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Maine Child Health Survey
Kindergarten Report
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Prepared by:

Kathy Tippy, MPH
Epidemiologist
Bureau of Health/University of Southern Maine

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Key Findings

Asthma: About 1 in 12 (8.5%) Maine kindergartners were found to have asthma. This compares to what we see in New England (8.7%) for children under 18 years of age (ARC, 2004). Asthma rates may be even higher than 8.5% since 13% responded that their child had exhibited wheezing in the past year even though they did not have a diagnosis of asthma. (However, not all wheezing indicates a diagnosis of asthma). Boys were more likely to have a diagnosis of asthma than girls (12% versus 6%). Less than 37% of kindergartners with asthma have a written plan to manage their asthma.

Child weight: 36.5% (1 in 3) kindergartners were either overweight (15.2%) or at-risk-for overweight (21.3%).

Special Health Needs: 1 in 7 (15.4%) kindergartners are considered to have a special health need such as cerebral palsy, asthma, attention deficit disorder, vision loss, hearing loss, and autism to name a few.

Oral Health: Almost 1 in 5 (18.4%) kindergartners had at least one untreated caries (oral dental caries or cavities), and those who had not been to the dentist in the past year were twice as likely to have untreated caries.

Tobacco: Almost 1 in 3 (31%) kindergartners were exposed to secondhand smoke on a routine basis.

Lead: Almost 1 in 3 (32%) kindergartners who may have been exposed to lead, had not been tested.

Health Insurance: 1 in 15 (6.7%) kindergartners were uninsured. This compares to 5.9% a Year 2000 survey showing 5.9% of children 0-5 years of age without insurance.

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Background

Within the Department of Human Services, the Maine Bureau of Health has a mission to develop and deliver services to preserve, protect and promote the health and well-being of the citizens of Maine. Within this report we will focus on the health of Maine's children in kindergarten.

A number of health conditions have an impact on the quality of life for children such as asthma, dental caries, and being overweight. Understanding the level of our population's knowledge regarding the effects of environmental exposures to tobacco smoke and lead and triggers for asthma, as well as knowing how many children have a special health need are important in helping to plan and evaluate efforts to keep our children healthy and active.

Asthma and dental caries are the two most common chronic diseases of childhood. Alarmingly, the prevalence of self-reported asthma in children increased 75 percent in the United States from 1980-1994 (CDC, 1998). Another alarming trend has been the dramatic increase in the number of children who are considered overweight (Dietz, W., Gortmaker, S., 2001). Previous studies have reported that 15.0 percent of adolescents in Maine are considered overweight (BMI ≥ 95 percent for age and gender) (DHS, 2004).

An environmental exposure that affects children, particularly in the Northeast and Midwest, is lead. Although we have seen more than an 80.0 percent decline in US children who have a blood lead concentration of 10 ug/dl or higher in the past two decades, it is still an issue of concern (Lanphear, B., Dietrich, K., Berger, O., 2003). We find now that there are two major risk groups; poor children living in older poorly maintained rental housing, and affluent children living in older homes undergoing renovations.

The purpose of the Maine Child Health Survey (MCHS) is public health surveillance. Surveillance is used to assess the current prevalence of conditions and diseases and identify trends over time. It is defined as "the on-going systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know. The final link in the surveillance chain is the application of these data to prevention and control (CDC, 1986)."

In Maine, occasional surveys have been conducted previously for conditions such as dental caries and asthma, but none of these efforts could be characterized as systematic surveillance. Some data collection systems have been representative and population-based but not on-going, while others have been collected regularly, but on an unrepresentative segment of Maine's population.

Moreover, data collection efforts focused on children's health have not previously been coordinated or integrated into a single system. With the cooperative agreement from the Centers for Disease Control and Prevention (CDC), the Maine Bureau of Health has developed an integrated data collection system for children entering kindergarten that serves as the basis for a formal multi-health condition surveillance system. A unique quality of the MCHS is the combination of formal questionnaire responses and actual physical measurements. The first MCHS conducted in kindergarten during 2002 is described within this report.

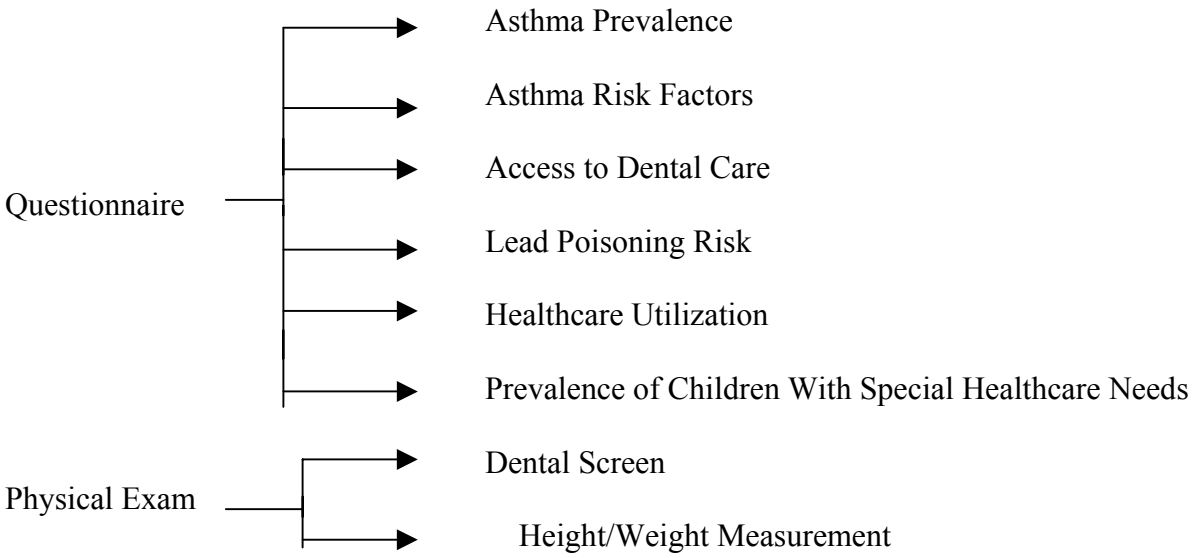
Project Overview

The MCHS provided an opportunity to gain critical information about indicators relating to the health and well being of Maine's children. While the MCHS was initiated through an asthma cooperative agreement, efforts were made to collaborate with multiple partners across the state to collect representative data at the kindergarten, third and fifth grade level for a variety of differing health indicators. The survey also provided an opportunity for referral into various health services as indicated by each respondent's answers.

The MCHS is comprised of several components (Figure 1). The components include: a questionnaire completed by the parent/primary caregiver and a physical exam of the child including a dental screen and height/weight measurements. Indicators collected from the questionnaire and physical exam of the child provide information on: the prevalence of asthma, dental caries, children with special health needs, and overweight; access to care issues; healthcare utilization; and environmental exposures to lead and tobacco smoke.

Figure 1.

Child Health Survey Components



The primary benefit of the MCHS was to gain state and local level health data that, historically, has been difficult to collect. Another benefit of conducting a statewide survey was to obtain multiple measures of health through the use of one tool. The MCHS serves as a foundation for pediatric health surveillance in Maine. Survey results are also used for program planning at the local level.

Schools within Maine, secondarily benefit by the provision of state and regional level data analysis.

We anticipate the MCHS will be conducted annually through collaborations among the Bureau of Health (BoH), the Department of Education (DoE), and the School Health Advisory Committee (SHAC).

Results

Quality Control and Assurance

Data entry for six of the twenty-nine schools required manual re-check of all individual questionnaire responses due to a greater than 1.0 percent discordance across all keyed fields.

Twenty questionnaires were identified as not included in the electronically scanned database and were then manually entered into the database for analysis. Duplicate questionnaires from one school were identified during the re-check procedure and were de-duplicated from the database.

All other changes (e.g. illogical date, missing dates, missing date of birth, and re-coding of other variables) are noted in the database log located in the epidemiology section of the Division of Community and Family Health, Maine Department of Health and Human Services.

Response Rates

Response rates are reported in Table 1. The statewide overall participation rate was 39.7 percent and varied from a low of 17.9 percent in the North Eastern region to a high of 65.5 percent in the Western region. School participation rates varied from a low of 33.3 percent in the North Eastern region to a high of 87.5 percent in the Western region. Student participation rates varied from 53.8 percent in the North Eastern region to 75.0 percent in the East Central region.

Table 1. School, student, and overall response rates according to region.

Region	School Participation Rate (%)	Student Participation Rate (%)	Overall Participation Rate (%)
Southern	4/6 = 67.0	272/471 = 57.8	67.0 * 57.8 = 38.7
Coastal	4/7 = 57.1	163/258 = 63.2	57.1 * 63.2 = 36.1
East Central	6/7 = 85.7	114/152 = 75.0	85.7 * 75.0 = 64.3
West Central	4/7 = 57.1	83/133 = 62.4	57.1 * 62.4 = 35.6
Western	7/8 = 87.5	225/301 = 74.8	87.5 * 74.8 = 65.5
North Eastern	4/12 = 33.3	57/106 = 53.8	33.3 * 53.8 = 17.9
Statewide	29/47 =61.7	913/1421 = 64.3	61.7 * 64.3 = 39.7

Demographics

Demographic results by region are presented in Table 2. The distribution of gender was similar to the survey overall (percent) and in public schools statewide (percent). The regional percent of males surveyed varied from 47.2 percent in the Southern region to a high of 58.2 percent in the Coastal region. The distribution of minority varied from a high 5.7 percent in the Southern region to a low of 1.0 percent in the Western region. The highest percent of self-reported Hispanic ethnicity was in the Southern region; none of the children surveyed in the Coastal and North Eastern regions were reported to be of Hispanic ethnicity.

Overall, 20.7 percent of the children enrolling for kindergarten were enrolled in the free/reduced lunch program. Enrollment in the free/reduced lunch program varied from a high of 46.2 percent in the North Eastern region and a low of 16.2 percent in the Coastal region.

