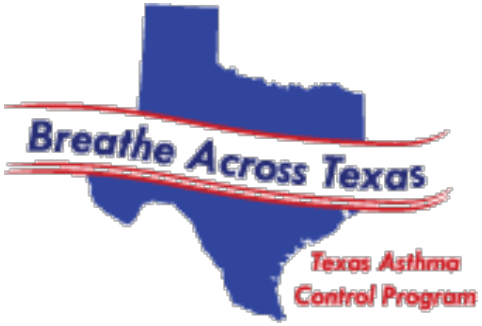
Evaluation of Integrated Educational Interventions (IEI) for Asthma Management

September 2013 to August 2014



BACKGROUND

The Texas Asthma Control Program (TACP) contracted with the University of North Texas Health Science Center (UNTHSC) to evaluate Texas A&M University's Integrated Educational Interventions (IEI) for asthma management program.

PROGRAM OVERVIEW

- **The Integrated Educational Interventions (IEI) program was developed in McAllen, Texas by the Texas A&M School of Rural Public Health.**

- **IEI educates families of children diagnosed with asthma by providing them with information about:**
  - **identifying and reducing household asthma triggers**
  - **recognizing signs and symptoms of asthma**
  - **proper use of asthma medications**

- **IEI is delivered through a 90-minute educational session and follow-up home visits or phone calls from a Promotora.**

LOGIC MODEL

Program: Integrated Environmental Asthma Management to Improve the Quality of Life for Hispanic Children with Asthma

Situation: Hidalgo County, Texas has a high rate of childhood asthma at 10% compared to 7.4% statewide, and a high rate of childhood asthma-related hospitalizations at 26.2 per 10,000 vs. 17.4 per 10,000 statewide. Many children are missing school and/or going to the emergency room due to their asthma. The high asthma prevalence rate among children in Hidalgo County is attributed to lack of asthma education, lack of consistent medical care, a high poverty rate of 35.2% vs. 17% statewide, and exposure to indoor and outdoor environmental asthma triggers.

Inputs	Outputs		Outcomes -- Impact		
	Activities	***Outputs***	***Short***	***Medium***	***Long***
			Knowledge	*Action*	*Conditions*
Texas A&M University School of Rural Public Health – Colonias Program McAllen Independent School District Federally Qualified Health Centers Rio Grande Hospital Edinburg Children's Regional Hospital South Texas Center Respiratory Therapy Department Texas Department of State Health Services, Health Promotion and Chronic Disease Prevention Section Asthma Patients Families/Caregivers of Asthma Patients Promotoras and Health Educators	Identify and enroll low income/uninsured Hispanic children with poorly controlled asthma, and their parents to participate in an asthma education and case management intervention. Conduct hospital-based asthma education to enrolled children with asthma on proper asthma self-management and control. Conduct hospital-based asthma education to parents of children with asthma who are enrolled in the program. Conduct in-home case management visits of enrolled families to identify and mitigate household triggers, and develop/monitor an asthma action plan for the child. Refer child/family to clinician for follow-up.	Number of low/income Hispanic children with poorly controlled asthma and families identified and enrolled in asthma education and case management intervention. Number of children with asthma completing the hospital-based asthma education training. Number of parents of children with asthma completing the asthma education training. Number of in-home case management visits conducted. Number of Asthma Home Environment and Trigger Surveys administered. Number of asthma action plans developed. Number of clinic referrals made.	**Management** • Children learn how to detect warning signs of asthma, how to avoid triggers, and how to manage their asthma, measured by pre- and post- cognitive tests. • Parents/families learn how to manage their child's asthma, measured by pre- and post- cognitive tests. **Triggers** • Parents/families learn how to reduce the number of asthma triggers in the home. **Medical Care Access** • Parents learn how to access low cost medicines and community clinics.	**Management** • Children with asthma have increased self-management capability; • Use their medicines as prescribed; and • Avoid asthma triggers. **Triggers** • Children with asthma experience reduced exposure to environmental triggers in the home. **Medical Care Access** • Children with asthma have an established clinic provider/medical home. • Children with asthma properly use their medications as demonstrated by clinician. • Clinician provides oversight and guidance with children's asthma action plans. • Children with asthma adhere to their asthma action plans.	**Management** • Children have improved asthma management as measured by the Child Health Survey for Asthma. • Children have sustained reduction in asthma severity, as measured by the Asthma Control Test at baseline and at three month intervals • Children experience reduced asthma related school absenteeism. • Children experience reduced emergency department visits and hospitalizations due to their asthma. • Disparities among Hidalgo County children with asthma relating to self-management and access to medical care are reduced. • Children with asthma experience improved quality of life as measured by the Quality of Life Survey.

