Performance of a Rapid Triple Test, SARS-CoV-2 + Influenza A/B + Respiratory Syncytial Virus Compared With RT-PCR for Ambulatory Pediatric Patients

Robert Cohen, MD,†‡§¶ Christophe Batard, MD,*†‡§¶ Olivier Romain, MD,*‡§ Franck Thollot, MD,*†‡§ Mohamed Benani, MD,*† Stéphane Béchet, MSc,*†‡§¶ Catherine Romain, MD,*‡§ and Corinne Levy, MD,*¶*

Background: Although the performance of multiplex antigen detection tests (MADTs) for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) + influenza A/B + respiratory syncytial virus (RSV) has been published for children hospitalized or seen in emergency departments, no report has described the performance of this test for children presenting less severe respiratory symptoms. This study aimed to compare the performance of an MADT and multiplex reverse transcription polymerase chain reaction (RT-PCR) in ambulatory settings.

Methods: From October 2024 to March 2025, 6 pediatricians performed a manufacturer-independent, cross-sectional, prospective study to compare the performance of an MADT and multiplex RT-PCR. All positive triple tests were considered true-positive. For children with a negative triple test result, an additional nasopharyngeal swab was collected, and each pediatric center analyzed the specimens by using RT-PCR.

Results: Among the 784 enrolled children, 571 were eligible for the performance analysis. During the study period, the triple test result enabled a diagnosis of virus infection for 73% of the children. The prevalence of influenza A, influenza B, RSV and SARS-CoV-2 infection was 39.6%, 25.8%, 9.8% and 0.9%, respectively. RT-PCR was performed for the 154 children with a negative triple test. The sensitivity of the triple test was 93.7% (95% confidence interval 89.8–96.4), 96.0% (91.6–98.5), 85.9% (75.0–93.4) and 71.4% (29.0–96.3) for influenza A, influenza B, RSV and SARS-CoV-2, respectively. The sensitivity for SARS-CoV-2 was not significant due to the very low incidence of SARS-CoV-2 during the study period. The specificity was always 100% for each virus.

Conclusions: Our results showed good performance of the triple test in ambulatory settings, comparable to that reported in hospitalized children.

Key Words: rapid antigen test, SARS-CoV-2, influenza A/B, respiratory syncytial virus, children, polymerase chain reaction, ambulatory settings

(*Pediatr Infect Dis J* 2025;XX:00–00)

Accepted for publication November 25, 2025

From the *Association Clinique et Thérapeutique Infantile du Val-de-Marne, Créteil, France; †Association Française de Pédiatrie Ambulatoire, Villeneuve les Avignons, France; ‡Groupe de Pathologie Infectieuse Pédiatrique, Paris, France; §IMRB-GRC GEMINI, Université Paris Est, Créteil, France; and ¶Clinical Research Center, Centre Hospitalier Intercommunal de Créteil, Créteil, France.

Supported by Association Clinique et Thérapeutique Infantile du Val-de-Marne, Créteil, France.

R.C. reports personal fees and nonfinancial support from Pfizer; personal fees from GSK, Merck, Pfizer, and Sanofi outside the submitted work. C.B. reports personal fees from GSK and SANOFI Astra Zeneca. F.T. reports personal fees and nonfinancial support from GSK, Merck, Pfizer, and Sanofi outside the submitted work. C.L. reports personal fees and nonfinancial support from Pfizer and MSD. All other authors declare no competing interests for this study.

R.C. and C.L. designed the studies and drafted the article. R.C., C.L., and S.B. analyzed and interpreted the data. C.L. and S.B. performed the statistical analysis. All authors revised and approved the manuscript.

Address for correspondence: Corinne Levy, MD, Association Clinique et Thérapeutique Infantile du Val-de-Marne, 31 rue Le Corbusier, 94000 Créteil, France. E-mail: corinne.levy@activ-france.fr.

Copyright © 2025 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 0891-3668/25/XXXX-0000
DOI: 10.1097/INF.0000000000005115

The clinical symptoms and syndromes associated with respiratory viruses often overlap.[1] Indeed, although the bronchiolitis epidemic in infants is the most reliable marker of respiratory syncytial virus (RSV) circulation, RSV may also be implicated in other clinical presentations such as otitis media, pneumonia, influenza-like illness and, more commonly, nonspecific upper or lower respiratory tract infections such as rhinopharyngitis and bronchitis.[2,3] Similarly, influenza viruses are responsible for most influenza-like illnesses during epidemic periods, but they can also cause bronchiolitis, otitis media and other respiratory infections.[1] The coronavirus disease 2019 (COVID-19) pandemic demonstrated that severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can be responsible for all of these clinical manifestations, which led to an unprecedented increase in the use of viral antigen tests that had already existed for influenza and RSV for several years.[4,5]

In this context, the utility of antigen testing in ambulatory care raises a critical question: can a positive or negative result meaningfully influence patient care?

