Improving Refugee Healthcare Literacy

Prepared for: Carolina Refugee Resettlement Agency

Photo by: South Philadelphia Library

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Disclaimer

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List of Acronyms

CDC	Centers for Disease Control
CMA	Refugee Cash and Medical Assistance Program
CMS	Centers for Medicare and Medicaid Services
HFP	Health Focal Point model
INA	Immigration and Nationality Act
IRC	International Rescue Committee
NPV	Net Present Value
PRM	Bureau of Population, Refugees, and Migration
PTSD	Posttraumatic Stress Disorder
ORR	Office of Refugee Resettlement
R&P	Reception and Placement Program
UNHCR	United Nations High Commission for Refugees
USCIS	United States Citizenship and Immigration Services
USCRI	U.S. Committee for Refugees and Immigrants

Executive Summary

Refugees in Charlotte, North Carolina make uninformed and costly decisions regarding their healthcare. Low healthcare literacy is evidenced by improper use of healthcare, which includes the inability to enroll in insurance (either public or through one's employment), misunderstanding where to go for medical services or not going at all, and accruing medical debt from not understanding co-payments, deductibles, and coverage of prescriptions. This problem is attributed to the inaccessibility of information regarding U.S. health insurance and health systems.

The evaluative criteria in this policy paper are cost effectiveness, equity, social reinforcement, and time (both implementation and effect time). Criteria are used to evaluate policy alternatives in improving refugee healthcare literacy. A review of tried solutions and promising case studies informed the following policy alternatives:

(1) Texting Campaign: send text messages containing healthcare related information to adult refugees up to one year after arrival.

(2) Healthcare Curriculum: design and implement a 12-lesson curriculum of healthcare information for refugees.

(3) Health Focal Point: identify prominent refugee community leaders and engage them in a healthcare education initiative.

(4) Health Collaborative: form partnerships with one other resettlement agency and eight healthcare providers to provide healthcare information to refugees.

Based on this analysis, Carolina Refugee should pursue a texting campaign to provide healthcare related information to refugees. This policy alternative scored high in cost effectiveness, equity, and time. Its weakness is its lack of social reinforcement. Up to one year after arrival, Carolina Refugee would send text messages to adult refugees about health insurance status updates, how to access a doctor for a physical check-up, and how to connect with a primary care physician.

The anticipated results are all adult refugees resettled by Carolina Refugee in 2020 – an estimated 92 refugees – will receive text messages containing healthcare related information. Of the 92 refugees, about 41 are expected to demonstrate improved healthcare literacy by calling a doctor to make an appointment, taking public transportation to see a doctor, and reading medical bills.

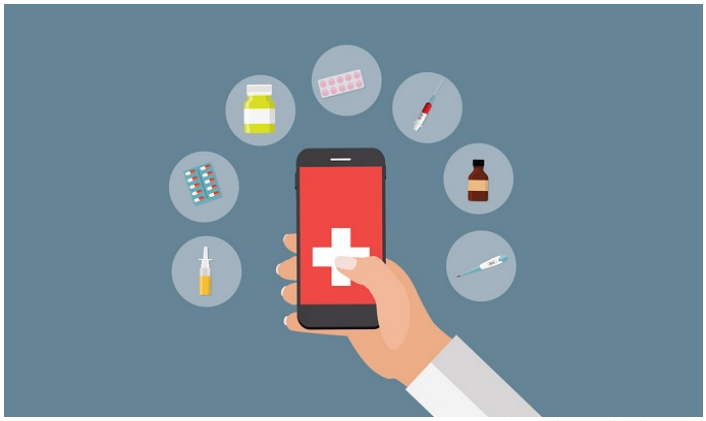


Photo by: ThinkStock

Problem Statement

Refugees in Charlotte, North Carolina make uninformed and costly decisions regarding their healthcare. The need for improved healthcare literacy is evidenced by refugees' inability to enroll in insurance, difficulty accessing medical services, receiving insufficient care, and accruing medical debt from not understanding U.S. insurance plans. Refugee healthcare literacy is defined as helping adult refugees enhance their knowledge of health insurance and their navigation of health services. Low healthcare literacy is attributed to the inaccessibility of complete information on healthcare. The present situation of low literacy leaves uninformed and uninsured refugees at risk of accruing medical debt and receiving insufficient care.

"A lot of times refugees will get so frustrated that [they don't] bother going to the doctor unless something is really seriously wrong.[1]"

- Refugee, age 31

Background

National policy regarding refugee resettlement in the United States

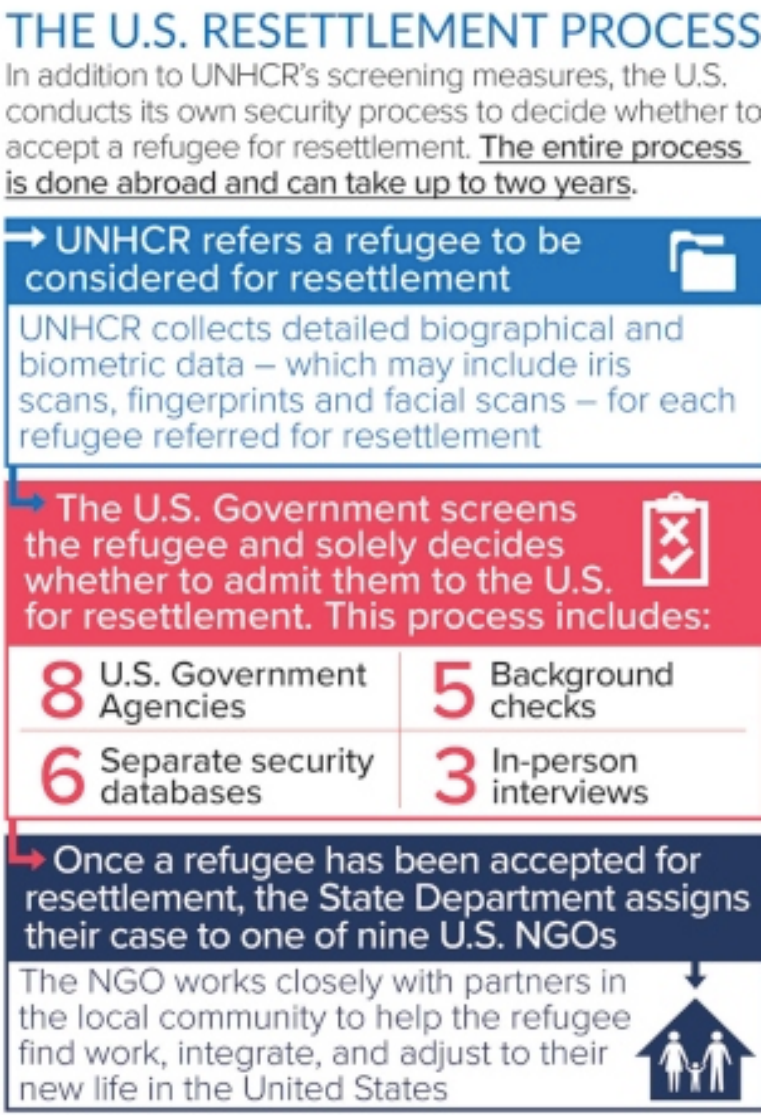
The admission and resettlement of refugees is authorized by the Immigration and Nationality Act (INA) under the Refugee Act of 1980. The INA stipulates that the President consult with Congress to set an annual ceiling for refugee admissions, a process called the Presidential Determination. By law, the ceiling shall be justified by humanitarian concern or otherwise in the national interest. Cabinet-level representatives from the House and Senate Judiciary Committees cite foreign policy, humanitarian assistance, and impact on the U.S. economy in their consultation. Congress is able to shape refugee resettlement by funding resettlement and integration programs (Refugee Council USA, n.d.).

