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Reducing Information Inequality: A Participatory Intervention in a Rural, Diverse Community

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UNIVERSITY OF CALIFORNIA, MERCED

REDUCING INFORMATION INEQUALITY:
A PARTICIPATORY INTERVENTION IN A RURAL, DIVERSE COMMUNITY

A Research Project submitted in partial satisfaction of the requirements for the degree of Master
of Science in Public Health (MSPH)

by

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The Research Project of Erendira Figueroa Estrada is approved, and it is acceptable in quality:

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Dedicated to Juan Estrada, Alejandra Estrada, and Zaira Estrada:
For the support and sacrifices you've made for me to be here, for the constant encouragement and pep talks on sleepless nights, for making me laugh when I needed it the most.
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ABSTRACT

Background: CDC-funded Partnerships to Improve Community Health (PICH) is a collaborative of over 40 community organizations working together to create a culture of health in Merced County. Underlying the policies, systems, and environmental approach that guided PICH projects is a comprehensive communication plan. As part of that plan, formative evaluation conducted at the start of the project found that residents and community organizations identified a weak information infrastructure as a major barrier to health: Residents struggle to find timely, relevant information that can help them improve their health, while stakeholders face challenges knowing how to reach diverse audiences with critical health-related information.

Aim: In this manuscript, I describe the process of conducting a participatory health communication intervention designed to address issues identified in communication infrastructure. The process includes adaptation of this method and intervention, developed in urban Los Angeles, to the rural context of Merced County.

Methods: Participatory health communication asset mapping (PHCAM), a method and intervention, was used to identify structures (safe, trusted spaces that serve distinct health communication needs: Informational, conversational, connection).

Development: A six-step process in which community leaders/residents identify & validate communication structures.

Implementation: Successful implementation of the map will be indicated from its use by (1) organizations (to disseminate information) and (2) residents (to obtain information). For the first, potential uses of the map were demonstrated at a convening with all partners, followed by one-on-one training and toolkit dissemination. To promote community knowledge/use, multiple resident convenings will be held at sites on the map.

Key words: rural intervention, participatory, communication infrastructure, information inequality, disparities

INTRODUCTION

Communication – timely access to and exchanging of information that is relevant and understandable – is an important determinant of health (Hornik, 2002; Viswanath 2006; Schiavo, 2013; Bernhardt, 2004; Healthy People, 2020; Rimal & Lapinski, 2009). Communication in health aims to do the following: inform and influence individuals, modify behaviors, and increase knowledge and understanding of health-related issues (Schiavo, 2013). As a determinant of health, communication can shape the public's knowledge and behaviors when it comes to technological advancements that medicine has made or diseases, such as in childhood immunization or HPV (Becker et al., 1993; Friedman & Shepeard, 2007). However, health communication discrepancies lead to communication inequalities (Viswanath, 2006). Communication inequalities have multiple dimensions to analyze including: access to and use of information channels and services; attention to and processing of health information; and the capacity and ability to act on information provided. Communication Infrastructure Theory (CIT) posits two strategy approaches when attempting to understand how information passes between individuals and their community, or communication environment (Kim & Ball-Rokeach, 2006). The purpose of this study is to situate the communication infrastructure framework in a rural context by applying a participatory intervention to develop a resource map that will be used as an intervention to address communication information inequalities found in this rural community.

Research Questions

1. How can communication asset mapping, a participatory intervention rooted in communication infrastructure theory, be adapted to a rural community?
2. What do Winton residents – who live in a rural and ethnically diverse community – identify as communication resources?

BACKGROUND

Communication & Health

Communication affects health through multiple functions: Informational (knowledge acquisition); Instrumental (converting information into action); Social Control (establishing norms in health); and Communal (social connections) (Viswanath, 2006). Communication serves an informational function, as demonstrated in mass media based health education campaigns. An example of an intervention leveraging the information function of communication is a mass media campaign to increase awareness of and promote prevention of AIDS among youths in Ghana (McCombie, Hornik, & Anarfi, 1992). The mass media campaign was successful in increasing the awareness of AIDS as a serious disease, improving the understanding of the incubation period, and reducing the belief that there was a cure among Ghanaian youths (McCombie, Hornik, & Anarfi, 1992). There was an increase in those reporting having heard about AIDS on television or radio and half the sample could complete the campaign's tag phrase, including those who lived in a rural region. This illustrates how far the campaign reached, affecting individuals who lived in areas where information access and exposure to varying media types are reduced (McCombie, Hornik, & Anarfi, 1992).

