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Test-to-Stay Implementation in Four Pre-K–12 School Districts

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Abstract

Objective—Globally, COVID-19 has affected how children learn. We evaluated the impact of Test to Stay (TTS) on secondary and tertiary transmission of SARS-CoV-2 and potential impact on in-person learning in four school districts in the United States from September 13–November 19, 2021.

Methods—Implementation of TTS varied across school districts. Data on index cases, school-based close contacts, TTS participation, and testing results were obtained from four school districts in diverse geographic regions. Descriptive statistics, secondary and tertiary attack risk, and a theoretical estimate of impact on in-person learning were calculated.

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Contributors' Statement

Drs. Lammie and Ford worked with COVID-19 response leadership to conceptualize the combining of these multiple projects into a single paper and drafted the initial manuscript. They were also the field-deployed medical epidemiologist and field team lead, respectively, for the deployment to KY. Dr. Ford also worked with Mr. van Zyl to verify the combined analysis.

Ms. Swanson was a field-deployed epidemiologist and Ms. Guinn and Dr. Kamitani were field deployment team leads. They all worked to clean and prepare their respective site data for analysis.

Mr. van Zyl and Dr. Rose advised on data analysis. They also participated in review and revision of the manuscript. Mr. van Zyl worked with Dr. Ford and other field team leads to complete and verify the analysis.

Ms. Marynak and Ms. Shields supported all work related to the GA and NM projects, respectively. They also participated in review and revision of the manuscript.

Drs. Donovan and Mark-Carew and Ms. Holman were project team leads who were involved in study design and field support. They also participated in review and revision of the manuscript. Dr. Welton was both a field deployment team lead and a project team lead who was involved in study design and field support. He also participated in review and revision of the manuscript.

Ms. Thomas and Mr. Neatherlin assisted in conceptualization and revision of the manuscript. Ms. Thomas was also involved in project study design and field support for all projects.

State and local partners were involved in project study design and logistical planning. They also participated in review and revision of the manuscript. This paper would not have been possible without their support.

All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Results—Fifty-one schools in four school districts reported 374 COVID-19 index cases and 2,520 school-based close contacts eligible for TTS. The proportion participating in TTS ranged from 22%–79%. By district, the secondary attack risk (SAR) and tertiary attack risk (TAR) among TTS participants ranged between 2.2%–11.1% and 0%–17.6%, respectively. Nine clusters were identified among secondary cases and two among tertiary cases. The theoretical maximum number of days of in-person learning saved by using TTS was 976–4,650 days across jurisdictions.

Conclusion—TTS preserves in-person learning days. Decisions to participate in TTS may have been influenced by ease of access to testing, communication between schools and families, testing logistics, and school resources. TAR determination became more complicated when numbers of close contacts increased. Minimizing exposure through continued layered prevention strategies is imperative. To ensure adequate resources for TTS, community transmission levels should be considered.

Article Summary

The experiences of four school districts implementing Test-to-Stay (TTS) protocols highlight the variability of implementation, equity considerations, and importance of layered prevention measures.

Introduction

The COVID-19 pandemic has profoundly impacted school-aged children. Loss of in-person learning due to quarantine following exposure to a COVID-19 case disproportionately impacts under-resourced communities, worsens mental health indicators, and decreases access to tools and support mechanisms, such as school-based meals, mental health services, and the internet.[1–3] To mitigate these effects, some school districts have implemented a modified quarantine approach called Test to Stay (TTS). TTS allows school-based close contacts of COVID-19 cases, who are not fully vaccinated, to remain in school if they are asymptomatic, adhere to regular testing, test negative, and follow specified prevention measures.[4]