The U.S. Department of State's Bureau of Population, Refugees, and Migration (PRM) is responsible for coordinating and managing the U.S. Refugee Admissions Program. Prospective refugees are referred by the United Nations High Commissioner for Refugees (UNHCR), U.S. embassies, or designated nongovernmental organizations. In some cases, refugees access the U.S. refugee program directly (Bruno, 2016).

Under the Refugee Act of 1980, refugees must undergo a robust system of criminal screening and background checks before refugee status is granted. The United States Citizenship and Immigration Services (USCIS) collect biographic and biometric information to confirm an applicant's identity. The information is vetted against U.S. law enforcement, the intelligence community, the Federal Bureau of Investigation, the Department of Defense, and the Department of Homeland Security. A face-to-face interview is conducted with an officer from USCIS before refugee status is ultimately granted. On average, this process takes 18 to 24 months and is summarized by **Figure 1** (USCRI, n.d.).

[1] Quotes are taken from the Morris, et al. survey of refugees on their healthcare use in San Diego in 2009.

Figure 1. Infographic Summary of the Refugee Resettlement Process



Source: U.S. Department of State; UNHCR

PRM operates nine Resettlement Support Centers, whose role it is to process and prepare a refugee for entry into the United States (Philbrick, 2017). Before a refugee arrives, one of the Resettlement Support Centers requests sponsorship assistance from a resettlement agency.

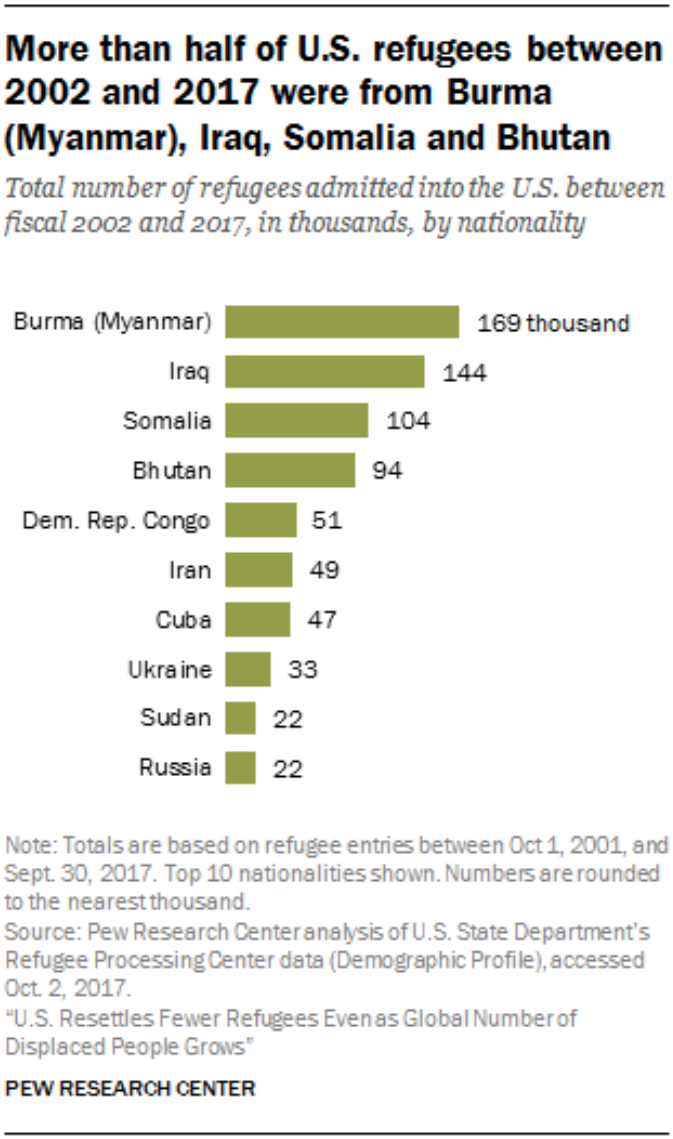
Resettlement agencies are state specific and rely on funding from the PRM office. Resettlement services follow the Reception and Placement (R&P) program. This includes finding employment, school enrollment for children, obtaining a driver's license, seasonal clothing, vocational skills training, translation and interpretation assistance, and assistance in applying for health benefits. R&P provides $1,975 per refugee for resettlement services the first 30-90 days, with possibility of extension up to 180 days (Morillo, 2017). During this time, resettlement agencies collaborate with local affiliates and field offices to help refugees secure financial self-

sufficiency and successful integration into American society (U.S. Department of State, n.d.; Bruno, 2016).

Refugee demographics and resettlement rates

In fiscal year 2019, the refugee ceiling was set at 30,000 (Wroughton, 2018). Nationally, 72 percent of refugees are women and children (ORR, 2016). As depicted in **Figure 2**, between 2002 and 2017, more than 169,000 refugees came to the United States from Burma – more than any other country. The second most was Iraq with 144,000 refugees followed by Somalia at 104,000. Although more than 21,000 Syrian refugees have entered the U.S. since 2002, they do not appear in the top 10 country of origin because most did not enter until 2016 and 2017 (Pew Research Center, 2017).

Figure 2. Top 10 Countries of Origin Between 2002 and 2017



North Carolina ranks 7th in the United States for number of refugees resettled. In 2016, North Carolina resettled 3,342 refugees, or 4 percent of total refugees resettled to the United States (ORR, 2016). Of the refugees resettled to North Carolina, 45 percent are under 19 years of age and 2 percent are over 60 (Morillo, 2017). In 2020, North Carolina is expected to resettle 200 refugees, which marks a significant decrease from previous years. The decrease is attributed to the effects of Executive Order 13680 signed by President Trump in January 2017. The Order indefinitely suspends the issuance of immigrant and nonimmigrant visas to applicants from five Muslim-majority countries – Libya, Iran, Somalia, Syria and Yemen – plus North Korea and Venezuela (Pierce, et. al., 2017). Of the 200 refugees resettled by Carolina Refugee, an estimated 92 will be adults.[2]

Prior to resettlement in the United States, refugees receive minimal health services.
Political, social, or economic turmoil in refugees' country of origin cause inadequate or nonexistent healthcare systems (Nies, 2016). The first medical screening refugees typically receive is during the resettlement process. A medical screening is conducted as part of the USCIS security screening. The medical screening portion is documented by the Immigration Medical Exam I-693 form. This form is used to determine whether the applicant has a health condition that would disqualify them for refugee status. Disqualifying factors include failure to provide proof of vaccination, a tendency toward harmful behavior, and drug abuses or addictions (USCIS, 2018).

Health services after resettlement varies by the needs of the refugee.
The R&P program recommends, but does not legally require, that resettlement agencies connect refugees with primary care physicians and other medical providers. The Centers for Disease Control (CDC) similarly recommends that refugees receive a medical screening within 30 days of arrival.

As summarized by **Figure 3**, refugees are eligible for the Refugee Cash and Medical Assistance (CMA) program and Medicaid within 8 months of arrival. The Office of Refugee Resettlement (ORR) reimburses screenings conducted during a refugee's first 90 days. The purpose of the examination is to identify conditions that may have been missed during the USCIS medical screening and to introduce refugees to the U.S. healthcare system (CDC, 2017). Resettlement agencies work with refugees to determine whether such screenings are a priority within the first 90 days of resettlement.

The CMA program reimburses states for 100 percent of health services provided to refugees, as well as any associated administrative costs (ORR, n.d.). Medicaid benefits are automatically provided to refugees through monthly federal grants to local medical offices (Public Assistance, n.d.). After the first 8 months of CMA and Medicaid coverage, refugees rely on employer healthcare benefits, enroll in private insurance, or re-enroll in Medicaid if eligible.