The instrumental function of communication goes beyond information provision to affect behaviors. Communication's instrumental function is evidenced in a case study where the effect of a media-based campaign in changing the behaviors of health

professionals and parents was measured through the diffusion of risk information about the association between aspirin and Reye's syndrome (Soumerai, Ross-Degnan, & Kahn, 1992). The first warning reports issued by federal agencies demonstrated no significant association in reducing disease incidence until a consistent and downward trend in disease incidence coincided with wide-ranging media covering three scientific studies, a federal agency report, and statements from the government and private agencies. Analysis indicates that the media-led campaign to change behaviors in consumers and providers was successful because the message behind the behavior change was simple and clear, alternative medication was available and inexpensive, a popular product could cause a rare but devastating illness, and the warnings were distributed through a multitude of media channels (Soumerai, Ross-Degnan, & Kahn, 1992).

Communication also serves a social control function. This may be deliberate, as in the case of health communication campaigns that aim to influence social norms. These often require studying the long-term effects of the campaign in effecting change of a certain behavior. An example of a communication campaign as social control function is demonstrated by Australia's antismoking campaigns to lower the prevalence of smoking (Pierce, Macaskill, & Hill, 1990). Findings indicate that the antismoking campaigns in Australia resulted in a lower smoking prevalence following the start of the campaign for everyone in Sydney, but only for men in Melbourne (Pierce, Macaskill, & Hill, 1990).

Finally, communication serves a communal function, wherein a sense of community and social connectedness are built through communication. Evidence for such a function comes from studies in social epidemiology and psychology that examine the importance of social networks and support in relation to health outcomes (Berkman, 1986).

Communication Inequality & Health Disparities

Although the examples given above illustrate the diverse functions of communication used for health promotion, inequality in communication access and usage is a social determinant of health. When communication is always controlled and unequally distributed, health communication discrepancies among social groups to retrieve, search, understand, and utilize health information constitute communication inequalities (Viswanath, 2006). Research in this area suggests that communication inequalities could potentially mediate how social determinants connect to health outcomes by influencing individual's access to and use of health information (Ackerson & Viswanath, 2009; Viswanath, Ramanadhan, & Kontos, 2007). Specifically, investigations that study how cancer-related health communications differ by race, ethnicity, language, and social class have been conducted to attempt and explain why there are gaps in health knowledge of cancer (Viswanath & Ackerson, 2011). Spanish-speaking Hispanics and non-Hispanic blacks were found to be more likely to pay attention to and trust cancer messages from all types of media channels, except for the Internet. Spanish-speaking Hispanics who are unable to fluently comprehend English show limited availability of cancer-related health information seeking. Education, an often-discussed socioeconomic determinant of health, strongly influences health communication behavior since it provides necessary skills, knowledge, and confidence to seek specific health information related to diseases such as cancer (Viswanath & Ackerson, 2011).

Sociodemographic and contextual factors influence the diffusion of health information; the case of the human papilloma virus (HPV) vaccine is instructive. Although awareness and knowledge of HPV – including its link to cervical cancer – has increased in the last few years, for certain populations – minorities, immigrants and non-Internet users – there exists an inconsistency of HPV understanding (Blake et al., 2015).Awareness and knowledge of HPV are highly associated with sex and age, men continue to be uninformed about HPV and appropriate vaccine uptake, and only women who have children less than 18 years old are not as likely to have heard of HPV or its vaccine for a multitude of reasons. Education played a significant role for those who were aware of HPV, the vaccine, and its relation to development of cervical cancer, with those who have college degrees reporting they were more aware of this information. Additionally, rural populations were less likely to have the knowledge and awareness that HPV causes cervical cancer in comparison to urban populations.

Communication inequality is not only about access to information, but also about how different populations use that information and sources of information. For example, communication inequalities in access (the digital divide) are further exacerbated when individuals do not have appropriate skills to navigate their way through the Internet (DiMaggio et al., 2001). Socioeconomic positions also contribute to communication inequalities by shaping the experiences of health and illness through health information retrieval where information is either active (purposely seeks information through varied media types) or passive (information is received primarily through television) (Bell, 2014). Additionally, acknowledging that access to, and quality of, health media is patterned by associated social determinants of health – such as race, language, education, and physical environment – permits the proposal of health communication interventions that aim to prevent communication inequalities that contribute to health disparities.

