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Asthma is the most common chronic childhood disease, affecting almost 5 million children in this country. The children most at risk for developing asthma come from low income, minority, and urban families. This study examines a proposed pediatric asthma intervention program targeting Tarrant County area Medicaid clients.

The purpose of this study is to define different subgroups and preferences among those clients and to recommend modifications that are likely to improve program outcomes. Recommendations were based on information gathered from interviews with 70 families, all having at least one child with asthma. Specific interests in learning more about asthma as well as learning preferences are tested for association with a variety of family characteristics.

Although no statistically significant results were determined for subgroups, descriptive findings reveal that a large majority of respondents are interested in more information about asthma, but not necessarily by the means proposed. The study also suggests special needs for families with very young children, for those with adult asthma, and for Hispanics.

POPULATION CHARACTERISTICS SUGGEST  
MODIFICATIONS TO PROPOSED PEDIATRIC  
ASTHMA INTERVENTION PROGRAM


Margaret W. DeMoss, B.A.

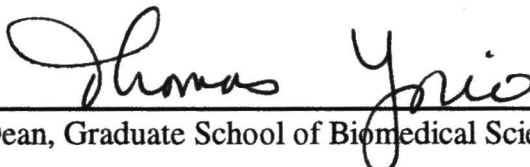
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ASTHMA INTERVENTION PROGRAM

THESIS

Presented to the Graduate Council of the  
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in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC HEALTH

By

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## Chapter 1

### INTRODUCTION

#### Purpose of the Study

Trends show that the children most at risk for developing asthma come from low income, minority, and urban families. This population has frequent and repeated usage of medical emergency facilities, often in lieu of seeing a primary care physician and practicing good asthma management techniques. The results are increased costs and increased rates of morbidity and mortality for childhood asthma.

In a local response to this childhood disease, a research group and a private medical health care system are developing an innovative pediatric asthma intervention program. The target population for this proposed intervention will be children served by the Medicaid service area for Tarrant County, Texas. The program goal is to reduce the number of emergency visits to hospitals, clinics, and physicians' offices; the program integrates multi-media technology with traditional educational tools. Prior to the implementation of the intervention, this study was undertaken to aid in the conceptualization and design analysis for the pilot.

The purpose of this study is to delineate different subgroups of the target population by examining family characteristics and preferences and to recommend modifications for the program intervention that are likely to improve outcomes.

## Importance of the Research

### Asthma: A Childhood Epidemic

Asthma is the most common chronic disease of childhood, affecting an estimated 4.8 million children in this country (Adams & Marano, 1995). In the United States, asthma accounts for about 15% of non-surgical hospital admissions in the pediatric age group. It is one of the leading causes for emergency care and for missed school, and is a cause for considerable morbidity, disability, and occasional mortality. Of the nearly 5 million children suffering from asthma, an increasingly disproportionate percentage are minorities living in the inner cities. Death rates have been consistently highest for black males aged 15 to 24 (CDC, 1996). Among children, 80% of the deaths from asthma are in those who live in urban areas (CDC, 1996). And, asthma is on the increase; from 1982 to 1992 the prevalence of asthma increased 42%, and the average annual death rate, by 40% ("Current trends," 1995). The most recent data from the Center for Disease Control (CDC), published in April 1998, reported that, since 1984, asthma rates have increased 75% in the United States. The study found the highest rates of hospitalization and visits to the emergency room for asthma among African Americans and people living in the Northeast ("Asthma increases," 1998).

Asthma-related medical costs in 1990 were about \$3.6 billion, more than one-half due to emergency department (i.e., hospital and clinic emergency rooms) and inpatient services. Associated costs drove the total to over \$6.2 billion for missed school/work days, caregiver expenditures, travel, time, etc. People with asthma collectively



have more than 100 million days of restricted activity and 470,000 hospitalizations annually (Weiss, Gergen, & Hodson, 1992, Adams & Marano, 1995).

National health objectives for the year 2000 regarding asthma prevention, for both children and adults, include goals to reduce hospitalizations, to increase patient education, and promote better surveillance. State-specific questions have been added to the national Behavioral Risk Factor Surveillance System, and asthma has been designated a performance measure in the Health Plan and Employer Data Information Set (HEDIS) (Anderson, 1996).

In their response to this growing asthma epidemic, the medical professions, private drug companies, and non-profit organizations have developed a plethora of asthma education materials for use by providers, educators, parents, and children (see Appendix A). Traditional written materials have been supplemented with workbooks, visual aids, diaries, structured classes, focus groups, individual teaching, promotion of peak flow monitoring, residential camps, relaxation and hypnosis sessions, and, most recently, videocassettes and computer games (Bernard-Bonin, Stachendo, Bonin, Charette, & Rousseau, 1995, Capen, Dedlow, Robillard, Fuller, & Fuller, 1994, Clark et al., 1986, Huss et al., 1992, Kohen & Wynn, 1993, Kohler et al., 1993, Rachelefsky, 1987, Rubin et al., 1986).

The direct healthcare costs for asthmatic patients has been estimated to average from an annual per patient cost of \$140, for the least costly patients, to \$2,504 per patient for the more expensive 20%. According to Rubin et al. (1986) the average cost

of stay for patients hospitalized with severe asthma for 5 to 6 days is about \$18,000. A study of 250 children by Bruhn (1983) estimated that a family education self-management plan saved an estimated annual cost of more than \$11,500 per patient. Major health care providers, in particular, managed care organizations, have adopted corporate goals to reduce costs, especially those related to frequent use of the emergency room. Strategies they employ include helping clients learn to better manage their own health care by using primary care physicians, calling a 24-hour nurse hotline, accessing health-related social services, and practicing preventive strategies.

#### Asthma: A Local Concern

Asthma has become a local concern as well. In 1996 the North Central Texas HEDIS Coalition (NCTHC) surveyed the greater metroplex school districts to determine to what extent schools interface with asthmatic children and are able to contribute to the delivery of asthma care and prevention (North Central Texas, 1998). Local initiatives by the public health departments, managed care providers, and organizations such as the American Lung Association, provide continuing, if sporadic, education for school personnel, students, and families.

In the six-county area that includes Tarrant County, Medicaid recipients are provided healthcare through STAR, the State of Texas Access Reform managed care program. STAR requires a quarterly report on the frequency of diagnosis of asthma. Data is collected on emergency room visits, triage visits, follow-up by the primary care physician, medications, and education and prevention services (Harris

Methodist, 1997). It is the hope that this and subsequent information will help Medicaid managed care providers design aggressive patient education and case management programs.

Schools are also concerned about children with asthma. Across the nation, those children collectively lose an extra 10 million school days each year compared with children who do not have asthma. According to Jackie Thompson, director of health services for the Fort Worth Independent School District (FWISD), asthma is one of the leading causes for outside medical referral by Fort Worth public school nurses (J. Thompson, personal communication, April, 1998). As public schools serve increasing numbers of poor children, Medicaid providers have begun seeking ways of reaching their asthmatic patients through school programs. Over 67% of FWISD children qualify for free or reduced lunch (Linda Ragsdale, personal communication, July 22, 1998), and at least a majority of students qualify at 17 of the 44 of Arlington ISD elementary schools (Sandy Rivers, personal communication, May 1, 1998). Some local providers are also targeting families directly through telephone calls and home visits.