In spring 2021, before younger ages were eligible for vaccination, an open-label randomized trial assigned a subset of schools in the United Kingdom to participate in TTS, which allowed students enrolled in secondary schools and institutions of higher education (IHEs) who came into close contact to someone with COVID-19 to continue in-person learning if they underwent daily SARS-CoV-2 testing in place of a 10-day home quarantine.[5] Although subject to limitations, results suggested that daily testing of school-based close contacts was non-inferior to traditional quarantine. A United States study looking at elimination of student quarantine following mask-on-mask exposures to COVID-19 did not identify any associated secondary transmission.[6] Two studies of TTS in Lake County, Illinois, and Los Angeles, California, found that TTS did not appear to increase SARS-CoV-2 transmission risk in the K–12 setting and identified substantial numbers of in-person learning days saved.[7,8]

TTS protocols in the United States vary widely,[7,8] and the optimal characteristics of TTS are not yet known. In the context of unique TTS protocols and resource constraints, we

evaluated secondary and tertiary transmission of SARS-CoV-2 associated with TTS, clusters among TTS participants, and TTS impact on in-person learning days in four geographically distinct public school districts in the United States from September 13–November 19, 2021. This is the first paper combining lessons from TTS implementation in various school districts across the country.

Methods

The Centers for Disease Control and Prevention (CDC) collaborated with four states to evaluate TTS impact on SARS-CoV-2 transmission in pre-K–12 settings between September 13, 2021, and November 19, 2021. The investigation included one public school district each from Georgia (GA), Illinois (IL), Kentucky (KY), and New Mexico (NM) for a total of four school districts. All schools within the districts in GA, IL, and NM, and a representative sample of schools in KY, representing 27% of elementary and middle schools, implemented TTS for a total of 51 participating schools.

TTS implementation varied across the school districts by school type, eligibility criteria, SARS-CoV-2 test type, and testing logistics (Table 1). District TTS protocols often mirrored those of existing state guidelines; however, districts occasionally implemented more restrictive TTS guidelines, primarily differing on eligibility, testing cadence, testing location, and participation in extracurricular or after-school programs. In all four districts, TTS-eligible close contacts were defined as individuals not fully vaccinated who were within 3 feet of a COVID-19 case for a cumulative total of ≥15 minutes over 24 hours if masked; two districts allowed participation of close contacts exposed within 6 feet if unmasked. Once enrolled in TTS, participants in all districts were required to mask. Students in grades pre-K–12, teachers, and staff were eligible in three districts. KY limited eligibility to students in grades K–8. In all four districts, only close contacts exposed in the school setting were eligible for TTS; individuals identified as household contacts of COVID-19 cases were excluded. Siblings of TTS participants testing negative remained in school.

TTS-eligible individuals with close contact to a COVID-19 case were tested regularly for seven days following exposure (testing cadence varied by site, Table 1) and could remain in school if tests were negative, they remained asymptomatic, and adhered to prevention measures. Student participation required parental consent. GA and IL used rapid antigen tests; KY and NM used point-of-care rapid reverse transcription-polymerase chain reaction (RT-PCR) tests, which provided results in 30 minutes. Test samples were collected at schools in KY, IL, and NM, and at a single centralized site in GA. TTS participants were instructed to quarantine at home while not at school or not participating in school-based activities during the TTS period. If close contacts were not eligible or did not consent to TTS, districts in GA, KY, and NM required close contacts to quarantine at home for 10 days without a test. GA and KY also allowed close contacts to quarantine at home for seven days with a negative test between days five and seven. IL required close contacts to quarantine at home for seven days with a negative test after day six or for 14 days without a test. Students, teachers, and staff who were fully vaccinated or who received a COVID-19 diagnosis in the 90 days before exposure were exempt from quarantine and not eligible for

TTS participation. At the time of this investigation, students and staff were considered fully vaccinated ≥14 days after receipt of the second dose in a 2-dose series (Pfizer-BioNTech or Moderna COVID-19 vaccines) or after 1 dose of the single-dose Janssen (Johnson & Johnson) COVID-19 vaccine.

Community incidence rates during the evaluation period were obtained from the CDC COVID Data Tracker,[9–11] and district demographics were obtained from publicly available sources where possible.[12–17] School administrators also completed a survey on school demographics and COVID-19 mitigation measures. We obtained data on index cases, school-based close contacts (including exposure, location, and dates), TTS participation, and testing results from the school districts from testing contractors and/or local health departments.

