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Respiratory Health in Los Robles, Nicaragua:
A curriculum and facilitation guide for community health workers

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An abstract of
a thesis submitted to the Faculty of the
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Abstract

Respiratory Health in Los Robles, Nicaragua:
A curriculum and facilitation guide for community health workers

By: Claudia Moya

Background: Despite recent declines in mortality**,** respiratory diseases continue to be a problem for rural populations of Nicaragua. Community health workers known as *brigadistas* voluntarily work in health promotion activities at the community level but they lack consistent, standardized training. Los Robles, a community in Jinotega, has 15 brigadistas that work alongside a partner non-governmental organization—the Nicaragua Community Health Connection (NCHC). Brigadistas, along with other stakeholders, identified respiratory health as the most pertinent health issue afflicting the community. Further, brigadistas shared that they had received little formal training on respiratory health.

Purpose: The purpose of this special studies project was to create a uniform resource that equipped brigadistas with basic respiratory health knowledge including anatomy, common illnesses, and prevention, and also built self-efficacy of brigadistas by providing guidance for facilitation through suggested interactive activities.

Methods: The development of the guide was informed by a review of the literature that encompassed existing curricula and training manuals and participatory learning methods and theory, one focus group discussion, pre- and post-tests on respiratory health knowledge and self-efficacy levels, and 15 key informant interviews.

Results: The literature review provided useful examples of curricula and manuals as well as successful applications of participatory learning methods and theory. The qualitative findings suggested that brigadistas favor participatory learning methods in small group settings and found the capacity building sessions useful in their educational and personal development. Additionally, brigadistas provided helpful suggestions to guide the structure and design of the guide. The respiratory health knowledge pre- and post-tests implied that there was improvement before and after the capacity building sessions but several unknowns are associated with these results and cannot be considered accurate. Similarly, self-efficacy levels were assessed through a pre-test only and therefore, it cannot be determined if self-efficacy levels changed. Ultimately, the final guide includes four modules with topics ranging from basic anatomy to prevention strategies.

Discussion: It is my hope that brigadistas will host educational sessions using this guide and encourage community members to adopt health behaviors and preventive strategies. By doing so, Los Robles may experience a reduction in respiratory-health related clinic visits.

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Table of Contents

Chapter 1: Introduction

1.1 Background and Rationale

Despite the recent decline in mortality rates, respiratory diseases remain a top public health priority for Nicaragua. According to available data, in 2010 there were an estimated 8.9 million reported cases of acute respiratory infections, with a morbidity rate of about 3,550 per 10,000 inhabitants (PAHO, 2012). In that same year, there were approximately 1.4 million reported cases of pneumonia, 1,400 new cases of tuberculosis, and 1,160 deaths due to chronic respiratory diseases (PAHO, 2012 ; WHO, 2014). Moreover, in 2013, lower respiratory infections, along with diarrhea and other infectious diseases, accounted for nearly 45% of all deaths in Nicaragua, making these the most deadly communicable diseases of the year (Health Grove, 2013). Further, in 2013, air pollution led the mortality rate for most significant environmental risks in Nicaragua, at an astounding 66.2%, with one of the deadliest risk factors being household air pollution from open-fire stoves (Health Grove, 2013). Thus, it is no surprise that the rural population, especially women and children that spend more time near open-fire stoves, continue to be disproportionately affected by respiratory diseases (Gray, 2015 ; WHO, 2016).

To address the high prevalence rates of respiratory diseases and other preventable diseases, the Ministry of Health (MINSA) aims to provide free health services and to promote healthy practices that will “improve quality of life and life expectancy” for all (MINSA, 2006). Consequently, MINSA operates at three different administrative levels that are each associated with certain types of health services. The municipal level, for instance, encompasses health centers, health posts, and nationwide community-based health networks. For the majority of the rural population, community-based clinics and maternity homes, which comprise community-

based health networks are the only means of accessing any form of health care (Sequeiera et al., 2011).

One of the unique strengths of Nicaragua's community-based health networks is the impressive amount of MINSA-trained volunteers, including *brigadistas* (community health workers), who are individuals that primarily serve rural areas and "undertake health promotion activities at the community level with no remuneration from MINSA" (MINSA, 2006 ; Sequeiera et al., 2011). Brigadistas receive several trainings in areas such as maternal and child health, family planning, and nutrition. In addition, brigadistas partake in activities including home visits to identify and refer patients to health facilities, national health campaigns to promote immunizations, and educational sessions on health topics like exclusive breastfeeding, diet, and hand-washing hygiene.

1.2 Problem Statement

While the brigadista program has received praise for 'empowering' community volunteers to make change in their local contexts, it has also received criticism for exploiting its uncompensated workforce. Arguably, one form of exploitation is the inconsistency and insufficiency in MINSA trainings (Nading, 2013 ; Sequeiera et al., 2011). At this moment, MINSA relies heavily on both international and local non-governmental organization (NGO) partners to train, support, and monitor and evaluate brigadistas. As a result, there is no standardization of training content, delivery, or methodology since this is left at the discretion of the respective NGO partners (Valadez, Hage, and Vargas, 2005).

An example of MINSA's reliance on NGOs to train brigadistas can be seen through Nicaraguan Community Health Connection (NCHC), an NGO that works alongside fifteen

brigadistas[1] in Los Robles—a rural, coffee-growing community situated in Jinotega, one of the poorest departments in Nicaragua. NCHC has several stated approaches one of which is to "improve local health knowledge and cultivate more healthful behaviors" by "cultivating resources with the help of supportive networks" (NCHC, 2014). "Supportive networks" include groups of international volunteers that come from abroad to partake in health projects like cook stove construction, cement floor installation, and medical brigades. During their short stay in Los Robles, some groups provide specialized training sessions to brigadistas in areas such as physical therapy, weight management techniques, and yoga. While many brigadistas appreciate and benefit from these specialized trainings, key informant interviews reveal that they believe the trainings to be sporadic since the topics and timing vary. Additionally, brigadistas state that MINSA trainings are far more infrequent, with 'formal' trainings taking place once a year. Further, not all brigadistas are invited to the annual MINSA trainings or are present during trainings offered by volunteer groups, which means that some brigadistas will be at different levels of knowledge than others.

Thus, at the request of NCHC, this special studies project addresses the problem of inconsistent and infrequent trainings by providing a comprehensive, culturally appropriate, and standardized curriculum and facilitation guide on respiratory health to be used by all Los Robles brigadistas, regardless of knowledge level. Respiratory health is the focus of the guide not only because it is a top national priority for Nicaragua but also because relevant stakeholders—brigadistas, the local clinician, and NCHC staff—identified respiratory diseases as the primary issue afflicting the community (Los Robles). Clinic records revealed that nearly 37% of all clinic visits in 2015 were respiratory disease related, making it the most common reason to visit the

[1] From this point forward, brigadistas refers specifically to brigadistas in Los Robles

clinic. In addition, many brigadistas expressed that they had received little to no consistent training on respiratory health.

1.3 Purpose Statement

The purpose of this special studies project is to create a uniform resource that equips brigadistas with basic respiratory health knowledge including anatomy, common illnesses, and prevention, and also builds self-efficacy of brigadistas by providing guidance for facilitation through suggested interactive activities.

1.4 Objectives

In developing the curriculum and facilitation guide, the following objectives should be met:

- *Objective One:* Conduct a review of the literature focused on two main categories—existing curricula and training manuals and participatory learning methods and theories.
- *Objective Two:* Identify the knowledge levels, self-efficacy levels, and learning style preferences of brigadistas through one focus group discussion, fifteen key informant interviews, and pre and post tests.
- *Objective Three:* Use the findings from the literature review, focus group discussion, key informant interviews, and pre and post tests to create the curriculum and facilitation guide.
- *Objective Four:* Make recommendations for the implementation of the curriculum and facilitation guide.

1.5 Significance

Rote learning, a memorization technique based on repetition, is common practice in Nicaragua and MINSA trainings are no exception. Too often, these trainings are lengthy and dry, affecting concentration and causing over-saturation of information. Thus, this guide will allow for manageable levels of educational content while making facilitation a feasible experience through interactive activities. More broadly, since the focus of the guide is on respiratory health—the most common reason for clinic visits—the hope is for brigadistas to share correct information on healthy behaviors, risk factors, and preventive health strategies with their fellow community members by hosting educational sessions. In doing so, Los Robles may experience a reduction in respiratory disease related clinic visits as community members adopt healthy behaviors and use preventive health strategies.

1.6 Definition of Terms and Acronyms

- *Brigadistas (community health workers):* individuals that primarily serve rural areas and "undertake health promotion activities at the community level with no remuneration from MINSA" (MINSA, 2006; Sequeiera et al., 2011)
- *Community:* "a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings" (MacQueen et al., 2001)"; in this case, the geographical location is Los Robles
    - *Community members:* all individuals that reside in Los Robles
- *Curriculum:* "a set of courses constituting an area of specialization" (Merriam-Webster, 2017)

- *Facilitation:* "to help smoothly manage the flow and discussions of a meeting or event" (CDC, n.d.)
- *Ministry of Health (MINSA):* Nicaragua's Ministry of Health
- *Nicaragua Community Health Connection (NCHC):* an NGO based in Los Robles that works alongside local brigadistas to implement health projects
- *Respiratory diseases:* an umbrella term that encompasses a range of illnesses that affect the respiratory system, from mild (e.g. common cold) to severe (e.g. pneumonia)
    - *Acute respiratory diseases:* "a sudden condition in which breathing is difficult and oxygen levels in the blood drop lower than normal; includes upper respiratory tract infections and lower respiratory tract infections" (Simoes et al., 2006)
    - *Chronic respiratory diseases:* "incurable diseases of the airways and other structures of the lung" (WHO, 2017)
- *Rural population: "*refers to people living in rural areas as defined by national statistical offices" (Trading Economics, 2017)
- *Self-efficacy: "*the strength of one's belief in one's own ability to complete tasks and reach goals" (Bandura, 1977)

Chapter 2: Review of the Literature

2.1 Introduction

To provide an evidence-based foundation for the curriculum and facilitation guide, a literature review was conducted. Two main categories were investigated: 1) existing curricula and training manuals and 2) participatory learning methods and theories.

Existing curricula and training manuals were assessed so as not to reinvent what has already been done, but rather to draw inspiration from proven, effective practices. The initial search began broadly, with general training manuals recommended by health care professionals that have worked with community health workers (CHWs) in Latin America. From there, using Google Scholar, a more specific search on respiratory health focused curricula took place. Search words such as "respiratory health curricula," "respiratory disease curricula," "manuals for respiratory disease management," and "community health worker manual respiratory health" were utilized, with the latter proving most effective in narrowing down relevant material. The Centers for Disease Control and Prevention (CDC), Peace Corps, the United Nations Children's Fund (UNICEF), and the World Health Organization (WHO) returned the most useful, evidence-based content.

Participatory learning methods and theory were explored so as to provide a framework for the design of the guide. Inspired by community-based participatory action research courses, the search began with participatory learning methods that are commonly used by researchers or instructors that work in low-resource settings. From there, theory, predominantly theory focused on self-efficacy was searched. Databases used to search for self-efficacy theory included these (in alphabetical order): Anthropology Plus, Google Scholar, JSTOR, PsycINFO, and Science Direct. Some keywords used were "self-efficacy low-resource," "community health workers self-

efficacy," and "self-efficacy theory," with the former proving most useful in returning relevant results. In addition to theory, examples on successful applications of participatory learning methods were searched. Databases used to search for examples included these (in alphabetical order): Anthropology Plus, Google Scholar, JSTOR, PsycINFO, PubMed, and Science Direct. Search words such as "participatory learning community health workers," "community-based learning with health workers," and "participatory learning community health workers Latin America," were used, with the first two offering the most applicable results.

This literature review begins with the review of existing curricula and training manuals, from general CHW training manuals to specific respiratory health focused curricula and manuals. Next, the literature review continues with discussion of participatory learning methods and theory as well as pertinent examples. Finally, the literature review concludes with a brief summary and how this special studies project contributes to the existing body of literature.