Overall, 26.8 percent of the kindergarten children were enrolled in MaineCare, 66.5 percent Private/HMO, and 6.7 percent reported having no insurance. The percentage of children enrolled in MaineCare varied from 47.3 percent in the North Eastern region to a low of 16.2 percent in the West Central region. The percentage of kindergartners covered by commercial insurance varied from an estimated 83.1 percent in West Central region to 48.3 percent in the North Eastern and East Central regions. Un-insured kindergartners varied from a high of 12.9 percent in the East Central region to 0.7 percent in the West Central region.

Table 2. Comparison of public school and MCHS demographic data according to region.

Variable	% Public Schools	% MCHS Total N= 913	% Southern N = 273	% Coastal N = 163	% East Central N = 114	% West Central N = 83	% Western N = 226	% North Eastern N = 58
Gender								
Male	51.6	50.8	47.2	58.2	55.2	49.2	51.2	50.3
Female	48.4	49.2	52.8	41.8	44.8	50.8	48.8	49.3
Race								
White	96.5	96.4	94.3	96.7	98.3	96.3	99.0	96.8
Asian/Pacific Islander	1.0	0.7	1.4	0.4	0	0.7	0.2	0
Native American	0.7	0.5	0.4	0.4	0.4	0	0.8	3.2
Black/African American	1.2	1.3	3.2	0.4	0	0	0	0
Other		1.1	0.7	2.1	1.3	3.0	0	0
Hispanic	0.6	1.6	3.1	0	0.8	0.7	0.7	0
Free/reduced lunch								
Yes	32.7	20.7	17.7	16.2	22.9	19.5	24.3	46.2
No		52.2	63.0	55.4	31.9	55.9	46.6	37.4
Don't know		27.1	19.3	28.4	45.3	24.7	29.1	16.4
Insurance								
Private/HMO		66.5	71.5	71.4	48.3	83.1	62.6	48.3
MaineCare		26.8	22.5	23.2	38.8	16.2	30.1	47.3
None		6.7	6.1	5.4	12.9	0.7	7.3	4.4

*Weighted results except for public school. Due to rounding, may not total 100.0%.
Source: Public school – Department of Education, State of Maine.

Asthma

Prevalence estimates from the MCHS, Kindergarten 2002 is reported in Table 3 Statewide asthma prevalence estimates were similar using the Council of State and Territorial Epidemiologist. (CSTE) definition of probable asthma (8.5 percent, 95% CI: 4.9-12.3) and the International Survey of Asthma and Allergies in Children (ISAAC) definition of asthma (8.4 percent, 95% CI: 4.8-12.0). Using the CSTE definition of asthma, regional differences were seen within Maine ($p<0.05$). No statistically significant regional differences were seen using the ISAAC definition for asthma. No statistically significant regional differences were found for lifetime asthma with a reported statewide rate of 10.0 percent (95% CI: 6.3 – 13.7) or for current wheeze only with a statewide prevalence of 13.1 percent (95% CI 5.5-20.7).

Table 3. Prevalence of asthma and current wheeze only according to region.

Location	CSTE Asthma N=905	ISAAC Asthma N=897	Lifetime Asthma N=913	Current Wheeze Only N=913
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Coastal	12.8 (10.4-15.5)	11.4 (8.5-14.3)	13.7 (10.7-16.7)	9.0 (3.0-14.1)
East Central	13.4 (7.1-19.7)	12.6 (7.0-18.2)	14.5 (9.2-19.8)	11.1 (6.9-15.3)
Northeast	*	*	*	11.1 (0.9-21.3)
Southern	5.3 (0-12.4)	5.4 (0-12.4)	6.5 (0-13.5)	17.5 (1.6-33.4)
Western	6.7 (2.3-11.1)	6.0 (1.6-10.4	7.6 (2.7-12.5)	10.3 (4.1-16.2)
West Central	*	*	15.8 (9.4-22.2	9.8 (0-20.9)
State	8.6 (4.9-12.3)	8.4 (4.8-12.0)	10.0 (6.4-13.6)	13.1 (6.0-20.2)

*Indicates 5 or fewer, therefore, not reported due to confidentiality.
Weighted prevalence estimates are presented.

The demographic breakdown for children with asthma (CSTE) and without asthma are reported in Table 4. About 12.0 percent of males had asthma compared to 5.5 percent of females. Although no statistically significant differences are noticed between minority and white only race, a higher percentage of minority children had asthma. A statistically significant percent of kindergarthers with asthma report having good or fair health compared to excellent or very good ($p < 0.01$.) There does not appear to be any variation in regard to insurance status among persons having asthma as compared to those without asthma.

Table 4. Prevalence of asthma (CSTE) according to demographics.

	Asthma (CSTE) % (95% CI)
Gender	
Male n = 463	11.8 (7.8-15.8)
Female n = 434	5.5 (3.0-8.0)
Race	
Minority n = 36	16.9 (0-35.7)
White n = 863	8.3 (6.0-10.6)
Health Status	
Excellent/Very Good n = 843	7.5 (5.2-9.8)
Good/Fair n = 52	30.7 (15.3-46.1)
Insurance	
Private n = 588	8.1 (5.2-11.0)
MaineCare n = 258	10.0 (5.6-14.4)
None n = 44	10.3 (0-21.7)

A comparison of asthma (CSTE) and current wheeze only by symptom and management are presented in Table 5. No comparisons between asthma and current wheeze only are reported if either health outcome had a variable with fewer than five children.

Asthma Symptoms

Relatively few parents reported that their children with asthma or current wheeze had speech limitations (23.8 and 1.0 percent, respectively). Among all symptom variables, wheezing attacks were reported with the highest frequency (96.5 percent). Sixty percent of children with asthma and 48.0 percent of children with current wheezing have nocturnal cough.

The percentage of children with asthma who experienced wheezing attacks, sleep disturbances, nocturnal cough, and activity limitations were similar to those who had current wheezing only. Although no statistically significant differences were found for wheezing during or after exercise, a higher estimated percentage of children with asthma had wheezing during or after exercise than children with current wheeze only.

Table 5. Comparison of asthma (CSTE) and current wheeze by symptom and management.

Variable	**Asthma (CSTE) N=905**	**Current Wheeze Only N=913**
	% (95% CI)	**% (95% CI)**
Wheezing attacks	96.5 (92.2-100.0)	80.1 (65.5-94.7)
Sleep disturbance due to wheezing	59.6 (48.1-71.1)	36.5 (18.1-54.9)
Speech limitation	23.8 (14.5-33.1)	*
Wheeze during/after exercise	54.6 (21.0-63.0)	17.2 (3.3-31.1)
Sleep disturbance due to nocturnal cough	59.2 (45.6-72.8)	47.7 (31.3-64.1)
Activity limitation	66.3 (49.8-82.8)	50.5 (33.7-67.3)
Symptomatic MD visit past 12 months	87.6 (77.4-97.8)	69.4 (53.9-84.9)
Symptomatic ED/urgent Care visit past 12 months	29.9 (22.0-37.8)	32.0 (15.7-48.3
Symptomatic hospital visit past 12 months	*	*
Prescription medication for asthma in past 12 months	94.0 (88.4-99.6)	13.6 (0-28.8)
Over-the-counter medications for asthma in the past 12 months	11.1 (4.1-18.1)	*
Written plan to manage asthma	36.8 (15.4-58.2)	NA
Parent/adult missed work due to child's wheezing or asthma in past 4 weeks	24.5 (17.7-31.3)	1.3 (0-2.8)

*Indicates five or fewer, therefore not reported due to confidentiality.

Asthma Management

According to the Expert Panel of the National Asthma Education and Prevention Program, a written plan for individually managing the patients asthma should be provided during the patient's first clinical visit (NIH, 1997). Based on parental reports on the 2002 MCHS, 36.8 percent (95% CI: 18.0 – 55.6) of children with reported asthma had a written plan for managing their asthma. Additionally, parents indicate 42.8 percent (95% CI: 13.0-72.6) of kindergarteners with symptoms consistent with severe asthma (i.e. speech limitations, and/or nocturnal cough) had a written plan for managing their asthma (data not shown).

Another measure of asthma management is the number of physician visits, emergency/urgent care visits, or hospitalizations due to wheezing, dry cough, or breathing difficulties. This allows us to examine the extent to which children with symptoms are going to see their physician for breathing difficulties, or whether they are able to control their asthma without acute problems requiring an emergency room visit or hospitalization. A reported 87.6 percent of the kindergarten children in the study with asthma and 69.4 percent of those with current wheeze only visited their physician within the past 12 months because of dry cough, wheezing, or breathing difficulties (Table 5). Another 29.9 percent of those with asthma visited the emergency/urgent care department within the past 12 months for dry cough, wheezing, or breathing difficulties. No statistical differences were observed between children with asthma and those with current wheeze only for symptomatic physician visits and ED/urgent care visits in the past year. Comparisons were not available for hospitalizations due to the small number of occurrences.

Parental reports also indicate that 94.0 percent of the children with asthma had taken a prescription medication for asthma and 11.1 percent some form of over-the-counter medication for asthma during the past year (Table 5). Among children with current wheeze only, 13.6 percent took prescription medications for asthma in the past 12 months.

Additionally, the proportion of parents who missed work due to their child's wheezing or asthma (24.0 percent) was significantly higher for those families whose child has asthma compared to children who exhibit current wheeze only (1.3 percent).

Comparison of CSTE and ISAAC Asthma Definitions

We obtained similar prevalence estimates using either the CSTE or ISAAC definition for current asthma (Table 3). Agreement between the CSTE and ISAAC definitions for asthma are presented in Table 6. The ISAAC surveillance definition of asthma has been validated against a clinical diagnosis of asthma and is recognized universally in the domestic and international asthma community. Although there is no real 'gold standard' for defining asthma, we used ISAAC as the "gold standard" for this analysis because of the previously mentioned reasons (Fuso, L., etal, 2000). Assuming ISAAC to be the "gold standard", there were 7 false negatives and 13 false positives using the CSTE definition.

