



EXECUTIVE SUMMARY

Overview

Children and Asthma in America is a landmark survey of the current state of asthma and asthma management among children in the United States. This is one of the largest and most comprehensive surveys of knowledge, attitudes and behavior toward asthma in children in America. A survey of a national probability sample of 801 children, four to 18 years of age with current asthma was conducted. This sample was identified by systematically screening a geographically stratified national sample of 41,433 U.S. households by telephone, February to May 2004. Asthma is a serious lung disease and one of the most common chronic childhood illnesses, yet with proper long-term management asthma is a controllable disease. However, the *Children and Asthma in America* survey concludes that **a significant number of children with asthma do not have their condition under control, falling far short of national treatment goals.**

The survey found that nearly one out of 10 (9.2%)* American children 18 years of age and younger currently suffers from asthma [Figure 1]. This figure is comparable to the most current estimate from the National Center for Health Statistics, which estimates that 8.8% of children 18 years of age and younger have the disease. With the latest U.S. Census data projecting 77.5 million children 0 to 18 in the United States, it can be estimated that there are approximately seven million children with asthma in America. The *Children and Asthma in America* survey focused on children four to 18 years of age with asthma, which represents about 5.8 million children in the country based on figures from the 2002 National Health Interview Survey.

Among respondents of the survey,** nearly 80% reported that their or their child's asthma is well or completely controlled [Figure 2], **yet asthma control in many of these children missed the mark on nearly every asthma management goal established by the National Institutes of Health (Expert Panel Report 2: Guidelines for Clinical Care, National Heart, Lung, and Blood Institute [NHLBI]).**

The survey yields six important observations about the current state of children with asthma in America.

- Many children with asthma **experience frequent and/or severe symptoms** that indicate their asthma is not well controlled; additionally, parents tend to underestimate the frequency of their child's symptoms, contributing to **inaccurate perceptions of control**
- **Poorly controlled asthma continues to cause a significant number of children to be hospitalized, go to the emergency room and seek other urgent care visits**

- Poorly controlled asthma also causes missed school days for children, lost work days for parents, activity avoidance and limitations and emotional burdens that **interfere with the everyday lives of children and their families and often force them to accept a much lower quality of life**
- The **current standards for ongoing monitoring** of children with asthma, including follow-up healthcare professional visits, lung function testing and written action plans, **lag far behind the treatment goals** set by the NHLBI
- A comparison of responses between parents and children 10 to 15 years of age about the frequency and severity of their child's asthma symptoms indicate a **communication gap within the family** that may contribute to sub-optimal asthma management ***
- Finally, a **widespread lack of understanding about asthma causes, treatment and symptom prevention** remains a major obstacle to improved management of this condition

Children and Asthma in America is unique in providing an in-depth examination of asthma and asthma management among a large, national probability sample of children with asthma. Its national sample size is comparable to the largest government health assessment surveys, and it is believed to be the largest survey to explore disease burden, quality of life and asthma management among children. The survey also contains an **unprecedented comparison of parent and child reporting** of asthma symptoms and experiences (among the 10 to 15 year olds with asthma in the national sample).

The survey was conducted by the national public opinion research organization Schulman, Ronca and Bucuvalas, Inc. (SRBI) on behalf of GlaxoSmithKline.

* This estimate is almost identical to the 8.8% current asthma prevalence from the most recently available data from the National Health Interview Survey (2002).

** Eighty-five percent of people interviewed were either the parent or the caregiver most knowledgeable about the designated child with asthma in the household. The remaining 15% represents children 16 to 18 years of age who were interviewed exclusively about their asthma.

*** In addition to the main interview with parents, children 10 to 15 years of age were interviewed with the permission of the parent. Eighty percent of the eligible children participated.

Frequency and Severity of Symptoms Indicate Asthma is Not Controlled in Many Children

One of the primary goals of asthma treatment set by the NHLBI guidelines is to prevent chronic and troublesome symptoms during the day and night and to prevent recurrent exacerbations (asthma attacks). The survey demonstrates that a significant number of children experienced symptoms (wheezing, shortness of breath, chest tightness, coughing) as often as three times a week to daily [Figure 3].

Symptom Frequency (in the past four weeks)

- Nearly one in five of children with asthma (19%) experienced daytime symptoms at least three times a week to daily [Figure 3]
- One-third (34%) of children were awakened at night by asthma symptoms, with nearly one in four children with asthma (22%) having nighttime symptoms at least once or twice a week [Figure 3]
- Nearly half (49%) of children with asthma experienced symptoms during exercise, play or physical exertion in the past four weeks, with a third (33%) having these exercise-induced symptoms at least once or twice a week [Figure 3]
- Two-thirds (67%) of children with asthma had asthma symptoms during the daytime, during exercise or exertion or during the night in the past four weeks [Figure 4]

Symptom Severity and Asthma Attacks

- More than half of the children with asthma (54%) had one or more sudden, severe asthma attacks (episodes) in the past year [Figure 5]
- One in five children with asthma (21%) experienced a sudden, severe asthma attack at least twice a month [Figure 5]
- More than one-quarter (27%) ever thought their child's life was in danger during an asthma attack, and one in 10 (10%) had an asthma attack so bad that they thought their life was in danger within the past year [Figure 6]

Parents Underestimate Symptom Severity

The majority of respondents significantly underestimated the severity of their or their child's symptoms, particularly when they or their child had asthma that could be classified as "moderate persistent" (moderate) or "severe persistent" (severe). Severity criteria were based on NHLBI asthma symptom severity classifications.

- The survey suggested that more than a quarter (28%) of children experienced symptoms consistent with moderate or severe asthma [Figure 7]
- Of the children classified with moderate asthma, 46% of respondents rated his or her asthma as good or very good; of the children classified with severe asthma, 50% responded it was good or very good [Figure 8]

- Of the children classified with moderate asthma, nearly three out of five respondents (58%) believed his or her asthma was well or completely controlled [Figure 9]
- Of the children classified with severe asthma, nearly half of respondents (48%) believed his or her asthma was well or completely controlled [Figure 9]

Implications

Based upon the frequency and severity of symptoms reported here, it is no exaggeration to say that asthma is uncontrolled for many children in America – and parents may not realize the extent of the problem. If better asthma control is the goal, the expectations of asthma control among both parents and children need to be raised. Parents play a critical role in the management of their child’s asthma, and therefore need to regularly ask their child very specific questions about his or her condition to get an accurate picture of symptom severity.

Acute Treatment of Asthma through Emergency Room Visits, Hospitalizations and Other Urgent Care is Alarming

The NHLBI set no or minimal exacerbations, which includes hospitalizations or emergency department visits, as another goal of successful asthma control. The survey found that this goal is not being met in the management of asthma in children.

- In the past year, more than two out of five (42%) children with asthma in the United States had some form of urgent or emergency care visit for their asthma [Figure 10]
- More than half of children with asthma have experienced an asthma attack so bad that they had to go to an emergency room (53%) or had to go to a doctor right away (54%) [Figure 11]
- More than a quarter (27%) of children with asthma have experienced an asthma attack so bad that they were hospitalized [Figure 11]

Implications

The frequency of asthma-related emergency room and urgent care visits reported, illustrate the degree to which asthma is uncontrolled in this country. Medical experts agree that with proper long-term management of asthma, emergency room and other acute care could be significantly reduced. Hence, the survey findings suggest the need for parents and children to shift their focus from treating symptoms to a more preventative approach to asthma management.

The Personal Consequences of Asthma: Poor Asthma Management Can Take a High Toll

Other important goals set forth by the NHLBI as measures of optimal asthma control are no missed school or work and the ability to maintain normal activity levels, including exercise and other physical activities. The survey reveals that the management of asthma in children falls short of these measures. Consequently, asthma forces many children to accept a lower quality of life than children without asthma.

Missed School/Work

Asthma is the leading cause of school absenteeism due to chronic illness among school-aged children. As a result, parents often must take time off from work to care for their child with asthma. The survey found that:

- The majority (54%) of children four to 18 years of age with asthma missed school (or day-care) in the past year as a result of their asthma [Figure 12]
- On average, children missed nearly four (3.7) days of school in the past year because of asthma [Figure 12]; when this number of school days missed is applied to the estimated 5.8 million children in this age group with asthma, the survey estimate translates into approximately 21 million school days lost per year due to asthma
- Almost one in 10 (9%) children with asthma missed more than two weeks of school in the past year as a result of their condition [Figure 12]
- More than a third (39%) of parents missed work in the past year as a result of their child’s asthma, and more than one in 10 (11%) missed more than a week of work in the past year as a result of their child’s condition [Figure 13]
- On average, parents missed nearly three (2.6) days of work due to their child’s asthma in the past year [Figure 13]; when this number of work days lost is applied to parents of the 5.8 million children in this age group with asthma, this translates into more than 15 million lost work days per year for parents of children with asthma

Avoiding Activities

Poor management of asthma means that many children with the condition are sometimes forced to avoid or limit activities that are important to them.

- Nearly two in five (37%) respondents reported that asthma interfered a lot or some with their or their child’s life [Figure 14]
- Nearly two-thirds (62%) of children with asthma were limited a lot or some in at least one of the following activities: playing organized sports, outdoor activities, having pets, sleeping, going out/playing with friends, doing things with their family, doing well in school and participating in school activities [Figure 15]

Emotional Well-being

In addition to missing the mark on these quality of life indicators, uncontrolled asthma can impact the emotional well-being of affected children. As a result of their asthma:

- Nearly one in three children (30%) with asthma often or sometimes felt fearful [Figure 16]
- Nearly one in three children (30%) with asthma often or sometimes felt angry [Figure 16]
- One out of five (20%) often or sometimes felt depressed [Figure 16]
- About one in five children (19%) often or sometimes felt embarrassed [Figure 16]

Implications

Uncontrolled asthma forces many children to accept a lower quality of life. Many children with asthma have to limit and avoid activities due to their condition, impacting their family life, their own lives and possibly impacting their emotional well-being as a result. If their asthma was properly controlled and symptoms prevented, these children may be able to experience a significant improvement in their quality of life.

Many Standards of Care for Asthma Management Not Followed

To help ensure asthma control is achieved and maintained, the NHLBI guidelines call for several actions related to ongoing monitoring of asthma. These include: regular follow-up visits to a healthcare professional, spirometry to assess lung function, long-term peak flow monitoring on a daily basis for patients with moderate or severe asthma and a written Asthma Action Plan developed with their healthcare professional. *Children and Asthma in America* suggests many of these recommendations are not being followed.

- One-quarter of children with asthma (25%) had no visits to the doctor about their asthma in the past 12 months; almost one in five (18%) had only one visit to the doctor about their asthma in the past 12 months; consequently, close to half (43%) of children with asthma did not have the recommended two doctor visits for their asthma in the past 12 months [Figure 17]
- More than half (54%) of all respondents had not had a lung function test in the past year [Figure 18]
- While more than one-third of those children whose symptoms in the past four weeks were considered moderate (37%) or severe (38%) reported having a peak flow meter [Figure 19], 80% did not use it on a daily basis and 10% never used it [Figure 20]
- More than half of children with asthma (54%) did not have a written Asthma Action Plan [Figure 21]

Implications

Without routine monitoring, parents and healthcare professionals do not have objective measures of how well the child's asthma management plan is working. Regularly assessing a child's asthma at home and maintaining an ongoing dialogue with the child's healthcare professional is recognized as crucial to maintaining a child's long-term treatment plan.

Unique Insights into Parent-Child Communication Gap

The *Children and Asthma in America* survey shows a concerning difference between how parents perceive their child's asthma and how children themselves perceive their disease. In fact, when comparing responses of parents and their children with asthma who were 10 to 15 years of age, the survey showed that the majority (71%) of parents and their children disagreed about the child's overall health status [Figure 22]. Additionally, almost half of children (46%) indicated that they didn't want to worry others about their asthma, so they don't admit it when asthma is the reason they miss activities [Figure 23].

Many parents and their children consistently disagreed on when and which asthma symptoms the child experienced.

- More than one-third of parents and their children (38%) disagreed that the child had no asthma symptoms (e.g., shortness of breath, wheezing, breathing problems) in the past four weeks [Figure 24]
- More than one-third of parent/child pairs disagreed that the child experienced specific symptoms in the past four weeks, including coughing (46%), shortness of breath (44%), wheezing (40%) and breathing problems (37%) [Figure 24]
- Forty-five percent disagreed that the child experienced any daytime asthma symptoms in the past four weeks, while 31% of parents and their children disagreed that the child was awakened at night by asthma symptoms in the same period [Figure 25]
- Forty-six percent disagreed that the child experienced any asthma symptoms during exercise in the past four weeks [Figure 25]

Parents and their children also disagreed about the impact of asthma symptoms on the child's life.

- Seventy-seven percent of parents and their children disagreed on how often asthma is the reason children cancel, postpone, interrupt or stop an activity [Figure 26]
- Overall, 62% of parents and their children disagreed on the worst aspect of having asthma; the responses where parent/child pairs had the highest levels of disagreement were: restrictions on activities (32%), ability to play sports (23%) and inability to breathe (21%) [Figure 27]

Implications

These findings suggest a clear disparity between parents' and their children's perceptions about asthma symptoms and the impact of symptoms on the child's life. Parents cannot always be with their child to observe symptoms – and children do not want to worry others about their symptoms. If parents are unaware of how often and how severe their child's asthma symptoms are, they may not be able to communicate accurate information to the child's healthcare provider. Better parent-child communication about asthma symptoms is needed to guide long-term treatment decisions. Parents asking their children very specific questions about their symptoms, and the impact of these symptoms, can help provide a more accurate representation of asthma control.

Widespread Misunderstanding Exists About the Causes of Asthma Symptoms, Available Treatments and Proper Use of Medications

The survey reveals widespread misunderstanding about the causes of and treatments for asthma symptoms. Many respondents were uninformed about the two main underlying causes of asthma symptoms – **inflammation** (airway swelling and irritation) and **bronchoconstriction** (tightening of the muscles surrounding the airways). In fact, a majority incorrectly believed that only the symptoms could be treated.

