2016 Asthma Community Needs Assessment in Children in Hartford

Presented by Collaborative for Asthma Equality in Children, an initiative of the Asthma Center at Connecticut Children's Medical Center.

Connecticut Children's MEDICAL CENTER 20 years

ACKNOWLEDGEMENTS

The Collaborative for Asthma Equity in Children under the leadership of the Asthma Center at Connecticut Children's Medical Center began working on the Asthma Community Needs Assessment in July 2015 as part of a grant from the National Heart, Lung and Blood Institute of the National Institutes of Health. The goal of this collaborative was to understand the successes and gaps in asthma care and management from the perspective of the child with asthma, the child's family and the child's community or neighborhood. Taken in its broadest perspective, the goal was to explore as deeply as possible how to improve asthma care and importantly reduce asthma disparities in children through the voices of those who lived with asthma.

In addition to the 22 member Collaborative, experts in all areas that touch upon asthma in Hartford were interviewed and surveyed to understand their perspectives and a Hartford Resident Survey was completed by a group of dedicated volunteers during the hot summer months of 2016.

We want to thank all of the individuals and community organizations that participated and so generously gave of their time. We especially want to thank the families who completed the surveys and participated in the focus groups for their time and their willingness to share their experiences and feelings about the effect of asthma on their life and their children's lives. We learned so much from them.

Finally, we want to thank the staff of the Asthma Center who diligently worked to complete the needs assessment in record time and to the Institutional Review Board at CT Children's who quickly reviewed the myriad of instruments that were used in the interviews, focus groups and surveys. Finally, we want to thank the City of Hartford Health and Human Services Department and the Connecticut Department of Public Health for their participation and support. We hope that this document will be of use to all who work in Hartford and are touched by childhood asthma.

The report is available both as an Executive Summary and as a full report at:
http://www.connecticutchildrens.org/community-child-health/asthma

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INTRODUCTION

Asthma is the most common chronic disease of children and is associated with high morbidity especially in low income, underserved, minority populations. Significant advances in the treatment of asthma have been achieved in the past 20 years and evidence-based guidelines for asthma diagnosis, testing and treatment have existed since 1991 with the most recent revision in 20071. In 2016, the Asthma Center at Connecticut Children's Medical Center conducted a community needs assessment in Hartford's children with asthma as part of a grant from the National Heart, Lung and Blood Institute (U34 HL-130665-01). The results of this community needs assessment are being used to refine a multi-level, coordinated, tailored clinical intervention that empowers families to manage their child's asthma through multi-directional information sharing. This new health care and information system will be capable of being sustained, replicated by others and broadly disseminated. It is hoped that this system of care for disadvantaged, underserved children with asthma in Hartford will improve the health of children with asthma, decrease asthma morbidity and eliminate asthma disparities.

In order to complete this asthma community needs assessment, the Asthma Center created the Collaborative for Asthma Equity in Children (CAsE), a 22 member Steering Committee (SC). Members of the Steering Committee (Appendix 1) represent families and youth, community organizations, schools, the faith community, school- based health centers, the pediatric medical community including primary care clinicians and asthma specialists as well as housing, pharmacy, community health workers, the Hartford Department of Health and Human Services and the Connecticut Department of Public Health. The SC, which met monthly, provided oversight, reviewed materials and plans for and the results of the community needs assessment and helped to inform the clinical intervention that has been proposed. To assist with this effort, eight working groups were created (Medical, Community Organization, Home Environment, School Environment, School, Community Health Worker, Smoking and Information Technology) and experts in each of these areas were invited to join the working groups, thus expanding the reach and breadth of the program. A total of 33 experts participated on the working groups in addition to the members of the SC with administrative support from the Asthma Center. Each working group was charged with reviewing existing data, determining where gaps in data occurred and developing a plan to fill the gaps. The working groups addressed the information gaps using a combination of surveys, key informant interviews, focus groups and mixed methods (e.g., a survey followed by a focus group) and identified the key stakeholders. Interview questions, survey questions and focus group guides were created and were administered by Asthma Center staff between March 16, 2016 and August 6, 2016. A Hartford Resident Survey composed of questions of highest importance from each of the working groups was developed and administered throughout Hartford in physician offices and clinics, grocery stores, health fairs, places of worship, schools and community organizations. Questions related to the social determinants of health including the quality of housing, education, access to medical care, community cohesion and social justice were asked. Residents were also queried about available and desired resources to support their child's asthma health and deal effectively with illness. When data collection was complete, each working group met to discuss the results and to make recommendations for integrating the results into the final intervention. The results and the recommendations from the working groups were then presented to the Steering Committee for discussion and final recommendation.

The information included in this report is being used to create a new system of community-based asthma-specific health care and information system for children with asthma in Hartford that empowers families, is effective in reducing/eliminating asthma disparities in vulnerable children and is capable of being sustained and disseminated to other communities. This report can also be used by other groups and organizations to inform policy and implement interventions to explore the needs of their constituents.

II. SUMMARY WITH KEY RECOMMENDATIONS

Asthma Medical Care and Access

Eighty percent of Hartford families report a follow-up asthma visit with their child's primary care clinician this past year and 63% describe no barriers to these visits. Sixteen percent, however, report that transportation is a barrier to accessing asthma care for their children which corresponds with the no-show rate data from urban-based primary care clinics (15-17%) nationally. Using Medicaid claims data, on average, children with asthma in Hartford have just under one (0.96) asthma-specific clinic visit per year which is below the NAEPP-EPR recommendation for asthma visits by severity suggesting that under-utilization of follow-up medical services for asthma is a problem in Hartford. Many families of children with asthma worry about the uncertainty of the disease with its exacerbations and quiescent periods and the potential for death from asthma. Families also report becoming very frightened when their child cannot breathe. These worries and fears inform many of their behaviors and attitudes about going to the emergency room, restricting activities and their feelings about their child's vulnerability.

Concerns about whether electronic prescriptions (e-prescribing) are received by pharmacies were expressed by some Emergency Department (ED) and primary care clinicians. Delays in electronic transfer of up to 2 hours routinely occur. Often, if the family goes directly from the ED or clinic to the pharmacy, the prescription may not have even been received. This results in telephone calls from the pharmacy to the clinician's office and to frustration by families who feel that the clinician did not complete the prescription. This may be a major and previously unrecognized gap in getting families to fill their prescriptions especially prescriptions for oral prednisone during an asthma exacerbation.

Clinicians uniformly endorse the importance of a written Asthma Treatment Plan for all children with asthma but they also note that they did not always complete one. School nurses want copies of these treatment plans to use to reinforce therapy and often do not receive one. Clinicians expressed concerns about the possibility of school nurses using old and inaccurate treatment plans. A mechanism by which current Asthma Treatment Plans are shared in real time between clinicians, families, school nurses and pharmacists should be developed.

Hartford parents want more asthma education. In their opinion, this information could be provided in many different locations and by many different educators. Nevertheless, the doctor's office is the primary place for asthma education and printed materials are the most useful to families. Parents expressed concerns about some of the educational materials that were being provided; some materials were not felt to be culturally and/or linguistically responsive.

Asthma and School Nurses, Teachers and Coaches

Parents overwhelmingly (90%) expressed satisfaction with the care that school nurses and their child's teachers were providing for their children with asthma. School nurses are confident in their ability to manage asthma but feel they would benefit from having a copy of every child's Asthma Treatment Plan and want more asthma educational materials and tools including spacer devices and rescue inhalers. Nurses were not aware of a standing order for albuterol in the event a student does not have medicine at school although a verbal policy is reported to exist. Formalizing this policy is an opportunity to assist school asthma management and a plan to include this information in the school nurse's manual has already been made. Teachers are confident in their ability to recognize and manage an acute asthma exacerbation in the classroom but want more education about how to recognize an asthma exacerbation. Coaches are not provided with asthma education nor are they necessarily aware of which children have asthma and who has an inhaler with them. These areas represent additional opportunities for intervention in the school.

The Home Environment

The most recent American Housing Survey (2013) for the city of Hartford notes that 15.7% of homes in

Hartford experienced water leakage/plumbing related problems in the previous 12 months. Most respondents are satisfied with their home environment and 89% of Hartford residents are completely or partially satisfied with their building maintenance. Vermin (rodents or roaches) were reported in 23% of homes in the AHS Survey. Regarding smoking in the apartment complex, public housing authorities report no policy on smoking in common areas such as hallways, landings or outside the complex. Hartford residents, most of whom rent (76%), are confident in how to report problems in their unit.

The School Environment

Some parents (9%) report that the school environment is a trigger for their child's asthma. Triggers for asthma in schools are school-specific with some parents reporting problems with dust and others reporting vermin. Tools for Schools™, a school environment indoor air quality improvement program, was successfully implemented in Hartford Schools in the early 2000s to national acclaim. The program stopped when school administration and priorities changed but efforts to reinstate the program began this past year. The most common complaints related to the school environment include concerns about outdoor temperatures (hot and cold) and recess.

Smoking

Many Hartford residents (45%) with children with asthma smoke cigarettes or have smoked cigarettes in the past. Most (88%) parents in Hartford who smoke want to quit and would like help from their child's physician. There is a paucity of smoking cessation programs for adults and none for youth in Hartford. Pediatricians provide limited smoking cessation counseling or aids to parents of children with asthma and 17% provide no services. Pediatricians also do not counsel adolescents regarding the hazards of electronic cigarettes. They cite time constraints and competing higher priorities as reasons for not counseling adolescents about smoking cessation/ prevention. They see mothers of newborns as an important group to prevent smoking re-initiation after delivery but need a system to identify mothers who stopped smoking during pregnancy. They also do not bill for smoking cessation counseling services and do not know how to bill for these services.

Role of Community Health Workers in the Asthma Neighborhood

Community Health Workers (CHWs) are new members of the health care team. In general, families, pediatricians and CHWs agree on the potential role and activities of CHWs in providing asthma education, home environmental assessment and basic remediation and smoking cessation counseling. There are differences in communication strategies with CHWs preferring face-to-face communication and clinicians preferring written communication (e.g., written referral). Families of children with asthma also support activities involving CHWs in their homes and in the pediatric offices.

