UNIVERSITY OF CALIFORNIA, MERCED

# Childhood Asthma Control Intervention through Community Health Workers in the California Central Valley – A mixed Methods Analysis of Feasibility, and Desirability of Addition of Peer Support.

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy

In

Public Health

By

Gracy Durães Mantoan

Committee in Charge:

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2022

The Dissertation of Gracy Durães Mantoan is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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**Dedication**

**To those who came before me…**

All those who, from generation to generation cared enough to pass along their gift of life, straight from God!

Specially my mother, Geralda Teixeira (who, even in her short passage through this earth was able to instill the **love** for life, curiosity, learning, and joy)

and my father, Valeriano Barbosa Durães (source of courage and resiliency)

**… and those who came with me…**

Siblings, friends, and husband, who share this journey of life with me – my Peers!

**…and specially to those who come after me!**

Through whom my existence makes sense.

" The purpose of life is to **discover** your gift.
The work of life is to **develop** it.
The meaning of life is to ~~give your gift away.~~"
**SHARE IT**!

**THAT WHICH IS SHARED MULTIPLIES,**

**NEVER GETS LOST!**

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**List of Abbreviations and Acronyms**

| Acronym | Explanation |
|---|---|
| RSV | Respiratory Syncytial Virus |
| NIH | National Institute of Health |
| CDC | Center for Disease Control and Prevention |
| US/USA | United States of America |
| CDPH | California Department of Public Health |
| SJV | The San Joaquim Valley |
| NAEPP | National Asthma Education and Prevention Program |
| NIH | National Institute of Health |
| EPR-3 | Expert Panel Report 3 |
| ICS | Inhaled Cortico-Steroids |
| SABA | Short Acting Beta-2 Agonist |
| LTRA | Leukotriene Receptor Antagonist |
| AAP | Asthma Action Plan |
| PCP | Primary Care Provider/Practitioner |
| SES | Socio Economic Status |
| MDRC | Manpower Demonstration Research Corporation |
| RCTs | Randomized Controlled Trials |
| CHW | Community Health Worker or “Promotora de Salud” |
| QOL | Quality of Life |
| CBPR | Community Based Participatory Research |
| HEPA | High Efficiency Particulate Air (filter) |
| ED | Emergency Department |
| GINA | Global Initiative for Asthma |
| CCAC | Central California Asthma Collaborative |
| CEO | Chief Executive Officer |
| EPA | Environment Protection Agency |

| | |
|---|---|
| MiniPAQLQ | Mini Pediatric Asthma Quality of Life Questionnaire |
| ACT | Asthma Control Test |
| AIM | Asthma Impact Model Program |
| CARES | Comprehensive Asthma Remediation and Education Service |
| CCAH | Central Valley Alliance for Health |
| MCSD | Merced City School District |
| MUHSD | Merced Union High School District |
| MCOE | Merced City Office of Education |
| IRB | Institutional Review Board |
| MMCAC | Merced/Mariposa County Asthma Coalition |
| SH | Stakeholder |

## List of Tables

## List of Figures

**Acknowledgements**

Beyond those mentioned on the dedication, who I thank with all my heart, there is a whole “village” who assisted me to get to this point of my dissertation:

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To the research assistants who contributed with this work:

**Cherilyn Moses** (Charly), for assistance with transcriptions and text editing.

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To my husband, **Angelo C. Mantoan**, and my children, **Arthur**, **Gabriel**, **Brenda**, and **Luigi Mantoan**, who mean the world to me, and had patiently endured with me through the efforts of accomplishing one more milestone.

To my advisor, **Dr. Paul Brown**, who I see as an example of inclusion and goodwill in “Team Science”, as well as my committee members, **Drs. Linda Cameron, Ricardo Cisneros, and Matthew Zawadzki**, for their patience, support and sharing of knowledge, which should remain a memorable experience in my life!

Last, but not least, to our **Heavenly Father**, who gives us the chance to come to this huge school called “life”. I could not have done it without all the divine guidance and inspiration from higher spheres! I hope He will be proud of me when I go back HOME! Thank you!

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## EDUCATION

University of California Merced – Public Health — Expected Summer 2022

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Dissertation: "Asthma Control Intervention through Community Health Workers in the California Central Valley: Effectiveness, Feasibility, and Desirability of Addition of Peer Support"

Advisor: Paul Brown

University of California Merced – Public Health — Dec 2018

Master of Science in Public Health

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School of Medicine - Medical Doctor

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## RESEARCH EXPERIENCE

UC Merced HSRI – Health Sciences Research Institute — Sep 2013 – Aug 2014

*Research Assistant*

Interviewed a focus group with parents of school-aged children for Community Needs Assessment Research. Participated in staff meetings and trainings with HSRI Research on the subjects of Valley Fever and Community Needs Assessment.

Immunology Department- UNICAMP — Jun 1990 – Jan 1993

*Research Assistant*

"Occurrence of anti-DNA antibodies during pregnancy in asymptomatic women and their offspring in Brazil". Compiled and interpreted all international research data available on the subject and presented it to medical professors and associates. Developed a plan for research at the University and submitted the project to the University Research Council. Identified and categorized local mites responsible for respiratory allergies using skin test method and orienting patients about their treatment and environmental control. Participated in the follow up of the patients in weekly Immunology and Asthma Clinics.

Internal Medicine Department – UNICAMP Feb 1989 – Jun 1990

*Research Assistant*

Processed Research data

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**ACADEMIC PRESENTATIONS**

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Mantoan G., Boyajian, J., Fleszar-Pavlovic, S., O'Carroll, R., Cameron, L., Schnier K., Singh, R., Brown P.. "Addressing Organ Donation preferences through Discrete Choice Experiment (DCE)" American Public Health Association Annual Meeting and Expo, Atlanta, GA, November 2017

Mantoan, G., APHA 2017 Annual Meeting & Expo, Use of Discrete Choice Experiments (DCE) In Public Health: Evaluating Organ Donation Preferences, Atlanta, GA, November 7th 2017 Abstract ID: 386825

Mantoan, G., "Asthma Interventions", Merced-Mariposa Asthma Coalition Meeting, September 2017, Merced, California

Mantoan, G., "Asthma Control", Merced City Employees "Wellness Brownbag Luncheon", September 2017, Merced, California

Mantoan G., Schnier K., Boyajian J., Singh R., Brown P. "Preferences regarding organ donations: Evidence from a discrete choice survey." AcademyHealth Annual Research Meeting (ARM) June 2016, Boston Massachusetts

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**ACADEMIC PUBLICATIONS**

Mantoan, G., Brown, P. M, Schnier, K., Boyajian, J., & Singh, R. (2018). Preferences Regarding Kidney Donations from Deceased Donors: Evidence from a Discrete Choice Study among young adults. *UC Merced: School of Social Sciences, Humanities, and Arts*. Retrieved from https://escholarship.org/uc/item/1ww4m5rh

Aponte, J., Mantoan, G., & Moreno, M. (2016, November). Measuring what people value: Discrete Choice survey results on *organ donations*, antibiotic use, and options for childbirth. in *International Journal Of Behavioral Medicine* (vol. 23, pp. s128-s128). 233 Spring St, New York, NY 10013 USA: Springer.

Mantoan G., Boyajian, J., Fleszar-Pavlovic, S., O'Carroll, R., Cameron, L., Schnier K., Singh, R., Brown P.. "Addressing Organ Donation preferences through Discrete Choice Experiment (DCE)" Manuscript under review

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University of California Merced – UC Merced — Jan 2015 – Fall 2021

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| PH 102 - Health Promotion | Fall 2015, Fall 2018, Spring 2018, Fall 2020 |
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**OTHER PROFESSIONAL EXPERIENCE**

Brazilian Army — Jan 1996 – Mar 1999

*2nd Lieutenant Medical Doctor- General Physician*

*Interim Director of Health Department in the Army Headquarters.*

Assessed, diagnosed and treated military personal and their families. Provided primary and emergency care. Performed preventive health assessments. Educated and monitored health care practices in the military activities. Reviewed, evaluated and approved medical claims for military personal.

Dr. Mario Gatti Campinas City Hospital Mar 1998 – Mar 1999

*Emergency Room Physician*

Triaged patients according to seriousness of illnesses. Assessed, diagnosed and treated emergencies in the adult population

Campinas City Public Health Facilities Aug 1998 – Mar 1999

*General Practitioner Physician*

Provided primary care to adult population. Assessed, diagnosed and treated patients in the community. Provided in-office consultations and home visits in rural areas. Educated patients on chronic illnesses management.

UNICAMP- University of Campinas Poison Control Center Nov 1992 – Nov 1994

*Intern*

Under supervision of Attending Physician, provided care at the University Hospital Emergency Room for patients with cases of accidental and suicidal poisoning, snake, scorpion and spider bites, as well as rabies prophylaxis. Provided education and assistance by phone for poisoning cases to city hospitals and household calls. Monitored the cases that were admitted to the University Hospital and other hospitals in the Poison Control Center's Area.

**SERVICE EXPERIENCE**

Merced & Mariposa County Asthma Coalition Jul 2018 - Present

*Chair*

Participation on monthly Steering Committee meetings and bimonthly Community Meetings. Discuss asthma issues in the community, invite and organize community speakers. Involved in Community outreach with key physicians and healthcare stakeholders involved in the treatment and education of asthmatics. Participate in advocacy efforts and Policy making for asthma campaigns and interventions in California. Trained in Asthma Community Education.

CCAC – Central California Asthma Collaborative Jul 2017 – Present

*Volunteer*

Review data from the AIM Program and prepare it for evaluation.

Bristol Hospice – California LLC May 2012 – May 2013

*Volunteer*

Worked at the office organizing patient charts, inputting quality control data and creating systems to make the office work more effective. Assist the Director of Clinical Development and Education on his duties.

UNICAMP 1988 – 1995

Class Representative throughout medical school

Student body member & educational commission representative

Member of the Student body Athletic Organization – 1989

Medical School Student Newspaper editor – 1989

**PROFESSIONAL MEMBERSHIP AND CERTIFICATIONS**

APHA – American Public Health Association 2016 – present

CRM-SP – S. Paulo State Regional Medical Council (Brazil) 1995 – present

Medical License CRM 83949

AcademyHealth 2015 – 2016

ECFMG (Educational Commission for Foreign Medical Graduates) USA Certified Dec 21st, 2001

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**HONORS AND AWARDS**

UC Merced Research Week, HSRI best innovative research in Behavioral Science Award, “Discrete choice survey in organ donation”, Merced California - Spring 2015

INTERMED 1989 (São Paulo State Medical Schools Athletic Competition) Track and Field 200m Bronze medalist.

## PROFESSIONAL DEVELOPMENT

RAMP (Regional Asthma Management and Prevention) Asthma Summit May 2019

Attended the summit classes and participated in advocating activities for SB-207 at the Sacramento CA Capitol

St. Mark's Hospital – Family Medicine Residency May 2004

*Guest Observer*

Clinical Experience with Impatient services with Family Medicine Residents and Attending Physicians at the Saint Mark's Hospital – Utah. Attended their weekly Resident's Noon Conferences for about three months.

University of Utah – Department of Family Medicine Apr 2003 – Oct 2003

*Guest Observer*

Clinical Experience with Family Medicine Professors at the Madsen Clinic. Weekly attendance to the Family and Preventive Medicine Grand Rounds and bimonthly attendance to the Residents Training Sessions for six months.

University of Utah – Department of Dermatology Jun 1999 – May 2001

*Guest Observer*

Accompanied Medical Professors, residents, and students in patient care at the Veteran's Hospital Dermatology Clinic.

## OTHER PERSONAL INFORMATION

### Volunteer Service

The Church of Jesus Christ of Latter-Day Saints - Brazil Brasilia Mission - Feb 1991 – Jul 1992

*Missionary*

Volunteered as a full-time missionary, teaching and serving in the communities in the Central Area of Brazil.

### Language Fluency

English – fluent; Portuguese – native; Spanish - intermediate

## Abstract

University of California, Merced – 2022

Childhood Asthma Control Intervention through Community Health Workers in the California Central Valley – A Mixed Methods Analysis of Feasibility, and Desirability of the Addition of Peer Support.

A dissertation submitted in partial satisfaction of the requirements for the degree of Doctor of Philosophy in Public Health

By Gracy Durães Mantoan
Advisor: Paul Brown

The California Central Valley has a higher-than-average incidence of childhood asthma and a severe shortage of healthcare providers, which, added to the demographic characteristics of the population, makes it a serious problem in public health. Community Health Workers Interventions have been used to reduce the disparities of the problem, with great results.

The addition of peer support to interventions has the potential to increase the effectiveness of interventions without adding to the cost. This study uses a Mixed Methods approach to evaluate the readiness and desirability of such interventions in the community by accessing the needs, opinions, and receptivity of parents of asthmatic children and community stakeholders.

The results show that the need for implementation of this kind of intervention in the community is indeed significant and a portion of the target population would be open to addition of peer support. Community stakeholders agree that the local asthma coalition would be a great catalyst to guide the community stakeholders to come together to bring about the materialization of this intervention, and that it is paramount that funding for this type of program should be obtained. The addition of peer support for the interventions also has the potential to involve researchers and students of community interventions to assist in implementation and evaluation of the performance of the program.


Keywords: Mixed Methods Research, Community Interventions, Community Health Workers Intervention, Peer Support, Asthma Education Intervention, Asthma Management..

# Chapter 1: Controlling childhood asthma through community interventions

## 1.1. Introduction/ Context

Childhood asthma is an important public health issue in the San Joaquin Valley of California. This work brings to light important topics pertaining to the problem. It starts by defining what asthma is, then discusses how and why it is important to control it, including a brief review of the burden brought by asthma to our country, state, and community. It also reviews the attempts to address the issue through community interventions, their effectiveness, the theoretical framework involved in these efforts and their financial feasibility. It concludes with a brief description of the current effort being made in the community to address the problems along with comments on the importance of adding research to these efforts by testing new ways to improve interventions.

This dissertation includes data gathered from interviews with key stakeholders in Merced, CA and a survey of the general population in the San Joaquin Valley. This mixed methods approach aims to review existing interventions aimed at helping parents of children with asthma and propose a new intervention. This 'peer support' intervention would overcome some of the barriers that exist with current interventions and would be tailored to the population of the San Joaquin Valley.

## 1.2. Literature Review

Asthma is a chronic inflammatory disease of the airways that causes coughing, shortness of breath, wheezing, breathlessness, and chest tightness. The airflow obstruction is usually reversible, either spontaneously or through use of medication. The episodes are triggered by exposure to a variety of stimuli, including allergens (pollen, dust mites, mold, animal dander, insect particles, etc.), irritants (chemical cleaners, pollution, tobacco smoke, strong odors, etc.), viral infections (rhinovirus, respiratory syncytial virus - RSV, etc.), physical exertion (exercise, strong emotions/stress, etc.) and exposure to cold or humid conditions. Besides these environmental factors or triggers, host genetics are also involved in the development of asthma[1–3]. The inflammation in the airway causes spasms or constriction of the muscles on the bronchii, further worsening the obstruction of the airway, hence the symptoms. The severity of symptoms can range from mild to life threatening.

Currently there is no cure for asthma and no known primary preventions. However, secondary and tertiary prevention are possible through medication and environmental control, which make asthma symptoms manageable and death due to asthma preventable. The National Institute of Health (NIH) has published specific guidelines establishing best current medical practices in order to obtain control of asthma symptoms. Great efforts have been made to have these guidelines followed, in order to reduce the burden of asthma[1]. A summary of these guidelines will be discussed in detail.

### 1.2.1. The burden of asthma

Just as with other chronic diseases, asthma incidence has been increasing over the years. According to the Center for Disease Control and Prevention (CDC)[4], currently,

asthma affects approximately 25.7 million people in the USA, including 7 million children under 18 years of age. The prevalence of asthma in the population is estimated to be about 8% or 1 in 12 adults and 10% or 1 in 10 children. Asthma was linked to 3,447 deaths, or about 9 per day, in 2007. The death toll in 2007 was 185 for children and 3,262 adults in the US. Asthma costs in the US grew from about $53 billion in 2002 to about $56 billion in 2007, an increase of about 6%. It costs the US about $3,300 per person with asthma each year. It is estimated that, in 2010, there were 1.8 million emergency department visits for asthma-related care, and of these visits, 429,000 people had to be hospitalized. This burden is also reflected through missing days of work and school: one third of adults (33%) and more than half (59%) of the children had missed days of work or school due to asthma in 2008, with an average of 4 missed days of school for children and 5 days of work for adults during the year. Asthma attacks tend to be more frequent in children (57%) than in adults (51%), with women more likely than men and boys more likely than girls to have an asthma attack. Racial distribution puts non-Hispanic blacks (11% in overall and 17% in children) at a higher rate among racial/ethnic groups. Therefore, asthma causes a significant health and economic burden to patients, families, and to society.

In the state of California[5–7], the California Department of Public Health (CDPH) and the California Breathing Organization estimate that the lifetime prevalence of asthma is 3.7 million (13.7%) for adults and 1.7 million (13.3%) for children. Approximately 2.1 million adults (7.6%) and 827,000 children (8.6%) in California currently have asthma. The mortality rate due to asthma in California in the year 2004 was 13.0 per million residents for a total of 450 deaths[7]. There were also 145,000 (39.1 per 10,000 residents) asthma-related emergency visits, with 36,000 hospitalizations (10.0 per 10,000). The CDPH reports similar disparities for age and gender in proportion with the national average, and also reports that "…lower income is associated with higher asthma hospitalization rates and worse symptoms. The rate of asthma hospitalizations is three times higher among people from places where the median income is less than $20,000 compared to people from places where the median income is greater than $50,000. People with more repeat asthma hospitalizations come from areas with a lower median income than people who do not have repeat hospitalizations. Prevalence of severe symptoms is almost seven times higher among adults with household incomes below $20,000 (19.5%) compared to adults with household incomes over $100,000 (2.8%). Costs for asthma hospitalizations are very high. The average charge for an asthma hospitalization was $23,953 in 2005, a 158 percent increase since 1995. However, the average length of stay for asthma hospitalizations did not change during this same time period. Total cost for asthma hospitalizations in 2005 in California were $763 million. Government-funded health insurance programs (Medicare and Medi-Cal) pay for 61 percent of asthma hospitalizations, or $547 million in charges. Charges for repeat hospitalizations were $118 million in 2005 and $565 million for 2003–2005 combined." [5–7]

The San Joaquim Valley (SJV), located in the southern half of the Central Valley Region of California, is a mostly rural area well known for its farming activities. Due to being surrounded by mountains on both sides, the airflow patterns funnel pollution from the Bay Area south down the valley, adding to the local emissions, farming dust,

pesticides, pollen, smoke from wildfires, etc. During certain times of the year, weather conditions in the region cause a thermic inversion which entraps the polluted air in the valley[8,9], causing the air pollution to rise to critical levels. These conditions are especially troublesome for those who suffer from chronic respiratory diseases[10]. Add to this the socio-demographic characteristics of the population[11–13], the reduced number of primary healthcare providers[14], lack of access to quality healthcare, low Socio-Economic Status (SES), low level of education in general and low health literacy, the region presents disparities that are particularly troublesome, especially for children[12]. The California Department of Public Health (CDPH), through the California Breathing Organization, publishes an online report of the epidemiologic state data, separated by county. They report that, while the prevalence of active asthma is 8.3% for the whole state, Merced County presents a prevalence of 13.6%. The rate of emergency room visits per each 10,000 residents due to asthma is 49.5 in the whole state, but in Merced County it is 85.5. The rate of hospitalizations due to asthma for each 10,000 residents in Merced County is 9.0 whereas it is 7.6 in the state as a whole. Fresno County, where the regional Children's Hospital is located, presents a rate of 12 hospitalizations per 10,000 residents.

### 1.2.2. Guidelines for the diagnosis and management of asthma

In 2007 the National Asthma Education and Prevention Program (NAEPP) was commissioned by the National Heart, Lung, and Blood Institute (NHLBI), part of the National Institute of Health (NIH), to review the National Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007. Their work was called the Expert Panel Report 3 (EPR-3)[1]. The "Asthma Care Quick Reference-Diagnosing and Managing Asthma"[15] shows a summarized version of the EPR-3. All guidelines presented here are extracted from those two documents.

There are four components of asthma care:

**Component 1** – Assessing and monitoring asthma severity and asthma control:

Initial asthma diagnosis is contained in this component. Monitoring the severity and the control are part of the procedures of follow-up, thus ensuring that all the next steps are being followed successfully. The individual steps will be explained below.

**Component 2** – Education for a partnership in care:

Health care providers must develop a partnership with each patient in order to assure that the patient learns asthma control procedures, how to use their prescribed medication and how to report progress or complications.

**Component 3** – Control of environmental factors and co-morbid conditions that affect asthma:

This is an important component of asthma control, since controlling asthma involves minimizing exposure to allergens and irritants, as well as managing diseases associated

with worsening of symptoms, such as gastro-esophageal reflux, obesity, rhinitis, sinusitis, stress, depression, etc.

**Component 4** – Medications: The prescribing of rescue and asthma control medications

These components are further broken down into ten clinical steps involved in providing quality asthma care (see Figure 1 for summary of steps) [15].

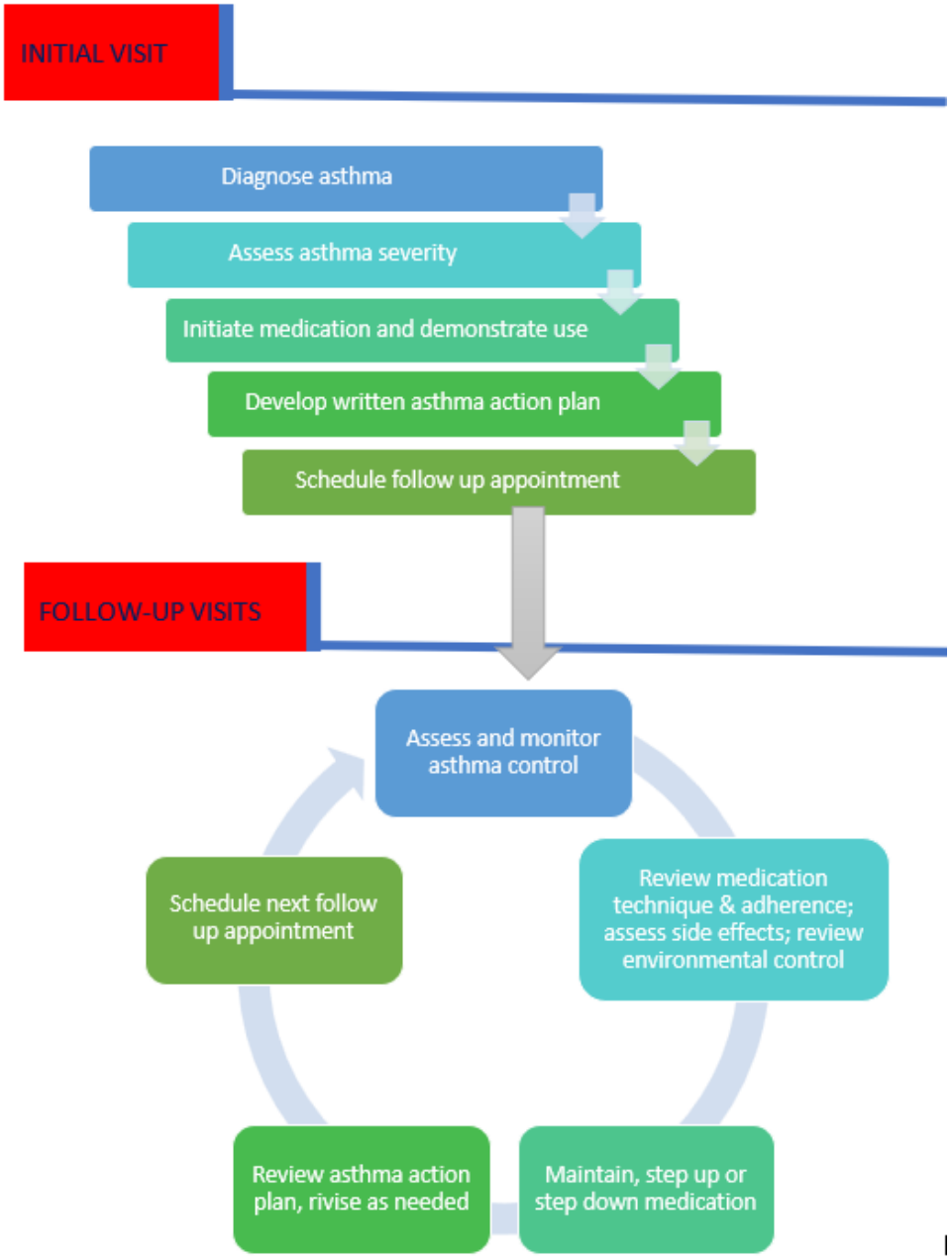


**Figure 1 - Steps for Providing Quality Asthma Care - EPR-3/ NAEPP/ NIH**

*Step 1*: Diagnosing asthma. The diagnosis must be done by a trained physician, who documents the symptoms presented by the patient and, with children ages 5 years and over, uses spirometry to determine if the airway obstruction is reversible, which confirms the diagnosis of asthma[15].

*Step 2*: Assessing asthma severity. The severity of asthma is determined according to frequency and intensity of the symptoms presented by the patient. If the symptoms occur two days or less per week, with nightly symptoms being less than twice a month, the component of severity is said to be “Intermittent”. If the symptoms are present on more than two days a week, with nightly symptoms more than 3 times a month, the severity is classified as “Persistent”. Persistent asthma can also be further classified as “Mild”, with more than two symptomatic days a week, but not daily, and nightly symptoms 3 to 4 times a month; “Moderate”, with daily symptoms, and more than once a week nightly symptom, but not daily; or “Severe”, with daily symptoms throughout the day, nightly symptoms more than once a week, often 7 times a week. The higher the spectrum of the severity of asthma, the worse the lung function detected on spirometry and the higher the risk of complications.

*Step 3:* Initiate medication and demonstrate use. The NAEPP guidelines have a structured, stepwise approach to tailoring the prescription of medication according to the severity of the symptoms. As the patient starts getting better control, some of the medications can be stepped down after at least 3 months without symptoms or stepped up again as necessary. For all classifications of asthma, the first medication prescribed is a short acting beta-2 agonist (SABA) inhaler. SABAs act as bronco-dilators and are frequently referred to as rescue inhaler, because if administered at the beginning of an asthma crisis, it can reverse the bronchospasms and stop the crisis. SABAs can also be administered through nebulization. The next step of medications is the Inhaled Cortico-Steroids (ICS). These also come as inhalers, but they are referred to as controlling inhalers because, used in the long term, they act as anti-inflammatory agents, stabilizing the mucosa in the bronchii to prevent the bronchospasms caused by the inflammation. ICS can be scaled from low dose to medium dose and high dose, depending on the severity. The next line of medications is the inhaled Long-Acting Beta-2 Agonists (LABA) that act similarly to the SABA, but their action, while not as immediate as the SABA, lasts longer, so when patients are having frequent bronchospasms, they can be added to SABA to obtain a lasting beta-2-agonist effect or bronchodilation. Next up is “Montelukast”, an oral antihistamine and mast-cell membrane stabilizer used to control allergic reactions responsible for the inflammation of the airways as well as “Cromolyn”, which has the same mechanism of action but is administered via inhalation. Oral corticosteroids are only prescribed for the more severe cases, when there is low responsiveness to the short acting bronchodilators, and they need to be administered with caution, with a weaning schedule as soon as control is obtained due to the side effects of corticosteroids. For children 5 years or older, there is also the option of administration of oral theophylline, which is a smooth-muscle relaxer and also acts preventing bronchii-responsiveness. However, this therapy is less desirable due to the need to monitor the blood levels of theophylline. For persons 12 years or older with severe asthma, there is also the option of oral use of Leukotriene Receptor Antagonist (LTRA), Zileuton (a leukotriene formation inhibitor through inhibiting the 5-lypoxigenase)

or Omalizumab, an immune-modulator for controlling allergic reactions. Patients over 5 years of age with an important allergic component to their symptoms can also have subcutaneous allergen immunotherapy. As any treatment designed for severe cases of asthma can contain complex medication regimes, it is important for the patient and caregivers to be educated on how to use each medication properly, so the guidelines must remind of this necessity.