Logic model developed by TACP (2013)

PHASES OF THE IEI EVALUATION

PHASE I

- Observe and review existing methods of measuring program outputs and outcomes for cultural appropriateness and evaluative utility

PHASE II

- Determine ways to consolidate the number of assessment items and improve the assessment of behavioral changes made by the participating families

PHASEIII

- Examine baseline and follow-up assessment data to determine the extent to which desired outcomes were achieved

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AREAS OF ASSESSMENT

Areas	Assessment Tools	Assesses
Asthma knowledge	Healthy Homes Pre and Post Surveys	Changes in asthma symptom trigger and management knowledge
Asthma severity	Asthma Control Test (ACT)*	Severity of asthma symptoms
Quality of life, asthma symptoms, asthma triggers, health care utilization	Children's Health Survey for Asthma (CHSA)	(1) Effects of asthma on the family: including physical health, activities, and emotional health; (2) frequency of asthma symptoms; (3) contact with asthma triggers; (4) use of health care associated with asthma symptoms
Asthma triggers	Asthma Home Environment and Trigger Checklist (AHEAT)	Presence of household asthma triggers
Asthma management	Exit Survey	Behavioral changes made following the IEI intervention
Satisfaction	Post - Training Satisfaction Assessment	Level of satisfaction with the training/ presentation

*ACT data was not analyzed due to inconsistent administration of the assessment tool

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PHASE I - EVALUATION RESULTS

- **The existing quality of life tool was exchanged for the Children's Health Survey for Asthma (CHSA).**
- **A retrospective exit survey was implemented at the last follow-up instead of the Asthma Home Environment Trigger checklist (AHEAT) assessment.**
- **A summary report was completed for the 2012-13 program year.**

PHASE II - EVALUATION QUESTION

How can the battery of assessment tools be reduced to minimize duplicity, lessen survey burden, and improve the measure of behavioral changes?

Source: http://www.rch.org.au/

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PHASE II EVALUATION

Data for a subset of 50 families was analyzed in May & June of 2014 to:

- **Explore item-by-item patterns of change between baseline and 6- months**
- **Determine ways to consolidate the number of assessment items and strengthen the measurement of behavioral changes associated with better asthma management**

PHASE II EVALUATION RESULTS

The evaluation team (TACP, UNTHSC & TAMU):

- Concluded that the AHEAT checklist was a useful diagnostic tool, but was not adequate to measure changes made in the home environment

- Elected to retain the use of the CHSA since it is well validated, assesses triggers, and measures several types of outcomes

- Created pre- and post- versions of a second tool that included modified items from the knowledge and exit surveys

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PHASE II EVALUATION RESULTS

Behavioral change items:

The behavior change items were modified to measure both desirable (dusting living and sleeping areas) and undesirable behaviors (smoking cigarettes or cigars) during reference periods that are appropriate for the activity.

6. In the past two weeks, how many times has the following been done in your home?
(Please answer honestly and circle the most correct response)

Swept or vacuumed floors	0 times	1 time	2-3 times	4 or more times
Dusted living and sleeping areas	0 times	1 time	2-3 times	4 or more times
Changed children's bed linens	0 times	1 time	2-3 times	4 or more times
Removed or organized clutter in main living areas	0 times	1 time	2-3 times	4 or more times

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PHASE II EVALUATION RESULTS

Knowledge items:

Knowledge items were modified from a true/false format to a Likert-style response set in order to promote more variability and improve the likelihood of measuring small changes.

Mold can cause asthma attacks	Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree
A home is a shelter from the wind, animals or insects, sun, cold or hot air, and dust.	Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree
The principles of Health Homes are: keeping it dry, clean, ventilated, pest-free, safe, containment free and maintained.	Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree
Dust and moisture are normal in a household.	Strongly Disagree	Disagree	Neutral or Don't Know	Agree	Strongly Agree

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PHASE III EVALUATION QUESTION

To what extent do IEI participating families demonstrate improvements in general knowledge, asthma symptoms, asthma management, quality of life, and health care utilization?