Information Technology

Hartford residents are technology savvy. Eighty-two percent of respondents report access to the internet all or most of the time with smartphones being the most commonly used device. For families, the preferred person for asthma education is their pediatrician and the preferred vehicle is printed information provided in the pediatrician's office. When asked about sharing asthma-specific information, the overwhelming majority of Hartford residents endorsed sharing this information with their clinician, the school nurse, the pharmacist, teachers and coaches.

Community Organizations and their Role in the Asthma Neighborhood

Community organizations rarely provide asthma education to their staff (16%) and only a few (37%) sponsor asthma educational programs for their clients. Most of the organizations who responded to the survey are interested or very interested in providing this training and education which can be conducted by asthma-knowledgeable Community Health Workers.

Key Recommendations

1. Identify children with asthma and a low number of routine follow-up visits and children with asthma and a high no-show rate as one way to reduce asthma

disparities. Understanding barriers to follow-up visits for the specific child are critical. Decreasing barriers to transportation could improve visit rates and decrease clinic no-show rates. This could be accomplished by reviewing the bus routes, by using Community Health Workers to help families with appointments, by increasing access to care at school-based health centers and by educating families about the value of follow-up visits.

2. Develop a written Asthma Treatment Plan for every child with asthma. This plan should be re-assessed at least yearly during an asthma follow-up visit. A mechanism to share current Asthma Treatment Plans needs to be developed. Computer generated plans in the clinician's office could facilitate treatment plan development and distribution.

3. Educate families and clinicians about delays in the transfer of electronic prescriptions and explore ways to reduce the transit time as a way to improve the rates of filling prescriptions.

4. Provide additional educational opportunities for families, children with asthma, clinicians, school nurses, school-based health center nurses, teachers, coaches, pharmacists and community organizations. Messages that are consistent across all groups and that are culturally responsive and linguistically appropriate are needed. This education should include basic asthma knowledge, proper inhaler technique and basic home remediation/ improvement. Despite internet availability, families prefer printed materials. Community Health Workers could serve a major role in educating families, the community and community organizations. Appropriate training in asthma is critical to this role.

5. Provide school nurses with the child's current asthma treatment plan. The school nurse is an important provider of asthma care and is trusted by families of children with asthma. School-based health center practitioners provide asthma care and should be included in these activities as well.

6. Review asthma-related policies in the school district. Formalizing some policies may be beneficial to the school nurse.

7. Increase the number and access to smoking cessation programs for adults and youth who smoke. Train clinic staff how to counsel and how to bill for these services.

8. Improve communication between obstetricians and nursery staff regarding maternal smoking before and during pregnancy. Implement a smoking recidivism prevention program for mothers of newborns at risk for smoking re-initiation during the newborn period.

9. Increase support for Tools for Schools™. Facilitate classroom assessments for children experiencing school-specific asthma symptoms.

10. Create an easy to use Air Quality Index and cold temperature monitoring system for Hartford Public Schools linked to school policy regarding outdoor play/recess.

11. Improve the quality of housing for children with asthma in Hartford by implementing water/ mold reduction strategies and integrated pest management efforts.

12. Enact and enforce smoking ban policies in apartment building common areas.

13. Develop a credentialed, asthma-trained Community Health Worker workforce. CHWs should be embedded in clinics and internships within the school could provide additional educational opportunities for the CHW, could help to develop the CHW workforce and could support the school nurse in asthma activities. The role of the CHW is broad both in terms of helping families with access to medical care and in terms of asthma-specific activities. Providing easy transportation for CHWs to make home visits is important.

14. Explore use of mobile technology with families, most of whom in Hartford have internet access through smartphones.

III. METHODS

A mixed methods approach was used to conduct the community needs assessment including interviews with key informants, surveys and focus groups (Table 1). A total of 552 individuals participated in the Hartford Asthma Community Needs Assessment.

Table 1. Data Collection Strategies	
Strategy	**Number of participants**
Key Informant Interviews	22
Hartford Resident Surveys	263
Other Surveys	
School: Teachers and principals	148
Nurses	36
Community Organizations	19
Community Health Workers	14
Focus groups	
Primary care clinicians	24
Families	26

Key Informant Interviews

Each working group developed a list of key informants who were content experts and a list of specific interview questions. Asthma Center staff contacted the key informants and interviewed them either face-to-face or, if this was not possible, by telephone. Interviews were recorded, reviewed by the interviewer to assess information completeness and accuracy and verified by a second listener. The responses to the individual questions were written and then summarized.

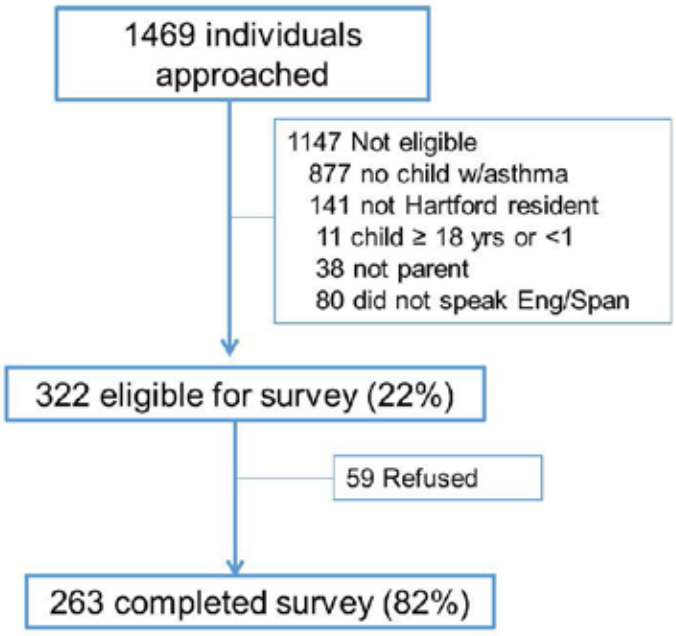

Figure 1. Flow diagram of Hartford Resident Survey

Surveys

Hartford Resident Survey

Each working group submitted a list of questions to ask Hartford residents. The original list contained more than 50 questions and was subsequently pared down first by the working groups and then by the Steering Committee. The final survey consisted of 26 questions and included questions about the home and school environment, asthma-specific medical care, asthma care in schools, asthma educational needs, smoking (both cigarettes and electronic cigarettes), the internet and community health workers.

Asthma Center staff conducted surveys with Hartford residents between April and August 2016 at primary care clinics in Hartford, at neighborhood grocery stores, at school events, at places of worship and sponsored events and at community and school health fairs. A total of 1469 residents were approached of whom 322 met all eligibility criteria which included residence in Hartford and child with asthma in the household who was less than 18 years of age (Figure 1). A total of 263 residents (82% of all eligible residents) completed a survey. Each respondent received a $5 gift card or grocery store coupon and asthma information for

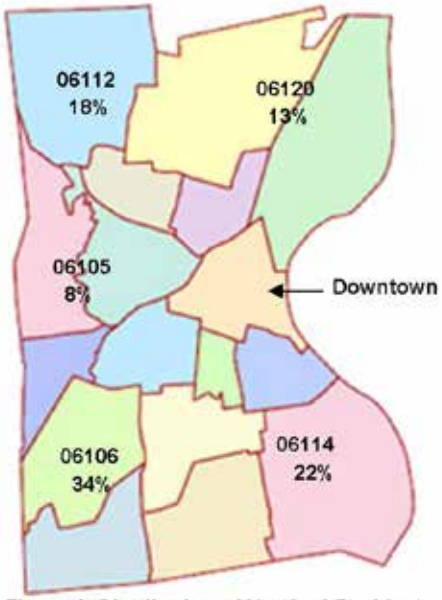

Figure 2. Distribution of Hartford Resident Survey Respondents by Zip Code

their time. Respondents were anonymous; only the family's zip code was obtained. Respondents were evenly distributed throughout Hartford according to the population density (Figure 2).

Clinicians

A total of 28 pediatric primary care clinicians were identified in Hartford and 24 (85%) completed a brief survey which asked questions about the asthma care they provided, how they counseled parents and adolescents about smoking and their attitudes and beliefs about using Community Health Workers in their practice. This was followed by a focus group which explored these areas in greater depth.

School Nurses

A 25 question survey was mailed to all school nurses and school based health center practitioners regarding asthma management. Thirty-six surveys (63%) were returned. Nurses were asked questions about their confidence in managing asthma in the school, their knowledge and training, their understanding of asthma-related school policies and any gaps that they perceived.

School Principals

The NHLBI/NAEPP *How Asthma-Friendly Is Your Schoo*l checklist was distributed to school principals. Seventeen principals (41%) returned the survey.

School Teachers

An electronic survey was sent by e-mail to all principals who were asked to distribute the survey to teachers in their school. This is a frequently used approach to obtain teacher information. Responses were received from 131 teachers. The exact numbers who were sent a survey is not known; according to the Hartford Federation of Teachers there are 1558 teachers in Hartford.

Community Organizations

A list of community organizations was created and grouped into 11 organization types (places of worship, boys and girls clubs, after school programs, etc.) Each organization on the list was asked to complete a survey which explored asthma-related education currently provided to their staff and to their clients and their interest in receiving additional information and in providing asthma education to staff and clients in the future. Responses were obtained from one or more groups within each of the organization types.

Community Health Workers

Using a list provided by the Southwestern Area Health Education Center (Southwestern AHEC), an electronic survey was distributed to all the CHWs in CT, Three reminder follow-up e-mails were sent to encourage participation. CHWs were asked about their interest in learning more about asthma and what they would need to teach families about asthma. Responses were obtained from 14 CHWs (9%).

Focus groups

Clinicians

Upon completion of a survey, 24 clinicians participated in three 60 minute focus groups that explored asthma care needs, barriers and facilitators, smoking counseling with parents and youth, and community health workers. These focus groups were transcribed verbatim and read by two core staff who extracted the themes using the template format described by Miles and Huberman2. A third reader adjudicated differences using a modified Delphi approach.

