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The West Texas Measles Outbreak and Student Absences

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Declining child-vaccination rates are driving a measles resurgence in the US, yet little evidence documents how these outbreaks may disrupt schooling. Using daily absence data from a school district at the center of the West Texas outbreak, this preregistered analysis finds absences increased 41 percent relative to the within-year variation from two prior years, with larger effects among younger students. This increase is 10 times greater than expected from confirmed infections, suggesting substantial precautionary absences and possible infection undercounting. These findings provide early evidence on the impact of vaccine-preventable disease outbreaks on learning opportunities, with implications for broader child development.

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The resurgence of measles in the US is an active public-health concern given declining school-vaccination rates, growing vaccine hesitancy, and recent state and federal actions against vaccinations (Zucker, 2025). Because measles is both highly contagious and risky, health authorities target vaccination coverage for measles, mumps, and rubella (MMR) of at least 95 percent among children entering kindergarten. However, national vaccination rates for kindergarten students recently fell below this "herd immunity" threshold with considerable variation both across and within states (CDC, 2025).

Though 2025 has not concluded, confirmed measles cases in the US—1798 as of November 26—exceed any year in the past three decades (CDC, 2025). These cases occurred across 43 states and in 46 official outbreaks. Nearly half of these cases occurred in Texas alone. Within Texas, a prominent outbreak centered in Gaines County, where kindergarten vaccination coverage is well below the recommended 95-percent threshold (Texas Department of State Health Services, 2025a). A state health alert was issued on January 30 after multiple school-aged children in Gaines County were confirmed with measles and hospitalized (Texas Department of State Health Services, 2025b).

This preregistered quasi-experimental analysis examines how the measles outbreak in West Texas affected absences in a public school district that enrolls more than eighty percent of Gaines County students. Student absences provide leading evidence of the broader developmental harm of measles outbreaks, such as lost instructional time, disruptions to instructional pacing in classes, and the mental-health consequences of missing school. However, despite the public-health urgency of the measles resurgence, we know of little evidence documenting how such outbreaks may influence school absences. Case reports of prior outbreaks indicate absences occur among children with known infections and unvaccinated students who are excluded from school as a containment strategy (e.g., Hall et al., 2017). However, the total number of absences during an outbreak can also include students with unconfirmed infections as well as those who intentionally skip school as a precaution. Given declining trends in school vaccination coverage, the Gaines County data on total absences offer a unique and timely view of the schooling disruptions that the growing number of low-coverage communities could face if outbreaks continue to spread.

Data and Methods

We acquired daily absence counts across the 2022-23, 2023-24, and 2024-25 school years (n = 506) through a public-records request to the Seminole Independent School District. This district serves 82 percent of public-school students in Gaines County. The natural logarithm of daily absence counts is the dependent variable in preregistered regression specifications that control for time-varying determinants through fixed effects unique to each school year, each calendar month, and each day of the week, as well as attendance-relevant indicators for community-relevant holidays and the days before major school breaks. Absences by grade are also considered given the differential measles risk by age. The independent variable of interest is a binary indicator for January 31, 2025, or later. This design effectively compares the post and pre-outbreak difference in absences during the 2024-25 school year to the corresponding seasonal differences in the prior two years (e.g., Dee, 2025). A second preregistered specification allows this effect to vary dynamically by month during the remainder of the 2024-25 school year. The online Appendix provides further information on the data construction, data-quality control, the preregistered research design, and relevant robustness checks.

Results

The onset of the measles outbreak coincided with an estimated 41 percent (i.e., $e^{0.342} - 1$) increase in absences relative to the within-year variation observed in the prior two years ($p < 0.01$, Table 1). This sharp increase in absences occurred among students at all grade levels. However, these estimated increases are consistently larger among younger students, ranging from a 71 percent (i.e., $e^{0.534} - 1$) among pre-K and kindergarten students to 25 percent (i.e., $e^{0.226} - 1$) among high-school students. We also find that absences increased significantly through each remaining month of the school year (i.e., February through May, Table 2). Four findings suggest the internal validity of these findings. First, these results are similar when conditioning on additional covariates (Tables 1 and 2). Second, the pattern of absences across the four remaining school months under the outbreak parallels the timing of reported measles cases (Table 2). The hypothesis of a common increase across these months is rejected ($p < 0.05$, Table 2). Third, event-study estimates suggest the month-to-month variation in absences prior to the outbreak resembled the two prior years (Appendix Table A2). Fourth, this study's central finding is robust to alternative approaches to estimation, inference, and outbreak timing (Appendix Table A3).