Secondary and tertiary transmission were analyzed in relation to TTS participation. We defined secondary cases as school-based close contacts not fully vaccinated who received a positive SARS-CoV-2 test within 14 days after exposure to an index case, and tertiary cases as school-based close contacts not fully vaccinated who received a positive SARS-CoV-2 test within 14 days after exposure to a TTS participant who tested positive. We interviewed secondary and tertiary cases or their parent/guardian by phone about activities and potential exposures during the TTS period to determine whether school-associated transmission was probable, possible, or unlikely (Supplementary Methods).[18] If we were unable to contact secondary or tertiary cases or their parent/guardian and information could not be obtained from the school, we considered transmission undetermined and assumed possible school-based transmission. We defined secondary attack risk (SAR) and tertiary attack risk (TAR) as the number of probable or possible school-based secondary or tertiary cases divided by the total number of close contacts of index cases or secondary cases, respectively. We used the Clopper-Pearson method to calculate confidence intervals (CI) at the 95%-level. Secondary and tertiary clusters were identified using the Council of State and Territorial Epidemiologists definition of at least three school-associated COVID-19 cases within a specified core group who develop symptoms or test positive within 14 days of each other.[19]

We calculated the theoretical maximum number of in-person learning days saved from TTS, assuming eight missed school days for every 10-day quarantine in three school districts and 10 missed school days for every 14-day quarantine in one district. Each round of TTS an individual participated in was considered to have saved the maximum number of in-person learning days for that district, eight and 10, respectively. We did not account for holidays, exposure notification lag time, shortened quarantine based on test results and lack of symptoms, or home quarantine time of those who switched from TTS to home quarantine midway through their TTS period.

All analyses were performed using R (version 4). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy (See, for example, 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.).

Results

During September and November 2021, 51 public schools in four school districts with 28,373 enrolled students and 4,404 teachers and staff implemented TTS. Among the 51 schools, there were three (6%) early childhood education schools (Pre-K), 30 (59%) elementary schools, 12 (24%) middle schools, three (6%) high schools, and three (6%) alternative schools (Table 2). On review of each district's home county seven-day rolling average community incidence rates during the evaluation period, rates were lowest in IL (median 39.6 per 100,000; range: 24.9–76.4 per 100,000) and highest in GA (median 178.6 per 100,000; range: 75.4–550.9 per 100,000).[10, 11] Non-pharmaceutical interventions required or recommended by each school district and district demographics are outlined in Table 2. Notably, a mask mandate was in place in all four school districts at the start of the fall semester but was lifted in the GA school district on October 16, 2021, midway through this investigation.

Across the four districts, there were 374 index COVID-19 cases (ranging from 56–163 per district) and 2,520 school-based close contacts eligible for TTS (ranging from 559–783 per site) (Table 3). Among the 374 index COVID-19 cases, 52 (13.9%) were teachers or staff and 322 (86.1%) were students, and among the 2,520 close contacts, 37 (1.5%) were teachers or staff and 2,483 (98.5%) were students. Index cases were identified either through screening testing or other school- or community-based testing (symptomatic testing, routine testing for medical procedures, or other reasons). TTS participation among eligible close contacts was lowest in GA (22%) and highest in IL (79%). Among TTS participants, secondary COVID-19 cases were identified: nine in IL, 12 in GA, 17 in KY, and 30 in NM (Supplementary Table). SAR ranged from 2.2% (95% CI 1.0%–4.2%) in IL to 11.1% (95% CI 5.9%–18.6%) in GA (Table 3). There were nine clusters among secondary cases: one each in IL and NM, two in GA, and five in KY. The majority (8/9, 88.9%) of secondary clusters were in elementary schools, one (1/9, 11.1%) was in a middle school.