Notification of this change in health coverage is not widely known. As dictated by R&P, resettlement agencies have 30-90 days to work with refugees on resettlement services. By the 8-

[2] The UNHCR estimates that 46 percent of refugees resettled to the United States are adults (UNHCR, n.d.). Forty-six percent of 200 is 92.

month mark when Medicaid and CMA coverage expire, resettlement agencies may not be in regular contact with refugees to provide this information.

Figure 3. Summary of Health Coverage Upon Arrival

PROGRAM	ELIGIBILITY	BENEFITS
ORR	90 days after arrival	Full coverage for health screenings
MEDICAID	8 months after arrival	Full coverage for health services
REFUGEE CASH AND MEDICAL ASSISTANCE (CMA)	8 months after arrival	Full coverage for health services and associated administrative costs

In a survey of refugees aged 18 or older, ORR found that about 60 percent of refugees had health coverage throughout the previous 12 months. Of refugees who had coverage, about half received coverage through Medicaid or the CMA (referred to as the Refugee Medical Assistance program in the report) and about 10 percent received coverage through an employer. About 34 percent of refuges were uninsured (ORR, 2017). For comparison, in 2015 the uninsured rate of nonelderly Americans was about 10 percent (Kaiser Family Foundation, 2018).

"[Refugees] think 'mental problems' that…those words should be reserved for… somebody with severe Down's syndrome or something. They don't think mental health can be things like depression or posttraumatic stress disorder.[3]"

- Refugee, age 24

As identified by the CDC in Figure 4, refugees enter the United States with high rates of mental health disorders caused by traumatic experiences prior to resettlement. War, political unrest, and economic hardships are associated with trauma such as torture, rape, bombings, fighting, death of family members and neighbors, loss of property, hunger, and homelessness (Arcell, 1995; Lipson, 1997; Miller, 1994). The refugee experience is a range of such trauma, and even within refugee groups, individual accounts can vary. Once resettled to the United States, past trauma is accompanied by stressors of financial difficulties, family separation, cultural and linguistic isolation, and struggle to acculturate to American culture and society (Hauf, 1995).

Refugees also suffer from high rates of chronic disease. In a medical review of refugees resettled to the northeast United States, 51.1 percent of refugees who sought medical help were diagnosed or treated with at least one chronic disease (Yun, 2016). The two most common chronic diseases captured in this study were behavioral health problems at 15 percent, which researchers

[3] Quotes are taken from the Morris, et al. survey of refugees on their healthcare use in San Diego in 2009.

associated with mental health disorders like depression and anxiety, and hypertension at approximately 13 percent. Hypertension in refugees, a disease marked by abnormally high blood pressure, is attributed to the stress of resettlement (Yun, 2012; MacGill, 2018).

Figure 4. Priority Health Concerns by Refugee Group

Refugee Group	*Priority Health Concerns*
Bhutanese	Anemia, Mental Health, Vitamin B12 deficiency
Burmese	Hepatitis B, Intestinal Parasites
Central African Republic	Anemia, Mental Health, Parasitic Infection, Obesity, Soil-transmitted Helminth Infections
Congolese	Parasitic Infections, Malaria, Mental Health, Sexual and Gender-based Violence
Iraqi	Diabetes, Hypertension, Malnutrition
Somali	Anemia, Diabetes, Female Genital Mutilation/Cutting, Intestinal Parasites, Hepatitis B and C, Lead Poisoning,
Syrian	Anemia, Diabetes, Hypertension, Mental Health

Source: Centers for Disease Control, 2017.

The CDC recommends primary care for treatment method for refugees (Kirmayer et al., 2011; Walden, 2017). Primary care allows for a continuing relationship between physician and patient. Physicians are recommended to coordinate with local resettlement agencies for mental and physical health screenings and to make referrals for more severe cases (Walden, 2017).

Adult refugees in the United States suffer disproportionately high rates of depression and anxiety. As summarized by **Figure 5**, bout 30 percent suffer from depression and 45 percent suffer from anxiety. For comparison, 7 percent of U.S. adults suffer from depression and 10 percent suffer from anxiety (Vonnahme, 2015; National Institute of Mental Health, 2017). Depression and anxiety, or a combination of the two, in refugees is often accompanied by high rates of post-traumatic stress disorder (PTSD) (Hinton, 2005; Hinton, 2006; Nelson-Peterman, 2015). A medical review of 80,000 refugees resettled to the United States estimated that of the 30 percent who suffer from depression, 86 percent also experience PTSD (Terasaki, 2015).

Figure 5. Mental Illness, Chronic Illness, and Uninsured Rates of Refugees vs. U.S. Citizens

CONDITION	**REFUGEES**	**U.S. CITIZENS**
DEPRESSION	30 percent	7 percent
ANXIETY	45 percent	10 percent
CHRONIC ILLNESS	51 percent	40 percent
UNINSURED	34 percent	10 percent

Low healthcare literacy is evidenced by improper use of healthcare.
Improper use of healthcare is characterized by refugees not receiving the intended health care that they seek. This includes inability to enroll in insurance (either public or through one's employment), misunderstanding where to go for medical services or not going at all, and accruing medical debt from not understanding co-payments, deductibles, and coverage of prescriptions (Morris, et al., 2009; Yun, 2016; Phillbrick, 2016). Refugees have been cited as accruing between $150 and $35,000 in medical debt due to low healthcare literacy (Yun, 2016).

Information on the U.S. healthcare system is typically provided to refugees during the first 30-90 days of resettlement when refugees are overwhelmed with the resettlement process. Resettlement agencies are similarly consumed with providing as many services as possible within the allotted time. The whirlwind of finding employment, enrolling children in school, learning English, and obtaining a driver's license, which leads to gaps of information about the U.S. healthcare system (Agrawal, 2016).

Low English ability exacerbates the issue of low healthcare literacy.
English language ability is self-reported by refugees upon arrival. Between 2008 and 2013, 33 percent of recently arrived refugees reported some spoken English ability, however only 7 percent self-reported "good" English ability. English ability varies by refugee group, age, and gender. Liberian refugees and Bhutanese arriving from camps in Nepal arrive with high level of English proficiency (Capps, 2015). Older refugees and female refugees are associated with relatively worse English proficiency (Watkins, 2012; Warriner, 2007). This is attributed to older refugees and female refugees having lower literacy in their own native language and lower education levels (Capps, 2015).

"Due to a lack of proper translation, a Somali refugee delivered her baby on the doorstep of a hospital when there were open after-hour emergency services on the other side of the building.[4]"

- Healthcare provider

There is a concerted effort to connect refugees with doctors with foreign language ability. However, language barriers extend beyond interactions between doctors and patients. Refugees report language barriers when making appointments, filling a prescription, completing paperwork, and understanding written materials (Morris, 2009).

The cultural and religious beliefs of refugees may conflict with Western practice of medicine. There is recognition of the importance of immunization, check-ups, and screenings across refugee groups, however there is also a demonstrated reliance on traditional healers and home remedies (Brainard, 1989; Carrol, 2006). A comprehensive study conducted in Australia found that Iraqi and Sudanese refugees preferred spiritual and religious approaches to mental health treatment (May, 2013). Similar results in the United States were found in a study from the

[4] Quotes are taken from the Morris, et al. survey of refugees on their healthcare use in San Diego in 2009.

early 1990s on Southeast Asian refugees. Spiritual and supernatural remedies for health concerns were preferred over Western medicine. Southeast Asian refugees also indicated that they believed suffering was inevitable and that one's life span was predetermined (Uba, 1992). In a survey of refugees resettled to San Diego, many refugees stated that they are not fully accustomed to the idea of preventative care and do not seek care until conditions are severe (Morris, et al., 2009).