#### Asthma: Treatment vs. Management

In the 1980s the debate was on as to whether asthma self-management education should be a part of medical service delivery. If such programs were to be integrated into healthcare systems, where would they be provided? And by whom? What were the incentives to provide such programs? Who would pay? (Mullen, P., & Mullen, L., 1983, p.611) By the 1990s, medical protocols for asthma treatment included new



diagnostics, new medications, patient and family education, and self-management through patient and family behavior change (National Heart, 1997). Discussed below are two elements of current asthma management strategies: Patient and Family Knowledge and Behavior Change.

### Patient and Family Knowledge

Accurate knowledge about asthma--the disease, its management, and its prevention--is critical to reducing the morbidity and mortality for pediatric asthma patients. Research has shown serious deficits, among some patients and their families, in their ability to judge the severity of the asthma and in their knowledge of medication and what corrective action to take, when symptoms occur (Green & Frankish, 1994). Treatment and prevention strategies for asthma are complex, requiring skills and effort on the part of healthcare providers and educators in order to convey this knowledge to families. Kohler et al. (1995) describe in more detail why children and families must acquire the motivation and skills in order to successfully manage the asthma in partnership with physicians, both in crisis and for long-term control.

Newly revised protocols for diagnosis and primary care practice and treatment of asthma were recently released by National Institute of Allergy and Infectious Diseases (1997). Strategies are based on successful interventions involving family-centered patient education, repeated counseling, and increased patient participation in monitoring, predicting, and preventing asthma attacks. Management tools include increased knowledge about asthma, personal triggers, and what to do in emergencies;

improved skills in using peak flow meters and inhalers; and increased communications among family members and with clinicians (Mullen, P., & Mullen, L., 1983, pp. 27, 48).

Some studies show asthma education programs to be cost-effective and to reduce morbidity, even among high-risk patients. Components of successful education programs begin with identifying the child and family's expectations and concerns about the disease and include a discussion about the basic asthma facts, the types and uses of medications, and a demonstration of the skills involved in the proper use of inhalers, spacers, and peak flow meters (Stoloff & Janson, 1997). The patient has a written, individual, self-management asthma plan, for which the child and family are responsible; this plan usually includes keeping an asthma log to help identify triggers that exacerbate breathing problems, to record peak flow rates, and to indicate the frequencies and dosage of medications/treatments administered.

### Behavior change

Health education has been used successfully for years to increase knowledge, modify attitudes, and change behaviors. Although numerous studies are available that correlate health education with improved asthma management, resulting in reduced incidence and severity of asthma, more recent studies, including two separate meta-analyses, indicate otherwise (Bernard-Bonin, Stachendo, Bonin, Charette, & Rousseau, 1995, Howland, Bauchner, & Adair, 1988, Kolbe, 1996, Rachelefsky, 1987). Kolbe (1996) reported education programs improved knowledge but did not necessarily reduce morbidity. Boulet et al. (1994) found that early asthma education program

evaluations were not usually performed with the same rigor as those for asthma drugs; few programs had been examined in a randomized, controlled fashion.

In 1983, Bartlett wrote about the merging of educational theories and behavioral theories as applied to the burgeoning self-care philosophies. Many of these education/behavioral theories fell under the umbrella of the PRECEDE framework. (The acronym stands for Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation.) “There have been more than 360 published applications of the [PRECEDE] model, many in asthma education” (Boulet et al., 1994, p.185). In the 1980s, numerous health educators embraced the PRECEDE model with their own variations and blends. The health belief model, the self-efficacy theory, and the social learning theory have been those most vigorously supported by asthma educators (Bartlett, 1983, Bruhn, 1983, Clark et al., 1997, Green & Frankish, 1994). For example, Bartlett supported Bandura’s self-efficacy theory for asthma intervention. It is not enough to know what causes one’s asthma; one must have expectations that a given behavior can be successfully performed (e.g. to manage one’s wheezing) (Bartlett, 1983, p.547). Various studies attempted to match theories with asthma intervention programs and visa versa (Bruhn, 1983, Clark, 1983).

By the 1990s, most experts agreed asthma education and behavior change were neither synonymous nor easy. One-size theory did not fit all. What little analysis there was pointed to the need for multiple interventions, individualized to match different



family backgrounds (Bruhn, 1983, Green & Frankish, 1994). Successful interventions were the ones that included both the child and the family, where good provider-patient relationships existed (Clark et al., 1997).

### Theoretical Model

An examination of the literature indicates a variety of theory-based constructs necessary for successful interventions. An examination of the intervention proposed for Tarrant County reveals the strategies for that asthma intervention pilot. A summary of those constructs and strategies are found in Appendix B. Many of the factors influencing success are already built into the proposed intervention. For example, there is training in culturally sensitivity and good communication skills for the health educator. This training helps establish the critical factors of trust and confidence between families and providers. There is reinforcement of the education through the different types of materials and strategies provided, in the follow-up home visit by the health educator, and by coordinating with the primary care physician. And, there is an attempt to individualize through the interactive computer game and the Personal Asthma Management Plan. This research study will examine some of the variables that might be related to three additional constructs: Is the target population ready to learn? Do they believe a change in behavior is possible and that it will improve the asthma? Is the education provided relevant to the target population?

To clarify the design of the asthma program proposed for Tarrant County, I have provided a schematic interpretation of that intervention (see

Figure 1, page 11). The model is provided as a theoretical design only. This research study does not attempt to test the constructs of this model, but to test variables that might be related to predisposing factors or subsequent outcomes.