2.2 Existing Curricula and Training Manuals

General Training Manuals

In searching for existing curricula and training manuals, it made sense to begin with two manuals frequently cited in the literature as the 'go-to' tools and recommended by health care professionals working with CHWs. Considered by WHO to be the most "widely used health care manual in the world," *Where There is No Doctor* covers a wide range of health topics such as common illnesses, maternal and child health, and severe illnesses while addressing the underlying causes of poor health (Hesperian Health Guides, 2017). Based on village health workers (equivalent to the term *brigadistas*) in rural Mexico, the manual is intended primarily for other health workers in similar settings. Additionally, it is written in plain language, has a

plethora of illustrations, and has been checked for medical accuracy by multiple physicians and other health care specialists (Werner, 1992). Further, it has several companion pieces, one of which is *Helping Health Workers Learn*, an educational compendium of participatory "methods, aids, and ideas for instructors at the village level" (Werner & Bower, 2001). Similar to *Where There is No Doctor*, this manual was also based on village health workers in rural Mexico and thus much of the focus is on Latin America. However, it includes examples from about thirty-five other countries, making it useful for other contexts.

While both manuals are the 'gold standard' for those working with CHWs in low resource settings and two of the few manuals focused on Latin America, they do have a considerable limitation in that they are lengthy. *Where There is No Doctor*, in particular, covers a vast number of health topics to the point that it may be an overwhelming amount of information, especially considering that it is primarily to be used in areas with low levels of literacy (Werner, 1992). *Helping Health Workers Learn* offers a superfluous amount of participatory methods, activities, and ideas. Excessive recommendations may also prove overwhelming and could inhibit creativity.

Respiratory Health Focused Curricula and Training Manuals

In addition to being lengthy, the aforementioned manuals spend little time on respiratory health. Since this special studies project centers on respiratory health, it was critical to search for evidence-based curricula and manuals that had substantial information on respiratory health. CDC, Peace Corps, UNICEF, and WHO searches all returned useful content. The following curricula and manuals will be discussed in the order from least useful to most useful—utility being in the context of Los Robles.

UNICEF's *Management of Sick Children by Community Health Workers* reviews different CHW models and programs from around the world (Gilroy & Winch, 2006). The intended audience is for countries contemplating to begin a CHW program, particularly programs that aim to address child health. Thus, there is not much educational content. As a result, this review was not incredibly useful. However, throughout the document there are annexes that cover acute respiratory infections, such as pneumonia. These annexes proved useful when building educational content for the curriculum and facilitation guide for Los Robles since they provided examples of standardized language used when describing respiratory diseases.

CDC's manual on respiratory health, *Respiratory Health Spirometry Procedures Manual*, proved more useful than UNICEF's review. Although it mostly covers spirometry, a test that measures the amount and speed of air that a person can inhale and exhale, there are helpful introductory sections that accurately describe chronic respiratory diseases like asthma and chronic obstructive pulmonary disease (COPD) (CDC, 2008). Moreover, these sections use plain language to describe illnesses that can be difficult to understand for laypersons. In addition to describing chronic respiratory diseases, there is a section that breaks down the functionality of the respiratory system using simple pictures and again, plain language. Aside from these sections, this manual was intended for surveyors conducting the National Health and Nutrition Examination Survey (NHANES) and as a result, is highly technical.

The next manual, Peace Corps' *Improved Cookstoves Handbook*, is an extensive manual that details an array of improved cook stove designs, maintenance, and benefits. Since prevention is a core component of the curriculum and facilitation guide for Los Robles, this Peace Corps manual proved to be one of the most helpful resources when developing content for prevention.

Its greatest pitfall is that it does not spend enough time emphasizing that when used correctly, improved cook stoves help reduce respiratory infections (Peace Corps, 2013).

Lastly, the most useful manuals were WHO's *Engage TB* and *Children's Health and the Environment*. The tuberculosis (TB) manuals are excellent at integrating educational content and facilitation. Additionally, they utilize participatory learning methods whenever possible and their contents are organized into short modules. Moreover, the intended audience for the TB manuals is CHWs making this a desirable template to follow. Its shortcoming is that it suggests many activities involving technology, which is not realistic in the context of Los Robles but perhaps could be useful in the future (WHO, 2014 ; WHO, 2015). On another note, the *Children's Health and the Environment* manual is comprised of many 'training packages,' three of which are particularly informative—"Indoor Air Pollution," "Outdoor Air Pollution," and "Childhood Respiratory Disease." Each of these packages is a deck of slides that deconstructs difficult subject matter into simpler terms. These packages are meant for health service providers, namely clinicians, but they are written such that anyone can understand them (WHO, 2005). Moreover, each deck has detailed lists of additional references and resources, which proved beneficial when fact-checking for the curriculum and facilitation guide for Los Robles.

2.3 Participatory Learning Methods and Theories

Participatory Learning Methods

In the 1980s, several development practitioners and researchers grew increasingly dissatisfied with how communities were being used solely for data and how little participation community members had in the process, including monitoring and evaluation of development projects (Shah, 1999). Out of the need to find ways to actively involve community members in

the development of their own communities, participatory learning and action (PLA), then commonly known as participatory rural appraisal (PRA) was born. Over time, PLA has evolved but its roots stem from areas such as activist participatory research (inspired by Paulo Freire), applied anthropology, and field research on farming systems (Chambers, 1997).

PLA can be defined as an evolving "family of methods and approaches that enable local people to analyze, share, and enhance their knowledge of life and its conditions and to plan, prioritize, act, monitor, and evaluate " (Absalom et al., 1995 ; Chambers, 1997). Although predominantly used in rural settings, it is applicable in urban contexts as well. According to Chambers, three guiding principles comprise the foundation of PLA:

- Outsiders should facilitate and not dominate
- Methods should concentrate on group learning and visual aids, if possible
- Insiders, outsiders, and organizations should be partners and share information (1997).

Presently, a variety of tools are used in PLA. However, the repertoire of tools is ever growing since the tools are adapted to meet the specific needs of communities (Chambers, 1997 ; Thomas, 2004). Some of the more popular, successful methods include community mapping, case studies, picture stories, problem trees, focus group discussions, rankings/scoring, and role-plays. There are no fixed rules as to which method should be used first though it is recommended that some type of discussion precede other methods (Pretty, Gujit, Scoones, & Thompson, 1995).

Participatory Learning Theory

Underlying PLA methodology is theory, primarily theory regarding self-efficacy. The concept of self-efficacy, or the "strength of one's belief in one's own ability to complete tasks and

reach goals," gained traction with the introduction of Bandura's Self-Learning Theory (Bandura, 1977). The Self-Learning Theory posits that people learn skills in a group setting by observing and imitating each other (Bandura, 1977). With the introduction of self-efficacy, the Self-Learning Theory eventually evolved into the Social Cognitive Theory, a widely utilized health behavior theory that states that cognitive, behavioral, and environmental factors influence an individual's ability to replicate or not replicate a certain behavior (Bandura, 1986). Further, the more self-efficacy an individual has, the more confidence this individual will have to master a task as opposed to avoiding a task.

In addition to the Social Cognitive Theory, Brazilian educator and philosopher Paulo Freire explores self-efficacy in his Empowerment Theory. The Empowerment Theory, similar to the Social Cognitive Theory, asserts that health education is more empowering when individuals dialogue and problem solve together (Freire, 2000 ; Wallerstein & Bernstein, 1988). Additionally, Freire's theory suggests that individuals "best learn and use new information to achieve desired behavioral changes when such information is delivered with empathy and patience and in language that can be easily understood" (Pinto, Bulhões da Silva, & Soriano, 2012).

Participatory Learning Application

Various CHW (or similar) programs throughout the world have successfully applied PLA methods and related theory. In Southeast Michigan, for example, Chinese-English bilingual trainees participated in a lay health advisor (LHA) pilot training program for breast cancer screening. The program was grounded in Bandura's Social Cognitive Theory in that it was designed to "enrich the trainees' knowledge on breast cancer and screening and bolster self-

efficacy in promoting breast cancer screening in their communities" (Yu et al., 2007). In addition, developers of the pilot training program utilized participatory learning and action to plan a health messaging strategy, pretest concepts among each other, create materials, implement their strategy, and lastly, used feedback to make refinements (Yu et al., 2007). Further, the program borrowed Freire's suggestions on using empathy and patience in language by making sure that all material produced was culturally sensitive and in terms laypersons could understand (Yu et al., 2007). At the end of the pilot program, pre- and post-tests results, as well as t-test results, showed an increase in knowledge levels and self-efficacy levels.

Similar observations were seen in studies done in rural settings. For instance, a team of US-Brazil research partners, including CHWs, worked together to construct a praxis and patient health behavior framework in order assess CHW impact on patient health outcomes and to advance CHW training in Rio de Janeiro, Brazil (Pinto et al., 2012). A participatory action research approach was taken, involving CHWs from the design stage of the study all the way to the dissemination of findings. Through semi-structured in-depth interviews, the team learned that CHWs effectively use "cyclical processes of learning and teaching, out of which they develop strategies to help community members acquire health promotion and disease prevention behaviors" (Pinto et al., 2012). Another example can be seen in a systematic review and meta-analysis of the effect of women's groups in Bangladesh, India, Malawi, and Nepal on birth outcomes in low resource settings. Prost et al. found that women's groups that practiced participatory learning and action methods, including dialogues sessions (e.g. focus groups, home based counseling sessions) and problem solving sessions, led to "substantial reductions in neonatal and maternal mortalities in rural, low-resource settings" (2013). As an added bonus, the researchers also found that this participatory learning and action approach proved to be cost-

effective by WHO standards and could save "an estimated 283,000 newborn infants and 36,600 mothers per year" (Prost et al., 2013).

2.4 Summary and Special Studies Project Relevance

The curricula and training manuals reviewed above provided an abundance of correct information and useful activities some of which made its way into the curriculum and facilitation guide for Los Robles. However, there is no curriculum or CHW training manual in current existence that solely focuses on respiratory health. Several briefs, fact-sheets, and documents published by organizations like WHO do exist but there is no single resource that comprehensively covers respiratory health topics. Respiratory health tends to either be lumped into general health curricula and manuals or teased out by specific diseases, particularly tuberculosis, pneumonia, or chronic diseases. Given that the majority of clinic visits in Los Robles were due to respiratory diseases, it was imperative to piece together a comprehensive, relevant curriculum and facilitation guide from current existing curricula and training manuals.

Another component that was particularly lacking in existing respiratory health curricula was the use of participatory learning methods that were grounded in self-efficacy theory. Several studies show that participatory learning methods are effective among CHWs in rural settings. Further, the studies reviewed above integrated theory into their methodologies, such as elements from Bandura's Social Cognitive Theory or Freire's Empowerment theory. Thus, participatory methods are incorporated into the curriculum and facilitation guide for Los Robles. Lastly, self-efficacy theory provided a foundation for the design of the guide for Los Robles.

Chapter 3: Methods

3.1 Introduction

In addition to the literature review, numerous research methods informed the content and structure of the curriculum and facilitation guide for Los Robles. Beginning in October of 2015, a multi-disciplinary team of six Emory graduate students planned a respiratory health focused intervention that attempted to integrate capacity building, clinical management, and cook-stove construction into one holistic health approach. At that time, and throughout the next two years, my role on this team was to research, design, and implement the capacity building aspect to our approach.

Given that my role centered on capacity building, I spent several months researching the majority of the ideas seen in the literature review prior to traveling to Los Robles. Additionally, I informally interviewed brigadistas, NCHC staff members, former mentors, and faculty at Emory multiple times throughout the years to keep myself cognizant of best practices for capacity building. This formative research helped guide the development of the methods that were used in Los Robles during May – August 2016. These methods will be presented in this chapter. All data collection tools were originally created in Spanish but can be found in the appendices translated into English.

3.2 IRB Approval

Before embarking on any research, a proposal was submitted to the Emory IRB. The IRB determined that this special studies project was exempt from review because it did not include human subject research or clinical investigation.

3.3 Focus Group Discussion Methods

Using *Qualitative Research Methods* by Hennink, Hutter, and Bailey, as a reference, the focus group discussion guide was created on site in Los Robles. It consisted of a mix of open-ended and closed-ended questions. The guide can be found in Appendix A.