CSTE definition of asthma had a 90.2 percent sensitivity, 98.4 percent specificity, and an 83.3 percent positive predictive value in relation to ISAAC defined asthma.

Table 6. Agreement between measures of asthma.

	ISAAC +	ISAAC -
CSTE +	65	13
CSTE -	7	809

For 6 out of 13 false positives, parents or primary caregivers indicated that a physician had told them their child had asthma at some time in their life, yet they did not report that their child had ever had asthma. False negatives using the CSTE definition primarily reflected the fact that the presence of nocturnal cough is sufficient to meet ISAAC's definition of asthma, but is not included in CSTE's case definition.

However, in comparing risk factors for CSTE and ISAAC defined asthma, results were quite similar (Table 7).

Table 7. Comparison of asthma (CSTE and ISAAC defined) by risk factor.

Variable		**Asthma (CSTE)**		**Asthma (ISAAC)**
	#	**% (95% CI)**	**#**	**% (95% CI)**
At risk of overweight	62	36.6 (23.1-50.1)	58	32.4 (18.4-46.4)
Overweight	78	25.2 (2.6-47.8)	72	25.1 (1.9-48.1)
Environmental tobacco smoke	80	33.7 (15.3-52.1)	73	37.1 (17.1-57.1)
Mold	78	15.0 (0-30.5)	71	17.7 (1.1-34.3)
Kitchen stove (propane/natural gas)	79	44.9 (24.7-65.1)	70	44.5 (20.6-68.1)
Kerosene heater	73	*	64	*
Wood burning stove	75	21.7 (5.4-38.0)	66	19.5 (3.4-35.6)
Wood burning fireplace	71	6.6 (0.1-13.1)	63	8.1 (0.4-15.8)
Wall to wall carpeting (bedroom)	78	69.6 (49.6-89.6)	72	69.6 (48.3-90.3)
Private Insurance/HMO	80	61.6 (49.3-73.9)	73	61.6 (49.6-73.6)

*Indicates five or fewer, therefore not reported due to confidentiality.

Table 8. Asthma inhalant/allergen main effect model

	Asthma (CSTE)		Asthma (ISAAC)	
Independent Variable	**OR (95% CI)**	**Wald P-value**	**OR (95% CI)**	**Wald P-value**
Sex				
Male	2.53 (1.33 – 5.04)	0.01	2.65 (1.33 – 5.30)	0.01
Female	1.0		1.0	
Race				
Minority	0.56 (0.07 – 4.52)	0.57	0.61 (0.07 – 5.0)	0.63
White	1.0		1.0	
Health Status				
Good/Fair	5.40 (1.61 – 18.15)	0.01	6.43 (1.76 – 23.47)	0.01
Excellent/Very Good	1.0		1.0	
Insurance				
Private	0.97 (0.55 – 1.72)	0.91	0.98 (0.55 – 1.74)	0.95
MaineCare/None	1.0		1.0	
Mold				
Yes	2.60 (0.48 – 14.02)	0.25	2.81(0.51 – 15.45)	0.22
No	1.0		1.0	
Bedroom Carpeting				
Yes	2.33 (1.14 – 4.77)	0.02	2.52 (1.29 – 4.91)	0.01
No	1.0		1.0	
Wood burning Stove				
Yes	0.84 (0.22 – 3.21)	0.79	0.60 (0.13 – 2.73)	0.50
No	1.0		1.0	
Wood burning Fireplace				
Yes	0.34 (0.09 – 1.29)	0.11	0.40 (0.10 – 1.56)	0.18
No	1.0		1.0	

Referent group = 1.0

We constructed several statistical models using CSTE and ISAAC defined asthma as the dependent variable to examine associations with independent variables such as inhalant allergens, irritants, and weight status.

The results from an asthma inhalant allergen model are listed in Table 8. In our final model we included sex, race, health status, insurance status, mold, bedroom carpet, wood burning stove, and wood burning fireplace. Wood burning stove and fireplace were left in the final model to account for confounding. When all independent variables from the final model were included, we found a positive relationship between asthma and being male (OR 2.53), reporting good/fair health (OR 5.40) as opposed to excellent/very good, and having wall-to-wall carpeting in the bedroom (OR 2.33).

We next created a separate model to examine the relation between asthma and environmental tobacco smoke exposure (ETS). We were unable to find any associations between asthma in our study and exposure to environmental tobacco smoke (OR 1.06)(data not shown).

A positive association between asthma and children at-risk-of-overweight (OR 2.02) was found in another model (Table 9). No association was found between children who were overweight and asthma.

Table 9. Asthma (CSTE) and weight status main effect model

Independent Variable	Odds Ratio	95% Confidence Limit	Wald P-Value
Sex			
Male	2.22	1.19 – 4.13	0.0148
Female	1.0		
Race			
Minority	2.86	0.59 – 13.93	0.1820
White	1.0		
Insurance Status			
Private	1.14	0.60 – 2.14	0.6787
MaineCare/None	1.0		
Health Status			
Good/Fair	10.69	3.15- 36.24	0.0006
Excellent/Very Good	1.0		
At Risk of Overweight			
Yes	2.02	1.16 – 3.53	0.0155
No	1.0		

Referent group = 1,0

Children With Special Health Needs (CSHN)

The prevalence of children with special health needs overall is 15.4 percent (95% CI: 11.6-19.2). Statistically significant ($p < 0.05$) regional variation within Maine are seen for the prevalence of children with special health needs (Table 10).

Table 10. CSHN prevalence estimates according to region.

Location	CSHN N = 913
	% (95% CI)
Coastal	21.2 (15.6-26.8)
East Central	19.0 (11.0-27.0)
Northeast	*
Southern	12.0 (8.1-15.9)
Western	14.7 (8.1-15.9)
West Central	19.8 (0-20.5)
State	15.4 (11.6-19.2)

*Indicates 5 or less, therefore, not reported due to confidentiality.

The demographic breakdown for children who have special health needs (CSHN) and who do not are reported in Table 11. Statistically significant differences are seen for gender, 22.0 percent of males have a special health need compared to 6.0 percent of females ($p < 0.01$). Although no statistically significant differences are noticed between minority and white race, a higher percentage of minority children have special health needs. More than 60 percent of the children reported as good/fair health have a special health need. Although kindergartners on MaineCare are not statistically significantly different than those with private or no insurance, they do appear to have the highest estimated percentage of children with a reported special health need.

Table 11. Prevalence of children who have special health needs (CSHN) according to demographics.

	CSHN % (95% CI)
Gender	
Male n = 464	21.6 (16.4-26.8)
Female n = 436	9.3 (5.5-13.1)
Race	
Minority n=36	19.8 (0.8-38.8)
White n=866	15.3 (12.0-18.6)
Health Status	
Excellent/Very Good n=846	13.1 (9.9-16.3)
Good/Fair n=52	63.1 (47.5-78.7)
Insurance	
Private n=589	13.5 (9.4-17.6)
MaineCare n=260	22.1 (15.6-28.6)
None n=44	10.9 (0.7-21.1)

The proportional breakdown of children defined as having a special health care need into "definitional domains" is included in Table 12. These domains are derived from the five separate questions on the survey. Service use (69.8 percent) appeared to capture the highest proportion of CSHN and functional limitations the lowest (22.7 percent). No statistical differences were observed for service use and dependency on prescription medications as a domain. The domains are not mutually exclusive categories, for instance a child might qualify in one or more of the definitional domains.

Table 12. Proportion of CSHN by definitional domains.

N=140	% (95% CI)
Dependency on prescription medications	53.0 (41.7 – 64.3)
Service use	69.8 (59.0 – 80.6)
Functional limitations	22.7 (11.4 – 34.0)

We constructed a model using CSHN as the dependent variable and including sex, race, insurance status, free/reduced lunch status, health status, asthma, and current wheeze as independent variables. We found that CSHN showed a positive association with eligibility for free/reduced lunch program (OR 2.2), reporting good/fair health status (OR 10.7) opposed to excellent/very good, and having asthma (OR 9.5) (Table 16). Although sex did not prove to have a statistically significant association with CSHN, the magnitude of the odds ratio for males is high enough to consider the likelihood that males are more likely to be screened positive for having a special health need.

Table 13 CSHN Model

Independent Variable	Odds Ratio	95% CI	Wald P-Value
Sex			
Male	2.18	0.96 – 4.93	0.06
Female	1.0		
Race			
Minority	1.44	0.60 – 3.43	0.39
White	1.0		
Insurance Status			
Private	1.22	0.58 – 2.58	0.59
MaineCare/None	1.0		
Eligible Free/Reduced Lunch			
Yes	2.21	1.05 – 4.62	0.04
No	1.0		
Health Status			
Good/Fair	10.69	3.15- 36.24	0.00
Excellent/Very Good	1.0		
Asthma			
Yes	9.52	3.06 – 29.6	0.00
No	1.0		
Current Wheeze			
Yes	1.75	0.55 – 5.53	0.32
No	1.0		

Referent group = 1.0

Dental Caries

Based on dental examinations, the statewide prevalence of untreated caries was 18.4 percent (95% CI: 14.4-22.4) in this study population. Untreated caries varied regionally from a low of 9.9 percent in the Coastal region to 29.5 and 29.7 percent in the Western and North Eastern regions ($p < 0.05$) (Table 14).

Table 14. Dental caries prevalence estimates according to region.

Location	Untreated Caries N=886
	% (95% CI)
Coastal	9.9 (2.7 – 17.1)
East Central	11.9 (0.2 – 23.6)
Northeast	29.7 (6.5 – 52.9)
Southern	18.2 (10.6 – 25.8)
Western	29.5 (22.2 –36.8)
West Central	15.8 (12.8 – 18.8)
State	18.4 (14.4 –22.4)

The demographic breakdown for untreated caries experience is reported in Table 15. There are equal proportions of males and females with untreated caries. Statistically significant differences ($p < .05$) are seen between minority (40%) and white race (17.5%). A higher percentage of minority children had untreated caries. The percentage of untreated caries increased with lower economic status as measured by insurance status. Twenty-six percent of the children on MaineCare and 34 percent of those without insurance had at least one untreated cavity in this study.

