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ORIGINAL ARTICLE

Asthma in schoolchildren in Monroe county, Florida: school-based needs assessment

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Abstract

Objectives: Asthma is the most common chronic pediatric condition (14%) and the leading cause of school absenteeism in the USA. However, little is known about asthma prevalence and distribution in schoolchildren in the Florida Keys region (Monroe County). Thus, the objectives of this study were to assess asthma prevalence, symptoms, cost and distribution in schoolchildren in the Florida Keys region and to pinpoint where asthma management services are most needed. **Methods:** Cross-sectional survey data on asthma prevalence, symptoms and socio-demographics was collected and analyzed by race, sex, grade and zip code. A total of 2313 parents of schoolchildren in the Florida Keys completed the adapted Harlem Empowerment Zone Asthma Initiative Questionnaire. The questionnaire was distributed to school principals, who sent them home with students to be filled out by parents or caregivers. We also analyzed data from the online Monroe County 2012 Florida Youth Tobacco Survey, the 2011 Florida CHARTS, the Medical Expenditures Panel Survey, and emergency departments (ED). Data were analyzed by race, sex, and grade. **Results:** In total 14.5% of respondents had been told their child had asthma and 9.6% reported their child had wheezing in the last 12 months. The prevalence was higher in the Lower Keys and Key West regions. Parents from households where anyone smoked cigarettes (OR 1.52, 95% CI 1.11–2.09) and those who had a male child (1.53, 1.17–2.00) more often reported that their child had asthma. The rate of asthma-related ED visits for Black non-Hispanic schoolchildren (1202 per 100 000) was substantially higher than the numbers for White (250.2 per 100 000) and Hispanic schoolchildren (325.1 per 100 000). Most of the direct cost of asthma was concentrated in children in grades four through seven (\$1236.02–\$2147.02 per child). **Conclusions:** The asthma prevalence in a sample of schoolchildren in the Florida Keys region was comparable to the nationwide prevalence. Black non-Hispanic schoolchildren had more asthma-related ED visits than White and Hispanic schoolchildren. Most of the direct cost of asthma is concentrated in children in late elementary through early middle school grades. Interventions are needed, particularly targeting Black schoolchildren in late elementary through early middle school grades in Lower Keys and Key West region.

Keywords

Community health, environmental, respiratory, student, wheezing

History

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Introduction

Asthma is the most common chronic pediatric condition in the USA, affecting up to 14% of children under 18 years of age [1]. Asthma is a serious, life-threatening respiratory disease that accounts for nearly 2 million emergency

department (ED) visits in the USA each year and is the leading cause of school absenteeism, accounting for >10.5 million missed school days per year [1]. In response to the growing asthma problem, the US Environmental Protection Agency created a national, multifaceted education and outreach initiative to share information about asthma [2]. However, little is known about asthma prevalence and distribution in schoolchildren in the Florida Keys region (Monroe County). The southeastern Florida Counties of Miami-Dade, Broward and Palm Beach participate in the Youth Risk Behavior Surveillance System (YRBSS) of the

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Centers for Disease Control and Prevention, which collects data on asthma. However, because Monroe County (Florida Keys region) does not participate in YRBSS, no readily available data exist on the distribution of asthma in Monroe County to guide planning for education and outreach. In 2010, the Monroe County had a total population of 73 090, of which 15.1% were children under 18 years of age [3]. The estimated direct cost of asthma in schoolchildren in Monroe County represented nearly 20% of the 2011 budget for human services in the county [4]. Of all households, 6.6% were extremely low income and severely cost burdened, in comparison to 6.1% for the State of Florida. Knowing the prevalence and distribution of asthma in different regions allow for proper intervention planning and management services allocation. Therefore, the objectives of this study were to assess asthma prevalence, symptoms, cost and distribution in schoolchildren in the Florida Keys region.

Methods

The study was conducted by the Asthma in Children: Community Information-Organization Network (ACCION), South Florida Asthma Consortium in collaboration with Monroe County Health Department officials to assess the burden of asthma in Monroe County schools by grade and plan a response as part of case-finding and needs assessment. We used a methodology adapted from the Harlem Children's Zone Asthma Initiative [5] and piloted in Miami-Dade County [6,7]. The study protocol was approved by the University of Central Florida Institutional Review Board (IRB No: SBE-13-09792).

Participants

All 11 Monroe County public schools and five of the eight private schools participated. During the spring of 2012, the county health department staff distributed 8151 questionnaires to the principals of the participating schools. The students took the questionnaire home with a cover letter indicating that the questionnaire was to be returned within 30 days. Families received a telephone reminder to return the questionnaire.