The purpose of the focus group discussion was three-fold: 1) to understand what resources brigadistas had available to them, 2) to gauge the preferred learning styles of brigadistas, and 3) to assess the levels of respiratory health knowledge and self-efficacy via a verbally administrated pre-test. Eight brigadistas were present for the focus group. The first half of the session (questions one through three) was done as a larger group and the second half (questions four to seven) was done in small breakout groups since those were determined to be more sensitive questions. The session was not recorded as it may have detracted from the discussion. Notes were taken instead, though not extensively because our team was still building rapport with brigadistas and we did not want to add to any potential discomfort. Following the session, there was a short break in which refreshments were served. After the break, a pre-test on respiratory health and self-efficacy was administered in the form of a game. Results from the focus group discussion and pre-test will be discussed in the next chapter.

3.4 Capacity Building Sessions

Following the focus group discussion, our team set out to use the results, along with the formative research done prior, to construct the lesson plans we would use for five capacity building sessions. For each session, we built an agenda, lesson plan, and handouts. The first three sessions were on respiratory health and covered topics such as basic anatomy, common illnesses, risk factors, and forms of prevention. They were a blend of didactic pedagogy and interactive

activities. Each session was about ninety minutes. Sessions were mostly held on Friday or Saturday afternoons.

The last two sessions were geared toward facilitation skills and health communication. During the facilitation skills session, brigadistas were taught simple techniques to become a facilitator. Some of the techniques included making eye contact with your audience, speaking in a clear voice, and remembering to engage your audience (e.g. asking the audience questions, creating interactive activities). Once the techniques were taught, brigadistas were split into four groups of three to four and asked to spend the next few weeks preparing a health communication presentation based on material from the first three educational sessions. The final session consisted of the teams of brigadistas presenting to each other or to close friends and family.

After each capacity building session, feedback was requested though not in a formal manner. Comments were generally positive, with most brigadistas enjoying the interactive activities as well as appreciating the structure to the educational sessions. This feedback was used to improve the handouts that were given during each session. In turn, those handouts served as templates for the modules created for the curriculum and facilitation guide. My intention was to preserve much of what brigadistas had seen during the summer so that the curriculum and facilitation guide would feel familiar. A brief synopsis of the final curriculum and facilitation guide will be discussed in the next chapter.

3.5 Key Informant Interview Methods

Similar to the focus group discussion guide, the key informant interview guide was created using *Qualitative Research Methods*. It was also created on site in Los Robles. It consisted of six open-ended questions, each with a set of probing questions. The guide can be found in Appendix B.

The key informant interviews were intentionally done in the last weeks of my time in Los Robles since at that point, I had built a certain level of trust with each brigadista. The main purpose of the interviews was to individually hear from each brigadista what he/she would like from the curriculum and facilitation guide for Los Robles. Questions about their time as brigadistas, their preferred learning styles, and their desires for the guide were all asked in the privacy of their choosing. Most brigadistas invited me into their homes and kindly gave me consent to record them. Three brigadistas interviewed with a fellow team-mate and unfortunately, her recording device failed so she resorted to taking extensive notes.

Interviews ranged from 10 – 60 minutes long, with the average interview length of 22 minutes. I did my best to ensure that the interviews were participant driven and welcomed long pauses of silence. Upon my return from Los Robles, each interview was transcribed and coded using Microsoft Word (MaxQDA, a qualitative software designed to make transcription and coding seamless, is a suggested alternative but it is expensive). Analysis was done using simple thematic analysis—the process where you examine pertinent patterns or themes within your data. Results from the analysis will be described in the next chapter.

Chapter 4: Results

4.1 Introduction

The results gathered from these data proved to be insightful. They were used solely to finalize the curriculum and facilitation guide. Thus, all data were de-identified for confidentiality and recordings were destroyed after analysis.

4.2 Focus Group Discussion Results

As mentioned in the previous chapter, the focus group discussion was not recorded. In lieu of recording, notes were taken instead. Additionally, once the small group sessions began, I walked from group to group to take notes. The notes aided in the identification of the following pertinent themes: access to correct health information, learning style preferences, and brigadista identity. Each theme will be described below.

Access to correct health information

When discussing access to correct health information, newer brigadistas (those that had been a part of the brigadista team for less than a year) stated that they seek correct information from brigadistas with years of experience. One of the newer brigadistas remarked that she especially looked up to the leader of the brigadistas: “At least for me, I consider our leader to be as knowledgeable as any doctor.” The leader responded to this comment by saying, “Thank you, but I do not know it all and I am comfortable saying that I do not know everything.” This statement resonated with some of the more tenured brigadistas. These brigadistas collectively reported that when they do not know something, they actively seek the answer. For some brigadistas, the answers are sought in books and handouts that they have collected over the years.

For others, the local clinician holds the answers, although it is important to note that some brigadistas shared their discomfort in approaching someone of "superior knowledge."

In terms of educational material, most brigadistas (with the exception of the newer ones) shared that they had access to books, handouts, and brochures. The majority of the handouts and brochures came from MINSA while the books were predominantly school textbooks or biology books. Lastly, few brigadistas had access to the Internet—only one claimed to have a functional smart phone and tablet.

Learning Style Preferences

Arrays of opinions were manifested when brigadistas were asked about learning style preferences. For instance, one soft-spoken participant claimed that she personally liked to learn one-on-one, in the comfort of her own home, stating, "It might be inconvenient but I like learning from one person at home. I think I am a slow learner." Conversely, others responded by saying that they were okay with learning in a small group setting (ideal number was four to five per group), as long as no single individual was dominant. Others shared that they enjoy traditional didactic pedagogy in which they sit and listen to an 'instructor' teach.

With regard to teaching aids, most brigadistas said that they enjoyed visual aids and participatory activities. They felt that these helped them focus on the material being taught and helped with memorization. One brigadista spoke up against participatory learning saying, "I prefer the way I have always done things which is sit in a classroom and take notes." This spurred a conversation about punishment and shaming in a classroom setting—some brigadistas recounted times when they got ridiculed for sharing a wrong answer in class and how to this day, they are scared to say the 'wrong thing.'

Brigadista Identity

When asked about how they felt in their role as brigadistas, all brigadistas shared that they felt "extremely proud and honored" in their roles. Newer brigadistas were eager to share their passion for their role. They stated that they feel "happy and love to work together as a team" and that they enjoy going door-to-door to "encourage people to partake in community activities." Other brigadistas commented that community members could easily identify them and trust them enough to ask questions, especially about "community hours." For context, in Los Robles, community members are encouraged to participate in community volunteer activities such as maintaining the roads, attending *charlas* (health education sessions), and helping construct the local cemetery. One brigadista spoke about the latter activity in particular, saying: "I love seeing my community working in the cemetery and knowing that I am a source of their motivation."

Although most comments were positive, some brigadistas shared that their identity occasionally caused friction in their sectors (there are 10 sectors in Los Robles and one to two brigadistas oversee a sector). They shared that their role as leaders is at times difficult, especially when they encourage people in their sectors to participate in community activities. One brigadista remarked, "I have a strong personality and so sometimes, people in my sector do not like me. In that case, I switch with another brigadista so she can visit the people that dislike me." Another brigadista followed up, nicely summarizing this theme: "We each have our strengths and weaknesses and not everyone is going to like you but that is why we are team. We support each other."

4.3 Pre and Post Test Results

At the conclusion of the focus group discussion, a pre-test was given to brigadistas that was meant to measure their respiratory health knowledge and their level of self-efficacy. As mentioned in the methods section, this orally administered pre-test was done in the form of a game because we did not know the literacy level of brigadistas. The game required that everyone close their eyes and answer by holding up a specific amount of fingers that corresponded with a certain answer choice. More details can be found on the original pre- and post-test, located in Appendix C. Results from the respiratory health portion will be presented first, followed by results from the self-confidence portion.

Respiratory health knowledge pre-test results

The pre-test for respiratory health knowledge was run slightly different than a traditional pre-test in that it was done collectively rather than individually. In other words, scores cannot be attributed to an individual but rather to the group as a whole. Further, not all brigadistas were present for this test so scores only pertain to those present.

Table 1 below demonstrates the results from the respiratory health knowledge pre-test. The correct answer for each question was ‘Yes.’ Thus, on average, brigadistas collectively answered correctly 58% of the time. The most challenging questions were about chronic disease and treatment.

Table 1: Respiratory Health Knowledge Pre-Test Results Group Scores per Question*				
Question #	**Answer Options**			**% Correct per question**
	Don't know	Yes**	No	
Q1	3	5	0	63%
Q2	0	8	0	100%
Q3	2	5	1	63%
Q4	1	4	3	50%
Q5	0	4	4	50%
Q6	1	5	2	63%
Q7	2	3	3	38%
Q8	2	4	2	50%
Q9	0	7	1	88%
Q10	2	4	2	50%
Q11	3	3	2	38%
Q12	0	6	2	75%
Q13	0	6	2	75%
Q14	5	2	1	25%
Q15	5	2	1	25%
Q16	0	6	2	75%
Percent Totals:	**20%**	**58%**	**22%**	

n=8 brigadistas
Percent totals are rounded to nearest whole number
***Correct answer for each question was 'Yes*

Respiratory health knowledge post-test results

The post-test for respiratory health knowledge was run in the same fashion as the pre-test. However, due to miscommunication, the post-test was not done immediately after all the capacity building sessions had ended. Instead, a NCHC staff member gave the post-test many months after, in March of 2017. Additionally, the number of brigadistas who took the post-test differs than the number of brigadistas that took the pre-test. Therefore, it is not certain if these results accurately reflect a change in knowledge level.

Table 2 below demonstrates the results from the respiratory health knowledge post-test. The correct answer for each question was 'Yes.' Thus, on average, brigadistas collectively

answered correctly 85% of the time. The most challenging questions were still about chronic disease and treatment although overall, the scores per question are high.

Table 2: Respiratory Health Knowledge Post-Test Results Group Scores per Question*

Question #	Answer Options			% Correct per question
	Don't know	Yes**	No	
Q1	0	4	1	80%
Q2	0	5	0	100%
Q3	0	5	0	100%
Q4	0	4	1	80%
Q5	0	5	0	100%
Q6	0	5	0	100%
Q7	0	2	3	40%
Q8	0	5	0	100%
Q9	0	4	1	80%
Q10	0	4	1	80%
Q11	1	4	0	80%
Q12	0	5	0	100%
Q13	1	4	0	80%
Q14	0	5	0	100%
Q15	1	2	2	40%
Q16	0	5	0	100%
Percent Totals:	**4%**	**85%**	**11%**	

n=5 brigadistas
Percent totals are rounded to nearest whole number
***Correct answer for each question was 'Yes'*

Self-efficacy pre-test results

The pre-test for self-efficacy was conducted in a similar format as the pre- and post-test for respiratory health knowledge. A key difference is that there were more options for brigadistas to select as opposed to 'Don't know,' 'Yes,' and 'No,' which may have skewed results. Further, due to miscommunication, no post test on self-efficacy was given.

Table 3 below demonstrates results from the self-efficacy pre-test. There were no correct answers but on average, 42% of the time, brigadistas collectively responded that they felt 'Confident.'

Table 3: Self-Confidence Level Pre-Test Group Scores per Question*

Questions	Answer Options				
	Extremely confident	Somewhat confident	Confident	Not confident	Extremely unconfident
Q1	0	0	4	4	0
Q2	1	2	3	0	2
Q3	1	0	4	2	1
Q4	0	3	4	0	1
Q5	0	1	4	1	2
Q6	2	2	1	2	1
Percent Totals:	**8%**	**17%**	**42%**	**19%**	**14%**

n=8 brigadistas
Percent totals are rounded to nearest whole number

4.4 Key Informant Interview Results

The results from the key informant interviews represent findings from twelve out of the fifteen interviews. Only twelve were recorded and thus, only twelve were transcribed and coded. Moreover, saturation was reached at about eight interviews. Due to the similarity with questions used in the focus group discussion, there is some overlap in themes and responses. Using basic thematic analysis, three major themes emerged: lessons learned as a brigadista, preferred learning styles, and desires for the curriculum and facilitation guide. Each theme will be described below.