Among school-based close contacts of TTS secondary cases, there were no possible or probable school-associated tertiary cases identified in IL, while there were one each in GA and KY, and 13 in NM. Six cases from NM who were considered tertiary cases were also within the 14 days of exposure to an index case and may have been secondary cases rather than tertiary cases. In IL, there were an additional six cases identified who were determined to be unlikely school-associated tertiary cases due to household exposure to COVID-19 (Supplementary Table). The estimated school-associated TAR was 0% (95% CI 0%–2.5%) in IL, 1.4% (95% CI 0%–7.8%) in KY, 5.9% (95% CI 0.1%–28.7%) in GA, and 17.6% (95% CI 9.7%–28.2%) in NM (Table 3). GA had the lowest TTS participation rate (22%). No tertiary clusters were observed in IL, KY, and GA, and two possible tertiary clusters were identified in NM, which were both in elementary school special education classes. Assuming a maximum of eight missed school days for every 10-day quarantine and 10 missed school days for every 14-day quarantine, TTS preserved 976–4650 in-person learning days for TTS participants. If all staff and students eligible for TTS had participated, a maximum of 4,472–6,264 in-person learning days could have been saved by TTS participation (Table 3).

Discussion

In four geographically diverse U.S. school districts implementing a range of TTS protocols, TTS was an alternative to traditional quarantine and saved an estimated 976 to 4650 in-person learning days. While other recent studies found that TTS maintained no or low school-based transmission,[6–8] we found that SAR and TAR varied among school districts. Districts in IL and KY had no or low (1%) tertiary transmission, respectively. GA had a higher TAR (6%), and NM had the highest TAR (18%) and two tertiary clusters. Both tertiary clusters occurred in elementary school special education classes, where students may require closer contact or have more frequent small group interactions.[20]

While some districts had a higher TAR, there were a small number of tertiary cases overall, leading to wide CIs. Also, TAR determination became more complicated when numbers of close contacts increased, making it difficult to identify source exposures. Six close contacts in NM who were exposed to both index cases and secondary cases within the same 14-day period were counted as tertiary cases. If all six had been considered secondary cases, TAR in NM would decrease to 8.0% (95% CI 3.3%–15.9%) and SAR would increase to 8.1% (95% CI 5.7%–11.0%). Hesitancy by index cases to report close contacts could have led to an overestimate of the TAR. However, there was a risk of school-based tertiary transmission in some districts that should be considered when implementing TTS.

This study was conducted at a time when Delta was the predominant SARS-CoV-2 variant in the United States. Emergence of more transmissible variants causing breakthrough infections, such as Omicron, will make it more difficult to document all close contacts. For schools without preexisting robust contact tracing and access to testing resources, TTS required significant resources, leading to increased staff burden and heightened need for testing and logistics planning.[7,21,22] As case counts rise, schools may be less likely to maintain contact tracing and will need additional testing resources.[23]

To ensure safe and equitable TTS implementation, under-resourced schools require increased testing capacity, on-site testing tools, and coordinated testing communication. Resource allocation may be challenging for under-resourced school districts, and care must be taken to ensure that TTS is equally affordable for both well-resourced and under-resourced schools. Not only could inequitable resource distribution and support increase disparities related to in-classroom learning,[24] but it has the potential to increase disparities related to food security, support for those with disabilities, and other ancillary services affecting social determinants of health impacting students' lives.[2, 25]

Access and communication likely influenced the lower participation in TTS in some districts. Daily TTS sample collection at one centralized location in GA may have complicated participation for parents, particularly those with inflexible work schedules and/or without transportation access. Other studies have cited testing location convenience and transportation as important factors impacting testing access.[26–28] Raising awareness of the TTS program and how it works may be challenging, and success in communicating with parents may vary by school staffing and time staff can spend reaching out to parents to explain the program and obtain consent.

COVID-19 vaccines reduce the risk of getting and spreading SARS-CoV-2.[29] Fully vaccinated student and staff close contacts (or those who had been diagnosed with COVID-19 in the prior 90 days) were exempt from quarantine and TTS. Some schools did not capture data for exempt or ineligible close contacts, and schools with fewer contact tracing resources and busier staff may have been less likely to capture these close contacts. With the emergence of highly transmissible variants, school districts may consider expanding TTS testing to exempt individuals. However, expansion may only be sustainable in districts with more resources, further contributing to inequitable testing opportunities.