Discussion

The results of this preregistered analysis indicate that a recent measles outbreak led to a substantial increase in student absences (i.e., 41 percent) over the remaining four months of the 2024-25 school year. At the height of the outbreak, district absences were equivalent to roughly 20 percent of overall enrollment. To place estimated increases like this in further perspective, we note that daily absences in the District averaged 200 in the February-to-May period of the two prior school years. Therefore, a 41-percent increase implies 82 additional absences during the 71 school days under the outbreak (i.e., 5,822 lost student-days). Based on official measles surveillance data from Gaines County and Seminole ISD's enrollment share, we estimate that 141 confirmed measles cases occurred among District students (see the online Appendix for details). State outbreak guidance for schools recommended 4 isolation days for these students after rash onset, implying at most 564 lost student-days among known measles cases. This implies that the overall estimated increase in absences is roughly ten times larger than what would be expected based on known measles cases alone. The stark difference in these magnitudes underscores the broader developmental consequences of measles outbreaks. Specifically, the substantial impact of this outbreak on the most fundamental measure of student engagement (i.e., attendance) provides important evidence on the overall social impact of declining vaccination rates and the resurgence of these vaccine-preventable infections.

References

CDC. (2025, November 26). Measles Cases and Outbreaks. https://www.cdc.gov/measles/data-research/index.html

Dee, T. S. (2025). Recent immigration raids increased student absences. Proceedings of the National Academy of Sciences, 122(45), e2510395122.

Hall, V., Banerjee, E., Kenyon, C., Strain, A., Griffith, J., Como-Sabetti, K., Heath, J., Bahta, L., Martin, K., McMahon, M., Johnson, D., Roddy, M., Dunn, D., & Ehresmann, K. (2017). Measles Outbreak—Minnesota April–May 2017. MMWR. Morbidity and Mortality Weekly Report, 66(27), 713–717. https://doi.org/10.15585/mmwr.mm6627a1

Texas Department of State Health Services. (2025a). School Coverage. https://www.dshs.texas.gov/immunizations/data/school/coverage

Texas Department of State Health Services. (2025b, January 30). State health officials urge vigilance as additional measles cases are identified. https://www.dshs.texas.gov/news-alerts/state-health-officials-urge-vigilance-additional-measles-cases-are-identified

Zucker, J. R. (2025). The Measles Resurgence. JAMA. https://doi.org/10.1001/jama.2025.19138

Sample by Grade Levels	(1)	(2)
All (PK-12)	0.342***	0.342***
	(0.044)	(0.043)
Early Elementary School (PK-1)	0.534***	0.534***
	(0.058)	(0.058)
Elementary School (2-3)	0.392***	0.392***
	(0.058)	(0.058)
Upper Elementary School (4-5)	0.262***	0.262***
	(0.059)	(0.058)
Junior High School (6-8)	0.259***	0.258***
	(0.066)	(0.065)
All High Schools (9-12, 2 schools)	0.226***	0.226***
	(0.073)	(0.073)
Events Fixed Effects	No	Yes

Table 1. Estimated Effects of Measles Outbreak on Student Absences. The data consist of districtwide daily observations of student absences in the 2022-23, 2023-24, and 2024-25 school year (n=506). The dependent variable is the natural log of absences. All specifications condition on fixed effects unique to each school year, to each calendar month, and to each day of the week. A binary indicator identifies the period of measles outbreak. Robust standard errors are reported in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Month	(1)	(2)
February 2025	0.361***	0.359***
	(0.074)	(0.072)
March 2025	0.499***	0.499***
	(0.070)	(0.066)
April 2025	0.301***	0.298***
	(0.073)	(0.073)
May 2025	0.216***	0.220***
	(0.053)	(0.052)
p-value (H_0: $M_1=M_2=M_3=M_4$)	0.003	0.002
Events Fixed Effects	No	Yes

Table 2. Estimated Effects of Measles Outbreak on Student Absences by Month. The data consist of districtwide daily observations of student absences in the 2022-23, 2023-24, and 2024-25 school year (n=506). The dependent variable is the natural log of absences. All specifications condition on fixed effects unique to each school year, to each calendar month, and to each day of the week. Binary indicators identify each month of outbreak period. The p-value refers to an F-test of the null hypothesis that the effects by month are equal. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Online Appendix

The West Texas Measles Outbreak and Student Absences

The PDF file includes:
Data Sharing Statement
Materials and Methods
Tables A1 to A3

Data Sharing Statement

All study data and code will be made publicly available on the Stanford Digital Repository (https://sdr.stanford.edu) upon publication.