Table 15. Prevalence of children with untreated caries according to demographics.

	Untreated caries
	% (95% CI
Gender	
Male n=453	17.4 (12.9-21.9)
Female n=420	18.7 (12.9-24.5)
Race	
Minority n=36	39.2 (20.2-58.2)
White n=839	17.5 (13.8-21.2)
Health Status	
Excellent/Very Good n=820	18.0 (14.2-21.8)
Good/Fair n=51	20.4 (9.8-31.0)
Insurance	
Private n=573	13.5 (9.1-17.9)
MaineCare n=249	26.4 (20.2-32.6)
None n=44	34.1 (13.4-54.8)

We developed a statistical model to look for relationships between untreated caries and sex, race, free/reduced lunch program, and last dental visit. We found a positive association between not having been to the dentist in over one year and having untreated caries (OR 2.1) (Table 16). Despite the fact that we found no statistically significant relationship between untreated caries and being a minority race or eligibility for free/reduced lunch, the magnitude of the relationship reported is strong.

Table 16. Dental Main Effect Model.

Independent Variable	Odds Ratio	95% Confidence Limit	Wald P-Value
Sex			
Male	0.90	0.50 – 1.61	0.70
Female	1.0		
Race			
Minority	1.87	0.90 – 3.87	0.09
White	1.0		
Eligible Free/Reduced Lunch			
Yes	1.95	0.94 – 4.04	0.07
No	1.0		
Dental Visit			
> 1 year	2.14	1.24 – 3.69	0.01
<= 1 year	1.0		

Referent group = 1.0

Weight Status

The statewide prevalence of at-risk-of-overweight is 21.3 percent (95% CI: 16.9-25.7) and 15.2 percent (95% CI: 10.5-19.9) for overweight (Table 17). At-risk-of-overweight varied regionally from a high of 35.6 percent in the North Eastern region to 19.4 percent in the Southern region. No statistically significant regional variation was seen for overweight in the kindergarten population.

Table 17. Weight status prevalence estimates according to region.

Location	At Risk Overweight N = 886	Overweight N = 886
	% (95% CI)	% (95% CI)
Coastal	23.6 (15.8 – 31.4)	13.1 (8.7 – 17.5)
East Central	20.6 (12.2 –29.0)	16.1 (3.0-29.2)
Northeast	35.6 (29.6 –41.6)	18.9 (0 – 39.9)
Southern	19.4 (9.6 – 29.2)	14.9 (5.8 –24.0)
Western	23.0 (16.9 – 29.1)	16.2 (16.9 –29.1)
West Central	20.9 (9.7 – 32.1)	14.7 (2.4 – 27.0)
State	21.3 (16.9-25.7)	15.2 (10.5-19.9)

The demographic breakdown for at-risk-of overweight and overweight is reported in Table 18. There are equal proportions of males and females that are at-risk-of overweight and overweight. Although no statistically significant differences are seen for overweight males and females, a higher percentage of males (19.2 percent) are reported as overweight than females (11.2 percent). No racial differences are observed for children at-risk for overweight or overweight. There are also no differences noted among health status categories for either at-risk-of-overweight or overweight children. More than one-third of children without insurance are at-risk-for overweight or overweight.

Table 18. Prevalence of at-risk-for overweight and overweight according to demographics.

	At-risk-of-Overweight % (95% CI)	Overweight % (95% CI)
Gender		
Male n=458	20.6 (15.1-26.1)	19.2 (13.4-25.0)
Female n=428	22.1 (15.7-28.5)	11.2 (6.5-15.9)
Race		
Minority n=36	21.8 (2.2-41.4)	10.9 (0.8-21.0)
White n=847	21.4 (17.1-25.7)	15.4 (11.5-19.3)
Health Status		
Excellent/Very Good n=832	21.1 (16.7-25.5)	15.0 (11.1-18.9)
Good/Fair n=50	24.1 (8.5-39.7)	18.8 (4.3-33.3)
Insurance		
Private n=577	18.1 (13.0-23.2)	14.8 (10.1-19.5)
MaineCare n=255	26.0 (17.9-34.1)	11.1 (6.6-15.6)
None n=42	33.5 (14.4-52.6)	34.0 (11.4-56.6)

Environmental Tobacco Smoke (ETS)

The prevalence of exposure to environmental tobacco smoke (ETS) is estimated at 30.5 percent (95% CI: 25.1 – 35.9). Statistically significant regional variation was seen for ETS within Maine ($p < 0.05$) (Table 19). The regional variation is driven by the lower prevalence of ETS exposure reported in the Southern Region.

Table 19. ETS prevalence estimates according to region.

Location	Environmental Tobacco Smoke N = 913 %(95% CI)
Coastal	27.9 (24.4-31.4)
East Central	40.9 (26.8 –55.0)
Northeast	43.3 (26.8 –60.0)
Southern	20.5 (13.7 –27.3)
Western	40.1 (27.9 –52.3)
West Central	32.3 (25.7-38.9)
State	30.5 (25.1-35.9)

The demographic breakdown for children with and ETS is reported in Table 20. There are equal proportions of males and females exposed to ETS. Although no statistically significant differences are noticed between minority and white race, a lower percentage of minority children (19.8 percent) were exposed to ETS than white children (30.6 percent). A higher percentage of children on MaineCare (47.1 percent) and no insurance (47.6 percent) were exposed to ETS than children with private insurance (21.2 percent).

Table 20. Prevalence of children with ETS exposure according to demographics.

	ETS % (95% CI)
Gender	
Male n = 464	32.1 (26.1-38.1)
Female n = 436	28.5 (23.0-34.0)
Race	
Minority n=36	19.8 (5.9-33.7)
White n=866	30.6 (26.5-34.7)
Health Status	
Excellent/Very Good n=846	29.5 (25.4-33.6)
Good/Fair n=52	47.2 (30.8-63.6)
Insurance	
Private n=589	21.2 (16.6-25.8)
MaineCare n=260	47.1 (39.3-54.9)
None n=44	47.6 (26.0-69.2)

Lead Exposure

Prevalence estimates for lead testing and living in or visiting a home built prior to 1950 are included in Table 21. The percentage of kindergartners who had ever been tested for lead exposure was 41.9 percent (95% CI: 36.2 – 47.6). The region with the highest percentage of kindergartners tested for lead exposure was the North Eastern (63.3 percent). Statistically significant regional variation exists within Maine for living in pre-1950 housing. This is driven by the lower prevalence reported in the Southern region. An estimated 35.8 percent (95% CI: 31.9-39.7) of kindergartners in the survey had a possible exposure to lead based on regularly visiting or living in a home built prior to 1950 (Table 24).

Table 21. Lead testing prevalence estimates and housing risk by region.

Location	Lead Testing N = 913	Pre 1950 Housing Risk (includes Don't know)
	% (95% CI)	% (95% CI)
Coastal	39.2 (22.3 – 56.1)	41.4 (33.6 – 49.2)
East Central	30.9 (12.1 – 49.7)	39.6 (29.4 – 49.8)
Northeast	63.3 (55.9 – 70.7)	44.6 (28.9 – 60.3)
Southern	41.6 (33.1 – 50.3)	25.1 (18.4 – 31.8)
Western	46.8 (35.5 – 58.1)	42.5 (35.5 – 49.5)
West Central	48.5 (41.1 – 55.9)	48.2 (35.3 – 61.1)
State	41.9 (36.2 – 47.6)	35.8 (31.9 – 39.7)

One hundred fifty-seven children out of 484 (31.4 percent, 95% CI: 26.0 – 36.8) who had never had a blood lead test or didn't know if they had a blood test were exposed to a possible risk for lead exposure from pre-1950 housing (data not shown).

Conclusions/Discussions

The information within this report is derived from the first statewide MCHS in 2002. For regions whose overall response rate was at least 60.0 percent (East Central and Western regions) the prevalence estimates in this report should be considered representative of their kindergarten populations. For regions whose overall response rate was less than 60.0 percent the prevalence estimates in this report are not considered representative of their kindergarten population but reflect the results of only those kindergartners surveyed. Keeping this in mind, we should also note that the comparison of sampled and public school demographics were comparable at the statewide level.

Interestingly, the 6.7 percent estimated uninsured kindergartners from the sample is close to the 5.9 percent of children 0-5 years of age estimated to be uninsured from a Year 2000 survey titled "Health Insurance Coverage Among Maine's Children" (Ormond, C., Salley, S., Kilbreth, E., 2000).

There are many problems associated with estimating asthma prevalence. First, there are many difficulties in making a clinical diagnosis and secondly, along with the clinical problems there is really no gold standard to define asthma within a survey. For these reasons, we included questions within the first statewide MCHS to assess two standard definitions for assessing asthma prevalence within a survey. What we found is that both the CSTE and ISAAC definitions provided similar prevalence estimates for current asthma. We also found that when using the CSTE definition for asthma, children exhibiting only nocturnal cough symptoms were excluded from estimated asthma prevalence.

An estimated 8.6 percent (95% CI 4.9-12.3) of children sampled have current asthma and an additional 13.1 percent (95% CI 5.5-20.7) exhibit symptoms of current wheezing. We know that current wheezing is not to be interpreted as a diagnosis of asthma, but there is a possibility that some children exhibiting current wheezing might have undiagnosed asthma. For example, almost 48 percent of children who had current wheezing only had nocturnal cough.

Maine is similar to the nation regarding gender differences in reported asthma (NHLBI, 1999). Almost 12 percent of males have current asthma compared to less than 6 percent of females.

We know from national surveys that asthma prevalence in children has increased (MMWR, 2002). It has also been reported that adult asthma-associated work absence days have increased > 50.0 percent since 1980 corresponding with the increased asthma prevalence. Although no explicit costs associated with missed work days due to asthma are reported on within this report, we do know that 25 percent of the parents responding to this survey indicated missing work due to their child's' asthma in the past 4 weeks. This indicates a cost burden to these families and their employers.