Source: Mountnittany.org

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PHASE III EVALUATION

Assessment of baseline and follow-up data for 89 families was completed to determine the extent to which desired outcomes were achieved.

PHASE III - PARTICIPANT PROFILE

- A very high retention rate of 95% was observed (89 out of 94 families completed the program).
- Nearly all participants were Hispanic.
- All reported household incomes were less than $30,000 a year.
- 91% of the families resided in single family households.
- 60% of the families owned their homes.

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PHASE III - PARTICIPANT PROFILE

Profile of IEI participant families at baseline (N=89)		Percent
Respondent's relationship to the child	Parent	**97.7%**
	Grandparent	**2.3%**
Gender of the respondents	Male	**6.8%**
	Female	**93.2%**
Percent reporting less than a high school education	Father	**58.2%**
	Mother	**69.8%**
Gender of the child with asthma	Male	**56.0%**
	Female	**43.7%**

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PHASE III – HEALTH INSURANCE STATUS

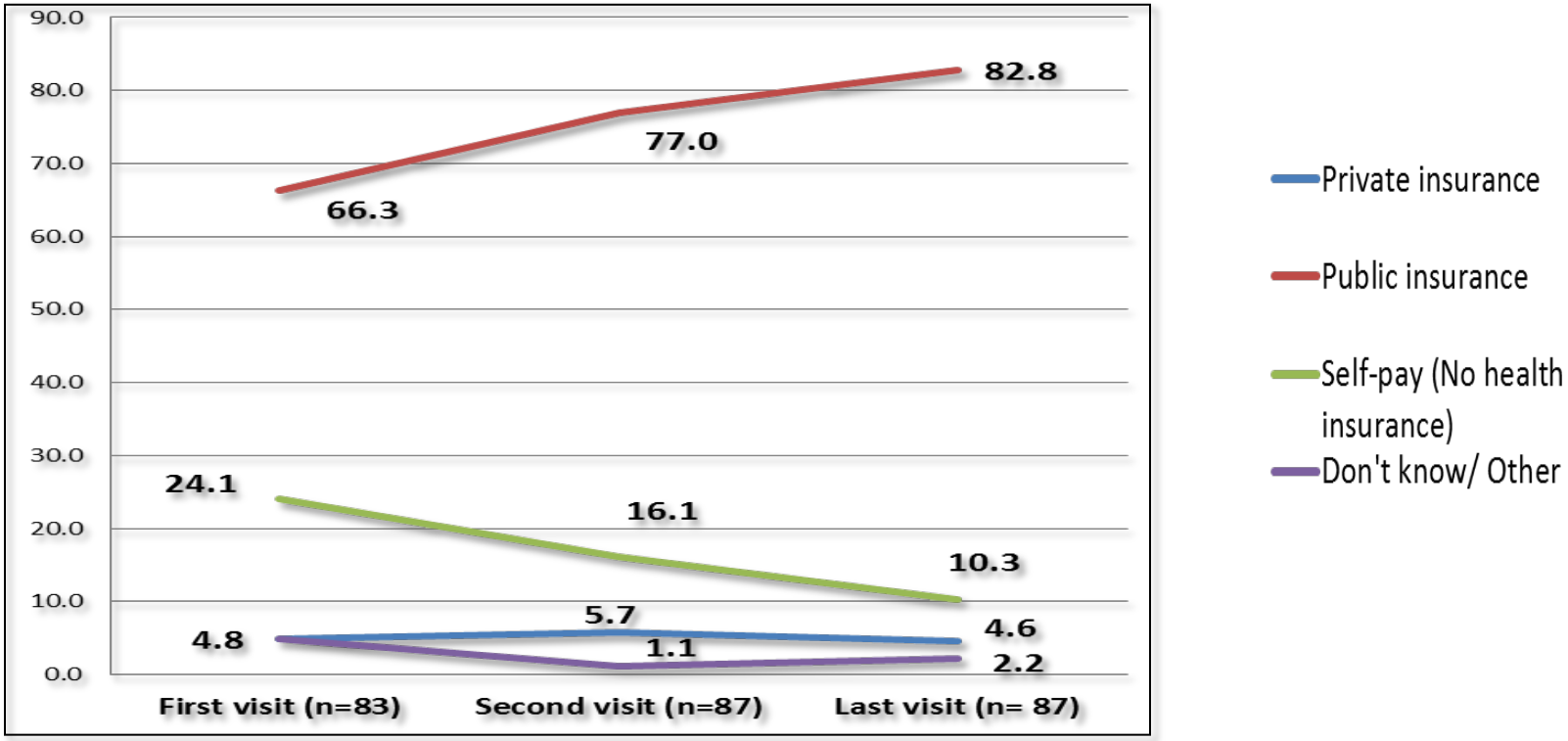
- **The number of IEI participants who were NOT covered by health insurance dropped from 24% at baseline to 10% during follow-up.**