Materials and Methods

Materials

The data for this study consist of a daily time series of all student absences (i.e., both excused and unexcused) for Seminole Independent School District (ISD) in Gaines County, Texas over the 2022-23, 2023-24, and 2024-25 school years. According to the federal Common Core of Data (CCD), there are three public school districts in Gaines County, Texas. Their aggregate enrollment was 3,642 in the 2023-24 school year. Over 82 percent of this county's enrollment (i.e., 2,986) was in the Seminole ISD. We obtained these data via a public-records request. The Human and Animal Research Compliance Office at Stanford University determined that our research based on these data did not require IRB review because it does not involve human subjects as defined in 45 CFR 46.102(e)(1).

We received these data as anonymized student-level absences by day, with indicators for absence type (i.e., excused or unexcused) and student grade level. We first organized the data into daily counts of student absences and then validated these counts by checking for outliers and cross-referencing them with district academic calendars to confirm that only valid instructional days were included. We resolved a small number of inconsistencies through follow-up communication with school districts (e.g., missing one valid attendance day due to weather-related closures). We exclude the first and last days of school from each school year, as absences on these days were not recorded.

The analytic sample consists of 506 district-day observations of student absences across three school years (Table A1). In addition to overall absence counts, the data allows us to identify daily absence counts by the district's six schools: Young Elementary (grades Pre-K-1st), Seminole Primary (grades 2-3), Seminole Elementary (grades 4-5), Seminole Junior High School (grades 6–8), Seminole High School (grades 9–12), and Seminole Success Center (grades 9-12, alternative HS). For analysis, we combine daily absences from Seminole High School and the Seminole Success Center to create a high school total (grades 9-12). We note that the district records absences for a small number of students who are eligible for special education and served in a pre-K classroom (i.e., Young Elementary School) under the grade-level code "EE" for Early Education (Texas Education Agency, 2025). We include these students in the Pre-K grade-level totals. Table A1 reports descriptive statistics for these counts (i.e., district total and by school).

The independent variable of interest is a binary indicator equal to one for school attendance days on January 31, 2025 (i.e., the day after Texas Health and Human Services announced a cluster of Measles cases in Gaines County, Texas) and later (Texas Department of State Health Services, 2025a). Over 14% percent of the data are observed in this treatment period.

The fixed-effect specification described below conditions on unrestricted fixed effects unique to each academic year, to each month, and to each day of the week. The covariate set also includes

two binary indicators that identify events relevant to school attendance. One is an indicator that identifies the last school day before one of the three major school breaks (i.e., Thanksgiving, winter holidays, and spring holidays). This indicator is defined uniquely by the school district's published calendars for each school year. The covariate set also includes a binary indicator for several community-relevant holidays that sometimes overlap with valid school-attendance days. These consist of March 2 (Texas Independence Day), October 31 (Halloween), January 6 (Epiphany), and May 18, 2023, May 9, 2024 (Ascension Day). Similar to Dee (2025), we also include binary indicators for September 16 (Mexican Independence Day), November 1 and 2 (Day of the Dead), December 12 (Feast Day for Our Lady of Guadalupe), and the first Monday in February (Constitution Day in Mexico).

Because the outcome is a count variable, our study preregistration (https://osf.io/snvdu) anticipated skewness and potential overdispersion. Accordingly, we preregistered research designs using both ordinary least squares (OLS) with the natural log of absences as the dependent variable (where possible) and count-data models (Poisson and negative binomial regressions). All models are estimated with heteroskedasticity-robust standard errors.

