-CoV-1	Not Applicable	POS
49	<i>Legionella bozemanii</i>	2E6 CFU/mL	NEG
50	<i>Legionella dumofii</i>	2E6 CFU/mL	NEG
51	<i>Legionella feeleeii</i>	2E6 CFU/mL	NEG
52	<i>Legionella micdadei</i>	2E6 CFU/mL	NEG
53	Nasal wash	Not Applicable	POS

Microbial Interference

The microbial interference of the Xpert Respiratory Panel test was evaluated by testing the same panel of 52 pathogens (8 viruses, 39 bacteria, 5 fungi) used in the analytical specificity / exclusivity study (**Table 6**), in the presence of individual on-panel analyte at a concentration of ~3x LoD in simulated nasopharyngeal swab (NPS) matrix. The panel was tested in different pools of pathogens, with 6 replicates per pool. A sample was considered positive if all 6 replicates were positive for the on-panel analyte tested. The bacterial and yeast strains were tested at concentrations of $\geq 1\text{E}6$ units/mL (CFU/mL, IFU/mL, copies/mL or CCU/mL) and viral strains were tested at $\geq 1\text{E}5$ units/mL (TCID₅₀/mL or copies/mL) in simulated nasopharyngeal swab (NPS) matrix, except for *Ureaplasma urealyticum* which was tested at 2E4 copies/mL. As no quantified stock was available, SARS-CoV-1 was tested at a dilution of 1:100.

No microbial interference by the pathogens was reported.

On-Panel Cross-Reactivity

To evaluate potential on-panel cross-reactivity, a subset of viruses and bacteria from the inclusivity study were tested individually at high concentrations ($\geq 1\text{E}6$ CFU/mL for bacteria, and $\geq 1\text{E}5$ TCID₅₀/mL for viruses) in simulated nasopharyngeal swab (NPS) matrix, without additional pathogens. The following on-panel viruses and bacteria were tested: Adenovirus, Coronavirus, Human Metapneumovirus (A and B), Rhinovirus, Enterovirus, Parainfluenza, Influenza A, Influenza B, Respiratory Syncytial Virus, *Bordetella pertussis*, *Bordetella parapertussis*, *Mycoplasma pneumoniae*, and *Chlamydia pneumoniae*. Each sample was tested with 6 replicates. All Xpert Respiratory Panel on-panel viruses and bacteria individually tested at high concentrations were reported positive only for the analyte being tested, while all other on-panel analytes were reported negative, except for two false positive results (Adenovirus and *M. pneumoniae*) observed during the testing of *B. pertussis*. Bioinformatic analysis conducted, incorporating both homology and thermodynamic assessments, did not show any predicted amplicons from cross-reactivity to the *B. pertussis* genome, suggesting that the observed false positives results were due to sporadic environmental contamination.

Competitive Interference

The potential competitive interference in the Xpert Respiratory Panel test caused by clinically relevant co-infections was evaluated by testing contrived samples of Adenovirus, Coronavirus, SARS-CoV-2, Human Metapneumovirus, Rhinovirus, Respiratory Syncytial Virus, *Bordetella pertussis* and *Chlamydia pneumoniae* strains at 3x LoD in the presence of another on-panel analyte at a high concentration (1E5 copies/mL for viral strains and 1E6 CFU/mL or IFU/mL for bacterial strains) in simulated NPS matrix, for a total of 18 combinations. Each combination was tested in replicates of 5 using one reagent lot. A sample was considered to show no competitive interference if the analyte at 3x LoD was positive in all 5 replicates. No competitive interference was observed for the potential co-infections tested in the study. The results for the combinations tested are presented in **Table 7**.

Table 7. Combinations Tested for Competitive Interference

Combination	Analyte at 3x LoD			Competitive Analyte at High Titer	Number of Positive Results / Total Valid Replicates
	Target Pathogen	Conc.	Conc. (Copies/mL)		
1	Adenovirus	10.4 TCID ₅₀ /mL	272	Rhinovirus	5/5
2	Respiratory Syncytial Virus	0.66 TCID ₅₀ /mL	11,943	Rhinovirus	5/5
3	Coronavirus	0.94 TCID ₅₀ /mL	7.7	Rhinovirus	5/5
4	Respiratory Syncytial Virus	0.66 TCID ₅₀ /mL	11,943	Adenovirus	5/5
5	Adenovirus	10.4 TCID ₅₀ /mL	272	SARS-CoV-2	5/5
6	Rhinovirus	30.6 TCID ₅₀ /mL	13,023	SARS-CoV-2	5/5
7	Human Metapneumovirus	0.26 TCID ₅₀ /mL	5,018	SARS-CoV-2	5/5
8	Respiratory Syncytial Virus	0.66 TCID ₅₀ /mL	11,943	SARS-CoV-2	5/5
9	Rhinovirus	30.6 TCID ₅₀ /mL	13,023	Adenovirus	5/5
10	Rhinovirus	30.6 TCID ₅₀ /mL	13,023	Respiratory Syncytial Virus	5/5
11	Rhinovirus	30.6 TCID ₅₀ /mL	13,023	Coronavirus	5/5
12	Adenovirus	10.4 TCID ₅₀ /mL	272	Respiratory Syncytial Virus	5/5
13	SARS-CoV-2	3.8 TCID ₅₀ /mL	1,169	Adenovirus	5/5
14	SARS-CoV-2	3.8 TCID ₅₀ /mL	1,169	Rhinovirus	5/5
15	SARS-CoV-2	3.8 TCID ₅₀ /mL	1,169	Human Metapneumovirus	5/5
16	SARS-CoV-2	3.8 TCID ₅₀ /mL	1,169	Respiratory Syncytial Virus	5/5
17	<i>C. pneumoniae</i>	131.9 IFU/mL	NA	<i>B. pertussis</i>	5/5
18	<i>B. pertussis</i>	16.5 CFU/mL	NA	<i>C. pneumoniae</i>	5/5