Some Western medication, dressings, and implants violate refugee religious beliefs. For instance, the presence of pork content would violate a refugees' Islamic beliefs. Pork content is used in drugs such as heparin for undergoing cardiac surgery, amoxicillin for infection and stomach ulcers, omeprazole for heartburn, warfarin to prevent blood clots, and oxynorm to treat pain (Cohne, 2009; Erikkson, 2013). Medical practitioners who serve refugees have been criticized for lacking the cultural competency to inform refugee patients of pork content in their medication and for not understanding the intersection of religion and health (Erikkson, 2013; Philbrick, 2017).

"Our elders are really suffering in terms of not knowing where to go [for care], … they stay at home, and they're really depressed.[5]"

- Refugee, age 37

Treatment is complicated by distrust in Western medicine, since the U.S. healthcare system differs from the system back home. Unfamiliarity with the insurance programs, employer-based insurance, or insufficient income to pay for health services causes misunderstanding and confusion (Agrawal, 2016). Patients are often confused by the differences between Medicaid, CMA, and private insurance plans. They sometimes switch health plans inadvertently, which can lead to delays in care (Brown, 2018).

[5] Quotes are taken from the Morris, et al. survey of refugees on their healthcare use in San Diego in 2009.

Literature Review

This section discusses two tried solutions to improving refugee healthcare literacy and presents four promising case studies.

Translation solution

The use of translators or translated material in medicine can improve health outcomes. In a study on oral preventative care of Somali refugees in Massachusetts, refugees who were provided translated materials were 2.3 times more likely to have had a preventative visit in the last year, meaning their overall oral health had improved (Geltman, 2013). However, informing patients by providing health education materials may not be appropriate, even if translated, because of uncertain understanding of medical terminology (Geltman, 2013; Beras, n.d.).

Cultural competency solution

Residency programs across the United States have implemented cultural competency training courses. As of 2004, 50.7 percent of residency programs in the United States offered cultural competency training (Betancourt et al., 2005). However, given a lack of standardization in curriculum across the country, the quality of the training varies greatly. There have been reported concerns that some training programs perpetuate stereotypes of certain ethnic groups (Betancourt et al., 2005).

Case Studies

The following case studies represent four different approaches to providing information. They fall into three categories: cross-sector collaboration, best practices from another field, and a texting campaign.

Cross-sector collaboration 1: Health Focal Point model

In Philadelphia, leaders of a Bhutanese refugee community adopted healthcare education initiative called the Health Focal Point (HFP). Modeled after programs in Nepalese refugee camps, refugee community leaders became health educators and sources of information within their community (UNCHR, 2012). The HFP was able to reach 34 participants in improving healthcare literacy. The metrics they used were ‘avoiding calling the doctor because of a language barrier’, which decreased from 31.3 to 2.9 percent, and ‘missing an appointment due to language barrier’, which also decreased from 25.8 to 8.8 percent. However, ‘not knowing how to call for emergency help, e.g. 911 or the fire department,’ increased from 26.5 to 29.4 percent (Yun, 2017).

A limitation of the HFP model when applying it to other contexts is the prerequisite of having an established refugee community with revered leaders. The HFP model worked well in the Bhutanese community because of the established culture within the specific community; most refugees would seek help from family or friends prior to seeking formal assistance. In contexts where refugees live in established communities, the HFP model has potential to improve healthcare literacy by providing information on calling doctors and arriving to appointments.

Pros	Cons
- Social reinforcement is high because of the established community - Empowers refugees to take autonomy in their healthcare literacy - High chance of similar results in Charlotte, NC because of established refugee communities there	- Refugee community must already by established and close-knit, with obvious and respected leaders - Community leaders must be willing to volunteer their time - Disregards refugees not part of a community

Cross-sector collaboration 2: Philadelphia Healthcare Collaborative

In September 2010, two refugee resettlement agencies and eight health care providers in Philadelphia came together to create the Philadelphia Refugee Health Collaborative. Together, they sought to implement health screenings upon arrival, establish a strong relationship with local primary care providers, and emphasize the benefits of preventive care. The Collaborative set up weekly medical clinics dedicated to refugees. They formed an extensive network of practices that accept refugee patients, provide interpretation services, and are collocated with refugee clinics. The agencies also hired volunteer clinic liaisons to schedule screenings and follow-up appointments, escort patients to the clinic and pharmacy, and to troubleshoot issues. Both the clinic liaisons and the medical providers screen for mental distress and collaborate to increase access to culturally and linguistically appropriate support for mental health. Regular meetings are held by the medical providers, clinic liaisons, and leadership to evaluate and strengthen the Collaborative. The Collaborative originally had the capacity to serve 250 new refugee patients per year. As of 2014, they have provided health screenings, primary care, and access to specialty services for up to 800 newly arrived refugees per year (Liberty Lutheran, n.d.).

Pros	Cons
- The Centers for Medicare and Medicaid Services (CMS) recommends collaborative efforts across agencies to improve health services (CMS.gov, 2019) - Encourages refugees to complete initial health screenings, which has positive implications for future health outcomes - Encourages refugees to complete initial health screenings, which has positive implications for future health outcomes - Reinforces the importance of healthcare literacy across multiple stakeholders	- High upfront costs of securing partnerships, hiring and training clinic liaisons, and establishing a network - Impact will be delayed for an estimated 5 years

Best practices from refugee financial literacy programs

While currently no programs address healthcare literacy, programs on refugee financial literacy provide a review of best practices in a similar field. The U.S. Committee for Refugees and Immigrants (USCRI) has produced a financial literacy course called Banking on the Future. The detailed curriculum is intended to be used by resettlement agencies to promote refugee financial literacy in refugees (USCRI, n.d.). It is an intermediate-level curriculum that consists of eight lessons, each lasting 50 or 90 minutes. The curriculum is designed to be easily integrated into English language courses or can be presented as stand-alone classes. Similarly, the International Rescue Committee office in Atlanta collaborates with JP Morgan & Chase on a Financial Literacy and Education Project (IRC, 2017). The Project covers banking, budgeting, and credit. After participating in a workshop, refugees are offered one-on-one support through credit counseling, individuals budgeting, or opening a bank account. The Project team develops and establishes relationships with financial institutions around Atlanta to provide much needed financial knowledge and services to the refugee community.

In the USCRI case study, 30 refugees were recorded as attending lessons and indicating improvements to healthcare literacy. Detailed descriptions of how many lessons the 30 refugees attended and what was considered an improvement to healthcare literacy are unreported. This lack of specific detail and outcome measurements represents a limitation of financial literacy programs.

Pros	Cons
- Increased interaction with refugees on healthcare issues - Curriculum could be tailored to fit specific healthcare issues stakeholders	- Materials do not exist; Carolina Refugee would have to pilot the program - High upfront costs to design and implement a curriculum - Existing models do not offer defined and measurable outcomes

Texting campaigns

In 2018, a study conducted in Haiti used text messages to encourage dog owners to vaccine their dogs against rabies. The study found that dog owners who received the text were two times more likely to vaccinate their dogs. Of the 600,000 text messages sent, about 92 percent of recipients indicated that the text was helpful and about 87 percent said they would like to receive text reminders in the future (Cleaton, et al., 2018). In the United States, a similar texting campaign was conducted in Texas to increase teens' knowledge of dating violence. The study considered a response to one of the interactive text messages as an indication of information received. Of the 264 recipients in the study, 45 percent responded to at least one text message (Guillot-Wright, et al., 2018).