Families

Parents of children with asthma were identified through the schools, from the clinics, at faith-based organizations, at community events and at health fairs. Two focus groups were conducted with Hispanic families (one in English and one in Spanish) and two were conducted with African American/Black families. Participants provided consent and were provided with a light meal, child care and a $40 gift card. Fifty-six participants were invited and 24 attended one of the four 90 minute focus groups which explored attitudes about asthma, care provided in clinics and schools, and attitudes about home visitors. Focus groups were audio-recorded and transcribed verbatim. The Spanish focus group was translated into English and the translation was confirmed by a second Spanish-speaking individual. Themes from the focus groups were determined using the template format of Miles and Huberman and two readers. Adjudication of differences was conducted using a third reader and a modified Delphi approach.

Secondary Data Sources Included in this Report

American Housing Survey 2013

A subset of the AHS Survey specific for the City of Hartford was extracted from the larger report. A total of 518 units were surveyed of which 334 units were successfully contacted.

Easy Breathing Database

Since its creation in 1998 in Hartford, 8,717 children in Hartford have been enrolled in Easy Breathing and 3,606 children have physician-confirmed asthma. The database includes asthma severity, exposure to environmental tobacco smoke, family history of asthma, eczema and environmental exposures such as pests and pets. These data have been used in multiple publications including an exploration of medical services utilization by race/ethnicity before and after enrollment in the Easy Breathing program[3].

Community Health Network of Connecticut

CHNCT has been the sole Administrative Service Organization/Medicaid vendor for CT for the past 5 years. CHNCT identified 5820 Medicaid-insured children who live in Hartford and who had a claim for asthma in the previous two years. For these children, CHNCT provided de-identified prescription and medical services utilization data between July 1, 2014 and June 30, 2015.

Easy Breathing for Schools

This is a school nurse-centered school program whose goal is to reduce school absenteeism in children with asthma. Since the 2013 school year, a total of 367 children with poorly controlled asthma in 20 elementary schools in Hartford have been enrolled. Absentee data for all children with asthma and for children enrolled in the program for the 2013-14 and 2014-15 school years were available.

Connecticut School-Based Asthma Surveillance Report 2014

Asthma prevalence and severity from the Hartford school district for children in Pre-Kindergarten, Kindergarten, and 6th or 7th grade or 9th or 10th grade from 2009-2012 were available.

Hartford Schools Facilities Survey (August 2013)

Connecticut state law requires all public schools in Connecticut to complete a School Facilities Survey (ED050) every three years. The survey includes questions related to school building systems and issues (e.g., ventilation systems, moisture issues, etc.) with responses ranging from poor to excellent. Data for the 41 Hartford public schools for 2013 were downloaded and asthma-related questions were extracted.

Healthy Homes

Healthy Homes tracks information about the home environment for families referred to its program throughout Connecticut. Information for Hartford homes referred to Healthy Homes was obtained for the period 1/2011 to 2/2014.

US Census Bureau

Data from the Hartford City Census 2010 were used.

IV. DEMOGRAPHICS OF ASTHMA IN MEDICAID-INSURED CHILDREN IN HARTFORD

Estimated Prevalence of Asthma in Hartford's Medicaid insured Children.

CHNCT identified a total of 5,820 children with at least one asthma-related claim in the previous 2 years who lived in Hartford (Table 2, Figure 3).

Table 2. Demographics of Children Enrolled in HUSKY A (7/1/14-6/30/15)

Total population of children (0-17 years old) in Hartford	N = 32,192	
	n	%
Children with asthma*	5,820	18**
Age group		
0-2	803	14
3-5	1199	21
6-9	1683	29
10-14	1546	26
15-16	589	10
Zip code		
06105	514	9
06106	1880	32
06112	1122	19
06114	1331	23
06120	929	16
Other	44	1

*Source: CHNCT 7/1/14-6/30/15
**Expressed as percent of children with asthma

This represents the number of Medicaid-insured children with asthma in Hartford which is estimated at 18% of the pediatric population and demonstrates the high asthma prevalence in this community.

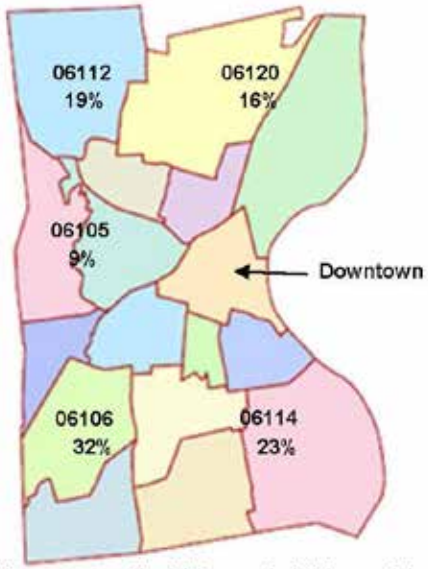

Figure 3. Medicaid-insured children with asthma living in Hartford with claims between 7/1/14-6/30/15.

Medical Services Utilization for Medicaid-Insured Children with Asthma in Hartford

Forty percent of the children with asthma in Hartford had one or more Emergency Department visits with asthma as either the primary, secondary or tertiary diagnosis and 2.8% were hospitalized at least once (Table 3).

Table 3. Asthma-Related Medical Services Utilization HUSKY A Children: Hartford, CT (7/1/14-6/30/15)*

	n	%
Emergency Department Claims		
0	3877	67
1	1290	22
2	404	7
>2	249	4
Hospital/Inpatient Claims		
0	5655	97
1	147	3
>1	18	0.3
Emergency Department Location		
CT Children's	1777	58
Saint Francis	1180	38
Other	123	4

*Asthma was identified using a 1st, 2nd, or 3rd asthma diagnosis code

When compared to the rates for Emergency Department visits and hospitalizations, Hartford has one of the highest rates in the country (Table 4, Figure 4).

Table 4. Medical Services Utilization Rate: Number/10,000

	Hartford	CT	US
ED visits	241.7	61.3	10.7
Hospitalizations	41.5	12.7	2.1

ED: Emergency Department
ED visits for asthma as a primary diagnosis
Hospitalizations: For asthma as a first or second diagnosis
Source: The Burden of Asthma in CT 2012 Surveillance Report

On average, children with asthma have less than one asthma-specific outpatient visit with their primary care clinician/year (0.96) which is below the recommended average for children with asthma. This overall underutilization of the doctor's office for care and relative overutilization of the ED is a gap in medical care for children with asthma in Hartford.

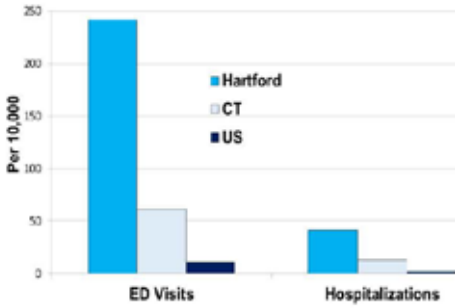

Figure 4. Medical service utilization per 10,000 for Hartford, CT and the U.S.

Asthma Severity

Asthma severity has been assessed using 3 different datasets (Tables 5-7). Using the CHNCT provided dataset (Table 5), a presumptive asthma severity was estimated based upon the type and dosage of asthma medication prescription refills. Thirty seven percent of children in Hartford had persistent disease. In contrast, using the Connecticut School-based Asthma Surveillance Report (ASR), almost 75% of students had a diagnosis of persistent asthma (Table 6). The Easy Breathing dataset (Table 7) for Hartford reported a rate of persistent asthma at 48%.

Table 5. Presumptive Asthma Severity in Hartford Medicaid Insured Children (2014-2015) (n=5,820)

Presumptive Asthma Severity	Number	Percent
Intermittent	3658	63
Mild, persistent	777	13
Moderate, persistent	1348	23
Severe, persistent	37	1

Source: CHNCT dataset using medication to determine asthma severity

Table 6. Asthma Severity in Children in Hartford School District (22,202 Students in 48 Schools (2009-2012))

Asthma Severity	Number	Percent
Intermittent	5,639	25.4
Mild persistent	13,188	59.4
Moderate or Severe Persistent	3,375	15.2
Asthma Treatment Plan (ATP)		
Has ATP	1,798	8.1

Source: Connecticut School-Based Asthma Surveillance Report 2014
An ATP is a set of instructions for the parent or child that includes instruction on how to treat their asthma to keep their asthma under control, how to treat their asthma when it is not under control (asthma attack/exacerbation) and when to call the doctor.

Table 7. Asthma Severity in Hartford Children 0-17 years (n=6,745)

Asthma Severity	Number	Percent
Intermittent	3,470	51
Mild persistent	1,893	28
Moderate persistent	1,241	18
Severe persistent	141	2

Source: Easy Breathing database 2015

Each of these datasets has strengths and associated limitations. Both Easy Breathing and the ASR report clinician-determined asthma severity; Easy Breathing reports this for children of all ages while the ASR reports asthma severity for children by school district in grades Pre-Kindergarten, Kindergarten, 6th or 7th grade or 9th or 10th grade. Irrespective of the data used, however, asthma is a major disease with high severity and associated morbidity in children in Hartford.

Table 8. Asthma Diagnosis by Race and Ethnicity: Hartford Children

Race/Ethnicity	No Asthma	Asthma	Unable to Determine
Black/African Am	1940	1471	262
Hispanic	2879	4143	428
Non-Hisp White	206	130	13
Carribean/VI	251	137	41

Race and Ethnicity of Children with Asthma in Hartford

Information on asthma diagnosis by race/ethnicity is not available from the CHNCT dataset. Using Easy Breathing data, more than 95% of the children with asthma in Hartford are either Black or Hispanic (Table 8, Figure 5). This is not the prevalence of asthma by race/ethnicity in Hartford children but rather the percentage of children with asthma enrolled in Easy Breathing.