Instruments

The adapted Harlem Empowerment Zone Asthma Questionnaire used was in English and Spanish (Appendices 1 & 2). The questionnaire asked whether the child has ever been told he/she has asthma, whether anyone in the household smoked cigarettes, and included questions about asthma symptoms (e.g. wheezing, whistling, coughing, sleep disturbance), asthma-related ED visits, healthcare and insurance, and whether the respondent would like assistance in obtaining health insurance. The questionnaire was pre-tested in Miami-Dade County [6].

Additional data on Monroe County asthma prevalence, related ED visits, and cost were obtained from the following publicly available online datasets (most recent available data):

- (1) 2012 Florida Youth Tobacco Survey (FYTS: <http://www.floridahealth.gov/statistics-and-data/survey-data/fl-youth-tobacco-survey/index.html>) [8],

- (2) 2011 Florida Community Health Assessment Resource Tool Set (CHARTS: <http://www.floridacharts.com/charts.default.aspx>) [9],
- (3) Florida Department of Health (DOH) Asthma Prevention and Control Program (<http://www.floridahealth.gov/diseases-and-conditions/asthma/data.html>) [10], and
- (4) 2011 Medical Expenditure Panel Survey (MEPS).

Data analysis

Data from the questionnaires were entered and analyzed using Epi Info version 3.5.3 for Windows (Centers for Disease Control and Prevention, 2012, Atlanta, GA). Descriptive statistics were calculated to estimate proportions of schoolchildren affected by asthma, to compare proportions by school and student characteristics (age, gender and grade), and for measures of access and utilization of healthcare services. Multivariable analysis with logistic regression was used to control for confounding variables, computing adjusted odds ratios and 95% CIs of reporting asthma, controlling for schools, smoke status, health insurance, spoken language, age, sex and coughing during sleep. Analyses were conducted with the R statistical package (Version 3.0.2) and statistical significance was assessed using $p < 0.05$.

Direct costs of asthma were calculated by matching Questionnaire data with the 2011 MEPS data for ages 2–19 and grades pre-Kindergarten to 12th. Each child in the questionnaire was matched to one or more schoolchildren in the MEPS based on age, gender, insurance status and lifetime asthma prevalence. Of the 2313 schoolchildren, 98 were excluded because of missing information (4.2%); 104 (4.5%) could not be matched to any student in MEPS. Total expenditures from MEPS were defined as all out-of-pocket and other payer's payments for purchase of prescribed medicines, hospitalizations, ED visits, outpatient hospital visits, office-based visits, other medical equipment and home health care [11]. Estimated expenditures for each student in the questionnaire were obtained by averaging the expenditure of the corresponding matched students from MEPS. Direct costs associated to asthma were obtained as the difference in average expenditure between schoolchildren with and without reported lifetime asthma. Direct costs per schoolchild were expressed in 2011 dollars. One thousand replications were used to produce bootstrapped means and 95% CI by school grade.

Results

Of the 8151 questionnaires distributed, 2313 (28.4%) were returned (Table 1). The mean age of students was 9.5 years, with the greatest proportion of responses from parents or caregivers of 5th grade students (11.3%) and the smallest, from parents or caregivers of 12th grade children (1.2%) (Table 1). Most questionnaires (94.7%) were completed in English; 5.3% were completed in Spanish. Almost all (99.5%) of respondents reported their child's gender; 50.5% were female.

Almost 15% (336 [14.5%]) of respondents indicated they had been told their child has asthma by a healthcare provider (Table 1). A total of 308 (13.3%) parents indicated that their child had made an emergency visit

Table 1. Asthma prevalence in Monroe County Schools, January 2012, according to the ACCION survey.

School	Enrollment	Questionnaires returned	Response Rate ^a (%)	Number (%) told by MD/RN that has Asthma
School 1 ^E	520	145	27.9	36 (24.8)
School 2 ^E	387	85	22	9 (10.6)
School 10 ^E	625	298	47.7	48 (16.1)
School 12 ^E		225	41.9	23 (10.2)
School 16 ^E	37	11	29.7	0 (0) ^b
School 5 ^{K-8}	908	383	42.2	46 (12)
School 9 ^{K-8}	489	98	20	12 (12.2)
School 11 ^{K-8}	407	183	45	33 (18)
School 13 ^{K-8}	609	283	46.5	44 (15.5)
School 14 ^{K-8}	209	51	24.4	6 (11.8)
School 8 ¹⁻⁸	106	104	98.1	12 (11.5)
School 7 ^M	703	140	19.9	28 (20)
School 6 ^{MH}	612	50	8.2	6 (12)
School 3 ^H	757	203	26.8	23 (11.3)
School 4 ^H	1217	48	3.9	7 (14.6)
School 15 ^H	28	6	21.4	3 (50)
Total	8151	2313	2313/8151 (28.4)	336/2313 (14.5)