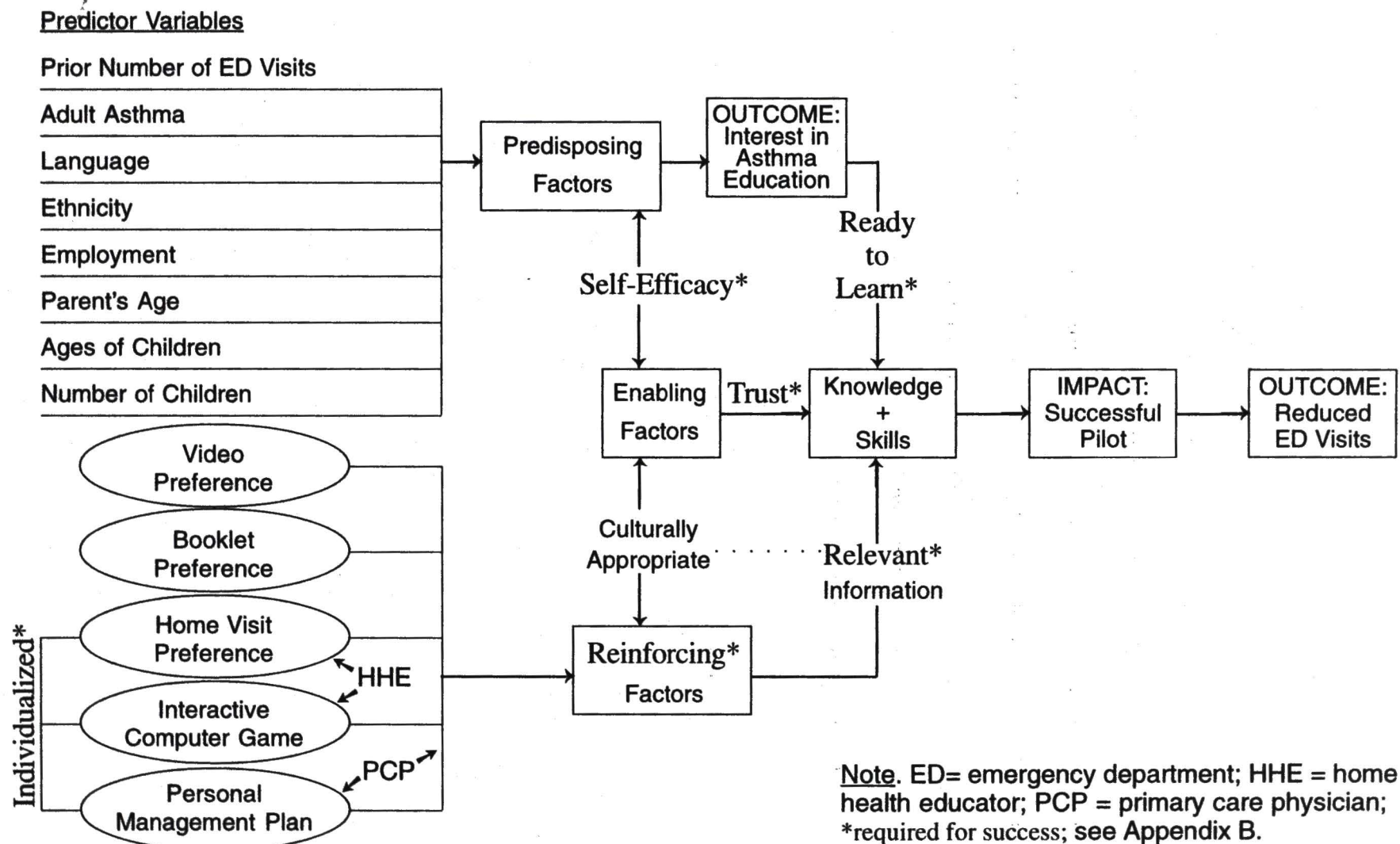


Figure 1. Theoretical Model of Proposed Intervention. (Adapted from Mesters, et al.)

## Fine-Tuning the Intervention

### Predisposing Factors

Before defining the research hypothesis, it is helpful to look at existing research on similar populations. Are there population characteristics that help determine learning preferences? Are there education tools more relevant and successful than others?

Sandra Wilson of the Institute for Health Care Research in Palo Alto has done several studies on patient behaviors and how they affect the outcome of asthma care. Although she finds some educational programs more successful than others in altering behaviors, she points to the need for more data on the contribution of various behaviors to morbidity or mortality rates (Wilson & Starr-Schneidkraut, 1994). She believes more data on patients and parents for specific subgroups is needed.

The target population for the proposed intervention is young and poor--Medicaid recipients, the majority being African-American or Hispanic and living in an urban area. The federal poverty level is now estimated at \$16,450 for a family of four. Texas currently provides medical coverage for children from birth to 1 year in families with incomes up to 185% of federal poverty; from ages 1 to 5 up to 133% poverty; 6 to 14 up to 100% poverty; and 15 to 18 up to 25% poverty. Recent Medicaid reform has imposed time limits for benefits, causing concern among state legislatures about growing numbers of uninsured children and adolescents. There are approximately 200,000 6 to 19 year-olds in Texas without the same benefits as younger siblings and approximately 400,000 more who are eligible but do not apply because family members may be undocumented aliens or choose not to enroll for other reasons (Elizondo, 1998).

Much of the current research on asthma is being done on these poor populations. Deaths from asthma are disproportionately common in minority groups and among the poor.

Many components of poverty may contribute to the increased risk, among them poor access to appropriate and high quality healthcare, ... decreased likelihood of treatment with anti-inflammatory drugs, dismal housing with high levels of cockroach and dust-mite antigens and molds, poor systems of social support, and low levels of education (Buist & Vollmer, 1994, p.1585).

Delay in seeking timely and preventive healthcare may be related to both financial problems as well as personal inconvenience of the parents (Wislon et al., 1998). There are also studies defining what is effective or not effective in the different age groups for managing asthma; very different behaviors are required by parents of very young children versus parents of school-aged children (Wilson & Starr-Schneidkraut, 1994).

Of particular interest is the current search for the human genome associated with asthma. National Health, Lung, and Blood Institute findings show that asthma genes are linked to chromosomal regions unique to different racial and ethnic groups. The National Institutes of Health (1997) reported the prevalence of asthma is greater for blacks (6.1%) than for whites (5.0%), while in Hispanics, it ranges from a low of 2.7% among Mexican-American children living in the Southwest to 11.2% for Puerto Rican children living in New York City. Both hospitalization and death rates for blacks are nearly triple those for whites. Although a racial genome is a potential indicator, other studies point to additional predisposing factors. A study by Lozano, Connell, & Koepsell (1995) released by the Journal of the American Medical Association in 1995, comparing asthmatics on Medicaid, found African-American children more likely than

white children to make emergency department visits and less likely to have made an office visit for asthma. This could not be explained by poverty or inadequate health insurance. The authors suggest further studies to discern cultural and behavioral characteristics that influence the use of health services (Lozano et al, 1995). Those characteristics might include education, support systems, availability of transportation, etc.

### Learning Tools and Preferences

Given racial differences within the target population, what other differences might be found regarding learning preferences and educational tools? Adaptations for culture and language are more frequently incorporated into educational strategies than in the past. Many of the commercially produced materials have been translated into Spanish; videos incorporate a rainbow of faces and ethnic jargon. In a comprehensive community intervention for the Fresno area of California, the entire target population is Medicaid or uninsured minority patients. All the handouts and visuals are translated into Spanish for the parents and for the Wee Wheezers classes; materials are adapted for the non-literate Asians. Although the complete data have not yet been published, early indications point to successful outcomes (Wilson et al., 1998).

Written materials, when culturally appropriate, can be used for reinforcement and have the advantage of being available for the family to read at their own leisure.

Unfortunately, there is ample evidence that the usual types of written patient education materials and pamphlets alone have little effect in altering behavior (Wilson &



Starr-Schneidkraut, 1994). Families have varying levels of reading comprehension and may be reluctant to admit problems with reading (Boulet et al., 1994). Indeed 23 million American adults are functionally illiterate (Doak, C., Doak, L., & Root, 1985). Ruby Payne, author and elementary school principal, explains the role of language in understanding how poverty affects education by describing different “language registers.” Poor families communicate in a different register than do middle class families. Most educational materials are written in the formal register of the middle class, while the poor use the casual register and an oral language pattern of discourse. The student or the educator must translate both verbal communication and written materials—before they can be assimilated (Payne, 1995). As new technology and new products are introduced, survival in today’s society becomes more and more challenging to those with literacy handicaps. Even now a sixth grade reading level is required to understand a driver’s license manual, and a tenth grade reading level is required to follow the instructions on a bottle of aspirin (Doak, C., Doak, L., & Hoot, 1985). This has implications for any asthma education take-home pamphlets or video/computer dialog. Self-help programs can never become a reality for people with low literacy skills unless they can comprehend what they are supposed to do (Doak, C., Doak, L., & Hoot, 1985, Payne, 1995).