- **A 17% increase in the number of respondents covered by public insurance was observed (from 66% to 83%).**

- **At baseline, 73% of IEI families reported that they pay nothing for their children's prescription medication.**

PHASE III – HEALTH INSURANCE STATUS

Changes in health insurance coverage among IEI families



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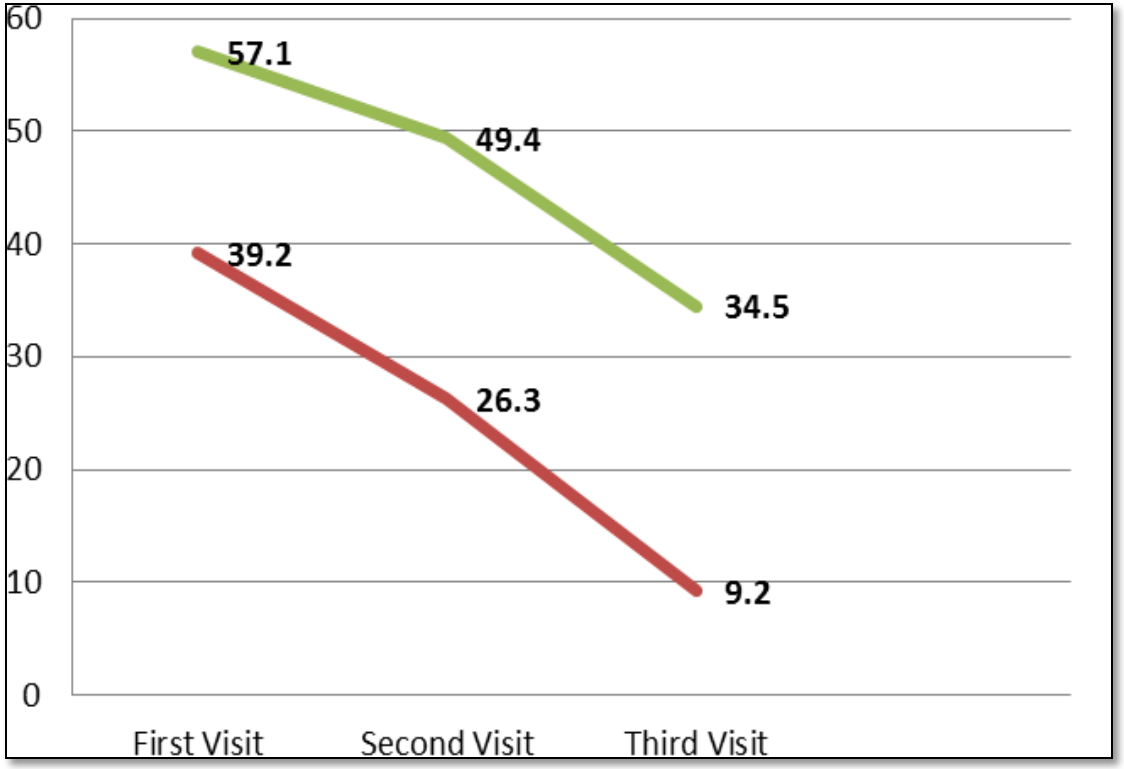
PHASE III – ASTHMA SYMPTOMS

- **The percent of families reporting asthma attack incidents decreased by 30% between the first and last visits and those reporting symptoms of wheezing or whistling while breathing declined by 23%. These differences were statistically significant.**

- **In the exit survey, 89% of IEI families reported a decrease in the frequency of asthma attacks.**

PHASE III – ASTHMA SYMPTOMS

Percentage of respondents who reported one or more asthma related incidents in the 4 weeks prior to the first, second and the last home visits