^aPer school.
^bAlthough none of the respondents reported their child had been told by a doctor that he/she had asthma, two respondents reported that their child had wheezing in the chest in the past and two more reported that their child wheezed and/or coughed during or after exercise.

to a doctor’s office or hospital at some point in the past due to asthma or other breathing problems and 118 (5.1%) indicated that this had occurred in the last 12 months. A total of 467 (20.2%) respondents indicated that their child had had episodes of wheezing or whistling in the chest in the past. In total, 223 (9.6%), reported that this had occurred in the last 12 months. 242 (10.5%) respondents indicated that their child had ever wheezed during or after exercise, and 349 (15.1%) respondents indicated that their child had ever coughed during or after exercise when they did not have a cold. More than 10% (266 [11.5%]) indicated that wheezing or coughing during or after exercise had occurred in the last 12 months. Finally, 270 (11.7%) respondents indicated that in the last 12 months, their child’s sleep had been disturbed by a dry cough unrelated to a cold or chest infection.

Of 2313 respondents, 1683 (72.8%) indicated that the child had a regular source of healthcare, outside of the ED; 1797 (77.7%) had health insurance coverage for their child, and 21.2% of children were uninsured. Of those respondents who had a child diagnosed with asthma, 85.1% reported a usual source of care and 18.1% requested help obtaining health insurance. Respondents who reported that the child had visited the ED for asthma in the last 12 months were slightly more likely to report a regular source of care (91/115 [79.1%]) than were other respondents (1576/2127 [74.1%]).

Responses by school

Response rate varied from 98.1% at School 8 (K-8 school) to 3.9% at School 4 (high school) (Table 1). The percentage of respondents ever told by a doctor or nurse that their child had asthma ranged from 10.2% (School 12) to 24.8% (School 1). Table 2 shows that the percentage of respondents who reported that their child had made an emergency visit to a doctor’s office or ED due to asthma or other breathing

problems ranged from 0% (Schools 14 and 15) to 13.1% (School 1).

The zip code with the highest asthma prevalence was 33 040 (Schools 1, 2 4, 7, 8, 10, 11 and 15) at 17.4%; zip code 33 006 (School 14) had the lowest asthma prevalence, 9.7% (Table 3; Figure 1). Data from the respondents to this questionnaire survey did not show a link between poverty level in the school zip code and child asthma prevalence. There were no zip code – level poverty data for Summerland Key (33042) and Tavernier (33070) [12].

Responses by grade

The largest proportion of total responses came from 5th grade children (11.3%) and the lowest, from 12th grade children (1.2%). The proportion of respondents who had ever been told by a doctor or nurse that their child had asthma (lifetime asthma) ranged from 9.8% (pre-Kindergarten) to 17.3% (6th grade). Reports of two symptoms suggestive of asthma were highest for pre-kindergarten children: 14.6% had experienced sleep disturbance in the last 12 months by a dry cough unrelated to a cold or chest infection, and 12.2% had experienced wheezing or whistling in the chest in the last 12 months. Parents and caregivers did not report a diagnosis of asthma in 131 (28.1%) of the 467 schoolchildren who had wheezing in the last 12 months. Reports of wheezing or coughing during or after exercise (when they did not have a cold) in the last 12 months ranged from 3.6% (12th grade) to 16.2% (8th grade). The percentage of respondents who indicated that, in the last 12 months, their child had made an emergency visit to a doctor’s office or ED due to asthma or other breathing problems varied from 0% (10th and 12th grade) to 7.7% (2nd grade). The median age of students who had made an emergency visit for asthma to a doctor’s office or ED (8 years) was significantly lower than that of students who had not made an emergency asthma visit (median = 9 years; $p < 0.001$).

Table 2. Number and proportion of responders, by school, who reported that their child's sleep was disturbed by cough, or who had wheezing, without or with exercise, or who had an emergency visit to physicians (MD) or emergency room in the prior 12 months, ACCION Questionnaire Survey, January 2012.