In an effort to appeal to children and to meet varying educational levels, the use of visual materials and technology is increasing in schools and elsewhere. The initial use of technology as an enhancement to education spread from the business sector to institutional, public, and private settings. Significant progress has been demonstrated with the use of multi-media training in the aircraft industry, for



example, in construction, maintenance, and flight training. Especially successful are the self-paced, interactive “games” where the student makes choices based on previous knowledge, is rewarded for correct decisions, or is re-routed for further training (Lanier, 1998). Auditory and visual enhancement for learning are especially helpful for patients and families with low literacy skills. Audiotapes offer both advantages and disadvantages. They can improve comprehension and reduce learning time, but, for those with low reading skills or for whom English is a second language, tapes can present the same challenges as written materials. Videos and interactive games are particularly engaging for children who enjoy the “action,” and children are less intimidated by technology than are adults. Interactive computer games can theoretically be individualized, be multi-lingual, and provide feedback and support (Boulet et al., 1994, Rubin et al., 1986). Early work with an asthma-specific computer game “Asthma Command” was done in the 1980s; Rubin et al. (1986) showed that significant improvement in knowledge and behavior of children but only a trend toward reduced emergency department visits.

Asthma education programs available on video or using computer games generally have been distributed by national drug companies or developed for broad audiences (Green & Frankish, 1994, Fitzgerald, Freund, Hughett, & McHugh, 1993, Wilson & Starr-Schneidkraut, 1994). As recently as 1993, Wilson reported there had been little experience with the use of video or computer assisted instruction for asthma. She believed no well-constructed video to date had been produced and evaluated in a well-controlled study (Wilson & Starr-Schneidkraut, 1994).

Videos and/or computer games are increasingly used as a part of multi-faceted programs, not as stand-alone tools. An integrated asthma education program for young children using an audio-tape, "Whee-Zee" the teddy bear, and a coloring book has been credited with a 76% decline in emergency department visits and a 91% decrease in hospitalizations among the 50 pediatric program participants in a Dayton-based United HealthCare of Ohio. Also included were two home visits and personal telephone calls by trained home-health nurses to each child's home, and a minimum of eight phone calls over a 12-month period. Safe Harbour, the national home healthcare agency administers the asthma contract for United HealthCare. This highly structured intervention targeted frequent users of emergency departments ("Little teddy bear," 1997).

An interactive CD-ROM is a part of an on-going asthma program based at Texas Children's Hospital in Houston. This 5-year, \$1.8 million study is funded by the National Institute of Allergy and Infectious Diseases. It is an integrated clinic-based program and targets inner-city minority children. The computerized adventure game targets 9-12 year olds; new versions of the game are being developed for under-9 and in Spanish. A controlled study for the CD-ROM effect is being conducted (Morgan, 1997).

Concerns about costs for asthma intervention are certain to accompany the growing pains of Medicaid and managed care. Many of the most successful asthma interventions have been long-term, intensive asthma schools, workshops, and residential camps; not surprisingly, these initiatives are also among the most expensive. Although effective, they have not always proven to be cost efficient, and those children most in need rarely attend. Technology allows video and computer-based

educational materials to be easily updated or modified for different languages or educational levels. Linking reproducible technological, educational tools to patients most at risk may reduce the cost of beneficial health education (Lanier, 1998).

An interesting comment by Charles Lewis, a professor at UCLA School of Medicine, gives a tangential viewpoint on the explosion of video and computer-related educational tools for asthma intervention. Referring to the importance of technology, he stated,

Given the nature of programs that have developed to date, as well as the history of health professionals' general tendencies to reinvent the wheel, it is highly likely that not one but several versions of "truth" will be marketed or advocated for use toward the goal of improved patient care for children with asthma (Lewis, 1983).

Computers and technology will most certainly play growing roles in the future of both asthma education and treatment. Two other growth areas in the application of technology to the management of not only asthma but also other diseases are in the use of interactive videos and computers for shared decision-making and for case management. The shared decision-making programs inform patients about a particular disease and its treatment options and then allows interactive treatment selections with accompanying information about risks, outcomes, and costs. There are specific case management programs for asthmatics; two examples are ASTRA by Hastings Healthcare Group and PCAA by Patient Infosystems.

## Chapter 2

### METHODS

#### Research Hypothesis

An asthma intervention program being proposed by local healthcare professionals is designed to improve outcomes for a particular target population. Although this population is alike in that all members are served by Medicaid, within this group are multiple sub-populations, i.e., different ethnicities, different age groups, different family sizes, etc. This study proposes that, for specific subgroups of that target population, predisposing factors and learning preferences are significantly different, suggesting that program components should vary for the different subgroups in order to effect positive change across the population.

#### Research Background

This proposed innovative pediatric asthma program incorporates a variety of intervention tools; the goal of the program is to reduce the number of emergency visits for asthma to hospitals, clinics, and physicians' offices. This intervention, still in the planning stages, is being proposed by Dr. Bob Lanier, allergy specialist and president of Lanier Education and Research Network, in cooperation with Harris Methodist STAR Health Plan and Cook Children's Hospital, all located in Tarrant County, Texas (Lanier, 1998).



The first step of the intervention is to provide an educational video to families upon dismissal of their child from the emergency room after treatment for asthma or breathing problems. The video tells the story of a day in the life of a middle-school aged boy with asthma. He makes good and bad choices throughout the day; a voice-over of a doctor provides educational information about the nature of asthma, preventive strategies, and the importance of good decisions. Approximately two weeks later, an outreach health educator will make a follow-up visit to the patient's home, for family education, building trust, and reinforcing the knowledge gained from the take-home video. A laptop computer game designed for children will be brought to the home and "played" by the child with asthma. The game is educational and interactive, testing and reinforcing knowledge. The health educator will be trained in good communication strategies for this population. He or she will provide additional instruction and support, if necessary; for example, he or she may work with the child on the use of a peak flow meter or the proper use of an inhaler. Printed materials will be left with the family for additional reference and reinforcement. A report on the visit and assessment by the health educator will be shared with the child's primary care physician who can integrate that information into the child's individual asthma management plan. The intervention design provides consistent information throughout the video, the computer game, and the printed materials, and, finally, to the doctor for coordination with individual asthma management plans (Lanier, 1998).