Lessons learned as a brigadista

This theme emerged from a few questions that were intended to serve as warm-up questions. Nevertheless, it was useful in identifying concepts and skills brigadistas had learned throughout the years in addition to a more broad sense of life lessons.

Several brigadistas shared that first and foremost, being a brigadista means being "a servant of the people" and that one could only succeed if it "came from the heart." Other brigadistas added to this notion by saying that a brigadista "needs to know the people, needs to be extremely patient, and needs to know time management." A few brigadistas commented that the role could be overly demanding at times and that they sacrificed time to fulfill their commitments as brigadistas. For instance, one brigadista said that she wakes up at four in the morning and is sometimes out in the community all day: "I wake up at 4:00 am to prepare meals, get my children ready for school, clean the house, and then I go out into my sector or to the clinic. By the time I get home, it is very late and I am tired. I wake up and do this everyday."

In terms of health topics and skills, brigadistas have learned an assortment of information. Some of the brigadistas with more years of experience recounted the earlier years when MINSA trained them in areas such as family planning, immunizations, and maternal and child health. One of the more experienced brigadistas remembered the time when she underwent specialized training for midwifery: "For a long time, I was the only one here who could handle pregnancies. I have seen some dangerous pregnancies, but I am glad I was trained to help." As NCHC, NGOs, and other volunteer groups moved into the community, the more training brigadistas received. Numerous brigadistas stated they in more recent times, they have received training in water, sanitation, and hygiene (WASH), chronic illnesses, mental health, post-partum care, first aid, and now, respiratory health. Additionally, a few brigadistas have received more

specialized training in areas including surveying, interviewing, and public speaking. These brigadistas commented that they now "feel very comfortable handling a 36-page survey even if takes three to four hours." All brigadistas agreed that they depend more so on these groups than MINSA for training. One brigadista summarized this feeling by saying, "Lots of groups come to train us and I really appreciate them because MINSA is not really around. I will tell you clearly and honestly, MINSA does not support us as they should."

Preferred learning styles

When asked about preferred learning styles, there was overlap between the responses given here and the responses given during the focus group discussion. However, not all brigadistas were present during the focus group so this may be slightly more representative of preferred learning styles.

Many brigadistas commented that they prefer interactive activities to traditional didactic lessons. They stated that "concepts stick better when we get to practice them" and that they are "better than just plain theory." In addition, they cherish the opportunity to learn a concept and then teach one another. For instance, one brigadista missed nearly all the capacity building sessions and thus asked a fellow brigadista to teach her. Of this, she said, "I reached out to *name*[2] to see if she would catch me up on things I missed. She did a great job. She taught me everything, down to the interactive activities you all did in your capacity building sessions."

Concerning group size, there was general consensus among brigadistas that small groups are preferred over large groups. Large groups allow "people to space out, not pay attention," and they tend to be "dominated by people who are more confident public speakers," making large

[2] *name* is the pseudonym used to protect confidentiality of brigadistas

group settings feel "intimidating." On small groups, many brigadistas shared that it is easier to coordinate tasks and everyone gets an opportunity to share his/her opinion. However, one brigadista pointed out a caveat about small groups: "You cannot combine men and women in a group. It is not comfortable for men and women to mix."

Regarding strategies to retain information, most brigadistas claimed to follow these steps: "first you observe and listen, then you ask questions, and finally you practice through repetition." Additionally, other brigadistas stated that they use positive reinforcement to remind themselves that they can retain information and that they can teach others. One brigadista summarized this point nicely by saying, "I am somewhat of an optimist. I like to tell myself that I can do things. That I can remember and that I can teach. This gives me a lot of confidence in my abilities." Further, other brigadistas specified certain techniques that help them retain concepts including these: role plays, case studies, and drawings.

Desires for the curriculum and facilitation guide

Brigadistas were particularly enthusiastic to express their desire for the curriculum and facilitation guide. Many of them immediately responded by saying, "Please follow the same exact structure you used during the capacity building sessions, including the helpful handouts you provided." One brigadista particularly emphasized, "We have never received education or training in the way your group presented it to us. I do not like MINSA trainings at all because MINSA has made health a political interest as opposed to a human right. So, I appreciate the structure and material you used." Additionally, several brigadistas applauded the facilitation tips given during the capacity building sessions because they had never received facilitation guidance. Thus, stated that they would like to see some of that in the guide as well. Of this, a few

brigadistas said, “The facilitation tips helped me lose my fear of public speaking so I would really like to see them in the guide.”

Concerning the educational content of the guide, all brigadistas stated that they wanted the same content presented during the capacity building sessions. All brigadistas stressed that basic anatomy of the respiratory system, common illnesses and treatments, risk factors, and prevention should be a part of the guide. One brigadista shared: “I think it is really important to have all of that information in there. I had no idea that COPD and smoke inhalation were related. Plus, respiratory diseases affect our community so much.” Another brigadista agreed, saying, “I now feel like I have a true understanding of respiratory diseases and prevention strategies. We never knew the impact smoke could have on someone.”

In terms of logistical components, most brigadistas voiced that they prefer short modules, no more than two hours in length. Additionally, they verbalized the importance of keeping language simple and less technical. They reiterated the desire to include interactive activities, such as case studies and story telling, so as to “spark creativity,” as one brigadista stated. Further, some brigadistas recommended that the guide include small personal touches such as images of them in action, images of material they produced during the capacity building sessions, and a “this guide belongs to_____” page. To protect their confidentiality, images of brigadistas are not included in this version (Appendix D) of the curriculum but they are included in the Spanish version to be given directly to them. Lastly, the Spanish title of the curriculum, *Mejorando la salud respiratoria de nuesta comunidad* (Improving the respiratory health of our community) was a collective suggestion from brigadistas.

In conclusion, all brigadistas shared that they were excited to receive a reference tool. Some brigadistas commented, “We are thrilled to finally have something we can refer to.

Something we can have confidence in." Others added to this by saying, "We can also use this as a template for other guides or manuals we make. Now we have something to go off of."

4.5 Curriculum and Facilitation Guide

The final version of the curriculum and facilitation guide for Los Robles is a culmination of all the research done over the course of two years: formative research, a literature review, quantitative data, qualitative data, and lastly, constructive feedback from several mentors, including my thesis chair Jonathan Colasanti, NCHC staff members, and other faculty at Emory. Below is a brief summary of each module included in the curriculum and facilitation guide. Each module is 60 minutes in length, offers facilitation guidance, and includes two suggested interactive activities. The intended audience for the guide is community members of Los Robles. For more details, the final version is in Appendix D.

- **Module One: The Respiratory System**
  - This module introduces the function of the respiratory system and covers basic anatomy of the respiratory system, placing emphasis on more important structures. By the end of the module, participants should be able to describe the main function of the respiratory system, identify two key organs, and name one function of phlegm.
- **Module Two: Common Diseases**
  - This module reviews common diseases seen in Los Robles, as well as corresponding symptoms and treatments. By the end of the module, participants should be able to name at least two common diseases, state two symptoms, and identify when someone should seek medical attention.
- **Module Three: Prevention Strategies and Risk Factors**
  - This module covers common risk factors for respiratory diseases and prevention strategies to avoid developing a respiratory disease. By the end of the module, participants should be able to identity at least two risk factors and name two prevention strategies.
- **Module Four: Benefits of an Improved Cook Stove**
  - This module explains the benefits of an improved cook stove compared to a traditional open-fire stove. By the end of the module, participants should be able to state at least two things that can happen when smoke is trapped inside a kitchen/house, at least two benefits to the improved cook stove, and one way to maintain the improved cook stove.

Chapter 5: Discussion

5.1 Introduction

The qualitative findings described in the previous chapter suggest that brigadistas favor participatory learning methods in small group settings and found the capacity building sessions useful in their educational and personal development. Additionally, brigadistas also provided helpful suggestions to guide the structure and design of the guide. The respiratory health knowledge pre- and post-tests imply that there was improvement before and after the capacity building sessions but several unknowns are associated with these results and cannot be considered accurate. Similarly, self-efficacy levels were assessed through a pre-test only and therefore, it cannot be determined if self-efficacy levels changed.

Given these results and alongside the additional research presented in this special studies project, this chapter seeks to provide NCHC with valuable insight on limitations, strengths, and recommendations for future implementation of the curriculum and facilitation guide.

5.2 Limitations and Strengths

Limitations

There were numerous limitations throughout the entire special studies project process. With regard to the data collection process, the first limitation was that all data collection tools were created on site. Although they were carefully crafted using a renowned qualitative methods research resource, the ideal would have been to review them with a qualitative researcher. In terms of other limitations during the qualitative research process, the focus group discussion was not recorded. Thus, notes were taken. It became particularly difficult to take notes when the focus group broke into smaller groups. As designated note-taker, I had to walk from group to

group and could have missed critical information for my thematic analysis. Another limitation during the qualitative research process was respondent bias during the interviews. While I felt that I did my best to remain neutral and ask fully open-ended questions, brigadistas may have been inclined to give me answers they thought I wanted to hear. Thus, it is important to take this into consideration when reviewing the results.

Similar to the qualitative research guides, the pre- and post-tests should have been reviewed by a healthcare professional. They were created with the assistance of a fourth-year medical student but it still would have been good practice to check with a licensed healthcare professional. Another limitation with the data collection process, particularly with the pre- and post-tests was length. The pre- and post-test for respiratory health knowledge was far too long. It should have been broken up into more manageable parts and given at the beginning and end of each capacity building session as opposed to once before all sessions and once several months after the sessions had ended. In addition, the corresponding directions to all pre- and post-tests proved to be confusing for brigadistas to follow. Thus, it is not certain if the answers given are accurate. The pre-test for self-efficacy had even more answer options (five opposed to three) than the one for respiratory health knowledge which caused significantly more confusion. Additionally, it would have been more appropriate the print out the pre- and post-tests and have brigadistas individually take the test—the majority of brigadistas in Los Robles can read and write. Individual scores would have been easier to manage. There is also the issue of respondent bias, especially with the pre- and post-test for respiratory health knowledge. Only five brigadistas took the post-test as opposed to the eight who took the pre-test and the five scored a significantly higher average than the eight that took the pre-test. Thus, it is possible that those five that took the post-test were those brigadistas that tend to be more available and more

engaged in the community. The NCHC staff member did mention it was difficult to gather more than five brigadistas. Lastly, it is worth mentioning that no threshold (i.e. 80% or above is significant) was specified as 'success' so although brigadistas seemed to score high on the post-test, it cannot be certain that it was true success. An appropriate threshold level should have been researched and established before creating the pre- and post-tests.

Concerning the capacity building sessions, there were many limitations. The more significant limitations will be discussed. One of the most significant limitations was that we could never achieve complete attendance (15 brigadistas) at the sessions. This was mostly due to responsibility conflicts—volunteer groups were present throughout the summer and brigadistas were required to assist these groups. A second limitation with the capacity building sessions was that even though brigadistas claimed to like participatory learning in the end, it was not easy for them to adapt to this teaching style. For several brigadistas, it was difficult for them to adapt to our presence as foreigners, much less adapt to our teaching style. Other limitations were more logistics based. For example, the length of our capacity building sessions were initially closer to two hours long which proved to be too lengthy for brigadistas. We modified this for later sessions based on informal feedback received. Moreover, we should have requested formal feedback from brigadistas so we could modify our sessions and so that we could measure how we were doing as facilitators. Lastly, and most importantly, we failed to identify a leader amongst brigadistas to oversee future curriculum implementation. This will be addressed in 'Recommendations.'

Generally speaking, and as a reminder, all research, data collection tools, and the final version of the curriculum and facilitation guide are tailored to meet the needs of brigadistas in Los Robles. As such, these items are not generalizable to other contexts.

Strengths

Despite the many limitations, there were also several strengths associated with this special studies project. A unique strength of this curriculum and facilitation guide is that it fills an unmet need that was identified directly by relevant stakeholders—brigadistas, NCHC staff, and the local clinician. Moreover, these stakeholders were as involved in the development of this guide as possible.