The weakness of a texting campaign is that sending texts is not indicative of changed behavior in recipients. Outcome measures in texting campaigns need to be definitive of informed decision-

making. In the context of refugee healthcare literacy, an outcome related to accessing and understanding the U.S. healthcare system is needed to assess the effectiveness of the alternative.

Pros	Cons
- Inexpensive to implement - Forty-five percent of participants accomplished the desired outcome	- Messages must be general to resonate with wide refugee audience - Harder to measure effect on decision-making

The case studies are better suited to improving healthcare literacy because they address the crux of the problem, inaccessibility of information.
Solutions related to translation and cultural competency fall short by focusing on smaller issues within low healthcare literacy. The case studies specifically aim to provide information that increase literacy and they assess how well that information is absorbed. Further, the Philadelphia Health Collaborative and the HFP model stem from Pennsylvania, which shares similar refugee statistics to North Carolina. As noted, North Carolina ranks 7th in the United States for accepting refugees whereas Pennsylvania ranks 9th (ORR, 2016). This similarity could provide replicable results in North Carolina. The texting campaign in Texas was not targeted at refugees, but provides outcome measures that are applicable to healthcare literacy. The financial literacy program in Atlanta is not related to healthcare, but represents best practices in improving refugee outcomes.

Research on refugee healthcare literacy uses proxy outcome to evaluate solutions.
The true outcome of improved refugee healthcare literacy is believed to be improved health. Increased literacy results in more informed decision-making and, ostensibly, better health. Research on improved health is limited due to the difficult and expensive task of tracking refugee health outcomes, most of which are indiscernible between pre- and post-resettlement. Instead, researchers use proxy outcomes to measure improved healthcare literacy. Commonly cited proxy outcomes include:

- Calling a doctor to make an appointment
- Taking public transportation to see a doctor
- Reading medical bills
- Connecting with a primary care provider
- Completing an initial health screening

Such outcomes indicate improved refugee healthcare literacy by refugees making informed decisions about the U.S. healthcare system. Calling a doctor to make an appointment is necessary for refugees to receive care and is commonly viewed as an indication of self-sufficiency. Accessing public transportation is commonly cited as a barrier to care, which makes learning the bus system to see a doctor an informed decision about receiving care. Reading medical bills requires understanding the U.S. healthcare system and its complexities. It is important to note the difference between reading and paying medical bills; reading indicates understanding whereas paying indicates financial capability. Connecting with a primary care provider indicates understanding the benefits of preventative care and familiarity with health insurance and health

systems. Lastly, completing an initial health screening indicates a refugee's ability to navigate insurance and health systems at an early stage of resettlement.

The weakness of proxy outcomes is that they are also interrelated, which can lead to distorted results on the effectiveness of policy solutions. They also do not evaluate policy alternatives on how well they achieve the true outcome, improved health. The data on refugee health outcomes is limited, leading an analysis of such to be speculative and unvalidated by rigorous research.

Despite the weaknesses, the proxy outcomes make a reasonable assumption that calling a doctor to make an appointment, taking public transportation to see a doctor, etc. will lead to improved health outcomes. For instance, completing an initial health screening is the mechanism through which refugees will understand and properly use the U.S. healthcare system, which could produce improved health. The proxy outcomes capture how well refugees absorb the information provided by each policy alternative, which is the purpose of this analysis.

Evaluative Criteria

The following criteria are used to evaluate policy alternatives in improving refugee healthcare literacy. Each criterion is quantified where possible or ranked using a low, medium, or high scale and all criteria are weighted equally.

Cost Effectiveness

Cost effectiveness compares the cost of each policy alternative to its projected outcomes. The purpose of this criterion is to allow for a comparison of the economic efficiency of the alternatives in improving healthcare literacy. The costs of each alternative stem from case studies discussed on pg. 11-13. Improvements to healthcare literacy, as discussed on pg. 14, are determined by the following proxy outcomes:

Proxy Outcomes	Points
Calling a doctor to make an appointment	1
Taking public transportation to see a doctor	1
Reading and understanding medical bills	1
Connecting with a primary care provider	1
Completing an initial health screening	1

All outcomes are weighted equally at 1 point. Alternatives receive points based on the expected reach of the alternative multiplied by total outcome points.

Total points = outcome points * expected reach
Cost effectiveness = program costs / total points

For example, if policy alternative 1 is projected to assist 30 refugees in calling a doctor to make an appointment and completing an initial health screening, the total points are (30*1) + (30*1) = 60. Alternative 1 is projected to cost $120. The cost effectiveness is $120/60 points = $2 per outcome. In other words, for every $2 spent on this alternative, 1 outcome of improved healthcare literacy is achieved. The ideal alternative will have the lowest cost per 1 outcome achieved. Appendix A provides more information and analysis on cost effectiveness.

Equity

Equity will determine the financial impact of each alternative on Carolina Refugee's budget. As resettlement funds per refugee are fixed, the financial burden of each alternative will take funding, resources, and time away from other resettlement services. Each alternative will receive a low, medium, or high equity rating. The numbers for low, medium, and high come from Carolina Refugee's expected funding for resettlement services. An estimated 200 refugees will be resettled by Carolina Refugee in 2020 and Carolina Refugee will receive $1,975 per refugee to provide resettlement services. The equity ratings are calculated by dividing total program costs by $1,975; this indicates the impact each alternative will have on the funding for newly arrived refugees. A low rating is defined as impacting at most 100 refugees, medium rating is at most 75 refugees, and high rating is at most 50. The ideal alternative will receive a high equity rating.

Social Reinforcement
This criterion evaluates how well alternatives are able to reinforce the benefits of healthcare literacy through social groups or interactions. This is measured by the extent to which refugee community members – including Carolina Refugee, healthcare providers, and fellow refugees – are exposed to the alternative. The underlying mechanism is that greater social reinforcement will encourage more refugees to act on the provided information. Alternatives are assessed as having low, medium, or high social reinforcement depending on the reach of the program. The ideal alternative will have the comparatively largest expected reach.

Time
This criterion is separated into two categories, implementation time and effect time. Implementation time will estimate how long each alternative will take to implement. Each alternative will receive an estimated time frame for implementation. Effect time will estimate how long until each alternative produces the projected outcome. The ideal alternative will have the shortest time frame for both implementation and effect.

Policy Alternatives

The following four policy alternatives aim to improve refugee healthcare literacy. The descriptions and costs of each alternative stem from the case studies discussed on pg. 11-13.

Note: One common characteristic of all alternatives is the need for translated materials. Carolina Refugee makes a point of hiring former refugees and persons with foreign language ability, which imbeds translation skills into employee salary. Translation costs are accounted for by calculating hours worked by Carolina Refugee employees.

(1) Healthcare Curriculum

Description: Carolina Refugee would design and implement a curriculum of relevant and updated healthcare information for refugees. The curriculum would include sections on the differences between insurance coverages (Medicaid, employer based, or private), the importance of primary care, and an individual worksheet for calculating insurance costs.

Partners: Carolina Refugee would seek advice from local healthcare organizations who have demonstrated experience in serving refugee needs, such as the Mecklenburg County Health Department and Project 658, to keep the curriculum relevant and updated.

Task: Carolina Refugee would teach 50 minute lessons once per month. The literacy program would take place in conference rooms within Carolina Refugee offices. The conference rooms have been used previously for community meetings and could suit the classroom needs of a healthcare literacy curriculum. The administrators and managers of the program would be Carolina Refugee employees who currently work on healthcare related issues. Their experience and familiarity with refugee healthcare issues would supplement the curriculum.

Expected reach: 30 refugees

Outcomes achieved: Calling a doctor to make an appointment, taking public transportation to a doctor, and reading medical bills

Cost: total program costs are projected at $15,009.60 for five years' worth of implementation (see Appendices A and B for more information).