## Research Design

### Description of the Survey Instrument

The target population for the proposed intervention is children aged 6 to 18 served by Medicaid managed care in the Tarrant County service area (six counties). Because the intervention targets clients are served by Medicaid through managed care, I chose a Group Needs Assessment conducted by the Harris Methodist STAR Health Plan to provide information for my study. The assessment is required annually of all managed care Medicaid providers of the State of Texas Access Reform (STAR) plan. A telephone survey of Harris clients was conducted from January 23 through February 4, 1998. These clients lived in the "Tarrant Service Area" which includes the counties of Tarrant, Hood, Denton, Johnson, Parker, and Wise. Medicaid eligibility requirements are complex; qualifying factors, in addition to income, are number of family members, pregnancy status, and ages of children. For the most part, the STAR plan serves poor young women and children. At the end of 1997, the Harris STAR plan served approximately 15,000 members, 39% male and 61% female. Seventy-seven percent of male members were under the age of nine years. Approximately 40% of all members were Anglo, 31% were African American, 22% were Hispanic, and 1% were Asian. Ninety-one percent of all members were under the age of 30. For comparison, in Tarrant County in 1995, 72% of the population was Anglo, 13.2% was Hispanic, 11.9% was African American, and 3% was classified as "other" (Harris Methodist, 1998).

## Survey Method

Data was collected by Harris Methodist STAR Health Plan. The interviewers attempted to get in touch with all members on current membership lists who had telephones. Only one attempt per working number was made. Callers documented if members no longer had a working telephone number or if the number was a beeper. Calls were placed Monday through Saturday between 12:00 p.m. and 8:00 p.m. If more than one member resided in the household, only one member in the household was interviewed (Harris Methodist, 1998).

A total of 344 households participated. Two hundred forty-nine respondents were actual members while the remaining 91 were either the parent or guardian of a member. The majority of respondents were female; only 6% of respondents were male. Fifty-two percent of interviewees were Anglo, 29% were African American, and 13% were Hispanic (Harris Methodist, 1998).

Seventy respondents answered "yes" to the question, "Have you ever been told by a doctor or other health professional that any of your children have asthma?" Data from those 70 surveys is the basis for the answering the research questions posed at the beginning of this section.

## Survey Measures

Information from the 70 surveys was entered into the database for SPSS for Windows, version 7.5. All the information was keyed as nominal data. Data was collapsed, when necessary, so that all data was categorical. Frequencies for the

family characteristics of interest were calculated. For this study, eight “predictor variables” and four “outcome variables” were assigned. I selected particular survey questions to serve as variables because they revealed information about family characteristics. Those characteristics might indicate certain predisposing factors or outcomes, which could affect the success of this intervention. They are as follows:

#### Predictor Variables

1. Parent asthma. Parent or grandparent indicated any time in the past being told by physician that they had asthma; answers were “yes” or “no.”
2. Ethnicity. Categories were “African-American,” “Hispanic/American Indian,” and “White/Other/Mixed race.” The Hispanic category was collapsed to include the two American Indians, and the White category was collapsed to include one each of “other” and “mixed.”
3. Parent age. The age of the parent, or grandparent of which there were two, who answered the survey questions was entered by categories of “25 years or less,” “26 to 35 years,” and “over 35 years.”
4. Number of children. The parent was asked how many children he or she had; there were two collapsed categories for “0,1, or 2” and “3 or more.”
5. Child under 7. The survey asked the ages of all the children. If there were any children in the family under 7 years old, “yes” was entered. “No” indicated all children were 7 years or older.
6. No job. Interviewees were asked if they currently had a paying job; answers were “yes” or “no.”

7. Language. In response to what language was spoken in the home, the choices were “Spanish,” “English,” or “other.” The two “other” were collapsed into Spanish.
8. Prior ER visits. Parents were asked how many times in the previous year had they taken a child to the emergency room. Answers were “none,” “1 time,” “2 times,” or “3 or more times.” There was a single category for one or two times.

#### Outcome Variables

- A. Interest in asthma education. Parents were asked if they would be interested in learning more about asthma; answers were “yes” or “no.”
- B. Video preference. Parents were asked how they wished to learn about a variety of topics, asthma being one of them. Video was one of the 6 ways from which to choose. Answers were keyed “yes” or “no.”
- C. Booklet preference. A “yes” or “no” indicated this way (preference).
- D. Home visit. A “yes” or “no” indicated this preference; the parent could check as many of the preferences provided that they wished.

#### Data Analysis

There are detailed frequency tables showing the number of responses in each category for each of the variables. The information is divided into four tables, one indicating the relationships of the predictor variables to each of the four outcome variables. Also included are the percentages for the number of responses for each category and the percentages of responses within each category or subgroup. For example, in Table 1 (see page 26), 21 parents out of the total of 70 responded



that they had asthma; of those, 15 parents or 29.4% of the 70 are interested in asthma education. Of the 21 with asthma, the 15 interested in asthma education represent 71.4% of all the parents with asthma, i.e., the % subgroup (see Tables 1 through 4).

Tests for association were computed pairing each of the eight predictor variables with each of the four outcome variables using the SPSS “crosstabs” function. A Pearson chi-square value, with its p-value, was assessed to determine whether or not the paired variables were statistically independent. In some cases where the expected cell count is less than 5, the Fisher Exact Test p-value is reported. A chi-square value of 3.84 or greater for 1 degree of freedom and a value of 5.99 or greater for 2 degrees of freedom were considered significant ( $p < 0.05$ ).

**Table 1. Frequency of Distribution of Interest in Asthma Education by Family Characteristics**

Variables	Interest in Asthma Education			No Interest			p-value <sup>a</sup>
	N	%	% subgroup	N	%	% subgroup	
Parent* with asthma	51			19			0.539 <sup>a</sup>
Yes	15	29.4	71.4	6	31.6	28.6	
No	36	70.6	73.5	13	68.4	26.5	
Ethnicity	51			19			0.250
African-American	18	35.3	75.0	6	31.6	25.0	
Hispanic/AmerIndian(2)	10	19.6	90.9	1	5.3	9.1	
White/Other(2)	23	45.1	65.7	12	63.2	34.3	
Language spoken at home	51			19			0.537 <sup>a</sup>
English	44	86.3	72.1	17	89.5	27.9	
Spanish/Other(2)	7	13.7	77.8	2	10.5	22.2	
Parent* age	51			19			0.636
25 years or less	21	41.2	75.0	7	36.8	25.0	
26-35 years	17	33.3	77.3	5	26.3	22.7	
Over 35 years	13	25.5	65.0	7	36.8	35.0	
Current paying job	51			19			0.244 <sup>a</sup>
Yes	17	33.3	81.0	4	21.1	19.0	
No	34	66.7	69.4	15	78.9	30.6	
Number of children	50			18			0.350 <sup>a</sup>
0, 1, or 2	24	48.0	77.4	7	38.9	22.6	
3 or more	26	52.0	70.3	11	61.1	29.7	
Children under 7 years	50			18			0.556 <sup>a</sup>
Yes	37	74.0	74.0	13	72.2	26.0	
No	13	26.0	72.2	5	27.8	27.8	
Prior emergency room visits	51			19			0.840
No visits in previous 12 months	21	41.2	72.4	8	42.1	27.6	
1 or 2 visits	14	27.5	77.8	4	21.1	22.2	
3 or more visits	16	31.4	69.6	7	36.8	30.4	

**Note.** <sup>a</sup>p-value for Fisher's Exact Test; all other p-values for Pearson Chi-Square test of significance of individual parameters. \* "parent" refers to parent or grandparent.

