Are We Ready for Universal School-Based Asthma Screening?

An Outcomes Evaluation

Barbara P. Yawn, MD, MSc; Peter Wollan, PhD; Paul Scanlon, MD; Margary Kurland, RN

**Background:** Asthma is the most common chronic condition of childhood and a common reason for school absenteeism and use of school health services. unrecognized but symptomatic childhood asthma may be adding to this school burden.

**Objective:** To evaluate the effectiveness of school-based asthma screening in identifying children at high risk for unrecognized asthma and facilitating new asthma diagnoses.

**Methods:** A controlled trial of school-based asthma screening using mailed parent surveys and medical record review to estimate outcomes of interest, specifically numbers of new asthma diagnoses.

**Results:** Most parents (80%, N=5116) responded to the asthma screening survey. About 1 in 5 (19.4%, n=994) parents reported that their children had previously been diagnosed with asthma or reactive airway disease. Letters recommending further evaluation for symptoms suggestive of possible asthma were sent to the parents of 388 children (7.6% of respondents) without known asthma. About half of parents returned postcards stating their intended reaction to the referral recommendation including 52 parents (13.4% of those referred) who thought no further action was necessary. Parent-initiated physician visits occurred in 45 (11.6%) of the 388 referred children. Overall, there were 57 (0.9%, 57/6401) new physician diagnoses of asthma among the screened children in the 6 months following screening: 16 in the referred group and 41 in the group not referred, including 20 in the group whose parents said they had known that their child had asthma, but had no medical record documentation of an asthma diagnosis. The incident asthma diagnosis rate was 1.2% (34/2906; \( P = .25 \)) in a comparable control group that did not participate in screening.

**Conclusions:** School-based asthma screening did not increase the incident rate of asthma diagnoses in this community. Parents participated in the screening process, but the percentage of referred children with follow-up medical visits was low.

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CHILDHOOD ASTHMA meets most of the suggested criteria for mass screening.\(^1\) The condition is common, affecting 7% to 20% of school-aged children.\(^2\) Simple, inexpensive, and validated screening tools for identification of asthma have recently become available.\(^3-15\) Treatment of asthma improves outcomes, children with unrecognized asthma experience increased morbidity compared with children without asthma,\(^8,10-16\) and parents and children seem to accept asthma screening.\(^13,15-24\) While no presymptomatic phase of asthma can currently be identified, a prerogation phase seems to exist,\(^7,8,12,25-27\) with a significant number of children believed to be suffering from unrecognized and untreated asthma.\(^8,12,25-27\)

Beginning in 1996, the National Heart, Lung and Blood Institute funded 3 centers to study asthma management in schools (grant NHLBI N01 HR 56077), including programs to identify or screen for children with undiagnosed asthma. Reports from these studies suggest that undiagnosed asthma can be identified by screening using parent questionnaires.\(^28\) The American College of Asthma, Allergy and Immunology (Arlington Heights, Ill) have taken the work a step further, sponsoring an ongoing research program to “create methods of screening school children for asthma and allergies and to implement the model programs in schools across the country.”\(^29\)

To date, most of the studies of school-based asthma screening have focused on validation of the screening instruments\(^13,19-24\) and on outcomes such as the number of children who do not pass the screening test and are referred to a physician, or the willingness and ability of parents and children to participate in screen-
None of the studies seem to have evaluated the effectiveness of mass school-based screening (ie, the effect of screening on the rate of new asthma diagnoses in the community setting utilizing usual sources of care). This type of outcome or effectiveness evaluation is necessary to assure that programs actually affect rates of diagnosis rather than merely rates of referral and that they are translatable to the community school system.

This article describes a controlled trial of the effectiveness and feasibility of implementing a simple asthma screening or case-identification process based on parent surveys, that fits within the budget and time constraints of a school-based screening activity. The outcome measures include the rate of new asthma, reactive airway disease (RAD), and exercise-induced asthma (EIA) diagnoses in the screened population, as well as the parent-reported intention to follow-up on referral recommendations and the actual number of community physician visits that result from screening referrals.

### METHODS

#### SETTING

Rochester is the largest city in Olmsted County, Minn, with a 2000 census population of 85806 and a school-aged population of approximately 17000. As of January 2, 2000 (the date of the group identification), 15.4% of all public school students were members of an ethnic minority (Table 1). The Rochester, Minn, public school system (N=15162 students) is divided into 3 “clusters,” with each based on one high school and the several elementary, middle, and junior-high schools that “feed into” that high school. Rochester also has a Catholic school system, with a single high school and 2146 students in kindergarten through 12th grade.