*Step 4*: Develop a written asthma action plan. The Primary Care Provider (PCP) should register on the asthma action plan all the steps necessary for controlling the asthma symptoms, so the patient or caregiver has a written guide on how to proceed in the event of an asthma attack.

*Step 5:* Schedule follow–up appointments. It is necessary to re-evaluate the progression of the disease or medication needs and uses in order to adjust the medication as necessary and provide education as needed at each follow up.

*Step 6:* Assess and monitor asthma control.

*Step 7:* Review medication technique and adherence; assess side effects; review environmental control.

*Step 8:* Maintain, step up, or step-down medication.

*Step 9*: Review asthma action plan; revise as needed.

*Step 10*: Schedule next follow–up appointment.

### 1.2.3. Reasons for poor asthma management

As we can notice from the brief review of the guidelines above, even though asthma is controllable, it takes a complex, multi-step process that needs to be tailored to each individual by a healthcare provider and understanding all the necessary procedures can be extremely daunting for patients and caretakers with low self-efficacy and health-literacy. There are many factors identified as barriers for obtaining asthma control:

**Barrier 1:** Access to healthcare/ PCP: Controlling asthma might take several appointments with a PCP, and, sometimes, even appointments with a specialist, with some tests being necessary for diagnosis. In a case of severe asthma, it might also take emergency care and/or hospital admissions[16,17].

**Barrier 2:** Cost of prevention: The high cost for these services poses a barrier to controlling asthma symptoms. Those without health insurance would have to pay the whole amount of the cost of care. For those who have health insurance, using these services would still incur expenses such as co-pays and out-of-pocket deductibles. When dealing with under-served areas such as the San Joaquin Valley[17], there is also the issue of being able to find a PCP close enough to perform the services in a timely manner or even the problem of managing access to transportation to the many office visits.

**Barrier 3:** Access to prescription medication: After consulting a doctor who will make the diagnosis and prescribe the treatment for asthma, using the medication as prescribed is imperative to obtain the control of asthma. Most health insurance plans have medication coverage, with copayment values varying according to each plan's benefits. The average annual cost per patient with health insurance for childhood asthma was calculated in 2012 to be between US $152 to $156[18]. The same study also concluded that higher co-payments for medication are associated with a higher incidence of poor adherence to treatment and an increased number of hospitalizations in children with asthma[18]. For patients who are not covered by a health insurance plan, the prices of many of these medications are exceedingly high and almost impossible for a low SES family to afford. Refilling the prescriptions can also be a challenge when patients live in rural areas with poor access to transportation.

**Barrier 4:** Limited ability for clinicians to educate parents: The clinical setting does not allow enough time to educate parents and patients on how to control their asthma. A standard consultation time only allows for about 10 to 15 minutes with the doctor, especially in areas where physicians are scarce[14,17,19]. Trained medical personnel can also explain how to use the medication and control environment irritants and allergens, but the time available for this training in the clinical office visit is very short.

**Barrier 5:** Low health literacy rates: Even with the best possible instructions on how to control asthma, other barriers make it harder for parents to be able to follow them. Psychology research has evidenced that giving people knowledge alone is not enough for even the highly educated to modify their behavior and grasp new concepts well enough to put them into practice in their daily routines[20]. The level of health literacy of the patients or caregivers can also influence their self-efficacy in controlling asthma symptoms[21–24]. Language barriers can also play a role in multi-ethnic communities. Children with multiple caregivers (such as daycare, divorced parents, cared for by other family members) might have difficulty maintaining the same routine for asthma prevention when moving through different environments.

**Barrier 6:** School policy and bureaucracy: Older children and adolescents are, if well trained, able to administer their own medication. In fact, when they are away from their caregivers, it might be crucial that they do. However, they might forget to carry their medication with them or they might require reminders, which are not always available. Schools might require parents to fill out medical authorization for children to carry and self-administer rescue medication during school hours, and may not permit children to use any medication on school grounds until they have this record on file[25].

**Barrier 7:** Socio-emotional conflicts: Both parents and children might have beliefs about using the medication that might prevent them from using it as required. These beliefs might include a lack of confidence in their ability to recognize when to use each medication and follow a routine plan to control asthma (self-efficacy), but feeling alone in the battle, not wanting the stigma of being sick, and fear of being "addicted" to the medicines[26].

### 1.2.4. Relieving the burden of childhood asthma

Because asthma is the leading chronic illness affecting children in the US[27], resulting in a great cost to the health care system and society[28], especially in the way that it affects minorities and disadvantaged populations, many attempts to increase adherence to asthma control therapy have been made[29]. A paper published by the MDRC (Manpower Demonstration Research Corporation)[30] reviews the literature of childhood asthma program evaluations between 2004 and 2014, includes 33 original articles: 26 experimental studies (RCTs) and 7 non-experimental, comparing results of before and after the intervention. It describes the three main types of interventions aiming to improve asthma outcomes. It also performs a meta-analysis to assess the effectiveness of those interventions.

#### 1.2.4.1. Education of Patients and Caregivers.

The main goal of education-focused interventions for the management of childhood asthma is to teach patients and caregivers how they can improve self-management of the disease. Their aim is to provide the knowledge necessary to understand the disease processes, the signs and symptoms of the disease, the different medications used to reverse the symptoms, how to use the medications for optimal control, and how to avoid asthma attacks. It usually involves also teaching people how to clean their environment and prevent allergen exposure that would trigger the asthma. Since asthma control involves what is often a very complex, stepwise therapy, it is important that the caregivers learn how to manage it comfortably. It is important to increase asthma-related health literacy of the caregivers of children with asthma, because if the symptoms are managed in a precise manner, many exacerbations and complications may be avoided that might otherwise lead to hospitalization and even death. However, it takes more than just a few visits to the doctors' office to master asthma management.

A great number of these interventions can best be managed using a delivery model in which home visits by a trained health coach called a "Community Health Worker" (CHW), sometimes called "Promotoras de Salud" in the Latino communities[30–38], are made. They are preferred over other delivery models (e.g., telephone coaches, healthcare navigators, parents' classes, case managers) because they add a component of social support to these families, who are often overwhelmed by the problem at hand and feel unsure of their ability to manage it[26,39,40]. It allows the health worker to assess each family individually, in their own environment, and tailor the instruction according to their specific needs and cultural/language level. These workers are trained to empathize with these families and teach them in a much more personal way than can be done in the clinical setting, where time constraints in addition to language and cultural barriers may not allow these families to optimally learn what is needed. Follow-up visits are designed to reinforce the learning and re-assess their needs. CHWs can also refer families to additional social programs as needed. These measures used together have the effect of increasing not only the family's knowledge, but also their self-efficacy or confidence in managing their child's disease. The resultant reduction of asthma attacks by improving control of asthma

have a positive effect showed by decreasing emergency room visits, hospitalizations, sick child doctor's visits, and days lost of school and work, as well as improving quality of life (QOL) for parents and children. Several studies have demonstrated that these interventions can be efficacious and effective[36,41] .

There are other modalities of educational interventions possible. Some organizations might prefer telephone coaching for parents of children with asthma[42,43]. For stakeholders responsible for the health of a group and who might already have case managers assigned to follow up on chronic cases, telephone coaching may be a good option to reach out, filling in the knowledge gap and offering support through phone coaching, which also has been shown to improve asthma control and QOL[42].

Involvement of community stake holders through community based participatory research (CBPR) has also led to the development and implementation of school-based interventions[44] aimed at improving children's wellbeing and symptoms, minimizing loss of school days. [Briefly identify and cite evidence regarding their efficacy]. The recent advances and availability of computers and internet can also be utilized for interventions aimed at managing asthma symptoms. Peer support chat rooms can assist in behavior and attitude modification for parents, children and teenagers[40,45,46].

According to the results from the MDRC meta-analysis, the 7 education interventions RCTs they evaluated were, on average, able to improve health services utilization by significantly reducing number of emergency department visits and hospitalizations, but they did not increase regular PCP visits as expected and 6 RCTs showed decreasing of number of functional limitation days.

#### 1.2.4.2. Environmental Control.

Environmental control interventions focus on reducing asthma triggers by improving the child's environment to reduce exposure to allergens[29,47–49]. Even though these interventions might also include a component of education and self-management of asthma and might be based on a skin test to determine the triggers, the main focus is on environmental assessment of the home and remediation of indoor triggers for better asthma control. This remediation may include pest control (cockroaches and other insects as well as mice), carpet and mold removal, a new mattress and pillow with impermeable covers for control of dust mites, HEPA-filter vacuum cleaner, non-irritant cleaning products and education on how to minimize environmental triggers. These interventions are usually done in low-income communities where there are poor housing conditions, and they typically involve employment of resources and referrals to provide the integrated remediation necessary to each home. They might even include assistance with landlords and housing authorities. All these measures need to be coordinated by trained staff and some of the home repairs can become quite costly, albeit necessary.

The MDRC meta-analysis demonstrated that the 4 home environment RCTs interventions evaluated were, on average, effective in reducing daily and nightly symptoms, functional limitation and missed days of school, with positive results also

on 2 RCTs improving the use of rescue medication, but all the other outcome variables did not have significant change.[30]

#### 1.2.4.3. Training Healthcare Providers.

This group of interventions focuses their efforts on improving the knowledge of health-care providers and school personnel on identification, diagnosis, treatment, and control of asthma. The main aim is on improving quality of care delivered to patients, attempting to get the procedures in asthma control closer to what it is prescribed by the National Guidelines[50,51]. The most current guidelines were published in 2007[1], and there have not been any new therapy discoveries for asthma or asthma management recently, so some of the primary care practitioners working in the field might have been practicing for a long time, and refresher courses that include the latest guidelines might be necessary for optimal health care practice. They are also required for renewal of healthcare personnel professional licenses. However, during daily practice, due to time constraints, professional habits, or distrust in the patient's ability to follow through with instructions, some practitioners might not do all that is required by the guidelines.

According to the MDRC meta-analysis of 2 RCTs, these kinds of interventions were generally effective in reducing the number of Emergency Department (ED) visits, reducing nightly symptoms and functional limitations, and, in their most significant performance, evaluated by 1 RCT, increased the number of current asthma action plans.

### 1.2.5. Sustainability of Community Interventions

Since uncontrolled asthma can have a high cost for both patients/caregivers and stakeholders[52,53], investing in asthma control interventions has potential for return-of-investment. Most healthcare organizations already possess some sort of assistance to patients prone to chronic use of the healthcare resources, since they are required by law to ensure a good quality of healthcare and, in certain cases, are not reimbursed for providing care to patients who return to their care within 30 days or less for the same disease. Some have this assistance in the form of case managers, who spend time educating the patients and caregivers about self-management of diseases; others have phone-coaching programs or community health workers who do home visits. Other community public health programs can also assist patients without health insurance. Publications of results on community asthma interventions do not always publish analysis of cost effectiveness[30]. According to the MDRC, systematic reviews of asthma interventions show that, of the interventions who report on cost, CHW interventions can result in savings of $57 to $80 per child in two months, just on costs due to urgent care. They also report great results in cost-effectiveness for the other forms of interventions[54–58]. Adding a peer support component to an asthma intervention has the potential to increase the results of said intervention without adding much cost, since, by definition, a peer is a member of the community that is willing to assist others with similar conditions. Peer interactions have a tendency to add value to both participants, and without adding on to the cost of the intervention, increasing the chance of sustainability of the intervention.

Most of the Interventions described in the literature do not mention any mechanism of behavior change as a framework for their methods, but rather follow a more pragmatic approach making the NAEPP Guidelines the reason for their intervention and using previously tested and approved methods, with adaptation to the community according to CBPR principles. Very few interventions have analyzed the importance of peer support for behavior change in asthma[46,59–61]. Since it is common for parents, children, and adolescents to have trouble adhering to treatment due to erroneous beliefs and feelings of loneliness in the battle against asthma, peer support can be a key element in behavior change and asthma control for those who are open to it.[26,39,59,62].

Peer support is an aspect of social relationships that has been gaining the interest of researchers and public health officials worldwide. As the focus of public health changes from acute infectious diseases to chronic diseases and from curative to preventive measures, peer support holds the possibility of being the most effective way to assist a community in learning new skills to cope with those diseases. It can facilitate communications, relationships, cognition, learning of new skills, dealing with health threats, and coping with stressors, all within the social environment in which the individual is inserted. An article by Cindy-Lee Dennis[63] describes the main points involved in this method of addressing adherence and self-management of chronic diseases, starting with the definition: “giving of assistance and encouragement by an individual considered equal.” The author identifies articles documenting cases in which peer support was applied successfully to transitional stressors (maturational or developmental life transitions – i.e. pre-natal care, childbearing, breastfeeding, post-partum depression and bereavement) chronic and acute situational stressors (diabetes, chronic renal failure, head injuries, cardiac conditions, cancer, loss of vision, HIV/AIDS, Hematology/oncology and psychiatric disabilities), and in health promotion in general (i.e. diffusion of information, substance use, gang violence, AIDS and STD prevention, cancer screening, development of health coping patterns, conflict resolution, injury prevention and violence and drug prevention interventions). In all of these different circumstances, the support of a peer greatly assisted participants by increasing preventative care visits and screening, treatment adherence, supporting healthy exchange of information between peers to learn new skills, learning to cope with loss or adapt to new circumstances, and to decrease feelings of loneliness among other benefits, all while improving health outcomes.

Peer support involves three identified attributes: emotional support (caring, encouragement, attentive listening, reflection, reassurance), informational support (advice, suggestions, factual input, and feedback), and appraisal or affirmation support (encouragement to persist in problem resolution, reassurance that efforts will result in positive outcomes, and assistance to endure frustration and communication of optimism). In a peer support partnership, at least two individuals are paired up who share the same demographic similarities and a willingness to participate in the social interactions. At least one of the peers should possess specific, concrete knowledge derived from personal experience and should be understanding of the target population’s situation. The relationship should ensure the assimilation of new knowledge and appraisals through the mutual exchange of wisdom. Peer support is believed to

positively affect psychologic and social health through mechanisms of a direct-effects model, (i.e., peer support, which enhances social integration, reduces feelings of isolation, increases access to multiple sources of information, and promotes normative behavior, directly improves asthma-related outcomes ); a buffering-effects model (i.e., peer support improves outcomes by increasing abilities to cope with stressors and thereby buffering the negative effects of stressors on outcomes); and mediation-effects model (peer support indirectly influences health outcomes through beneficial changes in emotions, cognitions, and behaviors). The author warns about possible adverse outcomes in working with peer support, which may include conflict, criticism, failed social attempts, and emotional over-involvement. These can result in contagion stress, reinforcement of poor behaviors, diminishing feelings of self-efficacy, lack of stability, possibility of exploitation or overburdening due to inappropriate use of peers, and other complications. They can arise due to poor work habits, assignment neglect, inadequate communication and short notice of vacations or resignations. Another warning is also given against the tendency to consider “natural lay helpers” and “paraprofessionals” as “peers”. They are certainly part of community support, but not peers. Natural lay helpers are those in the community to whom others “naturally” turn to for advice, emotional counselling, and tangible aid, with a reputation for good judgement, sound advice, a caring ear and discretion, but they lack the experiential knowledge and mutual identification. Paraprofessionals, since they are seen as part of a program, have their skills and accountability shifted to the healthcare system, decreasing their mutual identification, credibility and commonality with clients[63].

### 1.2.6. Outline of the presentation of this dissertation

As the above discussion highlights, asthma is a serious problem for children and their families in the San Joaquin Valley. There is a need to develop interventions that would fill in the gap to provide asthma control education for asthmatic children and their parents. The complexity of the circumstances each family is immerse in requires that such interventions would be tailored to the needs and characteristics of our community. In order to develop such tailored intervention, it is necessary to conduct a needs assessment with parents of children with asthma in the community, to gage what type of support they already have.

There are a number of unique factors that make it necessary to tailor the intervention to the SJV. These include shortage of healthcare practitioners, cultural and language barriers, fear of deportation and high levels of poverty. Even though it is well known that the area suffers from a shortage of healthcare practitioners, it is necessary to confirm if the parents of children with asthma really lack access enough to influence their performance in preventing asthma attacks and the need to resort to emergency or urgent care, as well as hospitalizations due to poorly controlled asthma. An intervention through home visits by CHW, even though is thought of as well accepted published literature, still needs to be confirmed to the specific population and culture locally, since it depends on parents accepting the CHW into their own homes. Acceptance also needs to be confirmed for the addition of peer support, especially since it is currently not known at all if the addition of peer support would be well received by the community and by stakeholders. As for the undocumented immigrants, they might be reluctant to give out

their personal information and addresses because of fear of deportation. Many parents may also not want the CHWs to come to their homes because of their poverty conditions and shame for their circumstances.

Because of these unique factors, it is important to evaluate the assessment of needs and of the readiness for these aspects of an intervention.

This dissertation seeks to advance the understanding of how best to develop interventions aimed at improving the health of children with asthma in the San Joaquin Valley by using a mixed methods approach ; First, by Surveying the general population to understand the challenges that people with asthma and parents of asthmatic children face in helping to control their asthma, the types of interventions that would be well received, what characteristics do parents expect from coaches of such interventions and if there is openness to add peer support to such interventions. Second, by interviewing key stakeholders in the Merced/Mariposa region to understand their perspectives on the needs and characteristics of the community and the resources that are available in the community to support parents and children with asthma.

The remainder of the dissertation is outlined as follows: Chapter 2 presents an overview of the Stakeholders in the region. While there are a number of governmental and national organizations that provide training, education, and resources to parents of children with asthma, this chapter will focus on two community-based organizations: The Central California Asthma Collaborative and the Merced Mariposa Asthma Coalition. The Central California Asthma Collaborative was chosen because they are an important stakeholder that has developed community-based interventions for asthma in the Fresno area, with attempts to expand it to the San Joaquin Valley; the Merced Mariposa Asthma Coalition was chosen because they have been involved with several campaigns to mitigate asthma in the area, and have access to local stakeholders that can participate in the efforts to introduce a new asthma control intervention into the Merced area. Thus, the members of these organizations were familiar with some of the challenges that exist to introducing new interventions and were knowledgeable about the local community.

Chapter 3 presents the methodology used to gather data for this dissertation. This includes a summary of the qualitative interviews with stakeholders in the region. The purpose of these interviews was to help understand the barriers that exist in helping parents and children with asthma control their asthma. This includes the possibility of introducing a peer support model that has been used elsewhere[46,60,64–66]. The chapter also describes the methodology used to survey members of the general population in the San Joaquin Valley. The survey was designed to include a significant number of people with asthma or parents of children with asthma, as well as people without asthma.

The results from the qualitative interviews are included in Chapter 4, followed by the results from the quantitative survey. The results suggest that while there are various barriers to asthma control, there is general support for a low cost, peer support type of intervention.

Chapter 5 describes what a peer support type of model might look like if developed and implemented in the San Joaquin Valley. The dissertation concludes with

a final chapter that summarizes the key findings from this dissertation and advocates for the design and implementation of a tailored peer support intervention for the Community.

# Chapter 2:

# Community Stakeholders and previous efforts to mitigate childhood asthma

## 2.1. CCAC – Central California Asthma Collaborative

The CCAC (Central California Asthma Collaborative) started their activities in the earlier 2000's, as the Central Valley Asthma Project, when their current CEO, KH, who is a Respiratory Therapist, was working with an Asthma Program associated with the Community Hospital in Fresno, caring for adult and pediatric patients. In partnership with TT, they put together their ideas on developing a program that would serve the community and focus on children chronic asthma management. Two stakeholders from the Bay Area invested in developing research[67] on such social issues in the Central Valley, so they secured a grant from the Global Health Research Foundation through the NIH. They developed the Fresno/Madera Asthma Coalition when there were only two other Asthma Coalitions in the country, in New York and Chicago. Through literature review, they identified tools that had been tested in the field and recognized worldwide, and they gathered information from the University of Washington and Massachusetts State Department of Health, who were piloting asthma programs. They also utilized guidelines from the Federal Government who had just started an asthma home visits and environment Assessment. Then, when they studied the materials available through the Environment Protection Agency (EPA), they found a detailed home environment assessment tool (the Asthma Home Environment Checklist)[68], focusing on asthma triggers and medication compliance that, incorporated with the other information, is still used today in their program. They also use the pediatric asthma quality of life survey, which was originally named the Juniper Survey- named after the researched who created and tested the tool. This tool was tested internationally. It was a long survey, but a shortened[69] version and a pediatric version (Mini PAQLQ- Mini Pediatric Asthma Quality of Life)[70] had also been tested and they adopted the latter. CCAC also utilizes the ACT (Asthma Control Test)[71] , which is a simple self-reported test that most programs use to monitor symptoms and manage asthma. All of these tools were organized and incorporated into Community Health Workers (CHW or "Promotora de Salud") Intervention, which has been one of the most effective types of intervention to promote asthma management education.

They developed a partnership with the Madera Department of Public Health and the Fresno County and in 2011 the CCAC initiated the AIM (Asthma Impact Model) Program, with grants from the California Endowment Society and Social Impact Bonds, targeting low-income families who would benefit from home visits for asthma control education. With the initial grants, the CCAC was able to implement the AIM Program, serving 270 patients in Fresno and 230 Patients in Bakersfield over the following 3 years. Along the implementation of their AIM Program, the CCAC did an evaluation of the patients who successfully completed their program and found that program significantly improved the rate at which initial 35 participants felt asthma conditions were controlled through the evaluation of their ACT and Mini-PAQOLQ scores. They have also seen significant decrease in Emergency Department Visits, Urgent Care Visits and Hospitalizations with those patients who participated in the AIM Project and reported a

Return of Investment (ROI) of $3.63 for each $1 invested. They found out that, when successfully implemented, their 12 months follow up of the patients with the AIM Program reduced asthma symptoms and Emergency and Hospital utilization while improving the Quality of Life for the low-income children with asthma.

They have managed to obtain funding through private foundations and expand their AIM Program into other counties, providing their services to some low-income families in Kern, Kings, Merced, Stanislaus and San Joaquin Counties. During the COVID-19 pandemic, CCAC continued to provide support to the families as well through phone/tablet assessments, home visits and education though the windows. If they identified a need for equipment, such as a tablet, that tool was also offered to the family so they could continue with remote contact, education, and monitoring. Their CHWs have also provided training to the families they serve on how to use media vehicles so that they can know how to connect to their CHW and doctors' visits through telehealth during the pandemic, allowing them to obtain the assistance needed even through social distancing time.

Through a grant administered by the Sierra Health Foundation in 2020, they aimed to expand the size and scope of CCAC's AIM Program. They were able to expand their in-home asthma remediation and education services, especially in Fresno and Kern Counties due to their partnerships with Health Net and Kern Health Systems. "In 2022, the AIM program was renamed as the "Comprehensive Asthma Remediation and Education Services" (CARES) program. CCAC entered contracts with Health Net, Anthem, Kern Health Systems and Kaiser Permanente to provide the CARES program to Medi-Cal patients in seven counties of the San Joaquin Valley."[72]

**2.2. Merced Mariposa Asthma Coalition and partners:**

The Merced/Mariposa County Asthma Coalition is a community-based health organization that started in the early 2000's with a group of respiratory therapists and nurses that were brought together by concerns for the increasing rates of asthma incidence in the community. They started organizing the community stakeholders on regular meetings to discuss the problems of asthma and provide an opening for stakeholders to share their concerns and unite efforts to fight against the disease. With their work they were able to take advantage of grants that were available in the early 2000 and offer classes and information to partners and the population, as well as organize the Air Quality Flag Program that was implemented throughout several School Districts across many Counties in the San Joaquin Valley and kept very active for many years, until Air Quality Apps for smartphones were developed, which nowadays provide more up-do-date information on air-quality. Their partnership with the Dignity Health Organization, which runs the Local Hospital in Merced, has created a mutually beneficial relationship, with Dignity Health providing access to office, meeting and storage space in their Mercy Medical Center Building, as well as involving some of their employees from the Department of Community Outreach and Education in the Asthma Coalition Program. Besides housing the Asthma Coalition Program, the organization is also willing to sponsor grant applications for the Asthma Coalition Programs. Their director of

community outreach has volunteered as part of the Asthma Coalition Steering Committee for many years.

Through the Merced/Mariposa Counties Asthma Coalition and Dignity Health, a list of Community members was accessed and invited to participate in the Interviews for this research. Among those partners are:

- Central Valley Alliance for Health (CCAH): They are the only provider organization for patients using Medi-Cal in Merced County.
- Merced City School District (MCSD): The main School District for Elementary and Middle Schools in the area.
- Merced Union High School District (MUHSD): The Main School District for high-school age children.
- Golden Valley Clinics: Provide Primary and Specialty Care in clinics in the Valley
- Merced City Office of Education (MCOE): Oversees several school districts in the area and conducts several community programs, i.e., “Head Start”, “First Five”, etc.
- Merced City Public Health Department
- California Health Collaborative – Merced County Tobacco Control Program
- United Way – Building Healthy Communities
- Cal-Fresh
- Merced Sleep and Lung Clinic
- Baz Allergy, Asthma and Sinus Center
- Merced Medical Supplies
- Children’s Hospital Clinic – Merced
- San Joaquin Drug (Pharmacy)
- Between Amigos
- Mariposa County Government Center
- Mariposa County Health Department
- Boys and Girls Club
- Other Private Doctors’ Clinics
- UC Merced: undergraduate students, graduate students and professors in public health and community development can get involved with the program
- Merced Community College: college students and students of their nursing program can also be interested on participating in community development and health education activities.

According to the Asthma Coalition, these and other organizations had been active participants on the Asthma Coalition bi-monthly meetings. Many individuals would also be attracted to the informational meetings on asthma, and asthma classes provided in the past. However, since the worldwide COVID-19 pandemic, the social distancing restrictions made it impossible to conduct those meetings as before, and many of the community stakeholders, being very busy with all the pandemic containment work, couldn’t participate in this research. However, as the pandemic chaos dies down, it would be the perfect time to re-engage the community on asthma prevention discussions and put the best foot forward to achieve community asthma control.

# Chapter 3: Methodology

A mixed-methods approach was used to identify barriers and unmet needs in the community, and the readiness of the community for a comprehensive, peer support asthma education Intervention

## 3.1. Survey of the general public and people with asthma

Three hundred and ten (310) people participated in the survey. Participants were recruited from Qualtrics' research panels and screened using age (over 18 years), whether they had been diagnosed with asthma, whether they had a child who had been diagnosed with asthma, and whether they lived in the San Joaquin Valley (identified by their zip code). Participants completed an online survey described as examining the impact of COVID-19 on air quality and asthma. The participants received monetary compensation from Qualtrics. Qualtrics data managers provided quality-control services, eliminating responders with unreasonably short completion times or exhibiting straight lining in responses. Surveys were prepared and submitted through Qualtrics. Online surveys were collected from 11/01/2020 to 11/22/2020. The university's Institutional Review Board approved this study.