**Table 2. Frequency of Distribution of Booklet Preference by Family Characteristics**

Variables	Interest in Booklet			No Interest			p-value <sup>a</sup>
	N	%	% subgroup	N	%	% subgroup	
Parent* with asthma	53			16			0.475 <sup>a</sup>
Yes	16	30.2	80.0	4	25.0	20.0	
No	37	69.8	75.5	12	75.0	24.5	
Ethnicity	53			16			0.095 <sup>b</sup>
African-American	16	30.2	66.7	8	50.0	33.3	
Hispanic/AmerIndian(2)	11	20.8	100.0	0	0.0	0.0	
White/Other(2)	26	49.1	76.5	8	50.0	23.5	
Language spoken at home	53			16			0.328 <sup>a</sup>
English	46	84.9	75.0	15	93.8	25.0	
Spanish/Other(2)	8	15.1	88.9	1	6.3	11.1	
Parent* age	53			16			0.662
25 years or less	23	43.4	82.1	5	31.3	17.9	
26-35 years	15	28.3	71.4	6	37.5	28.6	
Over 35 years	15	28.3	75.0	5	31.3	25.0	
Current paying job	53			16			0.200 <sup>a</sup>
Yes	18	34.0	85.7	3	18.8	14.3	
No	35	66.0	72.9	13	81.3	27.1	
Number of children	51			16			0.264 <sup>a</sup>
0, 1, or 2	22	43.1	71.0	9	56.3	29.0	
3 or more	29	56.9	80.6	7	43.8	19.4	
Children under 7 years	51			16			0.438 <sup>a</sup>
Yes	38	74.5	77.6	11	68.8	22.4	
No	13	25.5	72.2	5	31.3	27.8	
Prior emergency room visits	53			16			0.207
No visits in previous 12 months	24	45.3	82.8	5	31.3	17.2	
1 or 2 visits	15	28.3	83.3	3	18.8	16.7	
3 or more visits	14	26.4	63.6	8	50.0	36.4	

**Note.** <sup>a</sup>p-value for Fisher's Exact Test; all other p-values for Pearson Chi-Square test of significance of individual parameters. <sup>b</sup>approaching significance:  $\chi^2 = 4.71$  (2df, n = 69; 1 cell has expected count less than 5).; \*"parent" refers to parent or grandparent.

**Table 3. Frequency of Distribution of Video Preference by Family Characteristics**

Variables	Interest in Video			No Interest			p-value <sup>a</sup>
	N	%	% subgroup	N	%	% subgroup	
Parent* with asthma	19			50			0.494 <sup>a</sup>
Yes	6	31.6	30.0	14	28.0	70.0	
No	13	68.4	26.5	36	72.0	73.5	
Ethnicity	19			50			0.750
African-American	7	36.8	29.2	17	34.0	70.8	
Hispanic/AmerIndian(2)	2	10.5	18.2	9	18.0	81.8	
White/Other(2)	10	52.6	29.4	24	48.0	70.6	
Language spoken at home	19			50			0.474 <sup>a</sup>
English	16	84.2	26.7	44	88.0	73.3	
Spanish/Other(2)	3	15.8	33.3	6	12.0	66.7	
Parent* age	19			50			0.895
25 years or less	8	42.1	28.6	20	40.0	71.4	
26-35 years	5	26.3	23.8	16	32.0	76.2	
Over 35 years	6	31.6	30.0	14	28.0	70.0	
Current paying job	19			50			0.441 <sup>a</sup>
Yes	5	26.3	23.8	16	32.0	76.2	
No	14	73.7	29.2	34	68.0	70.8	
Number of children	19			48			0.242 <sup>a</sup>
0, 1, or 2	7	36.8	22.6	24	50.0	77.4	
3 or more	12	63.2	33.3	24	50.0	66.7	
Children under 7 years	19			48			0.603 <sup>a</sup>
Yes	14	73.7	28.6	35	72.9	71.4	
No	5	26.3	27.8	13	27.1	72.2	
Prior emergency room visits	19			50			0.831
No visits in previous 12 months	7	36.8	24.1	22	44.0	75.9	
1 or 2 visits	5	26.3	27.8	13	26.0	72.2	
3 or more visits	7	36.8	31.8	15	30.0	68.2	

**Note.** <sup>a</sup>p-value for Fisher's Exact Test; all other p-values for Pearson Chi-Square test of significance of individual parameters. \* "parent" refers to parent or grandparent.



**Table 4. Frequency of Distribution of Home Visit Preference by Family Characteristics**

Variables	Interest in Home Visit			No Interest			p-value <sup>a</sup>
	N	%	% subgroup	N	%	% subgroup	
Parent* with asthma	11			58			0.398 <sup>a</sup>
Yes	4	36.4	20.0	16	27.6	80.0	
No	7	63.6	14.3	42	72.4	85.7	
Ethnicity	11			58			0.166
African-American	6	54.5	25.0	18	31.0	75.0	
Hispanic/AmerIndian(2)	0	0.0	0.0	11	19.0	100.0	
White/Other(2)	5	45.5	14.7	29	50.0	85.3	
Language spoken at home	11			58			0.440 <sup>a</sup>
English	9	81.8	15.0	51	87.9	85.0	
Spanish/Other(2)	2	18.2	22.2	7	12.1	77.8	
Parent* age	11			58			0.936
25 years or less	5	45.5	17.9	23	39.7	82.1	
26-35 years	3	27.3	14.3	18	31.0	85.7	
Over 35 years	3	27.3	15.0	17	29.3	85.0	
Current paying job	11			58			0.556 <sup>a</sup>
Yes	3	27.3	14.3	18	31.0	85.7	
No	8	72.7	16.4	40	69.0	83.3	
Number of children	10			57			0.468 <sup>a</sup>
0, 1, or 2	4	40.0	12.9	27	47.4	87.1	
3 or more	6	60.0	16.7	30	52.6	83.3	
Children under 7 years	10			57			0.460 <sup>a</sup>
Yes	8	80.0	16.3	41	71.9	83.7	
No	2	20.0	11.1	16	28.1	88.9	
Prior emergency room visits	11			58			0.525
No visits in previous 12 months	3	27.3	10.3	26	44.8	89.7	
1 or 2 visits	4	36.4	22.2	14	24.1	77.8	
3 or more visits	4	36.4	18.2	18	31.0	81.8	

**Note.** <sup>a</sup>p-value for Fisher's Exact Test; all other p-values for Pearson Chi-Square test of significance of individual parameters. \* "parent" refers to parent or grandparent.

## Chapter 3

### RESULTS

#### Descriptive Findings

As a review to the reader, the survey data describes 70 families from a sample of 344 households served by the Harris STAR Medicaid managed care program. This subgroup of 70 families was chosen because the parent answering the telephone call for the survey had a child with asthma. Survey respondents were all parents with the exception of two grandparents, and all were female with the exception of two males. The interviewees ranges from age 18 to 71 years, 40% of which were 25 years or younger.