Percent of children with asthma attacks or trouble breathing

Percent of children with symptoms of wheezing or whistling when breathing out

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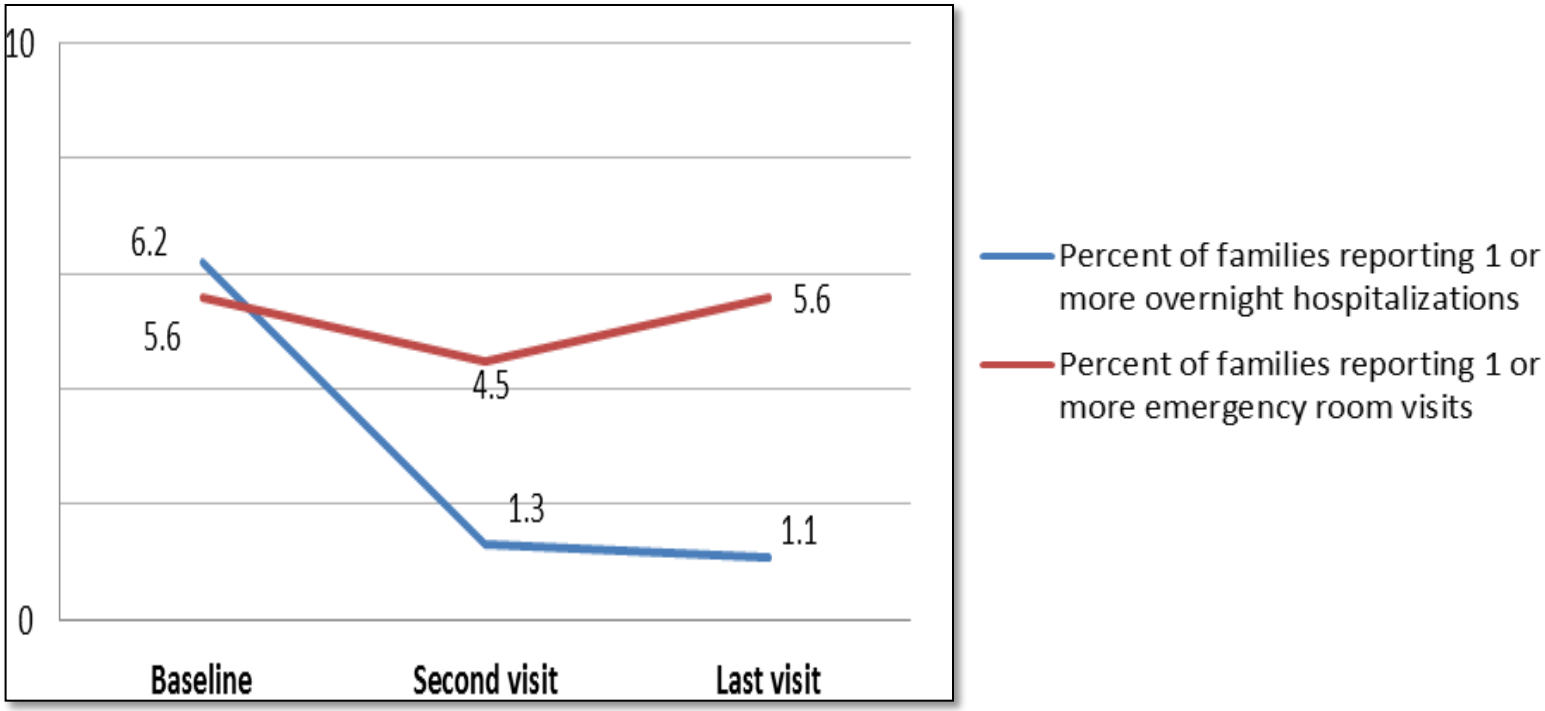
PHASE III – HEALTHCARE UTILIZATION

- **No change was observed in emergency department utilization, but overnight hospital stays dropped from 6.2% to 1%.**

- **A significant change was observed in the percent of families reporting that their child required a clinic or doctor visit in the prior 4 weeks due to problems with asthma. It dropped from 50% at baseline to 31% at follow-up.**

PHASE III – HEALTHCARE UTILIZATION

Asthma-related hospitalizations or emergency room visits in the 4 weeks prior to the first, second and the last home visits