### 3.1.1. Measures

The survey contained a number of measures of health and health behavior, including:

- Demographic information - Including:
    - Age in years
    - Gender (male, female, non-binary)
    - Ethnicity – Assessed with two questions: "Are you of Hispanic, Latino/a, or Spanish origin?" and "What is your race/ethnic group?" Based on the responses to these categories, participants were identified as:
        - Latino
        - White
        - Black
        - Asian
        - Other – including Pacific Islanders, Native American, and other identified race/ethnicity.
    - Household income – Assessed by asking individuals to identify the category (< $10,000, between $10,000 and $25,000, between $25,000 and $50,000, between $50,000 and $75,000, between $75,000 and $100,000, and over $100,000). The median point in each category was taken as the household income ($5,000, $17,500, $37,500, $62,500, $87,500, and $120,000).

  - Education – Respondents were categorized as having less than high school, high school graduate or some college, and college graduate.
  - Political views – Respondents were asked to rate their political views ("How do you rate your political views?") on scale ranging from conservative (1) to neutral (4) to liberal (7).

- Self-rated health status - The measure ranged from 1 to 5, with 1 = Excellent, 2 = Very Good, 3 = Good, 4 = Poor, and 5 = Poor. The participants were asked to rate their health status "In the Pre-Covid Period" and "Currently".

- EuroQol5D – The EuroQol5D is a standardized measure of health-related quality of life developed by the EuroQol Group[73] to measure health status. Respondents are asked to rate their health on each of 5 dimensions (Mobility, Pain, Personal Care, Usual Activities, and Anxiety/Depression) ranging from no issues (1) to serious issue (3). The corresponding sequence of responses was linked to a league table with a corresponding utility score ranging from 0 (death) to 1 (full health). The participants were asked to rate the health on each of the dimensions "In the Pre-Covid Period" and "Currently".

- Health history - Yes/no questions whether they had ever been diagnosed with one of 8 chronic conditions:

  1. Asthma
  2. Chronic Cardiovascular Disease
  3. Undergoing Chemotherapy or radiation therapy
  4. Immune system suppressed by disease or other causes
  5. Allergies
  6. Other Chronic Respiratory Disease
  7. Chronic Neurological Problems
  8. COPD, Chronic Obstructive Pulmonary Disease

- Use of smoking and vaping products – Respondents were asked about their use of tobacco, vaping, and marijuana. The respondents were asked whether they had used any tobacco product (cigarette, cigar, or hookah) more than 100 times in their lifetime and in the last 30 days. Similar questions were then asked about vaping and marijuana use. Tobacco users were defined as an individual who had used tobacco products more than 100 times in their lifetime and in the last 30 days. Similarly, vapers and marijuana users were identified as people who had used those products more than 100 times in the lifetimes and in the last 30 days.

- Experience with Covid – Respondents were asked a series of questions about their experience with COVID, including:

  - Whether they had ever been diagnosed with Covid (yes/no)
  - Health threat posed by Covid to them (ranging from 1 = no threat at all, 2 = a minimal threat, 3 = a moderate threat, 4 = a high threat, and 5 = a very high threat).

  - Financial threat posed by Covid ( ranging from 1 = no threat at all, 2 = a minimal threat, 3 = a moderate threat, 4 = a high threat, and 5 = a very high threat)

Those people who identified as being diagnosed with asthma were also asked a series of questions about their asthma, including:

- Having a child with asthma - Yes/no ("Do you have a child who has ever been diagnosed with asthma?")
- Having been diagnosed with asthma – Yes/No ("Have you ever been diagnosed with asthma")
- Help with asthma – Respondents were asked about how helpful doctors, nurses, friends or community workers/promotoras were when talking about their child's asthma. Response options ranged from not healthful (1) to slightly helpful (2) to moderately helpful (3) to quite helpful (4) to extremely helpful (5). Respondents were also given the option of "does not apply."
- Characteristics of a good and helpful asthma coach – Respondents with children with asthma were asked "If you were assigned an asthma coach to help you learn how to control your child's asthma, how important would be the following coach's characteristics?" The response options ranged from not important (1) to slightly important (2) to moderately important (3) to quite important (4) to extremely important (5). Respondents were asked to rate the following characteristics:
  - Speaks my language
  - Explains things in a way I understand
  - Is also a parent of an asthmatic child
  - Lives close
  - I can call if I have question or concern
  - Non-judgmental
- Interest in talking with an asthma coach – Respondents with children with asthma were asked their interest in talking to a parent of another child with asthma ("Suppose you had the opportunity to talk to another parent of an asthmatic child who was trained in the issues that can arise regarding your child's asthma. How interested would you be?") with the response options being not at all interested (1), slightly interested (2), and very interested (3).
- Interest in serving as a peer-support coach – Respondents were asked two questions about their interest in serving as a coach. First, parents were asked about their willingness to communicate with others on a regular basis ("Once you learned how to control your child's asthma, would you be willing to support other parents i) when they have questions, ii) once a week in a phone call, and/or iii) once a week or in case of an emergency") with the options being yes, maybe, and no. The respondents were then asked about their interest in serving as a coach ("Once you learned how to control your child's asthma, would you consider becoming an asthma coach?") with the response options being yes, maybe, and no.

Those people who identified as having a child with asthma were asked a series of questions about their child and their child's asthma, including:

- Demographic information of child – Including:
    - Age of child in years
    - Gender of child – Male or female
    - Ethnicity of child - Assessed with two questions: "Is your child of Hispanic, Latino/a, or Spanish origin?" and "What is the race/ethnic group of your child?" Based on the responses to these categories, children were identified as:
        - Latino
        - White
        - Black
        - Asian
        - Other – including Pacific Islanders, Native American, and other identified race/ethnicity.
- Self-rated health status of child - The measure ranged from 1 to 5, with 1 = Excellent, 2 = Very Good, 3 = Good, 4 = Poor, and 5 = Poor. The participants were asked to rate their child's health status "In the Pre-Covid Period" and "Currently".
- Complications from asthma during the past year – Respondents with children with asthma were asked to indicate (yes/no) whether their child had had each of the following events in the past 12 months:
    - Hospitalized overnight for asthma?
    - Taken to the emergency room for asthma?
    - Taken to urgent care or doctor's office for asthma?

  If a parent answered 'yes' to any one of these events, their child was identified as having an "adverse event due to asthma in the past 12 months."

- Whether child has a rescue inhaler – Parents were asked "Does your child have a "rescue" inhaler (Albuterol)?" (yes/no)

**3.1.2. Analysis:**

As mentioned above, the survey screened for whether the participant had asthma and whether they had a child diagnosed with asthma. There were therefore four types of respondents:

- No asthma for self or child

- Asthma for self but not for child
- Asthma for child but not for self
- Asthma for both self and child

While the results are presented for all four groups, the majority of the analysis focuses on the people in the last three categories since they represent people who might be interested in a peer support or asthma education type of program. The section below summarizes the findings for their views on the characteristics of a good coach and willingness to serve as a coach. A logistic regression analysis examined the predictors of willingness to serve as a coach (1 = yes, 0 = no or don't know) using the predictors:

- Age
- Latino – Whether they self-identify as Latino or Hispanic
- Household income
- Political leanings
- Having a child with asthma
- Health status now as measured by the EuroQol[73–75]
- Child with asthma who had a negative adverse event during the past 12 months

While there is little literature to suggest the impact of these factors on willingness to serve as a coach, the a priori predictions were:

- Age – Younger people would be more likely to serve as a coach
- Latino – Being Latino would be positively associated with willingness to serve as a coach
- Household income – People with higher household incomes and thus more capacity for contributing their time would be more likely to be willing to serve as a coach
- Political leanings – No prediction was made on the direction of the effect
- Having a child with asthma – Having a child with asthma would be associated with greater likelihood of being willing to serve as a coach
- Health status – Being healthy (high EuroQol score) would make it more likely
- Having a child with asthma who had a negative adverse event during the past 12 months would make it less likely to serve as a coach

Finally, the analysis examined the predictors of whether a child had an adverse event (measured by whether the child was hospitalized, had an ER visit, or had to visit

urgent care in the past 12 months because of their asthma). The a priori predictions were:

- Age – Younger people would be more likely to have a child with an event
- Latino – No prediction
- Household income – People with higher household incomes would be less likely to have a child with an event
- Political leanings – No prediction was made on the direction of the effect
- Child's health status – Being healthy would make it less likely to have an event.

Data from the Qualitative Survey was processed, cleaned, and analyzed using STATA17 and SAS 9.4.

**3.2. Interviews key stakeholders**

A grounded theory method of data collection and analysis was used to examine the perspectives of key stakeholder. A snowball approach was used to identify key stakeholders in the region. Community healthcare stakeholders were contacted through e-mail and phone calls from the list of stakeholders held by the Merced/Mariposa Counties Asthma Coalition and invited to participate on online interview (via Zoom). The list included the local hospital, primary care clinics, medical doctors, local school districts, local public health departments, county administrators, local children's programs, asthma intervention directors and the local Medi-Cal healthcare insurance providers. Those who agreed to participate were provided with the consent form and those who desired were provided with the themes for the interview script. The interviews were scheduled according to their own availability of time, with the interviews kept at a maximum of one hour duration.

A total of six interviews were conducted during the period of November 2020 through February 2021. Five interviews were conducted through video-calls on Zoom, which were recorded and transcribed, and one participant preferred to send the answers in written form, with a follow up phone call to confirm answers and take additional notes. The adaptations were made due to time restrains during the COVID-19 pandemic. One of the interviews had the participation of both the CEO and the program director of a community asthma intervention. All participants agreed orally with the consent form during the calls, according to procedures required by UC Merced IRB.

The community stakeholders interviewed (see Table 2) during this phase, three males and four females, are actively engaged in activities to mitigate asthma in the community, and currently hold the following positions: a) Director of Community Outreach and Education from our local hospital; b) Member of Mariposa County Administration (rural area); c) MD and Allergist, with clinics in the San Joaquin Valley; d) CEO of the Central California Asthma Collaborative (CCAC) together with the AIM

(Asthma Impact Model) Program Director; f) MD Pulmonologist, with clinic in the community; and g) Local School District Nurse.

**Table 1 - Stakeholders Interviewed**

| Stakeholders # | Gender | Organization |
|---|---|---|
| 1 | female | Dignity Health – Director of Community Outreach and Education &<br>Merced/Mariposa Asthma Coalition Steer Committee Treasurer |
| 2 | male | CCAC – CEO |
| | female | CCAC – AIM Program Director |
| 3 | male | Pulmonologist in the Merced Area |
| 4 | male | Allergist in the Merced Area |
| 5 | female | Mariposa County Administrative Officer (Economic Development) |
| 6 | female | Merced City School District Nurse |

### 3.2.1. Interview Script:

A semi-structured interview was designed based on the specific questions developed through literature review with aims to obtain the stakeholders opinion of what sort of intervention would best serve the local community and collect the experience with asthma mitigation in their practice. Open ended questions were strategically placed at the end of each section to allow the interviewees to add to the topic if they felt necessary.

After discussing and agreeing verbally with the terms of consent, the interviewees were explained the goals of the interview. The topics discussed with all participants were based on the following themes:

- Opinion on reasons for non-adherence to asthma treatment (barriers for controlling asthma in the community).
- Feasibility of addition of “peer support” into asthma control education in the community.
- Discussion of 7 different types of community interventions on a 3 points Likert scale based on their opinion of community acceptance (Very well Accepted – Somewhat accepted – Not accepted), with openness to mention any other intervention they might know.
- Efforts their organization have made to mitigate asthma in the community.
- Community resources utilized to mitigate asthma.
- Support needed from their organizations to better decrease the burden of asthma.

- Asthma education during the COVID-19 lockdown.
- Opinion on increasing the use of media for the management of asthma
- Opinion on the role of the Asthma Coalition to support stakeholders on asthma management efforts.
- Any other observations.

All but one interview were conducted and recorded using the recording feature on Zoom. One of the surveys was submitted through written form, and a phone call with additional field notes were taken for the last participant. Audio recordings of the Interviews were transcribed and reviewed to ensure accuracy, and personal information (identifiers) were removed. All the transcripts were then uploaded to Deduce Software, through which two researchers had access to the data. The researchers then independently performed a focus coding approach of the themes, recorded memos of any questions, and then conducted two Zoom meetings to discuss the findings until a consensus was reached about the specific themes. Any differences in opinion were acknowledged and recorded in the form of memos which were examined during data analysis. The axial coding technique was used to identify subthemes, understand relationships between the codes, and further explore the emerging themes from successive interviews.[76]

# Chapter 4: Results

## 4.1. Survey of the general public and people with asthma

### 4.1.1. Summary Statistics and Demographics

Of the 310 participants who responded the survey, 34.5% (n=107) were males and 64.8% (201) were female. The average age was 42.9 (18 to 83) years old. Of the total, 132 (43%) had been diagnosed with asthma themselves and 78 (25%) had children with asthma. The age of their asthmatic children averaged 11.5 years (1 to 17 years) and the children's gender was 63.2% male (n=48) and 36.8% female (n= 28The distribution of race-ethnicity, as well as summary statistics is shown in Table 2.

**Table 2 - Summary Statistics - Survey of the general public and people with asthma**

| | | Entire sample | No asthma | Self or Child with asthma | Self or child with asthma | | |
|---|---|---|---|---|---|---|---|
| | | | | | Self with asthma | Child with asthma | Self and child with asthma |
| Age of responders | | 42.9 years | 46.2 years | 40.1 years | 36.5 years | 45.6 years | 42.8 years |
| Female | | 64.8% | 63.9% | 65.7% | 60.2% | 73.5% | 70.5% |
| Ethnicity | NH-White | 49.7% | 47.2% | 51.8% | 50.0% | 58.8% | 50.0% |
| | Black | 3.9% | 3.5% | 4.2% | 1.1% | 5.9% | 9.1% |
| | Asian | 6.5% | 8.3% | 4.8% | 5.7% | 2.9% | 4.6% |
| | Latino | 31.0% | 30.0% | 31.9% | 35.2% | 23.5% | 31.8% |
| | Other | 9.0% | 11.1% | 7.2% | 8.0% | 8.8% | 4.6% |
| Area | Urban | 59.4% | 58.3% | 60.2% | 54.6% | 61.8% | 70.5% |
| | Suburban | 37.7% | 38.9% | 36.8% | 40.9% | 35.3% | 29.5% |
| | Rural | 2.9% | 2.8% | 3.0% | 4.6% | 2.9% | 0.0% |
| Household Income | | $37382 | $37100 | $37626 | $37545 | $35308 | $39579 |
| Reside near freeway | | 63.6% | 62.5% | 64.5% | 57.1% | 58.5% | 63.6% |
| Political leaning* | | 4.0 | 3.9 | 4.1 | 4.4 | 3.5 | 4.2 |
| n | | 310 | 144 | 166 | 88 | 34 | 44 |

* 1 to 7 scale with 1 being very conservative and 7 being very liberal

Table 3 summarizes the health conditions of the respondents. The results suggest high rates of smoking and vaping, particularly for people with asthma and whose children have asthma (43.1%). While the rates of Covid infection were relatively low (the survey being conducted fairly early in the pandemic), the infection rates were higher for this same group. And all groups perceived slightly lower risk of Covid to them as opposed to their family or society.

**Table 3 - Summary Statistics - Health Status of survey responders**

| | Entire sample | No asthma | Self or child with asthma | Self or child with asthma | | |
|---|---|---|---|---|---|---|
| | | | | Self with asthma | Child with asthma | Self and child with asthma |
| Tobacco use | 24.2% | 19.4% | 28.3% | 27.3% | 11.8% | 43.1% |
| Vaping | 12.3% | 6.9% | 16.9% | 12.5% | 11.8% | 29.6% |
| Marijuana use | 18.7% | 16.0% | 21.1% | 21.6% | 8.8% | 29.6% |
| Self-rated Health - Prior to Covid* | 2.6 | 2.6 | 2.6 | 2.6 | 2.4 | 2.8 |
| Self-rated Health - Time of survey* | 2.8 | 2.7 | 2.9 | 2.9 | 2.8 | 3.0 |
| Utility score - Prior to Covid** | 0.78 | 0.82 | 0.74 | 0.77 | 0.72 | 0.70 |
| Utility score - Time of survey** | 0.71 | 0.77 | 0.68 | 0.66 | 0.68 | 0.63 |
| Diagnosed with Covid | 5.8% | 4.2% | 7.2% | 8.0% | 0.0% | 11.6% |
| Covid Threat – Community*** | 3.4 | 3.2 | 3.6 | 3.6 | 3.1 | 3.7 |
| Covid Threat – Family*** | 3.2 | 3.1 | 3.1 | 3.4 | 2.9 | 3.6 |
| Covid Threat – Self*** | 2.9 | 2.6 | 3.1 | 3.1 | 2.4 | 3.5 |
| Covid Mask wearing**** | 3.4 | 3.4 | 3.4 | 3.5 | 3.1 | 3.5 |
| n | 310 | 144 | 166 | 88 | 34 | 44 |

* 1 to 5 scale with 1 being poor and 5 being excellent
** 0 to 1 scale where 0 = death and 1 = best possible health
*** 1 to 5 scale with 1 being no threat and 5 being significant threat
*** 1 to 5 scale with 1 being no protection from Covid from wearing a mask and 5 being extreme protection

#### 4.1.1.1. Specific Questions about Social Support for Asthma Management

In order to capture the parent's resources to asthma management, A specific set of questions was created asking How often they talk to the possible resources around them to ask questions about their children's asthma. The possible resources were:

a) A Family member
b) A Doctor
c) A Nurse
d) A Friend
e) A Promotora or CHW

Their answers were captured through a 5 points Likert Scale, ranging from 'Never' to 'Always", with a 'Doesn't Apply' option. The results are shown on Table 4:

**Table 4 - How often do you talk to (...) about your child's asthma?**

| n = 132 | Never | | Rarely | | Sometimes | | Often | | Always | | Doesn't Apply | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| **Family** | 7 | 9.90 | 22 | 28.57 | 19 | 24.68 | 15 | 19.48 | 5 | 6.49 | 9 | 11.69 |
| **Doctor** | 2 | 2.60 | 15 | 19.48 | 28 | 36.36 | 17 | 22.08 | 11 | 14.29 | 4 | 5.19 |
| **Nurse** | 9 | 11.69 | 18 | 23.38 | 22 | 28.57 | 16 | 20.78 | 3 | 3.90 | 9 | 11.69 |
| **Friend** | 14 | 18.18 | 30 | 38.96 | 16 | 20.78 | 6 | 7.79 | 2 | 2.60 | 9 | 11.69 |
| **Promotora** | 31 | 40.26 | 12 | 15.58 | 12 | 15.58 | 5 | 6.49 | 3 | 3.90 | 14 | 18.18 |

| **Ranking** | **1st** | **2nd** | **3rd** | **4th** | **5th** | **6th** |
|---|---|---|---|---|---|---|

These results show clearly that, even though one would hope that the doctors and nurses would be the highest-ranking source of asthma control information, the parents' answers show that, in reality, the majority of them rated them as "sometimes" and "rarely" at a higher frequency than that of family and friends. We can also see that only about 10% have frequent access to a promotora, while over 60% rated their access as "never" or "doesn't apply", which indicates that they do not have access to home education interventions about asthma.

The next group of questions had, again, the same format, but this time asking them to rate "How helpful it is talking to the same people" (see Table 5)

**Table 5 - How helpful is talking to (...) about your child's asthma?**

| n = 132 | Not Helpful | | Slightly Helpful | | Moderately Helpful | | Quite Helpful | | Extremely Helpful | | Doesn't Apply | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| **Family** | 9 | 11.70 | 17 | 22.80 | 14 | 18.20 | 14 | 18.20 | 12 | 15.60 | 11 | 14.30 |
| **Doctor** | 0 | 0.00 | 5 | 6.50 | 13 | 16.90 | 20 | 26.00 | 30 | 39.00 | 9 | 11.70 |
| **Nurse** | 3 | 4.00 | 7 | 9.10 | 15 | 19.50 | 23 | 30.00 | 14 | 18.20 | 15 | 19.50 |
| **Friend** | 9 | 11.70 | 20 | 26.00 | 21 | 27.30 | 9 | 11.70 | 4 | 5.20 | 14 | 18.20 |
| **Promotora** | 15 | 9.50 | 8 | 10.40 | 10 | 13.00 | 8 | 10.40 | 7 | 9.10 | 29 | 37.70 |

| **Ranking** | **1st** | **2nd** | **3rd** | **4th** | **5th** | **6th** |
|---|---|---|---|---|---|---|

This time, doctors and nurses are rated "extremely helpful" and "quite helpful" respectively, with friends and family coming right after as mostly "moderately helpful" and "slightly helpful". Promotoras, again, are rated mostly as "doesn't apply" or "not

helpful" at almost 50% of the responder's, which again might indicate lack of access. When comparing the responses of these two sets of questions, the lack of access to doctors and nurses still comes as a significant finding because, even though they are the most helpful of the group when it comes to asthma control, the parents do not talk to them very often.

### 4.1.2. Receptivity to an asthma "Coach" (Knowledgeable Peer)

A set of questions from the Survey asked the parents to, hypothetically, imagine they were given access to someone who knew how to use asthma medications and environmental control (of asthma triggers). They were then asked to rate how important certain characteristics of the coach would be to them. A 5-point Likert Scale was again given, from "not important" to "extremely important", with an option of "not applicable", so that they could rate their opinion of each characteristic (see Table 6).

**Table 6 - How important would be the following characteristics of the coach?**

| n =132 | Not Important | | Slightly Important | | Moderately Important | | Quite Important | | Extremely Important | | Doesn't Apply | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % | Freq | % |
| Coach Speaks my Language | 6 | 4.5 | 4 | 3.0 | 10 | 7.6 | 19 | 14.4 | 85 | 64.4 | 8 | 6.1 |
| Explains so I understand | 4 | 3.0 | 5 | 3.8 | 6 | 4.6 | 18 | 13.6 | 96 | 72.7 | 3 | 2.3 |
| Parent of Asthmatic Child | 48 | 36.4 | 16 | 12.1 | 21 | 15.9 | 15 | 11.4 | 21 | 15.9 | 11 | 8.3 |
| Coach Lives Close | 21 | 15.9 | 21 | 15.9 | 28 | 21.2 | 29 | 21.9 | 28 | 21.5 | 5 | 3.8 |
| I can call Coach for Help | 5 | 3.8 | 9 | 6.8 | 15 | 11.4 | 36 | 27.3 | 63 | 47.7 | 4 | 3.0 |
| Coach is Non-Judgmental | 8 | 6.1 | 5 | 3.8 | 10 | 7.6 | 19 | 14.5 | 82 | 62.6 | 7 | 5.3 |

| Ranking | 1st | 2nd | 3rd | 4th | 5th | 6th |
|---|---|---|---|---|---|---|

The qualities "Coach Speaks my Language", "Explains so I understand", "I can call Coach for Help", "Coach is Non-Judgmental" and "Coach Lives Close" all got ranked first as "Extremely Important" and/or in second as "Quite Important". However, the characteristic "Parent of Asthmatic Child" even though it was ranked first as "Not Important" by 36% of the parents, the second-place rank was a tie between Extremely Important" and "Moderately Important" (at 32% for both ratings together).

When asked specifically if they would be interested in having a coach to help them to learn how to control their child's asthma, 41.7% of the parents responded they would be "Somewhat Interested", 35.6% responded "Very Interested", but 22.7% Declared they would not be interested (see Table 7).

**Table 7 - How interested would you be in having an asthma coach?**

| n =132 | Freq. | % |
|---|---|---|
| Not interested | 30 | 22.7 |
| Somewhat interested | 55 | 41.7 |
| Very Interested | 47 | 35.6 |

On the last set of questions, the parents were asked if they were willing to support other parents, once they learn how to control their child's asthma (See Table 8).

**Table 8 - Willingness to help other parents to learn asthma control**

| n =132 | Yes | | Maybe | | No | |
|---|---|---|---|---|---|---|
| | Freq. | % | Freq. | % | Freq. | % |
| I would be willing to answer their questions | 83 | 62.9 | 40 | 30.3 | 9 | 6.8 |
| I would be willing to have a once-a-week phone call | 53 | 40.2 | 49 | 37.1 | 30 | 22.7 |
| Weekly call and emergencies | 60 | 45.5 | 48 | 36.5 | 24 | 18.2 |
| I would like to become an asthma coach | 39 | 30 | 50 | 37.9 | 43 | 32.6 |

The great majority of the parents would be willing ("yes" and "maybe" answers) to assist other parents with their questions, once weekly phone calls and emergencies. However, when it comes to becoming an asthma coach more parents answered "no" or "maybe" than "yes".

### 4.1.3. Predictors of willingness to be a coach

A logistic regression analysis was conducted in order to identify the variables associated with a willingness to serve as a coach as opposed to being uncertain or not being interested. The results shown in Table 9 suggest that younger people with a conservative political leaning who have a child with asthma who did not have an adverse event (ER, UC or Hospitalization) related to their asthma in the past 12 months were more likely to agree to be a coach.

**Table 9 - Logistic Regression to predict willingness to serve as a coach**

| | Coefficient | Standard Error |
|---|---|---|
| Intercept | 2.69 | 1.08 |
| Age | -0.03** | 0.02 |
| Latino | -0.46 | 0.48 |
| Income | 0.00 | 0.00 |
| EuroQol now | 0.26 | 0.73 |
| Political leaning | -0.21** | 0.12 |
| Have a child with asthma | 1.31* | 0.52 |
| Child with asthma had an event | -1.27* | 0.66 |
| n | 166 | |

* p<.05 ** p<.10

### 4.1.4. . Information about children of survey respondents

The demographic information about the children of the respondents who were identified as having asthma are shown in Table 11. Of the 78 children, the average age was 11.5 years, of whom 63.2% were female. The average time since diagnosis of asthma being 7.9 years, and the results suggest that their health status had gotten slightly worse when assessed before (2.1 score out of 5, 1 being Excellent health) and after Covid (average score of 2.3). 29.5% reported having an adverse event related to their asthma in the past 12 months.

**Table 10 - Demographic Information of Children**

| | | All parents | Parents without asthma | Parents With asthma |
|---|---|---|---|---|
| Child's Age | | 11.5 years | 12.1 | 11.1 |
| Child Female | | 63.2% | 73.5% | 54.8% |
| Years since diagnosis | | 7.9 | 8.6 | 7.4 |
| Child's Ethnicity | Latino | 38.5% | 38.2% | 38.6% |
| | White | 42.3% | 44.1% | 40.9% |
| | Black | 9.0% | 8.8% | 9.1% |
| | Asian | 3.8% | 2.9% | 4.5% |
| | Other | 6.4% | 5.9% | 6.8% |
| Child's Health status*- Before Covid | | 2.1 | 2.0 | 2.1 |
| Child's Health status* - Current | | 2.3 | 2.2 | 2.3 |
| Percent of children who suffered adverse event in past 12 months* | | 29.5% | 23.5% | 34.1% |
| n | | 78 | 34 | 44 |

* 1 to 5 scale with 1 being poor and 5 being excellent

** Defined as using Emergency Services, Urgent Care Services or being hospitalized for asthma related illness in the past 12 months.