The survey identified 34.3% African-Americans, 3% American Indians, 12.9% Hispanic, 47% white, and 3% other or mixed race. The ethnic balance did not correspond with that of the target population and is discussed under "Limitations" in the next chapter. About 90% of the respondents both spoke and read English. Ten percent reported Spanish was the preferred spoken language, and 3% reported a language other than English or Spanish was spoken in the home. The response to the question about their ability to read the newspaper in the preferred language was matched with their language; the results showed 91% reported they were able to read a newspaper in English. The remainder either did not answer the question or indicated another language preference.

Forty-nine (70%) of the respondents did not currently have a paying job. All the remaining 21 respondents reported that they were currently employed. (The survey did not ask about other adults in the home or other sources of income.) When asked if a doctor had ever told them they had asthma, 70% responded "yes."

When asked about their children, two interviewees did not give information about the number or ages of the children, but interestingly did respond to questions about the health of children in the home. Fifty-four percent of the respondents had three or more children; 71% had at least one child under the age of seven years. See the Tables for additional details. They were also asked how many times in the past year they had taken a child to the emergency room. It was not indicated which child or children, or for what reasons. Forty-one reported making no visits, and 33% reported making three or more visits.

The parents were asked if they had an interest in information on a number of different health topics such as how to quit smoking or how not to get pregnant. Fifty-one respondents or 73% of the total were interested in educational information on asthma. After making those selections, the parents were asked what way(s) they would prefer learning that information. They could answer all, some, or none. The number of selections they made was tabulated as well as the preference. There were 69 of 70 respondents to this series. The only answer receiving more "yes's" than "no's" was the preference for "booklet." Only six respondents chose "health fair," and only 11, "home visit." Twenty-three percent indicated a preference for attending a class, and 27% included a video in their choices. When asked about what might be an

incentive for attending an educational class, the respondents, again, could choose any or none of the following: childcare, lunch, a ride to class, or a gift (such as a baby item or store gift certificate). All incentives appealed to an overwhelming majority of the respondents. The highest responses were 80% for free childcare and 74% for the gift.

### Statistical Findings

The crosstabs analyses for chi-square values are included in Tables 1 through 4. Each predictor variable selected for analysis was paired with each outcome variable to produce a series of 2 x 2 and 2 x 3 tables. The results were disappointing as each one of them failed to meet the requirements for a significant association.

In the test for association between the preference for a booklet (as a way of receiving educational information) and ethnicity, the Pearson chi-square value approached significance. With a value of 4.710 (2df,  $p=0.095$ ) there is about a 90% probability of an association. (There was, however, one cell in the table having less than the expected count.) Although a majority of respondents within all three ethnic categories chose booklet, all of the Hispanics that responded preferred a booklet, (with 3/4 of the whites and 2/3 of the African-Americans doing so). There were two additional computations that revealed possible weak associations; further testing, with a larger sample, is suggested. Again, ethnicity was the predictor—this time for preference of home visit. All Hispanics surveyed chose “no” for home visit; again, the other subgroups agreed with the Hispanics but not in such large percentages. The second possible association was between the number of emergency room visits and the



preference for booklet. The more emergency room visits the family had made, the less likely it appears the parent was interested in receiving written information.

## Chapter 4

### DISCUSSION AND STUDY IMPLICATIONS

#### Discussion

The results of this study suggest a number of potential modifications for the proposed pediatric intervention programs. Conclusions are drawn by synthesizing information from three sources: the research literature, descriptive findings, and analysis of survey data.

From the Theoretical Model (Figure 1), the author proposes that the six constructs required for successful interventions be considered in evaluating the proposed asthma program.

- Trust. Health providers and educators to receive training in good communication and trust building.
- Reinforcement. Education information is reinforced through the video, the home visit, the booklet, the computer game, and the primary care physician.
- Individualization. Computer game is interactive; home visit provides individual instruction; and primary care physician designs Personal Asthma Management Plan.
- Self-efficacy. Screening by the health educator prior to the home visit and/or by the primary care physician could determine which families are confident they can

make behavior changes that will improve the child's asthma. An additional assessment of family resources and support would be useful.

- Ready to learn. The survey asked parents if they were interested in learning more about asthma. Seventy-three were; a significant majority of the study population appears "ready to learn." There was no statistically significant difference in how much more or less interested one subgroup of the population was as compared to another. Neither the parent's asthma, the language spoken, the ages of the parent or the children, how many children, nor how many previous emergency room visits seemed to make a difference in how ready to learn the families were. Only the difference in ethnicity appeared significant. Although a majority of ethnic groups indicated interest, the Hispanics appear the most interested (at 90.9%) and whites/other, the least interested (at 65.7%)
- Relevance. Evaluating the relevance of educational components is more complex. The research literature suggests a number of requirements: materials should be culturally appropriate, at an appropriate reading comprehension level, and in the primary spoken language. A careful examination of the educational materials for the proposed intervention (printed booklet, video script and visuals, computer game script and graphics) would be necessary to determine the degree to which materials meet those standards. The survey gives some indications about how relevant the proposed educational methods are to the target population as a whole. Although materials in English can be read by 90% of those surveyed, the ability level among the population and comprehension level for the

materials are both unknown. Because there was little statistical difference among the different subgroups of the population, it cannot be concluded that the preference for a particular educational method varies significantly from one subgroup to another. As previously noted, the association of booklet preference and ethnicity approached significance, with Hispanics having the greatest preference at 100%, whites/other at 76.5% and African-American at 66.7%. Although not statistically significant, there was an indication that Hispanics also had the lowest interest in a home visit; all those surveyed (100%) were not interested.

### Limitations

The internal consistency of the survey results is threatened most by the fact that the information was obtained by telephone. The data collected from the 344 Harris STAR members reflect only a small portion of member families with phones and those at home during the times interviews were made. As compared with the total target population, Anglos were over-represented, 47% respondents versus 40% total members; African Americans were fairly equally represented, 34% respondents versus 31% members; and Hispanics were under-represented, 13% respondents versus 22% members.

There are very few missing values for the variables tested. There are eight or fewer with one or two missing values (out of 70 possible). Five gave no answer to the question regarding their ability to read the newspaper. Answers to many of the questions are subject to memory bias. This is of primary interest for this study, because



the 70 member surveys analyzed herein were chosen based on positive response to the question about having been told a child has/had asthma. To minimize information bias (interviewer and language), callers were ethnically balanced and able to provide the interview in Spanish. Callers were trained; calls were made to accommodate a variety of days and evening job schedules of members. An individual survey tool was completed for each household reached.

This survey was quite lengthy with a wide variety of kinds of questions with different sets of instructions. Some questions required several choices, which is especially difficult in a telephone interview. A simpler format or a face-to-face interview would likely provide more reliable and consistent results. The absence of information from member families without telephones is usually an indication that both lower income and minority families are under-represented in the data.