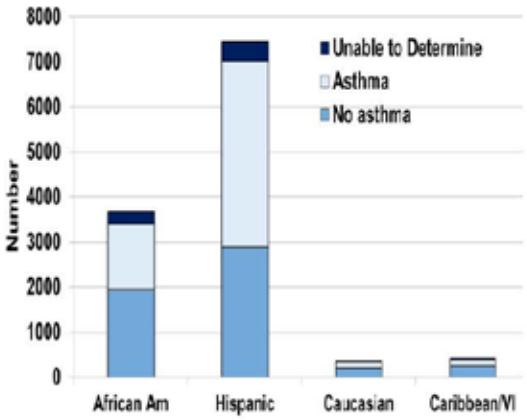

Figure 5. Asthma by Race/Ethnicity
Source: Easy Breathing 2015
Missing race/ethnicity: 866

Interventions to Reduce Asthma Disparities in Hartford Children: Easy Breathing

Easy Breathing is an asthma management program that has been implemented in Hartford since 1998[4]. The program is modeled after the national asthma guidelines and is designed to improve the care of children with asthma and to reduce asthma-related disparities. The program has demonstrated that the patterns of medical services utilization are different in Hispanic and Black children with longer durations of hospitalization for Black children and higher rates of ED utilization for Hispanic children with asthma. Easy Breathing successfully reduced medical services utilization for both Black and Hispanic children (Table 9) and is a nationally recognized evidence based asthma program.

Table 9. Effectiveness of Programs to Reduce Asthma Morbidity in Children in Hartford

	Black (n=546)			Hispanic (n=1,816)		
	Adjusted relative rate (95% CI)			Adjusted relative rate (95% CI)		
Asthma-related	Pre Ez B	Post EzB	P value	Pre EzB	Post EzB	P value
Hospitalizations	1.10 (0.77-1.57)	0.47 (0.27-0.83)	**0.009**	1.08 (0.9-1.68)	0.72 (0.47-1.09)	0.12
ED Visits	1.14 (0.99-1.32)	1.03 (0.86 -1.23)	0.73	1.58 (0.65-2.93)	0. 85 (0.76-.96)	**0.006**

Source: Easy Breathing Database[5]

Hartford Resident Survey Respondent Demographics (Table 10)

A total of 263 Hartford residents with children with asthma completed a Hartford Resident Survey. To participate, respondents had to be greater than 18 years of age, have a child in the household with asthma who was between 1 and 18 years of age and live in Hartford. The mean age of the children with asthma among the respondents was 8.5 ± 4.3 years.

Hartford Clinicians Demographics

Twenty four of the 28 pediatric primary care clinicians in Hartford completed a survey and participated in a focus group (Table 11).

Table 11. Clinician Demographics

Characteristic	Male	Female
Highest degree		
MD/DO	4	10
APRN/PNP/PA	0	10

Table 10. Demographics of Hartford Resident Survey Participants (n=263)

Characteristic	Number	%
Race/Ethnicity		
African American	69	26
Caribbean/Virgin Island	4	2
Hispanic		
Puerto Rican	137	52
Hispanic/Other	16	6
Multi-racial	32	12
Non-Hispanic White	4	2
Asian/ Pacific Islander	1	0.4
Respondent Age Range (yrs)		
18-24	18	7
25-34	115	44
35-5	110	42
>50	20	8
Zip Code		
06106	88	33
06114	58	22
06112	48	18
06120	35	13
06105	21	8
Other	13	5
Age of child with asthma (yrs)		
0-4	46	18
5-11	144	56
12-17	68	26
Participants by Recruiting Location		
Health clinic	90	34
Grocery store	47	18
Community fair	46	17
School/After school program	52	20
Focus group	14	5
Library, Place of worship/camp	14	5

V. MEDICAL CARE FOR CHILDREN WITH ASTHMA IN HARTFORD

Pediatric Primary Care Office/Clinic

Access and barriers to medical care

82% of respondents agree that routine asthma visits are very important and 80% report that their child has had a routine asthma follow-up visit in the previous 12 months. The most common barrier noted to a routine asthma appointment is a lack of transportation (16%); limited office hours are also reported as a barrier by 6% of respondents (Figure 6). These results are consistent with the no-show appointment rates nationally of 15-17%% and suggest that these are the important barriers to follow-up asthma care in Hartford.

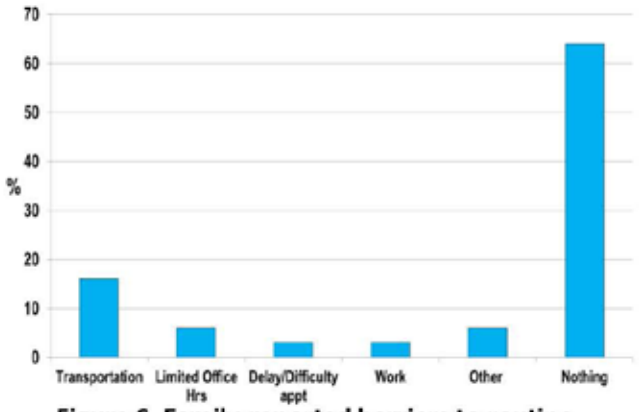

Figure 6. Family-reported barriers to routine asthma follow-up visits.

Asthma Management at Home

Giving rescue medications, beginning their child's sick plan and going to the emergency room are the 3 top activities endorsed by respondents if their child is experiencing an asthma exacerbation. More respondents choose going to the emergency room before calling their child's physician (47% would go to the ED vs 39% who would call their child's clinician). Overall, parents are either very confident (55%) or confident (31%) in managing their child's asthma. But it is the uncertainty and unpredictability of asthma that worries them the most (59%) followed by their child not being able to breathe (18%) and death (15%) from asthma. Only 11% of respondents report that they are not worried about their child's asthma.

Educational needs

Families are enthusiastic about their need and desire for more asthma information. Most respondents want to obtain this information from their primary care physician's office, followed by the school nurse and their pharmacy (Figure 7).

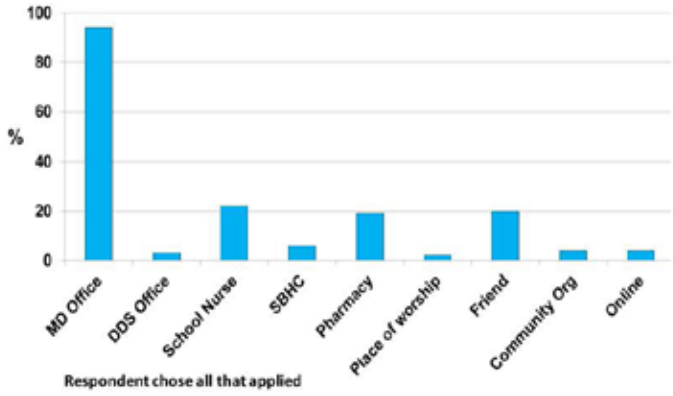

Figure 7. Where families with children with asthma want to receive asthma information.

Clinician Attitudes and Actions

All clinicians agree that every child with asthma should have a written asthma treatment plan but most clinicians provide a plan for many but not all of their patients. They also support and currently provide 24 hour phone/on-call coverage and same day appointments for children with asthma who are experiencing an asthma exacerbation. Clinicians want to provide computer generated written treatment plans and asthma education. Some feel that allergy testing is important and some feel that pulmonary function testing is useful in managing asthma but it has to be convenient. Clinicians especially want help teaching children proper inhaler technique. Some clinicians also express concern about the possibility that school nurses in particular could have recent but not the current Asthma Treatment Plan and could give families inaccurate messages about their medication. A real time system of information exchange is critical in their opinion.

Emergency Department and primary care clinicians express concerns about using e-prescribing because of frequent calls from pharmacies about prescriptions that have not been received electronically and families who are upset that their prescription is not ready.

Further discussions with pharmacists, however, reveal that it often takes up to 2 hours for a prescription to be received in the pharmacy. Thus, if a family comes directly from the ED or clinic to the pharmacy, the prescription may not have been received much less filled. Families may have to return at a later time to pick up their prescription which could result in the prescription not being picked up. This is a major heretofore unrecognized gap in care.

Asthma Care in the School

School nurses and School-Based Health Center (SBHC) practitioners express a high level of confidence in providing appropriate asthma care for students with asthma. They state that they understand the difference between persistent and intermittent asthma (72%), in how to manage a student's asthma treatment (75%) and when to call EMS for an asthma attack (89%). Conversely, 25% do not understand how to manage a student's asthma treatment and 11% do not know when to call EMS for an asthma attack. These are clear opportunities for education for the school nurses. They report that it is important to know what medications a student is taking every day for their asthma and to ask students if they are actually taking these medications. Similarly, school nurses feel a responsibility to observe, demonstrate and correct student's inhaler technique (97%).

Almost 90% of the school nurses and practitioners report frequent communication with parents about their student's asthma needs and 67% report some communication with the child's primary care provider. For school nurses and practitioners, having a copy of the child's home Asthma Treatment Plan is either moderately important (26%) or very important (74%).

In general, nurses are either somewhat aware (26%) or completely aware (74%) of school policies related to managing an asthma attack at school but, only 50% know of a standing order for albuterol administration. Twenty-seven percent are usually aware when students missed school because of their asthma and 33% are never or rarely aware of school absenteeism for asthma.

When asked what school nurses and practitioners need to provide care, the most frequent response is extra spacers followed by inhalers that can be used when students who self-carry forget to bring their inhaler to school, medication for children who are uninsured and supplies for the administration of aerosolized albuterol.

Parents are overwhelmingly satisfied with the care provided to their children by school nurses (Figure 8) and by the skill of their child's teacher in recognizing when their child is experiencing an asthma attack.

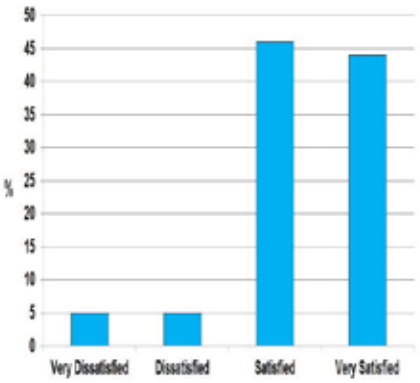

Figure 8. Parental satisfaction with the asthma care provided by the school nurse.