- For COVID-19, the primary motivation was to establish a diagnosis to reduce transmission risk.[4–6]
- For influenza, several potential benefits have been identified: a reduction in antibiotic prescriptions (observed in several studies), the possibility of prescribing targeted antiviral treatment if the diagnosis is established early and a decreased need for other diagnostic testing, especially in children for whom a clinical diagnosis can be challenging.[7–9]
- For RSV, in the absence of specific antiviral therapy and because of limited evidence showing a reduction in antibiotic prescriptions, the main benefit of diagnosis lies in reducing contagion via appropriate hygiene measures, particularly in high-risk groups such as infants <3 months old, elderly individuals or immunocompromised patients.[10] Moreover, a diagnosis of RSV infection has implications for short- and long-term prognoses and should not be considered trivial.[11]

The emergence of multiplex antigen detection tests (MADTs) represents a paradigm shift. Instead of relying on a single test result, clinicians can now interpret a comprehensive panel of results.[1] We recently showed that in children presenting influenza-like illnesses, wheezing episodes or laryngeal syndromes, a precise virologic diagnosis could be established in 47.9% of cases year-round, whereas during epidemic periods, this rate reached 68.8%.[1]

Numerous studies of the diagnostic performance (sensitivity, specificity, positive and negative predictive values, positive and negative likelihood ratios) of single-pathogen antigen tests have been published over the past 20 years.[12–14] These have been the subject of systematic reviews and meta-analyses.[12–14] Overall, these tests demonstrate high specificity (>95%) but lower and variable sensitivity depending on the target antigen, study design and population tested.[12–14] In contrast, few studies have examined the performance of MADTs in pediatric populations.[1,15–17]

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.

Our group conducted 2 studies comparing the performance of the rapid antigen triple test (COVID-VIRO ALL-IN TRIPLEX: SARS-CoV-2 + influenza A/B + RSV) and multiplex reverse transcription polymerase chain reaction (RT-PCR) in children hospitalized or seen in emergency departments.[1,16] In the first study, which included 263 children, for influenza, SARS-CoV-2 and RSV, specificity was close to 100%, whereas sensitivity was 91.6% (95% confidence interval [CI] 84.1–96.3), 88.9% (51.8–99.7) and 79.1% (64.0–90.0), respectively.[16] In the second study, we compared the performance of the triple test and multiplex RT-PCR in a subgroup of 192 patients hospitalized after an emergency department visit.[1] The sensitivity of the triplex test was 86.3% (95% CI 73.7–94.3), 85.7% (57.2–98.2) and 73.9% (61.9–83.7) for influenza A, SARS-CoV-2 and RSV, respectively.[1] Although the performance of this triple antigen test was already published for children hospitalized or seen in emergency departments, no report has described the performance of this test for children presenting less severe respiratory symptoms, in ambulatory settings.[1,16]

This study aimed to compare the performance of the MADT (SARS-CoV-2 + influenza A/B + RSV) and multiplex RT-PCR in children using data from the VIGIL cohort in ambulatory settings.[1,18,19]

METHODS

From October 2024 to March 2025, 3 pediatric centers involving 6 pediatricians in ambulatory settings performed a manufacturer-independent, cross-sectional, prospective study to compare the performance of the triple test COVID-VIRO ALL-IN TRIPLEX (AAZ-LMB, Boulogne Billancourt, France) and multiplex RT-PCR (PCR FLASH DX system, Nephrotek, Boulogne-Billancourt, France). This study was part of the VIGIL study, with methods previously described.[1,18,19] Briefly, the study enrolled children <15 years old who presented respiratory symptoms and were administered a nasal triple test.[1,18,19] After informing the parents of the participating children about the study (information sheet), an electronic case report form was prospectively completed by the pediatrician in a secure database. Subsequently, the triplex test was performed immediately after sample collection, with an anterior nasal swab, which was different from other swabs; the comfort of use allows for a long sampling time, 30 seconds (15 seconds per nostril). Test results were interpreted visually by the pediatrician. In addition, because of the high specificity (>98%) of these tests and in line with international recommendations, confirmatory RT-PCR was deemed unnecessary in cases of a positive antigen result in symptomatic individuals during high viral circulation periods.[1,4,5,15–17,20] Therefore, all positive triple test results were considered true positive (ie, presumed RT-PCR positive for the target virus). Conversely, for children with a negative triple test result, an additional nasopharyngeal swab was collected immediately, without delay, and each pediatric center analyzed the specimens using the PCR FLASH DX system (Nephrotek), with viral load expressed as cycle threshold (Ct).