Although children with reported asthma in our survey appeared to have access to health care (87.6 percent symptomatic visit to healthcare provider with 8.0 percent reporting no insurance), we found a high proportion exhibit indications of severe asthma (e.g. nocturnal cough, speech limitations) and a low proportion (36.8 percent) have the NAEPP recommended written plan for managing asthma. For these reasons, Maine needs to work not only on coordinating education for providers in managing their patients' asthma, but also to educate parents about appropriate symptom recognition and management. These educational goals are addressed as a part of Healthy People 2010, objective 24.6, (increase the proportion of persons with asthma who receive formal patient education, including information regarding community and self-help resources, as an essential part of the management of their condition) and objective 24.7, (increase the proportion of persons with asthma who receive appropriate asthma care). The MCHS may be used as a broad measure of asthma management, but for a more detailed evaluation of current asthma management practices a specific study of management practices would need to be developed.

Several models were constructed to look for associations between asthma and inhalant allergens, irritants, and weight status. A strong association (OR 2.33) was seen for those children reported as having current asthma and having wall-to-wall bedroom carpeting. Interestingly, no associations were found in this survey for exposure to mold and dampness or environmental tobacco smoke. There are a few possible explanations for these findings. First, while we know that there are proven associations between sensitization to allergens and asthma (NHLBI, 1997), this is difficult to show with questionnaire-based surveys by themselves without concurrent environmental testing. Dales, et al. found inaccuracies and systematic reporting bias when using only a questionnaire-based survey to detect associations between respiratory conditions and home dampness and mold growth (1997). Secondly, we know that tobacco smoke is considered the most important indoor environmental irritant, a major precipitant of asthmatic symptoms in children and adults, and is associated with many poor health outcomes (e.g., for a study byAbbey, DE., Peterson, F., Mills, PK., Beeson, WL., cited in NHLBI, 1997; Iribarren, C., 2001; Chilmonczyk, B., 1993). Keeping in mind that almost 31.0 percent of parents reported that their child is exposed to ETS, our findings suggest that parents are no less likely to smoke around children with asthma as children without asthma. There could be some reporting bias since parents' knowledge regarding exposure to ETS is probably quite high, therefore, they might be reporting what is expected or considered an appropriate response.

We also found that children with private insurance have a lower percentage of ETS exposure (21.2) compared to children in MaineCare (47.1) or with no insurance (47.6).

The CSHN screener (LWIM) used within the MCHS identified an estimated 15.4 percent of the children sampled as having a special health need. The screener has been used in the National Survey of Children with Special Health Needs and validated against a much larger survey (QUICC-R) showing a high level of agreement (Bethell, C., et.al., 2002).

According to our results, a statistically significantly higher percentage of males (21.6) were reported as having a special health need than females (9.3). We also found an association between having a special health need and health status (OR 10.69).

Service use and dependency on prescription medications appear to categorize the majority of children with special health needs. Functional limitations were only indicated in 22.7 percent of the children screened positive. This indicates that these children are primarily needing additional services for: medical care, mental health or educational services; special therapy such as physical, occupational, or speech therapy; and treatment/counseling for emotional, developmental or behavioral problems. There were also a high number of those same children who need or use prescription medications. This all represents additional costs and time management within limited resources both at home and in the school. This may be reflected in the higher proportion of CSHN who are enrolled in MaineCare. Not unexpectedly, we found a positive association between having a special health need and an indicator of low economic status (e.g. eligibility for free/reduced lunch, OR 2.2).

Two physical measures were included the MCHS. The first was a dental screen to look for the type and extent of dental need. The importance of this measure is to understand the dental health and needs of children as they enter the school system. An estimated 18.4 percent of kindergartners sampled in our survey had at least one area of untreated caries. While we did not specifically ask about dental insurance we did find that a higher proportion (34.0 percent) of children who did not have health insurance had untreated caries compared to 13.5 percent with private health insurance. We also found that children with untreated caries are more likely to not have seen the dentist in the past year (OR 2.14). There are several possible explanations for why these children did not visit the dentist: lack of insurance, inability to pay, no available dentists in the area, or lack of parental knowledge regarding the importance of regular dental checkups. In the future, we need to be able to measure dental insurance coverage in the MCHS survey so we can assess the impact on the dental health of Maine's children. We also need to understand why children are not going to the dentist for checkups.

The second physical measurement is height and weight. We found that 1 in 5 (21.3 percent) of the kindergartners sampled were considered at-risk-for overweight and 1 in 7 (15.2 percent) were overweight. Interestingly, we found no differences in health status (e.g. excellent, very good versus good, poor, fair health) among children who were at-risk or overweight.

Also in the environmental health arena, of particular importance to Mainers is exposure to lead. Within the MCHS, we wanted to look at estimating how many children had been tested for lead exposure and if they were living in or visiting regularly pre-1950 housing as a proxy measure for risk of lead exposure. We found that almost 32.0 percent of the children surveyed were potentially at risk of lead exposure and might not have ever been tested for lead exposure.

A major limitation of the MCHS was the response rate. An overall response rate of 60.0 percent is the accepted level for generalizing survey results to a population. Since our overall response at the state level for this survey was about 40.0 percent we are limited in our ability to say with any real certainty that these results broadly reflect the kindergarten population in Maine. We do know that two of the regions within Maine, East Central and Western regions, did have response rates greater than 60.0 percent overall (64.3 percent and 65.5 percent, respectively). Therefore, we do have the ability with this survey to make generalizable statements for those two regions within Maine. Again, we should also point out that demographic characteristics for the state as

a whole were similar to our survey data, and that several estimates such as the percentage of uninsured kindergartners were consistent with alternate sources of this data.

Another possible limitation is that we only surveyed public school kindergartners, so we are assuming that the public school responses will not be different than those for children in private and/or home school environments.

Since we relied upon actual height and weight measurements any concerns regarding self reported height and weight are not applicable to these results. We also decreased any possible measurement errors by training persons responsible for measuring the children and providing or ensuring calibrated scales (e.g. stadiometer) were used.

These findings will be used to further refine the MCHS for future surveying. Several of the questions did not yield accurate information (e.g. dampness and mold) and will not be repeated in the next MCHS. We will explore narrowing our definition of ETS exposure to include only persons living with someone who smokes in the home.

Additionally, we will continue to work with our partners to increase our response rates to ensure stable regional estimates which will allow us to monitor trends over time. Since this is the first time that this work has been completed we are hopeful that building a track record over time will help schools feel comfortable with participating. We also hope to improve participation by disseminating the information gained from the survey to those who participated as well as to those not participating.

Methods

Design

The study was approved by the Institutional Review Board (IRB) for the protection of human subjects at the Department of Health and Human Services, State of Maine.

The study design for the MCHS, kindergarten was cross-sectional with multi-stage clustering. The state was divided into six geographic regions with schools randomly sampled based on proportionate school enrollment. The study was conducted during Spring 2002/late Summer 2002 kindergarten registration and/or screening. Participation in the study was voluntary at the school level and individual level. All kindergarten children at each selected school were invited to participate.

The parent/primary caregiver of the kindergarten enrollee gave written consent for child's participation in the study (Attachment A). After written consent was obtained the parent/primary caregiver was given a questionnaire to complete (Attachment B). After the questionnaire was completed, it was checked for missing information. The child's height and weight were measured and an oral exam was conducted by a trained healthcare professional. The healthcare professional then also reviewed the questionnaire and findings from the oral exam to determine the necessity of referral for dental care or suggested follow-up with a primary healthcare provider for possible respiratory problems.

Sampling

The state was divided into six regions. The six regions were previously used in a statewide 'Smile Survey'. The six regions were chosen based on multiple criteria:

a. geographic location
b. population density
c. income
d. age distribution

Sample sizes per region were selected based on the ability to detect a sample mean within 5.0 percent of the true population mean with a 90.0 percent confidence interval using Epi-Info software (CDC, 2001). The prevalence used in the estimation was based on a study conducted by Maine Medical Assessment Foundation (MMAF) and backed by the MCHS pilot study in 2001 assuming an 11.0 percent prevalence of asthma (Wennberg, 1998).

Within each region individual schools were chosen using PC Sample software (Westat, 1996). The PC Sample software chooses schools based on a probability proportionate to their kindergarten size.

Table 22 denotes the counties in each region and the Kindergarten enrollment figures for 2000-2001 school year used as the basis for the sampling.

Table 22. Regional enrollment and sample size estimates.

Region	County	Enrollment 2000-2001	Sample size
Southern	Cumberland York	5146	104
Coastal	Knox Lincoln Sagadahoc	1071	96
East Central	Hancock Penobscot Waldo	2456	102
West Central	Androscoggin Kennebec	2304	101
Western	Franklin Oxford Piscataquis Somerset	1774	100
North Eastern	Aroostook Washington	1110	97

The probability proportionate sampling was based on:

80.0 percent school response rate
90.0 percent student attendance rate at kindergarten enrollment/screening
90.0 percent parental permission.

The above sampling response rates compute to an expected overall response rate of 64.5 percent.

Weighting

Initial weighting was based on school selection weights multiplied by the student non-response weights. The school selection weights were computed using PC Sample software (Westat, 1996) and were based on the inverse probability the school was selected by region. The student non-response weight was based on the inverse proportion of pupil participation (e.g. # enrolled/# participating) at the school level. No additional adjustments were added as post-stratification weights.

Research Questions

The survey research questions address three main areas: prevalence, distribution, and risk factors.

Prevalence: What is the prevalence of the differing health conditions? Does asthma prevalence differ using the Council of State and Territorial Epidemiologists (CSTE) definition as opposed to the International Survey of Asthma and Allergies in Children (ISAAC) definition?

Distribution: How are the differing health conditions distributed throughout the state?

Risk Factors: What risk factors are associated with prevalence of each health outcome?

Are well-known triggers/irritants for asthma recognized by parents?

What proportion of children with asthma are managed appropriately and protected from preventable risks, such as, environmental tobacco smoke?

Are potentially high-risk children being screened for blood lead levels?