- Ninety-three percent of respondents could not correctly identify inflammation as an underlying cause of asthma symptoms; 90% of respondents were unable to volunteer airway constriction as the other main cause [Figure 28]
- When prompted, nearly one-third admitted that they had never heard of inflammation (28%) or bronchoconstriction (29%) as a major factor causing asthma symptoms [Figure 28]
- More than half of those surveyed (55%) thought it was only possible to treat asthma symptoms, not the underlying causes of asthma symptoms [Figure 29]
- More than half of respondents were unaware that there are medications to treat inflammation (51%) or bronchoconstriction (52%) [Figure 30]

The NHLBI has identified under-treatment and inappropriate therapy as major contributors to asthma morbidity and mortality in the United States. According to their guidelines, increased use of a short-acting beta-agonist (medication for the immediate relief of asthma symptoms; also called a quick-relief or rescue inhaler) may be an indicator of poor asthma control. The guidelines also recommend long-term control asthma medication (medication for the preventative treatment of asthma) be taken daily to achieve and maintain control of persistent asthma. The *Children and Asthma in America* survey reveals misperceptions about the proper use of asthma medications, with many of those surveyed frequently relying on quick-relief rescue medicines to provide long-term control.

- Nearly half (42%) of those who used quick-relief medicine in the past four weeks said they used it at least three times a week – and one in four (26%) used it daily [Figure 31]
- Only 53% of those classified as having severe asthma and 63% of those with moderate asthma reported they/their child took a prescription medicine for daily maintenance therapy during the past four weeks [Figure 32]; of those, 14% did not take them daily [Figure 33]; 30% of respondents incorrectly named a short-acting beta-agonist as a long-term asthma control medicine [Figure 34]

Implications

Insufficient understanding of the underlying causes of asthma symptoms and available treatments combined with confusion about the purpose and function of available medications may be a key reason for poor asthma management. If parents underestimate the severity of their child's condition and the level of control that is possible, they may be less likely to seek proper care for their child. With continued education about the disease and when and why it is important to take certain medications, adherence to treatment plans may be improved.

Conclusion

Even though there are established guidelines for the treatment of asthma developed by the NHLBI, the *Children and Asthma in America* survey concludes that the nation falls far short on nearly every goal of successful treatment. This leads to unnecessary personal, physical, emotional, economic and public health consequences.

Despite the existing blueprint for successful asthma management strategies and the availability of effective long-term preventative medications, many parents are seriously uninformed and misinformed about how to achieve and maintain symptom control for their children. As a result, parents accept a much lower level of asthma control for their children than is possible. Poorly controlled asthma places children at potential risk for a variety of consequences including frequent symptoms, missed school, restriction on activities, emotional distress, hospitalizations and even fatal asthma attacks.

Parents and children need ongoing education and tools to help them recognize the signs of poorly controlled asthma and understand what optimal asthma control means. Helping to improve the communication between a parent and his or her child about asthma symptoms and how these symptoms impact their child's life may lead to an improved dialogue about asthma control with the child's healthcare provider. This in turn, may be the catalyst needed to help the nation meet the NHLBI goals.

Missing the Mark

Nearly 80% of respondents believed their or their children's asthma is well or completely controlled, yet children with asthma are missing the mark on asthma treatment guidelines.

NHLBI Goals of Therapy	Children and Asthma in America Survey Findings
Symptoms Minimal or no chronic asthma symptoms during the day or night	In the past four weeks: <ul style="list-style-type: none"> ■ 67% or about 2/3 experienced daytime, nighttime or exercise-induced symptoms [Figure 4] ■ 19% or 1 in 5 children experienced daytime symptoms 3 times a week to daily [Figure 3] ■ 22% or almost a quarter experienced symptoms at night once a week to daily [Figure 3]
Emergency Visits Minimal or no exacerbations (including hospitalizations or emergency room visits)	In the past year: <ul style="list-style-type: none"> ■ 23% have visited the emergency room [Figure 10] ■ 5% have been kept overnight [Figure 10] ■ 42% or more than 2 out of 5 reported having an unscheduled acute care visit [Figure 10]
Missed Work and/or School No limitations on activities; no school/parent's work missed	<ul style="list-style-type: none"> ■ 54% or more than 1/2 of the children in the survey missed school or daycare in the past year as a result of their asthma, with an average of nearly 4 days missed [Figure 12] ■ 39% or more than 1/3 of parents of children with asthma have missed work in the past year due to their child's condition [Figure 13] ■ 62% or nearly 2/3 of children with asthma were limited a lot or some by their condition in one or more activities such as sports, having pets, sleeping, doing well in school, and/or activities with friends and family outdoors or at school [Figure 15]
Use of Rescue Inhalers Minimal use of short-acting beta-agonists	<ul style="list-style-type: none"> ■ 42% or nearly 1/2 of those who used a quick-relief or rescue medication in the past 4 weeks said they use it 3 times a week to daily [Figure 31]
Written Asthma Action Plan Having a written Asthma Action Plan	<ul style="list-style-type: none"> ■ 54% or more than 1/2 of children with asthma did not have a written Asthma Action Plan [Figure 21]
Healthcare Professional Visits Visit your healthcare professional to monitor your asthma at least 2 times per year	<ul style="list-style-type: none"> ■ 25% or 1/4 of children with asthma had not seen their healthcare professional about their condition in the past year; another 18% had done so only once in the past 12 months [Figure 17] ■ 54% have not had a lung function test in the past 12 months [Figure 18]

Survey Methods

Children and Asthma in America is one of the largest and most comprehensive national surveys ever conducted about asthma in children. Questions explored asthma prevalence, the frequency and severity of symptoms, utilization of emergency care, quality of life, disease knowledge and use of medication. This survey had two main components:

- A survey of a national probability sample of 801 children, four to 18 years of age, with current asthma was conducted to yield current national estimates. This sample was identified by systematically screening a geographically stratified national sample of 41,433 U.S. households by telephone. Either the parent or the caregiver most knowledgeable about the designated child with asthma in the household was interviewed about the child's asthma if the designated child was four to 15, while children 16 to 18 years of age were interviewed directly about their asthma.
- A shorter interview with a subset of identical questions was completed with 284 children with asthma, 10 to 15 years of age, after their parents had been interviewed. A comparison of the responses of parents and children with asthma about the child's asthma provided a measure of agreement between parents and children about asthma symptoms and their effect on the child.

The interviews were conducted by telephone from February 25 to May 7, 2004. The parent/patient interview averaged 47 minutes in length. Full interviews were completed with 74% of the eligible cases identified in the household screening.

The maximum expected sampling error for a simple random sample of 801 would be +/- 3.5 percentage points at the 95% confidence level.

Children and Asthma in America should be considered a landmark study in asthma research because:

- **Scope:** The 801 asthma patients identified from a national probability sample of 41,433 U.S. households is comparable to the largest national health surveys conducted by the federal government, the National Health and Nutrition Examination Survey (1994) and the National Health Interview Survey (2002); moreover, these federal health surveys do not explore the burden of disease or asthma management in any detail
- **Depth:** The 47-minute telephone interview covered the asthma symptoms, burden of illness, impact on quality of life and disease treatment and management issues in more depth than any other national probability sample of children with asthma of comparable size that is currently available
- The parallel interviews with adolescent patients and their adult caregivers provided a **unique insight into communication issues between parents and children** that may affect the management and treatment of asthma

Glossary

Anti-inflammatories – A class of preventative medications used to help treat asthma by reducing inflammation in the airways of the lungs.

Asthma – A chronic, inflammatory condition of the airways with two main components: constriction – the tightening of the muscles around the airways, and inflammation – the swelling and irritation of the airways. Both the constriction and the inflammation cause narrowing of the airways, which may result in asthma symptoms such as coughing, wheezing, chest tightness or shortness of breath.

Asthma Action Plan – A written plan developed between the patient and healthcare professional to help manage asthma.

Asthma attack – When symptoms of asthma such as coughing, wheezing, chest tightness or shortness of breath suddenly become more severe, more frequent or both. They are also called asthma **flare-ups** or asthma **episodes**.

Bronchoconstriction (constriction) – A term that refers to the tightening of muscles around the airways.

Bronchodilators – Medications that relieve and help prevent constriction of the airways in the lungs. There are two types of bronchodilators: quick-relief bronchodilators are used to help relieve sudden asthma symptoms when they occur; long-acting bronchodilators are used to help prevent airway narrowing (constriction) from occurring.

Current asthma – For this survey, current asthma is defined as asthma in people who have been diagnosed with asthma and who had either experienced asthma symptoms or taken medication for asthma within the past year.

Inflammation – A term that refers to the swelling and irritation in the airways of the lungs. Airway inflammation from asthma is always there, even when symptoms are not present. There is increasing evidence that, if left untreated, inflammation can damage the airways and may cause long-term loss of lung function.

Inhaled corticosteroids (ICS) – A class of preventative medications (anti-inflammatories) used to treat asthma by reducing inflammation in the airways of the lungs. Because they are inhaled or breathed in, they go directly to the lungs where they are needed and have lesser effects on other areas of the body. According to NHLBI asthma treatment guidelines, inhaled corticosteroids are the preferred and most effective initial therapy for persistent asthma.

Long-acting beta-agonists – These are preventative bronchodilator medications that keep the airways open by relaxing the smooth muscle surrounding the airways.

Lung function test (spirometry) – A simple test administered by a healthcare professional to measure how much and how fast air can be blown out of the lungs after taking a deep breath. The results will be lower than normal if airways are inflamed and narrowed, as in asthma, or if the muscles around the airways have tightened up.

Peak flow meter – A portable, handheld device used to measure how fast a person can blow air out of the lungs.

Persistent asthma – Asthma symptoms experienced more than twice a week.

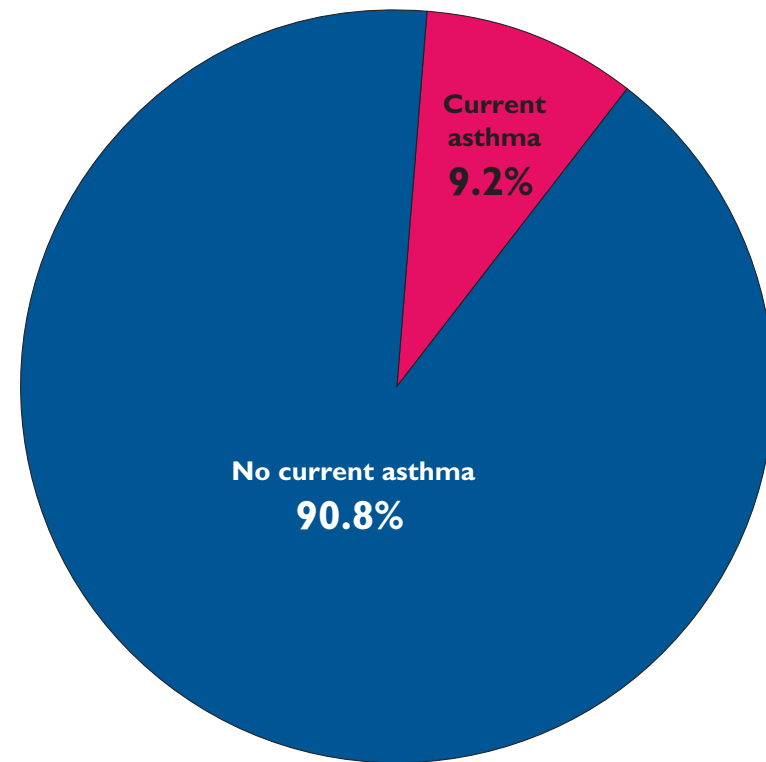
Preventative medication (controller or maintenance medication) – A medication taken every day to help prevent asthma symptoms from occurring. It is NOT used for quick relief.

Short-acting beta-agonist (rescue medication) – A quick-relief medication used to relieve sudden asthma symptoms. It works quickly to open airways by relaxing the muscles surrounding the airways. However, it does not treat the underlying airway inflammation or help to provide long-term control of asthma.

Symptoms of asthma – The four main symptoms of asthma are coughing, wheezing, chest tightness and shortness of breath.

FIGURE 1

POPULATION PREVALENCE OF CURRENT ASTHMA IN CHILDREN AGE 18 AND YOUNGER



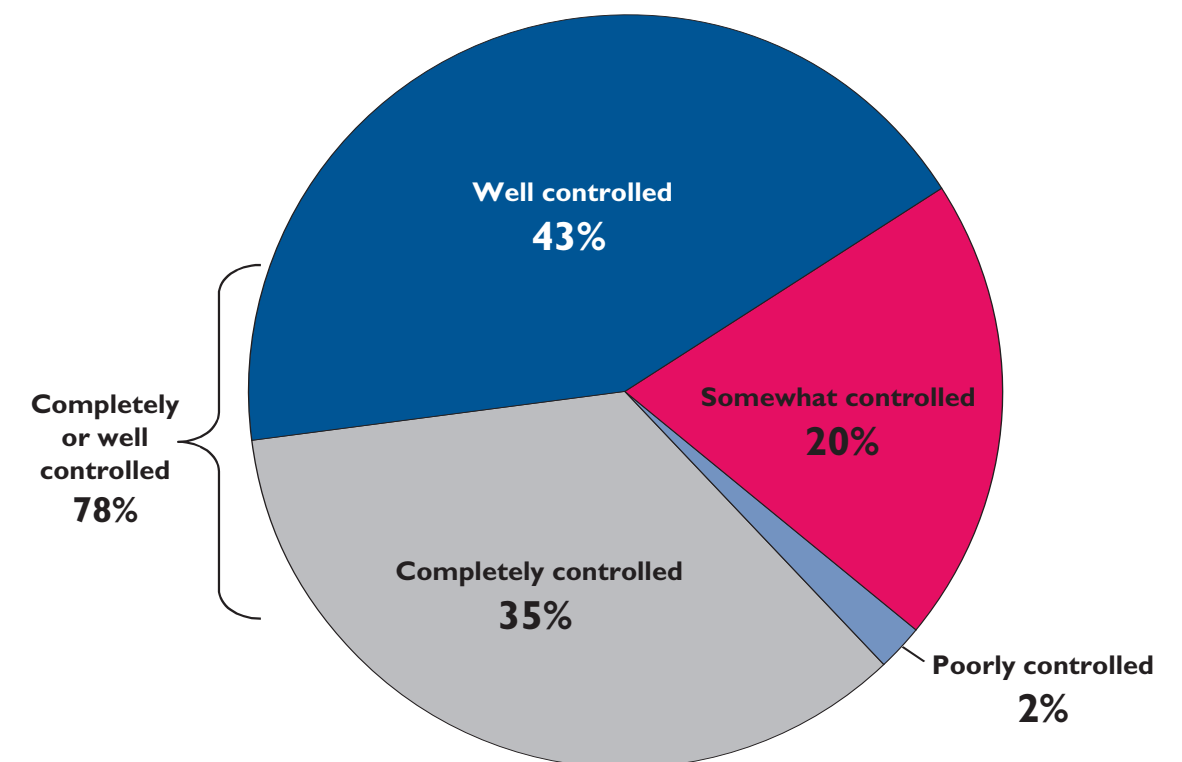
- QC.** How many persons UNDER 19 live in this household (even if not there right now)?
- QD.** Has a doctor or other health professional ever diagnosed any of these persons UNDER 19 as having asthma?
- QF.** (Does this person/Do any of these persons) take medication for their asthma?
- QG.** During the past 12 months, (has this person/have any of these persons) had asthma symptoms or an asthma attack?
- QH.** What (is/are) the age(s) of the (child/children) who take asthma medicine or has/had asthma in the past 12 months?