Interventions to reduce health disparities resulting from communication inequality have been limited, but suggest multiple levels of intervention. In one in-home pilot intervention, participants received a free computer system, broadband Internet access, monthly computer training courses, and technical support for a year to understand the facilitators and barriers that exist among urban low-income groups once an aspect of the digital divide - access to computers – is addressed (Kontos, Bennett, & Viswanath, 2007). The pilot found that the provided technical support, training, and social support of the intervention increased computer and Internet usage among urban low-income groups, demonstrating that the digital divide focusing on computer access can decrease between the two socioeconomic groups. The intervention's feasibility to be implemented among urban low-income groups, as well as its success in increasing Internet use, has set a precedent for other studies to follow so that those attempting to address digital divide's internet navigation among the different socioeconomic groups can best maximize health information seeking interventions among these individuals. Additionally, individuals with general health knowledge and whose health beliefs align with national standards of good health ("mavens") – are being investigated as a potential dissemination source that encourages positive behavior change among lower-socioeconomic position and minority groups (Kontos et al., 2011; Viswanath, 2006). The computer pilot intervention and interest in using mavens as potential future interventions are both examples of individual

level approaches to reducing communication inequalities of access and use of health information.

However, individual-level approaches to communication inequality only address disparities in health information needs and access. Such approaches do not take into consideration, or change, the social context or environment in which communication inequalities are taking place. Multilevel approaches to intervention are needed to fully address communication inequality. Communication Infrastructure Theory (CIT) offers a comprehensive and multilevel approach to address communication inequality and resulting health disparities.

Communication Infrastructure Theory (CIT)

Communication Infrastructure Theory (CIT) posits that each community has an invisible system it uses to communicate within itself. This is known as a community's communication infrastructure, or communication environment. This environment consists primarily of conversations and stories that are created and disseminated by various community members – people, media, organizations, but also specific community resources that promote communication between and among residents (Ball-Rokeach, 2001; Wilkin, 2013). The CIT framework consists of two parts: the ***storytelling network*** – a broad and integrated system that takes into consideration multiple levels of constituents within a community – and the ***communication action context*** – a variable resource that promotes communication between residents (Ball-Rokeach, 2001; Matei et al., 2001; Wilkin, 2013). The CIT framework identifies a communication environment's weaknesses to develop research-based strategies that better strengthens a community. Once the community is strengthened, CIT permits the development of practical health promotion strategies that work to effect change at both the individual and community level (Wilken et al., 2010).

CIT based strategies, specifically those relating to the storytelling network, have been used to effect change at a community-level by bringing together organizations and media through workshops with the goal of strengthening the connections between these two storytelling networks to promote community health in Los Angeles (Wilkin & Ball-Rokeach, 2006). Health centers attempting to get residents to utilize primary care instead of emergency departments have also utilized CIT's storytelling network strategy to improve the communication between residents and health centers. Health centers would incorporate feedback from residents into their health promotion implementation and residents would report back to the community through neighborhood meetings and community newsletters, encouraging the use of the health center instead of the emergency department (Wilkin, 2013). Though CIT based strategies concentrate on the storytelling network, others have considered strategies that relate to the communication action context, or its ecology. This strategy focuses on places where people gather and talk, as well as locations that people repeatedly frequent. Utilizing this CIT based strategy permitted residents to identify trusted community business and organizations that a health care center could successfully utilize to promote a healthcare assistance program to encourage use of the health center instead of emergency departments (Wilkin, Cohen, & Tannebaum, 2012; Kreuter et al., 2012).

Further research into communication action context based strategies is necessary to understand how a communication ecology constrains access to storytelling networks which in turn affects disparities in health (Wilkins, 2013). Communication ecologies represent a network of communication resources that individuals create but are also shaped by social and cultural conditions. Concentrating on individual communication ecologies contributes to better health communication outreach at a community level because we identify a combination of individual resources that help individuals construct knowledge through community and other types of communication resources – social media and modern technology (Wilkin, 2013; Ball-Rokeach, 2009; Broad et al., 2013, Villanueva et al., 2016). However, studies that have implemented this communication ecology approach are limited, and those that have utilized the approach specify to researchers, health practitioners, and residents the importance of adequately identifying communication resources that can be used to improve health communication exchange and promote community action are limited (Broad et al., 2013; Villanueva et al., 2016).