Another strength to this project is that for the first time, brigadistas will have access to comprehensive and correct information on respiratory health in one place. Moreover, each brigadista will receive the same information via the curriculum and facilitation guide, ensuring that brigadistas have equal opportunity to be at similar knowledge levels.

On a similar note, this guide will be the first that coalesces educational content with facilitation guidance. Most brigadistas have access to some form of educational material regarding respiratory health but from the interviews and informal conversations, I learned that they do not have any resources on facilitation.

Lastly, I designed this guide in the hopes that brigadistas will add to it or modify it as they see fit. In no way does this guide cover the entire spectrum of respiratory health or the entire realm of facilitation techniques. Thus, there is always room for additions or modifications. It also serves as a template for them to follow should they want to create their own guides on other diseases or health topics.

5.3 Recommendations

The following recommendations focus on suggestions for implementation and evaluation of the curriculum and facilitation guide.

Implementation

As mentioned in limitations, no one was identified to spearhead the implementation of the curriculum and facilitation guide. Thus, a suggestion is to identify an individual, often called a champion, to oversee the implementation. To identify this champion, potential criteria could be the following: the individual attended four out of the five capacity building sessions, the individual applied the lessons learned during the capacity building sessions (e.g. went on house visits, held education sessions) and the individual currently shows desire to obtain a leadership opportunity. An additional recommendation could be to give this individual a pre- and post-test to see if they can answer the questions correctly. Ideally, this individual would receive additional facilitation training as well as supportive supervision from NCHC staff members during a pilot testing phase. Lastly, this individual would be responsible for ensuring that all brigadistas are delivering the information correctly during educational sessions.

With regard to a pilot testing phase, it would be useful if the champion selected to spearhead implementation could test this guide on incoming brigadistas and receive their feedback through formal surveys. That feedback could then serve to make modifications, if necessary before educational sessions are held for community members.

Evaluation

After each educational session held by a brigadista, a pre- and post-test should be given to community members. Depending on the pre- and post-test scores, brigadistas can see if they are effectively communicating their message. If there is an increase in the scores from pre-test to post-test, then brigadistas will know they are delivering the information well. Conversely, if there a decrease in the scores from pre-test to post-test, then brigadistas will have to re-evaluate and modify something about the curriculum or the facilitation.

In addition to knowledge level pre- and post-tests, formal feedback surveys should be given. Questions to consider are these:

- What did you like the most about today's session?
- What did you like the least about today's session?
- What do you recommend for the next session?
- How could I improve as a facilitator?

This kind of feedback can help brigadistas know about their facilitation skills and suggest ways to improve.

Lastly, since this curriculum and facilitation guide addresses respiratory health, it would be interesting to track clinic visits to see if there were less respiratory health related visits. A question at an educational session could ask something along the lines of, "In the last x months[3], have you visited the clinic for respiratory diseases?" to see if perhaps the educational sessions minimized visits. Correspondingly, it would be interesting to identify if more community members utilized preventive strategies, such as improved cook stoves to reduce smoke, after they attended educational sessions. This could be measured during house visits, through a survey on

[3] X months would ideally refer to a period when brigadistas held educational sessions

stove uptake that is already being used by NCHC. Thus, this particular suggestion would not be disruptive as it is already being done.

5.4 Conclusion

Respiratory health continues to be a problem in rural populations throughout Nicaragua and unfortunately, Los Robles is no exception. Further, brigadistas in Los Robles do not receive consistent structured training in various topics, including respiratory health. Trainings given by MINSA tend to be overabundant in content but underwhelming in terms of personal development (i.e. facilitation skills training). By creating this curriculum and facilitation guide, I sought to intertwine manageable levels of educational content with facilitation guidance in a single, easy-to-understand resource. It is my hope that this resource bolsters self-efficacy in brigadistas so that they may deliver correct information to their community. In doing so, perhaps community members will recognize risk factors, adopt healthy behaviors, and use preventive strategies and Los Robles as a whole may see a reduction in respiratory health related clinic visit

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APPENDICES

APPENDIX A: Focus Group Discussion Guide

**Note: This is translated from its original Spanish. If you would like the original version, please contact me directly.*

Introduction: Thank you for taking the time to meet with us today. We would like to get to know you better by asking some questions. These questions will help inform our capacity building sessions so that we may tailor them according to your needs. We will ask three questions in a large, 'round table' setting and we will ask four questions in a small group setting. The session will not be recorded but notes will be taken. Before we begin, are there any questions?

If no questions, ask for permission to begin

If at any time, you feel uncomfortable or need to leave, please feel free to leave the session. If there are no questions, may we kindly begin the session?

If consent is given, proceed.

PART I: Warm Up-Questions in large group

Question 1: Whom do you turn to when you need information on a health topic?

Question 2: What do you do when you do not know the answer to something?

Question 3: How do you best learn?

- Probe: What learning styles do you prefer?

PART II: Breakout Session in small groups

Question 4: In your opinion, how do you think the community members best learn?

- Probe: What learning styles do you think they prefer?

Question 5: How do you feel being part of the brigadista team?

- Probe: What does it mean to be a brigadista?
- Probe: Describe a time where you enjoyed or did not enjoy being a brigadista.

Question 6: Please describe how development projects and community hours work.

Question 7: Can you give me names of potential beneficiaries for the improved cook-stoves?

At the end: Is there anything else you would like to share?

Conclusion: Thank you for participating in the focus group discussion. We will now take a short coffee break and meet back for the pre- and post-test on respiratory health knowledge and self-efficacy (*confianza*) levels.

APPENDIX B: Key Informant Interview Guide

**Note: This is translated from its original Spanish. If you would like the original version, please contact me directly.*

Introduction: Thank you for taking time out of your busy schedule to meet with me today. I am conducting these interviews to hear from you directly about what you would like to see in the manual. It is important for me to know your thoughts and ideas so that I can create the best possible reference tool. This interview will be recorded but if at any time, you feel uncomfortable, please let me know and I will stop the recording immediately. No one will ever know your name to protect confidentiality. All data will be destroyed at the end of analysis. Do I have your permission to record?

If yes, proceed. If no, do not record but ask if you can interview.

Question 1: What does it mean to be a brigadista?

- Probe: What motivates you?
- Probe: Why do this job that doesn't pay?

Question 2: What have you learned during your time as a brigadista?

- Probe: What have you learned in general?
- Probe: What have you learned in terms of health topics?

Question 3: How you do prefer to learn?

- Probe: What is your preferred learning style?
- Probe: What materials help you learn?
- Probe: What strategies do you use?
- Probe: What techniques help you retain information?

Question 4: Please describe what you would like out of this curriculum and facilitation guide

- Probe: Describe your ideal curriculum and facilitation guide.

Question 5: How can I support your learning?

Question 6: Is there anything else you would like to share?

Thank you for welcoming me into your home, heart, and community. I sincerely appreciate this valuable information and will use it to inform the development of the guide for Los Robles.

APPENDIX C: Pre- and Post-Tests

**Note: This is translated from its original Spanish. If you would like the original version, please contact me directly.*

PART I: Respiratory Health Knowledge Pre- and Post-Test

Directions: Have everyone close their eyes. Participants will use their fingers to answer the questions. All answer options correspond to a certain number of fingers to be held up.

- **Raise 1 finger for answer option 'Don't know'**
- **Raise 2 fingers for answer option 'Yes'**
- **Raise 3 fingers for answer option 'No'**

Remind participants to use the honor system! Please no peeking to see how many fingers your neighbor is holding up!

The correct answer for each question is YES

Respiratory health knowledge:

Question 1: Stark changes in weather can be periods of high risk for contracting respiratory diseases

Question 2: Smoke can damage our lungs

Question 3: Smoke may lead to lung cancer

Question 4: Two main producers of smoke are cigarette smoke and smoke from the stove in the kitchen

Question 5: Breathing in substantial quantities of smoke may lead to pneumonia, especially among children

Question 6: Breathing in substantial quantities of smoke over periods of time may lead to chronic diseases such as asthma

Question 7: The common cold does not require antibiotics

Question 8: The common cold that lasts for more than two weeks can turn into something like pneumonia and/or bronchitis

Question 9: If you are repeatedly getting the common cold, you should consult a physician

Question 10: When you have a respiratory disease, you should avoid taking cold showers

Question 11: Whistling noises can be indicative of asthma

Question 12: Persons with asthma should take precaution when exercising

Question 13: Persons with asthma need to seek immediate care if you hear them start struggling to breathe

Question 14: COPD (chronic obstructive pulmonary disease) is a dangerous incurable disease that develops after long-term exposure to smoke

Question 15: Adults or elderly persons who cough frequently and breathe rapidly may have COPD

Question 16: The best way to avoid COPD and other respiratory diseases is to avoid breathing in smoke

PART II: Self-Efficacy Pre- and Post-Test

Directions: Have everyone close their eyes. Participants will use their fingers to answer the questions. All answer options correspond to a certain number of fingers to be held up.

- **Raise 1 finger for answer option 'Extremely Confident'**
- **Raise 2 fingers for answer option 'Somewhat Confident'**
- **Raise 3 fingers for answer option 'Confident'**
- **Raise 4 fingers for answer option 'Not Confident'**
- **Raise 5 fingers for answer option 'Extremely Unconfident'**

Remind participants to use the honor system! Please no peeking to see how many fingers your neighbor is holding up!

There are no correct answers for this test

Self-efficacy:

Question 1: As a brigadista, I feel that I have a sufficient understanding about respiratory diseases

Question 2: As a brigadista, I feel capable of teaching others in my community about respiratory diseases

Question 3: I feel comfortable speaking in front of a group of community members

Question 4: If I see someone engaging in a risky behavior that may lead to respiratory disease (for example, smoking), I feel comfortable talking to that person about risk factors

Question 5: I feel confident that I know the health status of community members in my sectors

Question 6: I know how many community members in my sector have development projects and the prerequisites required to obtain projects (e.g. community hours).

APPENDIX D: Curriculum and Facilitation Guide for Los Robles

**Note: This is translated from its original Spanish. If you would like the original version, please contact me directly.*

Please also note that the flip chart mentioned throughout the guide is not included in this special studies project. I omitted it to protect the confidentiality of brigadistas, as the flip chart includes several photographs of them. If you would like a redacted copy of the original, contact me directly. You can also create your own flip chart using the concepts discussed in the guide.

The curriculum and facilitation guide begins on the **next page.**

Mejorando la salud respiratoria de nuestra comunidad

A Respiratory Health Curriculum and Facilitation Guide for Brigadistas of Los Robles, Nicaragua

Photo Credit: Ruofei Chen, used with permission

Written by: Claudia Moya
May 2017

This guide belongs to: _____

Table of Contents

Acknowledgements

This guide is dedicated to: brigadistas of Los Robles

This guide would not have been possible without the dedication, input, and support from the brigadistas of Los Robles. I extend my deepest gratitude for the warm welcome into your lives and into your community.

I would also like to thank the Global Health Impact Team (GHIP) of Emory University for their commitment to this project. Additionally, I would like to thank Amy Rudkoski and Gina Carroll, two University of Calgary graduate students for providing photos for the guide.

Lastly, I am grateful to Nicaragua Community Health Connection (NCHC) for their collaboration, patience, and time during my stay in Los Robles.

Sincerely,

Claudia Moya
On behalf of the entire GHIP team at Emory

Purpose

The purpose of this guide is to serve as an educational reference and facilitation tool for you, a brigadista of Los Robles. It is tailored to the needs of Los Robles but may be adapted for neighboring communities, such as the community of San Esteban II.

This guide covers the same topics that were presented by the GHIP team during the summer of 2016. The guide is divided into four modules:

Module 1: The Respiratory System
Module 2: Common Diseases
Module 3: Prevention Strategies and Risk Factors
Module 4: Benefits of an Improved Cook Stove

Each module focuses on an aspect of respiratory health and includes examples of interactive activities. The flip chart created by the GHIP team can be used in conjunction with any of the modules.

The intent of this guide is not to present a detailed curriculum on respiratory health but rather to equip brigadistas with fundamental knowledge and interactive activities that can be shared with community members. Thus, the activities presented in this guide serve only as examples. As the owner of this guide, you are free to modify the activities or create entirely new activities. You can also ask community members for their ideas or suggestions!