Summary of Costs	**Cost description**	**Cost for year 2020**
Advising with health professionals	Full time work for one week	$911.15
Curriculum design	Full time work for one week	$911.15
Lesson planning (30 minutes per month)	Hourly wage of case manager salary	$280.01
Space	Hourly cost of 30-person conference room	$182.79
Teaching the curriculum	Hourly wage of case manager salary	$420.01

(2) Texting Campaign

Description: Carolina Refugee would send text messages to adult refugees up to one year after arrival. The content of the text messages would include health insurance status updates, how to access a doctor for a physical check-up, and how to connect with a primary care physician.

Partners: Carolina Refugee would seek support from an information technology specialist to maintain and troubleshoot the texting software.

Task: First, Carolina Refugee would collect the phone numbers of all newly arrived refugee adults.[6] Text messages would begin within two weeks of arrival; this provides enough time for refugees to meet more immediate needs like housing and clothing, but still leaves time for ORR coverage of initial health screenings and CMA reimbursement. Around the 8-month mark when Medicaid coverage expires, a text will be sent out informing refugees of the change in coverage and provide information on possible next steps. On the health insurance side, routinely scheduled texts would send out information about premiums, deductibles, and other insurance terms to increase understanding of U.S. health insurance.

Expected reach: 41 refugees
Carolina Refugee is expected to resettle 200 refugees in 2020, of which an estimated 92 will be adults. Based on the Texas case study, 45 percent of participants will demonstrate the outcome of interest. In the context of this alternative, 41 refugees (45 percent of 92) are expected to demonstrate the associated outcomes.

Outcomes achieved: Calling a doctor to make an appointment, taking public transportation to a doctor, and reading medical bills

Cost: total program costs are projected at $9,970.02 for five years' worth of implementation (see Appendices A and B for more information).

Summary of Costs	**Cost description**	**Cost for year 2020**
Computer	Cost of use	$1,041.65
Texting software	Cost of use	$393.12
Sending texts	$0.045 per text	$49.68
Support from IT Specialist	Hourly wage of IT specialist salary	$328.53
Determining content, order, and frequency of text messages	Hourly wage of case manager salary	$933.37

[6] It is reasonable to assume that refugees arrive to the United States with a working cellphone based on a 2016 report by the UNHCR. Smartphones are memory holders of photos and text messages from refugees' homes, leading the majority of refugees to bring their smartphone to their country of resettlement (UNHCR, 2016). Carolina Refugee would need to ensure that refugees are able to access U.S. sim cards to receive texts.

(3) Health Focal Point (HFP)

Description: Carolina Refugee would identify prominent refugee community leaders and engage them in a healthcare literacy campaign modeled after the Health Focal Point (HFP). The HFP is a refugee driven initiative that gives autonomy to refugees in providing healthcare related information.

Partners: Leaders of established refugee communities

Task: Carolina Refugee would provide training and information on how refugees can connect with primary care physicians, understand their insurance coverage, schedule medical appointments, and how to purchase medicine. The refugee leaders would use this training to spread information through community meetings, call centers, and individual meetings. The refugee leaders would need to be willing to volunteer their time and efforts in implementing this alternative.

Expected reach: 34 refugees

Outcomes achieved: Calling a doctor to make an appointment, taking public transportation to a doctor, and reading medical bills

Cost: total program costs are projected at $33,716.14 for five years' worth of implementation (see Appendices A and B for more information).

Summary of Costs	**Cost description**	**Cost for year 2020**
Opportunity cost of community leaders' time	Minimum wage in North Carolina multiplied by expected training and working hours	$4,060.00
Materials (4 training worksheets)	1 hour per worksheet multiplied by hourly wage of case manager salary	$93.34
Space	Hourly cost of 60-person conference room	$4,265.15
Training conducted by Carolina Refugee (30 hours)	Hourly wage of case manager salary	$980.03

(4) Health Collaborative

Description: Carolina Refugee would form a Collaborative of refugee resettlement agencies and healthcare providers. Carolina Refuge staff who currently work on healthcare portfolios will incorporate the duties of the Collaborative into their work.

Partners: Eight medical providers and clinics specifically dedicated to refugees, e.g. the Mecklenburg County Health Department and Project 658; one other resettlement agency, e.g. Refugee Support Services.

Task: The Collaborative would set up initial health screenings for refugees, form relationships with primary care providers, and provide information on preventive care. They would hire and train volunteer clinic liaisons to schedule screenings and follow-up appointments for refugees, escort patients to the clinic and pharmacy, screen for mental distress, and troubleshoot issues. Appointments and screenings should be scheduled and conducted within the first 30-90 days of refugee resettlement to ensure that refugees have early familiarity with the local medical providers. Carolina Refugee staff would also meet with Collaborative partners on a monthly basis to evaluate and strengthen the partnership.

Expected reach: 250 refugees

Outcomes achieved: Completing an initial health screening, connecting with a primary care doctor, and calling a doctor to make an appointment

Cost: total program costs are projected at $220,531.76 for five years' worth of implementation (see Appendices A and B for more information).

Summary of Costs	**Cost description**	**Cost in year 2020**
Hiring and training clinic liaisons	Hourly wage of average case manager	$14,467.16
Opportunity costs of clinic liaisons' time (10 hours)	Minimum wage in North Carolina	$3,016.00
Securing partnerships (8 hours per partnership)	Average hourly wage of Carolina Refugee employees and Charlotte healthcare providers	$33,6011.15
Space	Hourly cost of 60-person conference room	$12,673.59
Health screenings for 250 newly arrived refugees	CVS rate	$16,000.00

Outcomes Matrix

Figure 6 depicts an outcomes matrix that evaluates each alternative against criteria of cost effectiveness, equity, social reinforcement, and time. All criteria are weighted equally.

Figure 6. Summary of alternatives evaluated against criteria

Alternative	**Cost Effectiveness** (lowest cost preferred)	**Equity** (high preferred)	**Social Reinforcement** (high preferred)	**Time** (shortest time preferred)
Texting Campaign	*$16.05*	*High*	*Low*	*Implementation: 5 work days* *Effect: 1 year*
Healthcare Curriculum	$33.35	High	Low	Implementation: 20 work days Effect: 1 year
Health Focal Point	$66.11	High	Low	Implementation: 3.75 work days Effect: 1 year
Health Collaborative	$58.81	Low	High	Implementation: 60 work days Effect: 5 years

Texting Campaign

The cost effectiveness of a texting campaign is $16.05. For every $16.05 spent on this alternative, 1 gain in literacy is achieved. This alternative specifically accomplishes calling a doctor to make appointments, taking public transportation to doctor, and reading medical bills. The equity of this alternative is high; with total program costs at $9,970.02, only 5.5 refugees' funding would be impacted ($9,970.02 divided by $1,975). Social reinforcement is low because the expected reach is comparatively low at 41 refugees. Lastly, the implementation time is estimated at 5 work days and effect time is 1 year, making this alternative the fastest to implement and on par with others in effect time.

Healthcare Curriculum

The cost effectiveness of a Healthcare Curriculum is $33.35. For every $33.35 spent on this alternative, 1 gain in literacy is achieved. This alternative specifically accomplishes calling a doctor to make appointments, taking public transportation to doctor, and reading medical bills. This alternative received a high equity rating; with total program costs at $15,009.60, only 7.6 refugees' funding would be impacted ($15,009.60 divided by $1,975). Social reinforcement is low because expected reach is estimated at 30 refugees. Lastly, the implementation time is

estimated at 20 work days and effect time is 1 year, making this alternative the third longest to implement and on par with others in effect time.