We found that TTS resulted in a theoretical maximum of 976–4,650 in-person learning days saved, with the opportunity to save more in-person learning days with higher participation. Heterogeneity across sites, lack of attendance records, low testing capacity in one district, and lack of standardization and documentation by some testing contractors complicated an estimation of observed in-person learning days saved across sites. Thus, we report a theoretical maximum, consistent with previous studies.[7, 30] Also, increases in case incidence and other factors can lead to delays in staff and student exposure notification, meaning close contacts might not find out about an exposure until near the end of what would have been their quarantine period. Exposure notification delays likely led to fewer days saved by TTS participation; however, TTS was less disruptive to in-person learning compared to traditional quarantine. Prompt notification of positive cases to schools and contact tracing are important for slowing the spread of COVID-19 and preserving in-person learning.[31]

A limitation of this investigation is that not all test-positive contacts could be reached to obtain outside-of-school exposure information, and these individuals were grouped with possible school-associated cases. This may have resulted in an overestimate of SAR and TAR as some who were unable to be reached may have had outside-of-school exposures that were unknown to investigators or the school. Another limitation is that we were not able collect demographic data for all participants, nor present feedback obtained on barriers to TTS implementation in a standardized fashion. Further analyses are underway to understand participant demographics, and parent and school opinions and experiences with TTS. We were also unable to comment upon COVID-19 infection trends in classrooms where occupancy varied over time, as occupancy data were not collected in real time. Additionally, we do not have detailed data on remote learning options, so we are unable to describe impact on children of various ages. Given heterogeneity of TTS implementation across sites, we were also unable to comment upon any association between testing location and participation rates. Finally, the school districts in our study were a convenience sample and not a representative sample of districts in the United States and the results may not be generalizable to all populations.

Conclusion

With well-planned, well-resourced implementation, combined with layered mitigation strategies, TTS allows students not fully vaccinated to remain in school after close contact with an individual with SARS-CoV-2. Despite the range of TTS protocols and difficulty measuring the exact number of in-person learning days saved, we estimated that TTS preserved in-person learning. Given the risk of future local outbreaks that

may lead some schools to reinstitute TTS, this multi-site analysis could be helpful in guiding implementation. Considering community transmission levels and continuing layered prevention are important. Properly wearing a well-fitting mask and vaccination are core components of COVID-19 mitigation. Further research on implementation barriers will help support schools and guide resource allocation for successful and accountable TTS programs. Experiences in these four districts highlight TTS implementation variability and underscore the broad nature of challenges faced by schools implementing TTS across the country. TTS implementation is resource-intensive and may put increased demands on staff, contact tracing, and testing. Education and public health agencies should work closely with school districts to ensure resources are available to schools wanting to implement TTS.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations:

TTS	Test to Stay (noun), Test-to-Stay (adjective)
COVID-19	Coronavirus Disease 2019
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
IHE	Institution of Higher Education
K–12	Kindergarten through grade 12
Pre-K–12	Pre-Kindergarten through grade 12
SAR	Secondary Attack Risk

TAR	Tertiary Attack Risk
CDC	Centers for Disease Control and Prevention
GA	Georgia
IL	Illinois
KY	Kentucky
NM	New Mexico

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Table 1:

Evaluation of SARS-CoV-2 in four pre-K–12 school districts implementing Test to Stay (TTS) – Implementation context and criteria by site, Fall 2021