Number of responders	Percentage of total	Number (%) sleep disturbed by cough in the last 12 months	Number (%) wheezing/whistling in last 12 months	Number (%) wheezing/coughing during/after exercise in last 12 months	Number (%) with emergency visit to MD/ER in last 12 months ^a
145	6.3	26 (17.9)	19 (13.1)	19 (13.1)	19 (13.1)
85	3.7	8 (9.4)	7 (8.2)	8 (9.4)	3 (3.5)
298	12.9	44 (14.8)	25 (8.4)	39 (13.1)	17 (5.7)
225	9.7	29 (12.9)	25 (11.1)	21 (9.3)	12 (5.3)
11	0.5	2 (18.2)	1 (9.1)	2 (18.2)	1 (9.1)
383	16.6	39 (10.2)	34 (8.9)	35 (9.1)	17 (4.4)
98	4.2	13 (13.3)	7 (7.1)	14 (14.3)	6 (6.1)
183	7.9	27 (14.8)	20 (10.9)	22 (12)	15 (8.2)
283	12.2	37 (13.1)	36 (12.7)	53 (18.7)	15 (5.3)
51	2.2	7 (13.7)	5 (9.8)	5 (9.8)	0 (0)
104	4.5	8 (7.7)	11 (10.6)	10 (9.6)	1 (1)
140	6.1	10 (7.1)	13 (9.3)	16 (11.4)	7 (5)
50	2.2	3 (6)	6 (12)	3 (6)	2 (4)
203	8.8	12 (5.9)	12 (5.9)	12 (5.9)	2 (1)
48	2.1	4 (8.3)	2 (4.2)	3 (6.3)	1 (2.1)
6	0.3	1 (16.7)	0 (0)	1 (16.7)	0 (0)
2313	100.00 ^b	270/2313 (11.7)	223/2313 (9.6)	263/2313 (11.4)	118/2313 (5.1)

^aDue to asthma or other breathing problems.

^bPercentages may not add up to 100% due to rounding.

Table 3. Poverty level and child asthma prevalence, by zip code, Monroe County, FL [4].

Zip code	Proportion of persons living below the poverty level, by zip code ^a	Asthma prevalence, by zip code
33050	10.8%	10.5 (29/275)
33070	N/A	11.2 (35/312)
33036	13.4%	9.7 (6/62)
33037	9.5%	12 (46/383)
33042	N/A	15.5 (44/283)
33040	13%	17.4 (176/1009)
TOTAL	N/A	14.5 (336/2313)

N/A (not available); no zip code data on proportion of residents living below the poverty level for these two zip codes (Summerland Key [33042] and Tavernier [33070])

Secondary data sets

The 2012 FYTS for Monroe County reported a lifetime asthma prevalence (ever diagnosed with asthma) of 16.8% for middle-school students and 18.5% for high school students, compared with statewide estimates of 20.1 and 20.8%, respectively [8,13]. The Florida CHARTS website summarizes FYTS data for prior years [9]. For the period 2008–2012, prevalence of lifetime asthma in Monroe County increased moderately (8.3%) among middle-school students and steeply (24.2%) among high school students [3,4]. During the same 4-year period, statewide lifetime asthma increased steeply among both groups (18.9% among middle school students, and 20.9% among high school students) [1,3,13].

According to the FDOH Asthma Prevention and Control Program asthma ED visit rates in 2006 through 2009 for Monroe County children aged 5–17 years were below (500 per 100 000 children) the Florida state rate (687.6 per 100 000 children). However, the asthma ED visit rate of Monroe

county non-Hispanic Blacks (1202.2 per 100 000), was 23.1% higher than the statewide rate for non-Hispanic Blacks, 4.8 times the rate of white non-Hispanics (250.2 per 100 000) and 3.7 times the rate of Hispanics (325.1 per 100 000) in Monroe County. The asthma ED visit rate for Monroe County Hispanics was comparable to the statewide rate; however, it was 30% higher than the rate for white non-Hispanics [10]. In Monroe County, according to the 2010 US Census, 5.7% of the population was non-Hispanic Black and 20.6% was Hispanic [3].