#### SAMPLE

The students in one of the public school system’s clusters plus the students in the Catholic school system were used as the intervention or screened group. Students in one of the remaining public school system’s clusters were the control group. The third public school cluster was not involved in this portion of the study. The control and intervention clusters from the public school system were purposefully chosen to allow for comparable student demographics. Inclusion of the Catholic school system allowed comparison of outcomes in a less racially and economically diverse group (Table 1).

Parents of all children in kindergarten through 12th grade of the intervention schools were mailed a 1-page machine-scannable survey that queried parents about previous diagnoses of asthma and symptoms that have been found to be associated with a diagnosis of asthma (Table 2). A new survey had to be developed since, at the time of study initiation, no 1-page validated surveys designed for identification of new asthma had been published. A group of clinicians (N=8) and parents of children with asthma (N=23) were used to test the survey for face validity. Reading level of the survey was at approximately eighth grade, and the survey was translated into the 7 most common languages of non–English-speaking parents in the Rochester school districts. All non-English questionnaires were back-translated prior to distribution.

Each survey was personalized with the name of the student, the name of the student’s homeroom teacher, and the appropriate school logo to highlight the school’s role in the screening activity. Surveys were mailed to each parent or guardian’s home. In the school districts’ experience, less than half of surveys sent home with children (especially children in higher grades) reach their parents, and having teachers deliver surveys to children for transport home was considered disruptive to usual school activities. The mailed questionnaire was preceded by announcements in the schools’ newsletters, announcements at Parent-Student-Teacher Association meetings, and an introductory postcard sent to each of the affected households. The postcard provided a telephone number that parents could call if they desired further information or did not want to receive the survey. The introductory postcard was part of the usual protocol used by the school districts for any surveys sent to parents, and was considered integral to the school districts’ participation in the program. The actual survey packet included the survey, a cover letter on school district letterhead signed by the superintendent of the relevant school district and the medical advisor for the project, and a postage-paid return envelope. If the parents did not return the survey within 2 weeks, a reminder postcard was sent, and a second survey was sent if no response was received within 4 weeks. Parents with multiple children in the intervention schools received only a single envelope with all surveys included. Each survey was electronically “pre-slugged” by the school district, with the child’s name and school identification number to prevent parental confusion. School identification numbers were used for linking surveys with other school data. All questionnaires were mailed to parents during the first week of March 2000.

Completed surveys were machine scored. A scoring algorithm was developed by a group of local childhood asthma experts (2 pediatric allergists, 2 pediatric pulmonologists, and a family physician) to identify children without known asthma who were considered at increased risk for unrecognized asthma. Parents of children considered at increased risk for unrecognized asthma were sent letters recommending medical evaluation for possible asthma. The letters were specific to the parent’s survey answers. For example, parents who reported coughing were told of the possible association between daytime or nighttime coughing and asthma. The “referral” letter was signed by the project’s medical advisor and the superintendent of the child’s school district. Included in the letter were telephone numbers for voicing questions (to the medical advisor) or concerns regarding the family’s inability to obtain access to medical care (to the school’s public health nurse).

A parent-addressed postcard that asked the parents to report their intentions regarding the recommendation for fol-

### Table 1. Student Demographics*

<table>
<thead>
<tr>
<th>SES</th>
<th>Public</th>
<th>Catholic</th>
<th>Public + Catholic</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>80.9</td>
<td>95.1</td>
<td>82.5</td>
</tr>
<tr>
<td>Black</td>
<td>6.1</td>
<td>0.8</td>
<td>6.4</td>
</tr>
<tr>
<td>Hispanic</td>
<td>2.3</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Asian</td>
<td>10.2</td>
<td>2.6</td>
<td>8.9</td>
</tr>
<tr>
<td>American Indian</td>
<td>0.5</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>No lunch</td>
<td>82.0</td>
<td>99.9</td>
<td>81.2</td>
</tr>
<tr>
<td>Reduced-cost lunch</td>
<td>4.1</td>
<td>0</td>
<td>4.0</td>
</tr>
<tr>
<td>Free lunch</td>
<td>13.9</td>
<td>0.1</td>
<td>14.8</td>
</tr>
<tr>
<td>Support</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Data are presented as percentages. SES indicates socioeconomic status. A 50% random sample was reviewed (n = 2906).
Table 2. Response to Parent Survey