Health Focal Point (HFP)
The cost effectiveness of HFP is $66.11. For every $66.11 spent on this alternative, 1 gain in literacy is achieved. This alternative specifically accomplishes calling a doctor to make appointments, taking public transportation to doctor, and reading medical bills. The equity rating of this alternative is high; with total program costs at $33,716.14 only 17 refugees' funding would be impacted ($33,716.14 divided by $1,975). Social reinforcement is low with an expected reach of 34 refugees. Also, this alternative alienates refugees not associated with a community.

Health Collaborative
The cost effectiveness of a Health Collaborative is $58.81. For every $58.81 spent on this alternative, 1 gain in literacy is achieved. This alternative specifically accomplishes calling a doctor to make an appointment, completing an initial health screening, and connecting with a primary care doctor. The equity rating of this alternative is exceedingly low due to high overhead costs; with total program costs at $220,531.76, 111.7 refugees' funding would be impacted $220,531.76 divided by $1,975). Social reinforcement is exceedingly high due to an expected reach of 250 refugees. Also, the reinforcing nature of two resettlement agencies and eight healthcare providers working together will impact a greater number of refugees.

Recommendation

Based on this analysis, Carolina Refugee should pursue a texting campaign to provide healthcare related information to refugees. This policy alternative scored high in cost effectiveness, equity, and time. Its weakness is its lack of social reinforcement. This alternative will allow Carolina Refugee to improve healthcare literacy without excessive costs, time, and resources. Carolina Refugee would need to ensure that information sent through the text messages is accurate and lead refugees to make informed decisions about their healthcare use.

The anticipated results are all adult refugees resettled by Carolina Refugee in 2020 – an estimated 92 refugees – will receive text messages containing healthcare related information. Of the 92 refugees, about 41 are expected to demonstrate improved healthcare literacy by calling a doctor to make an appointment, taking public transportation to see a doctor, and reading medical bills. In the event that such results are not achieved, Carolina Refugee would have spent $9,970.02 on this recommendation. This is a relatively low cost compared to the other alternatives that seek to achieve the same outcomes.

Implementation and Considerations

Implementation of the texting campaign would begin in January 2020. The first step would be for Carolina Refugee to identify staff to work on this program. Staff will need to select a texting service to partner with. A potential partner is Call 'Em All, which this policy paper used to identify program costs. Carolina Refugee would also need to identify an IT specialist, either within the organization or outside, to maintain, support, and troubleshoot the texting software. Text messages would be sent on a rolling basis depending on individual refugees' arrival to the United States.

With this recommendation, it is advised that Carolina Refugee conduct pre- and post-program surveys. This will help evaluate the effectiveness of the texting campaign. The surveys could advise future iterations of the texting campaign on improving healthcare literacy. This also has potential to capture the true outcome of whether informed decision-making improved health outcomes, as researchers hypothesize.

Appendix A: Cost Effectiveness Analysis

A cost effectiveness analysis compares the costs of policy alternatives to their projected outcomes. The costs associated with each alternative were informed by the case studies discussed on pg. 11-13 or were the author's best estimates. A sensitivity analysis was conducted on the best estimates to determine how extreme the estimated costs would need to be to make the alternative untenable. **Figure 7** depicts the major assumptions, and their justifications, that serve as a foundation for the cost effectiveness analysis.

Net present value (NPV) is used in this analysis to discount all costs into 2019 U.S. dollars. This allows for all costs, including implementation costs through 2024, to be calculated into today's dollars. This accounts for the opportunity cost of Carolina Refugees' future time spent on implementing each alternative. NPV in this analysis is calculated by summing all program costs across 5 years and discounting the sum at an interest rate of 7 percent, which is standard practice. Five years' implementation was chosen because the Health Collaborative alternative, according to the Philadelphia case study, would not produce results until 5 years into implementation. Other alternatives are costed out to 5 years to allow for equal comparison across alternatives.

Figure 7. Major Assumptions in the Cost Effectiveness Analysis

Assumption	*Amount*	*Source*
Hourly wage of a case manager at Carolina Refugee	$23.33 Average salary = $48,535 ($48,535/52 weeks)/8 hours per week = $23.33	Indeed.com
Hourly wage of an IT specialist in Charlotte, NC	$27.38 Average salary = $56,946 ($56,946/52 weeks)/8 hours per week = $27.38	Indeed.com
Hourly wage of healthcare workers (excluding physicians) in Charlotte, NC	$22.78 Average salary = $47,380 ($47,380/52 weeks)/8 hours per week) = $22.78	Indeed.com
Minimum wage in Charlotte, NC accounts for opportunity cost of volunteers' and clinic liaisons' time	$7.25	National Conference of State Legislators
Hourly cost of space (60 person conference room in Charlotte, NC)	$30.47	Coworking website
Discount rate	7 percent	Standard practice

(1) **Texting Campaign**

Item	*Calculation*	*Source*	*Cost*
Partner with texting service	Raw number	Haiti case study	$2,232.11
Carolina Refugee Determine order, content, and frequency of texts	5 full work days	Estimate	$933.37
Collect phone numbers	1 hour/month	Estimate	$280.01
Send 12 texts (1 text/month) to 92 participants	($0.05 per text*92)(12)	Call 'Em All texting service	$49.68
Receiving texts (1 text/month to 92 participants)	($0.20 per text*92)(12)	AT&T limited plan	$18.40
IT Specialist (1 hour/month)	Hourly wage*12	Indeed	$328.53
Materials Computer Texting software	 Raw number Raw number	 Haiti case study Haiti case study	 $1,041.65 $393.12
Total Costs in year 2020			$5,276.87

Five years' implementation

2020	2021*	2022*	2023*	2024*	Total Program Costs (NPV)
$5,276.87	$1,591.59	$1,591.59	$1,591.59	$1,591.59	**$9,970.02**

*Removed start-up costs of partnering with texting services, computer, and texting software

Expected reach = 41 (45 percent of 92 adults; based on Texas case study)

Outcomes achieved
Calling doctor to make an appointment (1 point)
Taking public transportation to see a doctor (1 point)
Reading medical bills (1 point)

Outcome points * expected reach = total outcome points
(1*41.4) + (1*41.4) + (1*41.4) = 124.2
(124.2*5 years' implementation) = **621**

Total program costs / total outcome points = **Cost Effectiveness**
($9,970.02/621) = $16.05

(2) **Healthcare Curriculum**

Item	*Calculation*	*Source*	*Cost*
Carolina Refugee Advise with healthcare provider	Full time work for one week	Estimate	$933.37
Design curriculum	Full time work for one week	Estimate	$933.37
Lesson plan	(1 hour/lesson)(12 lessons)	Estimate	$280.01
Teach	(1 hour/lesson)(12 lessons)	Estimate	$280.01
Lesson evaluation	(0.5 hours/lesson)(12 lessons)	Estimate	$140.00
Healthcare provider Advising time	Full time work for one week	Estimate	$911.15
Space (conference room for 30 people)	Hourly cost*12	Coworking website	$182.79
Total cost in year 2020			$3,660.70

Five years' worth of implementation

2020	2021*	2022*	2023*	2024*	Total Program Costs (NPV)
$3,660.70	$3,660.70	$3,660.70	$$3,660.70	$$3,660.70	**$15,009.60**

*All costs continue into each year of implementation

Expected reach = 30 (based on USCRI Banking on the Future program)

Outcomes achieved
Calling doctor to make an appointment (1 point)
Taking public transportation to see a doctor (1 point)
Reading medical bills (1 point)

Outcome points * expected reach = total outcome points
(1*30) + (1*30) + (1*30) = 90
(90*5 years' implementation) = **450**