Data were entered in the electronic case report form (Hypertext Preprocessor/My Structured Query Language) and analyzed by using Stata/SE v19 (StataCorp, College Station, TX). The diagnostic accuracy of the triple test was evaluated by computing sensitivity, specificity and predictive values, with multiplex RT-PCR as the reference standard.

No written consent was required for this study, but parents were informed, and all data were analyzed unless parents told the pediatrician that they refused to participate. This study was approved by the Créteil hospital ethics committee and was registered at ClinicalTrials.gov (NCT0441231).

RESULTS

From October 15, 2024, to March 14, 2025, among the 784 enrolled children, 571 (mean age 4.8 ± 3.7 years; median 4.0 years) were eligible for the analysis (Fig. 1). Boys accounted for 53.6% of cases. During the study period, the triple test result enabled a diagnosis of virus infection for 73.0% (417/571) of the children. The prevalence of influenza A, influenza B, RSV and SARS-CoV-2 infection was 39.6%, 25.8%, 9.8% and 0.9%, respectively (Table 1). RT-PCR was performed for the 154 children with a negative triple test. Given that positive results for each virus were interpreted as positive RT-PCR results, the total influenza A-, influenza B-, RSV- and SARS-CoV-2-positive RT-PCR results accounted for 238/377 (63.1%), 151/299 (50.5%), 64/209 (30.6%) and 7/159 (4.4%) cases, respectively. The denominator varied for each virus because it considered both the number of positive tests for each virus and the number of PCR tests performed on samples that tested negative (Fig. 1, Table 1).

For influenza A-, influenza B-, RSV- and SARS-CoV-2-positive results, the RT-PCR viral load showed a large range of Ct, from 21 to 42, 28.6 to 38, 29 to 39.7 and 26 to 39, respectively (Fig. 2).

Among the 154 RT-PCR tests performed, besides the results reported for influenza A, influenza B, RSV and SARS-CoV-2, other species were identified: human rhinovirus (n = 36), adenoviruses (n = 15), human metapneumovirus (n = 14), parainfluenzae (n = 8) and mycoplasma (n = 3).

The sensitivity of the triplex test compared to multiplex RT-PCR was 93.7% (95% CI 89.8–96.4), 96.0% (91.6–98.5), 85.9% (75.0–93.4) and 71.4% (29.0–96.3) for influenza A, influenza B, RSV and SARS-CoV-2, respectively (Table 2). The specificity was always 100% for each virus. When Ct values ≥30 were excluded, influenza A, influenza B, RSV and SARS-CoV-2 MADTs achieved higher sensitivities: 97.0% (95% CI 93.8–98.8), 98.6% (95.2–99.8), 94.8% (85.6–98.9), and 100% (47.8–100), respectively (Table 2).

DISCUSSION

To the best of our knowledge, this is the only study that has assessed the performance of MADTs in a pediatric population recruited in outpatient settings for respiratory and/or febrile syndromes. Another unique aspect of our study is the virologic confirmation strategy: given the excellent specificity of the antigen tests used—previously demonstrated in 2 earlier studies conducted in pediatric emergency and inpatient settings—to reduce the cost and logistical burden of the study, we chose to perform RT-PCR confirmation only for negative antigen results: positive antigen results were presumed to be true positives, under the assumption that they would have been confirmed by RT-PCR. The sensitivity of the 3 antigen targets tested, although not optimal, can be considered good, with narrow CIs, for influenza A, influenza B, RSV and SARS-CoV-2: 93.7% (95% CI 89.8–96.4), 96.0% (91.6–98.5), 85.9% (75.0–93.4) and 71.4% (29.0–96.3). For SARS-CoV-2, the low incidence during the study period prevents any definitive conclusions. However, as rapid antigen tests are generally known to perform better for SARS-CoV-2 than for influenza or RSV, owing to higher viral loads and longer periods of antigen detectability, the lower apparent sensitivity observed in our cohort should be interpreted with caution. This result most likely reflects the small number of SARS-CoV-2-positive cases rather than a true reduction in assay performance.

The optimal use of a single diagnostic test relies on understanding the pretest probability and the positive and negative likelihood ratios, which together help determine a very high or very low posttest probability according to the test's performance.[21] When using multiplex (triple) antigen tests, this reasoning must shift: the pretest probability and likelihood ratio must be considered

© 2025 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.