Multivariate logistic regression analysis

Table 4 shows the adjusted odds ratios predicting the odds of parent or caregiver report of asthma among Monroe County Schoolchildren. When controlled for other factors in logistic regression analysis, asthma prevalence varied significantly by school. For example, when compared with School 1, students attending schools 2, 3, 5, 9, 10 and 13 had significantly lower odds of having asthma. The odds of reporting asthma was 52% higher for students exposed to household environmental tobacco smoke compared with those who were not exposed. Having health insurance was also significantly associated with increased odds of reporting asthma. Odds of reporting asthma did not differ significantly by language used to respond to the questionnaire or by age when controlled for other factors. Male students had higher odds of having an asthma diagnosis than their female counterparts. Parents or caregivers of students with nighttime cough had nearly 11 times higher odds of reporting that their children had asthma than did those of children without nighttime cough.

Direct cost estimates

Direct cost associated with asthma was estimated at \$1035 per student (95% CI = [\$902, \$1177]) [4,8]. Table 5 reports estimated direct costs per student by school grade. Cost per

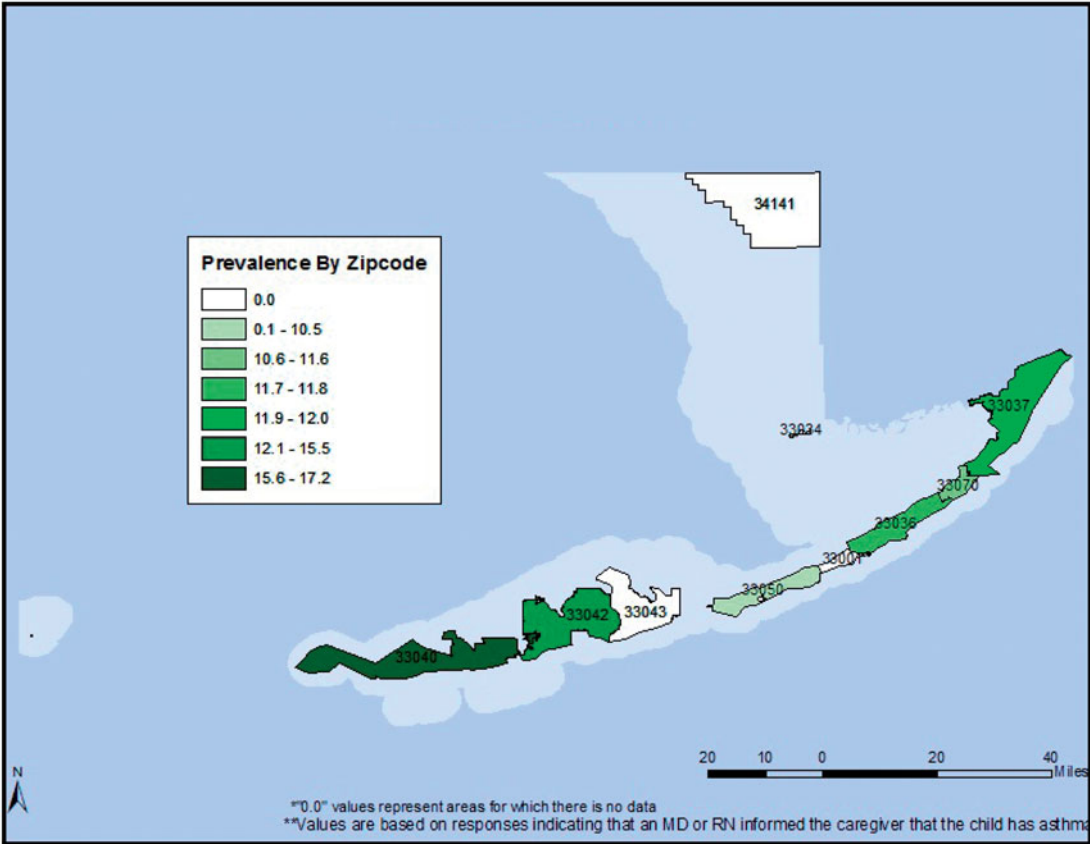


Figure 1. Asthma prevalence by school zipcode Monroe country, FL [11–14].

Table 4. Adjusted odds ratios from logistic regression analysis predicting odds of caregiver report of asthma among Monroe county students.