Combi- nation	Analyte at 3x LoD			Competitive Analyte at High Titer	Number of Positive Results / Total Valid Replicates
	Target Pathogen	Conc.	Conc. (Copies/mL)		

Potentially Interfering Substances

The susceptibility of the Xpert Respiratory Panel test to interference by elevated levels of potentially interfering substances was evaluated. Potentially interfering substances in the nasal passage and nasopharynx may include, but are not limited to, blood, nasal secretions or mucus, and nasal and throat medications used to relieve congestion, nasal dryness, irritation, or asthma and allergy symptoms, as well as antibiotics and antivirals. Additionally, method-specific substances for collecting and storing clinical nasopharyngeal swab specimens were also evaluated. Each substance was tested individually in the presence and absence of 6 representative on-panel viruses and bacteria (Adenovirus, SARS-CoV-2, Human Metapneumovirus, Rhinovirus, Influenza A, and *Chlamydia pneumoniae*), prepared at ~3x LoD in simulated nasopharyngeal swab (NPS) matrix. The viruses and bacteria were either tested in a pool of 4 pathogens or individually (e.g., SARS-CoV-2 and Rhinovirus). Positive and negative samples were tested with 6 replicates per substance. Positive and negative controls were also included in the study. A total of 34 substances were tested with the Xpert Respiratory Panel test, and 32 demonstrated no interference with the assay performance. Two substances, FluMist (6.7%) and Saline Nasal Gel (15%), showed interference with the Xpert Respiratory Panel test performance. As a safety precaution, a maximum bleach concentration of 1% is included as a limitation. The substances and concentrations tested are presented in **Table 8**.

Table 8. Potentially Interfering Substances Tested

Substance ID	Substance/Class	Highest Concentration Tested Without Interference
Control NPS Simulated Matrix	No substance	100% ^a
Human whole blood K2-EDTA	Endogenous substance	10 % v/v
Mucin	Endogenous substance	1% v/v ^b
Human genomic DNA	Endogenous substance	20 ng/mL
Tobramycin	Antibiotic	0.6 mg/mL
Mupirocin	Antibiotic	2% w/v
Saline Nasal Spray	Nasal spray	1% v/v
Nasal Decongestant Spray Oxymetazoline HCl 0.05%	Nasal spray	1% v/v ^c
Analgesic ointment (Vicks® VapoRub®)	Analgesic ointment	1% w/v
Petroleum Jelly (Vaseline®)	Topical ointment	1% w/v
Snuff (Nasal Tobacco)	Nasal tobacco	1% w/v
Zinc	Zinc supplement	0.1 µg/mL
FluMist	Influenza vaccine	6.7% v/v ^d
Zanamivir	Antiviral drug	7.5 mg/mL

Substance ID	Substance/Class	Highest Concentration Tested Without Interference
Nasonex (mometasone furoate)	Allergy medication	1% v/v
Saline Nasal Gel	Nasal gel	15% w/v ^b
Throat lozenges	Throat lozenge	1.7 mg/mL
Bleach	Disinfectant	5% v/v
Disinfecting wipes	Disinfectant	0.5 inches ² (3.23 cm ²)
Ethanol (70%)	Disinfectant	7% v/v
DNAZap™	Nucleic acid degrading reagent	1% v/v
RNAseOUT™	Nucleic acid degrading reagent	1% v/v
Nasopharyngeal swab 168C	Specimen collection device	1 swab ^b
FloQSwab 552C	Specimen collection device	1 swab
Nasopharyngeal swab 175KS01	Specimen collection device	1 swab
Eswab 480c	Specimen collection device	1 swab
Puritan® Calgiswab® 25-800 A 50c	Specimen collection device	1 swab
Microtest™ M4-RT transport media	Transport media	100% ^a
UTM	Transport media	100% ^a
eNAT®	Transport media	100% ^a
BD universal viral transport medium	Transport media	100% ^a
Sigma Virocult transport medium	Transport media	100% ^a
Microtest™ M6 transport media	Transport media	100% ^a
Microtest™ M5 transport media	Transport media	100% ^a
PrimeStore® molecular transport medium	Transport media	100% ^a

^a Test concentration of 100% denotes the use of the substance directly and undiluted as a sample matrix.

^b Interference was observed when testing *Chlamydia pneumoniae* in a representative mix of on-panel analytes. No interference was observed when testing *Chlamydia pneumoniae* as a single analyte.

^c Interference was observed when testing Influenza A in a representative mix of on-panel analytes. No interference was observed when testing Influenza A as a single analyte.

^d False positive results for Influenza A and Influenza B were observed with FluMist at 6.7% v/v.

Prevention of Carry-over Contamination

A study was conducted to demonstrate that single-use, self-contained Xpert Respiratory Panel test cartridges minimize specimen and amplicon carry-over contamination from very high titer positive samples into successively run negative samples when processed in the same GeneXpert module. The following on-panel viruses and bacteria were tested: Adenovirus (1E6 TCID₅₀/mL), SARS-CoV-2 (1E6 TCID₅₀/mL), Human Metapneumovirus (1E6 TCID₅₀/mL), Influenza A (1E7 CEID₅₀/mL), Influenza B (1E6 TCID₅₀/mL), *B. pertussis* (1E7 CFU/mL), *M. pneumoniae* (1E6 copies/mL), and *C. pneumoniae* (1E6 TCID₅₀/mL). The viruses and bacteria were tested in pools of 2-4 pathogens, except for SARS-CoV-2 which was tested individually. The negative sample consisted of simulated NPS matrix.

A high titer positive sample was tested, immediately followed by testing a negative sample in the same GeneXpert instrument module. The testing scheme was repeated 10 times for each

high titer positive sample, and two different modules were included in the study. Each replicate of the positive samples was correctly reported as positive for the on-panel viruses and bacteria tested. Each replicate of the negative sample, processed immediately following a replicate of the high titer positive sample, was correctly reported as negative. No evidence of specimen or amplicon carry-over contamination was observed.