Lastly, this guide is not the only resource on respiratory health. There are many educational resources that can be used alongside this guide. Helpful references are included at the end of each module for your benefit. Most of them are open access! An additional open access resource page is at the end of the guide.

Wishing you much success and remember to have fun!

How to use this guide

Each module is 60 minutes. At the beginning of each module, a short introduction and pre-test will be given. The module will begin after the pre-test and include educational components and two interactive activities. At the end of each module, a quick summary will be given followed by a post-test.

At the top of each module is a summary table that looks like the one below:

Theme:	The 'big picture' of what is going to be covered
Objectives:	What participants should know by the end of the module
Time Allocation:	60 minutes; this can be modified to be shorter or longer
Materials Needed:	These are for the activities
Number of facilitators:	This is only a suggestion

The summary table will help you prepare for the module. It is best to review it prior to the session.

Each module will feature facilitation instructions. Instructions that look *like this* are meant to be read in silence. Instructions that look **LIKE THIS** are meant to be read out loud. For example:

Note to facilitator: Participants may be shy
**You would not read this out loud*

SAY: Hello, my name is _____ and today we will talk about respiratory health
***You would read this out loud**

The pre- and post-tests can be found at the end of each module. They are meant to be exactly the same so do not panic when you see that they are identical! Please review these before the sessions. These tests can be administered orally. You can write the questions on a white board or on a large sheet of paper (*papelografo in Spanish)* and have your participants write or draw the answer on a piece of paper. Collect the pre-test at the beginning of the module and the post-test at the end. The scores are primarily feedback for you, the facilitator.

Facilitation Tips

Things to keep in mind:

- Prepare for each module by reading through this guide, gathering all materials, and determining the space where you will host your session
- Create a comfortable environment where everyone feels safe to ask questions. If you do not know the answer, that is okay! However, do let your participants know that you do not know and will find the answer if possible
- Guide the session but do not just talk at your participants
- Be confident in your ability to deliver the material presented in the guide. The guide is here to help if you get stuck!
- Be fair and inclusive of everyone. Find ways to involve the quiet participants!
- Remember to speak clearly and loudly. If you forget something, this guide is here to help you!
- Maintain eye contact with your participants even if you are reading the script provided in the guide
- Try not to show your opinion when participants are sharing their work
- Keep track of time but be flexible if more time is needed on certain topics
- Congratulate your participants for sharing
- Have fun and remember, “first and foremost, being a brigadista comes from the heart”

Module 1: The Respiratory System

Theme:	This module introduces the function of the respiratory system and covers basic anatomy
Objectives:	• Participants will be able to describe the main function of the respiratory system • Participants will be able to identify two key organs of the respiratory system • Participants will be able to name one main function of phlegm
Time Allocation:	60 minutes
Materials Needed:	• Drawing of the respiratory system, poster of the respiratory system, or anatomical model • Flip chart • Paper • Colored pencils, crayons, or markers • Balloons • Straws
Number of facilitators:	1-2 brigadista(s)

Introduction (3 minutes)

Note to facilitator(s): At the beginning of each module, it is very important to present yourself to the audience (even if they are your friends!) and state the overall theme of the module.

Example: "Hello, my name is _____. I am a brigadista. Today we will learn about the respiratory system."

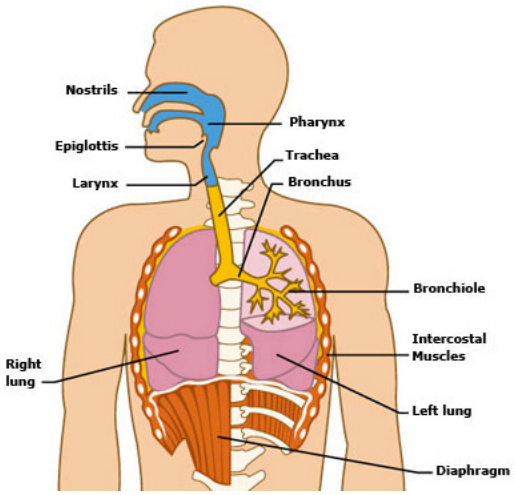
After you introduce yourself, ask your participants to take the short pre-test. The pre-test is located at the end of this module.

<u>Anatomy of the Respiratory System</u> (10 minutes)

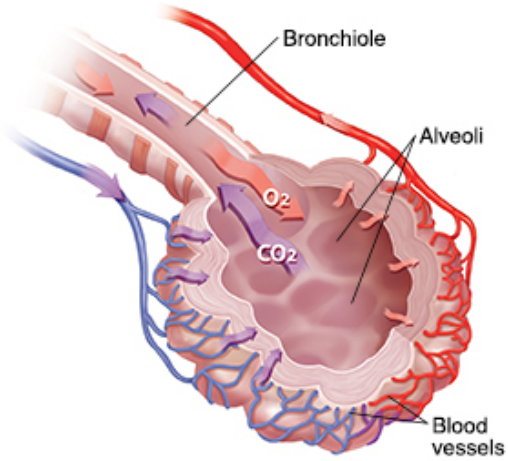
Note to facilitator(s): Utilize drawings or posters of the respiratory system to talk about the anatomy of the respiratory system. You can also use the flip chart or anatomical model.

SAY: "As you can see, there are many organs in the respiratory system. Some of the most important ones are:

- **The mouth: this is where you breathe in air**
- **Nostrils: this is where you breathe in air**
- **Lungs: help oxygen from the air we breathe enter the red cells in our blood**
    - **Within our lungs, we have these structures:**
        - **Bronchi: airways that lead air into the lungs**
        - **Bronchioles: small branches of the bronchi that act as passageways for air**
        - **Alveoli: small bags that contain air and also the place where oxygen goes in while carbon dioxide goes out**
            - **The image on the right shows this process. The red represents oxygen and the blue/purple demonstrates carbon dioxide**



Source: http://scotdir.com/other/the-respiratory-system



Source: http://poc.select.kramesstaywell.com/Content/healthsheets-v1/interstitial-lung-disease

Together these organs allow us to breathe. The main function of the respiratory system is to distribute oxygen throughout the body and this is done by breathing. While we breathe, we inhale air containing oxygen. After our body uses this oxygen, carbon dioxide is produced and then exhaled.

Activity #1: Drawing the respiratory system (15 minutes)

Note to facilitator(s): Hand out pieces of paper and some colored pencils, crayons, or markers. During the activity, remember to walk among participants in case they have questions.

SAY: "Now it is time for an activity. I want you all to draw the respiratory system. When you draw the respiratory system, label the following organs: the mouth, nostrils, bronchi, bronchioles, alveoli, and lungs. The drawings do not have to be perfect."

Note to facilitator(s): After the fifteen minutes pass, ask participants if anyone wants to share. If no one wants to share, that is okay.

BREAK: 5 minutes

A little more about the alveoli and bronchioles (10 minutes)

SAY: "As you saw earlier, the respiratory system contains alveoli and bronchioles, which are located in the lungs. From now on, we will call the alveoli "small bags" and bronchioles "small tubes."

The small bags are very important because:

- **They take up most of the space inside the lungs**
- **They are where oxygen is absorbed into the blood**
- **They are very fragile and can break**

The small tubes are very important because:

- **They have muscles in their walls that contract (close) and relax (open)**
- **The size of the opening of the small tube is very important so that air can enter into the small bags**
- **They contain phlegm that protects the wall of the tubes**

ASK: "Do know what phlegm is? "

SAY : "Inside the small bags and small tubes there is phlegm. Phlegm is a mucous (sticky) substance. Phlegm has 3 important functions:

- **It is a solvent (such as water) that dissolves oxygen in it (like the gas in a soda)**
- **It protects tissue through lubrication (think of engine oil for a car)**
- **It is part of the immune system, which protects our body against diseases (such as how police protect us)**

When there is a lot of phlegm, it is best to expel it because otherwise there will not be enough room for air to enter into the small bags."

Activity #2: Balloons and Straws (10 minutes)

Note to facilitator(s): Hand out balloons and straws. During the activity, remember to walk among participants in case they have questions.

SAY: "This activity demonstrates the function of the small bags and small tubes. The balloons represent the bags and the straws represent the tubes. Place the straw into the opening of the balloon. Now inflate your balloon using the straw. Inflate the balloon until it is filled with air."

After all participants have done the activity, ask how they felt. Then continue with the next part of the activity.

SAY: "Now, let's make things a little more difficult. I want you to fill your balloons with a little bit of water (not too much). The water represents phlegm. Inflate your balloon again, this time with the water inside."

After all participants have done the activity, ask how they felt.

ASK: **"What was different about adding water to the balloons? Just as you found it difficult to inflate the balloons when they were filled with water the same can happen to us when we have a lot of phlegm. That is why it is good to get it out of our system."**

Conclusion (7 minutes)

ASK: "Is there anyone who can tell us what we learned today?"

If no one wants to share, tell your participants to turn to the person sitting next to them and share what they learned with that person. After a few minutes, ask participants to take the post-test. Once they complete the post-test, then you the facilitator(s) give a summary of the module.

SAY: "Thanks to those who volunteered to share. Today we learned about the respiratory system. The main function of the respiratory system is to distribute oxygen throughout the body and this is done by breathing. Two of the most important organs in the respiratory system are the alveoli or small bags and bronchioles or small tubes that help with the distribution of oxygen. Inside the small bags and small tubes, there is phlegm which helps protect us but sometimes, there is too much phlegm and you have to expel it. That is all for today, thank you for participating."

At the end of the module remind participants when the next module is.

END OF MODULE 1

Module 1: Pre- and post-test

Note to facilitator: Feel free to modify these questions in any way. However, do make sure they correspond to the objectives of the module.

Name:

Date:

Question 1: What is the main function of the respiratory system?

- Answer (can be any of the following):
  - Preferred answer: To distribute oxygen throughout the body by breathing
  - To help us breathe
  - To distribute oxygen

Question 2: Name two key organs of the respiratory system.

- Answer (can be any of the following):
  - Nose
  - Mouth
  - Lungs
  - Bronchi
  - Alveoli (small bags)
  - Bronchioles (small tubes)

Question 3: What is one function of phlegm?

- Answer (can be any of the following):
  - It dissolves oxygen (like gas found in a soda)
  - It protects tissue through lubrication (like engine oil in a car)
  - It is part of the immune system which protects our body against diseases (such as how police protect us)

Module 1: References

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Module 2: Common Diseases

Theme:	This module reviews common diseases seen in Los Robles, as well as corresponding symptoms and treatments
Objectives:	• Participants will be able to name at least two common diseases • Participants will be able to state two common symptoms • Participants will be able to identify when someone should seek medical attention
Time Allocation:	60 minutes
Materials Needed:	• Large piece of paper or white board • Markers • Flip chart • Small rubber balls • Small pieces of paper containing respiratory disease symptoms for case studies • A bag or a bowl • Pencils
Number of facilitators:	1-3 brigadista(s)

Introduction (4 minutes)

Note to facilitator(s): At the beginning of each module it is very important to present yourself to the audience (even if they are your friends!) and state the overall theme of the module.

Example: "Good morning, my name is _____. I am a brigadista. Today we will learn about the most common respiratory diseases."

After, ask the following:

ASK:

1. **Share with me (or us if there is more than one facilitator) something you learned in the first module on the respiratory system. You do not have to answer in complete sentences.**

2. **Is there anything from the last session that I (or we) can clarify for you?**

After about 2 minutes, proceed to give the pre-test for Module 2 (found at the end of the module).

<u>Common diseases</u> (15 minutes)

SAY: "There are several respiratory diseases but the most common ones seen here in Los Robles are the following:

Use the flip chart to show pictures/graphics of the diseases listed below

- **Asthma**
- **Pneumonia**
- **Acute and Chronic Bronchitis**
- **Chronic Obstructive Pulmonary Disease (COPD)**
- **Active Tuberculosis (TB)**
- **Common Cold**
- **Allergies "**

Draw the following table (on the next page) on a large piece of paper. To make this activity more interactive, ask participants to help you fill it out. Do not do everything at once. Instead, slowly fill out each section of the table. Use the flip chart for reference.