Case Studies

Ongoing research project, Metamorphosis: Transforming the Ties that Bind, is an in-depth examination of the changes urban communities in Los Angeles undergo in an era of new communication technology and diverse populations (Ball-Rokeach, 2001). This project introduced the theoretical framework of communication infrastructure that consists of two strategies to identify a communication environment, which has led to exploring how the storytelling network affects health of individuals. The communication ecology approach has been less explored, with only a few exploring its potential to create a hub and physical tool that aims to advance community health promotions (Ball-Rokeach, Kim, & Matei, 2001; Wilkin, 2013; Wilkin et al., 2010; Broad et al., 2013; Villanueva et al., 2016). The creation of MetaConnects, an online platform that compiled into one location resources to support community-based practitioner communication ecology needs and gaps, led to an engaged initiative on behalf of both academic researchers and practitioners to facilitate social change in community neighborhoods (Broad et al., 2013). MetaConnects continues to provide collaborative opportunities between practitioners and academic researchers by permitting research findings to be discussed, strategies developed to improve community's well-being, and toolkits for those interested in engaging from a communication ecology approach but do not know how to do so. Limitations of this platform showed that online traffic to the website remained low despite positive feedback obtained from practitioners who utilized it. Funding cuts meant that the in-person interactions established by a community liaison between researchers and practitioners would no longer be able to facilitate future communications. The online platform also struggled to implement itself as part of practitioner's current communication ecologies. Despite the platform's limits, engagement of researchers to understand practitioner's communication ecologies and engagement by practitioners to understand resident's communication ecologies permitted the leverage of university resources to help facilitate community-based social change.

Understanding communication ecologies from different community perspectives – resident, health practitioner, academic researcher, organization – is important for identifying what communication resources can be leveraged by academics and health practitioners to conduct health communication outreach interventions. The process that

identifies communication resources and places them on a map is known as communication asset mapping (CAM), a methodology that allows residents and organizations to design a map of resources, implement it as a health communication outreach tool, and analyze the map's effect on its communication environment (Villanueva et al., 2016). Communication asset mapping also differs from previous studies that use CIT's communication ecology strategies to learn about a community's communication resources because it does not rely on surveys or focus groups to obtain the information. CAM requires applied field work and street-level mapping to obtain an in-depth understanding of a neighborhood's communication environment and what limits it from building a strong and healthy community.

  This methodology has been applied to two different Los Angeles communication environments: South Los Angeles and Boyle Heights. To start the CAM process, geographical boundaries for mapping of the area need to be established. South Los Angeles' mapping boundaries were set at 10 square miles due to it being a grant-funded project whereas Boyle Heights' mapping boundaries were set at 6.5 square miles, its determined boundaries (Villanueva et al., 2016; Los Angeles Times, 2000). The areas within these geographic boundaries were further divided into subareas to make mapping communication resources manageable for both CAM pilots. Development of field instruments included a section to write predetermined categories of communication resource type – public space, business, school, church, cultural arts center, etc – that had been previously identified by phone surveys, a section for recording a resource's address, subarea, observations of activities occurring at the location, and mapper name, date, and time. A section to write down a communication resource category or type that was not listed was also included. Instructions to photograph the communication resource were attached also. Before participants in the CAM pilots could start mapping resources, a training workshop that summarized the goals of Healthy Communities, CAM purpose, and the protocol of the CAM field instrument along with examples of appropriate communication resources was held. Once trained in CAM, participants were sent to map the subareas of the two neighborhoods, their return prompted data collection which was uploaded from the paper field instrument to a digital spreadsheet, along with the photo uploaded onto a database (Villanueva et al., 2016). Following the data collection from both neighborhoods, multiple discussions were moderated to establish which communication resources would be added onto the final resource map. Distribution of the final map to practitioners working on building healthy communities in the two neighborhoods would come about following the probing sessions with participants so that the design of the map was appropriate to each community.