Reproducibility

The reproducibility of the Xpert Respiratory Panel test was established at 3 sites (1 internal, 2 external) using a 7-member panel, including 1 negative sample, 3 low positive and 3 moderate positive samples. Collectively, the 3 positive panel members at each level included one strain per on-panel analyte for a total of 14 analytes detected by the Xpert Respiratory Panel. Positive panel members consisted of 5 – 6 different analytes, contrived in simulated NPS matrix to a low (~1x LoD) or moderate (~3x LoD) level. The negative sample consisted of simulated NPS matrix only. Testing was performed across 6 days, using 3 lots of cartridges at 3 sites. Each site had 2 operators who tested 2 runs of 2 replicates per testing day to yield a total of 144 observations per panel member (3 Sites × 2 Operators × 3 Lots × 2 Days /Lot × 2 Run × 2 Replicates = 144 test results/panel member).

As presented in **Table 9**, the percent agreement of qualitative results for each analyte within each panel member was analyzed across each of the 6 operators and across each of the 3 study sites. In addition, the overall percent agreement for each analyte within each panel member (total agreement) was calculated, as well as the Wilson Score 95% CI for each proportion of concordance.

Table 9. Summary of Reproducibility Results - Percent Agreement

Analyte	Level	Site 01			Site 02			Site 03			Total Agreement with 95% CI
		Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	
PIV	Low Pos (~1x LoD)	95.8% 23/24	95.8% 23/24	95.8% 46/48	100% 24/24	100% 23/23	100% 47/47	100% 24/24	95.8% 23/24	97.9% 47/48	97.9% (140/143) 94.0-99.3%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
CoV	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 23/23	100% 47/47	100% 24/24	100% 24/24	100% 48/48	100% (143/143) 97.4-100%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
<i>B. parapertussis</i>	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 23/23	100% 47/47	100% 24/24	100% 24/24	100% 48/48	100% (143/143) 97.4-100%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
Flu A	Low Pos (~1x LoD)	95.8% 23/24	100% 24/24	97.9% 47/48	100% 24/24	100% 23/23	100% 47/47	95.8% 23/24	100% 24/24	97.9% 47/48	98.6% (141/143)

Analyte	Level	Site 01			Site 02			Site 03			Total Agreement with 95% CI
		Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	
											95.0-99.6%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
RSV	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 23/23	100% 47/47	100% 24/24	100% 24/24	100% 48/48	100% (143/143) 97.4-100%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
<i>C. pneumoniae</i>	Low Pos (~1x LoD)	91.7% 22/24	100% 24/24	95.8% 46/48	87.5% 21/24	95.8% 23/24	91.7% 44/48	95.8% 23/24	100% 24/24	97.9% 47/48	95.1% (137/144) 90.3-97.6%
	Mod Pos	100% 24/24	100% 24/24	100% 48/48	95.8% 23/24	100% 24/24	97.9% 47/48	100% 24/24	100% 24/24	100% 48/48	99.3% (143/144) 96.2-99.9%
hMPV	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
AdV	Low Pos (~1x LoD)	95.8% 23/24	95.8% 23/24	95.8% 46/48	91.7% 22/24	95.8% 23/24	93.8% 45/48	100% 24/24	95.8% 23/24	97.9% 47/48	95.8% (138/144) 91.2-98.1%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
RV/EV	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
Flu B	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
<i>B. pertussis</i>	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	95.8% 23/24	95.8% 23/24	95.8% 46/48	100% 24/24	100% 24/24	100% 48/48	98.6% (142/144) 95.1-99.6%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	95.8% 23/24	97.9% 47/48	100% 24/24	100% 24/24	100% 48/48	99.3% (143/144) 96.2-99.9%
<i>M. pneumoniae</i>	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	95.8% 23/24	97.9% 47/48	100% 24/24	100% 24/24	100% 48/48	99.3% (143/144) 96.2-99.9%

Analyte	Level	Site 01			Site 02			Site 03			Total Agreement with 95% CI
		Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	Op 1	Op 2	Subtotal	
SARS-CoV-2	Low Pos (~1x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
	Mod Pos (~3x LoD)	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% 24/24	100% 24/24	100% 48/48	100% (144/144) 97.4-100%
Negative	N/A	100% 24/24	95.8% 23/24	97.9% 47/48	95.8% 23/24	100% 23/23	97.9% 46/47	100% 24/24	100% 24/24	100% 48/48	98.6% (141/143) 95.0-99.6%

The results of a nested ANOVA over the internal continuous response in the Xpert Respiratory Panel test (either Ct values or melt curve measurements) are presented by analyte in **Table 10**. The standard deviation (SD) and coefficient of variation (CV, expressed as a percentage) for each study factor (i.e., site, operator, lot, day, run, within-run), as well as the total variance, are also presented.