Nurses want more asthma education especially related to updates on best practices and new guidelines, knowledge about the availability of community resources and videos for themselves. They also want more educational materials for their students including videos for students and posters on inhaler technique and the different inhalers. They are evenly divided about best ways to deliver/receive educational information for themselves but the vast majority (78%) feel that a one-on-one interaction with the student is the best format to provide asthma education. Nurses also report providing education for classroom teachers (56%), gym teachers (42%) and other special teachers. A small number (14%) provide information for coaches and 31% do not provide any formal education to staff. Barriers to providing asthma education in schools include insufficient time (54%) and absence of someone to handle clinical duties while the nurse is providing asthma education (29%).

Teachers also want more education especially education about how to recognize an asthma exacerbation. They express interest in looking for ways to enhance communication between the school nurse and themselves. They are also satisfied (61%) or very satisfied (30%) with opportunities for students with asthma to fully participate in physical education, sports, recess and field trips

Fourteen respondents to the school teacher survey reported that they are either a physical education teacher or a sports coach. Eighty six percent responded that they are aware of exercise-induced asthma. Many coaches do not know if their students pre-treated prior to physical activity (Figure 9) or if they have asthma rescue medication with them during the sports activity (Figure 10).

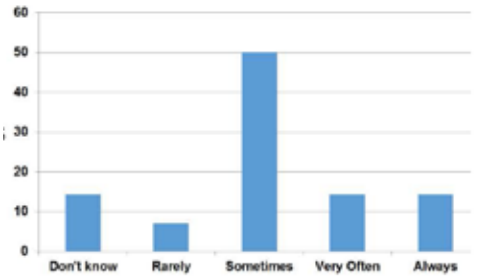

Figure 9. Frequency of coaches knowing if a child has pretreated with albuterol before exercise

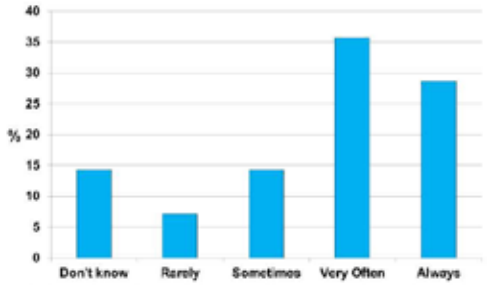

Figure 10. How often coaches know if a child with asthma is self-carrying an inhaler during a sporting activity

Only 14% report that a nurse is present in the school building during the sports program and many are not aware when a student is experiencing an asthma-related problem while participating. This observation by coaches was mirrored by Hartford residents who expressed concern about their child exercising and being without asthma medications after school when the nurse's office is locked. Over 50% of the coaches/physical education teachers have never received training in asthma.

VI. THE HOME AND SCHOOL ENVIRONMENTS

Housing and the Home Environment in Hartford

Over 75% of the housing stock in Hartford is renter-occupied and 66% of the housing stock was built

before 1950 (Table 12). Information about the home environment is available through 2 sources: Healthy Homes data on 140 homes referred to their program between November 2011 and February 2014 and the American Housing Survey (AHS) 2013, City of Hartford subset. The AHS is a comprehensive housing survey which has interviewed the occupants of the same units since 1985. Metro Hartford was last included in this survey in 2011 and data specifically for the City of Hartford have been extracted from this report.

Table 12. Housing Characteristics

Characteristic	Number	Percent
Total Housing Units	53,963	
Occupied Housing Units	45,808	85%
Owner Occupied	11,020	24%
Renter Occupied	34,788	76%
Median gross rent	$878	
Housing Units with children	16,592	36%
Single Units, detached	8,152	15%
Single Units, attached	2,243	4%
Average household size	2.57	
Housing stock age	66% built before 1950	

Source: US Census Bureau (2009-2013), http://www.census.gov/quickfacts

Healthy Homes: Hartford

Between November 2011 and February 2014, the Healthy Homes program assessed 140 units in Hartford (Table 13). Similar to the Census Bureau data, 58% of the units were built before 1950, 33% were built from 1950-1977 and 9% were built after 1978. Thirty six percent of these units were owner-occupied while 64% were renter-occupied. Thirty nine percent were single family or duplex homes while 61% were multi-family. Asthma related hazards were frequently observed with water-related hazards and structural issues being the most common. Tenant-related asthma hazards noted in the homes included strong smells (e.g., air freshener), visible dust and carpeting in the bedroom.

Table 13. Asthma-Related Hazards in Hartford Homes

Hazard	% of units
Observed Mold or musty odor	24
Musty Oder	20
Water stain or leak	37
Cockroaches	20
Mice (seen or evidence)	22
Holes in walls (Pest entrances)	36
Smoking indoors	14
Air freshener or potpourri, incense	50
Visible dust	42
Excess clutter	14
Bedroom carpet	44

Source: Healthy Homes 1/11-2/14

City of Hartford American Housing Survey (2013)

A total of 509 units in the City of Hartford were contacted for the AHS survey in 2011 and occupants of 412 units completed all or part of the survey. Consistent with the census data, 74% of the participating units were renter occupied. Most units (71%) had 3 or fewer floors and 2 or more bedrooms (Table 14). Amenities such as a garbage disposal were uncommon.

Table 14. Home Characteristics

	Percent
Ownership	
Owned	26%
Rented	74%
Bedroom Number: 0-1	27.4%
≥2	72.6%
Garbage disposal: No	71.6%
Number of floors in Bldg ≤3	70.9%
Gas stove	47.3%

Source: AHS 2013 City of Hartford extraction: Categories are not mutually exclusive

To assess the quality of the home, questions on the City of Hartford AHS explored three specific areas: Water/ plumbing related concerns, the presence of vermin and structural issues including cracks and holes (Table 15). When any water damage/leaks were examined and added together, 15.7% of the units reported a water-related issue with the unit.

Hartford residents express overall satisfaction with the maintenance of their building and with the rapidity with which issues are resolved (Table16). In 2015 there were 19 tenant complaints that were adjudicated by the State Superior court. Most of these tenant complaints include water leakage, holes in the walls, electrical concerns, vermin and appliance disrepair.

Table 15. Home Repair/Maintenance

Condition	Yes, Condition Present %
Water related:	
Any inside water leak in last 12 months	7.0%
Any outside water leak into unit in last 12 months	9.1%
Water in the basement	1.8%
Roof leak	4.3%
Vermin	
Evidence of Rodents	23%
Evidence of Roaches	15.9%
Open cracks, floors, walls, ceilings	8.7%
Foundation cracks/holes (single units)	7.7%
Holes in floor	4.6%
n (range) = 392-412	

Housing operators (Public housing, Section 8/ RAP) were surveyed and reported that housing units and common areas are assessed annually by maintenance staff or inspectors and that asthma-related conditions such as water leaks, cockroaches, vermin and mold are identified.

Table 16. Satisfaction of Hartford Residents with Unit Maintenance

With Building Maintenance	
Completely or Partially	89.3% (216/242)
Dissatisfied	10.7% (26/242)
Solves Problems Quickly: Yes	80.0% (184/230)
No	11.3% (26/230)
Mixed	8.7% (20/230)

One operator reported that maintenance staff also identified dust and clutter. One housing operator reports tobacco use in the individual units but none identify smoking in the common areas and none of the housing operators currently has a smoking policy. Operators also report that rarely or occasionally families self-identify as having a child with asthma but they are interested and willing to provide tenants with information about asthma and in receiving information about asthma (Figure 11).

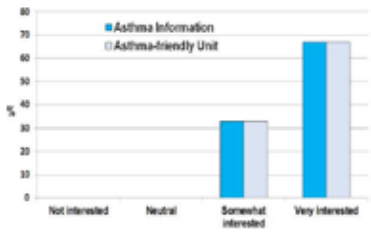

Figure 11. Level of interest of housing operators in providing asthma information to tenants and in receiving asthma information.

Hartford residents were asked about who they would call for a problem in their home and their confidence in controlling asthma triggers in their home. Thirty five percent of respondents say they would call no one while 57% report that they would call the landlord or property manager. Twenty percent report that they would call the City Health Department.

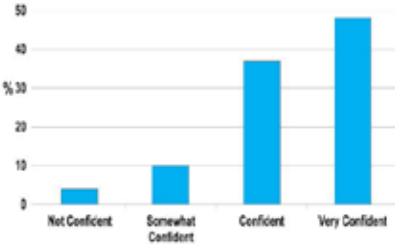

Figure 12. Parental confidence in controlling asthma triggers in the home.

Hartford residents are confident in their ability to control asthma triggers (Figure 12).

Table 17. Hartford Public Schools (n=41) by Grade Level

Grades	%
PK-4, K-4, PK-5, PK-6	22
PK-8, K-8	41
PK-12, K-12	5
4-12	2.5
5-8	2.5
6-12	7
9-12	20

The School Environment

Hartford Public Schools consists of 41 active school buildings with original construction ranging from 1883 to 2009. More than half of the schools were built prior to 1960 (51%). Twenty-seven schools have undergone major renovations. On average, there are 39 classrooms per building. School enrollment ranges from 96-1381 with an average enrollment of 528 students per school with many different grade level arrangements (Table 17).

Hartford Schools Facilities Survey (August 2013)

As required by law, all Hartford Schools except one, self-report adoption of an Indoor Air Quality (IAQ) program for the facility and 35 schools (85%) report that there is a program to uniformly inspect and evaluate the indoor air quality of the building. All schools report implementation of a Green Cleaning Program accompanied by a written statement regarding the program. Seventy-one percent of the schools have central HVAC and 3 have proposed HVAC; 22% of the schools use window air conditioners. The quality of specific items including air conditioning, heating, plumbing quality, ventilation, source reduction and moisture are reported below (Figure 13a-d).