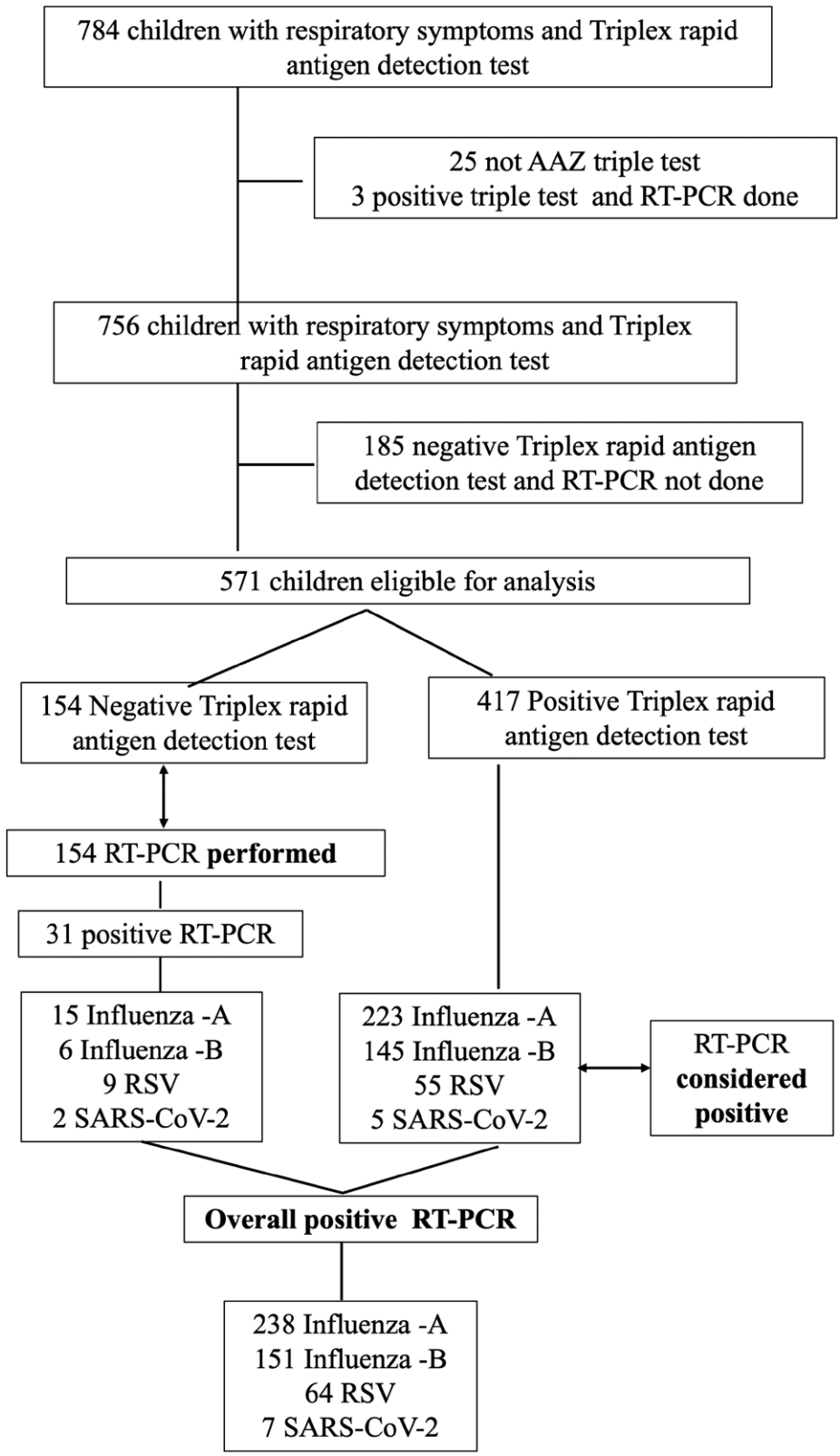

FIGURE 1. Flow chart. Triple test COVID-VIRO ALL-IN TRIPLEX (AAZ-LMB, Boulogne Billancourt, France), RT-PCR (PCR FLASH DX system, Nephrotek, France).

© 2025 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.