Logistic regression analysis was also conducted to identify the predictors of children who had an adverse event related to their asthma. Table 10 shows the specific demographics for the asthmatic children, as well as their Health Status and frequency of adverse events. The results shown in Table 11 suggest that health of the child overall was a significant predictor, along with age, Latino and political leaning. That is, all else equal, older, Latino parents who were more conservative leanings were more likely to have a child have an adverse event.

**Table 11 Logistic Regression to predict whether the child had an adverse event**

| | Coefficient | Standard Error |
|---|---|---|
| **Intercept** | 1.42 | 1.57 |
| **Age of parent** | 0.05* | 0.03 |
| **Latino parent** | 1.22** | 0.74 |
| **Income** | 0.00 | 0.00 |
| **Political leaning** | -0.35* | 0.18 |
| **Child's current health status** | -0.63* | 0.28 |
| **n** | 78 | |

* p<.05 ** p<.10

### 4.2. Qualitative interviews:

Aiming to obtain the community stakeholders opinions about the needs of the asthmatic children and their parents in the Merced area and establish what kind of community interventions would best suit our population, I contacted several stakeholders using the Merced /Mariposa County Asthma Coalition contact list. The following stakeholders agreed to participate in our Zoom Interviews (see also table 2):

- Dignity Health – the local Hospital/Emergency and a member of the Merced/Mariposa Asthma Coalition (Identified on quotes as SH1 – Stakeholder 1)
- Central California Asthma Collaborative (CCAC), which is over all the Asthma Coalitions in the Central California area and has the most experience on community interventions in the Valley (Identified on quotes as SH2)
- A local Pulmonologist, who owns his own practice in Merced (Identified on quotes as SH3)
- A local Allergist, who owns allergy clinics in the valley (Identified on quotes as SH4)
- A rural area (Mariposa) County Administrative Officer, who also has asthma in her family (Identified on quotes as SH5)
- The Merced City School District (MCSD) Nurse (Identified on quotes as SH6)

All the participating stakeholders were very responsive to the invitation. The MCSD nurse was very busy due to the COVID-19 Pandemic, but provided answers to the questionnaire in written form, confirmed by a phone call. A comprehensive and diverse overview of the problems with asthma control in the community was obtained. The themes and codes identified in the interview's transcripts are presented here in the order they were elicited through the semi-structured interview transcript.

### 4.2.1. Barriers to Asthma Control

The following barriers were identified through coding of the interviews:

#### 4.2.1.1. Access to Medical Insurance:

Many of the specific barriers described are very intertwined, and quite often were described by the stakeholders as associated with each other. However, for sake of clarity, they are described separately.

Most participants agree that Lack of health insurance is one of the barriers playing an important role in the Merced/Mariposa community.

*"Our biggest problem is access. Lots of patients do not have access to the doctors. Or the physicians. The patients don't have insurance. Unfortunately, there are a lot of people on Medicare which does not pay (what doctors normally charge), so that a lot of doctors do not accept it. (Those patients) end up in the urgent care all the time, left and right. In my point of view, 95 to 99% of those patients don't need to go to urgent care or the emergency room. Not if they follow with a good family doctor or allergist or pulmonologist. But in the medical payment structure, I don't think many of the doctors will take those patients" SH4*

*"I just think there is a big connection with, um, you know, rural asthma in rural communities and access to health care." SH5*

However, one of the doctors interviewed had a different opinion due to his own perspective. Because he sees patients both from Medicare (Medi-Cal) and private insurances, and in the last few years many people who had been uninsured were able to obtain access to Medi-Cal, he did not think that lack of access to insurance, specifically, was a big issue to our community:

*"It's not lack of insurance. I mean, I think, since we have had Alliance Medical in town coverage is not an issue. Access is not an issue. Because it's very easy in our County to get to… get Medi-Cal. And that's a big plus in our community" SH3*

#### 4.2.1.2. Access to Medication:

All of the stakeholders agreed that access to medication is a large barrier to controlling asthma in the community. For a condition (asthma) that does not have any kind of prevention besides the therapeutic, the lack of medication means no prevention at all. No treatment.

*"Another thing is, sometimes the medications (chosen by the doctor) are not on the list (of drugs the patients' insurance) plans will pay for, so you have to substitute some other kind of medication which may not be the best (treatment option) for them, but we have to give them whatever the insurance company allows" SH4*

*"Sometimes they don't get the medicine because they can't afford it. If they're uninsured, medicine can be very expensive, so they don't buy it, or they don't have transportation so they are unable to get to the pharmacy to get it, which is very different from understanding how to use it." SH2*

#### 4.2.1.3. Poverty – Cannot afford the Co-pay

This theme is one that is very intertwined with the previous one. Even the patients who have partial coverage plan for medication find themselves in trouble to be able to afford the cost of co-pays. Since Medi-Cal has allowed undocumented children to qualify for their services, most children have health insurance through them. However, the other barriers still play a part in preventing them from having ultimate control of their asthma. Poverty is already a barrier to good health prevention in the community as a whole, due to low SES. Adding a chronic disease with expensive medications to a family already leaving with a strict budget can be very daunting.

*"Sometimes they don't get the medicine because they can't afford it. If they're uninsured, medicine can be very expensive, so they don't buy." SH2*

*"Also, a lot of people don't have medication. A lot of people are lacking medication which is really the fundamental requirement for treating asthma or any chronic disease… However, coverage of all the medications. What is lacking (and it's not just alliance) is that a lot of insurances don't cover everything. And the cost of medicine …cost of these inhalers, medications is very high. Yes, I, I mean … that can be a barrier. So, controlling the medication cost is very important. If you're on a… a controller, medications cost $300, $400 dollars… How can a person afford it?" SH3*

*"Pertaining particularly to the Merced County area, one of the biggest reasons we're seeing (for that) is the lack of resources (financial)" SH4*

*"It's pretty unusual to find any kids that don't have insurance now, since undocumented kids in California qualified for Medi-Cal." SH2*

*"Living in poverty: Many families simply have bigger issues, like being able to pay bills, lack of transportation, unemployment, etc. Asthma management takes a "back seat." Unless the child is needing to visit the ER or urgent care, preventive care is not a priority." SH6*

#### 4.2.1.4. Low knowledge about asthma by health practitioners

Low knowledge about asthma is not an issue exclusive to the parents of children with asthma. Because there are many Nurse Practitioners and Physician Assistants operating in the community as primary care providers because of the shortage of physicians in the area, the children with the more severe cases of asthma end up being treated by practitioners who do not have necessary training to oversee those cases, and might not be able to make the necessary clinical judgement when it comes to fine-tunning asthma maintenance therapy; they are also overworked and cannot take the time necessary to educate their patients and their parents.

*"…unfortunately, is that most of physicians don't even realize that asthma is not a static disease, it's a dynamic disease. One day you could be perfectly normal and two weeks later you could have a serious asthma attack and three weeks, four weeks later you're back to normal. Their physicians see them when they have a severe asthma attack. They tell their patients don't do this thing or that thing or this other thing, either, and then the parents and the child both think the child can't do anything. So we really need to have those little camps where the children actually get to do this and that…" SH4*

*"(Another) fundamental is the education (about the disease) which we are lacking in the Valley. The American Lung Association used to do it, (but that isn't the case now). The amount of asthma education right now is paid for by the insurance company. No physician's office can do it for that particular reimbursement. So basically, there's very little education (being given) on chronic diseases. That's a very important part of the equation in managing any chronic disease… That's the key to it." SH4*

*"You know, I see a few pharmaceutical ads (for asthma treatment), but that's it. I mean, when my husband died and so many people were shocked that he died from asthma. I think, you know, that that really is the lack of education and the lack of media attention. It just is not a hot topic and I wish people would be made aware… so that there would be more knowledge about asthma fatalities and the severity of asthma. It really is underplayed." SH5*

#### 4.2.1.5. Lack of Asthma Management Education

As explained on Chapter 1, the Medical Guidelines designed to instruct doctors on how to manage asthma therapy, according to its different presentations, are very complex, encompassing different steps and multiple medications that have different ways of administration. Even well-trained primary care physicians might have to refer the most severe cases to the specialists (which in the case of Merced County, at the time of this research, would include a trip to other counties, because there is not one single pediatric pulmonologist in our area. The time dedicated in the doctors' offices for training parents of children on how to use their medication is very short, and not enough for providing a good comprehension on how to treat their children at home. All of the Stakeholders interviewed see a great need to increase asthma treatment education, which also includes managing exposure to inhaling triggers and other details, depending on each case.

*" …(even if you) you can have access to the provider… but providers' time is very short , and so… it's like... Maybe, you get 5 minutes (of education on how to control asthma)." SH1*

*"So compliance is really all about education. (…)So yes, it's really two different questions. One is about the ability to understand the medical plan that they're given and obtain the tools and then the other is things that are largely out of their control, which is their environment and the housing they live in. One is about the health care system; the other is about their life and their situation." SH2"*

*"Just understanding use of inhalers. Sometimes, because if you don't educate the patient well about using the inhaler properly, then they don't get half their dose." SH3*

*"In our own practice, we found out that we almost have to do training every six months as an education (process). Even very well-educated people. You have to do continuous assessment." SH4*

*"…Older children may not be compliant, due to a lack of knowledge regarding proper use of the medication (what it's for; why it needs to be given as prescribed). This swings back around to the importance of asthma education." SH6*

*"In my opinion, poor asthma management doesn't have to do with a lack of resources. It has to do with how much value is placed and priority given to obtaining the necessary knowledge, then applying it to daily life. This latter point speaks to a need for behavior change, which is a much more difficult thing to accomplish." SH6*

#### 4.2.1.6. Don't know how to use medication

Even though asthma education is much more than compliance to the medication therapy, it is one of the most important aspects of controlling asthma. Therefore, once again this theme is intertwined with the previous one, and some of the reasons for one are the same for the other.

*"…do they… realize why you need to use the controller every day? How it's correlated to the usage of your rescue medications?... SH1*

*"They don't understand how to use the medicine." SH2*

*"I think one is compliance with medications, lack of understanding between controller medications and rescue medications . People are more attuned to getting immediate relief. So, when they are on the controller medications, when they don't see the benefits of that, then sometimes they may end up stopping medication." SH4*

*"Just understanding use of inhalers… Sometimes, because if you don't educate the patient well about using the inhaler properly, then they don't get half their dose." (…)" Also, now there are so many inhalers, it gets confusing. So, it's not like it's just one. You know. Like, if you have a Ventolin or albuterol inhaler. In the past, 10 to 15 years ago, you could just show them one inhaler. It was the same for all the medications. Now you have a regular MDI, you have Alipta. You have Pressair, Arcapta so there are, like, six or seven different types of inhalers and each one has different techniques. That's another issue that needs to be… I wish the FDA had understood this beforehand and made just one single inhaler (type) for all pharmaceutical companies to use." SH3*

#### 4.2.1.7. Shortage of Medical Caregiver

This is another theme that is intertwined with others. As explained above, the lack of asthma education is tied to low knowledge on how to use medication, to shortage of medical caregivers and to the next theme, "not enough time with the PCP". These themes are separated enough to have their own meaning and different ways they might come about, but their consequences compound on each other, and mitigating one problem might not solve the other. I will not repeat their causes here, just cite the quotes that might refer to this and the next theme.

*"We don't really have too many providers in our community…"SH1*

*"Well, it's rural health care, so you know it's difficult, period… I have had issues getting into our local hospital and I really think that was part of the situation that caused my husband's death, as he could not get his maintenance medication and he could not get an appointment when he called, and they wouldn't give approval to have his maintenance prescription refilled without an appointment and when he called for an appointment they were three weeks out. I had the same issue with my daughter. You know, she would have asthma attacks and unless I took her to the emergency room we couldn't (see a doctor). We couldn't get an appointment, and the emergency doctors were not really prepared to treat asthma." SH5*

*"…access to care is another issue in our area because of shortage of primary care physicians. We have more and more nurse practitioners and you know, …that are doing primary care. Uh, so always the knowledge base is not always the same level. They can take care of patients up to a certain level, but*

*then when it requires a little bit more fine tuning, that thing is not there." "Man, it… you know… You… when you have an asthma program or...The protocols that are there… It's nice to have them on paper, but to put it in practice is totally different. Yeah, if you expect all the guidelines to be followed … in practice, It's nice to put it on paper, but in a basic clinic, say Golden Valley, MFA or whichever clinic you have. If you start to do everything on a asthma patient… If you spend one hour, you will only see five patients in a day. And patients have multiple problems. It's not just asthma, it's not just… they have so many things going. Which do I want to focus on? So… you have to spend time on every little problem. You can't do everything justice to every diagnosis and so you can't blame a physician or a yeah NP or a provider… so that that's the limiting factor that I see. Uh, in reality because of shortage of time. Shortage of providers." SH3*

#### 4.2.1.8. Not enough time with PCP

Even the families who have health insurance and medication provisions might be lacking enough health education on how to control their child's asthma because the doctors are very busy and do not allow enough time during the consultation to explain all the details involved in asthma control.

*"…(even if you) you can have access to the provider… but providers' time is very short , and so… it's like... Maybe, you get 5 minutes." SH1*

*"And I think That the doctors who see that… those asthmatic patients in our area, would they have enough time with the patient in order to explain correctly?" SH3*

*"When my older son developed asthma I realized that, even with me being an allergist, even living in the same house with me, how much education I had to do on continuing basis with my son because there's no asthma on either my side of the family or my wife's, so we have no one with asthma in the family for him to learn from. I had to go over things with him again and again, and again and again to teach him. Thanks to God that he does everything now. He goes hiking, plays football - he does anything he wants, but it took a while for me to get him there. I think it took two years to get it into his mind that, okay, you have asthma. Well, somebody else has diabetes. Some people have different health problems. You can live a perfectly normal life and you can still do anything. Yes, you have to do things a little bit differently. You have to manage your asthma" SH4*

#### 4.2.1.9. Lack of Asthma Action Plan

Even though the Asthma Action Plan (AAP) is part of the Medical Guidelines for Asthma Control, not all asthmatics receive their Plan from their doctors. Some of the Stakeholders do believe that providing an AAP to all asthmatics would be important to help parents and other medical professionals to understand the child's medication use and can be a reminder of the steps necessary for asthma control. However, many of them realize that, during the daily practice, providing the AAP falls through the cracks of the overwhelmed healthcare system and lack of time at the providers' offices. One of the physicians interviewed, however, sees the AAP as not essential, and values the education of the parents as more important than having an AAP (see the last quote in this subsection below)

*".. I feel that, not necessarily on purpose or anything like that, is just that there are so many things they are taking care of, that they (Medical Providers) forget to provide the family with that information." SH1*

*"I don't think it is used as much as it should. So that is certainly something that needs to be stressed. That it can be… It can be so self-care at home can prevent a lot of urgent care visits, an ER visits. And that can also help the County to cut down on the cost of care, so having that and it has to be done properly a lot of times there is a misunderstanding or lack of understanding of how to use that asthma action plan. So I think educating pro… the primary …. at the primary care level or at the NP level or PA level is important, but they see a lot of those patients." SH3*

*"When asthma Action Plan was a big thing in the 90s, every single patient asked (for one.) I didn't give (any of my patients had an AAP at) that time. I didn't agree with them. Instead, I would sit with my patients and explain to them I thought that was an easy way out. I would rather my time (to get a better result). I had no problem and lo and behold, 15 years later studies came in. There was a study, if I remember correctly it was done in Northern California, in which [the efficacy of action plans with] school nurses was the subject. Came in after 15 years and was done by nurses. What the nurses said was that the patient is the best resource. Better than any asthma action plan Now I do an Action Plan sometime because schools mandate us to make them. (…) That's why they're called guidelines. They are not mandatory rules. Many people don't follow them. I was never a big proponent of the action plan to begin with. I fill one in for the schools' benefit, but otherwise, no. 75 to 80% of patients have mild asthma. You're giving them those plans? Nobody gives a damn about those, and I don't either. So those are examples of*

*education, and repeated education, not a one-time education thing. Now let's go back to yes as an action plan at work you can make it. Ultimately, it is going to come back to education, not to the plan, (which gives us a) false sense of satisfaction." SH4*

#### 4.2.1.10. Lack of Transportation

The level of poverty of our population is also associated with lack of transportation. In a county where there are no Pediatric Pulmonologist or even Pediatric Emergency Department, being able to have their own way of transportation might be fundamental for being able to provide the care necessary to the children with severe asthma. Some parents might not even be able to take their children to regular PCP visits, and end up having to resort to using after-hours urgent care clinics or the local Emergency Department, where the care might not be optimal, especially when it comes to prescribing a comprehensive therapy plan and provide the parents optimal instruction on how to use the medication effectively, avoid triggers, etc.

Our local pulmonologist experience is with adults who have Medi-Cal coverage, so he explained that his patients are able to use a resource from their coverage that provides transportation for their consultations. The stakeholders that are used to seeing the children, however, do report lack of transportation as a barrier to asthma control. The question remains if the parents have knowledge of the benefits available for the children through Medi-Cal.

*"...our population or community does have a large number of community members that have an issue with transportation." SH1*

*"...or they don't have transportation, so they are unable to get to the pharmacy to get it (their medicines)" SH2*

*"I'm sure there's a lot of people in this community who are lower income who do… (speaking of having problems with transportation)" and "We do see some. We see more in the elderly than in the children. Transportation is well, maybe the people who have a transportation problem, we may not be even seeing them because they don't come to us . I don't know the answer to that, just the ones who're coming to us. As a country place, we don't see that much of that issue except the elderly." SH5*

*"Not a major. I mean in my practice, I'm in private practice. So, it's not a major issue. I mean they do have some… if they are Medicare patients, they do have transportation. Yeah, it's not always very timely, but they do have. I mean they do have some… some help with that… I think there is Medi-cab… And it seems that they use, yeah." SH3*

#### 4.2.1.11. Cultural Barriers

The diversity of ethnicities inherent to the California Central Valley adds another layer of barriers to asthma control. Many of the families have cultural and traditional barriers that conflict with Western Medicine style of care. The stakeholders confirm these difficulties with their experience with asthma care in the community.

*"…there are so many sub-cultures, and when you say one thing in one culture it's like, you know, it kind of goes over the head because… but it's not something they relate to, but yet there may be something very critical that is so norm in that culture they didn't realize this…" SH1*

*"the so-called Latino population also has a group of Hakka, indigenous peoples from the state of Oaxaca and other areas in Central America… some of them speak better English than Spanish… but culturally, they're not used to Western Medicine, and they tend to resist it or not understand it, and what people don't understand, they don't use. We've had to come up with strategies like pictures to be able to help them understand. (...) And then the other (language groups). We have a significant Hmong population (...) And again, they're spiritualist, so they go to the shaman first. I actually held it as part of a big event here on health, where we brought a bunch of dentists and doctors together to give free healthcare. I arranged with the lead Shaman in Fresno, who, by the way, is a woman, to bring her fellow shamans to that event and set up an area where they could provide care as well. And there you see things like candling and ceremonial string-tying and things like that, to cure asthma." SH2*

#### 4.2.1.12. Language Barriers

Right alongside the cultural barriers also come language barriers. Families who have difficulty with the language would, naturally, have difficulty understanding the instructions given during the doctors' appointments.

*"… (we have a )large population of Spanish speakers, but we have Hmong, we have, different Asian, like we have Mien, people from, Laos, we have Punjabi, Portuguese, we do have a group of Portuguese speakers, both from Portugal and Brazil, so all those things… and then even just in Spanish, we have so many dialects,… Mixtec, Zapotec, and those are very specific…" SH1*

*"For some of the patients, for example, they speak Spanish, and the provider doesn't speak Spanish. That has been an issue. The patient hasn't understood how to take the medication or even to get access to their medication. Again, if their pharmacy doesn't speak Spanish, being able to pick it up in the pharmacy can be an issue as well. (...) So here in Fresno and somewhat in Bakersfield, but I believe largely here in Fresno, the so-called Latino population also has a group of Hakka, indigenous peoples from the state of Oaxaca and other areas in Central America." SH2*

*"It … it can be, because, if you get a Hmong patient or if you get, you know if you see somebody and use phone (joins?). We have a lot of Spanish community here. They do have a fairly good incidence of asthma, so if you don't speak or if you don't have a MA who can interpret, then … then that creates a barrier and lack of understanding." SH3*

*"No, Mariposa County only has - I want to say our minority population is less than 10% though it's growing. It is growing but less than 5% is probably Hispanic, public Spanish speaking and there might be a couple of other different cultures and languages, but It's not a big majority in Mariposa County."SH5*

*"For some of the patients, for example, they speak Spanish, and the provider doesn't speak Spanish. That has been an issue. The patient hasn't understood how to take the medication or even to get access to their medication. Again, if their pharmacy doesn't speak Spanish, being able to pick it up in the pharmacy can be an issue as well. (…) here in Fresno, my experience has been yes." SH2*

#### 4.2.1.13. Other barriers

Through the open-ended question at the end of the discussion about barriers, some of the stakeholders were able to identify some interesting new barriers from their points of view. The school Nurse, who observes closely the daily family dynamics through the interactions with their children in the school setting, was able to describe problems that some of the families deal with that might not be observed by anyone else. Additionally,

the Mariposa County stakeholder, being a mother of asthmatic children, was able to identify difficulties that parents have to deal with because of school policy about children using medications during the school hours.

- **Mental Health issues in the family**

*"Substance abuse and mental health problems. Parents struggling with mental health or substance abuse issues are often unable to focus on the needs of their children. To that end, taking daily medication doesn't happen. This is especially true, if the child is not old enough to take on the responsibility to ensuring it is done." SH6*

- **Parent's Priorities**

*"Living in poverty. Many families simply have bigger issues, like being able to pay bills, lack of transportation, unemployment, etc. Asthma management takes a "back seat." Unless the child is needing to visit the ER or urgent care, preventive care is not a priority." SH6*

- **School Policy issues**

*"…with my daughter we actually got her excused from PE because running triggered her asthma to the point that they had to have an ambulance called to the school where she was doing running activities twice. So I finally just got a waiver and she didn't take PE for the rest of high school… with kids, they need to make sure that they have their rescue inhaler with them, and that is always an issue with my kids. You know, do you have your inhaler? No, like another one for you. I mean, that's probably just part of kids being kids, but I had to get a prescription authorization for each of my kids' schools in order for them to use their inhaler. At first they had to keep it in a backpack and then use it and then I told the school that didn't really do any good because if they're out on the playground and they have an attack they need it right away. Yeah, they did let them both have it on their body and I understand they're letting other kids have it on their person as well. So I think you know it's just a normal everyday case of kids being kids, but I think it's also some education that this is a serious illness that causes fatality and it needs to be treated as such." SH5*

### 4.2.2. Addition of Peer Support to Community Health Worker Intervention

The stakeholders' opinions on the addition of peer support was obtained through specific questions that fell onto the following themes:

#### 4.2.2.1. Would peer support be well received?

Generally speaking, the stakeholders were of the opinion that most people would be receptive to the idea of having a peer support component added to an educational intervention.

*"... I think that would be a good thing, and having a support group also like you said, time to call each other or having an asthma support group... Uh, something that they could perhaps meet once a ... or do like a zoom meeting once a month or something and they share their ideas and share their experiences." SH3*

*"I'm there it would be supported, especially by the Asthma Coalition, as well as the Central CA Asthma Collaborative (CCAC). " SH6*

#### 4.2.2.2. Would parents have time to call each other?

Even though the stakeholders are certain that many parents of asthmatic children would have difficulty finding time to contact each other, some believe that there are some parents that would find the time to call other parents to be able to tap into their expertise and learn from the more experienced parents. One of the physicians believes that it would only be possible with people who are especially close to each other.

*"I think that it takes a kind of person, or a certain personality that say: yeah, I want to do this. But I think it's possible, yeah, time management would be an issue, but when someone is truly vested, and they want to help another mother or father out with something they've struggled with, I think that's their buy in, and why they would want to do it, a possibility, definitely!" SH1*

*"The question is, would the people call each other? I doubt it very seriously, unless they are in the same neighborhood or attend the same school, maybe, but I doubt very seriously they will do it." SH3*

*"... I don't think it's a time problem, I think it's finances. I think it's a financial issue too, and the Internet is not. You know where it is. Our Internet service in some of the more remote areas is not there. Same for cell service." SH5*

*"They shared stories and there were new folks, and you could really see that learning happening, that shared experience, and that it really affected the newbies and the older ones felt like "Yeah, this is great! I've got some wisdom I can pass on." The problem was they don't have the time to participate in it. So that became the real issue: How do I get a parent who's got kids to participate in these meetings?" SH2*

#### 4.2.2.3. Getting Experienced Parents to help other parents of asthmatic children

Once again, even with time limitations, the general belief is that some parents would be willing to participate in peer support and offer their experience to assist parents of asthmatic children to learn how to control their children's asthma.

*"Absolutely yes. This is a very close-knit community, and we take care of each other. So absolutely we would." SH5*

*"...if we could find enough volunteers that are truly dedicated to it, and it is a passion of theirs, then that would work too."... "I know there is a group in Los Banos that is just a group of mothers in this tiny ... community and they are the ones everybody knows to go to with anything like this, and they want to be trained, and they want to be leaders, and they want to be coaches, health coaches, and they want to.. make a difference. So they would find these people, so there is a little network out there, we just have tap into them." SH1*

*"...we've tried it in the past where we put together a group before (name removed) came on board. Under our previous director, we set up a parent group, and we brought them together and it was great. We had 15 or 20 at one point with their kids. They shared stories, and there were new folks, and you could really see that learning happening, that shared experience, and that it really affected the newbies and the older ones felt like "Yeah, this is great! I've got some wisdom I can pass on." The problem was they don't have the time to participate in it. So that became the real issue: How do I get a parent who's got kids (to participate in these meetings?"SH2*

*"I could not predict the response on this. But my gut response is there would not be much interest. One suggestion would be to have UCM students come in and do the education. I have used UCM students to do dental education with preschool students. The time it takes to coordinate something like this is a consideration, however." SH6*

#### 4.2.2.4. Access to internet and cell phones

Through the stakeholders' answers, it is clear that most people in the community would have access to cell phones or the internet in order to communicate with each other.

> *"I think there is always going to be those exceptions here and there, but for the most part, I think it is something that is , uhm, most people do have access to that." SH1*

> *"Access to cell phones/communication: most people have access to it, but not all will use it for getting knowledge. Yes and no. Since I'm giving both answers, it depends upon what kind of community you are dealing with. I have found that [I've got friends in] the Bay Area, where there are white collar workers and people who are highly familiar (with technology), probably your apps and all those things will work wonderfully, but they're ahead of time as compared to the population you are dealing in the Valley. I doubt very seriously, even though almost everybody has a smartphone this day and age, (whether people in the valley will use them.) It's just the attitude or the way most of the people look at it. They will not spend time on the cell phone. I'm saying you can send all the information, but I don't know how many, how much they will read it again." SH3*

> *"Well, cell phones, probably Internet (are available). It did get better with distance learning. You know, there's a couple of things to know about Mariposa County, because it's a real community and there is a high poverty level up here that means access to Internet is far from 100%. The last I checked, it was about 60%. But we have a local provider, Sarah Towel, and they did increase that access, and they worked with a low-income family for distance learning." SH5*

### 4.2.3. Receptivity of Types of Community Interventions

During the discussion of this question, stakeholders were presented with a table (see Table 12). If they were not familiar with the type of intervention, they would get a brief explanation of what the intervention was about, and were asked to give their opinion, based on their experience with the community, about how receptive the community would be to the specific types of intervention. Sometimes they would just reply to what level they think the receptivity would be; others, they would expand on their answers with some comments. Below is a report of each of the types of interventions:

**Table 12 - Types of Community Interventions**

| | Very well accepted | Somewhat accepted | Not Accepted |
|---|---|---|---|
| **Home visits by health educators (CHW or Promotoras)** | 1☐ | 2☐ | 3☐ |
| **Healthcare Navigators on phone** | 1☐ | 2☐ | 3☐ |
| **Phone Apps: Reminders of doctor's appointments, medication refill and asthma trigger prevention** | 1☐ | 2☐ | 3☐ |
| **Training of school personnel** | 1☐ | 2☐ | 3☐ |
| **Schoolchildren's education on asthma** | 1☐ | 2☐ | 3☐ |
| **Parent classes** | 1☐ | 2☐ | 3☐ |
| **Support from knowledgeable peers** | 1☐ | 2☐ | 3☐ |

#### 4.2.3.1. Home visits by CHW/Promotoras:

It was a consensus among the answers of the stakeholders that home visits by CHWs must be the most accepted.