Methods

Following Dee (2025), we use the general regression specification to identify the effects of the West Texas measles outbreak on student absences in the following general form:

$$Y_{iwmt} = \beta M_{iwmt} + \lambda_w + \gamma_m + \delta_t + \varepsilon_{iwmt}$$

where the dependent variable is the natural logarithm of the count of student absences on calendar day i, on day of the week w, in month m, and in school year t (Dee, 2025). The terms λ_w, γ_m, and δ_t represent fixed effects unique to each day of the week, to each month, and to each school year, respectively, while ε_{iwmt} is a mean-zero error term. The independent variable of interest, M_{iwmt}, identifies days after the measles outbreak announcement (i.e., January 31, 2025, and later). In a semi-dynamic specification, effects related to each post-outbreak month in the school year (i.e., February through May) are estimated separately (Table 2). Because only the last day of January (i.e., the day after the state measles alert) is in the outbreak period, we code January 31, 2025 as a day in February 2025 in by-month specifications. The event-study estimates (Table A2) generalize this semi-dynamic specification further by also allowing for fixed effects unique to each month of the 2024–25 school year prior to the measles outbreak (Table A2). We note that this more unrestricted specification implies a loss of statistical precision relative to the semi-dynamic specification.

In addition to total district absences as the dependent variable, we estimate these specifications separately by these grade spans, as outlined in our preregistration. The district comprises six schools organized into discrete grade bands (i.e., one Pre-K–grade 1 school, one grades 2–3 school, one grades 4–5 school, etc.). The second specification in Table 1 also conditions on the two binary indicators described above that identify days associated with attendance-relevant events (i.e., the day before a major break or a community-relevant holiday).

The baseline results (Table 1) are based on ordinary least-squares estimation and heteroscedastic-consistent standard errors. Table A3 examines the robustness of the baseline method across

different approaches to estimation and inference, as anticipated in our preregistration. This includes bootstrapping the standard error associated with the estimated coefficient on M_{iwmt} as well as four different approaches that explicitly recognize the count-data nature of the daily absence counts. These consist of maximum likelihood (ML) and conditional maximum likelihood (CML) versions of Poisson and negative-binomial regressions that condition on the full covariate set. Because the link function in these count-data specifications is the natural log, the reported coefficients can also be understood as approximate percent change.

Our main specification defines the post-period as January 31, 2025—the day after Texas Health and Human Services announced a cluster of measles cases in Gaines County, Texas (Texas Department of State Health Services, 2025a). Table A3 also probes the sensitivity of our findings to this definition by redefining the post-period as beginning on February 6, 2025—the day after the state agency formally declared a measles outbreak in Gaines County, Texas (Texas Department of State Health Services, 2025b).

Externality Estimates

Our preregistered analysis indicates the outbreak led to a 41-percent increase in student absences. Given the baseline of 200 daily absences in the District during the February-May period in the prior two school years, this increase implies 82 additional absences per day during the remaining 71 days in the 2024-25 school year (i.e., 5,822 lost student-days). We imputed the number of confirmed measles cases among Seminole ISD students during the 2024-25 school year after the outbreak (i.e., January 31, 2025 and later) using several data sources. Data from the Texas Department of State Health Services (2025d) indicate that there were, in total, 414 confirmed measles cases in Gaines County, TX, as of August 12, 2025. These data also indicate that 95.8 percent of these cases had a rash onset between January 31, 2025, and the end of May (i.e., the school year under the outbreak), that 37.5 percent of these cases occurred among children aged 5 to 17, and that an additional 29.5 percent of cases occurred among children aged 0 to 4.

Seminole ISD enrolls children as young as 4 as of September 1 (Seminole Independent School District, 2025). We assume measles cases among children aged 0 to 4 are uniformly distributed by age. This implies that school-age children constitute approximately 43.4 percent $\left(0.375 + \frac{1}{5} \times 0.295\right)$ of confirmed cases. Taken together, these data imply that approximately 172 measles cases occurred among school-aged children and during the school year in Gaines County: $414 \times 0.958 \times \left(0.375 + \frac{1}{5} \times 0.295\right)$. Seminole ISD enrolls 82 percent of the public-school students in Gaines County. Conservatively ignoring private and homeschool enrollment, this implies 141 confirmed measles cases among Seminole ISD students during the 2024-25 school year (172×0.82).

The state's health guidance to schools during the outbreak recommended 4 days of isolation for measles-positive individuals (Texas Department of State Health Services, 2025c). Given 141 student cases, this implies 564 lost student-days of instruction (4×141). The estimated increase in student-days lost attributable to the outbreak is over 10 times larger than this, which implies

substantial externalities. Specifically, it is consistent with precautionary absences among uninfected students (i.e., parents keeping children home, schools excluding unvaccinated students who were exposed to measles) as well as the possibility that confirmed case counts understate the true prevalence of measles infections during the outbreak.