Base: Children screened for asthma. N=18,963

Occasionally figures do not total 100% due to rounding.

FIGURE 2

PERCEIVED CONTROL OF ASTHMA IN PAST FOUR WEEKS

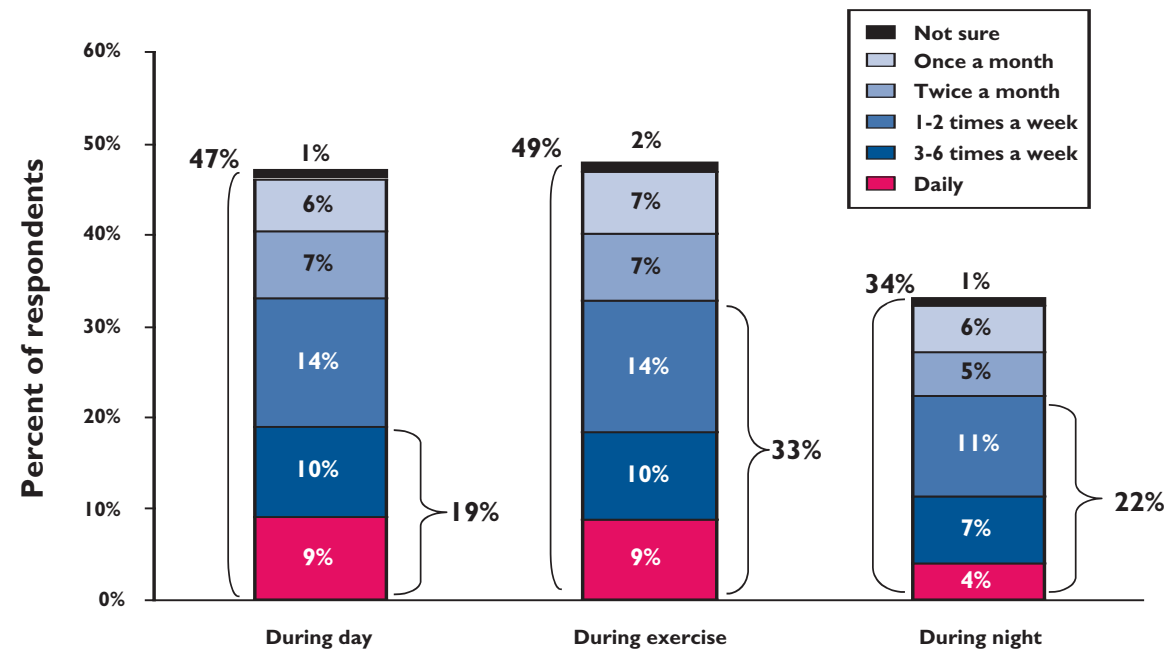


- Q22.** Overall, how well would you say that (your/your child's) asthma has been controlled in the past four weeks? Would you say it was completely controlled, well controlled, somewhat controlled, poorly controlled or not controlled at all?

Unweighted N=801

FIGURE 3

FREQUENCY OF ASTHMA SYMPTOMS IN PAST FOUR WEEKS

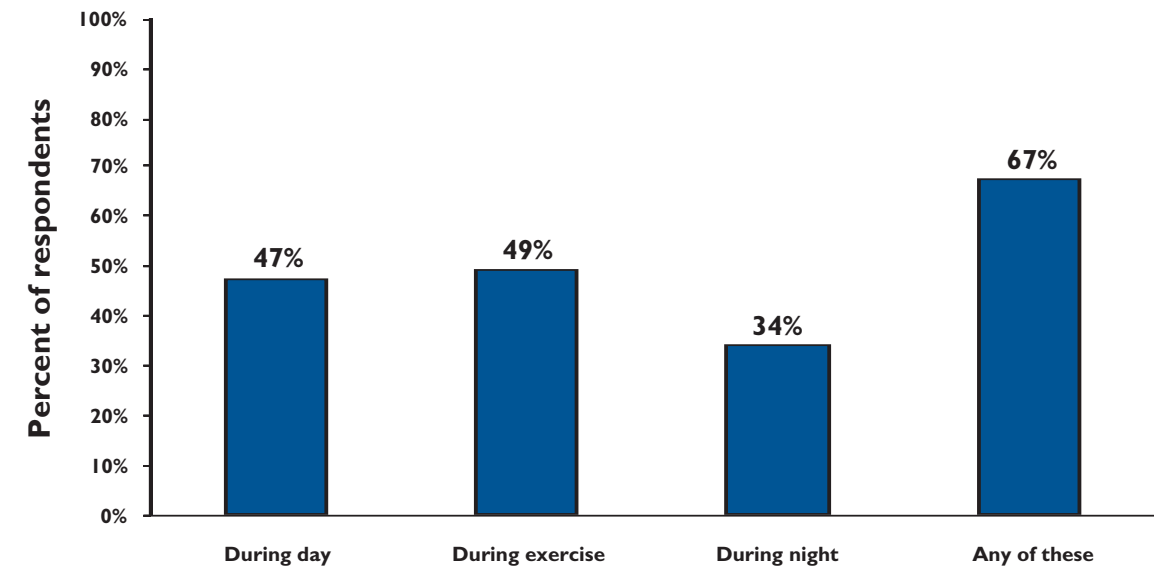


- Q19b.** How often in the past four weeks (did you/did your child) have these symptoms during the daytime?
- Q20b.** How often (do you/does your child) have these symptoms during exercise, play or physical exertion?
- Q21b.** How often (do you/does your child) have these symptoms at night?

Unweighted N=801

FIGURE 4

EXPERIENCED ASTHMA SYMPTOMS IN PAST FOUR WEEKS

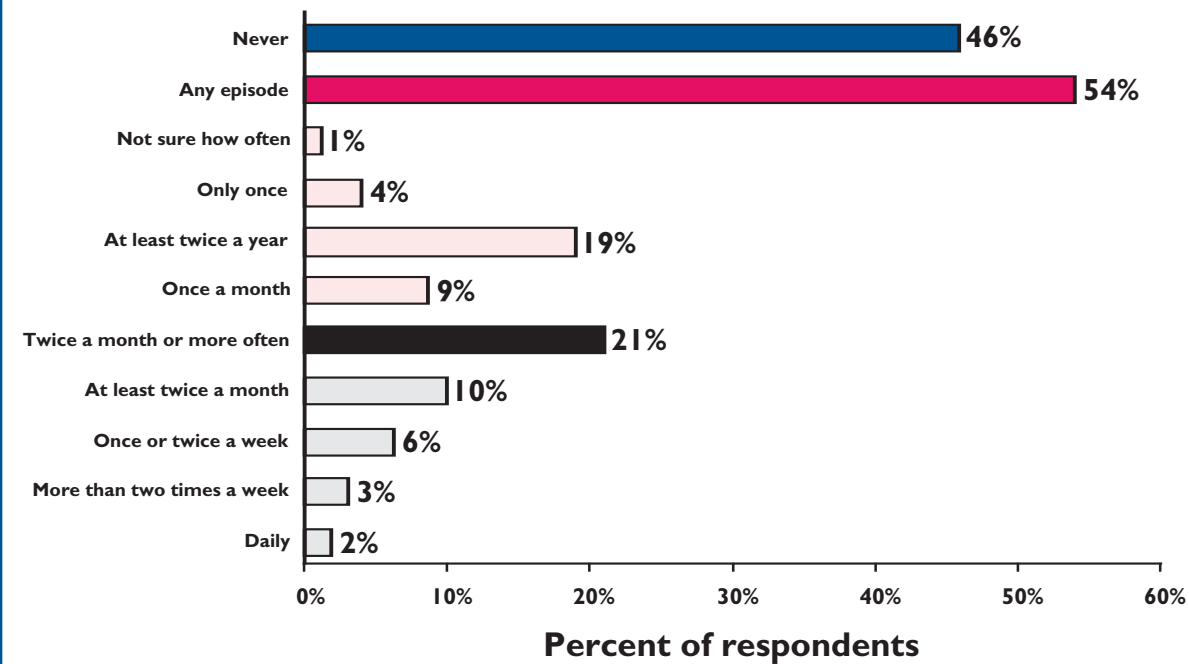


- Q19a.** In the past four weeks, (have you/has your child) had a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during the day?
- Q20a.** In the past four weeks, (have you/has your child) had a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during exercise, play or physical exertion?
- Q21a.** In the past four weeks, (have you/has your child) been awakened by a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during the night?

Unweighted N=801

FIGURE 5

FREQUENCY OF SEVERE EPISODES IN THE PAST YEAR



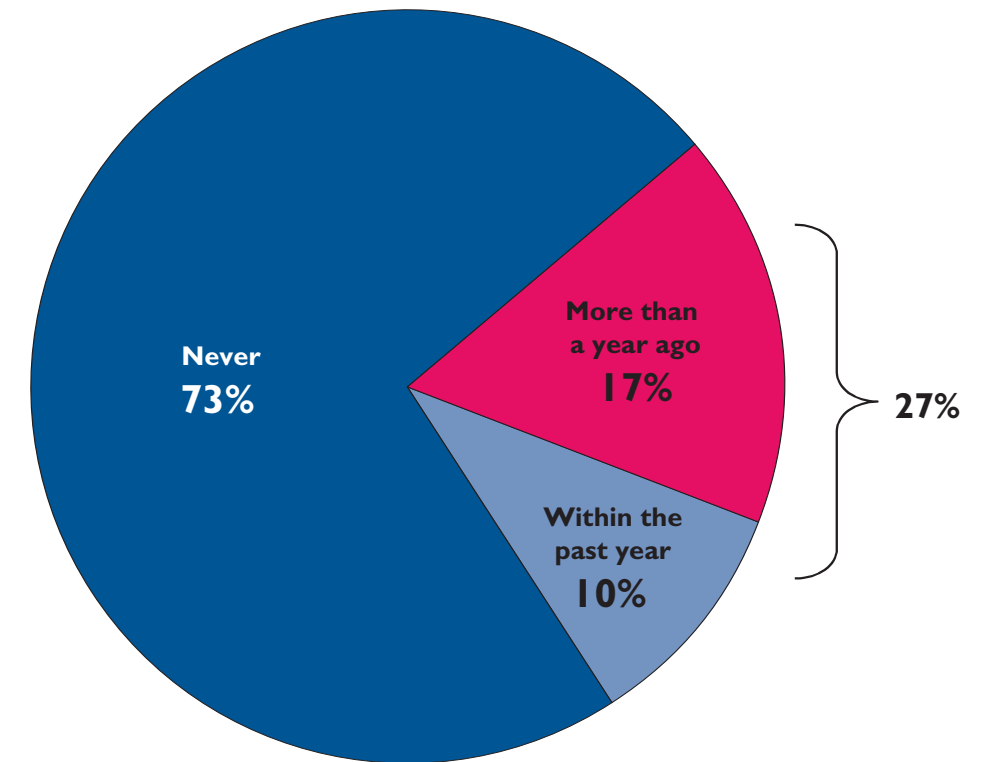
Q10a. (Have you/Has your child) had any SUDDEN SEVERE EPISODES of coughing, or wheezing, or chest tightness, or shortness of breath or trouble breathing in the past 12 months?

Q10b How often (have you/has your child) had these episodes in the past 12 months?

Unweighted N=801

FIGURE 6

ASTHMA ATTACK SO BAD THAT THOUGHT LIFE WAS IN DANGER



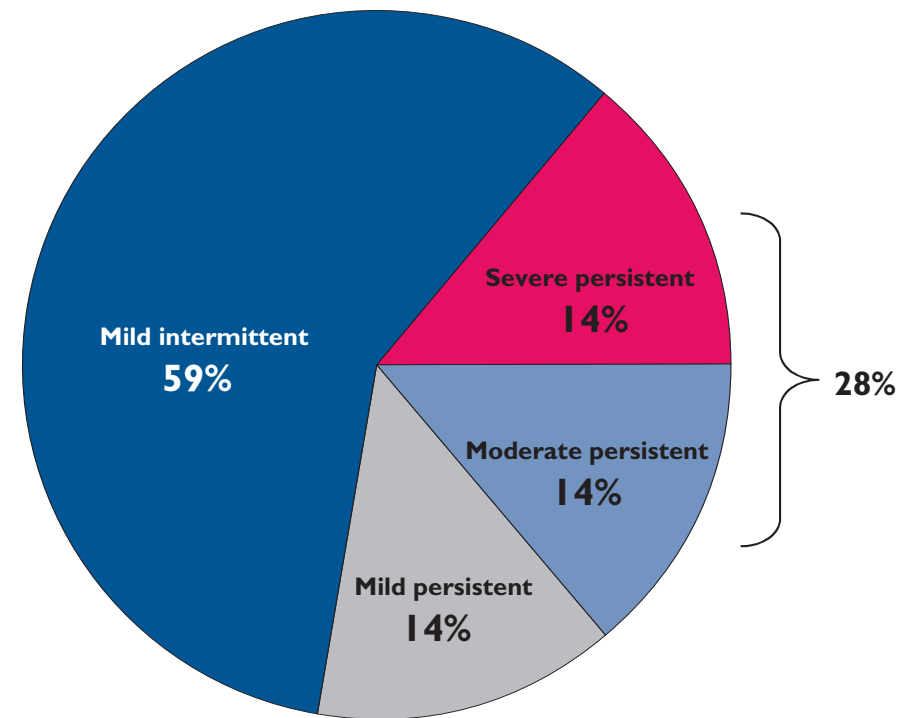
Q11a. (Have you/Has your child) EVER had an asthma attack so bad that (you/he/she) thought (your/his/her) life was in danger?