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes Response, No. (%) of Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has a doctor ever told you that your child has asthma, chronic bronchitis, or reactive airway disease?</td>
<td>994 (19.5)</td>
</tr>
<tr>
<td>In the past year, has your child been to the doctor because of asthma, chronic bronchitis, or reactive airway disease?</td>
<td>529 (10.3)</td>
</tr>
<tr>
<td>In the past year, has your child been to the emergency room for asthma, chronic bronchitis, or reactive airway disease?</td>
<td>111 (2.2)</td>
</tr>
<tr>
<td>In the past year, has your child been admitted to the hospital for asthma, chronic bronchitis, or reactive airway disease?</td>
<td>23 (0.4)</td>
</tr>
<tr>
<td>In the past year, has your child taken medicine for asthma, chronic bronchitis, or reactive airway disease?</td>
<td>765 (15.0)</td>
</tr>
<tr>
<td>Does your child have a doctor or clinic that takes care of his/her asthma, chronic bronchitis, or reactive airway disease?</td>
<td>923 (93.1)</td>
</tr>
<tr>
<td>Does your child have coughing or trouble breathing when playing outside, doing sports, or exercise?</td>
<td>677 (13.2)</td>
</tr>
<tr>
<td>Does your child have allergies to any food or insect sting that causes severe breathing problems or shock or anaphylaxis?</td>
<td>83 (2.6)</td>
</tr>
</tbody>
</table>

During the past 2 weeks, how many days has your child had coughing, wheezing, or chest problems during the day?
- 0 d: 4264 (83.3)
- 1-3 d: 368 (7.2)
- 4-6 d: 111 (2.2)
- ≥7 d: 124 (2.6)

During the past 2 weeks, how many nights has your child had coughing, wheezing, or breathing problems that woke you up at night?*
- 0: 4396 (85.0)
- 1-3: 287 (5.6)
- 4-6: 97 (1.9)
- ≥7: 75 (1.5)

During the past 2 weeks, how many days has your child taken medicines for asthma, chronic bronchitis, or reactive airway disease?
- 0 d: 4476 (87.5)
- 1-3 d: 129 (2.5)
- 4-6 d: 58 (1.1)
- ≥7 d: 206 (4.0)

*Options on survey were 1-day intervals that are summarized into groups here to save space.

Table 3. Parent Response Card Answers

<table>
<thead>
<tr>
<th>Answers</th>
<th>No. (%) of Parents (n = 388)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No response</td>
<td>198 (51)</td>
</tr>
<tr>
<td>Responses</td>
<td></td>
</tr>
<tr>
<td>Immediate visit planned</td>
<td>56 (14.4)</td>
</tr>
<tr>
<td>Plan to ask at next visit</td>
<td>10 (5.1)</td>
</tr>
<tr>
<td>Had recent visit; will ask at next visit</td>
<td>65 (16.9)</td>
</tr>
<tr>
<td>No visit or action required</td>
<td>54 (14.8)</td>
</tr>
<tr>
<td>Wanted to visit but couldn’t afford to</td>
<td>1 (0.3)</td>
</tr>
<tr>
<td>Returned blank</td>
<td>2 (0.6)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (0.6)</td>
</tr>
</tbody>
</table>

To test the outcomes of asthma screening, the medical records of all referred children and all children with parent-reported asthma or RAD were reviewed to identify preexisting asthma diagnoses plus new asthma or RAD diagnoses in the 6 months after referral letters were sent. To evaluate new asthma diagnoses in those who were not referred and those not reported by parents to have asthma, a search of the Rochester Epidemiology Project diagnostic index was completed for all diagnoses of asthma or RAD. All diagnoses in the diagnostic index were confirmed by medical record review. Students chosen for medical record review were matched to all records of all health care providers in Olmsted County using the unique resources of the Rochester Epidemiology Project. By using medical record review of all Olmsted County medical care providers, it was possible to directly assess the actual number and outcomes of asthma-related visits made during the 6 months following the asthma screening process rather than relying solely on parent self-reports. Previous reports show that this process captures approximately 98% of all care received by Olmsted County residents.