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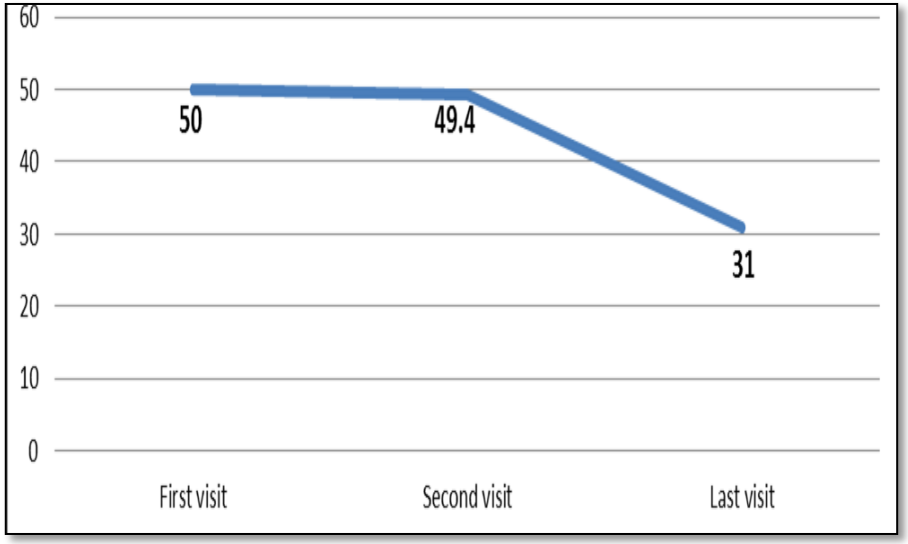
PHASE III – HEALTHCARE UTILIZATION

Percentage of respondents who reported that they had to take their child to the doctor due to problems with asthma in the 4 weeks prior to the first, second and the last home visits



% of children requiring a doctor's visit due to problems with asthma

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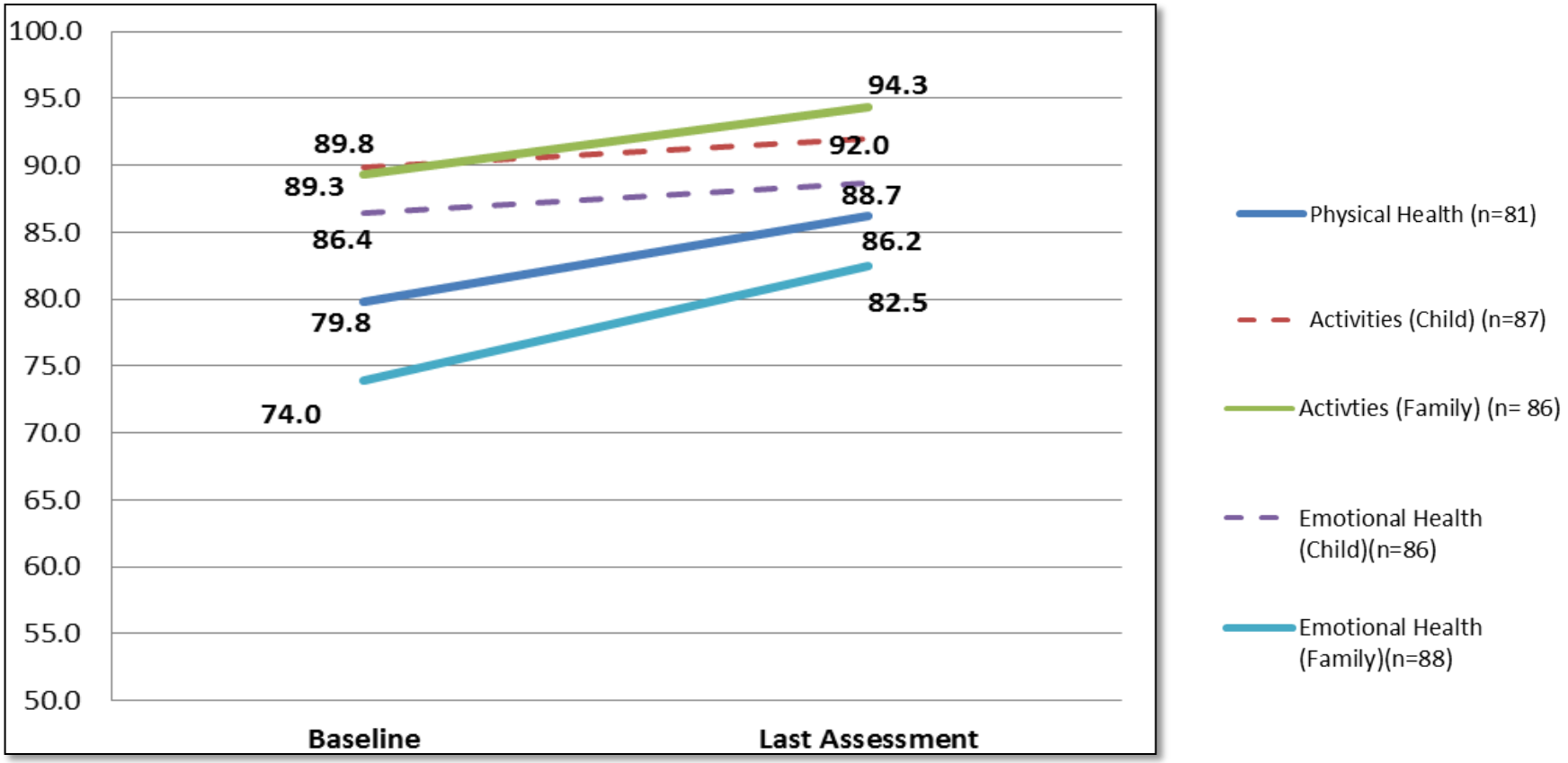
PHASE III – QUALITY OF LIFE