	Georgia	Kentucky	Illinois	New Mexico
Test-to-Stay (TTS) Criteria				
Close contact definition	<3ft. for a cumulative total of 15 minutes over 24 hours (if masked); <6 ft. for a cumulative total of ≥15 minutes over 24 hours (if unmasked)	<3ft. for a cumulative total of ≥ 15 minutes over 24 hours (if masked); <6 ft. for a cumulative total of ≥15 minutes over 24 hours (if unmasked)	<3ft. for a cumulative total of ≥ 15 minutes over 24 hours	<3ft. for a cumulative total of ≥ 15 minutes over 24 hours
Exposure type	School exposure only	School exposure only	School exposure only	School exposure only
Mask criteria for TTS	Masked & unmasked exposures eligible	Masked & unmasked exposures eligible	Masked exposure only	Masked exposure only
Who is eligible[a]	Students, teachers, & staff	Elementary & middle school students	Students, teachers, & staff	Students, teachers, & staff
Close contact testing cadence	Every school day for 7 days	Every other weekday for 7 days	Days 1–3–5–7	Days 1–3–5–7
Test type	Rapid antigen (CareStart ™)	Rapid RT-PCR (Thermo Fisher Scientific Accula ™ System)	Rapid antigen (BinaxNOW ™)	Rapid RT-PCR (Thermo Fisher Scientific Accula ™ System)
Testing location	One centralized location	Individual schools	Individual schools	Individual schools
Participation in school-sponsored after-school programs (e.g., sports and extracurriculars) allowed while in TTS	Yes	Yes	Yes	Yes
School quarantine policy[b]	7 days with test between days 5–7 or 10 days if symptom-free	7 days with test between days 5–7 or 10 days if symptom-free	7 days with test after day 6 or 14 days if symptom-free	10 days if symptom-free with no testing out policy
Evaluation dates	September 13 – November 5 (8 weeks)	September 27 – November 19 (8 weeks)	October 29 – November 19(3 weeks)	October 28 – November 19 (3 weeks)

[a]Students, teachers, and staff who were fully vaccinated or who received a COVID-19 diagnosis in the 90 days before exposure were exempt from quarantine and, therefore, not identified for TTS participation.

[b]Quarantine period was calculated using date of exposure as quarantine start date.

RT-PCR, reverse transcription polymerase chain reaction.

Table 2:

Non-pharmaceutical interventions, screening, community incidence, and number of participating schools in an evaluation of SARS-CoV-2 in four pre-K–12 school districts implementing Test to Stay (TTS), Fall 2021

	Georgia	Kentucky	Illinois	New Mexico
Non-pharmaceutical interventions recommended or required				
Handwashing	Yes	Yes	Yes	Yes
Regular cleaning and disinfection	Yes	Yes	Yes	Yes
Increased ventilation	Yes	Yes	Yes	Varied
Physical barriers in the classroom	No	No	No	No
Student cohorting[a]	Varied	Varied	No	Varied
Outdoor instruction	No	Yes	No	Varied
Desk spacing >3ft.	Varied	No	Yes	Varied
Desk spacing >6ft.	No	No	No	Varied
School extracurricular activities	Yes	Yes	Yes	Yes
Mask mandate	Mask optional beginning 10/16/2021	Yes	Yes	Yes
Screening				
Screening testing[b]	Yes (began late Oct)	No	Yes	Yes (for staff not fully vaccinated[c])
Symptom screening	Yes	No	Yes	Yes
Community incidence				
Median 7-day rolling average community incidence per 100,000 during evaluation period[9]	178.6 (range: 75.4–550.9)	67.6 (range: 42.9–176.7)	39.6 (range: 24.9–76.4)	51.6 (range: 40.1–69.1)
Number of participating schools				
Early Childhood Education (Pre-K)	1	0	1	1
Elementary (K–5)	8	8	5	9
Middle (6–8)	2	5	2	3
High School (9–12)	1	0	1	1
Alternative schools	1	0	1	1
School district demographics[13–17]				
Urban/Rural[d]	Urban	Urban	Urban	Urban
% Hispanic students	39%	19%	2%	40%

	Georgia	Kentucky	Illinois	New Mexico
% White, non-Hispanic students	20%	46%	<1%	44%
% Black, non-Hispanic students	35%	23%	97%	6%
% Asian/Pacific Islander, non-Hispanic students	2%	5%	<1%	3%
% American Indian/Alaskan Native, non-Hispanic students	<1%	<1%	<1%	1%
% Multiple races, non-Hispanic students	4%	6%	<1%	6%
Median % of students who qualify for free or reduced lunch	40% (range: 14%–86%)	57% (range: 14%–86%)	100% (range: 100%–100%)	77% (range: 6%–100%)

[a] Cohorting means keeping people together in a small group and having that group stay together throughout the day. Whether or not there was cohorting varied by grade level, school and/or class type.