### General Recommendations

Based on the literature and the survey results are the following recommendations and observations:

- Screen families to determine to what extent they (both patient and family) believe that the child is able to make the behavior changes necessary to manage his or her asthma, to what extent the other family members are able and willing to support the child, and to what extent they believe the behavior changes will improve the child's asthma.
- Train the health care providers and educators who will deliver the program, coordinate their training, and insure continued communication among all of

them. This is essential for building the relationships necessary to gain the trust and confidence of the family and for providing an appropriate Personal Asthma Management Plan.

- Examine educational materials for relevance to the target population. General family characteristics revealed by the survey should be revisited. Nearly all the parents are female, most are unemployed, and most have very young children. For example, does the video appeal to this “typical” family? In addition to possible literacy and language shortcomings, the findings suggest that specific changes to accommodate the Hispanic members are needed. Hispanics appear most interested in the booklet and the least interested in a home visit. Because Hispanics are under-represented in the survey data, it is possible other differences are significant in the total target population. Another interesting finding was the very high percentage of parents responding that they had asthma. With a possible 30% or more of parents with asthma, a parallel adult intervention might be indicated.
- Reinforce and individualize all learning. The proposed plan is potentially strong for both these components. Although specific ways for coordination and collaboration among the healthcare providers and educators are not indicated in the plan, there are successful models in the literature that parallel the schematic for this proposal that might act as guidelines.

### Specific Recommendations

- Find a way to assess this target population. Better survey data could be obtained from an instrument designed to test for the specific predisposing and outcome variables in the program. The study population might be a random sample from pediatric users of emergency departments with the diagnosis for asthma or breathing problems. Focus groups conducted with the different sub-populations could provide useful input.
- Accommodate for the Hispanic population. All written materials, both educational and instructional, and the video and computer audio portions should be translated into Spanish (at an appropriate literacy level).
- Produce different versions of the video and computer game to depict families of different ethnicities.
- Develop additional segments of the video and computer game to include very young children. Although the literature suggests children need to be at least six years old to be successful in self-management programs, the data suggest that this population would be receptive to video education targeted at helping families with younger children. Perhaps the computer game could be played by a parent or older sibling but include interactive instruction on ways to support younger children with asthma.
- Incorporate incentives. Although not currently part of the proposed intervention, incentives are highly regarded by the target population. It is recommended that all four incentives mentioned in the telephone survey be considered, perhaps given in exchange for agreeing to a home visit or for completing portions of the Personal Asthma Management Plan.

- Develop marketing strategies for video and home visit. The most important survey findings may be the responses to the questions about interest in video and home visits as means for receiving information. The majority surveyed do not indicate an interest in either. Because “video preference” could also be considered a proxy for interest in computerized education, a thorough examination of delivery strategies should be considered. It may be that “video” was not chosen because the family does not have a television and/or VCR player. Sending a videotape home with the family from the emergency room may not be the best approach. Consideration should be given to having the health educators take along the videotape and a portable player/monitor on the home visit. The lack of interest in the home visit may indicate a lack of trust in the medical system, lending support for the necessity of training and good communication skills, for all providers and educators. This reluctance for a home visit might be reduced with preliminary phone calls of introduction to stimulate both trust and excitement about the coming visit and the opportunity to “play” a computer game.

#### Indications for Further Study

Finally, further study is indicated to insure the proposed intervention targets the specific Tarrant County area Medicaid population. The small size of the sample study prohibits broad generalization of the findings. More information about the poorer and minority families, who were under-represented in the survey data, is needed.

- Confirmation on the prevalence of adult asthma in the families could trigger a



parallel intervention program. More study on how to reach families of very young children with asthma is also indicated. When available, the evaluations of ongoing programs for young children should be examined for potential local applications.

Finding ways to reduce the number of emergency room visits for pediatric asthma patients will help curb the rising rates for asthma morbidity and mortality. Until there is a magic bullet for asthma, families and children must learn to manage this chronic disease. Because families differ, so must their educational tools. This proposed asthma intervention program provides a variety of tools for families. With suggested modification and continued monitoring for fine-tuning, this program has promise for successfully reducing emergency room visits among Medicaid families in the Tarrant County area.

## **APPENDIX A**

### **ASTHMA PROGRAMS AND REFERENCES**

## ASTHMA\* PROGRAMS AND REFERENCES

Allergy and Asthma Network  
Mothers of Asthmatics, Inc.  
3554 Chain Bridge Road, Suite 200  
Fairfax, Virginia 22030-2709  
1-800-8784403  
[www.podi.com/health/aanma](http://www.podi.com/health/aanma)

Asthma and Allergy Foundation of America  
1125 15<sup>th</sup> St., NW, Suite 502  
Washington, DC 20005  
1-800-727-8462  
[www.aafa.org](http://www.aafa.org)

American Lung Association  
1-800-LUNG-USA (1-800-586-4872)  
6420 Southwest Blvd., Suite 113  
Fort Worth, Texas 76109  
817-732-6336

American Academy of Allergy, Asthma, and  
Immunology  
611 E. Wells Street  
Milwaukee, Wisconsin 53202  
1-800-822-2762

Asthma Zero Mortality Coalition  
1-800-777-4350

American College of Allergy, Asthma and  
Immunology  
85 W. Algonquin Rd., Suite 550  
Arlington Heights, Illinois 60005  
1-800-842-7777

The National Asthma Education and  
Prevention Program  
Of the National Heart, Lung, and Blood  
Institute Information Center  
P.O. Box 30105  
Bethesda, Maryland 20854-0105  
1-301-251-1222

National Jewish Center for Immunology and  
Respiratory Medicine  
1400 Jackson Street  
Denver, Colorado 800206  
1-800-423-8891

National Institute of Allergy and Infections  
Diseases  
Bldg. 31, Room 7A50  
9000 Rockville Pike  
Bethesda, Maryland 20892  
1-301-496-5717

\*Asthma is a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, macrophages, neutrophils, and epithelial cells. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and coughing, particularly at night or in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyperresponsiveness to a variety of stimuli. *Global Initiative for Asthma*. Bethesda, Md: National of Heart, Lung, and Blood Institute; 1995. Publ. 95-3659.

**APPENDIX B**  
**INTERVENTION COMPONENTS**



## INTERVENTION COMPONENTS

### Theory-Based Constructs for a Successful Intervention\*

1. Learner must be “predisposed”--ready to learn.
2. For learning to take place, learner must have trust and confidence in health providers/educators.
3. Learner must believe a change in behavior is possible and that it will improve his asthma.
4. Information and skills-building must be relevant.
5. The intervention must be individualized as much as possible.
6. Learning must be reinforced by caring providers/educators, families, and, even better, by peers.

### Strategies for the Proposed Intervention Pilot\*\*

- A. Videocassette taken home by family after emergency room visits for treatment of asthma.
- B. Written materials, to be referred to as a booklet, taken home from emergency visit or delivered during home visit.
- C. Home visit to family of child with asthma, two weeks after emergency visit, by trained health educator.
- D. Demonstration of interactive computer game by health educator, and played by child with asthma during home visit.
- E. Sharing of medical records with healthcare providers and development of Personal Asthma Management Plan by primary care physician for child and family.

\* Bartlett (1983).

\*\* Lanier (1998)

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