- **The largest gain was made in the emotional health of the family, which increased nearly 9%.**
- **Physical health increased by 6% and family activities increased by 5%.**
- **Children's activities and emotional health increased by 2%.**
- **IEI parents and their children demonstrated a reduction in the negative effects of asthma related to sleep.**

PHASE III – QUALITY OF LIFE

Average CHSA subscale scores at baseline and at the last home visit



*Solid lines indicate statistically significant changes between first and last assessments.

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PHASE III – ASTHMA KNOWLEDGE & MANAGEMENT

- **The vast majority (89%) of participants indicated they had made a change to their home environment in the prior 4 weeks.**

- **Participants reported using an average of 19 out of the 32 healthy homes strategies, ranging from roof repairs to avoiding pesticide use.**

- **The most commonly cited changes were frequent home cleaning, not allowing smoking in the home, and opening windows for ventilation.**

PHASE III – ASTHMA KNOWLEDGE & MANAGEMENT

- Post training scores were significantly higher than pre training scores on the Healthy Homes pre-post survey indicating an improvement in the participant's knowledge of asthma.

- Among the 9 families whose house had evident water damage during the first home visit, 5 reported that they repaired the water leaks on their exit survey.

- 11 families who reported smoking in the home or car at baseline indicated they were no longer allowing smoking in their homes on the exit survey.

LIMITATIONS/BARRIERS

- **A home and family-based intervention targeting parenting and home maintenance is prone to social desirability biases.**

- **Since CHSA was administered at the first home visit, rather than prior to the initial education session, the family may have made changes that were the result of the intervention but occurred prior to the "baseline" assessment of quality of life, asthma symptom, and trigger measures.**

LIMITATIONS/BARRIERS

- **The healthcare utilization section of the evaluation is limited by both self-report and the time periods referenced by the health care items (e.g., the tool references 4 week intervals, but is administered every 12 weeks).**

- **A pre and post (as well as retrospective) design does not control for all threats to internal validity (i.e., the ability to say that an intervention resulted in a predicted change).**

LESSON LEARNED -1

Balance assessment and intervention

Measuring the array of changes that may occur in a multi-component longitudinal project seemed to create a documentation burden on the participating families and Promotora.

RECOMMENDATION - 1

Consolidation of measurement tools will streamline the assessment process. However, it is recommended that the Promotora use the information gained from the surveys to tailor her dialogue with the family.

LESSON LEARNED - 2

Measure what families are doing differently

The team produced new Healthy Homes pre- and post-test assessment tools that measure knowledge and behavioral changes in order to minimize biases created by retrospective questions, such as those on the exit survey.

RECOMMENDATION -2

It is recommended that the new Healthy Homes pretest and post-test surveys be administered at baseline and every 3 months thereafter in the coming year.

Since these tools are newly adapted, it will be important to pilot-test them by closely examining the first set of baseline and three-month follow-up assessments. It may also be helpful to conduct a focus group to review the results and determine whether further changes are needed.

CONCLUSION

- **The Promotora model is effective in engaging families over time.**
- **The IEI program is well-situated to pilot-test the restructured assessment tools and continue serving families in Hidalgo county.**
- **Collectively, the IEI outcomes demonstrate that this comprehensive approach is improving the lives of children and their families who struggle with asthma.**