TABLE 1. Results for the Triplex Rapid Antigen Detection Tests and RT-PCR

	Triplex Rapid Antigen Detection Test (N = 571)		RT-PCR Performed for Negative Triple Test (n = 154)	RT-PCR Performed for Negative Triple Test + RT-PCR Considered Positive for Positive Triple Test	
	Positive	Negative	Positive	Positive	Negative
Positive for at least 1 virus	417/571 (73.0)	/	31/154 (20.1)	/	/
Negative for all virus	/	154/571 (27.0)	/	/	/
Influenza A, n (%)	223/563* (39.6)	340/563 (60.4)	15/154 (9.7)	238/377† (63.1)	139/377 (36.9)
Influenza B, n (%)	145/563* (25.8)	418/563 (74.2)	6/154 (3.9)	151/299† (50.5)	148/299 (49.5)
RSV, n (%)	55/564* (9.8)	509/564 (90.2)	9/154 (5.8)	64/209† (30.6)	145/209 (69.4)
SARS-CoV-2, n (%)	5/566* (0.9)	561/566 (99.1)	2/154 (1.3)	7/159† (4.4)	152/159 (95.6)

*% on available test

†The denominator varied for each virus because it considered both the number of positive tests for each virus and the number of RT-PCR tests performed on samples that tested negative.

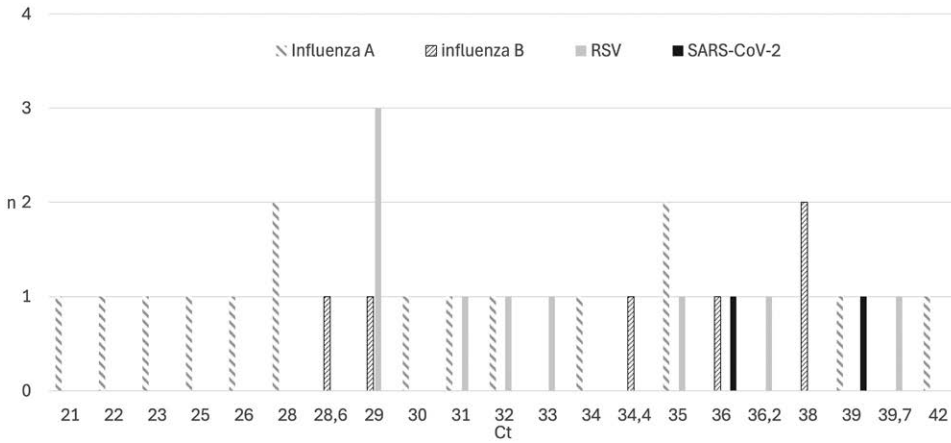

FIGURE 2. RT-PCR viral load (cycle threshold) by virus.

separately for each detected antigen but also globally. Ultimately, a precise diagnosis can be established with a high final probability of diagnostic certainty. In our study, three-quarters of the tests performed led to a high-quality clinical diagnosis. Moreover, the interpretation of MADT results must consider current epidemiologic trends. Several studies have shown that, after the relaxation of COVID-19 nonpharmaceutical interventions, influenza A/B and RSV activity rebounded to pre-pandemic levels, often with earlier and more intense peaks, particularly in pediatric populations.[22,23] Consequently, evolving patterns of viral circulation and population immunity directly influence pretest probabilities and the resulting likelihood ratios in multiplex testing. Accurate interpretation of multiplex antigen results therefore requires integrating intrinsic test performance with real-time data on circulating respiratory viruses.

During the study period—fall 2024 and winter 2025—nearly three-quarters of patients who underwent testing received a precise virologic diagnosis. This finding has several implications: first, the positivity of these tests may lead to a reduction in the need for additional diagnostic procedures, a decrease in antibiotic prescriptions, the use of antiviral treatments when appropriate, and the implementation of hygiene measures. However, perhaps most importantly, it strengthens the confidence of both physicians and patients in the diagnostic process.

The detection of a virus in a nasopharyngeal or oropharyngeal sample can be difficult to interpret because of the frequent presence of viruses in the upper respiratory tract: children typically harbor a particularly rich respiratory virome.[24,25] However, the 4 viruses tested in this study—influenza A, influenza B, RSV and SARS-CoV-2—are found significantly more often in symptomatic patients than in age-matched controls during the same period. If an additional virus were to be included along with the 4 already tested, it should be human metapneumovirus. Indeed, it is the only other virus found statistically significantly more frequently in sick children versus age-matched controls during the winter season in pediatrics. Moreover, because antigen tests are less sensitive when the viral load is low, this risk of misinterpretation is mitigated. In fact, a positive test result usually indicates a high viral load and is more frequently observed in symptomatic patients than in healthy controls. When positive, these tests reflect a relatively high viral load, thereby suggesting a greater risk of contagion. Indeed, and as expected, in our study, the highest sensitivities were observed in samples with higher viral loads (Ct < 30) for all tested viruses. Prior studies in adults have consistently shown that antigen-test sensitivity declines sharply beyond Ct values of 25–30, with detection becoming largely unreliable above Ct 30.[26,27] Adults are also known to carry lower viral loads than children, well demonstrated for both influenza and RSV, further contributing to reduced antigen-test sensitivity in this population. Although our findings, derived from an outpatient pediatric cohort, showed better performance than those reported in adult studies, they remain fully aligned with the existing diagnostic-testing literature.[26,27] We also outline several plausible explanations for the apparently higher detection rates observed in our study compared with adults: higher viral loads typically reported in children, earlier sampling relative to symptom onset, and anatomical or immunologic differences in the upper respiratory