Q11c. When was the most recent time (you/your child) had an asthma attack so bad that you thought (your/your child's) life was in danger?

Unweighted N=801

FIGURE 7

SEVERITY OF ASTHMA SYMPTOMS IN PAST FOUR WEEKS

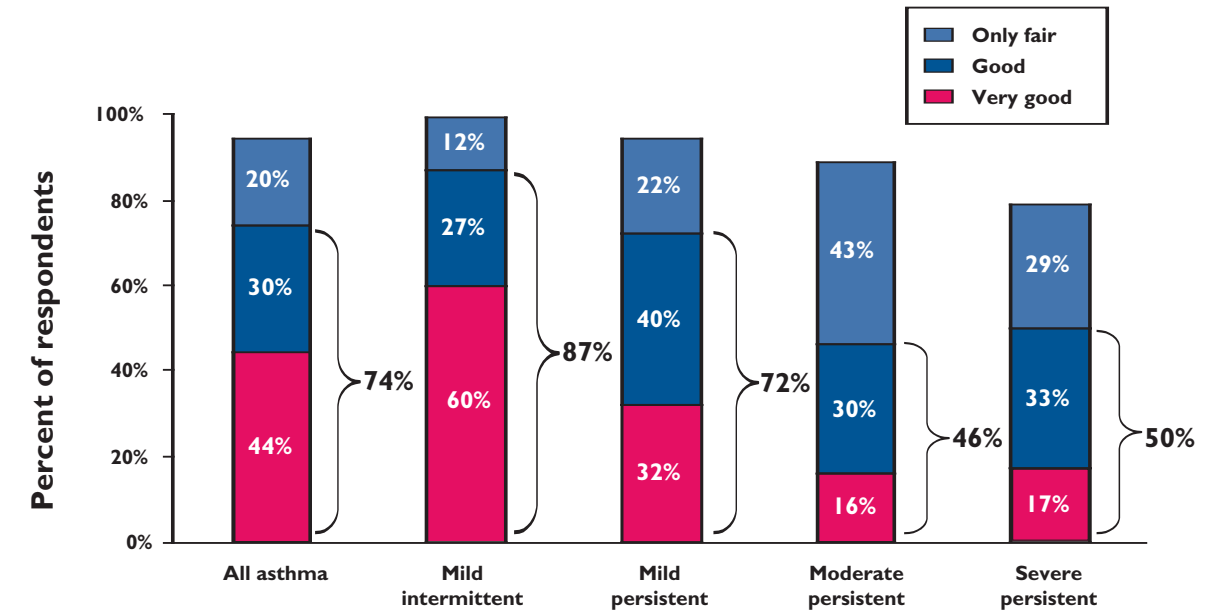


- Q10b.** How often (have you/has your child) had these [sudden severe] episodes in the past 12 months?
- Q18.** How many times in a typical week (do you/does your child) experience asthma symptoms?
- Q19b.** How often in the past four weeks (did you/did your child) have these symptoms during the daytime?
- Q19c.** How many times a day (do you/does your child) get these symptoms?
- Q20b.** How often (do you/does your child) have these symptoms during exercise, play or physical exertion?
- Q21b.** How often (do you/does your child) have these symptoms at night?

Unweighted N=801

FIGURE 8

PERCEIVED ASTHMA RATING BY SYMPTOM SEVERITY DURING PAST FOUR WEEKS

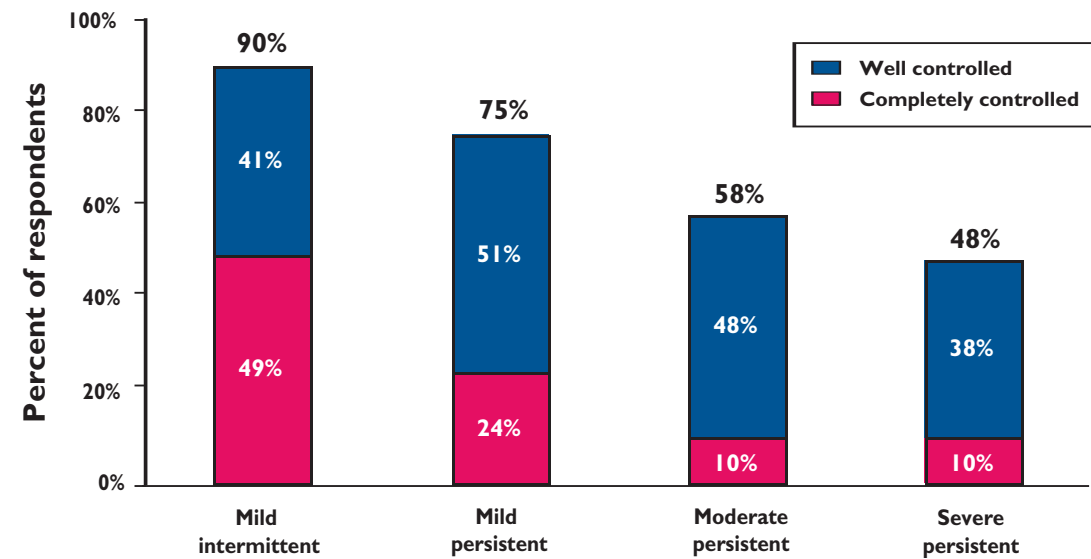


- Q16.** Now I would like you to think about just the last four weeks. Overall, how has (your/your child's) asthma been during the past four weeks? Has it been very good, good, only fair, bad or very bad?

Unweighted N=801

FIGURE 9

PERCEIVED ASTHMA CONTROL BY SYMPTOM SEVERITY DURING PAST FOUR WEEKS

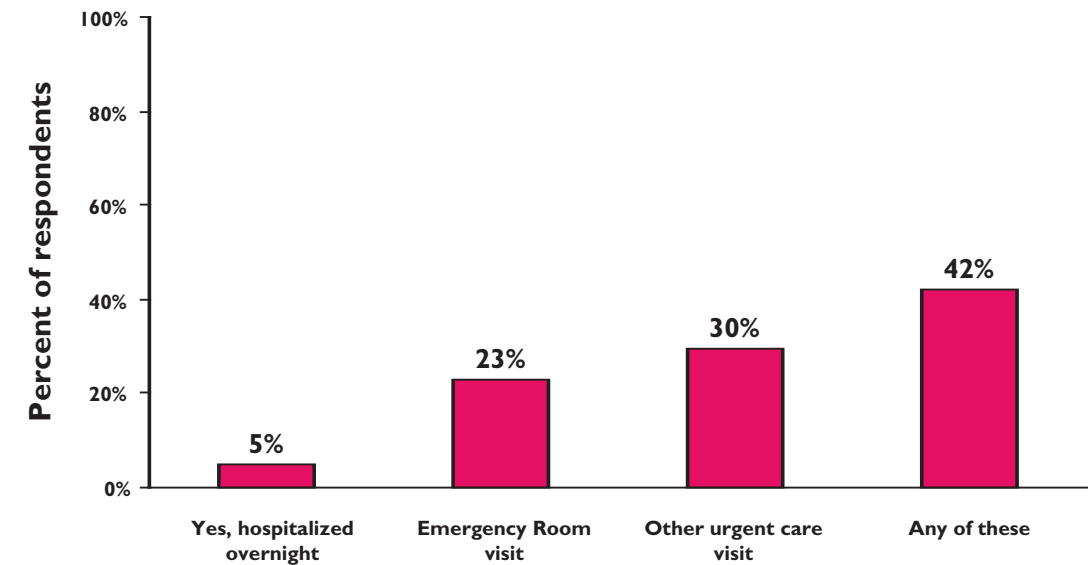


Q22. Overall, how well would you say that (your/your child's) asthma has been controlled in the past four weeks? Would you say it was completely controlled, well controlled, somewhat controlled, poorly controlled or not controlled at all?

Unweighted N=801

FIGURE 10

ACUTE CARE FOR ASTHMA IN PAST YEAR



Q12a. (Have you/Has your child) been hospitalized overnight for asthma in the past 12 months?

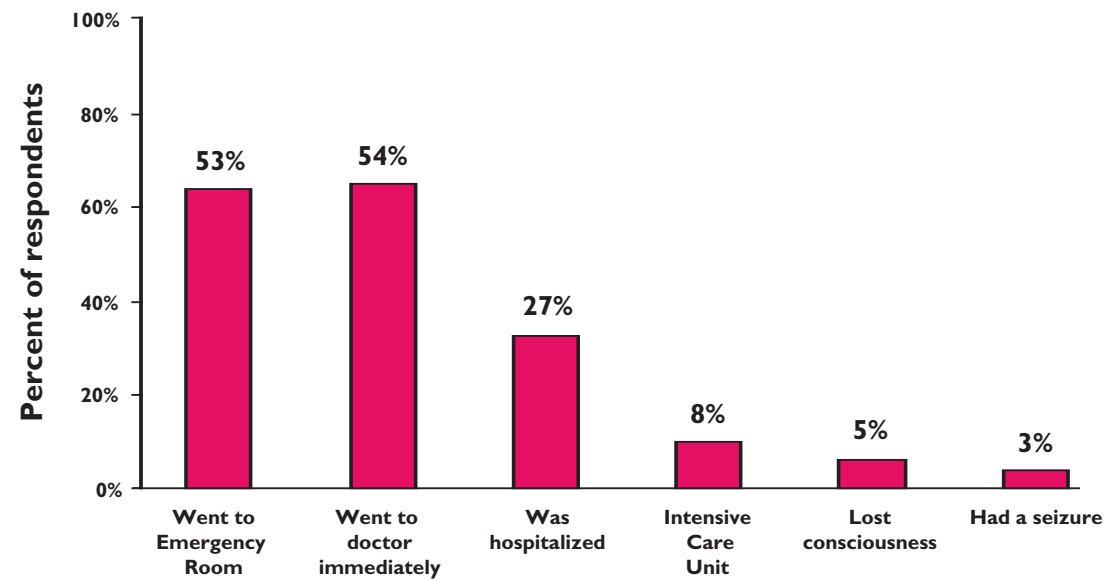
Q13a. (Have you/Has your child) gone to a hospital emergency room or emergency department for asthma in the past 12 months?

Q14a. Has (your/your child's) asthma caused any other unscheduled emergency visits to a doctor's office, clinic or somewhere else in the past 12 months?

Unweighted N=801

FIGURE 11

CONSEQUENCES OF ASTHMA ATTACK

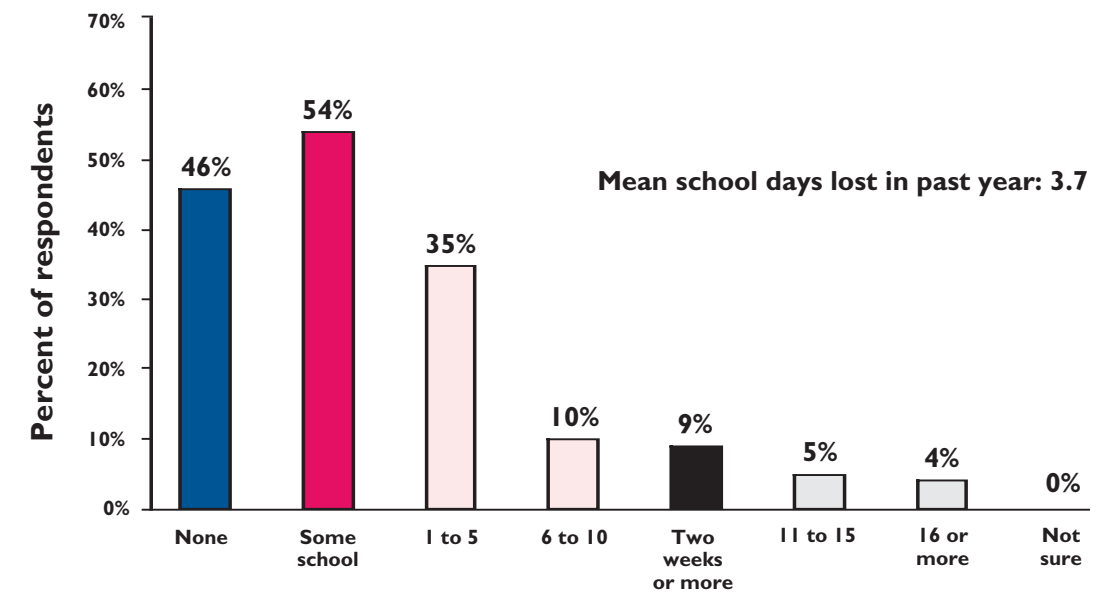


Q11a. (Have you/Has your child) EVER had an asthma attack so bad that (you/he/she)...?

Unweighted N=801

FIGURE 12

NUMBER OF SCHOOL DAYS MISSED DUE TO ASTHMA BY PATIENT IN THE PAST YEAR



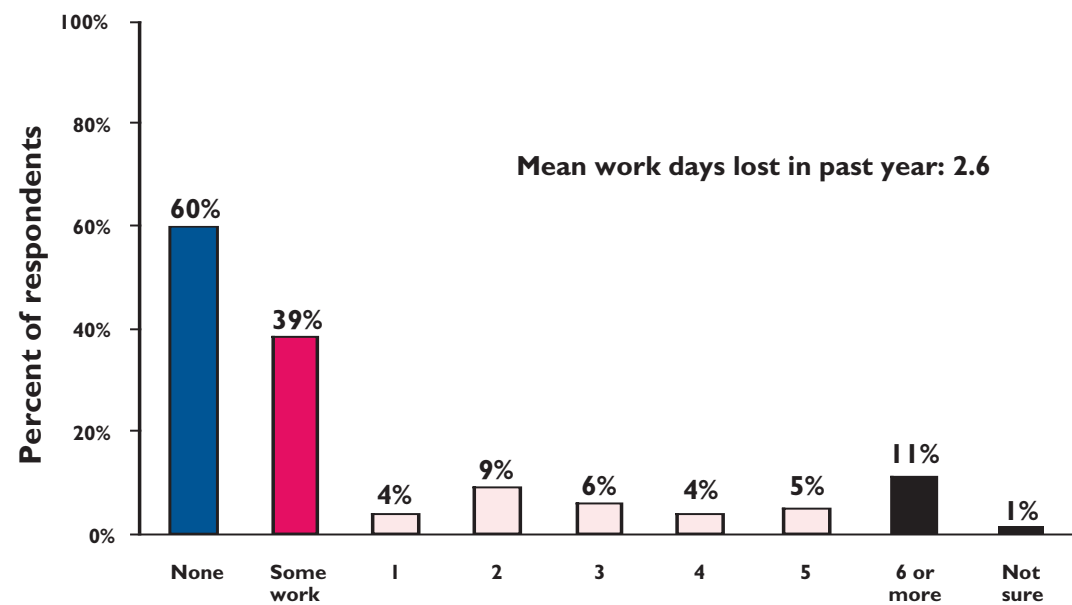
Q28a. Has (your/your child's) asthma caused (you/him/her) to miss (school/daycare) in the past year?