Table 10. Summary of Nested ANOVA by Coefficient of Variation

Analyte (Level)	Response	N	Mean	Variance Source													
				Site		OP		Lot		Day		Run		Within-Run		Total	
				SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)
PIV (Low Pos)	Ct	140 ^{ab}	39.2	0.2	0.6	0.0	0.0	0.7	1.7	0.2	0.4	0.0	0.0	1.2	3.1	1.4	3.7
PIV (Mod Pos)	Ct	144	38.5	0.0	0.0	0.0	0.0	0.6	1.5	0.0	0.0	0.5	1.2	1.2	3.0	1.4	3.6
CoV (Low Pos)	Ct	143 ^a	39	0.0	0.0	0.0	0.0	0.4	1.1	0.2	0.6	0.0	0.0	0.8	2.2	1.0	2.5
CoV (Mod Pos)	Ct	144	38.2	0.1	0.4	0.0	0.0	0.5	1.4	0.2	0.5	0.0	0.0	0.7	1.8	0.9	2.3
<i>B. parapertussis</i> (Low Pos)	MP	143 ^a	15.9	0.7	4.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	18.0	2.9	18.5
	MV	143 ^a	14	0.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.4	2.5	18.0	2.6	18.9
<i>B. parapertussis</i> (Mod Pos)	MP	144	16.9	1.3	7.6	0.0	0.0	0.3	2.0	0.0	0.0	0.9	5.2	2.7	15.7	3.1	18.4
	MV	144	15	1.2	8.0	0.1	0.7	0.3	1.8	0.0	0.0	1.0	6.6	2.4	16.1	2.9	19.2
Flu A (Low Pos)	Ct	142 ^{ab}	37	0.1	0.4	0.0	0.0	0.5	1.5	0.1	0.3	0.0	0.0	0.9	2.4	1.0	2.8
Flu A (Mod Pos)	Ct	144	36.4	0.0	0.0	0.0	0.0	0.3	0.9	0.0	0.0	0.1	0.4	5.3	14.5	0.6	1.8
RSV (Low Pos)	Ct	143 ^a	35.9	0.2	0.7	0.0	0.0	0.0	0.0	0.5	1.3	0.1	0.4	1.3	3.5	1.4	3.8
RSV (Mod Pos)	Ct	144	35.4	0.1	0.3	0.0	0.0	0.5	1.4	0.0	0.0	0.0	0.0	1.0	2.8	1.1	3.1
<i>C. pneumoniae</i> (Low Pos)	MP	137 ^c	9.1	0.0	0.0	0.0	0.0	0.5	6.0	0.1	1.1	0.5	5.2	1.0	11.4	1.3	13.9
	MV	137 ^c	4.6	0.0	0.0	0.0	0.0	0.5	11.7	0.0	0.0	0.5	11.7	0.8	18.1	1.1	24.5
<i>C. pneumoniae</i> (Mod Pos)	MP	143 ^c	9.7	0.0	0.0	0.0	0.0	0.4	4.3	0.0	0.0	0.2	2.3	1.2	11.9	1.2	12.8
	MV	143 ^c	5.1	0.0	0.0	0.0	0.0	0.5	9.4	0.0	0.0	0.2	3.9	1.0	18.9	1.1	21.4
hMPV (Low Pos)	MP	144	7	1.4	19.6	0.0	0.0	0.3	4.0	0.0	0.0	0.0	0.0	2.0	28.4	2.4	34.8
	MV	144	6.7	1.3	19.1	0.0	0.0	0.3	4.5	0.0	0.0	0.0	0.0	2.0	29.5	2.4	35.4
hMPV (Mod Pos)	MP	144	8.1	1.4	17.8	0.1	1.2	0.0	0.0	0.1	1.7	0.9	10.6	1.6	20.1	2.3	29.0
	MV	144	7.8	1.4	17.3	0.2	2.6	0.0	0.0	0.0	0.0	0.9	11.4	1.5	19.5	2.2	28.6
AdV	Ct	138 ^b	39.8	0.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.5	1.1	2.9	1.2	3.0

Analyte (Level)	Response	N	Mean	Variance Source													
				Site		OP		Lot		Day		Run		Within-Run		Total	
				SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)	SD	CV (%)
(Low Pos)																	
AdV (Mod Pos)	Ct	144	39.2	0.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.4	1.0	1.1	2.9	1.3	3.2
RV/EV (Low Pos)	Ct	144	36.4	0.1	0.3	0.0	0.0	0.3	0.7	0.0	0.0	0.1	0.4	0.4	1.0	0.5	1.3
RV/EV (Mod Pos)	Ct	144	35.8	0.0	0.0	0.0	0.0	0.3	0.9	0.1	0.4	0.0	0.0	0.3	0.9	0.5	1.4
Flu B (Low Pos)	Ct	144	37.2	0.0	0.0	0.0	0.0	0.7	1.8	0.0	0.0	0.0	0.0	0.4	1.2	0.8	2.2
Flu B (Mod Pos)	Ct	144	36.5	0.0	0.0	0.0	0.0	0.7	1.8	0.0	0.0	0.1	0.3	0.3	0.8	0.7	2.0
<i>B. pertussis</i> (Low Pos)	MP	142 ^c	14.1	0.9	6.3	0.0	0.0	0.8	5.5	0.2	1.6	0.0	0.0	2.2	15.7	0.8	5.6
	MV	142 ^c	11.6	0.7	6.3	0.0	0.0	0.7	6.0	0.1	1.2	0.0	0.0	1.8	15.6	2.1	18.0
<i>B. pertussis</i> (Mod Pos)	MP	143 ^c	14.4	1.2	8.1	0.0	0.0	1.1	7.6	0.0	0.0	0.0	0.0	2.3	15.6	2.8	19.2
	MV	143 ^c	11.9	1.0	8.1	0.0	0.0	1.0	8.3	0.3	2.4	0.0	0.0	1.9	15.7	2.3	19.7
<i>M. pneumoniae</i> (Low Pos)	MP	144	16.3	0.8	50.6	0.9	5.7	0.1	0.9	0.7	4.2	1.6	9.7	3.8	23.4	4.4	26.7
	MV	144	18.6	0.8	4.6	0.8	4.5	1.2	6.6	0.8	4.5	2.0	10.9	4.3	23.2	5.1	27.6
<i>M. pneumoniae</i> (Mod Pos)	MP	143 ^c	19.5	0.4	2.3	0.0	0.0	1.1	5.7	0.0	0.0	1.5	7.5	3.6	18.7	4.1	21.1
	MV	143 ^c	22.6	0.7	2.9	0.0	0.0	1.6	6.9	0.0	0.0	1.6	6.9	4.2	18.5	4.8	21.1
SARS-CoV-2 (Low Pos)	Ct	144	35.9	0.1	0.4	0.0	0.0	0.5	1.5	0.2	0.5	0.2	0.7	0.9	2.5	1.1	3.1
SARS-CoV-2 (Mod Pos)	Ct	144	35.1	0.2	0.6	0.0	0.0	0.5	1.4	0.0	0.0	0.0	0.0	0.9	2.6	1.0	3.0

Abbreviations: Ct, cycle threshold; CV, coefficient of variation; Low Pos, low positive ~1xLoD; MP, melt peak; Mod Pos, moderate positive ~3xLoD; MV, melt valley; SD, standard deviation

^a Sample excluded due to an ND result.