  The South Los Angeles CAM pilot strategy was driven primarily by a university team where researchers identified 54 communication resources ranging from businesses, churches, community organizations, to schools, clinics, and public spaces. To count as a resource, researchers applied the following criteria to their selections: 1) residents gathered there were discussing among themselves and 2) activities for community service were available – which are in line with CIT based strategies associated with the storytelling network and communication ecologies. Resources in South Los Angeles were predominately affiliated with religion and had varying degrees of church types with some of the bigger ones offering multicultural and multilingual services at separate times

throughout the day. The group's discussion led to the creation of a digital resource map, added to the MetaConnects online platform, to facilitate the sharing of resources among practitioners seeking to build healthier communities and not knowing where to begin. The online format of the map allows for interaction with communication resources that prompts a pop-up box containing the resource's name, photo, and description, including additional video resources that explain how the CAM process fits within communication infrastructure theory framework and healthy community-building.

The Boyle Heights CAM pilot strategy utilized Promotoras to identify communication resources due to findings from communication infrastructure theory that demonstrate the significant role community organizers play as individuals that seek to effect community change. The CAM process establishes a methodology for local individuals of the community to follow because they already contain extensive knowledge of their community. This methodology permits them to accurately identify communication resources that can serve as community outreach spaces or health communication promotion spots. Similar procedures as in the university team driven CAM pilot were followed. The smaller geographic boundaries that the Promotoras mapped resulted in 41 communication resources – only 13 fewer resources identified by the researcher driven CAM pilot. Community organizations, public spaces, schools, clinics, churches, and businesses were also categories identified by Promotoras. For this neighborhood, Promotoras followed the same criteria as researchers in South Los Angeles, but resources identified were predominantly family-oriented and known to participate in past health promotion outreach. When meeting to discuss final communication resources included on the map and its design, Promotoras emphasized that the resource map be printable so that they could utilize it in their interpersonal interactions when promoting health outreach work (Villanueva et al., 2016). Although including similar aspects of South Los Angeles' digital map such as the name and description of the communication resource, this map included information that health practitioners could use to help get in contact with resources that were willing to promote health, current healthy community campaigns being conducted in the area for interested community members, and contained select and photos of communication resources on its front that was visually representative of the neighborhood.

The two CAM pilot strategies demonstrate a methodology that identifies communication resources, which establishes a communication ecology that in turn can affect a community's communication environment by utilizing the resources for health promotion intervention (Villanueva et al., 2016; Wilkin, 2013). The South Los Angeles CAM process revealed how university-community partnerships could be developed to contribute to a larger cause, like contributing to the Healthy Communities movement, meanwhile the Boyle Heights CAM process contextualized communication theories for Promotoras' who often practice them but are not necessarily familiar with them. Nonetheless, future research in how residents who have no health outreach experience utilize the CAM process to identify communication resources is encouraged. In accordance with the storytelling network approach of communication infrastructure theory, varying populations – youth, community-based organizations, minority groups, residents – could demonstrate differing perspectives when identifying communication resources to use for health promotion in communication infrastructure theory's

communication ecology approach (Villanueva et al., 2016). Furthermore, much of the literature in communication infrastructure theory has been situated in the context of an urban environment, without considering if communication infrastructure theory approaches result in different findings if the context changes from urban to rural. The rest of this paper will describe our process and adaptation of communication asset mapping in a rural community in Merced County.

STUDY CONTEXT

Merced County

Merced County is in the heart of the San Joaquin Valley and consists of six cities and 18 census-designated places, of which about 60% of residents identify as Hispanic or Latino (U.S. Census Bureau, 2010). Merced County holds a higher proportion of people in poverty (53%) than California (36%) and 32% of Merced County residents, 25 and over, report having no diploma. Leading mortality causes in Merced County include cardiovascular disease, cancer, respiratory disease, and diabetes mellitus (Merced County Department of Public Health, 2016). Merced County overall ranks 54 out of 57 in health factors – measured as the culmination of health behaviors, clinical care, physical environment, social and economic factors – but overall ranks 49 out of 57 in health outcomes, demonstrating Merced County's poorer health outcomes compared to other counties in the San Joaquin Valley (County Health Rankings, 2017).

Partnerships to Improve Community Health

Partnerships to Improve Community Health (PICH) is a 3-year initiative funded by the Centers for Disease Control and Prevention (CDC) that strives to improve the health of communities and reduce the prevalence of chronic disease (CDC, 2017). To achieve this, PICH permits awardees to focus on four objectives related based on the following risk factors: 1) tobacco use and exposure, 2) poor nutrition, 3) physical inactivity, and 4) lack of access to opportunities for chronic disease prevention, risk reduction, and disease management (CDC, 2017). The initiative encourages awardees to collaborate with multi-sectoral coalitions to tailor the application of population-based strategies to individual community needs, across various settings, to generate access to healthier environments (CDC, 2017). Keeping in line with PICH objectives, but unique in its aims to tackle all four areas, Merced County strives to: expand smoke-free protections to multi-unit housing complexes and college campuses; increase physical activity opportunities through active transportation/community design planning and/or joint-use agreements; achieve Baby-Friendly Hospital designation in at least one local hospital system; and expand access to chronic disease prevention services through community health workers.