Variables	OR 95% CI
Schools	
School 1 ^E	1.00
School 2 ^E	0.41 [0.17, 1.00]
School 3 ^H	0.32 [0.14, 0.73]
School 4 ^H	0.44 [0.15, 1.32]
School 5 ^{K-8}	0.38 [0.22, 0.68]
School 6 ^{MH}	0.47 [0.16, 1.36]
School 7 ^M	0.79 [0.38, 1.62]
School 8 ¹⁻⁸	0.59 [0.27, 1.30]
School 9 ^{K-8}	0.41 [0.18, 0.92]
School 10 ^E	0.55 [0.31, 0.96]
School 11 ^{K-8}	0.63 [0.34, 1.17]
School 12 ^E	0.30 [0.16, 0.57]
School 13 ^{K-8}	0.49 [0.27, 0.86]
School 14 ^{K-8}	0.36 [0.12, 1.05]
Environmental Tobacco Smoke	
Unexposed	1.00
Exposed	1.52 [1.11, 2.09]
Health Insurance	
No	1.00
Yes	1.65 [1.15, 2.37]
Language	
English	1.00
Spanish	1.08 [0.58, 2.02]
Age	1.05 [0.99, 1.12]
Sex	
Female	1.00
Male	1.53 [1.17, 2.00]
Cough during sleep	
No	1.00
Yes	10.78 [7.97, 14.58]

student was estimated at \$371 (CI=[\$171, \$588]) at pre-kindergarten and kindergarten, and then increases rapidly in the next grades. The largest costs were observed in third grade to seventh grade, with the highest in the sixth grade (\$2857, CI=[\$2096, \$3713]). That implies a total direct cost of \$1 172 816 in year 2011, which represents nearly 20% of the 2011 budget for human services in the county.

Discussion

Overall, the asthma burden in Monroe County schoolchildren appeared to be below that of the state of Florida but greater than the national average [1,4,10]. As is the case nationwide, asthma ED visit rates and prevalence appear to be rising in Monroe County, with higher rates of diagnosed asthma in male children [11].

The school-health questionnaire findings suggest that there may be a significant number of Monroe County children with possible asthma (as indicated by history of wheezing) who have not been evaluated to determine whether they have asthma. The lower prevalence of diagnosed asthma and visits related to asthma in uninsured children suggests that diagnostic evaluations may be less likely in these children than in insured counterparts. Similarly, elevated and rising asthma ED visit rates in non-Hispanic Blacks suggest inadequate asthma control; disparities among racial groups may indicate lower access to or use of strategies to reduce asthma exacerbations. Our findings suggest that non-Hispanic Black and Hispanic children in third to seventh grades are in whom most of the direct costs for asthma are concentrated.

Table 5. Estimated direct cost of asthma in Monroe County, per schoolchild (in 2011 dollars).

Grade	Direct Cost	95% CI
All grades	1035.38*	(902.01, 1176.92)
Pre and Kindergarten	370.78*	(170.6, 587.56)
Grade 1	892.13*	(574.42, 1239.74)
Grade 2	255.05*	(92.85, 427.47)
Grade 3	917.56*	(620.3, 1260.47)
Grade 4	1235.07*	(1002.53, 1458.57)
Grade 5	1414.88*	(925.26, 2,012.31)
Grade 6	2856.55*	(2096.02, 3,712.69)
Grade 7	2140.09 ^{a,*}	(1587.87, 2,766.66)
Grade 8	−158.96 ^a	(−448.43, 165.75)
Grade 9	−203.07 ^a	(−486.13, 62.7)
Grade 10	560.68 ^a	(−4.69, 1,146.94)
Grade 11	1382.59 ^{a,*}	(391.79, 2,435.43)
Grade 12	641.86 ^a	(−258.41, 1730.39)

Average direct cost per schoolchild and 95% confidence interval were produced by bootstrapping.

^aSample of schoolchildren with lifetime asthma below 30 observations.

*Significant at 5% level.

Interventions focusing on those grades may be particularly important. Finally, another area of concern was the number of pre-kindergarten students with wheezing without an asthma diagnosis [14,15]. These findings should be explored using methodologies of other school nurse surveys; they represent important potential targets for intervention [16].

A review of diverse school-based asthma interventions reported that despite their heterogeneity, most had positive clinical, health, economic and academic outcomes [17]. School-based asthma initiatives that use a community health approach to asthma management, connecting families, school personnel, community organizations and county health officials, who can deal with environmental issues such as mold in the home, are particularly promising [18]. Our findings suggest that the priority target groups in need of better asthma control include Black non-Hispanic children and Hispanic children in grades 3–7. We also identified most of the direct cost of asthma is concentrated in third to seventh grade levels, suggesting that interventions targeting those grades may be the most promising. Finally, it is essential to address the requests, made by guardians, for help obtaining insurance and healthcare. The proportion of guardians requesting assistance finding and registering for health insurance (344/2297 [15%]) suggests that efforts need to be made to close the gaps in children's healthcare coverage in Monroe County.