^b Sample excluded due to 0 Ct value.

^c Sample excluded due to missing melt peak and melt valley values.

1.4.2. Clinical Performance

The clinical performance of the Xpert Respiratory Panel test was evaluated in a multi-site, all-comers method comparison study which included 19 geographically diverse sites within (15) and outside (4) of the U.S. During the study, prospectively collected NPS specimens in UTM/VTM from leftover standard of care testing were enrolled in the study. Prospective fresh specimens were enrolled from November 2024 to February 2025. Prospective frozen specimens were collected from January to March 2024 and during the month of September 2024. Xpert testing of all prospective specimens occurred from November 2024 to February 2025. To supplement the sample size for analytes with low prevalence, pre-selected archived specimens with collection dates of May 2009 to September 2025 were tested from January 2023 to August 2026. Contrived samples were also included to supplement the sample size for *B. paraptussis* and *C. pneumoniae* and were tested from November to December 2024.

A total of 3026 specimens (prospective fresh and frozen = 2631, archived = 279, contrived = 116) were tested with Xpert Respiratory Panel in the study. The initial and final non-determinate rates in the clinical performance study were 2.8% (86/3026) and 0.3% (8/3026), respectively.

1.4.2.1. Prospective Specimens

Available demographic data from the individuals (N=2643) from whom prospective specimens were collected are presented in

Table 11.

Table 11. Demographic Summary for Prospective Specimens by Site

Category		Overall (N=2643)	Site 1 (N=297)	Site 2 (N=275)	Site 3 (N=253)	Site 4 (N=293)	Site 5 (N=46)	Site 6 (N=252)	Site 7 (N=200)	Site 8 (N=187)	Site 9 (N=399)	Site 10 (N=183)	Site 11 (N=312)
Sex	Male	1240 (46.9%)	98 (33.0%)	122 (44.4%)	137 (54.2%)	124 (51.9%)	26 (56.5%)	122 (48.4%)	105 (52.5%)	108 (57.8%)	149 (37.3%)	102 (55.7%)	147 (47.1%)
	Female	1403 (53.1%)	199 (67.0%)	153 (55.6%)	116 (45.8%)	115 (48.1%)	20 (43.5%)	130 (51.6%)	95 (47.5%)	79 (42.2%)	250 (62.7%)	81 (44.3%)	165 (52.9%)
Age	≤ 5	556 (21.0%)	12 (4.0%)	4 (1.5%)	175 (69.2%)	27 (11.3%)	28 (60.9%)	85 (33.7%)	23 (11.5%)	96 (51.3%)	22 (5.5%)	2 (1.1%)	82 (26.3%)
	6-17	365 (13.8%)	8 (2.7%)	6 (2.2%)	77 (30.4%)	16 (6.7%)	15 (32.6%)	33 (13.1%)	57 (28.5%)	77 (41.2%)	29 (7.3%)	5 (2.7%)	42 (13.5%)
	18-21	104 (3.9%)	17 (5.7%)	13 (4.7%)	1 (0.4%)	3 (1.3%)	3 (6.5%)	5 (2.0%)	8 (4.0%)	13 (7.0%)	19 (4.8%)	5 (2.7%)	17 (5.4%)
	22-49	657 (24.9%)	120 (40.4%)	106 (38.5%)	0 (0%)	36 (15.1%)	0 (0%)	50 (19.8%)	45 (22.5%)	1 (0.5%)	174 (43.6%)	55 (30.1%)	70 (22.4%)
	50-64	374 (14.2%)	72 (24.2%)	53 (19.3%)	0 (0%)	24 (10.0%)	0 (0%)	33 (13.1%)	17 (8.5%)	0 (0%)	84 (21.1%)	48 (26.2%)	43 (13.8%)
	≥ 65	587 (22.2%)	68 (22.9%)	93 (33.8%)	0 (0%)	133 (55.6%)	0 (0%)	46 (18.3%)	50 (25.0%)	0 (0%)	71 (17.8%)	68 (37.2%)	58 (18.6%)

Table 12 presents the demographic information from the prospective symptomatic population.

Table 12. Demographic Summary for the Prospective Symptomatic Population

Characteristics	Symptomatic Subjects
Total, N	2643
Age Group (Years), n (%)	
≤ 5 yr	556 (21.0%)
6-17 yr	365 (13.8%)
18-21 yr	104 (3.9%)
22-49 yr	657 (24.9%)
50-64 yr	374 (14.2%)
≥ 65 yr	587 (22.2%)
Sex, n (%)	
Male	1240 (46.9%)
Female	1403 (53.1%)
Ethnicity, n (%)	
Hispanic / Latino	592 (22.4%)
Not Hispanic / Not Latino	1529 (57.9%)
Not Available	522 (19.8%)
Race, n (%)	
American Indian / Alaskan Native	9 (0.3%)
Asian	61 (2.3%)
Black / African-American	533 (20.2%)
White	1094 (41.4%)
Other or Mixed Race	15 (0.6%)
Not Available	931 (35.2%)

Of the 2,643 prospective specimens included in the final dataset, 12 were excluded due to protocol deviations with Xpert Respiratory Panel testing. The initial non-determinate rate for the Xpert Respiratory Panel test was 3.0% (79/2631). After retest, the final non-determinate rate for the Xpert Respiratory Panel test was 0.3% (7/2631) specimens in prospectively collected specimens.