Community

PICH's encouragement for multi-sectoral coalition collaboration required that communication take place between them and communities to effectively identify mutual needs and implement sustainable change. To address community needs in Merced County and establish a culture of health, formative PICH research focused on the development of appropriate communication strategies and messages for the creation of a communitywide media campaign that would inform, educate, and empower residents to change individual behavior and increase civic engagement (Ramirez, 2015). For the media campaign to be created, analysis of Merced County perceptions of health and safety were obtained from

the residents of South Merced and Winton communities. Perceptions of health aligned with the county's health assessment of obesity, diabetes, allergies, asthma, and air quality as common health issues (Ramirez, 2015; Merced County Department of Public Health, 2016). Structural features in the South Merced and Winton community, such as unequal access to full-service grocery stores, parks, gyms, and bike paths – in comparison to North Merced and Atwater – were identified as barriers preventing residents from engaging in healthy behaviors. South Merced and Winton residents also noted the difficulty in locating existing services or programs in a timely matter since there was no existing infrastructure for communicating about such resources in their communities (Ramirez, 2015). The finding of a lacking communication infrastructure to identify health-related resources by residents is further supported by the minimal amount of health information available in current Merced County newspapers (Ramirez, Estrada, & Ruiz, 2017).

METHODS

We utilized communication asset mapping to 1) establish Winton's communication infrastructure by developing a resource map full of resources residents identified as health information promoting and 2) encourage the use of the resource map among multi-sector partners to build interventions for reducing the unequal distribution of health information within Winton's communication environment. The UC Merced communication team reached out to Winton community organizations, leaders, and residents asking them to take part in our participatory health communication asset mapping (PHCAM) process (see Figure 1), an adaptation of the communication asset mapping methodology.

Prior to engaging organizations or residents, field instruments that include predetermined categories of communication resources, an area to include communication resources that fall outside the pre-determined categories, a section to write the location of the resource and group names, the type of communication resource as well as a reminder to photograph the communication resource were developed. A summary sheet was also created that had communication category and communication resource type definitions to aid residents in their health communication asset mapping. Due to the smaller geographic region of Winton (3 square miles), we were aware that there could be fewer potential communication structures dispersed within its geographic boundaries and larger residential areas. To avoid this, a predetermined region that reduces the boundaries of the PHCAM process was established to ensure that only appropriate communication resources were considered for inclusion in the final resource map.

PHCAM first requires identification of community organizations that are trusted by community residents to facilitate active resident engagement to categorize communication resources. LifeLine Community Development Corporation (LifeLine CDC) operates a model for community development centered on coaching, consulting, and cultivating the structures of communities to empower communities to act. The Winton Educational Foundation provides education, economic development support and social/health referral services to low-income individuals, with services mostly oriented to serving the bilingual and Latino population. Our partnership with these two community organizations allow us, as academic researchers, to invite community members to be trained in the PHCAM process in settings that encourage residents to become advocates

of change which is in line with CIT storytelling network and communication ecology approaches.

An all-day workshop to train residents in the PHCAM process was held and included an 80-minute presentation by a project staff member on Los Angeles' CAM pilot strategies, a 90-minute walking section where residents identified communication resources, a moderated group discussion about what communication resources should be added to the map, and a process evaluation of PHCAM. Walking groups were assigned one UC Merced undergraduate assistant to help complete the field instrument and ask residents probing questions as to why they included certain communication resources. A discussion about the communication resources chosen by each group was held with all residents, where all twelve residents could vote for their top 3 communication resources. A final round of voting was held where residents voted for their single most important communication resource they wanted included in the map. At the end of the discussion a process evaluation was conducted in the form of individual interviews to obtain the perspectives of residents on the PHCAM process to identify health communication resources and resident engagement.