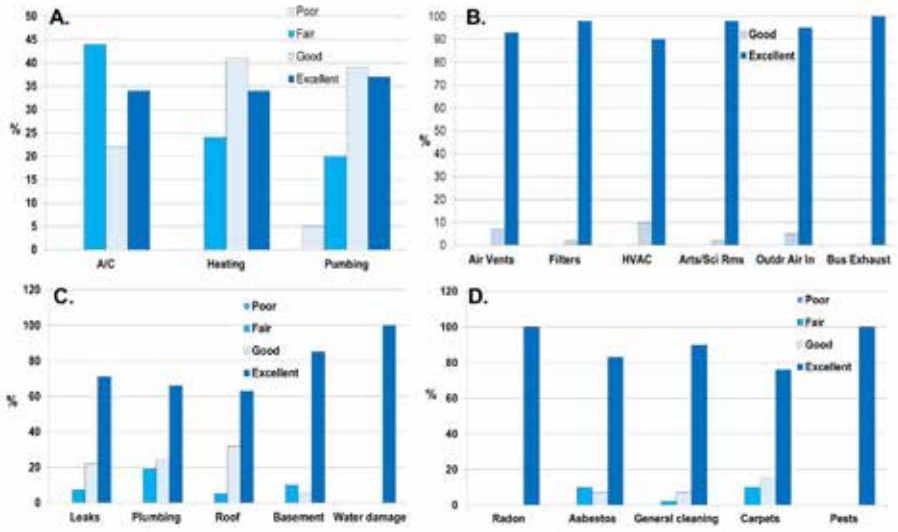

Figure 13. Self-reported Indoor Air Quality assessment in Hartford Schools. A. Building systems. B. Ventilation quality. C. Moisture issues. D. Source reduction

Of the 41 schools, 24 have proposed capital improvement projects as of January 2016. Some of these improvements include extensive renovations (renovate to new); others include replacing the roof, removing the carpet, mechanical and lighting upgrades and improving security systems.

Hartford Principals completed a How Asthma Friendly is Your School Survey (Table 18). Principals report that Hartford schools are tobacco free and efforts are made to reduce students' exposure to asthma triggers inside and outside of school buildings. Their responses also suggest opportunities for improvement particularly around implementing the no-idling policy for vehicles on school grounds and monitoring the daily local Air Quality Index.

Table 18. "Asthma friendliness" of Hartford Schools (School Environment); 2016

Questions	Yes (%)
Are all school buses, vans and trucks free of tobacco smoke?	100
Are all school events, like field trips and athletic events (both at "home" and "away" free from tobacco smoke?	100
Are the school building grounds free of tobacco smoke at all times?	94
Does the school help to reduce or prevent students' contact with allergens or irritants-indoors and outdoors-that can make their asthma worse?	94
Are any of the following present?	
-Cockroach droppings	6
-Excessive dust and/or carpets, pillows, cloth-covered or upholstered furniture, or stuffed toys that harbor dust mites)	13
-Mold or persistent moisture	13
-Pets with fur or hair	6
-Strong odors or sprays, such as paint, perfume, bug spray, and cleaning products	6
Does your school have a not-idling policy for vehicles on school grounds, such as school buses and car pools?	65
Does your school monitor daily local Air Quality Index (AQI) information to help reduce students' exposure to unhealthy air?	29

The School Environment and Asthma

Hartford school teachers report that student's asthma is very often (8%) or sometimes (39%) triggered by something in the school environment (Figure 14). While most of this is attributable to exercise as an asthma trigger, a few teachers report the presence of rodent droppings, dusty classrooms that are "rarely cleaned", difficulty with air circulation and exchange and unclean carpeting.

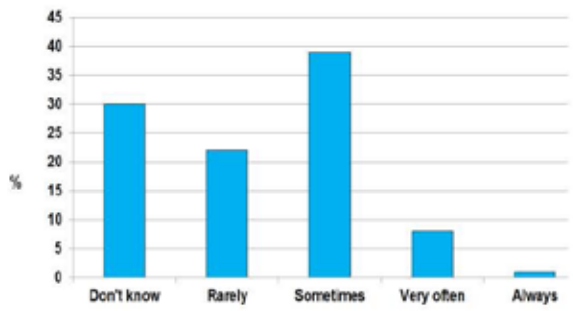

Figure 14. Frequency of asthma symptoms triggered in school reported by teachers.

Hartford parents were asked these same questions in the Hartford Resident Survey and report similar frequencies with 9% of the opinion that their child's asthma is triggered in the school most or all of the time. Upon further questioning, most parents report that exercise during gym class or recess is a major trigger. Some parents (14% of the total group), however, express an opinion that there are issues with air quality and/or poor ventilation (16% of the 14%), dust/dust mites (16%), pollen count/too hot outside (16%), allergens (6%), cleaning products (4%) and lack of air conditioning (2%).

HPS Family Services is the office parents are directed to if they want to register a formal complaint or concern regarding their child's education. Key informant interviewees reported that particularly during the Fall, the office receives complaints about mice and mice droppings at various schools, even some of the newer schools. A second common complaint is temperature in the schools (either too hot or too cold). Sometimes, parents will take pictures of the issue they are observing and send the pictures to Family Services. Family Services has governing policies that require them to return a parent's initial call within 24 hours, address the issue with the appropriate HPS personnel and follow-up with the parents within one-week to see if the issue has been addressed.

Tools for Schools™ (TFS) in Hartford Schools

The Tools for Schools™ (TFS) program is a comprehensive resource to help schools maintain a healthy environment in school buildings by identifying, correcting, and preventing Indoor Air Quality (IAQ) problems. TFS was previously implemented in 52 Hartford Public Schools during the 2000's with great success and national recognition. The program waned as administrative priorities changed but efforts to re-implement the program were initiated during the 2015-2016 school year.

As of April 2016, Session 1 TFS trainings have been conducted with 5-member teams from 24 Hartford Public Schools. Session 1 training included basic Indoor Air Quality (IAQ) information and steps

to successfully implement the program. Between Session 1 and Session 2, the teams have been charged with completing TFS checklists within their respective schools. Session II training includes steps for conducting an IAQ walkthrough. This training has occurred for 16 of the 24 schools that completed Session 1 training. After Session II, teams were instructed to conduct a walkthrough at their respective schools, combine the data from the walkthrough with the checklist data and develop a recommended action plan. As of July 2016, Hartford Public Schools is in the process of analyzing the TFS data with the intention of developing an action plan based upon review of all of the recommendations.

VII. ENVIRONMENTAL TOBACCO SMOKE AND ASTHMA

Clinician Activities for Smoking Cessation for Parents

Clinicians report that they often query parents of their patients about the parents' smoking habits. More than ¾ of clinicians ask about second hand smoke exposure at every visit or at least yearly. Most often clinicians refer parents to the CT Quit Line or provide printed educational materials. Twenty-five percent, however, provide no smoking services, materials or assistance to parents.

Clinician Activities for Youth Smoking Prevention and Cessation.

Clinicians begin counseling youth about smoking at 11.5 ± 2.0 years of age and more than 90% report asking about smoking at every visit, more than yearly or yearly

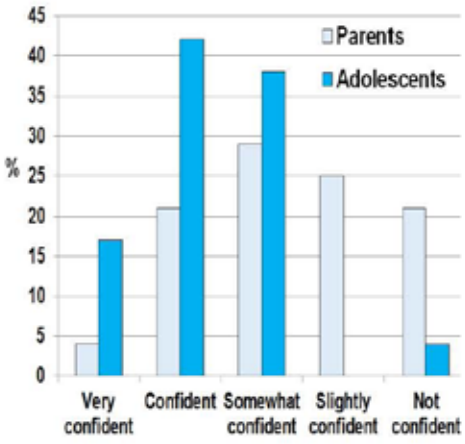

Figure 15. Clinician confidence in counseling parents and adolescents about smoking.

even though none of the clinicians think that their counseling activities are effective. In contrast, clinicians ask youth about electronic cigarette use rarely (18% ask more than yearly and 12% ask yearly) even though 90% believe e-cigarettes are as dangerous (82%) or more dangerous (8%) that cigarettes. Clinician confidence in counseling is highest for counseling youth as compared to parents (Figure 15).

Barriers to Smoking Cessation

Clinicians deny that reimbursement issues or a lack of importance are reasons why they do not provide smoking counseling to parents or youth. Very few clinicians also report knowing how to bill for smoking cessation/ prevention counseling. Rather all clinicians endorse that they have limited time for counseling and that other issues such as gun violence, sex and drugs are a higher priority. Clinicians express willingness to refer parents and youth to smoking prevention/ cessation programs if such programs are available either in their practice or in the community. Clinicians believe that the most teachable moment related to parental smoking cessation is in the newborn period and they would like training in how to be most effective and materials that they could use during this teachable moment. They also would like a system by which obstetricians could inform the newborn nursery of mothers who have stopped smoking during pregnancy and a program that they could implement for these mothers in the immediate postnatal period to prevent resumption of smoking.

Smoking Cessation Programs in the Greater Hartford Area

Five smoking cessation programs in the greater Hartford area have been identified. All programs are for adult smokers 18 years of age or older. One program is available only to adults in the New Haven area. Only two programs are available in both English and Spanish although one currently unfunded program can provide translation services. Success rates are not available for all of the programs; the American Lung Association's Freedom from Smoking program reports a 47-85% success rate if the participant completes all 8 sessions but information about what percentage of participants

completed all 8 sessions is not available. Grant funded programs have no charge to participants with a small fee of $50-100 if not grant funded.

Smoking in Hartford

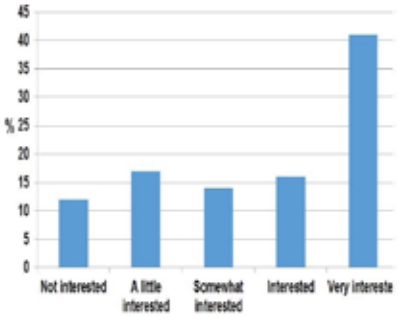

Figure 16. Parental interest in quitting smoking.

In the Hartford Resident Survey, 45% of the respondents, all of whom have a child with asthma in their household, report a history of smoking of whom half are current smokers. They deny smoking in the car or in the home. Of those respondents who have quit smoking, "cold turkey" is the most common response (80%) to the question about how they quit. None of the former smokers report attending a smoking cessation program. Respondents who smoked want information about how to quit from their primary care physician's office (51%) but some also report wanting to use the quit line (23%). Only 5 respondents express interest in a phone or mobile app and only 4 report wanting a brochure. Almost half of the current smokers are interested or very interested in quitting smoking but 17% were not interested at all in quitting smoking (Figure 16).