For each child in the reviewed group, all medical records were searched for evidence of a previous diagnosis of asthma and for any visit during which asthma (including EIA) or RAD was evaluated or diagnosed in the 6 months after referral. This included visits to all physicians’ offices, all emergency departments, and all hospitals within Olmsted County. New diagnoses of asthma, RAD, and EIA or exercise-induced bronchospasm (EIB) were recorded.

The baseline rate of asthma plus RAD diagnoses in the control group was determined by reviewing the medical records of a 50% sample of all children in the control group cluster (2006 children’s records reviewed). New diagnoses of asthma, RAD, and EIA or EIB were recorded in the control group during the same 6 months (May 1-October 31), but in 1999 rather than 2000. The earlier year was used to assure that introduction of the screening program did not affect outcomes in the control group. A 6-month window was used to eliminate any problems with an unusual month or short-term increase in respiratory infections. The months were chosen to avoid the influenza season. New diagnoses of asthma required review of the entire record to confirm that it was an incident diagnosis. Summary data on the control group has been reported previously.

DATA ANALYSIS

The sample size of approximately 6000 screened children provides 80% power to detect a 45% increase (from 1.2% to 1.9%) in the rate of new asthma diagnoses, assuming a survey return rate of 80%. Simple descriptive statistics were used to report...
response rates, and \( \chi^2 \) tests were used to compare rates across cases and controls, and for subgroup analysis.

**RESULTS**

The response rate to the mailed questionnaires was 79.9% (5116/6401) ([Figure](#)). The student demographics of the nonresponse group included a significantly higher percentage of students from lower socioeconomic status (SES) groups and nonwhite ethnicity (\( P<.001 \)). Parents who responded reported that 19.4% of their children had ever been diagnosed with asthma or RAD. The other responses to the survey questions are summarized in Table 2. Overall, 4.8% of children and 12% of those with previously diagnosed asthma were reported to have experienced coughing, wheezing, or breathing problems 4 or more days during the preceding 2 weeks. Seven percent of all children and 19% of those with diagnosed asthma were reported to have coughing, wheezing, or breathing problems that awoke the parents 2 or more nights in the preceding 2 weeks.

Parents of 388 children (6.1% of all children in the intervention group or 9.4% of those without reported asthma) were sent letters recommending medical evaluation for possible unrecognized asthma. All of the referred children were reported to have daytime coughing, wheezing, or breathing problems 4 or more days in the preceding 2 weeks. Two thirds of these children also had at least one episode of nighttime symptoms that awoke the parents. Half of the children referred for evaluation of potentially unrecognized asthma had parental reports of EIA problems without any use of asthma medications in the previous year. About half (49%, [190/388]) of the parents who received letters recommending further evaluation for possible asthma returned a postcard stating their intentions for follow-up care (Table 3).

According to the medical records of the 388 children referred for evaluation of potential asthma, 45 made visits during which asthma or breathing problems were mentioned, and 16 received a new diagnosis of asthma or EIA (referred to simply as asthma), or RAD in the 6 months after screening, for a positive predictive value of 36% in those who followed up on referral recommendations. The rate of follow-up visits did not differ by race or ethnicity (\( P=.52 \)) or by SES (\( P=.61 \)).

Among children who were not referred and who had no parent report of known asthma, an additional 21 new diagnoses of asthma or RAD were found. Eight diagnoses were in children whose parents did not return the survey. Three new diagnoses were in children who should have been referred but whose parents returned the survey after the referral letters were sent, and 2 received new diagnoses labeled “intermittent asthma” that may not have revealed any symptoms at the time of survey completion.

In the group with parent-reported preexisting diagnoses of asthma, 20 new diagnoses of asthma or RAD were noted in the 6-month window. None of these 20 children had a prior diagnosis of asthma, RAD, or EIA or EIB documented in their medical records. Overall, among the children screened, 57 new diagnoses of asthma or RAD were reported, which was 0.9% of the total population of 6401, or 1.1% in the group responding to the survey. Sixteen of the new asthma or RAD diagnoses were in the group of 388 children referred for possible undiagnosed asthma, 20 were from the group of 994 children whose parents said the child had previously been diagnosed with asthma, and 21 were from the group (n=3734) of children who had no parental report of asthma and who were not referred.