References

Dee, T. S. (2025). Recent immigration raids increased student absences. Proceedings of the National Academy of Sciences, 122(45), e2510395122.

Seminole Independent School District (2025). Enrollment & Registration: Pre-K and Kindergarten Eligibility & Enrollment. https://www.seminoleisd.net/apps/pages/enrollment-and-registration

Texas Department of State Health Services (2025a, January 30). State health officials urge vigilance as additional measles cases are identified. https://www.dshs.texas.gov/news-alerts/state-health-officials-urge-vigilance-additional-measles-cases-are-identified

Texas Department of State Health Services (2025b, February 5). Measles Outbreak in Gaines County, Texas. https://www.dshs.texas.gov/news-alerts/measles-outbreak-gaines-county-texas

Texas Department of State Health Services (2025c, March 13). Interim Guidance for Measles in Schools, March 2025. https://www.dshs.texas.gov/sites/default/files/Admin-Meales/doc/school-guidance-measles.pdf

Texas Department of State Health Services (2025d, August 12). Measles Outbreak – August 12, 2025. https://www.dshs.texas.gov/news-alerts/measles-outbreak-2025

Texas Education Agency (2024). 2024-2025 Student Attendance Accounting Handbook. https://tea.texas.gov/finance-and-grants/financial-compliance/saah/2425-saah-proposed.pdf

Variable	Mean	*SD*	Min	Max
Absence Counts				
District Total	209.74	81.01	37	674
Young Elementary (PK–1)	48.56	22.94	6	154
Seminole Primary (2–3)	30.52	13.81	4	98
Seminole Elementary (4–5)	28.55	11.88	4	97
Seminole Junior High School (6–8)	42.99	20.46	5	152
Seminole High School (9–12)	54.57	23.17	0	192
Seminole Success Center (9–12, alt)	4.54	3.13	0	21
High School Total	59.11	24.52	2	210
Covariates				
Post Measles Outbreak	0.14	0.35	0	1
Day Before Major School Break	0.02	0.13	0	1
Community-Relevant Event	0.04	0.19	0	1
Day-of-the Week	3.07	1.37	1	5
Month	6.33	3.77	1	12
Year	2023.53	0.95	2022	2025

Table A1. Descriptive Statistics. The data consist of daily observations of student absences in 6 schools in one district over the 2022-23, 2023-24, and 2024-25 school years (n=506). We summarize for each of the 6 schools, combine the traditional and alternative high school, and show the District total. The lower panel summarizes covariates used in the analysis: indicators for the post–measles outbreak period, days preceding major school breaks, and community-relevant events. Our analysis also conditions on fixed effects unique to each school year, to each calendar month, and to each day of the week. See text for details.

Month	Estimates
Sep-24	0.033
	(0.172)
Oct-24	-0.091
	(0.173)
Nov-24	-0.092
	(0.174)
Dec-24	-0.273
	(0.178)
Jan-25	0.099
	(0.192)
Feb-25	0.308*
	(0.182)
Mar-25	0.448**
	(0.179)
Apr-25	0.247
	(0.182)
May-25	0.169
	(0.174)

Table A2. Event-Study Estimates. The data consist of district daily observations of student absences over the 2022-23, 2023-24, and 2024-25 school year (n=506). The dependent variable is the natural log of absences. All specifications condition on binary indicators for event-relevant school days and fixed effects unique to each school year, to each month, and to each day of the week. Robust standard errors are reported in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Method	Estimate
Baseline Result	0.342***
	(0.043)
Bootstrapped Estimate	0.342***
	(0.042)
ML-Poisson	0.356***
	(0.043)
ML-Negative Binomial	0.352***
	(0.042)
CML-Poisson	0.346***
	(0.069)
CML-Negative Binomial	0.330***
	(0.042)
Alternative Treatment Definition (February 6, 2025 & later)	0.308***
	(0.046)

Table A3. Estimated Effects of Measles Outbreak on Student Absences by Method. The data consist of district daily observations of student absences in the 2022-23, 2023-24, and 2024-25 school year (n=506). The dependent variable is the natural log (or count) of absences. A binary indicator identifies the period of measles outbreak. All specifications condition on binary indicators for event-relevant school days and fixed effects unique to each school year, to each month, and to each day of the week. See text for details. Robust standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1