However, Winton's diversity required that we conduct a separate PHCAM workshop that was tailored appropriately for the Spanish monolingual community. The project staff member repeated the Los Angeles CAM strategies and its importance to health communication but instead of training residents for a walking group, a guided group mapping exercise followed the presentation. Residents were asked to grade with a letter grade the communication resources identified in the first workshop and discuss why they gave that grade to the communication resources. Following this group discussion, residents identified any additional communication resources they believed should be added to the map. Due to limited remaining residents in this second workshop, a process evaluation was not completed. Both workshop trainings were video-recorded from start to completion, the walking and guided mapping sections were audio-recorded, and the process evaluation interviews were recorded.

Twelve English-speaking residents – recruited by LifeLine CDC – and underwent the first workshop. Nine Spanish monolingual residents – recruited by LifeLine CDC underwent the second workshop (see Table 1). A third workshop – hosted by the Winton Educational Foundation – served as the center for eight residents from the original workshops to come together and discuss the production and design of a draft communication resource map developed by a graphic designer (see Figure 2a and Figure 2b). Although the implementation of the resource map for use as an intervention tool, the last step of the PHCAM process, falls outside the scope of this study a presentation with PICH stakeholders and one-on-one trainings to measure the communication resource map's validity is planned.

OUTCOME

Data collected in the first workshop with English-speaking residents yielded a total of 13 resident approved communication resources, however, the second workshop with monolingual Spanish Latinos yielded a total of 11 approved assets, of which six were previously identified by residents of the first workshop and received a letter grade of A or B. The Spanish workshop identified six new communication resources but gave poor letter grades to seven of the thirteen communication resources originally identified

by the first workshop. In total, both the English and Spanish workshop yielded a total of 19 communication resources to put in the final health communication map using the PHCAM process. However, 19 communication resources to include in a single map risked making it appear too cluttered and difficult for community organization and residents to form meaningful partnerships with the communication resources for information dissemination. We identified characterizing themes for each communication resource to help organize resources by theme (what communication needs it fulfilled: conversational, informational, or connection) and obtained descriptive summaries of each to include on the back of the map. Direct outreach to the managers of the potential communication resources was done by the community partner LifeLine CDC to consult them about being represented on the map and their agreement to (1) serve as a distribution point for the final map and (2) serve as a distribution point for other health communications – in a format appropriate for the resource. Utilizing the PHCAM process resulted in a total of 12 approved communication resources that were representative of both the English and Spanish workshop's communication resource identification. Five churches were identified by the two workshops and two local media outlets trusted by each respective community workshop, were also added to the map as other resources that are willing to share information.

The third workshop discussed the graphic designer's initial map concept resulting in resident feedback on the graphic design – color scheme, fonts, imagery – and the content – description of communication resources, map title, and presentation of information. Residents preferred a bright and lively color scheme but were concerned about the visibility of the communication resources and instead chose a color scheme that reflected traits they described as calming, soothing, healthy and improvement. The final title of the map chosen by residents was the *Winton Resource Guide* and the Winton mural, a design created and painted by the community, was added to the back of the map. The map included definitions of the communication resources that concisely summarized why the resource was important and how it can be utilized to promote health.

INTERPRETATIONS

Although methodologically like the Los Angeles CAM pilot strategies, our process differs in how we adapted it to our rural community. The geographic boundaries for which the PHCAM process would take place were much smaller in Winton (3 square miles, 3,537 people per square mile) than in South Los Angeles (10 square miles, 14, 671 people per square mile) and Boyle Heights (6.5 square miles, 14,229 people per square mile) (Villanueva et al., 2016; U.S. Census Bureau, 2010, Los Angeles, 2000). This was limited further by the characterization of Winton having more residential areas than shopping centers when compared to Los Angeles.

Secondly, our PHCAM process is driven by resident perspectives of their communication ecologies to identify relevant communication resources that can better address the weak health information infrastructure in Winton instead of by academic researchers or Promotoras who have spearheaded past health promotion outreach in their communities. This permits our PHCAM process to take into consideration Winton's diversity and consider how communication ecologies differ, for example, the perceptions of health communication resources among the English- and Spanish-speaking communities. Winton's Post Office was a resource that was important to residents from

the English-speaking community due to their perception of it being a safe and welcoming environment, whereas residents from the Spanish monolingual community felt that their experiences at the location were less positive and the resource would not be useful for their community. Additionally, certain businesses identified by English-speaking residents received a poor grade by the Spanish-speaking community since they did not patronize or felt uncomfortable utilizing the services these businesses provided. Winton's English- and Spanish-speaking communities also go to differing houses of worship, meaning that churches identified by the English workshop received poor grades by the Spanish workshop, although it is important to note that this was not due to animosity with the houses of worship chosen, but rather due to the lack of exposure to these houses of worship and differing religious beliefs.