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surveys (n = 6401)</td>
<td>No Asthma or RAD† (n = 1285)</td>
</tr>
<tr>
<td>No Response (n = 5116; 79.9%)</td>
<td>Referral for possible asthma (n = 388; 9.4%)</td>
</tr>
<tr>
<td>Asthma or RAD† (n = 994; 19.4%)</td>
<td>Parent Card Returned (n = 190; 49.0%)</td>
</tr>
<tr>
<td>No Asthma or RAD† (n = 4122; 80.6%)</td>
<td>Not Referred (n = 3734)</td>
</tr>
<tr>
<td>New Asthma or RAD† (n = 29)</td>
<td>New Asthma or RAD† (n = 21)</td>
</tr>
</tbody>
</table>

Screening results. New asthma or reactive airway disease (RAD) (reactive airway disease) cases were found in 0.9% of those screened (n=57). New asthma or RAD cases were found in 1.2% of controls. Asterisks indicate that the physician diagnosed asthma by medical record review. Dagger indicates that data are based on parent report.
Among the 2906 students in the control group (no screening) whose medical care records were reviewed, 604 (20.8%) had ever received a diagnosis of asthma or RAD prior to the 6-month window. Thirty-four (1.2%; in comparison with intervention group, \( P = .25 \)) received a new diagnosis of asthma, EIA, or RAD during the 6-month study period in the year prior to the screening project.

**COMMENT**

School-based asthma screening is feasible, with most parents (80%) responding to the mailed survey. When parents follow-up on referral recommendations, the positive predictive value of a failed screening test is 36% for a new diagnosis of asthma (including EIA/EIB) or RAD. But few parents actually follow up on referral recommendations. If the success of screening were assessed using only the number of children referred, or the positive predictive value of a failed test in those who do follow up, the program would probably be termed a success. However, the measure that is of greatest importance is the patient outcome (ie, how many children received new diagnoses and new treatment). The screening project as completed did not affect outcomes. It did not increase the rate of new asthma or RAD diagnosis above the baseline rate of incident asthma or RAD diagnoses.

The baseline (control group) rate of new asthma diagnosis in school students is higher in this studied population than the only childhood asthma incident rate (0.6%) found in the medical literature. This higher baseline incident rate in Olmsted County may have lowered the assessed effectiveness of the screening program.

The rate of parent-reported or prevalent asthma is also high in our population but comparable to other reported rates in the recent literature. Rates of ever having a physician diagnosis of asthma by the time a child enters kindergarten are 8.2% according to our data, and 10.8% in a group of inner-city Chicago kindergartners. In third graders, the lifetime asthma prevalence was 14% in boys and 5% in girls in a racially mixed middle class community in Michigan, compared with 14.9% and 7.9%, respectively, in third-grade boys and girls in our somewhat less ethnically diverse and mostly middle class community. Students in seventh and eighth grade in Chicago schools are reported to have an “ever diagnosed” prevalence rate of 16%, compared with 17.6% among 13-year-old children in our sample. It is possible that lower rates of known prevalent asthma in other communities would leave a larger unrecognized pool of students to be identified and treated, and would enhance the outcomes attributable to screening or case identification.

This study assessed a portion of the screening process that is seldom evaluated, the rate of community physician visits after referral recommendations. Before a child could receive a medical evaluation or a new diagnosis of asthma, the child’s parent or guardian had to initiate a visit. According to medical record review, approximately 1 in 10 parents of referred children chose to do this. Reasons for the lack of response are not known for the 51% of children whose parents failed to return the response postcard. For those who did return the parent-response postcard, almost a third (32%) felt that the identified symptoms did not represent a need for action. This is contrary to recommendations for asthma care in well-accepted national guidelines, and suggests that additional parent and community education regarding the recognition, treatment, and control of asthma might be useful.

Conversely, the lack of parent response could represent a lack of confidence in the survey’s ability to identify problems, or discomfort with the schools intervening in health issues. Perhaps the nonspecific nature of the coughing and wheezing symptoms represented other respiratory conditions (upper respiratory tract infections) or intermittent asthma that resolved by the time parents received the referral letter. Gerald et al have reported that most asthma diagnosed as a result of school-based screening is mild and intermittent and may not require additional intervention. This may explain some of the parents’ lack of response to the screening results.