© 2025 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.

TABLE 2. Performance of the Self-collected COVID-VIRO ALL-IN TRIPLEX Rapid Antigen Detection Test and RT-PCR Multiplex

Triplex Rapid Antigen Detection test	All PCR+ n	PCR– n	Sensitivity (95% CI)	Specificity (95% CI)	LR+ (95% CI)	LR– (95% CI)	PPV (95% CI)	NPV (95% CI)	Accuracy (95% CI)
Influenza A+	223	0	93.7	100	/	0.063	100	90.3	96.0
Influenza A–	15	139	(89.8—96.4)	(97.4–100)		(0.039–0.103)	(98.4–100)	(84.4–94.4)	(93.5–97.8)
Influenza B+	145	0	96.0	100	/	0.040	100	96.1	98.0
Influenza B––	6	148	(91.6–98.5)	(97.5–100)		(0.018–0.087)	(97.5–100)	(91.7–98.6)	(95.7–99.3)
RSV+	55	0	85.9	100	/	0.141	100	94.2	95.7
RSV–	9	145	(75.0–93.4)	(97.5–100)		(0.077–0.258)	(93.5–100)	(89.2–97.3)	(92.0–98.0)
SARS-CoV-2+	5	0	71.4*	100	/	0.286	100	98.7	98.7
SARS-CoV-2–	2	152	(29.0–96.3)	(97.6–100)		(0.089–0.922)	(47.8–100)	(95.4–99.8)	(95.5–99.8)

Triplex Rapid Antigen Detection Test	PCR+ Ct < 30 n	PCR– n	Sensitivity (95% CI)	Specificity (95% CI)	LR+ (95% CI)	LR– (95% CI)	PPV (95% CI)	NPV (95% CI)	Accuracy (95% CI)
Influenza A+	223	0	97.0	100	/	0.030	100	95.2	98.1
Influenza A–	7	139	(93.8–98.8)	(97.4–100)		(0.015–0.063)	(98.4–100)	(90.4–98.1)	(96.1–99.2)
Influenza B+	145	0	98.6	100	/	0.014	100	98.7	99.3
Influenza B–	2	148	(95.2–99.8)	(97.5–100)		(0.003–0.054)	(97.5–100)	(95.3–99.8)	(97.6–99.9)
RSV+	55	0	94.8	100	/	0.052	100	98.0	98.5
RSV–	3	145	(85.6–98.9)	(97.5–100)		(0.017–0.156)	(93.5–100)	(94.2–99.6)	(95.7–99.7)
SARS-CoV-2+	5	0	100 (47.8–100)	100	/	/	100	100	100
SARS-CoV-2–	0	152		(97. –100)			(47.8–100)	(97.6–100)	(97.7–100)

*The sensitivity for SARS-CoV-2 was not significant due to the very low incidence of SARS-CoV-2 during study period.
LR indicates likelihood ratio; NPV, negative predictive value; PPV, positive predictive value.

tract. In addition, the pediatricians participating in this study were highly trained in pediatric infectious diseases, which likely contributed to a substantially increased pretest probability.[1,2,18]

One limitation of our study deserves to be highlighted, namely, the choice of our study design. We decided that positive MADT results would not be confirmed by RT-PCR. This assumption of 100% specificity may slightly overestimate diagnostic accuracy and thus weaken internal validity, although it is partly supported by prior evidence. In addition, MADT detects only influenza A/B, RSV and SARS-CoV-2, whereas other pathogens such as picornavirus, metapneumovirus, parainfluenzae virus and adenovirus accounted for a substantial proportion of infections but remained undetected. However, although these other viruses were not captured, this limitation is of limited importance, except for human metapneumovirus.[28,29] We would like to underline also broader limitations and operational considerations. Although antigen-test sensitivity is highest during the early phase of infection and when both specimen collection and result interpretation are performed under standardized, quality-assured conditions, several operational factors may influence MADT performance. These include the interval between symptom onset and testing, as well as operator-related variables such as sampling technique and strict adherence to the manufacturer's protocol. Nevertheless, the likelihood of misinterpretation is low: the test line generally appears within 3 minutes and is typically well demarcated, minimizing the risk of false visual readings. Moreover, the procedure is inherently simple, as the assay is designed as a self-administered autotest that can be performed by the child with minimal supervision.[1]