IMPLICATIONS

We found that communication asset mapping can be adequately adapted to a rural environment and serve as the basis for participatory intervention to improve communication infrastructure in a geographically smaller and diverse population. Community residents identified similar communication resources as both the research driven and Promotora driven CAM pilot strategies: Churches (5), community organizations (2), businesses (4), schools (1 district), public services (4) and spaces (1) (Villanueva et al., 2016). Many residents described the process positively and had a general satisfaction for it stating that the process serves as an opportunity to determine the best ways to communicate with their community and encourage working together as residents to figure out the best resources in their community to include on a resource map.

Challenges identified by our Winton residents were a bit surprising in comparison to Villanueva et al.'s (2016) findings from the Promotora application in Boyle Heights since participants from that application closely resemble our residents. Although the groups mapping the communication resources were community residents from Winton, some locally-owned businesses and organizations (potential communication resources) were uncomfortable with having their business or organization photographed which resulted in residents having difficulty in obtaining permission or feeling awkward about this part of the PHCAM process. Another challenge arose in the discussion sections of the first two workshops since not all participants would engage equally, resulting in some residents taking the lead in the discussions about the communication resources while others did not speak much. This is in line

Whether these locations are utilized by current community organizations or PICH stakeholders to serve as starting points of health communication interventions will require further analysis that falls outside the scope of this manuscript. Further research is encouraged to track the usage of the *Winton Resource Guide* by community organizations, partners, and stakeholders. The *Winton Resource Guide* is planned to be released to the general Winton community at a later point in time, requiring evaluation of resident's knowledge of the *Winton Resource Guide* to accurately measure if residents of both communities understand its purpose and if they themselves share it among their communication networks. There do exist limitations for our study: since the implementation part of the PHCAM process requires active stakeholder and resident buy-

in for the *Winton Resource Guide* to be successfully implemented, the sustainability of the PHCAM intervention cannot be determined without further research.

CONCLUSIONS

The PHCAM process not only developed a resource map for use in discovering Winton's communication infrastructure to use for health promotion interventions by organizations, but also served as a building capacity for residents to be opinion leaders in their community. Once the resource map is implemented for use as a health promotion intervention tool by different constituents, residents that have participated in the PHCAM process will be able to influence and teach other residents how to use it to help them navigate their communication needs (Wilkin, Cohen, & Tannebaum, 2012; Kreuter et al., 2012; Wilkin, 2013).

This study is expected to add to the body of evidence for utilizing PHCAM methodology for use in the development of health promotion efforts in line with communication infrastructure theory based strategies, specifically using communication action context approaches (Ball-Rokeach, 2001; Wilkin, 2013). This intervention showcases how the communication ecology differs in a rural communication infrastructure context in two different language speaking communities furthering the research that communication infrastructures differ among different minority groups (Kontos et al., 2011; Viswanath, 2006). We also show that the CAM process is adaptable from an urban context to a rural one (PHCAM), with an emphasis on mapping communication resources from a community resident's perspective.

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Appendix 1: Table

Table 1. Resident Gender, Ethnicity, and Language by PHCAM Workshops

	Workshop 1 – English (LifeLine CDC)	Workshop 2 – Spanish (LifeLine CDC)	Concept Development Workshop (W.E.F.[*])[**]
Sex			
Female	10	6	3
Male	3	3	5
Race			
Caucasian	6	-	4
Latino	7	9	4
Language			
English	13	-	4
Spanish	-	9	4
Total	**13**	**9**	**8**

N=30 community residents including 2 leaders from the partner organizations.
* *Winton Educational Foundation*
**Residents from Workshop 1 and 2 were invited back for the Concept Development Workshop.

Appendix 2: Figures

Figure 1. Participatory Health Communication Asset Mapping Process

Partner Engagement	Resident Engagement	Data Analysis	Concept Development	Map Production	Implementation

Figure 2a. The front of the Winton Resource Guide, the communication asset map, mapped by Winton residents.

Figure 2b. The back of the Winton Resource Guide, the communication asset map, mapped by Winton residents.