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Missing the Mark: Chicago Schools Under-Identify Students with Asthma

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Introduction

Asthma is the most common chronic childhood condition, affecting one of every 11 American children. Disparities are well-documented with minority and underserved youth disproportionately affected.¹ In addition to causing medical complications leading to emergency department visits and hospitalizations, asthma negatively impacts school attendance, readiness, and achievement.²

Because children spend a significant part of their day in school, consideration of these school-based outcomes is important to supporting children with asthma and reducing disparities. As a first step, schools must accurately identify students with asthma to provide care and manage exacerbations.

Prior studies suggest schools do not accurately identify students with asthma. Chicago Public Schools (CPS) records document 4.5% of children have asthma,³ significantly less than the city's 13% prevalence.⁴ Other large school districts face similar challenges with asthma case identification.⁵ Disparities are notable with minority students with asthma less likely to have a health management plan on file at school than white students.³

We sought to compare school-documented versus parent-reported asthma prevalence within four Chicago schools serving a minority, underserved population.

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Trial registration: not applicable

Conflicts of interest: none

Methods

As part of a broader partnership, we conducted a cross-sectional study of asthma prevalence in 2014–2015 at a public charter school network on Chicago’s South Side. The four schools serve 1,900 African-American, underserved students in pre-kindergarten to 12th grade. University of Chicago’s IRB deemed the study exempt.

School-documented asthma rates were obtained directly from the school database of students’ medical conditions. These schools require families to report chronic conditions in accordance with local public school policy; families must submit documentation from a clinician annually to verify the asthma diagnosis, typically an emergency action plan.⁶

Parent-reported rates were obtained through a standardized asthma screening process utilizing the Brief Pediatric Asthma Screen (BPAS), a five-question instrument validated in schools.⁷ Asthma educators and project assistants distributed the English-only instrument to parents to voluntarily complete on-site at school-wide events (e.g. report-card pick-up).

Data analysis consisted of descriptive statistics and Chi-squared testing, with significance at two-sided p -value <0.05 . STATA version14 software (StataCorp) was utilized.

Results

School records documented 10% of children had asthma with no difference across grades. Based on 664 children screened by parent-report, 39.5% (262/664) of students had asthma or likely asthma (Table 1). A total of 25.2% (167/664) were identified to have physician-diagnosed asthma (BPAS question #1). An additional 14.3% (95/664) had symptoms suggestive of asthma without a known diagnosis (BPAS questions #2–5).

Unlike school data, prevalence of parent-reported asthma diagnosis and symptoms differed by school level (Table 1). Parents reported an asthma diagnosis in 21.9% elementary and 31.1% middle students, with a significant difference between the two levels ($p=0.009$). Elementary school students were also more likely to have symptoms suggestive of asthma as compared to middle school (18.4% versus 6.8%, $p<0.001$).

Discussion

With nearly 40% of students found to have a diagnosis or symptoms of asthma, this study highlights prevalence rates are 2–4-times higher than documented in school records.

These results are striking but not surprising for this Chicago school system. CPS data from 2012–2013 showed asthma prevalence was 4.5%,³ significantly lower than 20–30% prevalence on Chicago’s South Side found during school-based screening in 2003–2005.⁴ Our findings align with these disparate rates and further emphasize the incongruence by evaluating prevalence in the same student population during the same time period. Only one other study has directly compared school-documented and parent-reported asthma prevalence. A New York study, limited to minority, underserved elementary school students, found results (6.5% versus 25%) similar to ours.⁵ Our study showed disparate rates persist

into middle school, an important finding given rates of asthma diagnosis and symptoms may differ across school levels, with younger students more likely to have symptoms without a physician-diagnosis.

Although true prevalence is unknown, it is clear many children with asthma are going unrecognized by schools. Poor data capture is partly due to systems-level barriers, including limited parental process knowledge, school communication, and school nurse availability.⁶ Although Chicago's school asthma management policy outlines the process for identifying students with asthma, these processes are complex, requiring multiple forms and annual contact with medical providers, which is potentially challenging with limited access to care.

Schools must critically examine procedures for asthma identification, as streamlined processes hold potential to improve school-based care. School-based screening programs, like ours, could simplify the current complex, multi-step process. It is also practical to consider whether asthma identification can be made by parent-report or one-time confirmation by a clinician, instead of annual documentation. Further, increased communication by the school with families about asthma and other chronic illnesses may positively impact attendance, academic performance, and health outcomes. Messaging from teachers and staff may be prudent given limited nursing availability and schools' significant role in managing consequences of chronic disease.

Interventions to improve identification in schools are especially important in underserved communities, most affected by limited medical care, tight school budgets, and insufficient school resources. However, legal considerations, including privacy and scope of care delivery, must be balanced when considering benefits of more data versus need for accurate data. Feasible interventions can be piloted in schools like those in this study, prior to expanding to larger districts. With these efforts, better prevalence and outcomes data can be collected, which may ultimately support population-based screening in schools.⁸

Generalizability of this study to public schools or schools outside of Chicago may be limited due to policy differences. Nevertheless, our results mirror local and national data for urban, minority, and underserved communities. Further, selection bias was minimized by approaching all parents attending events. A sensitivity analysis accounting for the 58% of students not screened shows prevalence would be a minimum of 16.6% assuming none of these students had asthma up to 22.4% using the school-documented rate of 10%. Lastly, privacy regulations prevented linking individual student screening data to school records.

In conclusion, identification of students with asthma by schools is a necessary first step to improving school-based asthma care and addressing disparities. Efforts should focus on developing and piloting simplified school processes to enhance identification and maximally impact downstream academic and health outcomes for children with asthma.

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Abbreviations:

BPAS	Brief Pediatric Asthma Screen
CPS	Chicago Public Schools

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Table 1: Asthma prevalence rates based on parent-report during school screening, by school level

School (Grade)	Total students	Students screened		Asthma diagnosis or symptoms		Asthma diagnosis [#]		Symptoms suggestive of asthma [#]	
		n	%	n	%	n	%	n	%
Elementary (Pre-kindergarten-5 th)	942	429	45.5	173	40.3	94	21.9	79	18.4
Middle school (6-8 th)	637	235	37.3	89	37.9	73	31.1	16	6.8
Total	1,579	664	42.1	262	39.5	167	25.2	95	14.3
						p=0.009		p<0.001	

* Asthma diagnosis identified based on an answer of “yes” to question 1 on Brief Pediatric Asthma Screen - Has your child ever been diagnosed by a doctor as having asthma?

Symptoms suggestive of asthma determined based on an answer of “yes” to question 2, 3, 4, or 5 on Brief Pediatric Asthma Screen –

2. Has your child ever had episodes of wheezing (whistling in the chest) in the last 12 months?

3. In the last 12 months, have you heard your child wheeze or cough during or after active play?

4. Other than a cold, in the last 12 months, has your child had a dry cough at night?

5. In the last 12 months, has your child been to a doctor, an emergency room, or a hospital for wheezing?