Q28b. How many (school days/daycare days) (have you/has your child) lost due to asthma in the past year?

Unweighted N=801

FIGURE 13

NUMBER OF WORK DAYS MISSED DUE TO ASTHMA BY PARENTS IN PAST 12 MONTHS

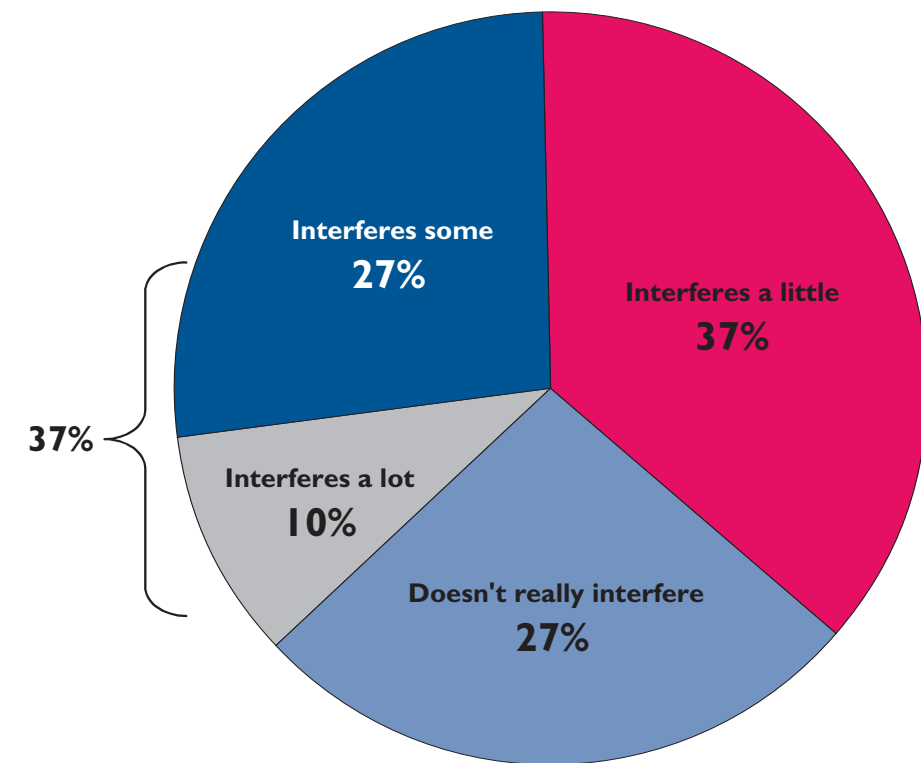


- Q15a.** Has your child's asthma caused you and your spouse to miss work in the past 12 months?
- Q15b.** How many work days have you and your spouse lost as a result of your child's asthma in the past 12 months?

Base: Parents of children four to 15 years of age. Unweighted N=678

FIGURE 14

ASTHMA INTERFERENCE WITH LIFE

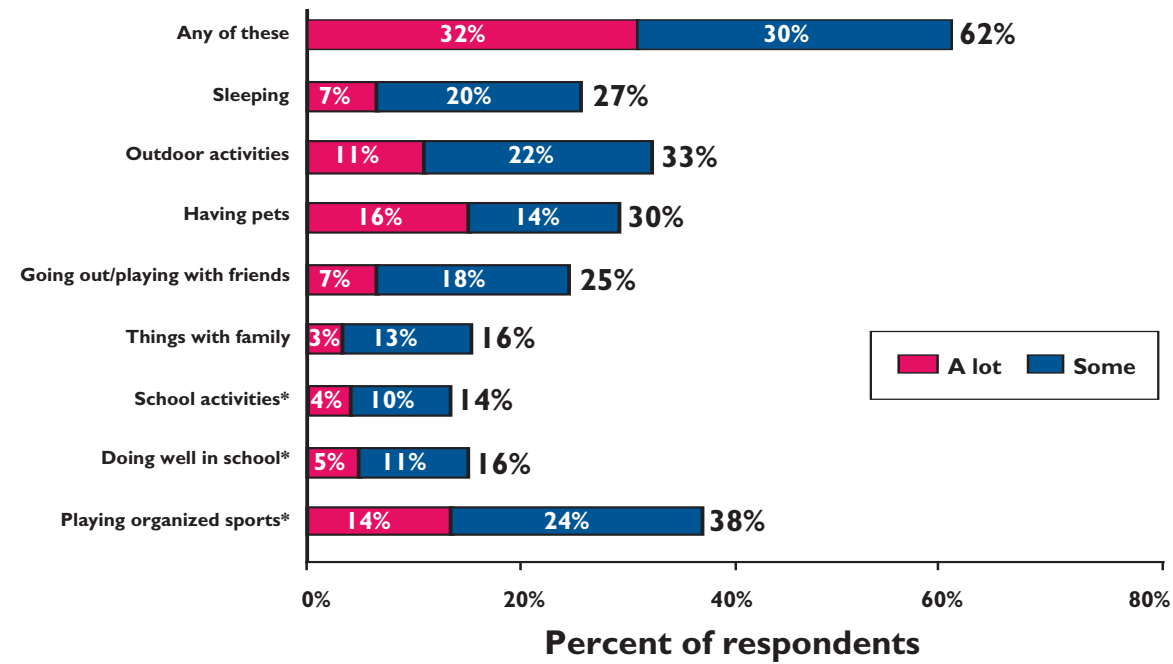


- Q24.** Overall, how much does asthma interfere with (your/your child's) life? Would you say it...?

Unweighted N=801

FIGURE 15

LIMITATIONS ON VARIOUS ACTIVITIES DUE TO ASTHMA

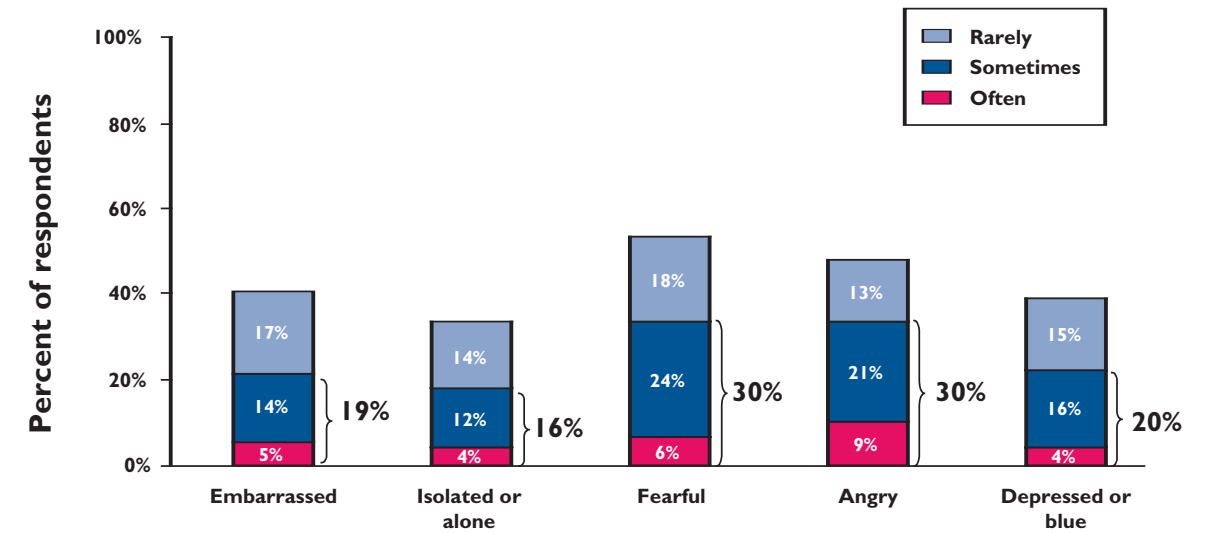


Q26. How much do you feel that (your/your child's) asthma limits what (you/he/she) can do in the following areas? Do you feel asthma restricts (you/your child) a lot, some, only a little or not at all in...? Unweighted N=801

*Indicates that only parents of children six years of age and older were asked. Unweighted N=694

FIGURE 16

EMOTIONS AS A RESULT OF ASTHMA

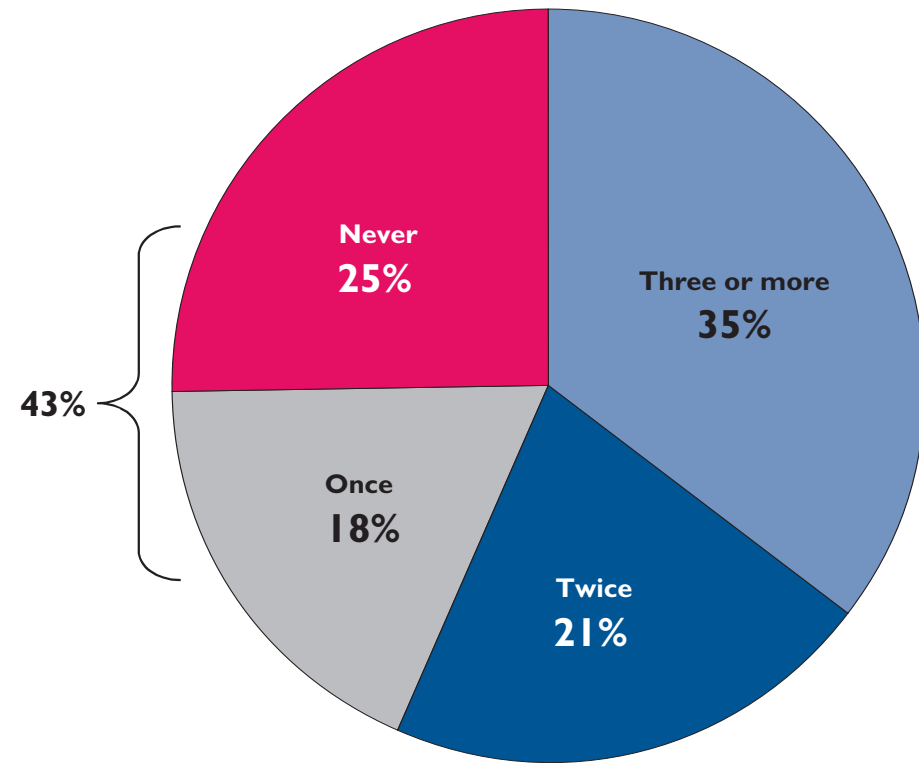


Q34. As a result of (your/your child's) asthma, how often (do you/does he/she) feel...often, sometimes, rarely or never?

Unweighted N=801

FIGURE 17

SEEN DOCTOR FOR ASTHMA IN PAST 12 MONTHS



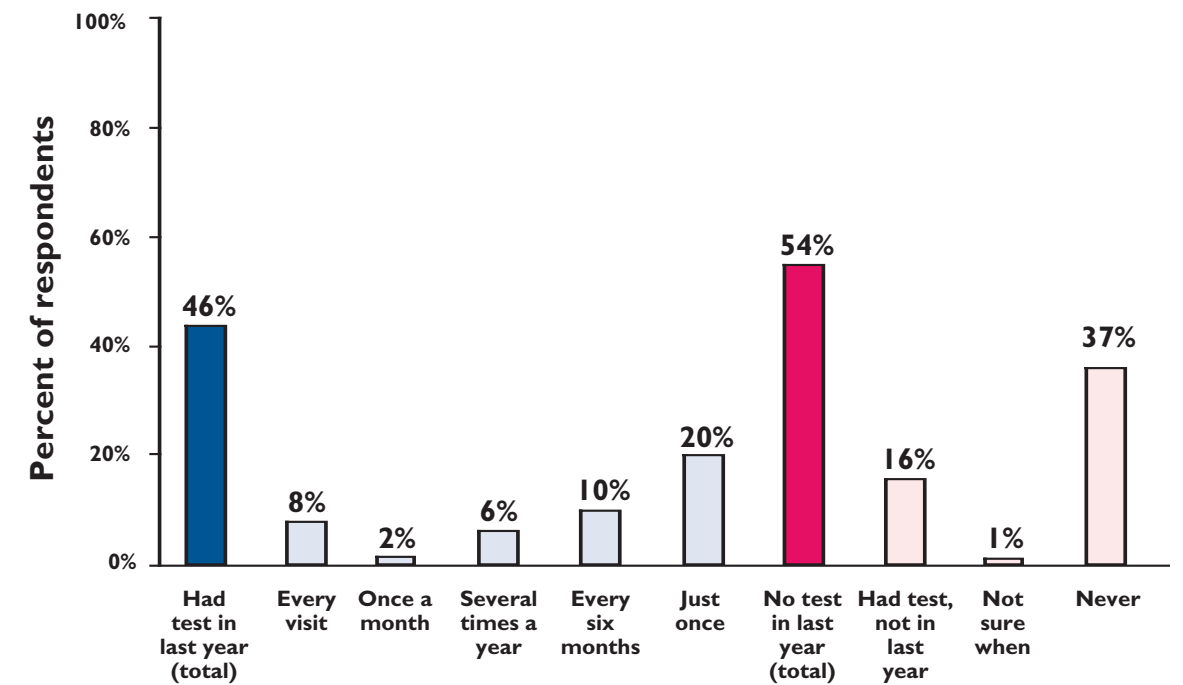
Q38a. Not counting hospital or emergency room visits, (have you/has your child) seen a doctor about (your/his/her) asthma in the past 12 months?

Q38b. How many times (have you/has your child) seen a doctor about (your/his/her) asthma in the past 12 months?