Limitations

The interpretability of these data was limited by several factors. First, except for the ED data, most data were self-reported by parents or caregivers or children. The response rate was considerably below 50%, thus limiting the generalizability of our findings. This may have been related to the fact that response was not incentivized, the timing of the survey in the school year, and/or lower perception of asthma and pediatric access to healthcare as problems in Monroe County Schools compared with Harlem [5] and Miami/Dade County populations [6], where similar surveys have been conducted, and other or unknown factors.

Second, part of the variation observed by zip code could be due to the fact that some zip codes had more schools included in the study than other zip codes [11]; e.g. there were data for eight schools in 33 040 but for only two for 33 050. The lack of association between asthma and poverty could have been affected by the small sample size. There were no zip code data on poverty level for two zip codes.

Third, no data on race or ethnicity were collected on the school health questionnaire, so no associations could be made about asthma prevalence and ethnicity in that portion of the study. The FDOH ED data indicated glaring disparities in ED use for non-Hispanic Black and Hispanic asthmatic children compared with White children suggesting that the inclusion of race and ethnicity data in the school health survey may have been helpful.

Despite these limitations, these data suggest important directions for further needs assessment and intervention.

Conclusions

According to this study, asthma is a significant health problem for Monroe County youth, with almost 15% (more than the nationwide average of 10%) of respondents reporting asthma in their children [1,4]. The discrepancy between the school-health questionnaire prevalence rates and rates reported in FYTS, especially for high school students suggest asthma underreporting for high school students. Striking racial and ethnic disparities and groups at highest risk (specifically at certain grade levels) were identified. Parents or caregivers of some children, including some with asthma, reported unmet needs in obtaining and maintaining health coverage. A substantial proportion of Monroe County schoolchildren is uninsured and has no regular care, an important problem in this population.

Based on these data, we concluded that efforts should be targeted at providing parents and caregivers of uninsured children (particularly those in pre-K who report wheezing without asthma) with support in finding insurance. Children who visit EDs because of asthma exacerbations should be targeted for multilevel asthma control interventions.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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Appendix



South Florida Asthma Consortium

The South Florida Asthma Consortium, Miami-Dade County Schools and Health Department, and local pediatricians have joined together to help children with asthma. We need your help on this survey, so we will be able to identify children with asthma that we can help with goods and services. If you have any questions about the survey and would like to talk with someone about it, please feel free to contact: South Florida Asthma Consortium; phone number: 954 524 4657 or visit our website www.southfloridaasthma.org. The Consortium office is located in the office of the American Lung Association en 2020 South Andrews Ave, Ft Lauderdale 33316.

It is important for you to answer the questionnaire even if your child **does not have** asthma or breathing problems to help us understand how much of a problem asthma and other breathing problems are in this community. Your participation in this survey is voluntary and the results of this survey will be kept confidential. It should take you **5-10 minutes** to answer the questions in this survey. If you have more than one child in this school, you should return **one** survey for **each** child. Questions that refer to "your child" refer to the child who brought this questionnaire home.

1. Age of this child: _____ 2. Gender of Child: Male ☐ Female ☐ 3. Grade _____

Check off "Yes" or "No"

		Yes	No
3	Have you ever been told by a doctor or nurse that this child has asthma?		
4	Has this child ever had episodes of wheezing/whistling in the chest in the past?		
5	In the last 12 months , has this child had wheezing or whistling in the chest?		
6	Has this child ever wheezed during or after exercise?		
7	Has this child ever coughed during or after exercise when s/he did not have a cold?		
8	In the last 12 months , has this child wheezed or coughed during or after exercise?		
9	Has this child ever made an emergency visit to a doctor's office or hospital emergency room because of asthma or other breathing problem?		
10	In the last 12 months , has this child made an emergency visit to a doctor's office or hospital emergency room because of asthma or other breathing problems?		
11	In the last 12 months , has this child's sleep been disturbed due to a dry cough at night, apart from a cough associated with a cold or a chest infection?		
12	Does this child have a regular source of healthcare (not just emergency room)?		
13	Do you have health insurance coverage for this child? Medicaid? Kidcare?		
14	Would you like help obtaining health insurance coverage for this child?		
15	Do you or anyone who lives in your home smoke cigarettes now?		
16	If yes, would that person like help quitting smoking?		

17. Where do you usually take this child for healthcare? _____
If you do not have a regular source of healthcare, would you like help getting a regular source? Yes ☐ No ☐

18. Would you agree to have your child's chest listened with a stethoscope by a healthcare provider affiliated with the South Florida Asthma Consortium? Yes ☐ No ☐



Stethoscope

Would you like to be contacted regarding your child's asthma or regarding obtaining health insurance or healthcare for a child? Please, provide your cell phone number and/or your email address.