Whether or not it is justified, the parental lack of action is not unique to this program of asthma screening and case identification. The parent-initiated response rate is, in fact, similar to that seen in response to school vision screening referrals (20% in the first 6 months) and to school scoliosis screening (15% in the first 6 months). Even in programs that provide free medical evaluation for asthma referrals, parental follow-up is not universal and is reported to be as low as 40%. It is also possible that understanding the long-term effect of screening referrals may require longer follow-up. A referral letter, in combination with future episodes of symptoms, could trigger future visits to assess asthma, or hasten visits to assess future symptoms. The rate of new diagnoses made as a result of the screening might require a longer postreferral review period. A similar “delayed” phenomenon was seen with repeated letters of referral related to school vision screening.

Other school-based asthma “screening” programs have reported greater success. Most of these programs have been limited to either studying EIB or EIA in select groups such as high school athletes, reporting only the number of children referred (not diagnosed), or providing follow-up medical care either within the schools or by transporting the children to care sites in the context of a research program or survey validation study. Even these programs have had difficulty recruiting children to participate in free examination programs.

Our study has several limitations, including a non-randomized design. However, the program was carried out within one school district to control for factors related to access to health care and school health facilities and programs. The public school clusters chosen for the control and intervention groups were purposefully selected to have similar racial, ethnic, and socioeconomic distributions. The Catholic school cluster was added to assess differences in response rate by SES, and racial and ethnic characteristics. Response to the initial survey was lower among those who were reported to be nonwhite (not Hispanic) and those with lower SES. The lower survey return rate among those at potentially higher risk for unrecognized asthma (nonwhite, lower SES) may have
lowered the potential benefit of this screening program. Among parents who returned the survey, follow-up on referral recommendations did not differ by race, ethnicity, or SES. The lower response rate to the initial survey among nonwhite and lower SES families highlights the need to find additional methods to increase parental response. Simply translating the survey into other languages was insufficient.

The school-aged population of Rochester has limited racial diversity and a high prevalence rate of diagnosed asthma, which may have limited the size of the “unrecognized” asthma population that could be discovered with screening. This limits the generalizability to some regions of the country, but the rates of parent-reported prevalence are similar to several other prevalence rates obtained with the ISAAC questionnaire, making the program generalizable to at least a subset of other communities.

Our questionnaire was not validated, but rather based on other validated surveys, and it had high face validity according to pretesting with asthma experts and parents of children with asthma. It is likely that parent-assessed face validity is the most important characteristic in determining parents’ responses to referral recommendations. In addition, our medical records review may have missed undocumented parent calls to query physicians about the referral recommendations, thus lowering the apparent follow-up rate. However, this should not affect the outcome rate of new diagnoses of asthma.

Finally, this type of screening program assumes that the gap in recognizing asthma is due to the parents, and that pointing out the potential association of symptoms with asthma will prompt physician visits and new diagnoses. It is possible that the gap is with physicians, and that some parents had previously recognized and reported the coughing or wheezing symptoms without receiving a diagnosis, therefore perceiving that another visit would be unnecessary or unlikely to produce a different result. This limitation suggests that future programs might more appropriately address physician and nurse recognition and practice issues rather than inform parents of something they may already know.

The lack of success in our screening program suggests that, at least in the short term, it may be more appropriate to use school and community resources to improve asthma management in children with known asthma and frequent symptoms, rather than screening for unrecognized asthma.

Future studies of school-based screening will need to go beyond the usual methods of survey validation and screening efficacy and begin evaluating other screening outcomes important to children and schools. Those outcomes should include the effect of screening on absenteeism, school performance, and the children’s and families’ quality of life. The probability of adverse effects of asthma screening, such as false-positive labeling of children with asthma or providing an inappropriate sense of security for false-negative screening, should also be studied.

In this community, parents completed asthma screening surveys, but less than 12% responded to recommendations for medical follow-up. The screening process did not increase incident asthma diagnosis rates.

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What This Study Adds

This study presents community-based outcome data from an effectiveness study of school-based asthma screening. Compared with studies published from clinical trials, this study uses existing community resources and assesses not only the number of children identified with potentially unrecognized asthma, but follows them into the community. Using medical record review to confirm the number of new asthma diagnoses resulting from screening. The results are compared with similar outcomes in a control group of students not screened.


47. Strachan DP, Butland BK, Anderson HR. Incidence and prognosis of asthma and wheeze illness from early childhood to age 33 in a national British cohort. BMJ. 1996;312:1195-1199.