Case Definitions

Minority:

A child met the definition for minority race if:

1. They indicated any other race exclusive of or in combination with white race.

Asthma (CSTE):

A child met the CSTE case definition for asthma if:

1. The answer to "Did a doctor or healthcare professional ever tell you that your child had asthma?" was 'yes', **And**
2. The answer to one or more of the following questions was 'yes':
    a. "Does your child still have asthma?"
    b. "Has your child taken prescription medications for asthma during past year?"
    c. "Has your child had a wheeze episode in the past year?"

Asthma (ISAAC):

A child met the ISAAC case definition for asthma if:

1. The answer to "Has your child ever had asthma? was 'yes', And
2. The answer to one or more of the following questions was 'yes':
   a. "In the last 12 months, has your child had wheezing or whistling in the chest?"
   b. **"**In the last 12 months, has your child's chest sounded wheezy during or after exercise? "
   c. "In the last 12 months, has your child's sleep been disturbed due to dry cough at night, APART from a cough associated with a cold or a chest infection?"

Current Wheeze:

A child met the current wheeze case definition if they **did not** meet the case definition for asthma using either the ISAAC or CSTE definition and :

1. The answer to one or more of the following questions was 'yes':
   a. "In the last 12 months, has your child had wheezing or whistling in the chest?"
   b. "In the last 12 months, has your child's chest sounded wheezy during or after exercise?"
   c. "In the last 12 months, has your child's sleep been disturbed due to a dry cough at night, apart from a cough associated with a cold or a chest infection?"

Lifetime Asthma:

A child met the lifetime asthma case definition for asthma if:

1. The answer to the following question was 'yes':
   A. "Has your child ever had asthma?"

At-risk-of-overweight:

85.0% - 94.9% Body Mass Index (BMI) percent for age and gender.

Overweight:

95.0% or greater BMI percent for age and gender.

Children With Special Health Needs (CSHN):

A child met the case definition for CSHN if:

1. The answer to all three parts of at least one of the following questions (or in the case of the last question, the two parts) is 'yes':

A. "Does your child currently need or use medicine prescribed by a doctor?"

A1. "Is this because of any medical, behavioral, or other health condition?"

A2. "Is this a condition that has lasted or is it expected to go on for at least 12 months?"

B. "Does your child need or use more medical care, mental health, or educational services than is usual for most children of the same age?"

B1. "Is this because of any medical, behavioral, or other health condition?"

B2. "Is this a condition that has lasted or is it expected to go on for at least 12 months?"

C. "Is your child limited or prevented in any way in his or her ability to do the things most children of the same age can do?"

C1. "Is this because of any medical, behavioral, or other health condition?"

C2. "Is this a condition that has lasted or is it expected to go on for at least 12 months?"

D. "Does your child need or get special therapy, such as physical, occupational, or speech therapy?"

D1. "Is this because of any medical, behavioral, or other health condition?"

D2. "Is this a condition that has lasted or is it expected to go on for at least 12 months?"

E. "Does your child have any kind of emotional, developmental or behavioral problem for which he or she needs or gets treatment or counseling?"

E1. "Has this problem lasted or is it expected to go on for at least 12 months?"

Oral Exam:
Urgency of care for the dental results was defined as emergency care needed within 24 hours due to an infection or acute pain. Referrals are made for non-urgent and urgent dental care with reminders for continuous dental care.

Rampant Caries: Untreated caries on 7 or more teeth.

Untreated Caries: Caries seen on either primary or permanent dentition.

Environmental Tobacco Smoke (ETS):
A child met the case definition for ETS exposure if either of the two conditions were met:

1. Having at least one person living in the same household as the child who smokes cigarettes, cigars, or pipes in the home, **OR**

2. The child is near enough to smell or breathe in smoke from other people's cigarettes/cigars/pipes at least once a week.

Blood Lead Test:
A child met the case definition for a blood lead test if the answer to the following question was 'yes'.

1. "Has your child ever been tested for blood lead poisoning?"

Mold Exposure:
A child met the case definition for mold exposure if the answer to either of the following questions was 'yes':

1. "In the last 12 months, have you ever had wet or damp spots on surfaces inside the present home other than in the basement?"
   And/or

2. "Have you ever had mold or mildew growing on any surface inside your present home?"
   2a. In the basement?
   2b. In the shower areas(s)?
   2c. In other areas of your house?

Analysis

Each health outcome was analyzed as described in the analysis plan (Table 23). Basic frequencies and univariate analyses were used to initially describe each outcome. Stratified analysis was used to examine associations between each health outcome and each risk factor listed in Tables 24 - 29.

Table 23. Health outcome analysis plan.

Outcome Measure	Survey Question
Prevalence of Asthma	
Current (Definition 1 – CSTE)	Q16 and Q17, or Q19, or Q5
(Definition 2 – ISAAC)	Q5 and/or Q10, Q11
Lifetime (Definition – ISAAC)	Q4
Prevalence of Current Wheezing	Q5
Prevalence of CSHN	Q35-39 positive response to all categories in any one question
Prevalence of Environmental Tobacco Smoke	Q23, Q24
Lead Testing Proportion	Q33
Prevalence of overweight	>94% BMI for age and gender
Prevalence of at-risk of overweight	85%-94% BMI for age and gender
Prevalence of Untreated Caries	Pg 8 – Untreated Caries
Prevalence of Rampant Caries	Pg 8 – Rampant Caries

Table 24. Asthma and current wheeze only risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Environmental tobacco smoke	Q23, Q24
Attacks of wheezing	Q6
Sleep disturbance due to wheezing	Q7
Speech limitation	Q8
Activity limitation	Q12
Asthma Management	Q13, Q14, Q15, Q20, Q21
Inhalant/allergen exposure	Q27, Q28
Access to care	Q18
Loss of work days	Q22
Stove use	Q25
Heating source	Q26
Bedroom carpeting	Q29
Perceptions of health	Q40
Gender	Q42
Race/ethnicity	Q44, Q45
Geographic location	Region
Insurance status	Q46
At risk for overweight	BMI %age/gender
Overweight	BMI %age/gender

Table 25. CSHN risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Insurance Status	Q46
Free/reduced lunch	Q48
Perceptions of health	Q40
Gender	Q42
Race/ethnicity	Q44 & Q45
Geographic location	School name
Asthma	Q16 and Q17, or Q19, or
Current wheeze	Q5
	Q5

Table 26. Dental Caries risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Dental visit	Q31
Insurance Status	Q46
Free/reduced lunch	Q48
Perceptions of health	Q40
Gender	Q42
Race/ethnicity	Q44 & Q45
Geographic location	School name

Table 27. Weight status risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Insurance Status	Q46
Perceptions of health	Q40
Gender	Q42
Race/ethnicity	Q44 & Q45
Geographic location	School name

Table 28. Environmental tobacco smoke exposure risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Insurance Status	Q46
Perceptions of health	Q40
Gender	Q42
Race/ethnicity	Q44 & Q45
Geographic location	School name

Table 29. Lead exposure risk factor analysis plan

Risk Factors for Cross-tabulation & Logistic Regression	Survey Question
Geographic location Pre-1950 Housing	School name Q34

For demographic variables, we examined the number in each category to determine how to group the data for logistic regression analyses. To assess regional differences we used chi-squared tests for homogeneity.

We constructed multivariate logistic regression models using SUDAAN software (Research Triangle Institute, 2002). Each independent variable was included based on the plausibility that it was associated with a particular dependent variable (see Tables 24 - 28). Variables were retained in the model if they were statistically significant at an alpha of 0.05. In addition, independent variables were retained in the model if they changed by more than 10.0% the association between another independent variable and the outcome, which is if they were confounders. Demographic variables were included in the model irrespective of their associations.

Secondary analyses were conducted using only children with asthma to report the proportion of children with preventable risk factors such as poor asthma management, environmental tobacco smoke, etc.

Quality Control/Assurance

The parent/primary caregiver of the child enrolling for kindergarten classes completed all questionnaires. After the questionnaire was completed and the child had their oral exam and height/weight measured, the questionnaire was reviewed for completeness by the healthcare professional conducting physical measurements.

All of the questionnaires were electronically scanned into a database for analysis.

Strategies employed to maintain the integrity/quality of the dataset included visual inspection of 10.0 percent of the surveys from each school to identify data entry errors. For schools with greater than 1.0 percent discordance across keyed fields, manual re-keying of all questions occurred. Discordance was determined by: (number of discordant fields) divided by (the number of questionnaires multiplied by the number of keyed fields).

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Attachment A

MAINE CHILD HEALTH SURVEY CONSENT FORM

We[1] want to ask you some questions during your child's school screening The survey is **not** a part of your child's registration or screening. This survey is voluntary. It will not affect your child's school registration. The school did not develop the survey. The school is helping by letting us ask you these questions now.

Both you and your child are asked to participate. You will answer the questions on the survey. Then your child will get their height and weight measured and have their teeth checked.

Your permission is required for your child to take part in the survey. Signing this consent form will allow us to do the survey. Your child can refuse to be measured. Your child can also refuse to get their teeth checked. They can refuse by telling or showing us.

We will ask about your child's health. The survey asks about your child's breathing, dental health, and other health topics. It does not cover all health problems. Answers are anonymous. Names will not be recorded. If we are concerned about your child's health we will tell you. We can also suggest where to go for care. The information from all surveys combined will allow us to better develop programs for your community and the state.

The survey will take about 10-15 minutes to finish. It will take 2 minutes to check your child's teeth. A dental professional using a light, a disposable tongue blade, and gloves will check your child's teeth. Information on sealants, the number of decayed, missing and filled teeth, and treatment needs will be recorded.

We will keep the surveys in a locked file cabinet. The Maternal Child Health (MCH) Epidemiologist will keep all results. We will not be able to tell who you are from any of the results.

If you have any questions please call:
Barbara Poirier, Asthma Program Coordinator, Muskie School of Public Service at 207-626-5235 or
Kathy Tippy, MCH Epidemiologist, Maine Bureau of Health at 207-287-4102.
If you have any questions regarding you or your childs' rights in participating in the child health survey, please contact Paul Kuehnert, Chairperson, Institutional Review Board (IRB), Maine Bureau of Health at 207-287-5179.