Unweighted N=801

FIGURE 18

FREQUENCY OF LUNG FUNCTION TEST IN THE PAST YEAR

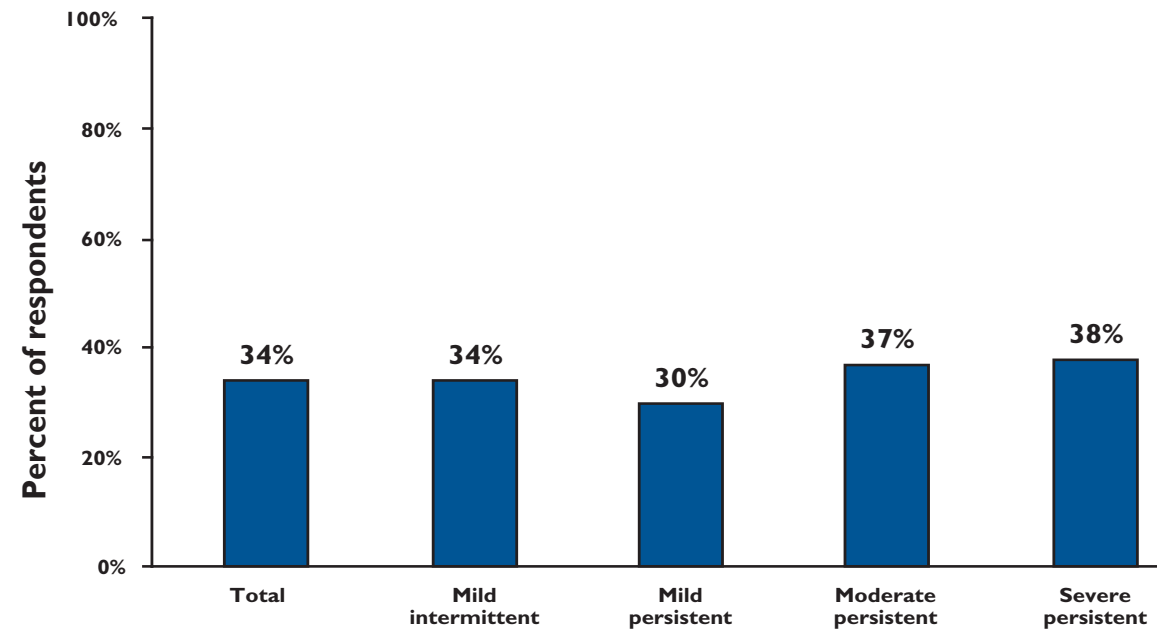


Q42b. How often has (your/your child's) lung function been tested by a doctor or nurse in the past year?

Base: Children over four years of age. Unweighted N=749

FIGURE 19

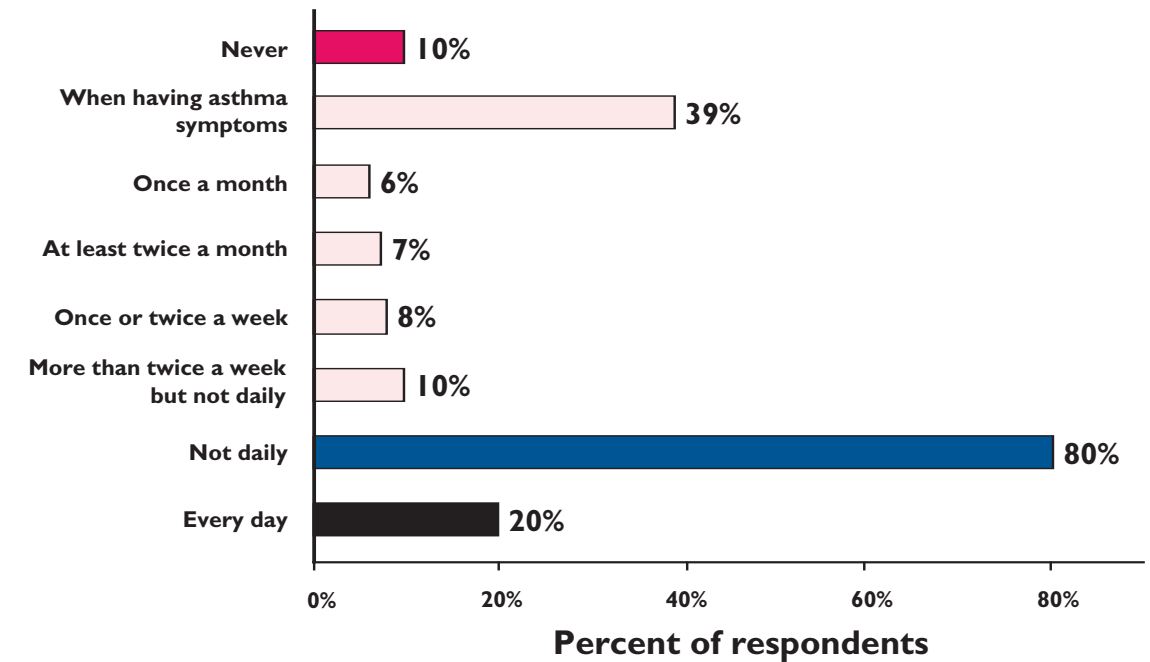
PATIENT HAS A PEAK FLOW METER BY SEVERITY



Q43b. (Do you/Does your child) have a peak flow meter?
Unweighted N=801

FIGURE 20

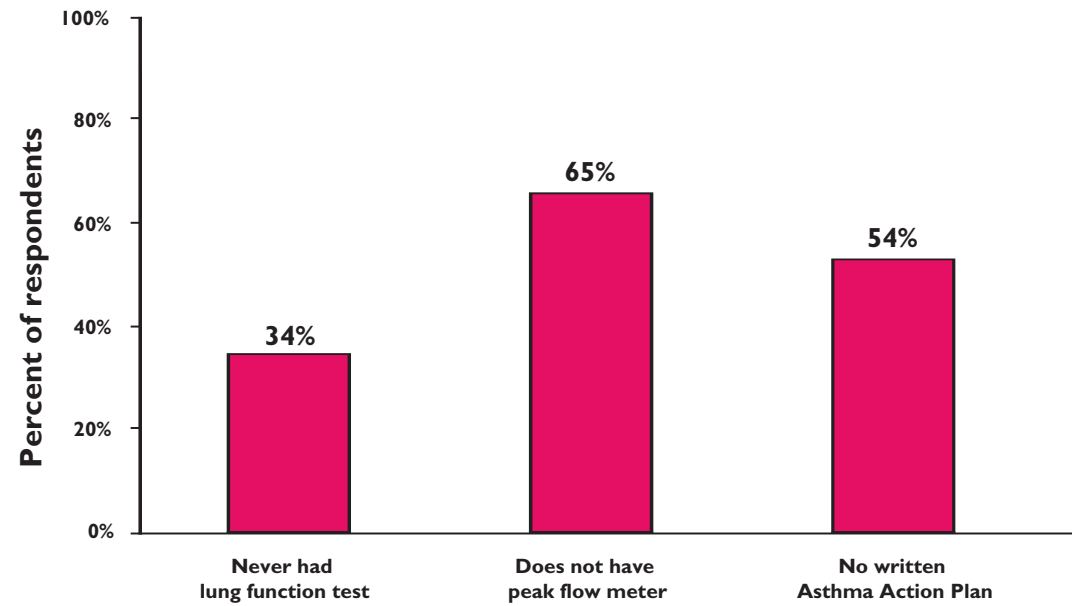
USE OF PEAK FLOW METER



Q43e. How often (do you/does your child) use a peak flow meter to measure (your/his/her) airway function?
Base: Children classified with moderate persistent and severe persistent asthma with a peak flow meter. Unweighted N=82

FIGURE 21

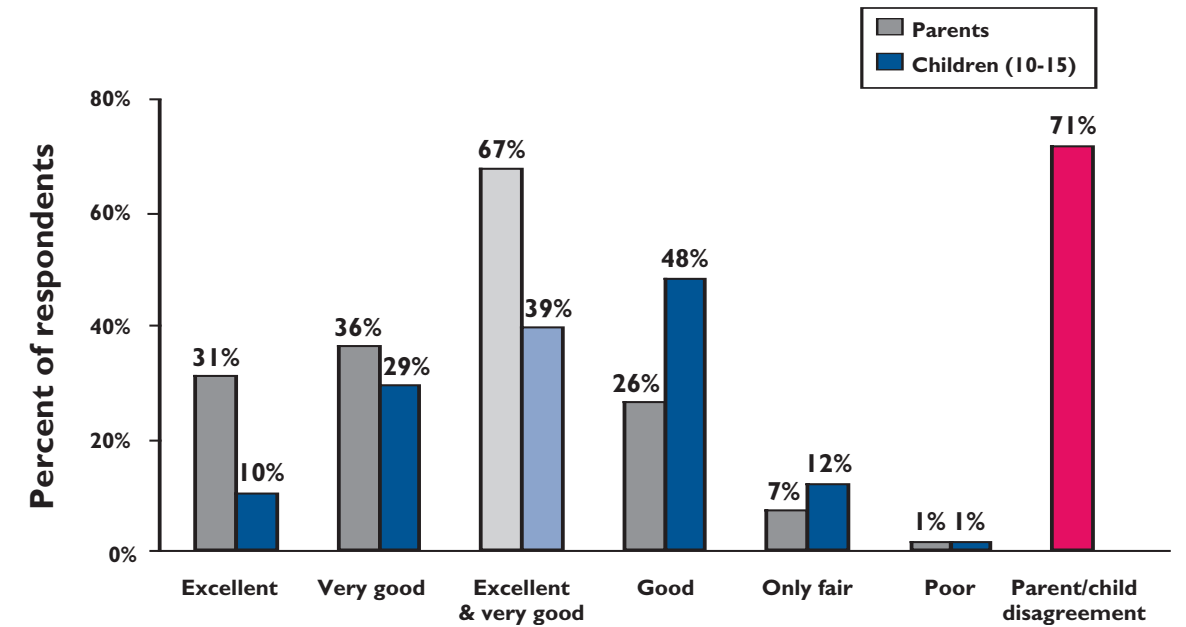
ASTHMA MANAGEMENT ACTIVITIES



- Q42a.** Lung function is normally measured by having patients breathe into a hose or tube connected to a special machine in a doctor's office, which gives a readout or print out of lung function. (Have you/Has your child) ever had a lung function test – where (you/he/she) blew into a tube? (excludes children four years of age) Unweighted N=749
- Q43b.** (Do you/Does your child) have a peak flow meter? Unweighted N=801
- Q45a.** Has (your/your child's) doctor developed a written Action Plan for (your/your child's) asthma treatment? Unweighted N=801

FIGURE 22

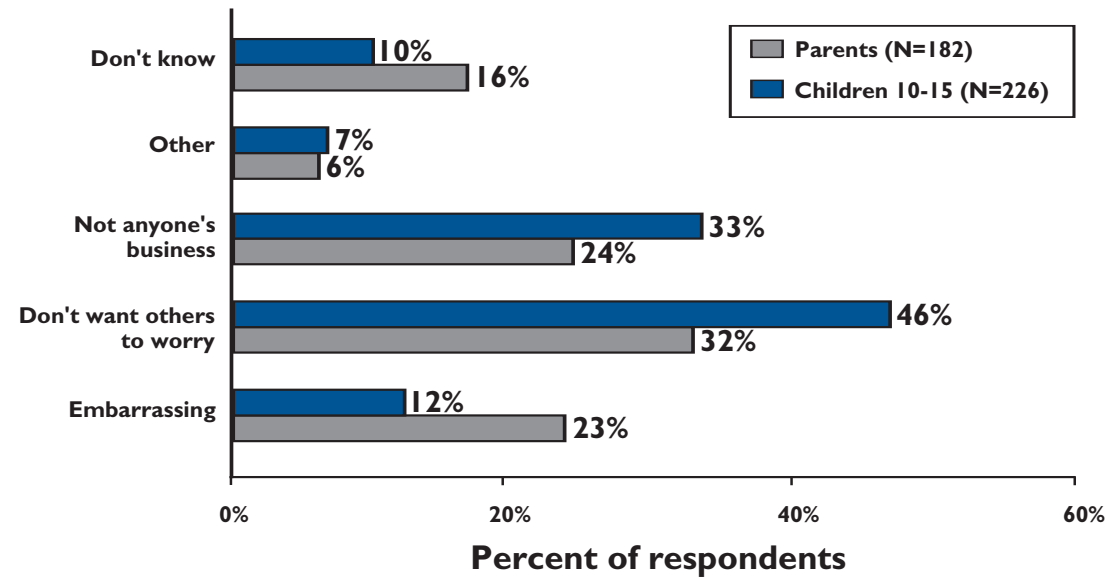
HEALTH STATUS



- Q2.** Would you say that (your/your child's) health, in general, is excellent, very good, good, only fair, poor or very poor?
Base: All children 10 to 15 years of age and their parent/guardian. N=284 pairs

FIGURE 23

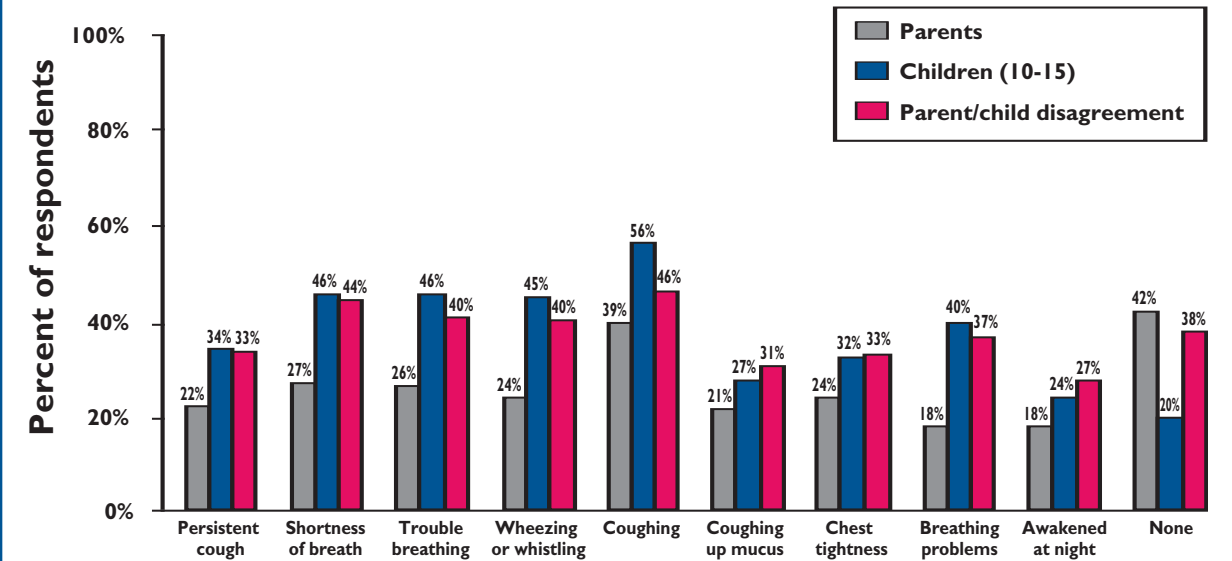
WHY RESPONDENTS DON'T ADMIT ASTHMA IS WHY MISSING ACTIVITIES



Q25b. When (you don't/your child doesn't) admit it was asthma that caused (you/him/her) to do these things, is it because...?
 Base: All parents and adolescents who don't always admit asthma is the reason for not doing an activity