The positive percent agreement (PPA) and negative percent agreement (NPA) of the Xpert Respiratory Panel test results in prospective and archived specimens were determined by comparing results of Xpert for all analytes except *B. paraptussis* with those from an FDA-cleared molecular respiratory panel (“NAAT 1”). The PPA and NPA for *B. paraptussis* detection were determined by comparing results for Xpert with those from a different FDA-cleared molecular respiratory panel (“NAAT 2”). Discrepant results between Xpert and the comparator for all analytes except *B. paraptussis* were investigated using results from NAAT 2. Discrepant *B. paraptussis* results were investigated using a molecular test for *B. paraptussis* (“NAAT-Bordetella”). The number of prospective specimens included in the clinical performance calculations for each analyte was based on the availability of valid results for Xpert and the comparator test and are presented in **Table 13**.

Table 13. Clinical Performance of Xpert Respiratory Panel in Prospectively Collected Specimens

Analyte		TP	FN	PPA% TP/(TP+FN)	PPA 95% CI	TN	FP	NPA% TN/(TN+FP)	NPA 95% CI
Adenovirus ¹	Prospective Overall	36	1	97.3% 36/37	86.2% - 99.5%	2448	20	99.2% 2448/2468	98.8% - 99.5%
	Fresh	33	1	97.1% 33/34	85.1% - 99.5%	2084	19	99.1% 2084/2103	98.6% - 99.4%
	Frozen	3	0	100% 3/3	43.9% - 100%	364	1	99.7% 364/365	98.5% - 100%
Coronavirus ²	Prospective Overall	128	4	97.0% 128/132	92.5% - 98.8%	2345	28	98.8% 2345/2373	98.3% - 99.2%
	Fresh	115	4	96.6% 115/119	91.7% - 98.7%	1996	22	98.9% 1996/2018	98.4% - 99.3%
	Frozen	13	0	100% 13/13	77.2% - 100%	349	6	98.3% 349/355	96.4% - 99.2%
SARS-CoV-2 ³	Prospective Overall	143	6	96.0% 143/149	91.5% - 98.1%	2297	59	97.5% 2297/2356	96.8% - 98.1%
	Fresh	53	1	98.1% 53/54	90.2% - 99.7%	2069	14	99.3% 2069/2083	98.9% - 99.6%
	Frozen	90	5	94.7% 90/95	88.3% - 97.7%	228	45	83.5% 228/273	78.7% - 87.4%
Human Metapneumovirus ⁴	Prospective Overall	30	0	100% 30/30	88.7% - 100%	2472	3	99.9% 2472/2475	99.6% - 100%
	Fresh	23	0	100% 23/23	85.7% - 100%	2113	1	99.9% 2113/2114	99.7% - 100%
	Frozen	7	0	100% 7/7	64.6% - 100%	359	2	99.4% 359/361	98.0% - 99.8%
Rhinovirus/ Enterovirus ⁵	Prospective Overall	362	16	95.8% 362/378	93.2% - 97.4%	2056	71	96.7% 2056/2127	95.8% - 97.3%
	Fresh	295	11	96.4% 295/306	93.7% - 98.0%	1767	64	96.5% 1767/1831	95.6% - 97.3%
	Frozen	67	5	93.1% 67/72	84.8% - 97.0%	289	7	97.6% 289/296	95.2% - 98.9%
Parainfluenza ⁶	Prospective Overall	57	1	98.3% 57/58	90.9% - 99.7%	2426	21	99.1% 2426/2447	98.7% - 99.4%
	Fresh	54	1	98.2% 54/55	90.4% - 99.7%	2063	19	99.1% 2063/2082	98.6% - 99.4%
	Frozen	3	0	100% 3/3	43.9% - 100%	363	2	99.5% 363/365	98.0% - 99.8%
Influenza A ⁷	Prospective Overall	297	5	98.3% 297/302	96.2% - 99.3%	2178	25	98.9% 2178/2203	98.3% - 99.2%
	Fresh	222	2	99.1% 222/224	96.8% - 99.8%	1906	7	99.6% 1906/1913	99.2% - 99.8%
	Frozen	75	3	96.2% 75/78	89.3% - 98.7%	272	18	93.8% 272/290	90.4% - 96.0%

Analyte		TP	FN	PPA% TP/(TP+FN)	PPA 95% CI	TN	FP	NPA% TN/(TN+FP)	NPA 95% CI
Influenza B	Prospective Overall	8	0	100% 8/8	67.6% - 100%	2497	0	100% 2497/2497	99.8% - 100%
	Fresh	8	0	100% 8/8	67.6% - 100%	2129	0	100% 2129/2129	99.8% - 100%
	Frozen	0	0	N/A	N/A	368	0	100% 368/368	99.0% - 100%
Respiratory Syncytial Virus ⁸	Prospective Overall	153	6	96.2% 153/159	92.0% - 98.3%	2319	27	98.8% 2319/2346	98.3% - 99.2%
	Fresh	152	6	96.2% 152/158	92.0% - 98.2%	1954	25	98.7% 1954/1979	98.1% - 99.1%
	Frozen	1	0	100% 1/1	20.7% - 100%	365	2	99.5% 365/367	98.0% - 99.9%
<i>Bordetella pertussis</i> ⁹	Prospective Overall	10	2	83.3% 10/12	55.2% - 95.3%	2488	5	99.8% 2488/2493	99.5% - 99.9%
	Fresh	9	1	90.0% 9/10	59.6% - 98.2%	2122	5	99.8% 2122/2127	99.5% - 99.9%
	Frozen	1	1	50.0% 1/2	9.4% - 90.6%	366	0	100% 366/366	99.0% - 100%
<i>Bordetella parapertussis</i> ¹⁰	Prospective Overall	0	0	N/A	N/A	2613	1	99.9% 2613/2614	99.8% - 100%
	Fresh	0	0	N/A	N/A	2218	0	100% 2218/2218	99.8% - 100%
	Frozen	0	0	N/A	N/A	395	1	99.7% 395/396	98.6% - 100%
<i>Mycoplasma pneumoniae</i> ¹¹	Prospective Overall	66	8	89.2% 66/74	80.1% - 94.4%	2409	22	99.1% 2409/2431	98.6% - 99.4%
	Fresh	65	8	89.0% 65/73	79.8% - 94.3%	2043	21	99.0% 2043/2064	98.4% - 99.3%
	Frozen	1	0	100% 1/1	20.7% - 100%	366	1	99.7% 366/367	98.5% - 100%
<i>Chlamydia pneumoniae</i> ¹²	Prospective Overall	1	0	100% 1/1	20.7% - 100%	2503	1	99.9% 2503/2504	99.8% - 100%
	Fresh	0	0	N/A	N/A	2137	0	100% 2137/2137	99.8% - 100%
	Frozen	1	0	100% 1/1	20.7% - 100%	366	1	99.7% 366/367	98.5% - 100%