*"I think it's very well accepted. The Community health workers In our programs, we try to make sure that they are from the community, that they look like the folks that we're working with, that they speak the language for the community that we serve. So I think they're well accepted." SH2*

*"In education, the question is how to do that, which all depends on how many resources you have . In our communities right now (people with asthma) will not be able to come (to a training session) on a regular basis. So, somebody has to go into their neighborhood to go and teach them all the time." SH4*

#### 4.2.3.2. Health Care Navigators on the phone:

Some of the stakeholders rated these type of interventions as somewhat accepted, because they find that, sometimes, there is resistance from people about speaking on the phone with a stranger about their personal problems; However, the stakeholder who has had experience with the intervention reports that, when the program is well presented to people, and they are trusting on the organization making the phone calls, it can be successful, as long as there is funding to maintain the program.

*"I ran Patient Navigator program started it at Clinica Sierra Vista as part of the 2010 clinic experiment that was ran back from 2010 to 2013… Health care patient navigators… we proposed a model where we would do it for diabetes and asthma as well, and I felt it was very successful. The problem again was there was no funding for it. Three years in, Congress cuts the funding from the next budget… So we had to shut almost all of it down. We just couldn't afford it. It was great while it lasted, though!." SH2*

#### 4.2.3.3. Parents Classes:

Parent classes has been put in the "somewhat accepted category" because, even though most people find it a great idea to educate the parents of asthmatic children, the reality of implementing such classes end up being a flop because of no-show from the part of the busy parents due to lack of "time".

*"I think all these things are accepted very well by the community, but their use… that's a different thing entirely. I would say parent classes are accepted, but are parents going to classes? No, but if you ask them, they'd say that's great. "I love the fact that you have parent classes. I'd love to go sometime, but I'm really busy." SH2*

*"Actually, the CCAH (Medi-Cal Provider) from the Merced County did contract with us about three years ago to pay for us (to set up classes.) We scheduled so many class periods… we scheduled 18 people, one or two would show up. So we finally gave up. Those were in the evening." SH3*

*"Oh, parents' classes, yeah? I think, especially in younger kids, I think it will be very important. You know, because they're the ones who are going to recognize the symptoms it. So, when the asthma is worse and all that so parent education in the in childhood asthma is very important ." SH4*

*"I think parents will go to a class in the evening or I think they would meet, yeah." SH5*

*"Not accepted." (She believes that the parents do not have time to dedicate to coming to classes at the school. They are much more preoccupied with paying bills and running their households.) SH6*

#### 4.2.3.4. School Children Asthma Education

Educating children about asthma in the school setting is another one of the interventions that lands on the "somewhat" category. Some stakeholders have had success with it in the past, but it has to go through some red tape with the public school system. It could work if the school district is involved and if there are enough people to go around doing the training, which again, requires funding.

*"we actually had an NIH grant to work with the schools to use schools as a recruiting mechanism for the program. Schools work under FERPA. We have HIPPA they have FERPA. But consenting all of the parents ahead of time proved to be more than we could handle, and more than the school was willing to do. Nurses cannot refer a student to a program that is not contracted with the school to provide that service. As we were a community-based organization, they weren't willing to (do it). The liability issues were just too much for them to overcome, so all they can do is hand the kid a handout to put in their backpack, or if they're really willing, call the parent. But again, the school nurses were just really busy, so they just didn't have time to sit down and call parents for us. Nor could they give us the phone numbers." SH2*

*" School training: well accepted – did it with private schools – not sure how it would go in the public setting." SH4*

#### 4.2.3.5. Training of School Personnel:

The schools are open to do training of their personnel during training before the beginning of the school year, so in that light it can be well accepted. However, there has to be a partnership with the school district for that to be allowed, and the practice would look like a very intense period of training in the end of Summer, and then schools start getting too busy after school starts. Funding is also very important.

*"We did trainings for the school nurses. We developed a hardcore cadre of asthma-trained school nurses. That's still there today in Fresno Kicks Asthma. That was the name of the project. Those nurses do surveys in the classrooms. There's five of them. I've actively trained that group every few years and they're great, you know? So, since we couldn't go one way, we went the other. What if we were to train school nurses to be able to do the asthma education with the students that they identify as problematic? Of course, they'd love to do the parents, but the gap is they can't go to the peak kids' homes, but they can educate the kids. And from about 5th or 6th grade on, you know those kids are pretty slick, they can (take care of themselves. They) at least know how to use their inhalers right?" SH2*

*"...we wanted to train the health aides because a lot of schools today don't have nurses. The nurse comes by maybe twice a week and the rest the week it's the health aide, who is the secretary in the front office, so they're not paid extra to be health aide. And what we found was they were very resistant to taking something like this on. It wasn't that they didn't want to, they just weren't comfortable. They were afraid because they're not medical people. They're the secretary at the front desk. They already felt that even being the health aide was already challenging with their regular work, but to take on something like my education for the kids, they just fled, it was just too much." SH2*

*" We did this for four years until 2016 as part of our Healthier Living Program that was funded by the Air District. At the beginning of August, the staff would be just really busy at different school districts doing these trainings with the teachers, teaching them about asthma, inhalers and how they work and taking some questions and talking a little bit about air pollution. Teachers loved it, but it's a lot of work and there's a lot of schools to cover. There are 37 school districts in Fresno County alone; I think it would be well accepted, and I guess if that's all you're asking, I think the teachers would be fine with it. I think the implementation is the key."SH2*

#### 4.2.3.6. Knowledgeable Peers:

The consensus from the stakeholders on peer support was between "very well accepted" and "somewhat accepted", depending on implementation and closeness of the community.

*"That is always the case, yeah, birds of feather flock together." SH3*

*"This (probably could) work if they're in the same neighborhood or they move in the same social circles. (Not so much if they are in different locations of circles and have less in common. (In that case,) I don't think it's going to work. That's just my opinion ." SH4*

#### 4.2.3.7. Phone Apps

Since most parents nowadays have access to cell phones, the use of apps with reminders and educational materials can be useful and well accepted for most.

*"You know, I have quite a few friends whose kids are friends with my son who is now in high school, and they have asthma and we do share information with them (and their families) and the ironic thing is we actually all keep eyes out, so you know it would be good to have that information and for them to know too. You know? Maybe hotlines and some places they could call if they're having severe issues because it's scary. I mean it's very scary to see a loved one and especially your child not to be able to breathe." SH5*

*"...we work with current health systems, and they refer patients to us, I know they have a system set up where they would send out reminders to patients like "These are asthma triggers", or "Here's your upcoming doctor's appointment" and I would hear feedback from the patients that they enjoyed getting those reminders and being reminded about their doctors' appointments." SH2*

#### 4.2.3.8. Others:

- **Asthma Camp**

This was a surprise finding in this research, as there was no mention of this type of intervention in the literature. Summer Asthma Camps were implemented by the CCAC with buy-in from local stakeholders and were very successful for many years in the community. They just had to be stopped because of lack of funding. There is still a desire in the community to reestablish them in them.

*Speaking about the Asthma Camps and how they came around: American Lung Association. We did those together with the American Lung Association; working for many, many years, and then they, about six or seven years ago, backed away from all that (so they stopped). One of our board*

*members wants us to try to get an asthma camp going again. It's the money, it's the money: It costs about $20,000 to do an asthma camp for a week" SH2*

*"When you do these camps, little camps, and let them do everything, they learn that they can do almost anything, (so long as they) manage their asthma. I just try to teach them (to choose a sport that fits them.) As long as you can manage (your asthma) properly, you can do almost anything and in almost in any sport you look at, whether it's football, basketball or even the Olympics, there are famous players who have asthma. Almost every year, every Olympics, about 20 to 25% of the gold medals are won by asthmatics. So the asthma does not stop you from doing anything. The key for (living with) asthma is management, not the diagnosis, (but learning how to take the medication and how to manage the condition)." SH 4*

- **Involve the Medical Community on Asthma Remediation Projects:**

Our physician stakeholders reinforced the need to involve the medical community on all interventions, so that they can refer their patients.

*"...the way that works ... you have to get in the medical community, you know? Involved in this, so that way, an MA (medical assistant) in the office will, when the patients come in for a visit. or if they're having an online visit, they tell them that this a service available. Would you be interested? Uh, and then make them aware of that. Then I think people will be more receptive. Or if they go to the ER, urgent care if they are told that this is available so. If they are educated on that, and if it's coming from a medical personal, they may be more receptive to that." SH3*

### 4.2.4. What activities your organization provide in Asthma Education?

The local hospital, which is the largest stakeholder who participated in this research, have had many activities in the community with asthma control education. They keep a Director of Community Outreach and Education who has been very active in the Asthma Coalition, currently holding the position of Treasurer in our steering committee. They have been very supportive of the asthma coalition, providing office space, storage space and funding for the coalition meetings and events. Those activities, however, came to a total halt during the COVID-19 Pandemic, and are still in need of being reinstalled. Below are some of her quotes:

*"One was the school program; so, we partnered with the Asthma Coalition. We were very strong support and partner in bringing the education into the classroom, and then we've had it... ongoing off and on, same thing asthma education in schools, but geared towards teachers and then there is another opportunity for parents, we've been off and on depending on the staffing that we had, and the support and availability, and also request from schools" SH1*

*"Asthma Management Workshop. It's based off of the training that you and attended as well, for the California Dept. of Public health, and the 'Comite Civico' in the Brawley area in Southern California, so we are working on launching the workshop, it's a 5 week workshop for about 1 hour,… 5 modules, we created a little workshop session, and it'd kind of interactive, it had the videos, they'll have the videos, you know, open answer… open questions, whatever, we create a dialog and people are able to share and ask questions, we do an overview of asthma, and how to do an assessment at home, we go over recipes for , like more healthier types of cleaning solution, rather than using harsher chemicals that ca trigger… we go over medication delivery devices…" SH1*

The CCAC, as described on Chapter 2, is located in Fresno, is also the organization in Charge of overseeing all the Asthma Coalitions in the Central California Valley, and have been very active in promoting asthma control education for over 2 decades. Their current CHW program (CARES) still kept contact with the patients they are serving during the Pandemic.

*"Part of our 12-months asthma Impact model program is, we call patients every month, so we have just been continuing that process, checking in, seeing how they're doing and if they are needing any other connection to resources because of Covid. We found that because people have been losing their jobs or their hours have been cut, that they've needed more assistance and to be connected to more resources." SH2*

The physicians who participated in the research are owners of their own practice and have a more limited scope of action. However, they also participate in the Asthma Coalition and try to do their best in educating their patients.

*"I don't do anything specific, so we use the NIH or the GINA guidelines uh-huh. So we basically just verbally tell them or will print the asthma action plan on my EMR. We have the patient education handouts. It's for different*

*process, but it has for asthma. Different things. You know how to do dust mites' control. So that sort of thing we have. You know air purifiers or HEPA filters at home. Use of that certain seasons of the year. So yeah, we do have that. On my EMR I have a program called "Adam" which is for patient education. ... sometimes I go to "up to date". Also, on there is a patient education site, so sometimes I will print, You know, though we may show them how to use her inhaler, I'll print it out and give it to them so they have. It was a lot of times patients say they know how to use it and then they forget by the time they're gone home. So giving them a handout can help." SH3*

*"My own experience from the late 80s early 90s was that we would give (printed) literature to all the patients, and everyone was told to read it. I used to give it to everybody. After a year, I decided to see how many patients actually read it, so what I did was I put a couple of garbage cans in my parking lot. Every piece of material I gave out I numbered, so I would know which patient took it. 85 to 90% of those pieces of literature I gave to them never made it out of my parking lot. People will take (whatever you give them) and they will throw it (away) rather than read it and learn something. Just giving them an education site on the Internet (would likely be the same .)" SH4*

The school district keeps track of the students who are asthmatic and do their best to assist the asthmatic children during school hours, besides trying to keep open communication with parents and healthcare providers of those children who have more severe asthma.

*"Intervention on asthma management is done by School Nurses when a child is missing a lot of school or is frequenting the health office regularly for use of a rescue inhaler. These will trigger a referral to the site school nurse for follow up with the family. We also have asthma questionnaires, which we send home for all students for whom a parent/guardian has noted there is an asthma diagnosis. The questionnaire is designed to obtain additional information regarding the severity of the child's asthma (subjective report), as well as who the child's PCP is, what medications they are taking, whether they have been hospitalized or referred to a pulmonologist, triggers, etc. That information is documented in our computer system. If we identify that a student's asthma is not being well managed and it appears medication prescribed is being used correctly and consistently, we will refer the student/family back into their PCP. We send them with a written referral and request that it be returned, so we are able to see the outcome." SH6*

### 4.2.5. Community Resources available

Besides the food bank, WIC, homeless shelter, and Medi-Cal assistance, which are available to the public in need in our community in general, I wanted to gage what sort of specific resources are available to the asthmatic children in need of assistance to mitigate asthma triggers or provide medications or education. Sadly, in the Merced/Mariposa Counties area, there are not a lot of assistance to asthmatics.

The doctors who own their private practice are able to ask, stock and provide their patients in need with free samples of medication, but bigger organizations are prohibited to do so due to their policies. Our local hospital has been able to support the Asthma Coalition and train healthcare personnel with training courses and materials for workshops, provided by the CDPH, but any activity has currently been stopped since COVID-19 Pandemic.

*"California Dept. of Public Health, and the 'Comite Civico' in the Brawley area in Southern California: (Provide trainers and materials for the Asthma Workshops)" SH1*

*"We have CAP K here in Kern County and we're actually partnering with them for their ... program to provide more direct services… it's a community benefits organization, so they help connect the community to resources. Like providing food banks, childcare services for folks that are homeless, WIC… or connect people to weatherization and energy efficiency programs too" SH2*

*"As far as medication in the community? No, I don't think there is any that I'm aware of. Now sometimes, you know, we do our best to give them samples and sometimes I'll ask the drug reps to give us more for a particular patient that just cannot afford it . And uh, or if they're able to afford just a little bit, but then we'll supplement it with samples, so that's how we do it. Uh, there are some drug companies that have financial help. Like, the patient has to send in their information. their income and all that, and then the drug company will give them supplies for a certain period. So, we do have, uh, some help." SH3*

*"Yes, all the time (speaking of having patients with problems of environmental control of antigens), especially the people who are renting their places and living in apartments. We get that problem all the time. Sometimes we give them certificates (to help pay to fix the problem) so maybe they can get it done, but a lot of time it's just (something they have to live with.). I have not found any kind of support. Once in a while, somebody will*

*be kind enough that they will do it for them, and I've seen people fight with their insurance companies for help, but most of them, unfortunately, come empty-handed." SH4*

*"We rely almost exclusively on primary care or a pulmonologist, if that is who is overseeing the student's asthma plan of care. We were given community resource information by CCAC; but I haven't utilized it; I can't comment on whether the other nurses in my district have." SH6*

### 4.2.6. How can Community improve on Asthma Education?

Our stakeholders agree that the community networking and communication among stakeholders needs to improve in order to come together and create a new comprehensive program to mitigate the effects of uncontrolled childhood asthma in our midst. Here are some of their ideas:

*"I would love to see more of that cohesive communication and working towards the goal of exactly what you said, better outcomes and reducing that burden, because it is ultimately all of us feel it. Everyone feels it, because the impact in the Emergency Room is tremendous. If we were to clear out of those people, children and adults who come to the emergency room because e they are having an asthma episode, that's huge, that would alleviate so much of people saying:" I can't come into the emergency room because there is a lot of o people", chances are a lot of them are not well controlled asthmatics…" SH1*

*"Here, CCAC participates (in) asthma coalitions, so we participate… as chair of the Asthma Coalition of Kern County, and we work with the different stakeholders that work on actual management in the County. We see how we can partner, how we can host events. Can't you provide us some education? Work with providers? So that's one of the ways that we get involved with other stakeholders in the Community. And state-widely we participate in California as a California Alliance fight asthma CAFA or the California Asthma Financing group. So those are statewide groups, and a lot more are also members of their coalitions in their County or leaders of their coalitions. And they meet. We meet monthly, so there's a pretty fair level of support in our counties. Merced has a really great asthma coalition. It's been around for a long time." SH2*

*" I know in the past the asthma coalition… I knew they used to go to schools, and… but I thought that kind of fizzled out . (…) in the past, the asthma Coalition used to give us spacers (for inhalers). Making home visits or phone calls to families with students who have asthma to do education on asthma and proper medication use. We do not have the resources, under normal circumstances, to provide this level of support. SH3*

*"I just think more education and the interventions like you talked about, and probably money. (These programs would) probably need donations. SH5*

*"Making home visits or phone calls to families with students who have asthma to do education on asthma and proper medication use. We do not have the resources, under normal circumstances, to provide this level of support." SH6*

### 4.2.7. What did you observe with asthmatics during: a) COVID-19; b) Wildfires

The participants agreed that, with the event of the COVID-19 Pandemic, a lot of resources for internet, social media and cell phone communications have improved greatly the ways in which people could communicate at a distance. Tele-health capabilities improved. Doctors and organizations found creative ways to keep in touch with their most critical patients. Shelter in place greatly reduced the exposure to viral airway infections, and asthmatic, staying indoors, reduced their exposure to outdoor triggers, even to the wildfires smoke in the air. Patients who still had asthma attacks during the pandemic still had access to instructions from their doctors through tele-health and safe-distancing practices during their office visits, who were operating only for urgent cases, with heightened safety precautions to control the spread of the Corona virus.

*"…we have this … incident command center that holds two calls every week, and we go over it and they brief us, it has always focus on COVID, but since the wildfire began, that has now been incorporated into our calls, because as the air quality fluctuates, uh… depending on how many fire we have going in any given time, we definitely do see the impact in the emergency room, and we want to make sure that everyone is prepared." SH1*

*"We use Webex, so we do the same thing with our patients, like the video using the video platform. That definitely has been helpful. And I mean we're still able to practice that. " Can I see your inhaler technique OK?" "Can I*

*hear you breathe?" " Can I see how you shake your medication?" We're still able to have that visual interaction with the patient, and we're able to send them videos (if, say, we think they) need a reminder, here's a video on how to use your inhaler properly. Now that we know that folks have that Internet connection and they have a device, that's something that we're able to share with them so they can view it any time. That definitely has been helpful. Now that everyone's adapting to the virtual world." SH2*

*From Pulmonologist: (paraphrasing) During wildfires, patients with respiratory illness called his office more. His private practice has a policy to teach patients to call if they need anything. Besides the wildfires, the number of calls has been about the same. SH3*

*"Well, we're trying to call on a regular basis. We are trying to make appointments to come in to be seen at the office and we're pretty much trying keep in contact with them all the time. Unfortunately, a lot of patients may not be able to come in and see us for different reasons, but we try to contact them as much as possible." SH4*

*"The best thing about the lock down was that it kept us away from any kind of viruses. Any kind of virus. ...between March and June, well, even now we haven't really been sick, but we did not get any illness at all during that period. My son usually comes home with colds and flus, and everything that he catches at school. Shelter in place actually really worked in our benefit. We were very, very healthy, but I think the fires were probably what triggered his asthma attacks that he had in the middle of the night because we kept our windows open in the summer for the cool layer and I think that smoke probably affected him." SH5*

*"This is not something we are able to do due to a lack of resources. Our focus is on when kids are in school and we are in a position to see how a child's asthma is impacting their ability to be at school every day and how often they are using their rescue inhalers." SH6*

### 4.2.8. Opinion on use of media resources for Asthma Education

The stakeholders, in general, are in favor of using modern technology of communication and media resources to enhance the variety of ways to learn about asthma education. The CHW in the AIM Program by CCAC were able to teach their

patients how to use the Webex App in order to maintain their meetings with their CHW through virtual meetings.

*"it's not the same as the human interaction, but those encounters and those moments count, because people keep it in the back of their subconscious (…) I'd say… there is this commercial I've been seeing, there is no words, really, just a song, and it had like scenes and different things, it just keeps flashing and changing the screen, uhm, and every time I hear it I stop in my tracks, cause I love this song, it's like an Orchestra, or something, I don't know what it is, and I don't even know what they do, but I like, I know the name of the company now. And if I ever see that name, I am going to go with them because I love that commercial. You know what I mean, and that's marketing. That is marketing at its best." SH1*

*"But you have to teach them how to do that first, and then that's what her team does is actually teach them how to use that smartphone to participate in an electronic virtual health care visit. Yeah, and we're not getting paid to do that, by the way, we should be because the health care system is dying to get people to be able to do virtual visits" SH2*

### 4.2.9. Opinions on role of the Asthma Coalition

All stakeholders agree that the Asthma Coalition can be a great influence in bringing all stakeholders together to collaborate and enhance each other's efforts to control asthma in the community.

*"I think that, in theory they are the primary vessel to help support this.. whatever programing or interventions that do come in or, that are brought into the community by stakeholders or whoever, and I feel like that Asthma Coalition is the Prime "suspect", if you wanna say it, who can get it out there. And they have been that in the past, they have been the drivers, they have been that force where everyone said… I mean, I don't want to toot our own horn, but the Merced Mariposa County Asthma Coalition was a pioneer, they are the ones who came up with, I won't say we, because it wasn't me, I mean, I had just come on, I mean, The Flag Program, in the Schools, that came out of Merced,…" SH1*

*"…in the prime of the asthma coalition we had the staffing (…) there were times our meetings had 70 people, 80 people. But I would qualify that by saying: that was the time when I felt like the asthma coalition was highjacked by… That was when the Walmart was wanting to build their Super Center and*

*Their Distribution Center, We had a whole subcommittee which focused on air quality only, so we had a bunch of people on our committee that were die hard environmentalists, and very focused on improving air quality, and so… they were very uhm… those meetings where tense, because they were very passionate about air quality, which we all were, but they were very like… very political – hard core.. yeah, so that was an issue. But little by little, as we lost the funding, those grants that ended, that's when it kind of dwindled down…" SH1*

*" I definitely see them assisting in connecting all those folks as I had mentioned. I participate in the asthma coalition here in Kern County. An all of the different folks on Kern County for the as a mitigation project, there were three organizations that were funded, and all three of the organizations participate in the Asthma Coalition. So that will be helpful to be able to share with the community. We have three organizations that are participating. Here are the resources that you have helping to connect folks and build those networks so that we can work together even outside of the coalition. (…) Merced has a really great asthma coalition. It's been around for a long time." SH2*

*"The coalition part should be the link between patients and the educators and the medical community. So, keeping that process going, perhaps getting some funding for patients who are not able to afford their inhalers. Like I said, the spacers program, education and prevention how to prevent rather than after the fact treatment. I think focusing on all that will be very important." SH3*

*"…education is ultimately the key to treat any chronic diseases, and especially asthma." SH4*

*"I think it would be very advantageous in our community because we're a rural community and kind of isolated. It would be great to have a coalition in order to have more resources for the people with asthma, the parents and teachers, yeah, I think that's a great idea. It would be very advantageous in this community" SH5*

*"Many years ago, I served on the asthma coalition. I am not aware of their current focus in the community. I would be interested in serving again. But I have not been contacted. I struggle with having the time to participate in such groups, given our work loads. But I absolutely see the value." SH6*

### 4.2.10. Any other important factors not mentioned before:

At this point of the interview, the stakeholders felt like we talked about the most important aspects of the topic of controlling childhood asthma in the community. There were no other factors added to our topic, and all of them expressed their desire for this conversation to continue and bring about some improvements on our community's ability to improve asthma control education.

## Chapter 5: Discussion

The field of public health has evolved greatly in the last few decades, and many of the processes for behavior change are now explained by psychological theories that have been empirically tested. Great efforts have been made to determine what factors are important when trying to assist individuals to adopt new behaviors successfully in order to elicit health improvement. When establishing an intervention to stimulate people to learn new techniques and change the way they do things in their lives, it is useful to not only understand the mechanisms of behavior change, but also to set up the procedures in a way that will favor their openness to change, so the health benefits aimed for can be attained.

By evaluating the needs, opinions, and preferences of parents of asthmatic children a Community Intervention can be tailored to those needs and expectations, making it compatible with the reality of the targeted population, minimizing unrealistic expectations and making the use of resources more effective.

The results from the specific questions of the survey confirm that the parents of asthmatic children in the community do lack access to healthcare professionals, and the great majority also lacks access to asthma control education from Community Health Workers/Promotoras. The finding of about 30% of the children identified by the survey having to use Urgent, Emergency or Hospital Services due to uncontrolled asthma confirms that the quality of the lives of these children and their families can greatly improve by increasing their mastery of preventive therapy and environmental control of asthma triggers. The more they know how to effectively use the medications and other preventative measures, the less symptoms they will have, reducing the need for use of Emergency, Urgency and Hospital services.

The responses from the parents indicate that they would be very receptive to a Community Intervention that would allow them access to a CHW/Promotora that would speak their language, understand their struggles, doesn't judge, or look down on them, belongs to the community and that would be available by phone when guidance is needed. As about two thirds of the participants were somewhat or very interested in having a knowledgeable peer to assist them during their learning period, and about a third of them would even be willing to assist other parents once they have learned enough, by becoming an asthma coach, the community intervention could have the option of looking for knowledgeable peers in the community or inviting the successful parent who have been trained by the community intervention to become a peer support for new groups, and then the progress of the peer supported parents can be compared with those parents that might find themselves too busy for the peer support group. Therefore, A Community Health Worker type of intervention could be proposed to the Community that could have two arms: one with the standard CHW/Promotora Program, and another that would add a peer support component to program. That way, the evaluation of the program can compare results between the two arms to verify if there are differences between the two and, therefore, observe if the peer supported group had any advantages over the Promotora/CHW group.

In addition to comparing ACT scores[71,77], MiniPAQOLQ scores[70,78], asthma symptoms and healthcare utilization outcomes, as it is already the practice of Programs in the community (ex.: CCAC CARES Program), other measures of asthma control knowledge, EuroQol[73,75], self-efficacy and health literacy can be added[79–82], as well as specific questions related to participants satisfaction with the program. Besides the potential for improving all the outcomes targeted inherently by the intervention, the addition of peer support has the potential to develop community ties, produce new coaches and CHWs for the program and decrease the cost of the intervention by increasing its efficacy. Educational stakeholders, like the Community College and the UC Merced, can also benefit from participating in such a community program by having a field training for their students in Community Based Participatory Research and in health education.