Total program costs / total outcome points = **Cost Effectiveness**
($15,009.60/450) = $33.35

(3) **Health Collaborative**

Item	**Calculation**	**Source**	**Cost**
Carolina Refugee			
Hiring (4 work days)	Hourly wage*160 hours	Estimate	$3,732.8
Training (30 hours)	Hourly wage*30	Philadelphia case	$700.02
Clinic Liaisons			
Training (30 hours)	Minimum wage*30	HFP model	$3,045.00
Work (10 hours/ person per year)	Minimum wage*(10*14)	Philadelphia case study	$1,015.00
Space (conference room for 60 people 8 hours per week)	(Hourly cost*8)*52 weeks	Coworking website	$12,673.59
Health Screenings	$64*250 participants	CVS minute clinic	$16,000.00
Weekly Medical Clinics (8 hours per week)			
Carolina Refugee	(Hourly wage*8)(52)	Philadelphia case	$9,707.00
Clinic liaisons	(Hourly wage*8)(52)	Philadelphia case	$3,016.00
Healthcare providers	(Hourly wage*8)(52)	Philadelphia case	$9,476.00
Partnerships (full time work for one month)			
Carolina Refugee	(Hourly wage*160)	Estimate	$3,732.8
Healthcare providers	(Hourly wage*160)	Estimate	$3,644.8
Total cost in year 2020			$98,940.91

Five years' worth of implementation

2020	2021*	2022*	2023*	2024*	Total Program Costs (NPV)
$98,940.91	$51,267.93	$51,267.93	$51,267.93	$51,267.93	**$220,531.76**

*Reduced number of clinic liaisons and removed partnership costs

Expected reach = 250 (based on Philadelphia case study)

Outcomes achieved
Calling doctor to make an appointment (1 point)
Completing an initial health screening (1 point)
Connecting with a primary care provider (1 point)

Outcome points * expected reach = total outcome points
(1*250) + (1*250) + (1*250) = 750
(750*5 years' implementation) = **3750**

Total program costs / total outcome points = **Cost Effectiveness**
(**$220,531.76/3750) = $58.81**

(4) **Health Focal Point (HFP)**

Item	*Calculation*	*Source*	*Cost*
Carolina Refugee Training (30 hours) Monitoring (1 hour/month)	 Hourly wage*30 Hourly wage *12	 HFP model HFP model	 $700.02 $280.01
Community leaders (14) Training (30 hours) Work (10 hours/ person per year)	 Minimum wage*30 Minimum wage*(10*14)	 HFP model HFP model	 $3,045.00 $1,015.00
Space (conference room for 60 people)	Hourly cost*12	Coworking website	$4,265.15
Total cost in year 2020			$10,051.88

Five years' worth of implementation

2020	2021*	2022*	2023*	2024*	Total Program Costs (NPV)
$10,051.88	$8,529.38	$8,529.38	$8,529.38	$8,529.38	**$36,395.03**

*Number of volunteer leaders reduces to 7, leading to reduced costs in training and work

Expected reach = 34 (based on HFP model)

Outcomes achieved
Calling doctor to make an appointment (1 point)
Taking public transportation to see a doctor (1 point)
Reading medical bills (1 point)

Outcome points * expected reach = total outcome points
(1*34) + (1*34) + (1*34) = 102
(102*5 years' implementation) = **510**

Total program costs / total outcome points = **Cost Effectiveness**
(**$36,395.03/510) = $71.36**

Appendix B: Sensitivity Analysis

A sensitivity analysis assesses uncertainty by testing critical estimated costs. This includes changing the discount rate and introducing a range of extreme values for estimated costs.

Discount Rate	1. Texting	2. Curriculum	3. HFP	4. Collaborative
3%	$10,866.95	$16,764.94	$37,548.03	$241,259.36
5%	$10,400.54	$15,848.92	$35,549.05	$230,478.54
7%	**$9,970.02**	**$15,009.60**	**$33,716.14**	**$220,531.76**
10%	$9,383.63	$13,876.94	$31,240.41	$206,992.07
15%	$8,539.85	$12,271.24	$27,725.56	$187,530.33
20%	$7,830.89	$10,947.74	$24,822.88	$171,204.23
25%	$7,228.45	$9,844.65		
27%	$7,012.35	$9,454.39		
30%	$6,711.26	$8,915.89		
35%	$5,908.16	$8,126.61		

Despite changes to the discount rate, the rank of alternatives by cost remains the same – texting campaign has the lowest costs, followed by the Healthcare Curriculum, HFP, and finally Health Collaborative with the highest costs. At a discount rate of 20 percent and higher, the costs of the texting campaign and Healthcare Curriculum become close, which has potential to change the rank of alternatives, but the texting campaign remains approximately $2,000 less.

Breakeven Analysis

A breakeven analysis tests uncertainty in estimated costs. The following costs were based on the author's best estimates or the Haiti case study, meaning their value may not be representative of costs in Charlotte, North Carolina. To account for this uncertainty, low and high values were introduced to assess whether the extreme values would change the rank of alternatives by cost effectiveness. In this analysis, the low values are half the estimate and high are double the estimate. Cost effectiveness is used as a comparison measure to account for net present value of costs. Alternatives are bolded if the extreme values affected their cost effectiveness.

Best Estimates	**Estimate**	**Justification**	**Low**	**High**
Partnership hours	160 hours	Full time work for one month	80	320
Designing Curriculum	40 hours	Full time work for one week	20	80
Lesson planning	12 hours	1 hour/lesson	6	24
Cost of computer	$1,041.65	Cost in Haiti case study	$520.83	$2,083.3
Cost of modem	$393.12	Cost in Haiti case study	$196.56	$786.24
Hiring time	32 hours	Four workdays	16	64

Partnership Hours

Alternative	Cost Effectiveness	Low	High
1. Texting	$16.05	$16.05	$16.05
2. Curriculum	$33.35	$33.35	$33.35
3. Collaborative	**$58.81**	**$52.45**	**$71.53**
4. HFP	$66.11	$66.11	$66.11

Designing Curriculum

Alternative	Cost Effectiveness	Low	High
1. Texting	$16.05	$16.05	$16.05
2. Curriculum	**$33.35**	**$29.1**	**$41.9**
3. Collaborative	$58.81	$58.81	$58.81
4. HFP	$66.11	$66.11	$66.11

Lesson Planning

Alternative	Cost Effectiveness	Low	High
1. Texting	$16.05	$16.05	$16.05
2. Curriculum	**$33.35**	**$32.08**	**$35.91**
3. Collaborative	$58.81	$58.81	$58.81
4. HFP	$66.11	$66.11	$66.11

Hiring Time

Alternative	Cost Effectiveness	Low	High
1. Texting	$16.05	$16.05	$16.05
2. Curriculum	$33.35	$33.35	$33.35
3. Collaborative	**$58.81**	**$56.74**	**$62.95**
4. HFP	$66.11	$66.11	$66.11

Computer and Modem in Haiti

Alternative	Cost Effectiveness	Low	High
1. Texting	**$16.05**	**$14.98**	**$18.21**
2. Curriculum	$33.35	$33.35	$33.35
3. Collaborative	$58.81	$58.81	$58.81
4. HFP	$66.11	$66.11	$66.11

In regards to designing curriculum, lesson planning, hiring time, and computer and modem in Haiti, the low and high estimates did not change the rank of alternatives from lowest to highest cost effectiveness. The only estimate that changed the rank was partnership hours, which put Health Collaborative at higher cost effectiveness than HFP. This is not a concern because partnership hours would need to be twice the original estimate – full time work for two months rather than one. Full time work for two months is an extreme and unrealistic value because of its effect on Carolina Refugee's ability to serve refugees.

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