¹ Discrepant test results based on NAAT 2: In specimens with FN results, 1/1 AdV negative. In specimens with FP results, 13/20 AdV positive, 7/20 AdV negative.

² Discrepant test results based on NAAT 2: In specimens with FN results, 3/4 CoV negative, 1/4 CoV positive. In specimens with FP results, 19/28 CoV positive, 9/28 CoV negative.

³ Discrepant test results based on NAAT 2: In specimens with FN results, 5/6 SARS-CoV-2 negative, 1/6 SARS-CoV-2 positive. In specimens with FP results, 22/59 SARS-CoV-2 positive, 37/59 SARS-CoV-2 negative.

⁴ Discrepant test results based on NAAT 2: In specimens with FP results, 1/3 hMPV positive, 2/3 hMPV negative.

⁵ Discrepant test results based on NAAT 2: In specimens with FN results, 3/16 RV/EV negative, 13/16 RV/EV positive. In specimens with FP results, 59/71 RV/EV positive, 12/71 RV/EV negative.

⁶ Discrepant test results based on NAAT 2: In specimens with FN results, 1/1 PIV negative. In specimens with FP results, 16/21 PIV positive, 5/21 PIV negative.

Analyte	TP	FN	PPA% TP/(TP+FN)	PPA 95% CI	TN	FP	NPA% TN/(TN+FP)	NPA 95% CI
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⁷ Discrepant test results based on NAAT 2: In specimens with FN results, 4/5 Flu A negative, 1/5 Flu A positive. In specimens with FP results, 11/25 Flu A positive, 13/25 Flu A negative, 1/25 with invalid results.

⁸ Discrepant test results based on NAAT 2: In specimens with FN results, 3/6 RSV negative, 3/6 RSV positive. In specimens with FP results, 20/27 RSV positive, 7/27 RSV negative.

⁹ Discrepant test results based on NAAT 2: In specimens with FN results, 2/2 *B. pertussis* negative. In specimens with FP results, 5/5 *B. pertussis* negative.

¹⁰ Discrepant test results based on NAAT-Bordetella: In specimens with FP results, 1/1 not sent for discrepant testing.

¹¹ Discrepant test results based on NAAT 2: In specimens with FN results, 7/8 *M. pneumoniae* negative, 1/8 *M. pneumoniae* positive. In specimens with FP results, 8/22 *M. pneumoniae* positive, 14/22 *M. pneumoniae* negative.

¹² Discrepant test results based on NAAT 2: In the specimen with FP results, 1/1 *C. pneumoniae* positive.

The Xpert Respiratory Panel test detected 2 or more analytes (multi-analyte detection) in a total of 215 specimens. Of the 215 specimens with multi-analyte detection, RV/EV was most commonly co-detected with another analyte (47.4%), followed by Flu A (34.0%), and SARS-CoV-2 (31.6%). The positivity rates of multi-analyte detection by Xpert are presented by analyte in **Table 14**.

Table 14. Xpert Positivity Rates of Multi-Analyte Detection

Analyte	Multi-analyte Detection (N = 215)
RV/EV	47.4% (102)
Flu A	34.0% (73)
SARS-CoV-2	31.6% (68)
RSV	24.7% (53)
CoV	23.7% (51)
AdV	17.2% (37)
PIV	14.4% (31)
<i>M. pneumoniae</i>	12.6% (27)
<i>B. pertussis</i>	4.7% (10)
hMPV	4.7% (10)
<i>B. parapertussis</i>	0.5% (1)

Table 15 presents only the number of specimens with multi-analyte detections by the Xpert Respiratory Panel test where there were five (5) or more occurrences of such combinations. Each combination is listed, along with the total number of occurrences observed, and the number of instances where there were false positive Xpert results for a given analyte as determined by the comparator.

Table 15. Combinations of Multi-Analyte Detection with ≥ 5 Occurrences by Xpert Respiratory Panel

Analyte 1	Analyte 2	Analyte 3	Total	Xpert False Positive Analytes
SARS-CoV-2	Flu A	N/A	28	SARS-CoV-2 (18) Flu A (8)
SARS-CoV-2	RV/EV	N/A	17	SARS-CoV-2 (10) RV/EV (4)
RV/EV	RSV	N/A	13	RV/EV (3) RSV (1)
RV/EV	AdV	N/A	11	AdV (4) RV/EV (3)
RV/EV	PIV	N/A	11	RV/EV (3) PIV (2)
CoV	Flu A	N/A	11	CoV (6) Flu A (1)
RV/EV	CoV	N/A	10	CoV (2) RV/EV (1)
RSV	CoV	N/A	9	RSV (3)
RV/EV	<i>M. pneumoniae</i>	N/A	8	RV/EV (3) <i>M. pneumoniae</i> (1)
RSV	AdV	N/A	5	AdV (3) RSV (1)
RSV	AdV	RV/EV	5	RSV (1)

1.4.2.2. Archived Specimens

To supplement the sample size for low prevalence pathogens (Human Metapneumovirus, Influenza B, *B. pertussis*, *B. parapertussis* and *C. pneumoniae*), a total of 279 archived NPS specimens in UTM/VTM with collection dates between May 2009 and September 2025 were enrolled in the study and included in the final dataset. The preselected, archived specimens were tested at 7 study sites by operators who did not have knowledge of the standard of care test result. **Error! Not a valid bookmark self-reference.** presents the demographic results for the 279 individuals from whom the pre-selected, archived NPS specimens were collected.