Smoking Policies

Policies related to smoking exist in schools, work places and restaurants in Hartford. A no smoking policy exists in housing units in Hartford but none of the housing agencies are confident that maintenance staff will report smoking-related issues to the agency.

VIII. COMMUNITY HEALTH WORKERS (CHWS)

The exact size of the CHW workforce in CT is not known. Southwestern Area Health Education Center (Southwestern AHEC) has a list of 148 CHWs in CT.

In 2013, AHEC conducted a survey of CHWs with 43 respondents; 76% of the CHWs were either Hispanic or Non-Hispanic Black; 19% had a high school diploma while the remainder had some college or an Associate or Bachelor degree. Half of the CHWs made $30,000-$45,000/year and over 90% were satisfied with their job; just under half of the respondents felt secure in their job with a lack of stable funding being the most common reason for job insecurity. Most CHWs provided help with community advocacy and access to medical and non-medical services for their clients.

Approximately 40% provided culturally appropriate health education. Most of the CHW respondents were employed by non-profit agencies followed by local health departments. Only 8% of the CHWs were employed by hospitals and health clinics.

In the CHW survey conducted for this needs assessment, 5 respondents (36%) report that they have received special training in asthma; of these five, one has had a life experience with asthma (a child) and one has received formal coursework in asthma. Most respondents (86%) are either somewhat interested or very interested in working with families with children with asthma. Fifty percent of these respondents have worked as a CHW for 10 years or more.

State Innovation Model (SIM) CHW Work Group

Leaders of the CHW SIM workgroup were interviewed to gain additional insights into the direction of the SIM related to CHWs. The CHW Advisory Committee of SIM is looking at credentialing CHWs with possible Certification as has happened in other states. The goal is for this plan to be presented to the legislature in the next session with licensure to begin in the fall of 2017. As part of this certification, CHWs will be required to participate in continuing education.

Clinician Attitudes Toward CHWs

In surveys and focus groups with the primary care clinician community in Hartford, 46% of the clinicians report that they have worked with a CHW in the past or are currently working with one. Clinicians are supportive of CHWs and their work (Figure 17). Ready availability during clinic hours, on site availability and being bilingual are important determinants of the clinicians'

willingness to work with a CHW.

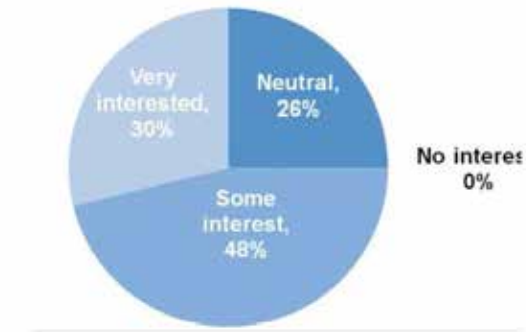

Figure 17. Level of clinician interest in working with a CHW.

Clinicians are concerned about the acceptability of a CHW in the home with their patient population. One clinician stated: "The family structure and the power structure within the family could be a real barrier to a CHW." (In contrast, most but not all of the Hartford Resident Survey respondents and focus group participants expressed an openness to welcoming a CHW into their home). One clinician suggested a "virtual home visit" to overcome this obstacle. Clinicians want CHWs to do home visits but think that some of the CHWs will need transportation. Clinicians suggest many activities both those related to general activities and those specific to asthma that CHWs can perform. Clinicians make it clear, however, that any CHW in their clinic needs to be well trained, capable of delivering consistent messages have a high level of professionalism and be approved for hire by them. Important attributes of the successful CHW include being trustworthy, personable, knowledgeable, flexible, and bilingual and a good teacher.

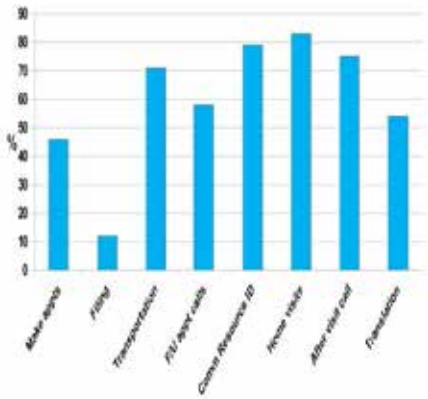

Figure 18. General activities that clinicians would like CHWs to perform.

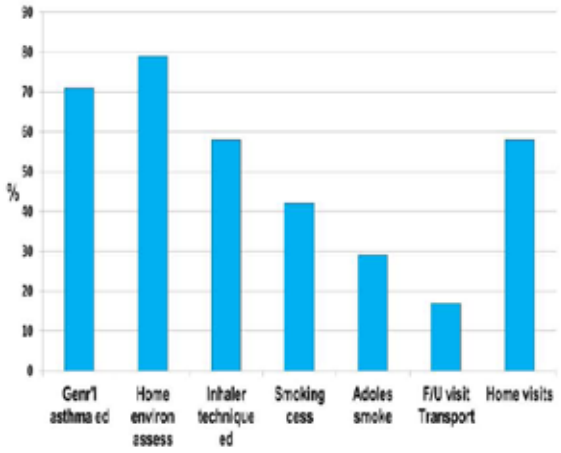

Figure 19. Asthma related activities that clinicians would like CHWs to perform.

CHW Attitudes About Asthma Services They Could Provide

With appropriate training, CHWs feel that they can provide multiple asthma-related services in the primary care clinic setting. They endorse the list of activities suggested by the clinicians but are least confident about teaching inhaler technique, helping families obtain their prescriptions and helping with transportation to the clinics for follow up visits.

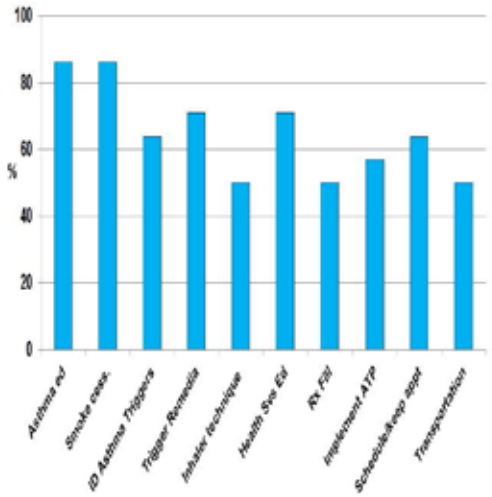

Figure 20. Services CHWs would like to provide in primary care settings.

Communicating with School Nurses and with Clinicians

CHWs express a strong preference for in-person or phone communication between themselves and school nurses (86%) and between themselves and clinicians (93%). Written communication is the least desirable form of communication (50%). This preferred communication strategy is in contrast to

the preferred method expressed by clinicians and school nurses. These two groups prefer written communication with CHWs (e.g., completing a referral form) over both phone and in-person communication.

Other Activities in the Community for Community Health Workers

Community organizations express interest in receiving training for their staff and education for their clients in asthma. They suggest that these are activities and roles that a well-trained CHW could provide. Ideas for education include lectures/ presentations at asthma programs, small group sessions and brief educational sessions in community locations (e.g., library, health fairs), as well as carwashes, barbershops, salons and laundromats. Expert CHWs trained in asthma can also conduct train-the- trainer sessions for parish nurses and faith-based health and wellness ministries.

CHWs also see a role in working with the community and specifically mention working with after school programs, DCF, the housing authority, places of worship and non-profits such as day centers. They recommend that college courses be created to provide all CHWs with basic asthma education and for interested students comprehensive education and training.

Attitudes of Families Toward CHWs

Parent focus group participants are very supportive of working with CHWs. Important roles that parents think CHWs can serve include helping to intervene between the child and the school nurse. Families express support for both small group sessions and one-on-one sessions. One mother states: "There's times where you could use one-on-one, where you just could express yourself and tell them how everything is really going." They also express support for meeting with CHWs in their homes as well as during visits to the doctor's office. Some prefer the doctor's office to the school and others express a desire to have telephone calls as checking-in opportunities to see how things are going. "A phone call is good, too, like every once in a while, like let's say if you're like always busy and running around…a phone call is good". Some families want CHWs in the school and in community centers and suggest other opportunities including during a hospitalization or ED visit for asthma.

None of the families in the focus groups are concerned about having CHWs in their home if "they're a good person and they treat you nice", "if they go for one purpose, it's for that purpose, that I will use the help, not to go into my personal stuff", "if they are professional", and if they are "sociable". They also feel that the CHW needs to be more knowledgeable than the parent. One parent expressed this when she said: "I go on the computer and read for that reason. That person needs to be someone I can learn something from that I didn't know." Parents also express a strong desire for cultural competence including bilingual CHWs, and accurate and culturally appropriate translations. One parent stated: "I don't have to pay an interpreter to accompany me twenty-four hours".

IX. INFORMATION TECHNOLOGY

Hartford residents were asked about their access to the internet and how they wanted to receive information. Eighty-two percent reported that they have internet access either all of the time (75%) or most of the time (7%) with access through smartphones (n=218) being the most common response. Four percent of respondents stated that they never have internet access.

Families also expressed a willingness and a desire to share asthma-related information about their child with all involved constituents including not only other clinicians, but school nurses, pharmacists, teachers and coaches.

X. EDUCATIONAL MATERIALS

Currently available educational materials for different groups (parents, young children, adolescents, professionals including clinicians, school nurses, coaches and teachers) have been reviewed initially by content experts and then by the Steering Committee

for appeal, understanding and likelihood of use by the different community groups. The final selection of educational materials was then reviewed by families and youth on the Steering Committee for cultural and linguistic appropriateness.

The result is a list of educational materials that are accurate, that resonate with clinicians and families and that are culturally and linguistically appropriate. An abbreviated list of these recommendations is below (Table 19). Not all of these materials are available in Spanish.