- This is voluntary
- My answers will be kept confidential
- I understand this may take about 5-10 minutes.
- I or my child can quit at any time.
- My child's dental exam does not take the place of an exam done by a dentist. I will be given the results of my child's dental exam upon completion.
- The questions included in the survey about my child's breathing are not to be considered an exam. If I have any questions about my child's breathing, it is recommended I see my child's physician.

I agree to let my child have his/her teeth checked, height and weight measured and I agree to answer the questions on the survey.

____ Yes ____No

PARENT OR GUARDIAN:

Print name_____ Sign _____ Date ___/___/____
WITNESS:

Print name_____ Sign _____ Date ___/___/____

For information about health insurance call: **Consumers for Affordable Healthcare**
Toll Free 1-800-838-0388

[1] *Maine Bureau of Health (MBOH), Division of Family Health and the American Lung Association of Maine.*

Attachment B

(For office use only) Survey ID # _____
Name of School_____

MAINE CHILD HEALTH SURVEY

1. Today's date _____ (MM/DD/YY)

2. What is the zip code for the child's place of residence? _____

2. What town/city does your child live in or closest to? _____

4. Has your child **ever** had wheezing or whistling in the chest at any time in the past?

☐ Yes ☐ No ➔ ***If you have answered "NO" please skip to Question 9.***

5. **In the last 12 months**, has your child had wheezing or whistling in the chest?

☐ Yes ☐ No ➔ ***If you have answered "NO" please skip to Question 9.***

6. **In the last 12 months**, how many attacks of wheezing or whistling has your child had?

☐ *None* ☐ *4-12*

☐ 1-3 ☐ More than 12

7. **In the last 12 months**, how often, on average, has your child's sleep been disturbed due to wheezing?

☐ Never woken with wheezing ☐ One or more nights per week

☐ Less than one night per week

8. **In the last 12 months**, has wheezing ever been severe enough to limit your child's speech to only one or two words at a time between breaths?

☐ Yes ☐ My child does not have wheezing

☐ No

9. Has your child ever had asthma?

☐ Yes ☐ No

10. **In the last 12 months**, has your child's chest sounded wheezy during or after exercise?

☐ Yes ☐ No

11. **In the last 12 months,** has your child's sleep been disturbed due to a dry cough at night, **APART** from a cough associated with a cold or a chest infection?

☐ Yes ☐ No

Survey ID # _____

12. **In the last 12 months,** how often has your child's activities been limited due to wheezing, dry cough, and/or breathing difficulties?

☐ My child does not have these symptoms

☐ Never ☐ One or more times per week

☐ Less than one time per week ☐ Almost daily

13. **In the last 12 months,** how often did you take your child to the doctor due to wheezing, dry cough and/or breathing difficulties?

☐ 0 (No visits) ☐ 3 visits

☐ 1 visit ☐ 4 visits

☐ 2 visits ☐ 5 or more visits

14. **In the last 12 months,** how many times did you take your child to an emergency room or urgent care due to wheezing, dry cough and/or breathing difficulties?

☐ 0 (No visits) ☐ 3 visits

☐ 1 visit ☐ 4 visits

☐ 2 visits ☐ 5 or more visits

15. **In the past 12 months,** how many times was your child admitted to a hospital due to wheezing, dry cough and/or breathing difficulties?

☐ 0 (No admissions) ☐ 3 admissions

☐ 1 admission ☐ 4 admissions

☐ 2 admissions ☐ 5 or more Admissions

16. Have you **ever** been told by a doctor or nurse that your child has asthma?

☐ Yes ☐ No ➔**If no, please skip to Question 22.**

17. Does your child still have asthma?

☐ Yes ☐ No ➔**If no, please skip to Question 22.**

18. Where do you usually take your child for medical assistance for asthma? *Mark only **ONE** answer.*

- ☐ My child does not have asthma
- ☐ Hospital Emergency Room (ER)
- ☐ Hospital Based Clinic
- ☐ Rural Health Center
- ☐ Private Doctor's Office
- ☐ No usual source of care for these conditions.
- ☐ Do not know
- ☐ Other _____

19. **In the last 12 months,** has your child taken prescription medications for **asthma**? (Common asthma medications are: albuterol (proventil, ventolin); pirbuterol (maxair); salmeterol (serevent); budesonide (pulmicort); fluticasone (flovent, advair); beclomethasone (vanceril, qvar, declovent); triamcinolone (azmacort); flunisolide (aerobid); montelukast (singulair); or zafirlukast (accolate)).

- ☐ Yes
- ☐ No

20. Has your child used over-the-counter medications for asthma during the past year?

- ☐ Yes
- ☐ No

21. **In the last 12 months,** has your doctor given you a *written* plan for taking care of your child's asthma?

- ☐ Yes
- ☐ No
- ☐ My child does not have asthma

22. **During the past 4 weeks,** how many days of work have you or another adult in your household missed because of your child's *wheezing and/or asthma?*

- ☐ None
- ☐ Less than 1 day (part of a single work day)
- ☐ 1 – 2 days
- ☐ 3 – 4 days
- ☐ 5 or more days

23. How many people living in the same household as your child smoke cigarettes, cigars, or pipes in the home?

- ☐ 0 (None)
- ☐ 1 person
- ☐ 2 persons
- ☐ 3 or more persons

24. **During the average month,** about how often is your child near enough to smell or breathe in the smoke from other people's cigarettes/cigars/pipes?

- ☐ Nearly every day
- ☐ 2 – 4 times per week
- ☐ Once a week
- ☐ Less than once a week
- ☐ Never

25. In the household where the child lives, is the kitchen stove fueled by natural gas or propane?

- ☐ Yes
- ☐ No
- ☐ Don't Know

26. In the household where the child lived, last winter, were the following heating sources used at least once per month on average? Mark **ONE** answer for each line.

	Yes	*No*
a) Kerosene heater?	◯	◯
If yes, the number of times per month_____		
b) Wood burning stove?	◯	◯
If yes, the number of times per month _____		
c) Wood burning fireplace?	◯	◯
If yes, the number of times per month_____		

27. **<u>In the last 12 months,</u>** have you ever had wet or damp spots on surfaces inside your present home other than in the basement (for example, on walls, wallpaper, ceilings or carpets)?

☐ Yes ☐ No

28. Have you ever had mold or mildew growing on any surface inside your present home (for example, on walls, wallpaper, ceilings, carpets, shower curtain, etc.)?

In the basement?	☐ Yes	☐ No
In the shower area(s)?	☐ Yes	☐ No
In other areas of your house?	☐ Yes	☐ No

29. **<u>In the last 12 months,</u>** was there "wall to wall" carpeting (that is carpeting that covers the entire floor of any room) in the room where your child normally slept?

☐ Yes ☐ Do not know

☐ No

30. Answer this question only if your child has had wheezing or whistling in the chest in the last 12 months. (*Indicate the importance of **EACH** in triggering your child's wheezing in the last 12 months):*
*Mark **ONE** on each line*

	Very Important	Somewhat Important	Somewhat Unimportant	Not Important at all	Not Exposed
a) Pets (cats, dogs, etc.)	◯	◯	◯	◯	◯
b) Head colds	◯	◯	◯	◯	◯
c) Exercise	◯	◯	◯	◯	◯
d) Dust, mold	◯	◯	◯	◯	◯
e) Other allergens	◯	◯	◯	◯	◯
f) Cigarette smoke	◯	◯	◯	◯	◯

31. About how long has it been since your child last visited a dentist? Include dental hygienists as well as all types of dentists, such as orthodontists, oral surgeons, and all other dental specialists.

- ☐ 6 months or less
- ☐ More than 6 months, but not more than 1 year
- ☐ More than 1 year, but not more than 3 years
- ☐ More than 3 years ago
- ☐ My child has never been to a dentist
- ☐ Don't know/don't remember

32. Has your child ever had dental sealants place on his/her teeth at either your dental office or through a school program? Sealants are a clear or white material placed on the chewing surface of teeth to prevent cavities.

- ☐ Yes – at a dental office
- ☐ Yes – at a school program
- ☐ No
- ☐ Don't know

33. Has your child ever had a blood **LEAD** test?

☐ Yes ☐ No ☐ Don't know

34. Does your child live in or regularly visit a house that was built prior to 1950? This question could apply to a facility such as a home day care center or the home of a babysitter or relative.

☐ Yes ☐ No ☐ Don't know

The next questions ask about all conditions that might affect your child's health & well-being.

35. Does your child currently need or use medicine prescribed by a doctor (other than vitamins)?

- ☐ Yes → **Go to Question 35a**
- ☐ No → **Go to Question 36**

35a. Is this because of **ANY** medical, behavioral, or other health condition?

- ☐ Yes → **Go to Question 35b**
- ☐ No → **Go to Question 36**

35b. Is this a condition that has lasted or is expected to go on for **<u>at least</u>** twelve months?

- ☐ Yes
- ☐ No

36. Does your child need or use more **<u>medical care, mental health or educational services</u>** than is usual for most children of the same age?

- ☐ Yes → **Go to Question 36a**
- ☐ No → **Go to Question 37**

36a. Is this because of **ANY** medical, behavioral, or other health condition?

- ☐ Yes → **Go to Question 36b**
- ☐ No → **Go to Question 37**

36b. Is this a condition that has lasted or is expected to go on for **at least** twelve months?

☐ Yes

☐ No

37. Is you child **limited or prevented** in any way in his or her ability to do the things most children of the same age can do?

☐ Yes → **Go to Question 37a**

☐ No → **Go to Question 38**

37a. Is this because of **ANY** medical, behavioral or other health condition?

☐ Yes → **Go to Question 37b**

☐ No → **Go to Question 38**

37b. Is this a condition that has lasted or is expected to go on for **at least** twelve months?