[b] Opt-in testing (e.g., once a week) of all students, teachers, or staff who are asymptomatic and do not have known, suspected, or reported exposure to SARS-CoV-2; includes those who are fully vaccinated unless otherwise stated.

[c] At the time of this investigation, staff were considered fully vaccinated ≥14 days after receipt of the second dose in a 2-dose series (Pfizer-BioNTech or Moderna COVID-19 vaccines) or after 1 dose of the single-dose Janssen (Johnson & Johnson) COVID-19 vaccine.

[d] Urban/Rural designation determined using the 2010 US Census bureau criteria. Urban designation includes both Urbanized Areas and Urban Clusters.[12]

Table 3:

Index, secondary, and tertiary cases and their contacts participating in Test to Stay (TTS) during an evaluation of SARS-CoV-2 transmission in four school districts implementing TTS, Fall 2021

	Georgia	Kentucky	Illinois	New Mexico
Index Cases	92	56	63	163
Test to Stay (TTS)				
Close contacts identified[a]	732	935	589[b]	779
Close contacts[c] eligible	559	783	589	589
Close contacts[d] enrolled	122	415	465	392
% participation	21.8%	53.0%	78.9%	66.6%
Index case close contacts[e]	108	404	405	445
Secondary cases	12	17	9	30
Secondary attack risk (SAR)[f] (95% CI)	11.1% (5.9%–18.6%)	4.2% (2.5%–6.7%)	2.2% (1.0%–4.2%)	6.7% (4.6%–9.5%)
Secondary case contacts[e]	17	69	148	74
Tertiary cases	1	1	0	13
Tertiary attack risk (TAR)[f] (95% CI)	5.9% (0.1%–28.7%)	1.4% (0%–7.8%)	0% (0%–2.5%)	17.6% (9.7%–28.2%)
Tertiary case close contacts[e]	0	0	0	37
Clusters[g]				
Secondary clusters	2	5	1	1
Tertiary clusters	0	0	0	2
Theoretical maximum days of in-person learning saved[h]				
TTS eligible contacts	4,472	6,264	5,890	4,712
TTS enrolled contacts	976	3,320	4,650	3,136

[a] Includes all close contacts of index, secondary, and tertiary cases.

[b] Data for exempt contacts not collected at this site.

[c] Calculated as number of times an individual was eligible to enroll in TTS or home quarantine. These individuals may have been exposed more than once during a quarantine period; however, eligible exposures were only included if they led to a new quarantine period.

[d] Calculated as number of times an individual enrolled in TTS. These individuals may have been exposed more than once during a quarantine period; however, enrollments are only included if they led to a new quarantine period.

[e] Calculated using the number of times an individual had contact with an index, secondary, or tertiary COVID-19 case, respectively. This includes all TTS- or home quarantine-eligible exposures; individuals could have been a contact more than once. Exempt individuals who had contact with a case were excluded.

[f] Calculated using the number of times an individual had contact with an index or secondary case, respectively, as the denominator. This denominator includes all TTS- or home quarantine-eligible exposures; individuals could have been a contact more than once. Exempt individuals who had contact with a case were excluded.

[g] The number of times a case (index case or secondary case) infected ≥3 individuals.

[h]The number of days of in-person learning a TTS participant could expect to save in comparison to the full traditional quarantine number of days home quarantine, assuming exposure date and exposure notification date were the same and assuming the individual missed no days of school while enrolled in TTS. Full traditional quarantine varied across sites as described in Table 1.