The main advantage of multiplex antigen tests over multiplex RT-PCR tests lies in their ease of use: they require no specialized equipment, are simple to perform, provide results within minutes, and are cost-effective (less than €10). In contrast, few RT-PCR tests have an actual cost <€100, and they typically require expensive equipment and more complex handling. Therefore, the main reasons we advocate for this type of test are its ease of use, its cost, which is compatible with the management of nonhospitalized ambulatory patients, and its very short turnaround time (less than 10 minutes), whereas RT-PCR requires substantially longer to obtain results. In a period of economic constraint, these elements are important to consider and may contribute to reducing unnecessary antibiotic prescriptions. There are also additional objectives: enabling oseltamivir prescription in cases of influenza, adapting infection-prevention measures to specific situations (eg, influenza in pregnant women, hygiene measures around a COVID-19 case, or RSV in older adults). Finally, having a documented diagnosis is reassuring for both the physician and the family. We advocate for the predominant use of antigen tests in emergency departments, in outpatient settings and in more severely ill hospitalized patients. In such cases, a negative antigen test should be followed by a multiplex RT-PCR assay, which provides higher sensitivity for the targeted viruses and can also detect other respiratory pathogens in vulnerable patients. However, implementing a screening algorithm in which all hospitalized patients with a negative antigen result must systematically undergo multiplex PCR confirmation would generate additional costs, increase laboratory workload, and prolong the time needed for triage and isolation decisions. This approach could therefore negatively impact workflow efficiency, cost-effectiveness and patient management, particularly in high-volume or resource-limited hospitals. Striking a balance between improved diagnostic sensitivity and real-world feasibility thus remains challenging.

REFERENCES

1. Cohen R, Haas H, Romain O, et al. Use of rapid antigen triple test nasal swabs (COVID-VIRO ALL-IN TRIPLEX: severe acute respiratory syndrome coronavirus 2, respiratory syncytial virus, and influenza) in children with respiratory symptoms: a real-life prospective study. *Open Forum Infect Dis*. 2024;11:ofad617.

© 2025 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.