☐ Yes

☐ No

38. Does your child need or get **special therapy**, such as physical, occupational or speech therapy?

☐ Yes → **Go to Question 38a**

☐ No → **Go to Question 39**

38a. Is this because of **ANY** medical, behavioral or other health condition?

☐ Yes → **Go to Question 38b**

☐ No → **Go to Question 39**

38b. Is this a condition that has lasted or is expected to last for **at least** twelve months?

☐ Yes

☐ No

39. Does your child have any kind of emotional, developmental or behavioral problem for which he or she needs or gets **treatment or counseling?**

☐ Yes → **Go to Question 39a**

☐ No → **Go to Question 40**

39a. Has this problem lasted or is it expected to last for **at least** twelve months?

☐ Yes

☐ No

40. In general, how would you say your child's health is?

☐ Excellent ☐ Fair

☐ Very Good ☐ Poor

☐ Good

41. What is your child's date of birth? (*Please include month, day, and year)* _____

42. What is your child's gender? Male ☐ Female ☐

43. Is your child hispanic? Yes ☐ No ☐

44. What race or ethnic group best describes your child (check all that apply)?

☐ White ☐ Black

☐ Asian/Pacific Islander ☐ Other _____

☐ Native American (North American Indian)

45. What type of insurance is your child covered by at this time (select the best answer)?

☐ Private Insurance/HMO/CHAMPUS ☐ Cub-care

☐ Medicaid ☐ No Insurance

☐ Other _____

46. **<u>In the past 12 months,</u>** was there any time that your child did not have any health insurance or coverage, including Medicaid?

☐ Yes ☐ No

If yes, how many months? _____

47. Is your child eligible for the free or reduced lunch program at school?

☐ Yes ☐ Don't know

☐ No

Thank you for your participation!

Child verbally and/or physically agrees to be measured and have their teeth checked.

☐ Yes ☐ No

Body Mass Measurements:

Child's Height _____ inches

Child's Weight _____lbs

Maine Dental Screening Form

Untreated Cavities:	0=No untreated cavities 1=Untreated cavities	Caries Experience:	0=No caries experience 1=Caries experience – primary only 2=Caries experience – permanent only 3=Caries experience – both dentitions
Rampant Caries:	0=No rampant 1=Rampant ≥ 7 teeth	Sealants on Permanent Molars:	0=No sealants present 1=Sealants present
Treatment Urgency:	0=No obvious problem 1=Early dental care 2=Urgent care	Need for Dental Sealants:	0=No need for sealants 1=Needs dental sealants
Comments:			

- All boxes must contain a valid code
- Use 4-digit codes for year (i.e. 1989, 1999, 2000)
- If no permanent molars, "Sealants on Permanent Molars"=0
- If no permanent molars, "Need for Dental Sealants"=0

Referred: ☐ Yes ☐ No

If yes, reason for referral: ☐ Dental

☐ Respiratory

Maine Child Health Survey

If you need information about health insurance please call:
Consumers for Affordable Healthcare
Toll Free 1-800-838-0388

Dental Screening Results

Dear Parent/Primary Caretaker,

Your child, _____, has been screened for dental needs. A dental screening does not take the place of a dental examination by a dentist.
The results of your child's dental screening are:

____ **Your child needs immediate dental care for _____.**
Please arrange for a dental appointment as soon as possible so that further problems can be avoided.

____ **Your child's teeth may need dental treatment for _____.**
Please make a dental appointment for your child as soon as possible.

____ **Your child's teeth have no visible decay.** However, we recommend routine dental care.

____ **Your child needs help taking care of his/her teeth every day.**

____ Ask your dentist about **dental sealants.** Your child may need dental sealants.

Respiratory Health

The information you provided on the survey suggests that your child, _____, may have a breathing problem like asthma. We recommend seeing your Pediatrician/Family Physician to discuss this issue.

Maine Child Health Survey
Rationale

This questionnaire follows the International Survey of Asthma and Allergies in Children (ISAAC) core questionnaire module and is adapted to include questions pertaining to basic demographic information, prevalence of asthma, utilization of healthcare, environmental triggers associated with asthma and additional questions regarding oral health, possible lead exposure and identifying children with special health care needs.

Justification for individual questions is as follows:

Question 1-3. Basic demographic information.

Question 4. According to ISAAC, this question is based on the IUATLD questionnaire. It does not mention "attacks" of wheezing, in order to identify children with persistent symptoms which are not obviously characterized as episodes or attacks. This is seen as a very sensitive question.

Question 5. According to ISAAC, limitation to a 12 month period reduces errors of recall and (at least in theory) should be independent of month of completion. This is considered to be the most useful question for assessing the prevalence of wheezing illness.

Question 6-7. According to ISAAC, these questions offer two alternative quantitative measures of frequency of wheezing. Problems with the concept of attacks (see above) and difficulty in quantifying the frequency of recurrent asthma lead to the inclusion of question 8 to quantify and identify persistent wheeze.

Question 8. According to ISAAC, this question aims to fill the gap of determining acute severe asthma.

Question 9. According to ISAAC, all respondents are asked about diagnosed asthma, as occasionally asthma may be diagnosed in the absence of wheeze (on the basis of recurrent nocturnal cough etc.).

Question 10. According to ISAAC, this question logically belongs as a stem question under number 5 (where it was used in the pilot study), it has been found in certain Australasian surveys to identify some children who deny (or whose parents deny) wheezing or whistling at question 4 or 5.

Question 11. According to ISAAC, nocturnal cough is widely accepted as an alternative presentation of asthma, and this question has been included to increase the overall sensitivity of the questionnaire, although its specificity in population surveys remains unclear.

Question 12. This question was modified from the North Carolina Adolescent Asthma Survey. The question was modified for a parental response. It is included in this survey as a 'Quality of Life' indicator.

Question 13-15. The intent of these questions is to look at healthcare utilization by provider type. Questions 13-15 came from the North Carolina Adolescent Asthma Survey. Question 13 is an adaptation of the NHIS 2000 Child Supplement. The NHIS question is directed to 'asthma' only and doesn't include wheezing, breathing problems, or dry cough. The NHIS 2000 question is narrow and might not incorporate the 'wheezer' population, which is a core component of the Maine School Health Survey.

Question 16. According to the Council of State and Territorial Epidemiologists (CSTE), this question is needed for a case classification of probable asthma. It can also act as an indicator of reliability for question 9.

Question 17. According to the CSTE, this question is one option for a probable case classification of asthma along with a positive response to question 16.

Question 18. This question gives an indication of 'medical home' for asthma and relates to access to care. The question is adapted from the North Carolina Adolescent Asthma Survey.

Question 19. According to the CSTE, this question is one option for a probable case classification of asthma along with a positive response to question 16.

Question 20. According to the CSTE, this question is one option for a possible case classification of asthma.

Question 21. It is the opinion of the National Asthma Education and Prevention Program (NAEPP) Expert Panel that, at first visit, clinicians should develop a written, individualized, daily self-management plan in consultation with the patient (NHLBI, 1997). This question seeks to determine if parents of children with asthma have a written plan to effectively manage their child's asthma which has been found to be associated with better asthma care.

Question 22. According to Weiss, Sulliven, Lyttle (2000), the largest component increase in indirect costs associated with asthma are due to loss of work. This question looks at parental loss of work due to their child's asthma. The question is adapted from the North Carolina Adolescent Asthma Study.

Question 23-24. Environmental tobacco smoke has been documented as a major precipitant of asthma symptoms in children and adults (NHLBI, 1997). Questions 23 & 24 are looking at environmental smoke exposure as a potential trigger. Question 23 came from the North Carolina Study. Question 24 is an adaptation of the North Carolina Study and a New York Asthma Study. The North Carolina question was adapted to include cigarettes, cigars, and pipes as potential sources of environmental smoke.

Question 25-26. Exposure to fumes from unvented gas, oil, or kerosene stoves; woodburning appliances, or fireplaces can irritate the lungs and precipitate asthma symptoms (NHLBI, 1997). Questions 25 & 26 attempt to quantify exposure to these irritants and both are adapted from the North Carolina study for a parental response.

Question 27 & 28. These two questions look at the relationship between dampness and mold and health. The questions came from a Canadian study conducted on adults 21+ years of age by Dales, et al reported in 1991. The study showed that exposure to home dampness and Mold may be a risk factor for respiratory disease in the Canadian population.

Question 29. Allergen sensitivity along with exposure of the patient with asthma to that allergen increases airway inflammation and symptoms (NHLBI, 1997). Question is adapted for parental response from the North Carolina study.

Question 30. This question looks at parental knowledge regarding their child's asthma and what triggers are associated with their child's asthma. This question came from the North Carolina study and the triggers are well documented in other literature in their relation to asthma.

Question 31. This question was taken from the 1999 Maine Smile Survey. It is a Federal Performance

Measure used in the Maternal Child Health Block Grant regarding oral health.

Question 32. This question was taken from the 1999 Maine Smile Survey. It is a Federal Performance Measure used in the Maternal Child Health Block Grant regarding oral health.

Question 33. This question in combination with question 32 can potentially determine if some at risk children have been screened for lead poisoning.

Question 34. This question is derived from the Centers for Disease Control and Prevention (CDC) screening guidance for state and local public health officials. The question relates to risk status for potential lead poisoning.

Question 35-39. These five questions are from the Living With Illness Module (LWIM) part of the CSHCN Screener is based on that of a longer and non-self administered tool, the Questionnaire for Identifying Children with Chronic Conditions (QuICC). The LWIM has been tested in Maine last year as part of a National Field trial directed at Medicaid Families. These five questions targeted at identifying children with special health care needs will also be a part of a National Survey (SLAITS) in 2001.

Question 40. The intent of this question is to look at parental perceptions of their child's health. There are numerous studies validating self-reported health status. Potential sources for validation of parental responses are being reviewed.

Question 41-45. Basic demographic physical descriptors.

Question 46-48. These questions are sensitive in nature and are potential indicators of socio-economic Status. The free/reduced lunch status has been used in the 1999 Maine Smile Survey and North Carolina Asthma Study and should be included for follow-up purposes and additionally can be a cross-reference for insurance status.