The results of the regression on the willingness to be a coach show that younger parents who lean politically as conservatives who have a child with milder symptoms (less adverse events) would be more willing to be a coach. Knowing these factors might help the Intervention organizers to look for coaches among those parents of younger children (who are also younger). Since political leaning in this case might be a proxy for altruism or even religiosity, hence they are more willing to help others in need, it might signify that, looking for parents of asthmatic children among faith organizations or even those who serve in their children's' school as members of the Parent-Teacher Organizations or as classroom moms or dads could result in a greater chance to recruit parents willing to coach others. The less interest of parents of children with adverse events might be just because they already feel low on self-efficacy to control their own children's asthma. Once they go through a training and learn to control their children's asthma, some of them might gain enough confidence to feel like they can help others.

On the second regression, the predictors of adverse events help us to identify the children who are more at risk for uncontrolled asthma. For our sample, children of older Latino parents, with a lower health status were more likely to have adverse events. This can guide us to develop screening questionnaire for parents of asthmatic children in the community and to target these children to be included in the intervention.

Based on the remarks and observations obtained from the community stakeholders, a first step towards introducing a Community Intervention would be to reignite the spark of the Merced/Mariposa Asthma Coalition. By presenting the results of this research to the Asthma Coalition Partners, making it very clear that the community really needs the efforts of all in order to put an intervention together might inspire all to come together and brainstorm solutions for the problems found in our community. The participation of the Stakeholders would be vital to contribute to the aspects of the intervention, which can instill the feeling of "ownership", making them more likely to buy in on the program and assisting in the development of the community leadership development, engagement, recruiting and communication.

As made clear by the stakeholders, it is necessary to find a way to finance the intervention. Organizations such as Dignity Health, CCAC, CCAH and the UC Merced can come together through the Merced/Mariposa Asthma Coalition and join efforts to

obtain grants and funds to finance the development and implementation of a CHW asthma intervention in the California Central Valley. The CCAC already has the “know-how” on community-based intervention that has been successful in the Fresno Area. Their efforts to extend it to Merced were only shortened by lack of funds and deeper reach of buying-in from stakeholders at the time they attempted it. Since the implementation of asthma education intervention has the potential to reduce healthcare utilization and hospital readmissions by asthmatics, that can be an incentive for the CCAH and Dignity Health to participate and promote such program.

In summary, the results from this dissertation suggest that a community-based intervention that involves promotoras and peer support would be valued by most people in the region. Such a program would address some of the special challenges facing the region, including:

### Shortage of healthcare practitioners

Developing a childhood asthma community intervention would not directly solve the issue of healthcare practitioners’ shortage, but it can certainly supplement the education and health literacy necessary to get better results from fewer doctors’ appointments by teaching the parents and children, in the comfort of their own home, how to use the medication and environmental triggers techniques.

### Cultural and language barriers

By hiring CHWs who speak the specific languages of the community being served, even if the healthcare professionals have difficulty communicating with their patients and caregivers, by providing an Asthma Action Plan they can send the CHWs the information about the care-plan for each patient, and then the CHWs can translate and build the knowledge and build their self-efficacy from wherever they are until they master the information. The assistance of peers in circumstances like these, when language and cultural barriers are present, can be of inestimable value.

### Fear of deportation

Similarly to language and cultural barriers, having a CHW and/or a peer from the same background can increase the potential for participation of undocumented immigrants, as they build trust and confidence on a program that is only present to assist them in learning how to help their children, and is non-judgmental of their individual circumstances.

### High levels of poverty

The intervention is not aimed at assisting people to come out of poverty but being able to provide asthma management education in the patient’s own home, or with assistance of multi-media would save in transportation, as it increases the patients QOL and days without symptoms, and need for emergency visits, which is already invaluable. Moreover, as parents become more knowledgeable about how to control asthma, they could, if they so desire, get inspired to become a “Promotora de Salud”. Additionally, as stakeholders come together and the community gets mobilized to assist asthmatic

children, more ideas can come to fruition on how to improve peoples' home environment and provide services for those who lack medication or funds to improve their home environment.

### Low knowledge about asthma by health practitioners

A Community Intervention through CHW home visits cannot aim at improving the knowledge of health practitioners. However, the engaging and campaigning for better quality of life for asthmatic children in our community can mobilize forces to inspire stakeholders who employ the healthcare personnel to offer professional development seminars or courses to those who they employ. CHWs can also ask healthcare providers to issue their patients' Asthma Action Plans, which can be an improvement from part of the healthcare providers.

### Lack of coordination and information sharing by healthcare providers

With a group of CHWs working to assist parents of asthmatic children in the community, there would have to be a better communication among healthcare providers and the CHWs, who can always assist patients on communicating better with their primary care doctors and provide better knowledge on healthcare navigation. If caregivers learn to take the responsibility to keep records from one provider to another, it can already facilitate the coordination of healthcare to their asthmatic child. By bringing the CHW as a type of advocate for the health of asthmatic children, it can raise the consciousness of all to the better care of these children. Community engagement with stakeholders can also bring them together to come up with a solution of their own issues in communication and coordination.

## Limitations

The methods utilized in this research had to be adapted because of the Worldwide COVID-19 Pandemic. We had to use of a convenience sample of parents of asthmatic children through a Qualtrics Survey instead of focus groups of parents of asthmatic school children. There are likely to be differences between those who answer a Qualtrics survey and the people in the Merced area who would be the target of the intervention. First of all, in order to answer a Qualtrics survey, the respondent needs to have access to a computer or other compatible media device and access to internet. Parents who work long hours might not have the time to participate in online surveys. The survey was conducted in English, so all parents who have language barriers would also be excluded from the survey.

I also had to do individual Interviews through Zoom Meetings with the stakeholders, instead of focus groups discussions facilitated by the Asthma Coalition. And the number of stakeholders who participated was reduced due to their limitations of time availability during the time the interviews took place. It is possible that speaking with others might have provided insights into the peer support intervention that I did not obtain.

A peer support program would be complicated to design and implement, and thus would involve significant training and monitoring of the coaches. Because of the

limitations of the survey, it was not possible to explore in greater depth with the survey respondents about what might be involved with being a coach. Thus, the results from the analysis, including the predictors of willingness to be a coach, should be viewed as indications of intent only. A more complete assessment would need to be made in tandem with the development of the peer support program.

## Conclusion

Through the results of both the quantitative and qualitative parts of this research, I can conclude that the there is a great need for asthma management education withing our community. The shortage of primary care and specialist providers in the community, combined with the increased incidence of asthma due to bad air quality and household condition issues give raise to great health disparity in our community. Therefore, a consensus among stakeholders and parents of asthmatic children exists that confirms the notion that CHW/Promotora type Asthma Education Intervention would be very well accepted by the community and stakeholders, and the addition of peer support to this intervention would be well accepted by a significant portion of the parents, allowing for a study of its effectiveness in comparisons with the “intervention only” group.

Using the Merced/Mariposa Asthma Coalition as a catalyst for the community meetings, Stakeholders can start coming together to start the planning for the intervention, look for funding opportunities and mobilize the community for a successful implementation. The stakeholders can also be involved in “thinking tanks” to discuss the barriers found through this research that are hindering asthma control and look for solutions to provide services not addressed by the CHW Interventions, such as affordable asthma medication, assistance with minimizing home environment triggers (pests and mold abatement, home weatherization, carpet removal, etc.), as well as funds to re-establish summer asthma camps. Engaging the community to come up with ideas to solve their own problems is in the core of CPBR. It is time to put it to work to decrease the burden of asthma in our community.

## Bibliographic References


1. National Asthma Education and Prevention Program. Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma-Summary Report 2007. *J Allergy Clin Immunol*. 2007;120(5 Suppl):S94-138. doi:10.1016/j.jaci.2007.09.043

2. Catrambone CD, Follenweider LM, Krau SD. *Asthma*. Philadelphia, PA: Elsevier; 2013.

3. Holgate ST, Douglass JA. *Asthma*. Abingdon : HEALTH Press; 2010. http://ucmerced.worldcat.org/title/asthma/oclc/746746641&referer=brief_results. Accessed April 17, 2017.

4. CDC - Asthma - Data and Surveillance - Asthma Surveillance Data. May 2016. http://www.cdc.gov/asthma/asthmadata.htm.

5. County Asthma Profiles - California Breathing. May 2016. http://www.californiabreathing.org/asthma-data/county-asthma-profiles.

6. Asthma_in_California2013.pdf. May 2016. https://www.cdph.ca.gov/programs/ohsep/Documents/Asthma_in_California2013.pdf.

7. Millet M, Lutzker L, Flattery J, Wohl-Sanchez L. *The Burden of Asthma in California A Surveillance Report*. Richmond, CA; 2007. http://www.cdph.ca.gov/programs/CABreathing/Documents/AsthmaBurdenReport.pdf. Accessed April 26, 2017.

8. San Joaquin Valley Air Polution Control District. In: *Extreme Ozone Attainment Demonstration Plan*. Fresno: San Joaquin Valley Air Polution Control District; 2004:Chapter 2-Pgs 2.1 to 2.30. http://www.valleyair.org/Air_Quality_Plans/docs/final_one_hour_adopted/Chapter 2-ARB Final.pdf. Accessed November 15, 2016.

9. Wilson SR, Scamagas P, Grado J, et al. The Fresno Asthma Project: a model intervention to control asthma in multiethnic, low-income, inner-city communities. *Health Educ Behav*. 1998;25(1):79-98. doi:10.1177/109019819802500107

10. Meng Y-Y, Rull RP, Wilhelm M, Lombardi C, Balmes J, Ritz B. Outdoor air pollution and uncontrolled asthma in the San Joaquin Valley, California. *J Epidemiol Community Health*. 2010;64(2):142-147. doi:10.1136/jech.2009.083576

11. *COUNTY PROFILE INDICATORS Merced County Asthma Profile*.; 2016. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHIB/CPE/CDPH Document Library/County profiles/Merced 2016 profile.pdf. Accessed September 23, 2017.

12. Schwartz NA, Pepper D. Childhood asthma, air quality, and social suffering among Mexican Americans in California's san Joaquin Valley: "Nobody talks to us here." *Med Anthropol Cross Cult Stud Heal Illn*. 2009;28(4):336-367. doi:10.1080/01459740903303944

13. Thakur N, Oh SS, Nguyen EA, et al. Socioeconomic status and childhood asthma in urban minority youths: The GALA II and SAGE II studies. *Am J Respir Crit Care Med*. 2013;188(10):1202-1209. doi:10.1164/rccm.201306-1016OC

14. San Joaquin Valley Has Greatest Shortage of Doctors in California | California Healthline. http://californiahealthline.org/morning-breakout/san-joaquin-valley-has-greatest-shortage-of-doctors-in-california/. Accessed January 31, 2017.

15. National Heart Lung and Blood Institute. Asthma Care Quick Reference: Diagnosing and Managing Asthma. *Asthma Care Quick Ref*. 2012:11.

16. Peterson JC, Czajkowski S, Charlson ME, et al. Translating basic behavioral and social science research to clinical application: the EVOLVE mixed methods approach. *J Consult Clin Psychol*. 2013;81(2):217-230. doi:10.1037/a0029909

17. National Rural Health Association. Health Care Workforce Distribution and Shortage Issues in Rural America. 2012:1-11. http://www.ruralhealthweb.org/index.cfm?objectid=3D776162-3048-651A-FEA70F1F09670B0D.

18. Karaca-Mandic P, AB J, GF J, et al. Out-of-pocket medication costs and use of medications and health care services among children with asthma. *JAMA J Am Med Assoc*. 2012;307(12):1284-1291. doi:10.1001/jama.2012.340

19. Senate Office of Research, and the Senate Health Committee. *A Review of California's Health Care Workforce Shortages and Strategies to Address These Shortages*.; 2012.

20. Beidas RS, Edmunds JM, Marcus SC, Kendall PC. Training and consultation to promote implementation of an empirically supported treatment: a randomized trial. *Psychiatr Serv*. 2012;63(7):660-665. doi:10.1176/appi.ps.201100401

21. Apter AJ, Wan F, Reisine S, et al. The association of health literacy with adherence and outcomes in moderate-severe asthma. *J Allergy Clin Immunol*. 2013;132(2):321-327. doi:10.1016/j.jaci.2013.02.014

22. Health Literacy Tool Shed. https://healthliteracy.bu.edu/. Accessed May 12, 2017.

23. Brown N, Gallagher R, Fowler C, Wales S. Asthma management self-efficacy in parents of primary school-age children. *J Child Heal Care*. 2014;18(2):133-144. doi:10.1177/1367493512474724

24. Bodenheimer T, Lorig K, Holman H, Grumbach K. Patient self-management of chronic disease in primary care. *JAMA*. 2002;288(19):2469-2475.

25. Morawska A, Stelzer J, Burgess S. Parenting Asthmatic Children: Identification of Parenting Challenges. *https://doi.org/101080/02770900802040050*. 2009;45(6):465-472. doi:10.1080/02770900802040050

26. Conn KM, Halterman JS, Fisher SG, Yoos HL, Chin NP, Szilagyi PG. Parental beliefs about medications and medication adherence among urban children with asthma. *Ambul Pediatr*. 1998;5(5):306-310. doi:10.1367/A05-004R1.1

27. Torpy JM, Campbell A, Glass RM. Chronic Diseases of Children. *JAMA*. 2010;303(7):682. doi:10.1001/jama.303.7.682

28. Brown P, Gonzalez M SR. Economic Burden of Chronic Disease in California FAQs – Frequently Asked Questions. http://cbcd.ucmerced.edu/Health/start. Published 2017. Accessed May 4, 2017.

29. Pinnock H, Parke HL, Panagioti M, et al. Systematic meta-review of supported self-management for asthma: a healthcare perspective. *BMC Med*. 2017;15(1):64. doi:10.1186/s12916-017-0823-7

30. Lee H, McCullough C, MDRC, (NASHP) NA for SHP. The Effectiveness of Interventions to Address Childhood Asthma: A Scan of the Literature and Current Approaches. MDRC Working Paper. *Mdrc*. 2016;(August). https://www.mdrc.org/sites/default/files/2016_The_Effectiveness_of_Interventions_to_Address_Childhood_Asthma.pdf.

31. Krieger J, Song L, Philby M. Community health worker home visits for adults with

uncontrolled asthma: the HomeBASE Trial randomized clinical trial. *JAMA Intern Med*. 2015;175(1):109-117. doi:10.1001/jamainternmed.2014.6353

32. Fisher EB, Strunk RC, Highstein GR, et al. A Randomized Controlled Evaluation of the Effect of Community Health Workers on Hospitalization for Asthma. *Arch Pediatr Adolesc Med*. 2009;163(3):225. doi:10.1001/archpediatrics.2008.577

33. Martin MA, Mosnaim GS, Olson D, Swider S, Karavolos K, Rothschild S. Results from a community-based trial testing a community health worker asthma intervention in Puerto Rican youth in Chicago. *J Asthma*. 2015;52(1):59-70. doi:10.3109/02770903.2014.950426

34. Parker EA, Israel BA, Williams M, et al. Community Action Against Asthma Examining the Partnership Process of a Community-based Participatory Research Project.

35. Turyk M, Banda E, Chisum G, et al. A multifaceted community-based asthma intervention in Chicago: effects of trigger reduction and self-management education on asthma morbidity. *J Asthma*. 2013;50(7):729-736. doi:10.3109/02770903.2013.796971

36. Horner SD, Brown A. Evaluating the effect of an asthma self-management intervention for rural families. *J Asthma*. 2014;51(2):168-177. doi:10.3109/02770903.2013.855785

37. Capitman JA, Gonzalez A, Ramirez M, Pacheco TL. The Effectiveness of a Promotora Health Education Model for Improving Latino Health Care Access in California's Central Valley. *Cent Val Heal Policy Insitute*. 2009. https://www.fresnostate.edu/chhs/cvhpi/documents/cms-final-report.pdf. Accessed July 28, 2017.

38. Rashid S, Carcel C, Morphew T, Amaro S, Galant S. Effectiveness of a promotora home visitation program for underserved Hispanic children with asthma. *LJAS J Asthma*. 2014;52(5):478-484.

39. Ponieman D, Wisnivesky JP, Leventhal H, Musumeci-Szabó TJ, Halm EA. Impact of positive and negative beliefs about inhaled corticosteroids on adherence in inner-city asthmatic patients. *Ann Allergy, Asthma Immunol*. 2009;103(1):38-42. doi:10.1016/S1081-1206(10)60141-X

40. Cohen R, Franco K, Motlow F, Reznik M, Ozuah PO. Perceptions and Attitudes of Adolescents with Asthma. *J Asthma*. 2003;40(2):207-211. doi:10.1081/JAS-120017992

41. Brown PM, Cameron LD, Ramondt S. Sustainability of Behavioral Interventions: Beyond Cost-Effectiveness Analysis. *Int J Behav Med*. 2015;22(3):425-433. doi:10.1007/s12529-014-9437-z

42. Garbutt JM, Banister C, Highstein G, et al. Telephone coaching for parents of children with asthma: Impact and lessons learned. *Arch Pediatr Adolesc Med*. 2010;164(7):625-630. doi:164/7/625 [pii]\r10.1001/archpediatrics.2010.91 [doi]

43. Goldman R, Jm G, Banister C, Highstein G, Epstein SR. Telephone coaching program improves asthma control in children. *J Pediatr*. 2011;158:169-170. doi:10.1016/j.jpeds.2010.09.074

44. Harris KM, Kneale D, Lasserson TJ, McDonald VM, Grigg J, Thomas J. School-based self management interventions for asthma in children and adolescents: a mixed methods systematic review. In: Harris KM, ed. *Cochrane Database of Systematic Reviews*. Chichester, UK: John Wiley & Sons, Ltd; 2015. doi:10.1002/14651858.CD011651

45. Bennett GG, Glasgow RE. The delivery of public health interventions via the Internet: actualizing their potential. *Annu Rev Public Health*. 2009;30:273-292. doi:10.1146/annurev.publhealth.031308.100235

46. Stewart M, Letourneau N, Masuda JR, Anderson S, McGhan S. Impacts of online peer support for children with asthma and allergies: “It just helps you every time you can’t breathe well.” *J Pediatr Nurs*. 2013;28(5):439-452. doi:10.1016/j.pedn.2013.01.003

47. Levy JI, Brugge D, Peters JL, Clougherty JE, Saddler SS. A community-based participatory research study of multifaceted in-home environmental interventions for pediatric asthmatics in public housing. *Soc Sci Med*. 2006;63(8):2191-2203. doi:10.1016/j.socscimed.2006.05.006

48. Freeman ER, Brugge D, Bennett-Bradley WM, Levy JI, Rivera Carrasco E. Challenges of Conducting Community-Based Participatory Research in Boston_s Neighborhoods to Reduce Disparities in Asthma. *J Urban Heal Bull New York Acad Med*. 83(6). doi:10.1007/s11524-006-9111-0

49. Bryant-Stephens T, Kurian C, Guo R, Zhao H. Impact of a household environmental intervention delivered by lay health workers on asthma symptom control in urban, disadvantaged children with asthma. *Am J Public Health*. 2009;99 Suppl 3(Suppl 3):S657-65. doi:10.2105/AJPH.2009.165423

50. Prevention NAE and. Diagnosis and Management. *J Allergy Clin Immunol Nov*. 2007;120(5 suppl):s94-138. doi:10.1016/j.jaci.2007.09.029

51. Okelo SO, Butz AM, Sharma R, et al. Interventions to modify health care provider adherence to asthma guidelines: a systematic review. *Pediatrics*. 2013;132(3):517-534. doi:10.1542/peds.2013-0779

52. Sadatsafavi M, Rousseau R, Chen W, Zhang W, Lynd L, FitzGerald JM. The preventable burden of productivity loss due to suboptimal asthma control: A population -based study. *Chest*. 2014;145(4):787-793. doi:10.1378/chest.13-1619

53. Peters SP, Ferguson G, Deniz Y, Reisner C. Uncontrolled asthma: A review of the prevalence, disease burden and options for treatment. *Respir Med*. 2006;100(7):1139-1151. doi:10.1016/j.rmed.2006.03.031

54. Goetzel RZ, Ozminkowski RJ, Villagra VG, Duffy J. Return on investment in disease management: a review. *Health Care Financ Rev*. 2005;26(4):1-19. http://www.ncbi.nlm.nih.gov/pubmed/17288065. Accessed July 28, 2017.

55. Krieger JW, Takaro TK, Song L, Weaver M. The Seattle-King County Healthy Homes Project: A Randomized, Controlled Trial of a Community Health Worker Intervention to Decrease Exposure to Indoor Asthma Triggers. *Am J Public Health*. 2005;95(4). doi:10.2105/AJPH.2004.042994

56. Karnick P, Margellos-Anast H, Seals G, Whitman S, Aljadeff G, Johnson D. The Pediatric Asthma Intervention: A Comprehensive Cost-Effective Approach to Asthma Management in a Disadvantaged Inner-City Community. *J Asthma*. 2007;44(1):39-44. doi:10.1080/02770900601125391

57. Morgan WJ, Crain EF, Gruchalla RS, et al. Results of a Home-Based Environmental Intervention among Urban Children with Asthma. *N Engl J Med*. 2004;351(11):1068-1080. doi:10.1056/NEJMoa032097

58. Nurmagambetov TA, Barnett SBL, Jacob V, et al. Economic Value of Home-Based, Multi-Trigger, Multicomponent Interventions with an Environmental Focus for Reducing Asthma Morbidity. *Am J Prev Med*. 2011;41(2):S33-S47. doi:10.1016/j.amepre.2011.05.011

59. O’Byrne PM, Pedersen SS, Schatz M, et al. The Poorly Explored Impact of Uncontrolled Asthma. *Chest*. 2013;143(2):511-523. doi:10.1378/chest.12-0412

60. Boothroyd RI, Fisher EB. Peers for progress: promoting peer support for health around the world. *Fam Pract*. 2010;27 Suppl 1(suppl_1):i62-8. doi:10.1093/fampra/cmq017

61. Baumann LC, Frederick N, Betty N, Jospehine E, Agatha N. A Demonstration of Peer Support for Ugandan Adults With Type 2 Diabetes. *Int J Behav Med*. 2015;22(3):374-383. doi:10.1007/s12529-014-9412-8

62. Koster ES, Wijga AH, Koppelman GH, et al. Uncontrolled asthma at age 8: The importance of parental perception towards medication. *Pediatr Allergy Immunol*. 2011;22(5):462-468. doi:10.1111/j.1399-3038.2011.01150.x

63. Dennis CL. Peer support within a health care context: A concept analysis. *Int J Nurs Stud*. 2003;40(3):321-332. doi:10.1016/S0020-7489(02)00092-5

64. Stewart M, Letourneau N, Masuda J, Anderson S, McGhan S. Online Solutions to Support Needs and Preferences of Parents of Children With Asthma and Allergies. *J Fam Nurs*. 2011;17(3):357-379.

65. Building Peer Support Programs to Manage Chronic Disease: Seven Models for Success - CHCF.org. http://www.chcf.org/publications/2006/12/building-peer-support-programs-to-manage-chronic-disease-seven-models-for-success. Accessed October 4, 2017.

66. Heisler M, Vijan S, Makki F, Piette JD. Diabetes Control With Reciprocal Peer Support Versus Nurse Care Management. *Ann Intern Med*. 2010;153(8):507. doi:10.7326/0003-4819-153-8-201010190-00007

67. Wilson SR, Scamagas P, Grado J, et al. The Fresno Asthma Project: A Model Intervention to Control Asthma in Multiethnic, Low-Income, Inner-City Communities. *Heal Educ Behav Off Publ Soc Public Heal Educ*. 2015;25(1):79-98. doi:10.1177/109019819802500107

68. Asthma Home Environment Checklist | Asthma | US EPA. https://19january2017snapshot.epa.gov/asthma/asthma-home-environment-checklist_.html. Accessed July 27, 2022.

69. Juniper EF, Guyatt GH, Cox FM, Ferrie PJ KD. Development and validation of the Mini Asthma Quality of Life Questionnaire. *Eur Respir J*. 1999;14(32):8.

70. Wing A, Upton J, Svensson K, Weller P, Fletcher M, Walker S. The standardized and mini versions of the PAQLQ are valid, reliable, and responsive measurement tools. *J Clin Epidemiol*. 2012;65(6):643-650. doi:10.1016/J.JCLINEPI.2011.12.009

71. Schatz M, Sorkness CA, Li JT, et al. Asthma Control Test: Reliability, validity, and responsiveness in patients not previously followed by asthma specialists. *J Allergy Clin Immunol*. 2006;117(3):549-556. doi:10.1016/J.JACI.2006.01.011

72. CCAC. CCAC webpage. Our Story. http://cencalasthma.org/aboutccac/. Accessed July 30, 2022.

73. Devlin NJ, Brooks R. EQ-5D and the EuroQol Group: Past, Present and Future. *Appl Health Econ Health Policy*. 2017;15(2):127-137. doi:10.1007/S40258-017-0310-5

74. Balestroni G, Bertolotti G. EuroQol-5D (EQ-5D): An instrument for measuring quality of life. *Monaldi Arch Chest Dis - Card Ser*. 2012;78(3):155-159. doi:10.4081/monaldi.2012.121

75. Simon Pickard A, Wilke C, Jung E, Patel S, Stavem K, Lee TA. Use of a preference-based measure of health (EQ-5D) in COPD and asthma. *Respir Med*. 2008;102(4):519-536. doi:10.1016/j.rmed.2007.11.016

76. Grossoehme DH. Overview of Qualitative Research. *J Health Care Chaplain*. 2014;20(3):109-122. doi:10.1080/08854726.2014.925660

77. Nathalie duRivage M, 1, Michelle Ross P, et al. Asthma Control Test: Comparing Parent Proxy With Parent and Child Report for Children 6 to 12 Years. *Clin Pediatr (Phila)*. 2017;56(4):341-347. doi:10.1177/0009922816675013

78. Minard JP, Thomas NJ, Olajos-Clow JG, et al. Assessing the burden of childhood asthma: validation of electronic versions of the Mini Pediatric and Pediatric Asthma Caregiver???s Quality of Life Questionnaires. *Qual Life Res*. 2016;25(1):63-69. doi:10.1007/s11136-015-1055-y

79. Butz A, Pham L, Lewis L, et al. Rural Children with Asthma: Impact of a Parent and Child Asthma Education Program. *J Asthma*. 2005;42(10):813-821. doi:10.1080/02770900500369850

80. Wigal JK, Stout C, Brandon M, et al. The Knowledge, Attitude, and Self-Efficacy Asthma Questionnaire. *Chest*. 1993;104(4):1144-1148. doi:10.1378/CHEST.104.4.1144

81. D'Alonzo KT. Getting started in CBPR: lessons in building community partnerships for new researchers K T D'Alonzo Getting started in CBPR. *Nurs Inq*. 2010;17(4):282-288. https://frodon.univ-paris5.fr/url?http://search.ebscohost.com/login.aspx?direct=true&db=aph&AN=55088537&lang=fr&site=ehost-live.

82. Lai AY, Stewart SM, Wan A, et al. Development and evaluation of a training workshop for lay health promoters to implement a community-based intervention program in a public low rent housing estate: The Learning Families Project in Hong Kong. *PLoS One*. 2017;12(8):e0183636. doi:10.1371/journal.pone.0183636

## Apendix 1 Focus Group/Interview

### Script for Community Stakeholders Focus Groups/ Interviews

As a public health researcher, I am interested in finding ways to support and augment the efforts of community stakeholders in the education of asthmatics and their caregivers on asthma management at home. Your participation on this interview is very important to determine what type of intervention our community needs.