Cell phone number: _____ e-mail address: _____

Or if you prefer not to give your cell phone number, turn in the sheet without phone number, and send us an email at Asthma_in_school@southfloridaasthma.org

Please, make sure this child's teacher receives this completed questionnaire in the enclosed envelope!
Your child will receive a present to acknowledge our gratitude for your help! Thank you!



South Florida Asthma Consortium

El Consorcio para el asma del Sur de la Florida, las escuelas, el Departamento de Salud del condado de Miami Dade y pediatras del área se han unido en un esfuerzo para ayudar a los niños con asma. Usted nos puede ayudar llenando este cuestionario. Así podremos identificar niños con asma a quienes podremos ayudar con servicios y artículos. Si tiene preguntas acerca del cuestionario y/o le gustaría hablar con alguien acerca de él, por favor contacte a: South Florida Asthma Consortium, teléfono: 954 524 4657, o visite nuestro sitio en el internet: www.southfloridaasthma.org. La oficina del Consorcio se encuentra en la oficina del American Lung Association en 2020 South Andrews Ave, Ft Lauderdale 33316.

Es muy importante que usted responda este cuestionario aún si su niño no tiene asma o problemas respiratorios. Al hacerlo usted nos ayudará a entender qué tan importantes son el asma y otros problemas respiratorios en nuestra comunidad. Su participación es voluntaria. La información obtenida será mantenida en forma confidencial. Llenar esta encuesta le tomará entre 5 y 10 minutos. Si tiene más de un niño en la escuela, usted debe llenar un cuestionario por cada niño. Las preguntas que se refieren a su niño se refieren al niño que llevó el cuestionario a la casa.

1. Edad del niño: _____ 2. Grado _____ 3. Sexo del niño

Masculino Femenino

Marque "Sí" o "No"

		Sí	No
3	¿Algún médico o enfermera le ha dicho alguna vez que su niño tiene asma?		
4	¿En el pasado, ha tenido su niño alguna vez episodios de silbidos en el pecho?		
5	¿En los últimos 12 meses, ha tenido su niño silbidos en el pecho?		
6	¿A su niño le ha silbado el pecho alguna vez durante o después de hacer ejercicio?		
7	¿Ha tenido su niño alguna vez tos durante o después del ejercicio, aún cuando no esté resfriado?		
8	¿En los últimos 12 meses, ha tenido su niño tos o silbidos en el pecho durante o después del ejercicio?		
9	¿Ha tenido que llevar a su niño alguna vez de emergencia al doctor o a la emergencia del hospital por asma u otros problemas al respirar?		
10	¿En los últimos 12 meses, ha tenido que llevar a su niño de emergencia al doctor o a la emergencia del hospital por asma u otros problemas al respirar?		
11	¿En los últimos 12 meses, la tos no ha dejado dormir bien a su niño? No tenga en cuenta cuando está resfriado.		
12	¿Tiene su niño pediatra? (no solamente la sala de emergencias)		
13	¿Tiene su niño seguro médico? ¿Medicaid? ¿Kidcare?		
14	¿Le gustaría recibir ayuda para conseguir seguro médico para este niño?		
15	¿Actualmente, usted o alguien en su casa fuman cigarrillos?		
16	¿Si "Sí", le gustaría recibir ayuda para dejar de fumar?		

17. Generalmente, ¿a dónde lleva a su niño para atención en salud? _____ Si no tiene un médico de cabecera para su niño, le gustaría que le ayudemos a obtener atención en salud para su niño? ☐ Sí ☐ No

18. Aceptaría que un miembro del South Florida Asthma Consortium le examinara el pecho a su niño con un estetoscopio? ☐ Sí ☐ No



Estetoscopio

Si desea ser contactado(a) acerca del asma de su niño, o sobre cómo conseguir seguro médico o atención para su niño/a, por favor escriba su número de celular y/o su e-mail (correo electrónico).

Celular: _____ e-mail: _____

O si prefiere no dar su número de teléfono celular, devuelva la hoja sin su número de teléfono y mándenos un correo a Asthma_in_school@southfloridaasthma.org

¡Por favor, devuelva este cuestionario completo al profesor de su niño en el sobre incluido!
Su niño recibirá un obsequio de agradecimiento por su ayuda. ¡Gracias!