Table 19. Educational Materials and Messages

Target Audience	Source	Title	Comments
Parents	Easy Breathing	-My Asthma Triggers	Eng, Span
		-What you can do…	Eng, Span
		-Inhaled CS	Eng, Span
	EPA	-Second hand Smoke	Eng, Span
Younger children	Open Airways, Bermuda	-Action Asthma	Eng, Span
	Arkansas FMC	-Be "A" OK! With Asthma	Eng only
	EPA	-Dusty, the Asthma Goldfish…	Eng, Span
Older children	CDC	-Asthma Fast Facts	Eng only
	ALA	-QA for teens	Eng
	Easy Breathing	-Using Asthma Meds	Eng,Span
All children	DPH	-How to use inhaler	Eng, Span

Parents want more asthma education and educational materials. Most want these materials to come from their pediatrician's office and they most often want printed materials

XI. COMMUNITY ORGANIZATIONS

Most community organizations report that they do not provide asthma-specific training to their staff (84%) or to their members/clients (68%). They are, however interested in providing this training to their staff (Figure 21) and interested in offering educational materials or programs to their members/clients (Figure 22).

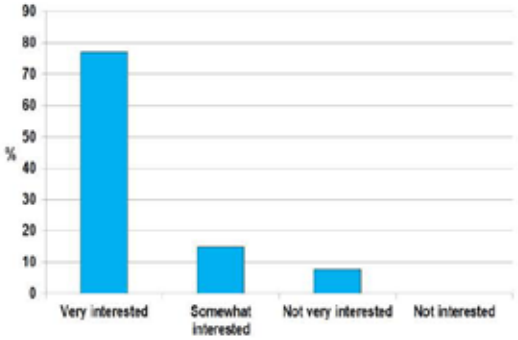

Figure 21. Level of interest of community organizations in getting asthma training for their staff.

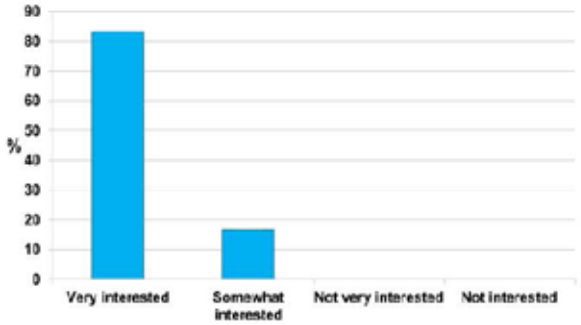

Figure 22. Interest by community organizations in providing asthma education to their clients.

For those organizations that are providing asthma programs, 50% provide printed asthma materials, 17% provide materials electronically and one provides demonstrations when dispensing medications (this was a pharmacy).

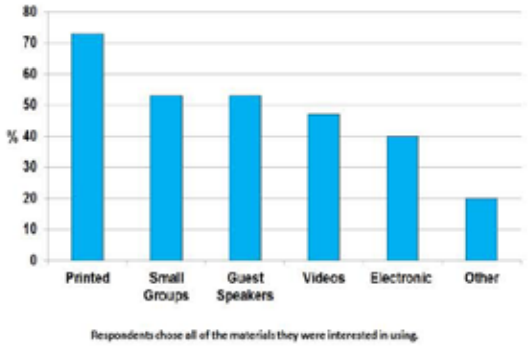

Figure 23. Types of materials community organizations want to provide to their clients.

Organizations are interested in providing a variety of different asthma programs to their clients/members (Figure 23). Four organizations do not currently provide any asthma materials and are not interested in providing any materials.

When asked to rank order the materials that organizations wanted to distribute related to asthma, written/printed materials are the most often endorsed followed by electronic materials and small group workshops.

XII. SUMMARY AND CONCLUSIONS

1. Hartford children have a high prevalence of asthma and high asthma morbidity.
2. Families of children with asthma agree that routine follow-up asthma visits are important. The major access-related barrier to asthma medical care reported by families is transportation.
3. Rates of follow-up visits for asthma in Hartford are currently below recommended levels.
4. Families of children with asthma want more education and more culturally appropriate information.
5. Clinicians and school nurses identified the need for an accessible, up-to-date Asthma Treatment Plan.
6. Teaching correct inhaler technique is a major concern for Hartford's pediatric clinicians.
7. Gaps in transfer of electronic prescriptions may be a previously unrecognized barrier to families picking up emergency prescriptions.
8. The uncertainty and unpredictability of asthma is a major worry for Hartford families and likely drives them to seek emergency care at a high frequency.
9. Clinicians are not aware of smoking cessation programs for parents of their patients, view smoking cessation as a low priority for most children and their parents, have low outcome expectancy related to counseling families and patients about smoking and rarely counsel parents or patients about electronic cigarettes.
10. There is a paucity of smoking cessation programs in Hartford.
11. School nurses are not aware of some asthma-related school policies.
12. In general, families are very satisfied with the care provided to their children with asthma by school nurses.
13. Teachers express high confidence in recognizing an asthma attack in a student but want more education in this area.
14. Most coaches for after school programs are not aware of who has asthma and have received little training in asthma.
15. The Hartford schools are modestly asthma-friendly with efforts to resume Tools for Schools and other asthma-friendly policies.
16. In general, Hartford residents are satisfied with their current living environment.
17. Water-related/mold issues and vermin infestation are the most common asthma-related problems in Hartford homes and apartments.
18. The workforce for Community Health Workers in CT is small but CHWs are welcomed by both primary care clinicians and Hartford families with children with asthma.
19. The great majority of families in Hartford have access to the internet but almost all families want information about asthma in printed format with the pediatrician, school nurse and pharmacist being the trusted providers of this information.
20. Community organizations provide very little training about asthma for their staff and offer very few asthma educational programs to their clients. Most organizations would like asthma-specific training and educational opportunities.

In all, more than 550 individuals participated in the Hartford Asthma Community Needs Assessment. The information these participants have provided and the recommendations to address the above needs are being incorporated into the design of a multi-level, multi-faceted system of care and information sharing for children with asthma in Hartford. This new system is tailored to the needs of the individual child and empowers families to improve asthma care for their children by linking families to their clinicians, to their school nurses and to their pharmacists as part of the extended person-centered medical home. It supports families in these efforts through interventions to improve the home and school environments. It creates an asthma neighborhood composed of asthma-trained

community organizations and staff in addition to health care providers who all speak with one voice in support of the child and it will strengthen policies to support these efforts.

XIII. RECOMMENDATIONS

1. Identify children with asthma and a low number of routine follow-up visits and children with asthma and a high no-show rate as one way to reduce asthma disparities. Understanding barriers to follow-up visits for the specific child are critical. Decreasing barriers to transportation could improve visit rates and decrease clinic no-show rates. This could be accomplished by reviewing the bus routes, by using Community Health Workers to help families with appointments, by increasing access to care at school-based health centers and by educating families about the value of follow-up visits.
2. Develop a written Asthma Treatment Plan for every child with asthma. This plan should be re-assessed at least yearly during an asthma follow-up visit. A mechanism to share current Asthma Treatment Plans needs to be developed. Computer generated plans in the clinician's office could facilitate treatment plan development and distribution.
3. Educate families and clinicians about delays in the transfer of electronic prescriptions and explore ways to reduce the transit time as a way to improve the rates of filling prescriptions.
4. Provide additional educational opportunities for families, children with asthma, clinicians, school nurses, school-based health center nurses, teachers, coaches, pharmacists and community organizations. Messages that are consistent across all groups and that are culturally responsive and linguistically appropriate are needed. This education should include basic asthma knowledge, proper inhaler technique and basic home remediation/improvement. Despite internet availability, families prefer printed materials. Community Health Workers could serve a major role in educating families, the community and community organizations. Appropriate training in asthma is critical to this role.
5. Provide school nurses with the child's current asthma treatment plan. The school nurse is an important provider of asthma care and is trusted by families of children with asthma. School-based health center practitioners provide asthma care and should be included in these activities as well.
6. Review asthma-related policies in the school district. Formalizing some policies may be beneficial to the school nurse.
7. Increase the number and access to smoking cessation programs for adults and youth who smoke. Train clinic staff how to counsel and how to bill for these services.
8. Improve communication between obstetricians and nursery staff regarding maternal smoking before and during pregnancy. Implement a smoking recidivism prevention program for mothers of newborns at risk for smoking re-initiation during the newborn period.
9. Increase support for Tools for Schools™. Facilitate classroom assessments for children experiencing school-specific asthma symptoms.
10. Create an easy to use Air Quality Index and cold temperature monitoring system for Hartford Public Schools linked to school policy regarding outdoor play/recess.
11. Improve the quality of housing for children with asthma in Hartford by implementing water/mold reduction strategies and integrated pest management efforts.
12. Enact and enforce smoking ban policies in apartment building common areas.
13. Develop a credentialed, asthma-trained Community Health Worker workforce is needed. CHWs should be embedded in clinics and internships within the school could provide additional educational opportunities for the CHW, could help to develop the CHW workforce and could support the school nurse in asthma activities. The role of the CHW is broad both in terms of helping families with access to medical care and in terms of asthma-specific activities. Providing easy transportation for CHWs to

make home visits is important.

14. Explore use of mobile technology with families, most of whom in Hartford have internet access through smartphones.

XIV. REFERENCES

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XV. APPENDIX

List of Steering Committee Members

MEMBER	ROLE
Miguel B.	Youth
D. Chameides	HPS School Nurse Supervisor
M. Cloutier	PI, Asthma Specialist
S. Decker	CASE Partners, Inc
V. Forbes	FaithCare
H. Friedman	CASE Partners, Inc
J. Hollenbach	Asthma Center
Ivy J.	Youth
R. Kraatz	Healthy Homes
C. Langton	Asthma Center
Maria M.	Hartford parent
N. Mayeda-Brescia	School Based Health Center
A. Mitchell	Asthma Center
Stacey M.	Hartford parent
T. Nguyen	Hartford Dept of Health & Human Svcs
H. Norcia	Asthma Center
Joanna Q.	Hartford parent
Katiria S.	Hartford parent
M. Seguinot	Area Health Education Center (Southwest)
T. Simoneau	Pediatric Pulmonary
J. St Germain	Arrow Pharmacy
C. Vinick	Asthma Center

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