FIGURE 24

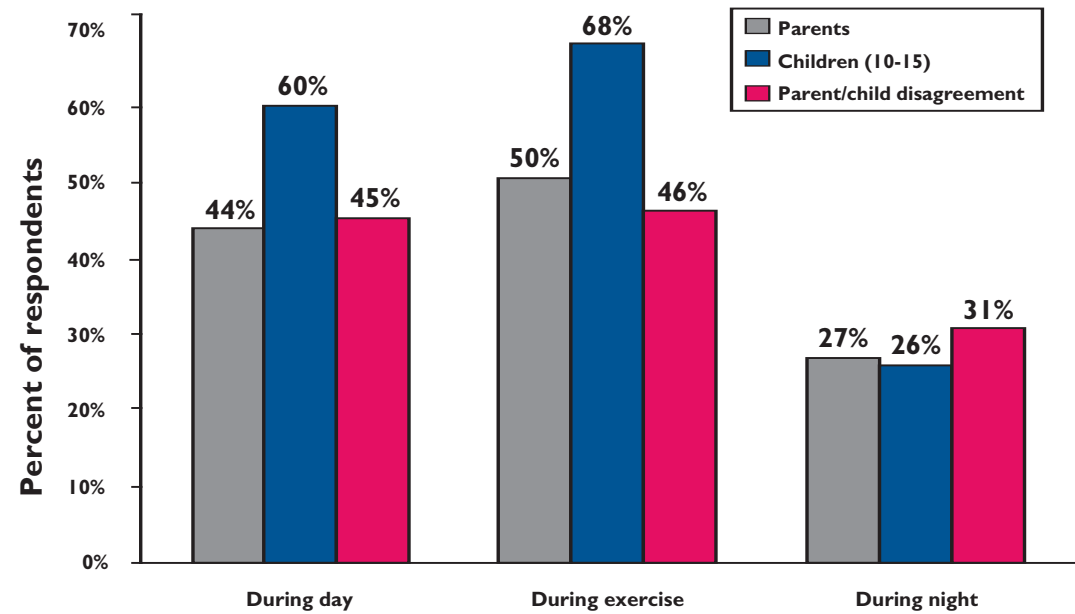
CONDITIONS IN PAST FOUR WEEKS



Q17. During the past four weeks, (have you/has your child) had...?
 Base: All children 10 to 15 years of age and their parent/guardian. N=284 pairs

FIGURE 25

ASTHMA SYMPTOMS IN PAST FOUR WEEKS

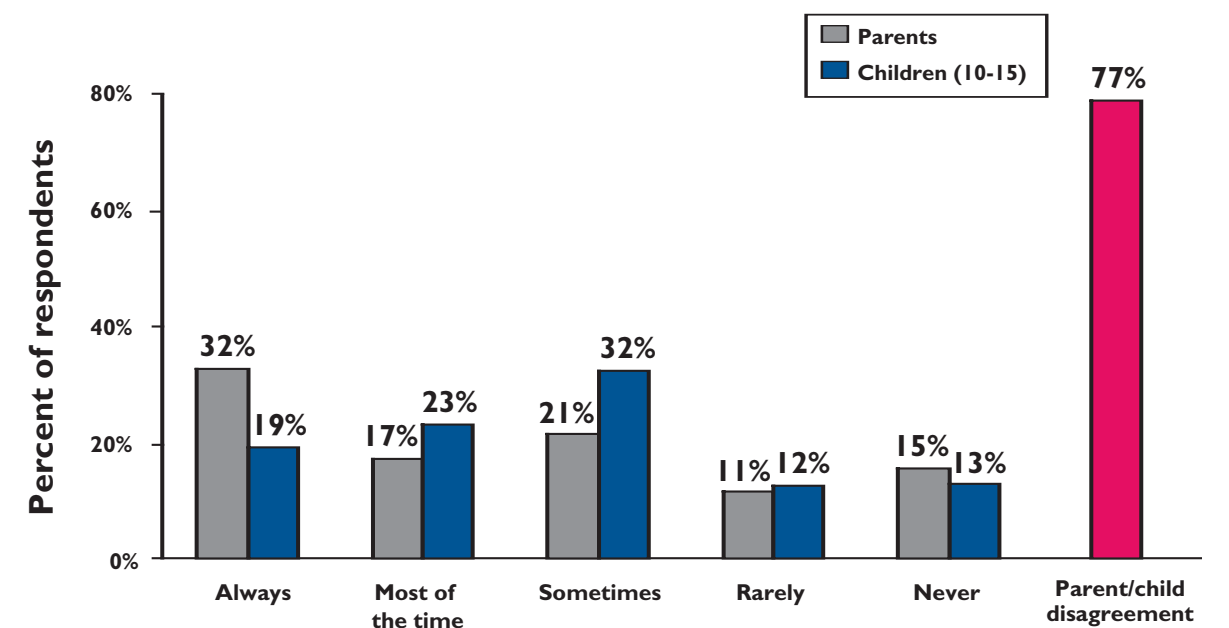


- Q19a.** In the past four weeks, (have you/has your child) had a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during the day?
- Q20a.** In the past four weeks, (have you/has your child) had a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during exercise, play or physical exertion?
- Q21a.** In the past four weeks, (have you/has your child) been awakened by a cough, or wheezing, or shortness of breath, or trouble breathing or chest tightness during the night?

Base: All children 10 to 15 years of age and their parent/guardian. N=284 pairs

FIGURE 26

TELL OTHERS ASTHMA IS REASON

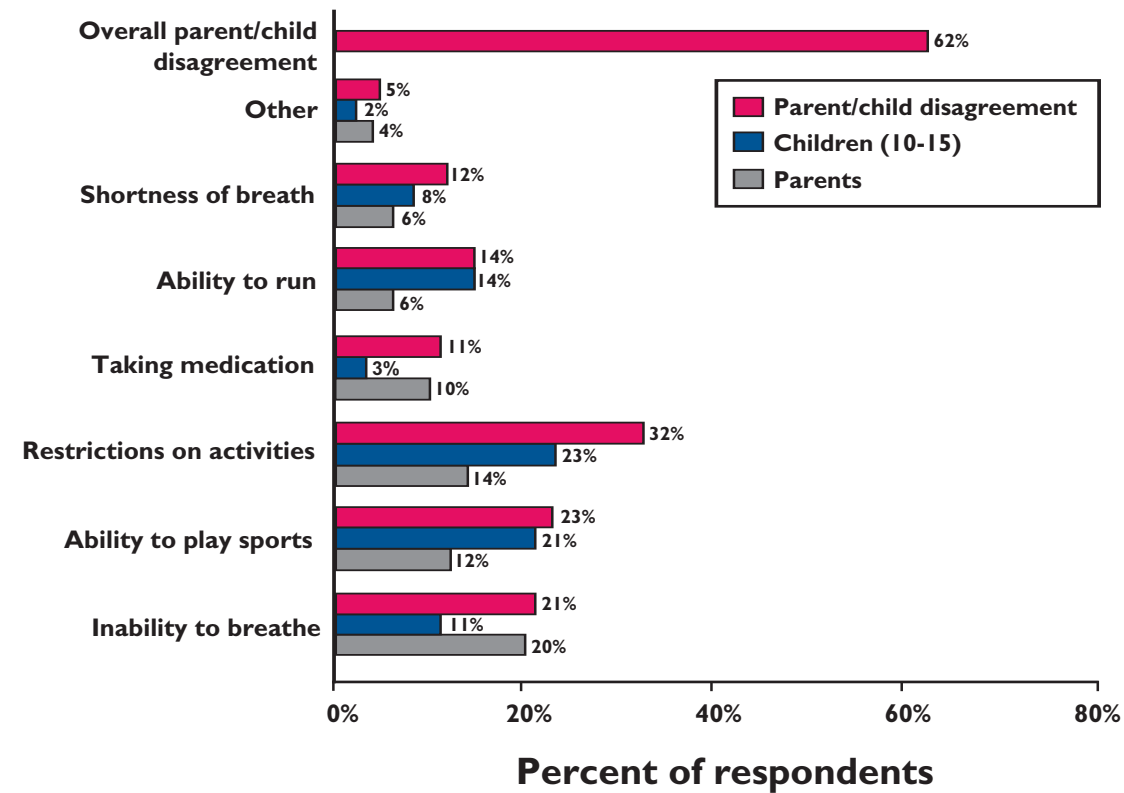


- Q25a.** When asthma causes (you/your child) to cancel, postpone, interrupt or stop an activity, (do you/does he/she) tell others that asthma is the reason...?

Base: All children 10 to 15 years of age and their parent/guardian. N=284 pairs

FIGURE 27

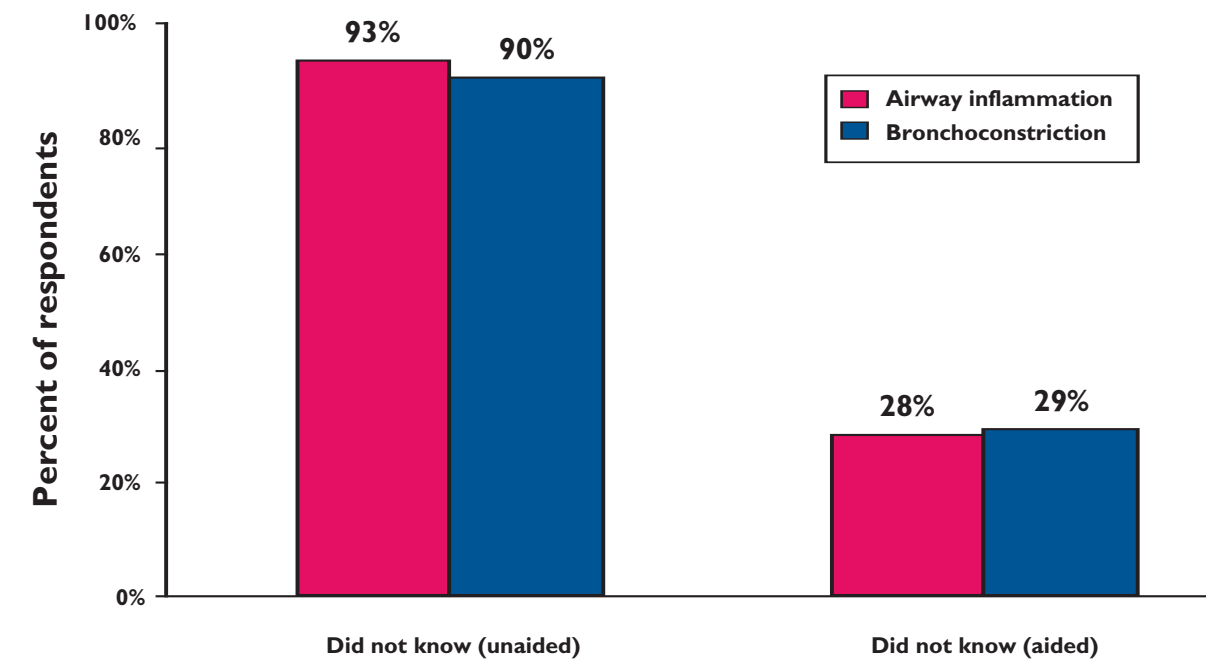
WORST THING ABOUT ASTHMA



Q36. What (do you/does your child) think is the worst thing about having asthma?
 Base: All children 10 to 15 years of age and their parent/guardian. N=284 pairs

FIGURE 28

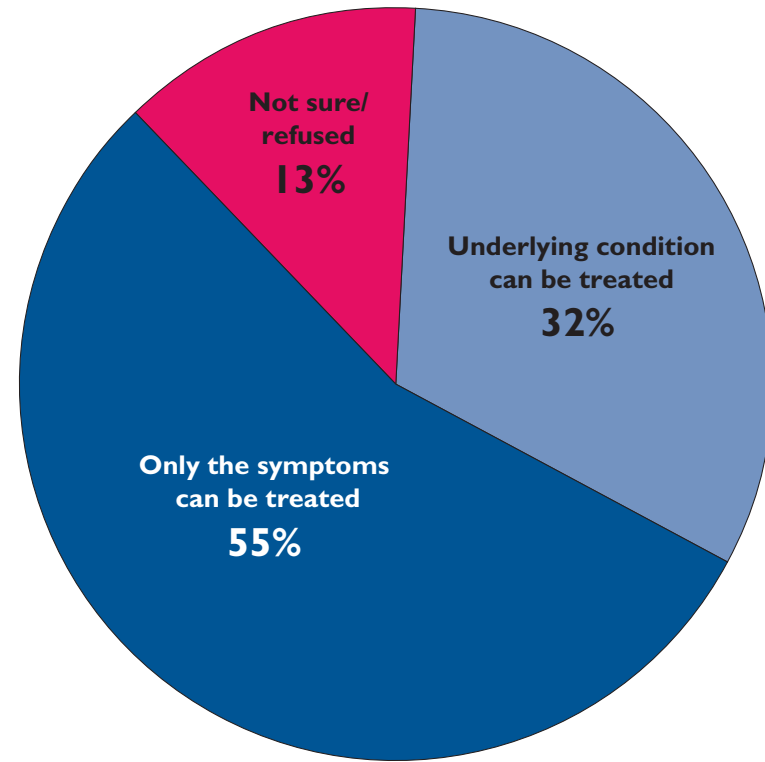
AWARENESS OF UNDERLYING CAUSES OF ASTHMA SYMPTOMS: AIDED & UNAIDED



Q48. Based on what you know or have heard, what are the causes of asthma?
Q50a. Have you ever heard that inflammation of the airways is one of the underlying causes of asthma symptoms?
Q51a. Have you ever heard that tightening of the muscles surrounding the airways, sometimes called bronchoconstriction, is another major factor causing asthma symptoms?
 Unweighted N=801