Diseases	Causes	Duration	Symptoms	Treatment*
Asthma	• It is not clear why some peope get Asthma and others do not • Can be a combination of environmental and genetic factors • Triggers for an Asthma attack may include: pollen, smoke, or exercise	Asthma is chronic but treatable Asthma attacks can last between minutes to days	• Shortness of breath • Chest tightness or pain • A whistling or wheezing sound when exhaling • Coughing or wheezing attacks are worsened by a virus, like a cold or flu	• Long-term: Inhalers • Quick-relief: short-acting inhalers • Breathing exercises
Pneumonia	• Bacteria • Viruses	In healthy individuals, pneumonia may last between 2 – 3 weeks. In older individuals it can last up to 6 – 8 weeks or longer.	• Fever, sweating, and shaking chills • Chest pain when you breathe or cough • Shortnes of breathe (particularly on exertion) • Fatigue	• Antbiotics for bacterial pneumonia • Cough medicine can ease a cough • Pain relievers like acetaminophen
Acute Bronchitis	• Viruses, typically the same ones that cause inluenza (flu) or common cold	It usually lasts about a week but the cough can persist for several weeks	• Common cold symptoms • Cough • Production of mucus • Chest discomfort	• Most get better without treatment, usually within a couple weeks
Chronic Bronchitis	• Most common cause is cigarette smoking or inhaling smoke produced by open- fire stove	It is definied by a productive cough that lasts at least 3 months, with recurring bouts for at least 2 years	• Includes symptoms above • Defined by a productive cough that lasts at least 3 months, with recurring bouts for at least 2 years	• Inhalers • Breathing exercises
COPD	• Cigarette smoke • Exposure to fumes produced by open-fire stoves in poorly ventilated	It is a chronic condition that is treatable	• Fatigue • Cough • Having to clear your throat first thing in the morning • Shortness of breath • Wheezing • Frequent respiratory infections	• Smoking cessation • Updating cook-stove • Some inhalers
Active Tuberculosis (TB)	• Bacteria	Once active, TB can last between 6 to 9 months	• Coughing that lasts 3 or more weeks • Coughing up blood • Chest pain with breathing or coughing • Unintentional weight loss	• Antibiotics for at least 6 to 9 months
Common Cold	• Viruses	It lasts for about a week but can last for up to 10 days	• Runny or stuffy nose • Sore throat • Cough • Congestion • Sneezing	• Pain relivers • Nasal spray

Allergies	• In terms of respiratory health, airborne allergies can be triggered by pollen, dust, and mold	Allergies are generally temporary and so they come and go	• Sneezing • Itchy nose • Runny, stuffy nose • Watery eyes	• Avoid triggers • Loratadine • Nasal spray • Eye drops

***Please consult with a local physician before beginning any treatment. The list of treatment options is not exhaustive and is simplistic.**

BREAK: 2 minutes

Activity #1: Story-telling (10 minutes)

Note to facilitator(s): Divide participants into small groups, from three to six persons per group. If possible, assign one facilitator per group but if that is not possible, remember to walk among groups. Give each group a small ball or another small object to toss.

SAY: "We are now going to do a story-telling activity. In your small groups, share an experience or testimony about cases of respiratory diseases you have seen or heard of in Los Robles. Use the small ball to choose who shares. For example, person 1 shares his/her testimony and then tosses the ball to another person who then shares next. You do not have to pass the ball to the person right next to you."

Note to facilitator(s): After the ten minutes pass, ask participants if anyone wants to share. If no one wants to share, that is okay.

BREAK: 2 minutes

Common symptoms of respiratory diseases (10 minutes)

SAY: **"Let's move on to talk about some of the most common symptoms of respiratory diseases. Remember that these do not represent all possible symptoms.**

Use the flip chart to show pictures/graphics of the symptoms listed below

- **Cough**
- **Congestion**
- **Fever**
- **Fatigue**
- **Shortness of breath**
- **Headache**
- **Watery eyes (in reference to allergies)**

Cough
Coughing is a muscle contraction to expel something out of the body or to prevent something bad from entering the body. There are two types of cough:

- **Dry cough: Where coughing is to prevent something from entering the body or from irritation in the lungs**
- **Productive cough (with phlegm): Where coughing is for the body to expel something**

Congestion
This refers mostly to upper airway congestion. It usually manifests itself as a stuffy nose, sore throat, or other related symptoms.

Fever
Fever is the body's reaction to killing bacteria and viruses. Bacteria are tiny living things (called micro-organisms) that can live in different environments. Unlike bacteria, viruses are even smaller and need living hosts in order to multiply. A low fever is manageable but a fever higher than 38.5 degrees Celsius needs medical attention.

Fatigue
Fatigue is a constant state of tiredness that develops over time and drains your energy.

Shortness of breath
This is intense tightening of the chest or a feeling of suffocation.

Headaches
Headaches are pain in any region of the head. They happen when you are not breathing in enough oxygen. They can also happen when you are not drinking enough water.

Watery eyes (in relation to allergies)
Watery eyes occur because our tears dissolve toxins in irritants such as smoke."

When to seek immediate medical attention (2 minutes)

SAY: "Most people with respiratory diseases like the common cold do not need to seek immediate medical attention. Symptoms like nasal congestion will go away eventually, usually within a week or so. However, symptoms like a high fever, shortness of breath, or a persistent cough or cold (more than 2 weeks) need immediate attention. You should refer anyone with these symptoms to the nearest health facility."

Activity #2: Case studies (10 minutes)

Note to facilitator(s): Prior to this activity, make sure you have written down the case studies on small pieces of paper. Put the pieces of paper into a bowl or a bag. Have participants pair up and together pull out a piece of paper and read it aloud or help them read aloud. Ask each participant to guess which disease the case is describing. It is okay to ask for help!

To create your own individual cases, use the table on pages 16 – 17. An example will be provided below:

Sample case 1: Little Jose is playing soccer with his friends. His doctor warned him not to play for too long or to over-exert himself. As he runs and runs, Jose starts to cough and complain of tightness in his chest. When he exhales, you can hear a distinct whistling sound. Which respiratory disease do you think Jose has?

The answer: Asthma

Conclusion (5 minutes)

ASK: "Is there anyone who can tell us what we learned today?"

If no one wants to share, tell your participants to turn to the person sitting next to them and share what they learned with that person. After a few minutes, ask participants to take the post-test. Once they complete the post-test, then you the facilitator(s) give a summary of the module.

SAY:" Thanks to those who shared. Today we learned about some of the most common respiratory diseases, symptoms associated with certain diseases, and treatment options. Here in Los Robles there are cases of asthma, pneumonia, bronchitis, COPD, TB, and allergies to name a few. Some of the most common symptoms are cough (remember that there are two types of cough) congestion, fever, fatigue, shortness of breath, and headaches. Symptoms from a common cold disappear fast and usually do not require immediate medical attention. However, some symptoms like a high fever or shortness of breath require immediate medical attention. That is all for today. Thank you for your participation."

At the end of the module remind participants when the next module is.

END OF MODULE 2

Module 2: Pre- and post-test

Note to facilitator: Feel free to modify these questions in any way. However, do make sure they correspond to the objectives of the module.

Name:

Date:

Question 1: Name at least two common respiratory diseases seen in Los Robles.

- Answer (can be any of the following):
  - Asthma
  - Pneumonia
  - Acute and Chronic Bronchitis
  - Chronic Obstructive Pulmonary Disease (COPD)
  - Active Tuberculosis (TB)
  - Common Cold
  - Allergies

Question 2: State two common symptoms of respiratory diseases seen in Los Robles

- Answer (can be any of the following; more found on the table):
  - Cough
  - Congestion
  - Fever
  - Fatigue
  - Shortness of breath
  - Headache
  - Watery eyes (in reference to allergies)

Question 3: When should someone seek immediate medical attention for respiratory disease?

- Answer (can be any variation of the following):
  - Symptoms like nasal congestion will go away eventually, usually within a week or so. However, symptoms like a high fever, shortness of breath, or a persistent cough or cold (more than 2 weeks) need immediate attention. You should refer anyone with these symptoms to the nearest health facility

Module 2: References

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Module 3: Prevention Strategies and Risk Factors

Theme:	This module covers common risk factors for respiratory diseases and prevention strategies to avoid developing respiratory diseases
Objectives:	• Participants will be able to identify at least two risk factors • Participants will be able to name two prevention strategies
Time Allocation:	60 minutes
Materials Needed:	• Flip chart • Large pieces of paper or white board • Markers • Small pieces of paper and colored pencils
Number of facilitators	1-2 brigadista(s)

Introduction (4 minutes)

Note to facilitator (s): At the beginning of each module it is very important to present yourself to your audience (even if they are your friends!) and state the overall theme of the module.

Example: "Good morning, my name is_____. I am a brigadista. Today we are learning about preventive strategies to avoid respiratory diseases and risk factors."

After, ask a question:

ASK:

1. **Share with me (or us if there is more than one facilitator) something you learned in the second module on most common diseases. You do not have to answer in complete sentences.**

After this, ask your participants to take the short pre-test. The pre-test is located at the end of this module.

<u>Prevention strategies</u> (10 minutes)

Note to facilitator (s): Start with a brief discussion of 5 minutes.

ASK: "What are some prevention strategies to avoid respiratory diseases?'

During the brief discussion, write down the answers of the participants on a large piece of paper or on the white board. After the discussion, use the flip chart to show the page (pictured below) containing a chart with preventive strategies.

SAY: "Thanks to those who shared. Here are all your answers (*point to the piece of paper or white board*). (*Using the flip chart*) As can be seen, this chart shows measures that can be taken to prevent respiratory diseases. Can someone tell me what they see? (*Wait a few minutes*). Very good. To prevent respiratory diseases, we can: (*read what it says on the chart*).:"

Source: http://hidalguense.soy/hidalguenses/buena-higiene-para-evitar-enfermedades-respiratorias/

The chart above is in Spanish. In short it says: Wash your hands with soap several times a day (emphasize how important this point is!), cover your mouth and nose when you sneeze or cough, eat a healthy diet, sleep well, drink plenty of water, stay home from school if you are sick and DO NOT self-medicate.

<u>Activity #1: Drawing preventive strategies</u> (10 minutes)

Note to facilitator(s): Hand out pieces of paper and colored pencils. Divide participants into pairs.

SAY: "For our first activity, I want you to sit in pairs. I would like for you to draw preventive strategies that you can practice at home, in your own life. You will have 10 minutes to draw and then we will share with the large group."

After the 10 minutes have passed, ask if groups would like to share or hang up their drawings.

BREAK: 2 minutes

<u>Risk factors</u> (10 minutes)

Note to facilitator (s): Start with a brief discussion of 5 minutes.

ASK: "Does anyone know what a risk factor is?"

Note to facilitator (s): During the brief discussion, write down the answers of the participants on a large piece of paper or on the white board. After the discussion, use the flip chart to show the chart below.

SAY: "Thanks to those who shared. Here are all your answers (*point to the piece of paper or white board*). (*Using the flip chart*) As you can see, this chart shows some of the most serious risk factors Can you tell me what you see? (*Wait a few minutes*). Very good. To begin, a risk factor is something that may increase our likelihood of getting sick. This chart indicates certain risk factors that increase our chances of getting a respiratory disease (*read the chart*): "
The chart below is in Spanish. In short it says: cigarette smoke, smoke from burning trash, other infections, the elderly and children, and in the center smoke from an open-fire stove

Source: Image crafted by Elizabeth Elliott; original sources are unknown

.

SAY: "These risk factors are very important to know because smoke, other infections, and our age can cause damage to the respiratory system. Smoke, above all, can damage the small bags and small tubes in our lungs and this can result in serious diseases like COPD. Once structures like our small bags and small tubes are damaged, then there is an increased risk for viral and/or bacterial infections. Excessive smoke inhalation damages our body's protective mechanisms. Additionally, our age can affect our health because when we are children, our immune system is not fully developed. Further, as we age, our immune system no longer has the same duress as before. So, if you see your neighbor smoking cigarettes, what would you do? (*Allow a few minutes for discussion*) "

Activity #2: Role play (20 minutes)

Note to facilitator(s): Ask the participants if there are 4 volunteers to do a role play. In the first role play, there is the part of a mother, her 2 children, and an elderly person.