Q1 – In your experience, what are the main reasons why asthmatic children have difficulty adhering to their asthma treatment plan?

Q2 – I am particularly interested on peer supported interventions. There are many research studies showing that, when people have support from their peers, it becomes not only easier to make changes to their health behaviors, but it is also more likely that the changes will be more significant and effective to obtain better health outcomes. In a Peer supported intervention, the parents who have already been trained and are successful in controlling their children's symptoms can become a support for newcomers. How do you think the addition of peer support to asthma education efforts would be received in our area?

- **Access to cell phones and/or internet**
- **Time to call each other**
- **Would more experienced parents be willing or able to support others to learn? (time, language, knowledge, efforts)**
- **Would community stakeholders be supportive to introduce a peer support program in the community?**

Q3 – Here is a list of commonly known interventions for asthma management. How would you rate the acceptability of these interventions in our community?

Types of Community Interventions

| | Very well accepted | Somewhat accepted | Not Accepted |
|---|---|---|---|
| **Home visits by health educators (CHW or Promotoras)** | 1☐ | 2☐ | 3☐ |
| **Healthcare Navigators on phone** | 1☐ | 2☐ | 3☐ |
| **Phone Apps: Reminders of doctor's appointments, medication refill and asthma trigger prevention** | 1☐ | 2☐ | 3☐ |
| **Training of school personnel** | 1☐ | 2☐ | 3☐ |
| **Schoolchildren's education on asthma** | 1☐ | 2☐ | 3☐ |
| **Parent classes** | 1☐ | 2☐ | 3☐ |
| **Support from knowledgeable peers** | 1☐ | 2☐ | 3☐ |

Q4 - I would like to know if your organization have any type of educational intervention on asthma home management (if not: partnership with other organizations or providers of such educational intervention).

Q5 – Which community resources have you and/or your organization been using to assist your asthmatic patients? (ex: social services, medication and healthcare for uninsured, home triggers remediation programs, asthma education programs, etc.)

Q6 - Is there anything you feel that the other organizations or community stakeholders in our area could do to assist your organization in your efforts to decrease the burden of asthma?

Q7 - During the COVID-19 lock down, how is your organization maintaining contact with asthmatic patients in the community to ensure they are keeping up with their treatment plan?

- **Did you notice any difference on symptoms of asthmatic patients during the lock down? Did staying home increase asthma symptoms due to exposure to indoor triggers?**
- **Did seasonal allergies play any role in asthma during shelter in place?**
- **Any change with the improvement of air quality before the wildfires?**
- **How are the wildfires impacting the asthmatic patients?**

Q8 – How do you see the use of communication media in the management of Asthma, especially in the post COVID world? (Ex. TV, radio, billboards, social media, YouTube videos, podcasts, Zoom meetings, etc.)

Q9– How do you see the role of the asthma coalition in our community, especially in supporting the stakeholders and facilitating the healthy interaction between stakeholders?

Q8 – How do you see the use of communication media in the management of Asthma, especially in the post COVID world? (Ex. TV, radio, billboards, social media, YouTube videos, podcasts, Zoom meetings, etc.)

Q9– How do you see the role of the asthma coalition in our community, especially in supporting the stakeholders and facilitating the healthy interaction between stakeholders?

**Apendix 2 Quantitative Questionnaire**

# Air Quality and COVID

Start of Block: Consent

Q189 **CONSENT TO PARTICIPATE IN A RESEARCH STUDY UNIVERSITY OF CALIFORNIA, MERCED** **Title of the Study**: Impact of COVID-19 on Air Quality and Asthma

Investigators: Paul Brown, PhD, Gilda Zarate-Gonzalez, MPH CLC, Gracy Mantoan MD MSPH, David Veloz PhD, Ricardo Cisneros PhD MPH, Social Sciences, Humanities and the Arts, University of California, Merced. Email: pbrown3@ucmerced.edu and/or gzarate-gonzalez@ucmerced.edu, gmantoan@ucmerced.edu, dveloz@ucmerced.edu, rcisneros@ucmerced.edu.

**PURPOSE**

You are invited to participate in a research study that aims to understand the impact of COVID-19 on air quality and asthma. Anyone over 18 years of age and is a student attending UC Merced are invited to participate in this study. We anticipate that up to 300 participants will complete this online survey.

**PROCEDURES**

The study involves completing an anonymous online survey questionnaire. The questionnaire asks about your health status, the factors that have changed since the COVID-19 pandemic, ways that you expect to resume normalcy, and some of the efforts that you will maintain or support. In addition, we will ask your views on the current restrictions. This online survey takes about 25 minutes to complete.

**RISKS**

There are no risks of physical discomfort from participation in this study. Responding to questions about stress could arouse feelings of discomfort or distress, but these feelings are likely to be temporary and similar to those normally experienced in the course of daily life. You can quit the survey at any time. **BENEFITS**

It is possible that you will not benefit directly by participating in this study. However, you may indirectly benefit by becoming more aware of your views about the changes in air quality, respiratory diseases, COVID-19 and impact of the restrictions on your daily life.

**CONFIDENTIALITY**

Your responses to this research will remain anonymous. You do not need to share your name or any other information that would reveal your identity. All information will be kept strictly confidential.

**COSTS/COMPENSATION**

There is no cost to you beyond the time and effort required to complete the online questionnaire. You will be compensated upon survey completion by your panel provider.

**RIGHT TO REFUSE OR WITHDRAW**

Participation in this study is voluntary. You may refuse to participate in this study. You may change your mind and stop completing the questionnaire at any time. You may choose to not answer any questions on the questionnaire. Should you decide not to continue the survey at any point, you will still receive the credits.

**QUESTIONS**

If you have any questions about this research project please contact Gilda Zarate-Gonzalez at gzarate-gonzalez@ucmerced.edu.

For questions about your rights while taking part in this study call the Office of Research at IRB 209-228-4613 or write to the Office of Research, 5200 North Lake Rd, UC Merced, Merced, CA 95343. The Office of Research will inform the Institutional Review Board which is a group of people who review the research to protect your rights. If you have any complaints or concerns about this study, you may address them to Ramesh Balasubramaniam, IRB Chair 209-228-2314, irbchair@ucmerced.edu. **CONSENT**

BY SELECTING "AGREE" BELOW AND PROCEEDING WITH THE SURVEY INDICATES THAT YOU HAVE DECIDED TO VOLUNTEER AS A RESEARCH SUBJECT AND THAT YOU HAVE READ AND UNDERSTOOD THE INFORMATION PROVIDED ABOVE.

○ **Agree (1)**

○ **Don't Agree (2)**

Page Break

Q372 What is the zip code of your primary residence?

_____

End of Block: Consent

Start of Block: Asthma Qualifier

Q293 Have you ever been diagnosed with asthma?

- **Yes (1)**
- **No (2)**

Q294 Do you have a child who has ever been diagnosed with asthma?

- **Yes (1)**
- **No (2)**

End of Block: Asthma Qualifier

Start of Block: Air Quality

Q209 **COVID-19, Asthma and Air Quality** The COVID-19 pandemic has affected our lives in many ways. The shelter in place measures, in an attempt to stop the spread of the virus, caused people to stay home, lowering the number of transportation vehicles circulating, and stopping some industrial activities that cause air pollution. Scientists are interested on learning how these changes have impacted your life. The following questions will help researchers understand how it has affected the lives of the people who live in the San Joaquin Valley. Your answers are very important, as a member of

our community. We will be asking a number of questions relating to how life was before the COVID-19 pandemic began to how it has been afterwards. In doing so, we will pick the date of March 1 to indicate the start of the pandemic. We will be referring to the time before March 1st, 2020 as the “pre-COVID-19 period”, and after March 1st as the “COVID-19 period.”

Q210 To begin, we wanted to ask you some questions about the air quality in the city you are living in. What city were you mainly living in prior to March 1st (the Pre-COVID-19 period)?

_____

Q211 What city are you mainly living in after March 1st (the COVID-19 period)?

_____

Page Break

Q212 In general, aside from any smoke caused by wildfires, what was the air quality like in the city you were living in during the pre-COVID-19 period (before March 1st),?

- **Very unhealthy air quality (1)**
- **Unhealthy (2)**
- **Unhealthy for sensitive groups (3)**
- **Moderately healthy (4)**
- **Good air quality (5)**

Q213 In general, aside from any smoke caused by wildfires, what has been the air quality like in your city in the COVID-19 period (after March 1st)?

- **Very unhealthy air quality (1)**
- **Unhealthy (2)**
- **Unhealthy for sensitive groups (3)**
- **Moderately healthy (4)**
- **Good air quality (5)**

Page Break

Q176 In the past 2 weeks, what has been the air quality like in your city?

- ○ **Very unhealthy air quality (1)**
- ○ **Unhealthy (2)**
- ○ **Unhealthy for sensitive groups (3)**
- ○ **Moderately healthy (4)**
- ○ **Good air quality (5)**

Page Break

Q214 Currently, at what time of day you generally notice air quality issues or air pollution? (Check as many as apply)

- ☐ **Morning (1)**
- ☐ **Afternon (2)**
- ☐ **Evening (3)**
- ☐ **All day is bad (4)**
- ☐ **I don't notice bad air in my city (5)**

Q215 In which seasons of the year do you usually notice more air quality issues or air pollution? (Check as many as apply)

- ☐ **Spring (1)**
- ☐ **Summer (2)**
- ☐ **Fall (3)**
- ☐ **Winter (4)**

Page Break

Q216 How do you check the air quality in your area? (check all that apply)

- ☐ **I look outside and see if the mountain range is clear (1)**
- ☐ **I look outside and see if the valley floor is clear (2)**
- ☐ **I rely on recommendations from the Valley Air District (3)**
- ☐ **I see the air quality flags in my kids' school (4)**
- ☐ **I have my own monitor at home (5)**
- ☐ **I check the Purple Air website (6)**
- ☐ **I check the internet (Please tell us where) (7)** _____
- ☐ **I get text messages from CalFire (8)**
- ☒ **I don't check the air quality (9)**
- ☐ **Other (10)** _____

Q217 What do you think a “bad air” day means? (check all that apply)

- ☐ **High mold/pollen levels in the air (1)**
- ☐ **High particle matter counts in the air (2)**
- ☐ **High ozone levels in the air (3)**
- ☐ **There is gray or brown haze outside (4)**
- ☐ **The hole in the ozone layer has made it unhealthy to be outside (5)**
- ☐ **The air is dirty/polluted (6)**
- ☐ **Other meaning: (7)** _____
- ☐ ⊗ **I don’t know what a “bad air” day means (8)**

Page Break

Q218 How informed do you feel about air quality in your city/community?

- **Not informed at all (1)**
- **Not very informed (2)**
- **Somewhat informed (3)**
- **Very informed (4)**
- **I don't know (5)**

Q219 How would you rate the information that you hear about air quality information in your region?

- **Inaccurate and incomplete (1)**
- **Accurate but incomplete (2)**
- **Accurate and complete (3)**
- **I don't know (4)**

Q220 What sources of information about the air quality in your city or community do you trust the most? (Check all that apply)

- ☐ **Research institutes (1)**
- ☐ **Universities (2)**
- ☐ **Local health authorities (3)**
- ☐ **Citizens' associations or community-based organizations (4)**
- ☐ **Environmental protection agencies (5)**
- ☐ **City government and Municipalities (6)**
- ☐ **Television or Radio (7)**
- ☐ **Internet (8)**

End of Block: Air Quality

Start of Block: Transportation

Q222 **We would now like to ask you some questions about your transportation in the Pre-COVID-19 period and in the COVID-19 period.**

In the Pre-COVID-19 period (before March 1st), approximately how many miles was your normal daily commute one-way?

- **Less than 5 miles (1)**
- **5-10 miles (2)**
- **11-15 miles (3)**
- **16-20 miles (4)**
- **21-30 miles (5)**
- **30+ miles (6)**
- **I don't regularly commute (7)**

---

X→

Q223 In the Pre-COVID-19 period (before March 1st), approximately how many days did you commute to work?

- **1 (1)**
- **2 (2)**
- **3 (3)**
- **4 (4)**
- **5 (5)**
- **6 or 7 (6)**
- **I don't regularly commute (7)**

Q224 In the Pre-COVID-19 period, what was your preferred mode of transportation?

- ○ **Public transport (e.g. bus, train etc.) (1)**
- ○ **Private car (your own or car share) (2)**
- ○ **Cycling (3)**
- ○ **Walking (4)**
- ○ **Ride hailing (e.g. taxi, uber etc.) (5)**
- ○ **Other: (6) _____**
- ○ **I don't regularly commute (7)**

Page Break

Q225 Approximately how many days do you commute to work right now?

- **1 (1)**
- **2 (2)**
- **3 (3)**
- **4 (4)**
- **5 (5)**
- **6 or 7 (6)**
- **I don't regularly commute (7)**

Q226 Approximately how many miles is your normal daily commute one-way right now?

- **Less than 5 miles (1)**
- **5-10 miles (2)**
- **11-15 miles (3)**
- **16-20 miles (4)**
- **21-30 miles (5)**
- **30+ miles (6)**
- **I don't regularly commute (7)**

---

Q227 What is your preferred mode of transportation right now?

- **Public transport (e.g. bus, train etc.) (1)**
- **Private car (your own or car share) (2)**
- **Cycling (3)**
- **Walking (4)**
- **Ride hailing (e.g. taxi, uber etc.) (5)**
- **Other: (6) _____**
- **I don't regularly commute (7)**

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Page Break

Q229 Do you currently own an electric or hybrid car?

- **Yes (1)**
- **No (2)**

---

Q231 Since the start of the COVID-19 pandemic, has your interest in buying an electric or hybrid car changed?

- **My interest has decreased a lot (1)**
- **My interest has decreased a little (2)**
- **My interest has stayed the same (3)**
- **My interest has increased a little (4)**
- **My interest has increased a lot (5)**
- **Not applicable - I have never considered purchasing an electric car (6)**

---

Q232 How much of a concern are each of the factors when you think about purchasing an electric or hybrid car?

| | Not at all a concern (1) | A small concern (2) | Somewhat a concern (3) | Very much a concern (4) | Don't know/need more information (5) |
|---|---|---|---|---|---|
| Too expensive (4) | ○ | ○ | ○ | ○ | ○ |
| Too complicated to purchase (12) | ○ | ○ | ○ | ○ | ○ |
| Charging stations are not widely available in my city or community (5) | ○ | ○ | ○ | ○ | ○ |
| Charging stations are not widely available when I travel long distances (13) | ○ | ○ | ○ | ○ | ○ |
| Too small for my family/Not spacious enough (7) | ○ | ○ | ○ | ○ | ○ |
| Not safe (8) | ○ | ○ | ○ | ○ | ○ |
| Don’t like the look (9) | ○ | ○ | ○ | ○ | ○ |
| Don’t go fast enough (10) | ○ | ○ | ○ | ○ | ○ |
| Other (11) | ○ | ○ | ○ | ○ | ○ |

End of Block: Transportation

Start of Block: City

Q416 In which **city** do you currently reside?

_____

End of Block: City

Start of Block: Air Pollution Views

Q234 How effective do you think the following organizations are in helping to improve the quality of air?

| | Not at all (1) | A little (2) | Somewhat (3) | Very much (4) | Don't know (5) |
|---|---|---|---|---|---|
| The U.S. Government (1) | ○ | ○ | ○ | ○ | ○ |
| The Environmental Protection Agency (EPA) (4) | ○ | ○ | ○ | ○ | ○ |
| The State of California (5) | ○ | ○ | ○ | ○ | ○ |
| The San Joaquin Valley Air District (6) | ○ | ○ | ○ | ○ | ○ |
| County supervisors/City Councils (7) | ○ | ○ | ○ | ○ | ○ |
| Farmers, growers and ranchers (8) | ○ | ○ | ○ | ○ | ○ |
| Grassroot community organizations (9) | ○ | ○ | ○ | ○ | ○ |
| Environmental organizations (10) | ○ | ○ | ○ | ○ | ○ |
| Scientists and Researchers (11) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q235 In deciding what types of policies to enact to reduce air pollution, how important is it that organizations (such as the EPA, the State, or the Air Control Boards) consider the following factors:

| | Not at all important (1) | A little important (2) | Important (3) | Very important (4) | Extremely important (5) |
|---|---|---|---|---|---|
| Cost that it will impose on businesses (1) | ○ | ○ | ○ | ○ | ○ |
| Cost to consumers (4) | ○ | ○ | ○ | ○ | ○ |
| Reducing PM2.5 (5) | ○ | ○ | ○ | ○ | ○ |
| Reducing ozone (6) | ○ | ○ | ○ | ○ | ○ |
| Making the air look cleaner (7) | ○ | ○ | ○ | ○ | ○ |
| Having it be locally run as opposed to by the EPA (8) | ○ | ○ | ○ | ○ | ○ |
| The impact it will have on low income communities (9) | ○ | ○ | ○ | ○ | ○ |
| Making sure that people in the Bay Area also have to reduce their pollution (10) | ○ | ○ | ○ | ○ | ○ |
| Getting agriculture to change its practices (11) | ○ | ○ | ○ | ○ | ○ |
| Reduce heating from fireplaces or woodstoves (12) | ○ | ○ | ○ | ○ | ○ |
| Eliminate or reduce large incinerators (13) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| Reduce the amount of pollution from commercial cooking/kitchens (14) | ○ | ○ | ○ | ○ | ○ |
| Reducing pollution from dairies (15) | ○ | ○ | ○ | ○ | ○ |
| Eliminate pesticide drift (16) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q236 Please express how much do you agree or disagree on the following statements.

| | Strongly Disagree (1) | Somewhat Disagree (2) | Neither agree nor disagree (3) | Somewhat Agree (4) | Strongly Agree (5) |
|---|---|---|---|---|---|
| “During the COVID-19 period or shelter-in-place, I have sensed/experienced good clean air and I don't want to go back to the air pollution levels we previously had” (1) | ○ | ○ | ○ | ○ | ○ |
| “Cities must take effective measures to protect citizens from air pollution, even if this requires reallocating public space to walking, cycling and public transport” (4) | ○ | ○ | ○ | ○ | ○ |
| “Cities must take effective measures to protect citizens from air pollution, even if it means preventing polluting cars from entering the city” (5) | ○ | ○ | ○ | ○ | ○ |
| “I think we need to resume our normal lives soon and must accept that air pollution will rise again” (6) | ○ | ○ | ○ | ○ | ○ |
| “More public space in your nearest town/ city should be reserved for public transport (e.g. by expanding bus lanes)” (7) | ○ | ○ | ○ | ○ | ○ |
| “More public space in your city and nearest towns should be reserved for cycling” (8) | ○ | ○ | ○ | ○ | ○ |

| | | | | | |
|---|---|---|---|---|---|
| "More public space should be reserved for pedestrians" (9) | ○ | ○ | ○ | ○ | ○ |
| "More policies should be adopted to stop polluting cars and trucks from entering the city, for example through Zero-Emission Zones" (10) | ○ | ○ | ○ | ○ | ○ |
| "More companies should allow their workers to continue working from home or telecommuting" (11) | ○ | ○ | ○ | ○ | ○ |
| "More cities and counties should work together to create clean, fast and reliable regional transportation systems to connect the Central Valley" (12) | ○ | ○ | ○ | ○ | ○ |

End of Block: Air Pollution Views

Start of Block: Health Conditions

Q237 Thank you. We now want to ask you some questions about your health and whether you or any family members have health conditions made worse by air pollution.

Page Break

Q177 **In the Pre-COVID Period**, would you say that your health was

- **Excellent (1)**
- **Very good (2)**
- **Good (3)**
- **Fair (4)**
- **Poor (5)**

Q178 Would you say your current health is:

- **Excellent (1)**
- **Very good (2)**
- **Good (3)**
- **Fair (4)**
- **Poor (5)**

Page Break

Q238 We'd like to start by asking you about your health in the Pre-COVID-19 period and right now. Please indicate which statements best describe your own health state in the Pre-COVID-19 period (before March 1st).
**For each question, choose the statement that best described your health state in the Pre-COVID period (before March 1st):**

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Q239 Mobility

- ○ **I had no problems in walking around (1)**
- ○ **I had some problems in walking around (2)**
- ○ **I was confined to bed (3)**

---

Q240 Personal Care

- ○ **I had no problems with personal care (1)**
- ○ **I had some problems washing or dressing myself (2)**
- ○ **I was unable to wash or dress myself (3)**

---

Q241 Usual Activities

- ○ **I had no problems with performing my usual activities (1)**
- ○ **I had some problems with performing my usual activities (2)**
- ○ **I was unable to perform my usual activities (3)**

---

Q242 Pain/Discomfort

- ○ **I had no pain or discomfort (1)**
- ○ **I had moderate pain or discomfort (2)**
- ○ **I had extreme pain or discomfort (3)**

---

Q243 Anxiety/Depression

- ○ **I was not anxious or depressed (1)**
- ○ **I was moderately anxious or depressed (2)**
- ○ **I was extremely anxious or depressed (3)**

---

Page Break

Q245 We'd like to ask you about your health right now.
Please indicate which statements best describe your own current health state.
For each question, choose the statement that best describes your health state right now.

Q246

Mobility

- **I have no problems in walking around (1)**
- **I have some problems in walking around (2)**
- **I am confined to bed (3)**

Q247 Personal Care

- **I have no problems with personal care (1)**
- **I have some problems washing or dressing myself (2)**
- **I am unable to wash or dress myself (3)**

---

Q248 Usual Activities

- **I have no problems with performing my usual activities (1)**
- **I have some problems with performing my usual activities (2)**
- **I have unable to perform my usual activities (3)**

---

Q249 Pain/Discomfort

- **I have no pain or discomfort (1)**
- **I have moderate pain or discomfort (2)**
- **I have extreme pain or discomfort (3)**

---

Q250 Anxiety/Depression

- ○ **I am not anxious or depressed (1)**
- ○ **I am moderately anxious or depressed (2)**
- ○ **I am extremely anxious or depressed (3)**

Page Break

End of Block: Health Conditions

Start of Block: Smoking

Q259 How often do you currently smoke or use each of the following products?

| | Never (1) | Less than once a month (2) | A couple of times a month (3) | At least once a week (4) | Nearly every day (5) |
|---|---|---|---|---|---|
| Cigarettes (1) | ○ | ○ | ○ | ○ | ○ |
| Cigars (4) | ○ | ○ | ○ | ○ | ○ |
| Cigarillos (5) | ○ | ○ | ○ | ○ | ○ |
| Hookahs (6) | ○ | ○ | ○ | ○ | ○ |
| Vaping products (7) | ○ | ○ | ○ | ○ | ○ |
| Marijuana (8) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q260 Have you smoked or used each of the following in the past 30 days?

| | Yes (1) | No (2) |
|---|---|---|
| Cigarettes (1) | ○ | ○ |
| Cigars (4) | ○ | ○ |
| Cigarillos (5) | ○ | ○ |
| Hookahs (6) | ○ | ○ |
| Vaping products (7) | ○ | ○ |
| Marijuana (8) | ○ | ○ |

Page Break

Q261 Have you smoked or used each of the following 100 times or more in your life?

| | Yes (1) | No (2) |
|---|---|---|
| Cigarettes (1) | ○ | ○ |
| Cigars (4) | ○ | ○ |
| Cigarillos (5) | ○ | ○ |
| Hookahs (6) | ○ | ○ |
| Vaping products (7) | ○ | ○ |
| Marijuana (8) | ○ | ○ |

Page Break

Q262 Does anyone who is living with you smoke or vape regularly?

- ○ **Yes (1)**
- ○ **No (2)**

---

Q179 Have **you** been diagnosed with any of these health conditions that may make you particularly susceptible to air quality and environmental problems? (Check as many as apply)

- ☐ **Asthma (1)**
- ☐ **Chronic Cardiovascular Disease (2)**
- ☐ **Undergoing Chemotherapy or radiation therapy (3)**
- ☐ **Immune system suppressed by disease or other causes (4)**
- ☐ **Allergies (5)**
- ☐ **Other Chronic Respiratory Disease (6)**
- ☐ **Chronic Neurological Problems (7)**
- ☐ **COPD, Chronic Obstructive Pulmonary Disease (8)**
- ☐ **Other: (9) _____**

---

Q263 How does the outdoor air quality impact your health?

- ○ **Serious impact (1)**
- ○ **Moderate impact (2)**
- ○ **Minimum impact (3)**
- ○ **Insignificant impact (4)**
- ○ **No impact at all (5)**

Page Break

Q180 **Has anyone who is living with you** been diagnosed with any of these health conditions that may make you particularly susceptible to air quality and environmental problems? (Check as many as apply)

- ☐ **Asthma (1)**
- ☐ **Chronic Cardiovascular Disease (2)**
- ☐ **Undergoing Chemotherapy or radiation therapy (3)**
- ☐ **Immune system suppressed by disease or other causes (4)**
- ☐ **Allergies (5)**
- ☐ **Other Chronic Respiratory Disease (6)**
- ☐ **Chronic Neurological Problems (7)**
- ☐ **COPD, Chronic Obstructive Pulmonary Disease (8)**
- ☐ **Other: (9) _____**

Page Break

Q264 How does the outdoor air quality impact the health of people who are living with you?

- ○ **Serious impact (1)**
- ○ **Moderate impact (2)**
- ○ **Minimum impact (3)**
- ○ **Insignificant impact (4)**
- ○ **No impact at all (5)**

Page Break

Q266 How often do you feel that poor air quality affects you or people who are living with you in the following ways?

| | Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) |
|---|---|---|---|---|---|
| Breathlessness/having more difficulty in breathing (1) | ○ | ○ | ○ | ○ | ○ |
| Doing less outdoor activities (4) | ○ | ○ | ○ | ○ | ○ |
| Doing more to look after my skin (5) | ○ | ○ | ○ | ○ | ○ |
| Doing more to stay healthy (6) | ○ | ○ | ○ | ○ | ○ |
| Feeling depressed (7) | ○ | ○ | ○ | ○ | ○ |
| Irritation to eyes/nose/throat (8) | ○ | ○ | ○ | ○ | ○ |
| Skin problems (9) | ○ | ○ | ○ | ○ | ○ |
| Wanting to move to other less polluted place (10) | ○ | ○ | ○ | ○ | ○ |
| Asthma incidents or attacks (11) | ○ | ○ | ○ | ○ | ○ |
| Poor visibility (12) | ○ | ○ | ○ | ○ | ○ |
| Worrying about the living environment for children (13) | ○ | ○ | ○ | ○ | ○ |
| Please select "Rarely" for this statement (15) | ○ | ○ | ○ | ○ | ○ |
| Other (please specify) (14) | ○ | ○ | ○ | ○ | ○ |

End of Block: Smoking

Start of Block: COVID-19

Q267 Thank you. We would now like to ask about COVID-19.

Q268 Have you been diagnosed with COVID-19?

- **Yes (1)**
- **No (2)**

Q269 Did you require hospitalization for treatment?