FIGURE 29

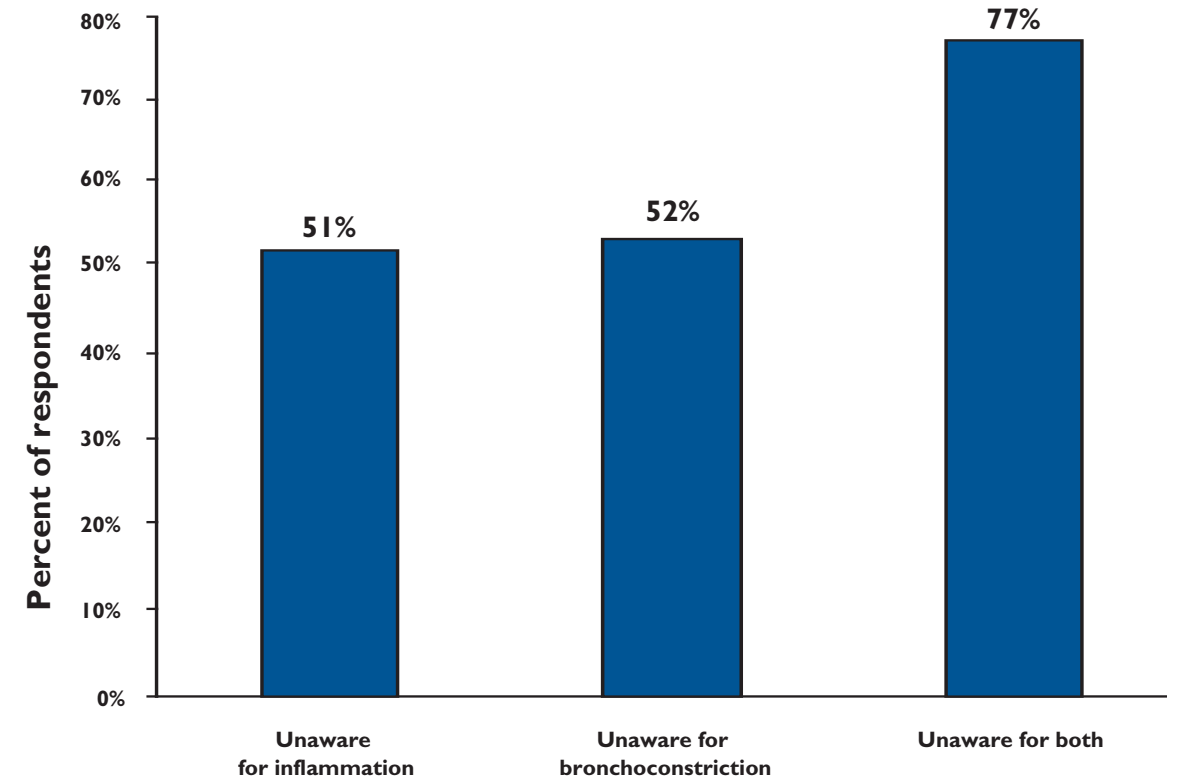
WHETHER CONDITION CAN BE TREATED OR ONLY SYMPTOMS



Q49. Can the underlying cause(s) be treated or only the symptoms?
Unweighted N=801

FIGURE 30

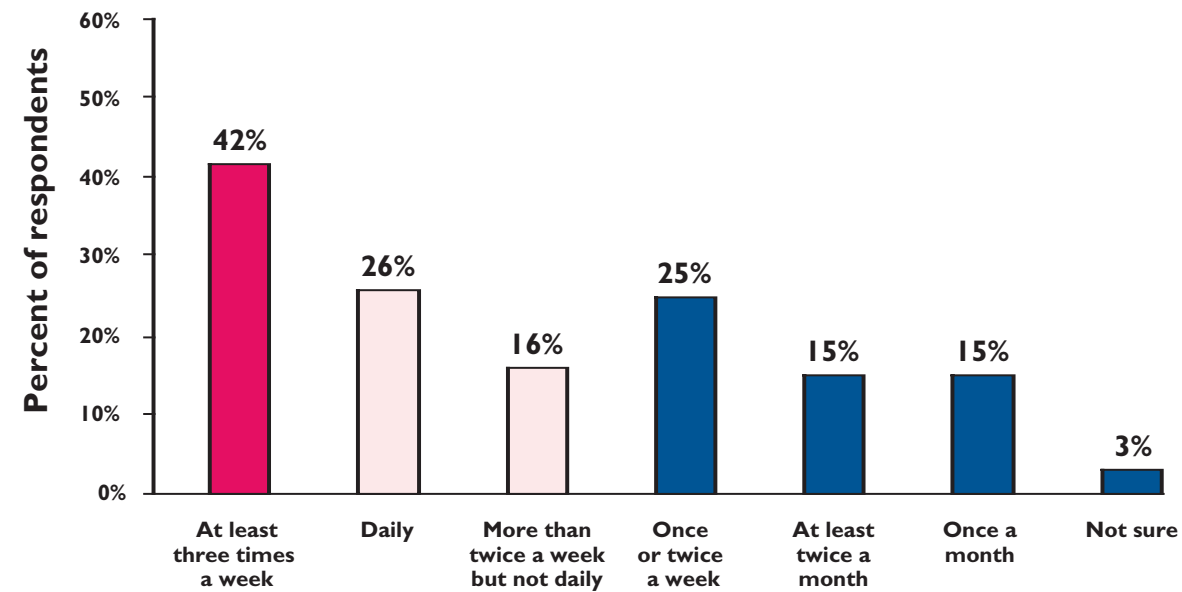
AVAILABILITY OF EFFECTIVE MEDICATIONS FOR CAUSES OF ASTHMA SYMPTOMS



Q50b. Are there any asthma medications that are really effective in reducing airway inflammation?
Q51b. Are there any asthma medications that are effective in helping to prevent tightening or constriction of the muscles surrounding the airways?
Q52a. To the best of your knowledge, are there any medications that treat both airway inflammation and constriction of the airways?
Unweighted N=801

FIGURE 31

HOW OFTEN TAKE MEDICINE FOR QUICK RELIEF: USED IN PAST FOUR WEEKS

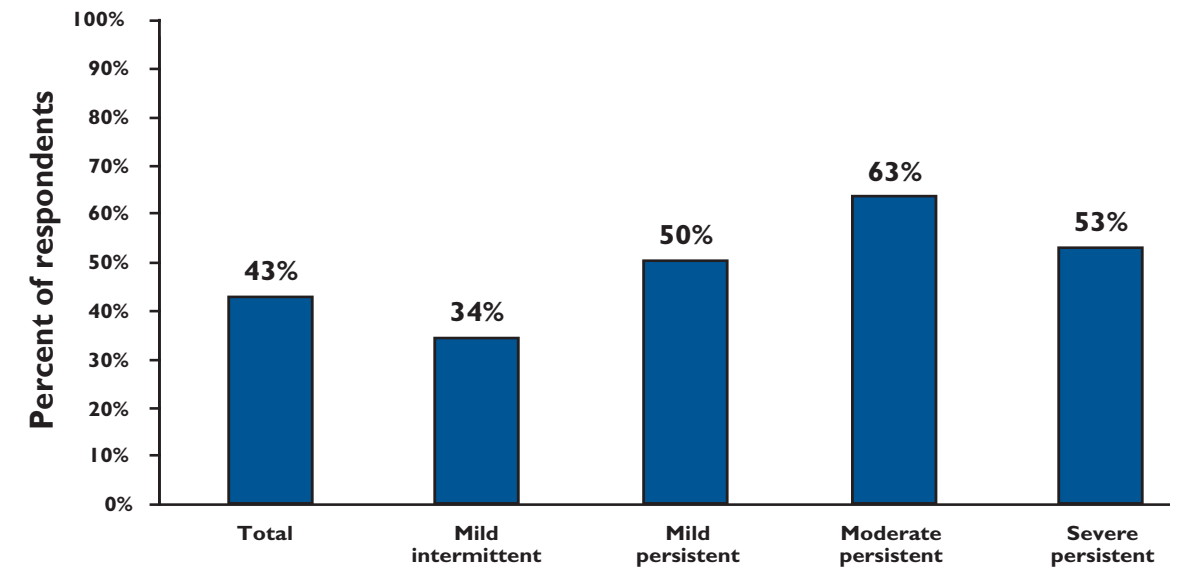


Q54d. During the past four weeks, how often do/does/did (you/your child) use medicine for quick relief from asthma symptoms?

Base: Users of quick-relief medicines in the past four weeks.
Unweighted N=310

FIGURE 32

USED PRESCRIPTION MEDICINE FOR LONG-TERM CONTROL IN PAST FOUR WEEKS BY SEVERITY

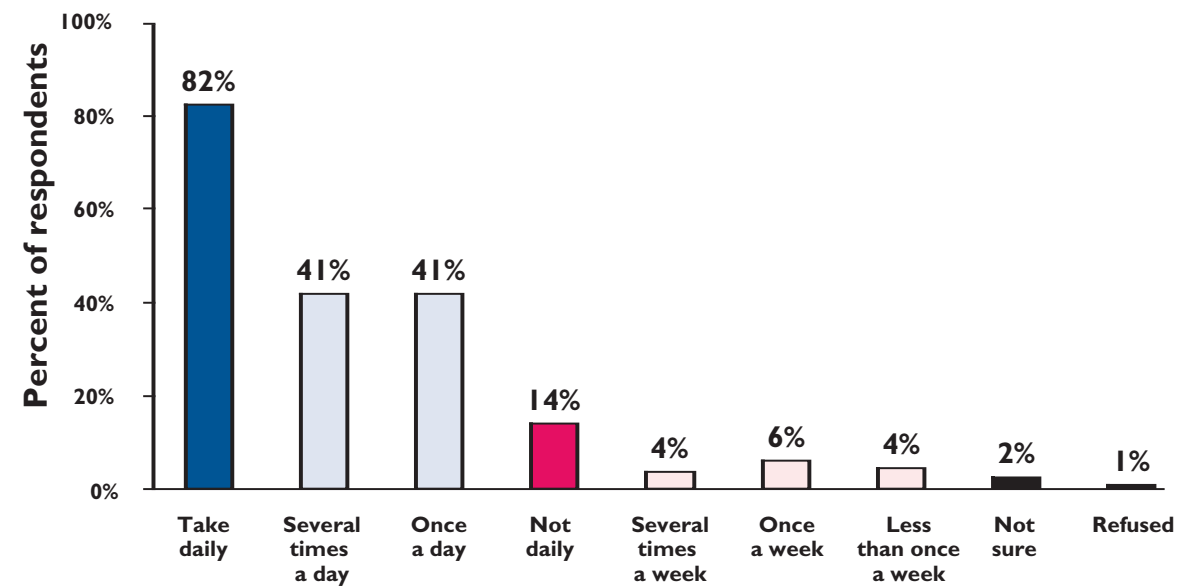


Q56a. In the past four weeks, (have you/has your child) used any prescription medicine as daily maintenance therapy for controlling (your/his/her) asthma?

Unweighted N=801

FIGURE 33

HOW OFTEN TAKE MAINTENANCE MEDICINE FOR MODERATE AND SEVERE PERSISTENT

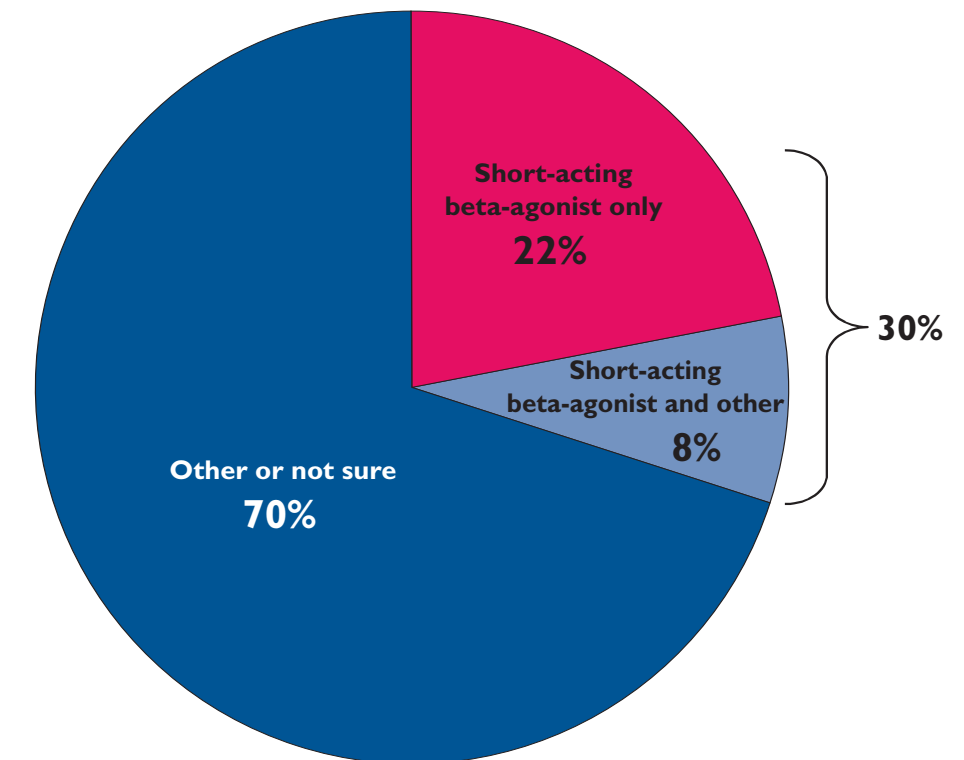


Q56d. How often do/does/did (you/your child) take this asthma control medicine?

Base: Children with moderate and severe persistent asthma.
Unweighted N=135

FIGURE 34

TYPE OF PRESCRIPTION MEDICINE USED FOR LONG-TERM ASTHMA CONTROL IN PAST YEAR



Q56e. What is/are the name(s) of that/those medicine(s) (you/your child) used for long-term control of (your/your child's) asthma?

Base: Users of prescription medicine for maintenance therapy in past year.
Unweighted N=445



GlaxoSmithKline

Research Triangle Park, NC 27709
www.gsk.com