SAY: "Thanks to the volunteers. In a role play, a scene is acted. The first role play is a mother and her 2 children who are waiting for the bus to Jinotega. Standing nearby the mom and her two children is an elderly person smoking a cigarette. The mother starts a discussion with the older person about the damage that cigarette smoke can cause. Please act out this scene and have fun! This is not about acting perfectly!"

Allocate 5 minutes for the scene. After 5 minutes, thank those who participated in the scene and ask the following questions to all participants:

ASK:

1. **What is the risk factor?**
2. **Why did the mother feel compelled to speak to the elderly person?**
3. **How is cigarette smoke harmful?**

Give 5 minutes for questions. Then begin the second role play. Ask the participants if there are 4 volunteers. In the second role play, there is the part of a mother, her 2 children, and a friend of the mother.

SAY: "Thanks to the volunteers participating. The second role play is a mother cooking with her traditional open-fire stove. The mother has two children who are playing in the kitchen. A friend comes to visit the mother and notices that there is a lot of smoke in the kitchen. The friend starts a discussion with the mother about the damage smoke from an open-fire stove can cause. Please act out this scene and have fun, this is not about acting perfectly!"

Allocate 5 minutes to the scene. After 5 minutes , thank those who participated in the scene and ask the following questions to all participants:

ASK:

1. **What is the risk factor?**
2. **Why is the mother's friend so concerned about the smoke?**
3. **How damaging do you think the smoke from the open-fire stove is?**

Give 5 minutes for questions.

Conclusion (4 minutes)

ASK: "Is there anyone who can tell us what we learned today?"

If no one wants to share, tell your participants to turn to the person sitting next to them and share what they learned with that person. After a few minutes, ask participants to take the post-test. Once they complete the post-test, then you the facilitator(s) give a summary of the module.

SAY: "Thanks to those who shared. Today we learned about preventive measures we can take to avoid certain respiratory diseases. For example, when we cough it is important to cover our mouths. We also learned about risk factors that can increase our chances of getting a respiratory disease. For example, smoke from an open-fire stove can severely damage the small bags and small tubes in our lungs, especially if you spend much time in the kitchen. Smoke can damage our body's protective mechanisms. That's it for today, until next time."

At the end of the module remind participants when the last module is.

END OF MODULE 3

Module 3: Pre- and post-test

Note to facilitator: Feel free to modify these questions in any way. However, do make sure they correspond to the objectives of the module.

Name:

Date:

Question 1: What are two risk factors for respiratory disease?

- Answer (can be any of the following):
  - Cigarette smoke
  - Smoke from burning trash
  - Other infections
  - Age
  - Smoke from an open-fire stove

Question 2: What are two preventive measures we can take against respiratory disease?

- Answer (can be any of the following):
  - Wash your hands with soap several times a day
  - Cover your mouth and nose when you sneeze or cough
  - Eat a healthy diet
  - Sleep well
  - Drink plenty of water
  - Stay home from school if you are sick
  - DO NOT self-medicate

Question 3: True or False. Smoke can damage our body's protective mechanisms.

- Answer (true):
  - True
  - False

Module 3: References

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Module 4: Benefits of an Improved Cook Stove

Theme:	This module explains the benefits of an improved cook stove compared to a traditional open-fire stove
Objectives:	• Participants will be able to state at least two things that can happen when smoke is trapped inside a kitchen/house • Participants will be able to name at least two benefits to the improved cook stove • Participants will be able identify one way to maintain the improved cook stove
Time Allocation:	60 minutes
Materials Needed:	• Flip chart • Large pieces of paper • Markers • Cardboard or pieces of colored paper • Scotch tape • Colored pencils
Number of facilitators	1-3 brigadista(s)

Introduction (5 minutes)

Note to facilitator(s): At the beginning of each module it is very important to present yourself to your audience (even if they are your friends!) and say the overall theme of the module.

Example: " Good morning, my name is _____. I am a brigadista. Today we will learn about the benefits of an improved cook stove "

After, ask a question:

ASK:

1. **Share with me (or us if there is more than one facilitator) something you learned in the third module on prevention strategies and risk factors . You do not have to answer in complete sentences.**

After this, ask your participants to take the short pre-test. The pre-test is located at the end of this module.

<u>Traditional open-fire stoves and Improved Cook Stoves</u> (10 minutes)

Note to facilitator(s): Start with a brief discussion of 5 minutes. Show the participants photos, drawings, or descriptions of a traditional open-fire stove and an improved cook stove.

ASK: "Who can tell me which one of these is a traditional open-fire stove? Who can tell me which one is an improved cook stove?"

After discussion, use the flip chart to show a photo of a traditional open-fire stove and a photo of an improved cook stove.

SAY: "Thanks to those who shared. (*Using the flip chart*) As you can see, these pictures are of a traditional open-fire stove and an improved cook stove. Can you tell me what you see? (*Wait a few minutes*). Very good. There are many differences between these stoves but one of the most important differences is that smoke can not escape from the household using a traditional open-fire stove."

Traditional stove

Improved stove

Photos courtesy of Gina Carroll, used with her permission

SAY: "When there is a lot of smoke due to the traditional open-fire stove, this can happen:

- **A high presence of chronic respiratory diseases may occur, including:**
    - **COPD**
    - **Asthma**
    - **Bronchitis**
- **Respiratory diseases may worsen:**
    - **COPD and Asthma can be exacerbated (this means smoke can make these worse!)**
    - **Cough and flu**
    - **Pneumonia**
    - **Allergy**

- **Other symptoms such as:**
    - **Frequent headaches**
    - **Watery eyes**
    - **Body aches "**

ASK: "Knowing all this, what are some benefits of the improved cook stove? (*Wait a few minutes*). Very good. Some benefits of improved stoves are:

- **Temperature: The improved cook stove has a closed structure that uses the heat generated by firewood and so it is more efficient and avoids heat loss. The improved cook stove thus:**
    - **Reduces wood consumption**
    - **Reduces cooking time**
    - **Reduces risk of burning**
    - **Saves time, money and effort to collect firewood**
    - **Protects the environment by reducing deforestation**

- **Smoke: The improved cook stove leads smoke out of the house through a chimney. The improved cook stove thus:**
    - **Lowers risk for respiratory diseases**
    - **Improves cooking conditions**
    - **Reduces pollution inside the house"**

Activity #1: Comparison Table (10 minutes)

Note to facilitator(s): Divide participants into small groups of four to five. Give a large piece of paper to each group. On the piece of paper, ask the groups to draw a table, similar to the following:

COMPARISON TABLE	
Traditional open-fire stove	**Improved cook stove**

Then, spread out pieces of cardboard or colored paper, colored pencils, and tape. Ask participants to think of and write or draw at least four characteristics of a traditional open-fire stove and four characteristics of an improved cook stove. Use tape to tape characteristics on the appropriate side.

Example answers:

COMPARISON TABLE	
Traditional open-fire stove	**Improved cook stove**
Smoke fills the house and affects the health of the family	Guides the smoke out of the kitchen
Creates and worsens respiratory diseases	Prevents and reduces respiratory diseases
Uses a lot of firewood	Uses less firewood which saves time and resources
Causes symptoms such as watery eyes, headaches, and cough	Improves conditions and effectiveness kitchen
Encourages deforestation	Protects the environment by using less firewood
It can cause burns when cooking	It has less risk of causing burns

When you spend 10 minutes, ask if anyone wants to share. Allow some time for those who want to share. Then take a break.

BREAK: 2 minutes

<u>Recommendations for maintaining an improved cook stove</u> (10 minutes)

SAY: "Since we know a little more about the benefits of improved cook stoves, let's talk about maintaining them. Improved cook stoves work well and last a long time but you need to take care of them and provide periodic maintenance. Here are some guidelines for maintenance:

- **Best Practices:**
  - **Cover the stove top burners with metal or with an old frying pan when you are not cooking**
  - **Use thin, short, and dry wood**
  - **Remove any noticeable splinters before lighting the fire**

- **Everyday:**
  - **Remove the ash pit before lighting the stove**
  - **Clean all cookware**
  - **Remove the firewood once you are done cooking**

- **Weekly:**
  - **Clean the burners and tunnels**
    - **to clean the burner, use a cloth**
    - **to remove the ashes, scrape the sides and the top**
    - **to remove soot from the tunnels, use a spoon or rag**
  - **Go over the stove with earth, lime, or ash**
  - **Gently shake the chimney**

- **Every 6 months:**
  - **Clean the chimney pipe with a stick or by briefly removing it. It collects soot."**

Activity #2: Checklist for an improved cook stove (10 minutes)

Note to facilitator(s): You know as brigadistas that this is the checklist used on house visits. However, it is good practice to make participants aware of what they must do to maintain the stove. This way, they can be prepared for your visits.

Divide participants in groups of four to five. Distribute the pieces of large paper and markers. Ask participants to write or draw what they think is important in maintaining an improved cook stove. Give them 8 minutes. In the last 2 minutes ask participants to share.

For your reference, this is the checklist:

	Mark (Yes or No)	
	Yes	**Do not**
This stove in use		
This fully functioning stove		
This stove in good condition		
Maintenance		
This stove clean		
This clogged holes when they are not using		
The chimney has been cleaned every six months		
Other comments		
Other comments		

Conclusion (10 minutes)

In the first 5 minutes, **ASK: "Is there anyone who can tell us what we learned today?"**

If no one wants to share, tell your participants to turn to the person sitting next to them and share what they learned with that person. After a few minutes, ask participants to take the post-test. Once they complete the post-test, then you the facilitator(s) give a summary of the module.

SAY: "Thanks to those who shared. Today we learned about the benefits of improved cook stoves and the maintenance required for an improved cook stove. There are many benefits but the most important one is that it reduces the amount of smoke in the house and in turn helps reduce respiratory diseases. For the improved cook stove to run at its best, it is very important that we keep it clean. That's what we learned today."

In the last minutes, ask:

SAY: "Now as a bonus, who can summarize everything we have learned in the past four modules?"

If no one wants to share, tell your participants to turn to the person sitting next to them and share what they learned with that person.

SAY: "Thanks to those who have shared throughout these modules and thanks to everyone for participating. At the very beginning, we learned about the respiratory system. The main function of the respiratory system is to distribute oxygen throughout the body and this is done by breathing. Some of the most important organs are the small bags and small tubes that help with the distribution of oxygen. Inside the bags and tubes, there is phlegm, which protects us but sometimes, there is too much phlegm and you have to remove it from your body. After the respiratory system, we learned about most common diseases. Here in Los Robles there are cases of asthma, pneumonia, bronchitis, COPD, TB, the common cold, and allergies. Some common symptoms are cough (remember that there are two types of cough) congestion, fever, fatigue, shortness of breath, headaches, and watery eyes. To prevent respiratory diseases, we learned about preventive strategies. For example, when we cough it is important to cover our mouths. We also learned about risk factors that can increase our chances of getting a respiratory disease. For example, smoke can damage the small bags and small tubes in our lungs, especially if you spend a lot of time in the kitchen. And finally, we learned about the preventive benefits of the improved cook stove and the maintenance of improved cook stove."

END OF MODULE 4

Module 4: Pre- and post-test

Note to facilitator: Feel free to modify these questions in any way. However, do make sure they correspond to the objectives of the module.

Name:

Date:

Question 1: What are two things that can happen when smoke stays trapped inside a home?

- Answer (can be any of the following):
  - High presence of chronic respiratory diseases
  - Diseases can get worse
  - Any symptoms including headaches, watery eyes, trouble breathing

Question 2: Name two benefits of the improved cook stove.

- Answer (can be any of the following):
  - Lowers risk for respiratory diseases
  - Improves cooking conditions
  - Reduces wood consumption
  - Reduces cooking time
  - Reduces risk of burning
  - Saves time, money and effort to collect firewood
  - Protects the environment by reducing deforestation
  - Reduces pollution inside the house

Question 3: True or False. Routinely cleaning the chimney of an improved cook stove is one way to maintain it in good shape.

- Answer (true):
  - True
  - False

Module 4: References

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