Table 16. Demographic Results of Archived Specimens by Site

Category		Overall (N=279)	Site 1 (N=3)	Site 2 (N=36)	Site 3 (N=26)	Site 4 (N=103)	Site 5 (N=4)	Site 6 (N=20)	Site 7 (N=87)
Sex	Male	134 (48.0%)	2 (66.7%)	16 (44.4%)	7 (26.9%)	53 (51.5%)	2 (50.0%)	7 (35.0%)	47 (54.0%)
	Female	145 (52.0%)	1 (33.3%)	20 (55.6%)	19 (73.1%)	50 (48.5%)	2 (50.0%)	13 (65.0%)	40 (46.0%)
Age*	≤ 5	86 (30.8%)	3 (100%)	11 (30.6%)	6 (23.1%)	45 (43.7%)	2 (50.0%)	1 (5.0%)	18 (20.7%)
	6-17	93 (33.3%)	0 (0%)	9 (25.0%)	7 (26.9%)	54 (52.4%)	1 (25.0%)	9 (45.0%)	13 (14.9%)
	18-21	10 (3.6%)	0 (0%)	1 (2.8%)	3 (11.5%)	3 (2.9%)	0 (0%)	2 (10.0%)	1 (1.1%)
	22-49	31 (11.1%)	0 (0%)	6 (16.7%)	4 (15.4%)	1 (1.0%)	0 (0%)	7 (35.0%)	13 (14.9%)
	50-64	16 (5.7%)	0 (0%)	0 (0%)	1 (3.8%)	0 (0%)	0 (0%)	1 (5.0%)	14 (16.1%)
	≥ 65	33 (11.8%)	0 (0%)	0 (0%)	5 (19.2%)	0 (0%)	0 (0%)	0 (0%)	28 (32.2%)

*There were 10 specimens with unknown age groups

Among the 279 preselected archived specimens included in the final dataset, the initial non-determinate rate was 2.5% (7/279). After retest, the final non-determinate rate was 0.4% (1/279).

The number of archived specimens included in the clinical performance calculations for each analyte were based on the availability of valid results for Xpert and the comparator test and are presented in **Table 17**.

Table 17. Clinical Performance of Xpert Respiratory Panel in Archived Specimens

Analyte	TP	FN	PPA% TP/(TP+FN)	PPA 95% CI	TN	FP	NPA% TN/(TN+FP)	NPA 95% CI
AdV ¹	22	0	100% 22/22	85.1% - 100%	250	4	98.4% 250/254	96.0% - 99.4%
hMPV ²	102	1	99.0% 102/103	94.7% - 99.8%	173	0	100% 173/173	97.8% - 100%
Flu B	63	0	100% 63/63	94.3% - 100%	212	1	99.9% 212/213	97.4% - 100%
<i>B. pertussis</i> ³	57	2	96.6% 57/59	88.5% - 99.1%	217	0	100% 217/217	98.3% - 100%
<i>B. parapertussis</i>	18	0	100% 18/18	82.4% - 100%	260	0	100% 260/260	98.5%-100%
<i>C. pneumoniae</i>	19	0	100% 19/19	83.2% - 100%	24	0	100% 24/24	86.2% - 100%

¹ Discrepant test results based on NAAT 2: In specimens with FP results, 3/4 AdV positive, 1/4 AdV negative.

² Discrepant test results based on NAAT 2: In specimens with FN results, 1/1 hMPV positive.

³ Discrepant test results based on NAAT 2: In specimens with FN results, 2/2 *B. pertussis* negative.

1.4.2.3. Contrived Samples

Contrived samples were needed to further supplement the sample sizes for *B. paraptussis* and *C. pneumoniae*. The 116 contrived samples consisted of positive samples prepared using leftover individual clinical NPS-UTM/VTM specimens that were confirmed negative by Xpert prior to preparation. Intact genomic DNA from live bacteria for *B. paraptussis* and *C. pneumoniae* was spiked in at 3 concentrations: ~1x LoD (low positives), ~3x LoD (moderate positives), and ~10x LoD (high positives). A total of 40 *B. paraptussis* and 44 *C. pneumoniae* positive samples were contrived and tested with 32 negative samples in a blinded fashion.

There were no ND results among the 116 contrived samples that were tested.

The performance of Xpert in the 116 contrived samples was calculated relative to the expected result and is presented by analyte level in **Table 18**.

Table 18. Summary of Xpert Performance in Contrived Samples

Analyte	TP	FN	PPA% TP/(TP+FN)	PPA 95% CI	TN	FP	NPA% TN/(TN+FP)	NPA 95% CI
<i>B. paraptussis</i>	40	0	100% 40/40	91.2% - 100%	32	0	100% 32/32	89.3% - 100%
1x LoD	20	0	100% 20/20	83.9% - 100%				
3x LoD	10	0	100% 10/10	72.3% - 100%				
10x LoD	10	0	100% 10/10	72.3% - 100%				
<i>C. pneumoniae</i>	44	0	100% 44/44	92.0% - 100%	32	0	100% 32/32	89.3% - 100%
1x LoD	22	0	100% 22/22	85.1% - 100%				
3x LoD	11	0	100% 11/11	74.1% - 100%				
10x LoD	11	0	100% 11/11	74.1% - 100%				

1.5. Conclusions

The results of the analytical and clinical performance studies summarized above demonstrate that the Xpert Respiratory Panel test is substantially equivalent to the predicate device.