2. Cohen PR, Rybak A, Werner A, et al. Trends in pediatric ambulatory community acquired infections before and during COVID-19 pandemic: a prospective multicentric surveillance study in France. *Lancet Reg Health Eur*. 2022;22:100497.
3. Heikkinen T, Ojala E, Waris M. Clinical and socioeconomic burden of respiratory syncytial virus infection in children. *J Infect Dis*. 2017;215:17–23.
4. Haute Autorité de Santé (Health Authority) Rapid review of SARS-CoV-2 antigen detection test. 2020. Available at: https://www.has-sante.fr/jcms/p_3213483/fr/revue-rapide-sur-les-tests-de-detection-antigenique-du-virus-sars-cov-2. Accessed December 15, 2025.
5. European Centre for Disease Prevention and Control. Options for the use of rapid antigen tests for COVID-19 in the EU/EEA. 2021. Available at: https://www.ecdc.europa.eu/en/publications-data/options-use-rapid-antigen-tests-covid-19-eueea-first-update. Accessed December 15, 2025.
6. Mina MJ, Parker R, Larremore DB. Rethinking covid-19 test sensitivity—a strategy for containment. *N Engl J Med*. 2020;383:e120.
7. Schober T, Wong K, DeLisle G, et al. Clinical outcomes of rapid respiratory virus testing in emergency departments: a systematic review and meta-analysis. *JAMA Intern Med*. 2024;184:528–536.
8. Hagedoorn NN, Kolukirik P, Nagtzaam NMA, et al. Association of monocyte HLA-DR expression over time with secondary infection in critically ill children: a prospective observational study. *Eur J Pediatr*. 2022;181:1133–1142.
9. Doan Q, Enarson P, Kissoon N, et al. Rapid viral diagnosis for acute febrile respiratory illness in children in the emergency department. *Cochrane Database Syst Rev*. 2014;2014:CD006452.
10. Langedijk AC, Bont LJ. Respiratory syncytial virus infection and novel interventions. *Nat Rev Microbiol*. 2023;21:734–749.
11. Binns E, Tuckerman J, Licciardi PV, et al. Respiratory syncytial virus, recurrent wheeze and asthma: a narrative review of pathophysiology, prevention and future directions. *J Paediatr Child Health*. 2022;58:1741–1746.
12. Chartrand C, Leeflang MM, Minion J, et al. Accuracy of rapid influenza diagnostic tests: a meta-analysis. *Ann Intern Med*. 2012;156:500–511.
13. Onwuchekwa C, Atwell J, Moreo LM, et al. Pediatric respiratory syncytial virus diagnostic testing performance: a systematic review and meta-analysis. *J Infect Dis*. 2023;228:1516–1527.
14. Vilca-Alosilla JJ, Candia-Puma MA, Coronel-Monje K, et al. A systematic review and meta-analysis comparing the diagnostic accuracy tests of COVID-19. *Diagnostics (Basel)*. 2023;13:1549.
15. Bayart JL, Gillot C, Dogne JM, et al. Clinical performance evaluation of the Fluorecare(R) SARS-CoV-2 & Influenza A/B & RSV rapid antigen combo test in symptomatic individuals. *J Clin Virol*. 2023;161:105419.
16. Ferrani S, Prazuck T, Bechet S, et al. Diagnostic accuracy of a rapid antigen triple test (SARS-CoV-2, respiratory syncytial virus, and influenza) using anterior nasal swabs versus multiplex RT-PCR in children in an emergency department. *Infect Dis Now*. 2023;53:104769.
17. Gentilotti E, De Nardo P, Cremonini E, et al. Diagnostic accuracy of point-of-care tests in acute community-acquired lower respiratory tract infections. A systematic review and meta-analysis. *Clin Microbiol Infect*. 2022;28:13–22.
18. Cohen R, Rybak A, Ouldali N, et al. From the original SARS-CoV-2 strain to the Omicron variant: predictors of COVID-19 in ambulatory symptomatic children. *Infect Dis Now*. 2022;52:432–440.
19. Eskander E, Jung C, Levy C, et al. Assessment of SARS-CoV-2 testing in children during a low prevalence period (VIGIL study 1). *Infect Dis Now*. 2021;51:552–555.
20. Hanson KE, Caliendo AM, Arias CA, et al. The infectious diseases society of America guidelines on the diagnosis of COVID-19: molecular diagnostic testing. *Clin Infect Dis*. 2021:ciab048.
21. Fagan TJ. Letter: nomogram for Bayes's theorem. *N Engl J Med*. 1975;293:257.
22. Cohen R, Ouldali N, Bechet S, et al. Disruption of epidemic patterns in community-acquired respiratory infections post-covid-19 in France: a 5-year analysis using the French pediatric and ambulatory research of infectious diseases network [published online ahead of print November 3, 2025]. *Pediatr Infect Dis J*. doi:10.1097/INF.0000000000005033.
23. Gosert R, Naegele K, Weiss M, et al. Rebound of respiratory virus activity and seasonality to pre-pandemic patterns. *J Med Virol*. 2025;97:e70658.
24. Liang G, Gao H, Bushman FD. The pediatric virome in health and disease. *Cell Host Microbe*. 2022;30:639–649.
25. Wylie KM. The virome of the human respiratory tract. *Clin Chest Med*. 2017;38:11–19.
26. Meyer J, Gosert R, Bingisser R, et al. Diagnostic performance of a combined rapid antigen test for detecting SARS-CoV-2, influenza virus, and respiratory syncytial virus in symptomatic patients in tertiary care. *J Med Virol*. 2025;97:e70493.
27. Savolainen LE, Peltola J, Hilla R, et al. Clinical performance of two commercially available rapid antigen tests for influenza, RSV, and SARS-CoV-2 diagnostics. *Microbiol Spectr*. 2025;13:e0163024.
28. Ben-Shimol S, Ramilo O, Leber AL, et al. A hypothesis-generating prospective longitudinal study to assess the relative contribution of common respiratory viruses to severe lower respiratory infections in young children. *Pediatr Infect Dis J*. 2023;42:396–404.
29. Levine OS, O'Brien KL, Deloria-Knoll M, et al. The pneumonia etiology research for child health project: a 21st century childhood pneumonia etiology study. *Clin Infect Dis*. 2012;54:S93–101.

© 2025 Wolters Kluwer Health, Inc. All rights reserved.

Copyright © 2025 Wolters Kluwer Health, Inc. Unauthorized reproduction of this article is prohibited.