- **Yes (1)**
- **No (2)**

Page Break

Q271 What level of **health threat** do you think COVID-19 poses to the following:

| | Not at all (1) | A minimum threat (2) | A moderate threat (3) | A high threat (4) | A very high threat (5) |
|---|---|---|---|---|---|
| Your local community (1) | ○ | ○ | ○ | ○ | ○ |
| Your family and friends (2) | ○ | ○ | ○ | ○ | ○ |
| You personally (3) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q181 People can have different responses to COVID-19, ranging from having no symptoms to having just flu like symptoms to being serious ill and requiring hospitalization to dying. So please answer this question based on what you know about COVID-19 and how sick you think you would be if you we to get COVID-19. **If you were to contract COVID, what statements do you think would best describe your own health state?**

---

Q182 Mobility

- ○ **I would have no problems in walking around (1)**
- ○ **I would have some problems in walking around (2)**
- ○ **I would be confined to bed (3)**

---

Q183 Personal Care

- ○ **I would have no problems with personal care (1)**
- ○ **I would have some problems washing or dressing myself (2)**
- ○ **I would be unable to wash or dress myself (3)**

---

Q184 Pain/Discomfort

- ○ **I would have no pain or discomfort (1)**
- ○ **I would have moderate pain or discomfort (2)**
- ○ **I would be in extreme pain or discomfort (3)**

---

Q185 Anxiety/Depression

- ○ **I would not be anxious or depressed (1)**
- ○ **I would be moderately anxious or depressed (2)**
- ○ **I would be extremely anxious or depressed (3)**

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Page Break

Q272 What level of **financial threat** do you think COVID-19 poses to the following:

| | Not at all (1) | A minimum threat (2) | A moderate threat (3) | A high threat (4) | A very high threat (5) |
|---|---|---|---|---|---|
| Your local community (1) | ○ | ○ | ○ | ○ | ○ |
| Your family and friends (2) | ○ | ○ | ○ | ○ | ○ |
| You personally (3) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q273 How much has COVID-19 impacted you?

| | Not true of me at all (1) | A little true of me (2) | Somewhat true of me (3) | True of me (4) | Very true of me (5) |
|---|---|---|---|---|---|
| COVID-19 has had a negative financial impact on me. (1) | ○ | ○ | ○ | ○ | ○ |
| I have lost job-related income due to COVID-19 (4) | ○ | ○ | ○ | ○ | ○ |
| I was already seeking employment, and am having more difficulty due to COVID-19 (5) | ○ | ○ | ○ | ○ | ○ |
| I have had a hard time getting needed resources such as food, toilet paper, or other supplies due to COVID-19 (6) | ○ | ○ | ○ | ○ | ○ |
| The COVID-19 Period has had a negative impact on my mental health (7) | ○ | ○ | ○ | ○ | ○ |

Page Break

Q274 In the beginning of the  COVID-19 Period (March, April, and May), how often did you practiced social distancing (this means: reducing your physical contact with other people in social, work, or school settings by avoiding large groups and staying 3-6 feet away from other people)?

- **Never  (1)**
- **Rarely  (2)**
- **Sometimes  (3)**
- **Most of the time  (4)**
- **Always  (5)**

Page Break

Q275 How often do you practice social distancing right now?

- **Never (1)**
- **Rarely (2)**
- **Sometimes (3)**
- **Most of the time (4)**
- **Always (5)**

Page Break

Q276 How much do you think wearing a mask and social distancing protects you from getting COVID-19 from others?

- **Not at all (1)**
- **A little bit (2)**
- **Somewhat (3)**
- **A lot (4)**
- **Fully protects me (5)**

Q277 How much do you think wearing a mask and social distancing protects others from getting COVID-19 from you?

- **Not at all (1)**
- **A little bit (2)**
- **Somewhat (3)**
- **A lot (4)**
- **Fully protects others (5)**

Page Break

Q285 If the air quality was bad, how likely would you be to wear a face mask or covering during peak hours outside?

- **Not at all likely (1)**
- **A little likely (2)**
- **Somewhat likely (3)**
- **Very likely (4)**
- **I don't know (5)**

Q286 If the air quality was bad, how likely would you be to encourage a child or family member to wear a face mask or covering during peak hours outside?

- **Not at all likely (1)**
- **A little likely (2)**
- **Somewhat likely (3)**
- **Very likely (4)**
- **I don't know (5)**

End of Block: COVID-19

Start of Block: Healthcare Access

Q312 We now would like to know about your access to healthcare during the COVID-19 period.

Page Break

Q314 How helpful are each of the following when you talk about your asthma?

| | Not helpful (1) | Slightly helpful (2) | Moderately helpful (3) | Quite helpful (4) | Extremely helpful (5) | Does not apply (6) |
|---|---|---|---|---|---|---|
| Family member (1) | ○ | ○ | ○ | ○ | ○ | ○ |
| Doctor/physician (4) | ○ | ○ | ○ | ○ | ○ | ○ |
| Nurse (5) | ○ | ○ | ○ | ○ | ○ | ○ |
| Friend (s) (6) | ○ | ○ | ○ | ○ | ○ | ○ |
| Promotora or Community Health Worker (7) | ○ | ○ | ○ | ○ | ○ | ○ |

Page Break

Q315 If you were assigned an asthma coach to help you learn how to control your asthma, how important would be the following coach's characteristics?

| | Not important (1) | Slightly important (2) | Moderately important (3) | Quite important (4) | Extremely important (5) | Does not apply (6) |
|---|---|---|---|---|---|---|
| Speaks my language (4) | ○ | ○ | ○ | ○ | ○ | ○ |
| Explains things in a way I understand (14) | ○ | ○ | ○ | ○ | ○ | ○ |
| Is also a parent of an asthmatic child (15) | ○ | ○ | ○ | ○ | ○ | ○ |
| Lives close (16) | ○ | ○ | ○ | ○ | ○ | ○ |
| I can call if I have question or concern (17) | ○ | ○ | ○ | ○ | ○ | ○ |
| Non-judgmental (18) | ○ | ○ | ○ | ○ | ○ | ○ |

Page Break

Q316 Suppose you had the opportunity to talk to another asthmatic who was trained in the issues that can arise regarding asthma control. How interested would you be?

- **Not interested (1)**
- **Somewhat interested (2)**
- **Very interested (3)**

Page Break

Q317 Once you learned how to control your asthma, would you be willing to support other asthmatics…

| | Yes (1) | Maybe (2) | No (3) |
|---|---|---|---|
| When they have questions? (1) | ○ | ○ | ○ |
| Once a week phone call? (4) | ○ | ○ | ○ |
| Once a week phone call and/or in case of emergency? (5) | ○ | ○ | ○ |

Page Break

Q318 Once you learned how to control your asthma, would you consider becoming an asthma coach?

- **Yes (1)**
- **Maybe (2)**
- **No (3)**

End of Block: Healthcare Access

Start of Block: Demographics

Q359 Please, let us know some information about you. This information is confidential and will be kept private; it helps us to understand the characteristics of our population in comparison with their points of view.

Page Break

Q360 What is your current age in years? (Enter a number)

_____

Q361 What is your sex?

- **Male (1)**
- **Female (2)**
- **Non-binary (3)**

Page Break

Q362 What is the highest level of school, college or vocational training that you have finished?

- ○ **Less than 9th grade (1)**
- ○ **9-12th grade, no diploma (2)**
- ○ **High school graduate (or GED/ equivalent) (3)**
- ○ **Associate's degree or Vocational Training (4)**
- ○ **Some college (no degree) (5)**
- ○ **Bachelor's degree (6)**
- ○ **Graduate or professional degree (7)**
- ○ **Refuse to answer (8)**
- ○ **Other: (9) _____**

Page Break

Q364 Do you live in an apartment complex?

- **Yes (1)**
- **No (2)**

Page Break

[Type here]

*Display This Question:*

*If Q364 = 2*

Q365 Do you rent or own your home?

- **Rent/Lease (1)**
- **Own (2)**

*Display This Question:*

*If Q364 = 2*

Q366 Approximately how old is the home you are living in?

- **2000 or newer (1)**
- **1978-2000 (2)**
- **Built before 1978 (3)**
- **Don't know (4)**

Page Break

Q367 How many people currently live in your home or apartment?

- **1 (I live alone) (1)**
- **2 (2)**
- **3 or 4 (3)**
- **4 to 10 (4)**
- **More than 10 (5)**

Page Break

Q368 In general, how often do you use the fireplace or woodstove in your home or apartment?

- **Everyday (1)**
- **2-3 days per week (2)**
- **Once a week (3)**
- **Once per month (4)**
- **Never / I don’t have a fireplace or woodstove (5)**

Page Break

Q369 Which of the following best describes your employment status?

- **Employed, working 40 or more hours per week (1)**
- **Employed, working 1-39 hours per week (2)**
- **Not Employed, looking for work (3)**
- **Not employed, not looking for work (4)**
- **Retired (5)**
- **Disabled, not able to work (6)**

---

Q173 Are you considered an essential worker during the COVID-19 pandemic period?

- **Yes (1)**
- **No (2)**
- **I don't know (3)**

---

*Display This Question:*

*If Q173 = 1*

*Or Q173 = 3*

Q174 What type of essential worker are you? (Select all which may apply)

- [ ] **Grocery/Pharmacy Staff (1)**
- [ ] **Food worker (2)**
- [ ] **Farmworker or agricultural worker (i.e. dairy, packing house, meat processing plant) (3)**
- [ ] **Police Officer (4)**
- [ ] **Firefighter (5)**
- [ ] **Paramedic/EMT (6)**
- [ ] **Essential government worker (7)**
- [ ] **Child care provider (8)**
- [ ] **Hospital personnel (9)**
- [ ] **Nurse/Nurse Assistant/Licensed Vocational Nurse (10)**
- [ ] **Physician (MD, OD, DMD, DDS) (11)**

Q370 What was your total household income last year, before taxes?

- ○ **Less than $10,000 (1)**
- ○ **$10,000 to $24,999 (2)**
- ○ **$25,000 to $49,999 (3)**
- ○ **$50,000 to $74,999 (4)**
- ○ **$75,000 to $99,999 (5)**
- ○ **$100,000 or more (6)**

Page Break

Q371 How many people, including yourself, does this income support? (If you are paying child support but your child is not living with you, this still counts as someone living on your income. Please enter a number)

_____

Page Break

Q175 How would you describe the area where you live?

- **Urban (1)**
- **Rural (2)**
- **Frontier or Remote (3)**

Page Break

Q373 Are you of Hispanic, Latino/a, or Spanish origin? (One or more categories may be selected.)

- [ ] **No, not of Hispanic, Latino/a, or Spanish origin (1)**
- [ ] **Yes, Mexican, Mexican American, Chicano/a (2)**
- [ ] **Yes, Puerto Rican (3)**
- [ ] **Yes, Cuban (4)**
- [ ] **Yes, another Hispanic, Latino, or Spanish origin (5)**

Page Break

Q374 What is your race/ethnic group? (One or more categories may be selected)

- ☐ **White (1)**
- ☐ **Black or African American (2)**
- ☐ **American Indian or Alaska Native (Please tell us what Tribe or Indigenous Community) (3) _____**
- ☐ **Asian (4)**
- ☐ **Hawaiian or Pacific Islander (5)**
- ☐ **Other (6) _____**

Page Break

Q375 How well do you speak English?

- **Very well (1)**
- **Well (2)**
- **Not well (3)**
- **Not at all (4)**

Q376 What is the mostly spoken language in your family?

- **English (1)**
- **Spanish (2)**
- **Hmong (3)**
- **Portuguese (4)**
- **Native American or Indigenous language. Please tell us which one: (5)** _____
- **Other: (6)** _____

Page Break

Q377 What is your marital status?

- ○ **Single/Never married (1)**
- ○ **Married (2)**
- ○ **Widowed (3)**
- ○ **Separated (4)**
- ○ **Unmarried partner (5)**
- ○ **Divorced (6)**
- ○ **Other (7) _____**

Page Break

Q378 What type of health insurance do you have?

- ○ **Uninsured (1)**
- ○ **Medicare & Medi-Cal (2)**
- ○ **Medicare & others (3)**
- ○ **Medicare only (4)**
- ○ **Medi-Cal only (5)**
- ○ **Healthy Families/CHIP (6)**
- ○ **Employment-based (7)**
- ○ **Privately purchased (8)**
- ○ **Other public program (9)** _____
- ○ **Don't know (10)**

Page Break

Q379 Do you live within 1 mile of a freeway or highway?

- ○ **Yes (1)**
- ○ **No (2)**

Page Break

Q380 Of the major political parties list below, which party do you most identify with:

- ○ **Democratic Party (1)**
- ○ **Republican Party (2)**
- ○ **Libertarian Party (3)**
- ○ **Green Party (4)**
- ○ **Constitution Party (5)**
- ○ **Other party (6)**
- ○ **Don't know (7)**
- ○ **I don't support any party (8)**

Page Break

Q383 How do you rate your political views?

| | Extremely Conservative | | | Neutral | | | Extremely Liberal |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Political Views () |  | | | | | | |

Page Break

Q384 To what level do you consider yourself to be religious or spiritual?

- ○ **Not religious/spiritual (1)**
- ○ **Slightly religious/spiritual (2)**
- ○ **Moderately religious/spiritual (3)**
- ○ **Very religious/spiritual (4)**
- ○ **Don't know (5)**

Page Break

Q386 Is there anything else you would like us to know? Please type it here

_____

End of Block: Demographics

Start of Block: Child with asthma

Q186 You mentioned that you have a child with asthma. We would now like to ask a few questions about that child. If you have multiple children with asthma, please answer about the one whose asthma is the most severe or poses the biggest health concern.

Q320 What is your child's age in years?

▼ 1 (1) ... 17 (17)

Q321 What is your child's sex?

- ○ **Male (1)**
- ○ **Female (2)**

Page Break

Q322 Is your child of Hispanic, Latino/a, or Spanish origin? (One or more categories may be selected.)

- ☒ **No, not of Hispanic, Latino/a, or Spanish origin (1)**
- ☐ **Yes, Mexican, Mexican American, Chicano/a (2)**
- ☐ **Yes, Puerto Rican (3)**
- ☐ **Yes, Cuban (4)**
- ☐ **Yes, another Hispanic, Latino, or Spanish origin (5)**

Page Break

X→

Q323 What is your child's race or ethnic group? (One or more categories may be selected)

- ☐ **White (1)**
- ☐ **Black or African American (2)**
- ☐ **American Indian or Alaska Native (Please tell us what Tribe or Indigenous Community) (3) _____**
- ☐ **Asian (4)**
- ☐ **Native Hawaiian or Pacific Islander (5)**
- ☐ **Other ethnicity (6) _____**

Page Break

Q187 **In the Pre-COVID period**, would you say that your ***child's health*** was

- **Excellent (1)**
- **Very good (2)**
- **Good (3)**
- **Fair (4)**
- **Poor (5)**

Q188 **At the current time**, would you say your ***child's health*** is

- **Excellent (1)**
- **Very good (2)**
- **Good (3)**
- **Fair (4)**
- **Poor (5)**

Page Break

Q324 Is your child fluent in English?

- **Yes (1)**
- **No (2)**

Q325 What is your child's main language?

- **English (1)**
- **Spanish (2)**
- **Hmong (3)**
- **Portuguese (4)**
- **Other: (please, specify) (5)** _____

Page Break

Q326 What school grade is your child in? (If not in school or in a lower grade than first grade, please enter 0)

_____

Page Break

Q327 Do any of the child's parents have asthma?

- **Yes (1)**
- **No (2)**

Q328 Does your child have any brothers or sisters with asthma?

- **Yes (1)**
- **No (2)**

Page Break

Q329 When was your child first diagnosed with asthma? (year)

_____

Q330 In the past 12 months, has your child been:

| | Yes (1) | No (2) |
|---|---|---|
| Hospitalized overnight for asthma? (1) | ○ | ○ |
| Taken to the emergency room for asthma? (5) | ○ | ○ |
| Taken to urgent care or doctor's office for asthma? (6) | ○ | ○ |

Q331 Has your child seen his/her primary care physician for a well child visit in the past 12 months?

○ **Yes (1)**

○ **No (2)**

Q332 Have you or your child seen an Asthma Educator to learn more about their asthma?

- **Yes (1)**
- **No (2)**

---

Q333 What type of Health Insurance does your child have?

- **Uninsured (1)**
- **Medicare & Medi-Cal (2)**
- **Medicare & others (3)**
- **Medicare only (4)**
- **Medi-Cal (5)**
- **Healthy Families/CHIP (6)**
- **Employment-based (7)**
- **Privately purchased (8)**
- **Other public (9)**
- **Don't know (10)**

---

Q334 Does your child have any of the following known allergies?

- ○ **Dust (1)**
- ○ **Pollen (2)**
- ○ **Animals (3)**
- ○ **Mold (4)**
- ○ **Pests (5)**
- ○ **Food (6)**
- ○ **Other: (7) _____**

Q335 Which of the following triggers make your child's asthma worse?

- ○ **Dust (1)**
- ○ **Pollen (2)**
- ○ **Furry animals (3)**
- ○ **Mold (4)**
- ○ **Cockroaches/Pests (5)**
- ○ **Cold/ Flu/Sore throat (6)**
- ○ **Tobacco or Fireplace/Wood stove smoke (7)**
- ○ **Exercise (8)**
- ○ **Weather Changes (9)**
- ○ **Strong Smells/ Chemicals (10)**
- ○ **Air Pollution (11)**
- ○ **Anger/ Fear/ Laughter / Stress (12)**
- ○ **Other: (13) _____**

---

X→

Q336 Does your child have a "rescue" inhaler (Albuterol)?

- ○ **Yes (1)**
- ○ **No (2)**

*Display This Question:*

*If Q336 = 1*

Q337 How often does your child use their “rescue” inhaler?

- **As Needed (1)**
- **One-Time per day (2)**
- **Two or more times per day (3)**
- **Before exercise (4)**

*Display This Question:*

*If Q336 = 2*

Q338 What is the reason your child does not have a “rescue” inhaler?

- **Not prescribed (1)**
- **Too expensive (2)**
- **Not needed (3)**
- **Other: (4) _____**

Q339 Does your child use any of the following “controller” medication (Containing bronchodilator Albuterol)?

- ○ **Flovent (1)**
- ○ **QVAR (2)**
- ○ **Pulmicort (3)**
- ○ **Advair (4)**
- ○ **Asmanex (5)**
- ○ **Other: _____ (6)**
- ○ **No, my child does not use controller medication (7)**

---

X→

Q340 How often does your child take the “controller” medication?

- ○ **As Needed (1)**
- ○ **One-Time per day (2)**
- ○ **Two or more times per day (3)**
- ○ **No, it doesn’t apply (4)**

---

*Display This Question:*

*If Q340 = 4*

X→

Q341 What is the reason your child does not have a “controller” medication?

- ○ **Not prescribed (1)**
- ○ **Too expensive (2)**
- ○ **Not needed (3)**
- ○ **Forgets (4)**
- ○ **Other: (5) _____**

---

X→

Q342 Does your child do any treatment for allergies?

- ○ **Yes (1)**
- ○ **No (2)**

---

*Display This Question:*

*If Q342 = 1*

X→

Q343 Which of the following allergy treatments does your child do? (Check all that apply)

- [ ] **Nasal Spray (1)**
- [ ] **Over the Counter Medication (2)**
- [ ] **Prescription Medication (3)**
- [ ] **Allergy Shots (4)**
- [ ] **Other: (5) _____**

---

X→

Q344 Where do you pick up your medication?

- ○ **Doctor (1)**
- ○ **Pharmacy (2)**
- ○ **Emergency Room (3)**
- ○ **Family Member (4)**
- ○ **School Nurse (5)**
- ○ **Grocery Store (6)**
- ○ **None of the above (7)**
- ○ **Other: (8) _____**

---

Q345 Did you experience any fear of shortage of asthma medication during the COVID-19 Period?

- **Yes (1)**
- **No (2)**

---

Q346 Did you have any difficulty getting your child's asthma medication refilled during the COVID-19 Period?

- **Yes (1)**
- **No (2)**

---

Q347 During the COVID-19 Period, how would you describe your child's asthma:

- **Staying home has benefitted my child's asthma –He/She did not get asthma attacks (1)**
- **Staying home did not change my child's asthma (2)**
- **Staying home has made my child's asthma worse – He/She had to use the rescue inhaler more often than normal (3)**

---

Q348 Did you feel any difference on your child's asthma symptoms when breathing the air outside of your house during the COVID-19 Period and before the beginning of the wild fires?

- **Yes, it has improved (1)**
- **Yes, it made them worse (2)**
- **No, it did not change them (3)**

Q349 How concerned are you for each of those factors concerning your child's health during the COVID-19 Period?

| | Extremely worried (1) | A little worried (2) | Not worried (3) |
|---|---|---|---|
| Being able to get to a Doctor or Emergency Service (1) | | | |
| Being able to get needed medication (4) | | | |
| Being afraid of contracting the COVID virus if I went to the Hospital or Doctor's Office/Clinic (5) | | | |

Q350 Did your child express being upset or show signs of distress during the COVID-19 Period due to the following reasons?

| | Yes, a lot (1) | Yes, but just a little (2) | Not at all (3) |
|---|---|---|---|
| Not being able to play with friends (1) | ○ | ○ | ○ |
| Not being able to go to Park/ public places (4) | ○ | ○ | ○ |
| Not being able to sleep well at night or maintain regular schedule (5) | ○ | ○ | ○ |

Q351 How would you classify the impact of stress your child has experienced during the COVID-19 Period?

- ○ **Staying home has made him/her more relaxed; it improved health (1)**
- ○ **Staying home was indifferent on my child's stress level or health (2)**
- ○ **Staying home has increased my child's stress level, but his/her health remained the same (3)**
- ○ **Staying home has increased my child's stress level, aggravating his/her health problems. (4)**

Q352 How often do you usually talk to each of the following about your child's asthma?

| | Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) | Does not apply (6) |
|---|---|---|---|---|---|---|
| Family member (1) | ○ | ○ | ○ | ○ | ○ | ○ |
| Doctor/physician (4) | ○ | ○ | ○ | ○ | ○ | ○ |
| Nurse (5) | ○ | ○ | ○ | ○ | ○ | ○ |
| Friend (s) (6) | ○ | ○ | ○ | ○ | ○ | ○ |
| Promotora or Community Health Worker (7) | ○ | ○ | ○ | ○ | ○ | ○ |

Q353 How helpful are each of the following when you talk about your child's asthma?

| | Not helpful (1) | Slightly helpful (2) | Moderately helpful (3) | Quite helpful (4) | Extremely helpful (5) | Does not apply (6) |
|---|---|---|---|---|---|---|
| Family member (1) | ○ | ○ | ○ | ○ | ○ | ○ |
| Doctor/physician (4) | ○ | ○ | ○ | ○ | ○ | ○ |
| Nurse (5) | ○ | ○ | ○ | ○ | ○ | ○ |
| Friend (s) (6) | ○ | ○ | ○ | ○ | ○ | ○ |
| Promotora or Community Health Worker (7) | ○ | ○ | ○ | ○ | ○ | ○ |

Q354 If you were assigned an asthma coach to help you learn how to control your child's asthma, how important would be the following coach's characteristics?

| | Not important (1) | Slightly important (2) | Moderately important (3) | Quite important (4) | Extremely important (5) | Does not apply (6) |
|---|---|---|---|---|---|---|
| Speaks my language (9) | ○ | ○ | ○ | ○ | ○ | ○ |
| Explains things in a way I understand (10) | ○ | ○ | ○ | ○ | ○ | ○ |
| Is also a parent of an asthmatic child (11) | ○ | ○ | ○ | ○ | ○ | ○ |
| Lives close (12) | ○ | ○ | ○ | ○ | ○ | ○ |
| I can call if I have question or concern (13) | ○ | ○ | ○ | ○ | ○ | ○ |
| Non-judgmental (14) | ○ | ○ | ○ | ○ | ○ | ○ |

Q355 Suppose you had the opportunity to talk to another parent of an asthmatic child who was trained in the issues that can arise regarding your child's asthma. How interested would you be?

- ○ **Not interested (1)**
- ○ **Somewhat interested (2)**
- ○ **Very interested (3)**

---

X→

Q356 Once you learned how to control your child's asthma, would you be willing to support other parents…

| | Yes (1) | Maybe (2) | No (3) |
|---|---|---|---|
| When they have questions? (4) | ○ | ○ | ○ |
| Once a week phone call? (7) | ○ | ○ | ○ |
| Once a week phone call and/or in case of emergency? (8) | ○ | ○ | ○ |

---

X→

Q357 Once you learned how to control your child's asthma, would you consider becoming an asthma coach?

- ○ **Yes (1)**
- ○ **Maybe (2)**
- ○ **No (3)**

End of Block: Child with asthma

Start of Block: Asthma

Q295 What was your age when you were diagnosed with asthma?

▼ 1 (1) ... 100 (100)

Page Break

Q299 Do you have a “rescue” inhaler (Albuterol)?

- **Yes (1)**
- **No (2)**

*Display This Question:*

*If Q299 = 1*

Q300 How often do you use your “rescue” inhaler?

- **As Needed (1)**
- **One-Time per day (2)**
- **Two or more times per day (3)**
- **Before exercise (4)**

*Display This Question:*

*If Q299 = 2*

Q301 What is the reason you do not have a “rescue” inhaler?

- ○ **Not prescribed (1)**
- ○ **Too expensive (2)**
- ○ **Not needed (3)**
- ○ **Other: (4) _____**

---

X→

Q302 Do you use any of the following “controller” medication?

- ○ **Flovent (1)**
- ○ **QVAR (2)**
- ○ **Pulmicort (3)**
- ○ **Advair (4)**
- ○ **Asmanex (5)**
- ○ **Other: (6) _____**
- ○ **None of them (7)**

---

*Display This Question:*

*If Q302 = 1*

*Or Q302 = 2*

*Or Q302 = 3*

*Or Q302 = 4*

*Or Q302 = 5*

*Or Q302 = 6*

Q303 How often do you take the “controller” medication?

- **One-Time per day (1)**
- **Two or more times per day (2)**
- **As Needed (3)**

---

*Display This Question:*

*If Q302 = 7*

Q304 What is the reason you do not have a “controller” medication?

- **Not prescribed (1)**
- **Too expensive (2)**
- **Not needed (3)**
- **Forget (4)**
- **Other: (5) _____**

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Q305 If you had gotten sick with COVID-19, how do you think your health would have been affected because you have asthma? Having asthma would have resulted in:

- **No difference – I would be just as sick regardless of whether I had asthma (1)**
- **Making me a little bit sicker (2)**
- **Making me a sicker (3)**
- **Making me much sicker (4)**
- **Making me extremely sick (5)**

Q306 Since the start of the COVID-19 period, how would you describe your asthma:

- **Staying home has benefitted my asthma – I did not get asthma attacks (1)**
- **Staying home did not change my asthma (2)**
- **Staying home has made my asthma worse – I had to use the rescue inhaler more often than normal (3)**

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Q307 Did you feel any difference on your asthma symptoms when breathing the air outside of your house during the COVID-19 Period and before the beginning of the wild fires?

- **No, it made no difference (1)**
- **Yes, the clean air made it better (2)**
- **Yes, the seasonal allergies made it worse (3)**

Q308 How would you classify the impact of stress you experienced during the COVID-19 Period?

- **Staying home has made me more relaxed; it improved my health (1)**
- **Staying home was indifferent on my stress level or health (2)**
- **Staying home has increased my stress level, but my health remained the same (3)**
- **Staying home has increased my stress level, aggravating my health problems. (4)**

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Q309 Have you experience any fear of shortage of asthma medication during the COVID-19 Period?

- **Yes (1)**
- **No (2)**

Q310 Have you had any problems getting your asthma medication refilled during the COVID-19 Period?

- **No difference – ~~I would be just as sick regardless of whether I had asthma~~ (1)**
- **A little bit harder (2)**
- **It has been harder (3)**
- **It has been much harder (4)**
- **It has been extremely hard (5)**

End of Block: Asthma