

# Surmounting Barriers to Public Health/Park Agency Partnerships: Insights From a County Public Health Department

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**EXECUTIVE SUMMARY:** The American Public Health Association (APHA) recently recommended that health professionals partner with park agencies in order to use nature for health promotion. We aimed to 1) determine the capacity of a local public health system to implement the APHA recommendations, 2) test the hypothesis that the likelihood of implementation is associated with health professional knowledge and beliefs, and 3) identify a framework for facilitating implementation. We surveyed all staff members at the San Francisco Department of Public Health (SFDPH) Maternal, Child and Adolescent Health Branch. SFDPH, like many health departments, provides services for underserved and marginalized populations. The results of 108 quantitative surveys and the qualitative analysis from small group discussions with 120 public health professionals are presented in this paper. The majority of those surveyed (81%) agreed that patient health would improve if they spent time in nature. However, few health professionals believed that patients regularly visit parks (11%) or would follow a practitioner's recommendation to visit a park (16%) in order to experience nature. We found that if public health professionals knew of a specific location and activity to do in nature, and if they were confident that their low income patients would be welcome at parks, they were more likely to recommend a park visit. In group discussions, health professionals showed enthusiasm for collaboration with park agencies, pragmatism that their patients will need multiple supports in order to sustain outdoor behaviors, and a perspective that time in nature for underserved communities is the product of a socioecological system. This socioecological system includes factors to be considered at the individual, interpersonal, community, and societal levels. Participants engaged in a rich discussion on how health departments can partner with park agencies and community-based organizations to encourage nature for health at each of these levels. We turned to public health professionals for suggestions about how nature can be integrated into public health systems. The resulting discussions

came together in the form of a framework that provides insight on public health priorities, a roadmap for those who seek to initiate interdisciplinary alliances, and suggestions for future research.

**KEYWORDS:** *Nature and health; park, preventive health; public health practice; national parks; American Public Health Association; San Francisco Department of Public Health; SFDPH*

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## Introduction

In 2013, the American Public Health Association (APHA) adopted a policy to improve health and wellness through access to nature (American Public Health Association, 2013), which recommends that “public health officials, physicians, nurse practitioners, and other health professionals should advise patients and the public at large about the benefits of green exercise, personal and community gardening, and nature-based play and recreation.” Amongst other strategies, APHA recommends health professionals partner with park administrators “in order to increase access to green spaces where people live, work, and play and to raise awareness about their value.”

A growing body of literature provides evidence for the role of nature in public health (McCurdy, Winterbottom, Mehta, & Roberts, 2010). The presence of nature in communities has been associated with lower rates of all-cause mortality (Maas, Verheij, de Vries, Spreeuwenberg, Schellevis, & Groenewegen, 2009), higher longevity (Takano, Nakamura, & Watanabe, 2002), lower prevalence of asthma diagnoses (Lovasi, Quinn, Neckerman, Perzanowski, & Rundle, 2008; Pilat, McFarland, Snelgrove, Collins, Waliczek, & Zajice, 2012), lower rates of pre-term labor (Dadvand et al., 2012), (Kihal-Talantikite, Padilla, Lalloue, Gelormini, Zmirou-Navier, & Deguen, S. 2013), less myopia

(Ip, Rose, Morgan, Burlutsky, & Mitchell, 2008; Morgan, Ohno-Matsui, & Saw, 2012; Rose, Morgan, Ip, Kifley, Huynh, Smith, & Mitchell, 2008), higher vitamin D levels, improved attention deficit hyperactivity disorder symptomatology (Taylor & Kuo, 2009), improved self-reported well-being (Cervinka, Roderer, & Hefler, 2012), and less physician-diagnosed anxiety and depression. Mental health benefits are even more pronounced for those living in poverty (Sugiyama, Leslie, Giles-Corti, & Owen, 2008). Health benefits associated with exposure to nature are thought to be mediated by air quality, opportunities for social interaction (Maas, van Dillen, Verheij, & Groenewegen, 2009; Sugiyama, Leslie, Giles-Corti, & Owen, 2008), reduced stress (Wells & Evans, 2003), and increased physical activity (Davis et al., 2011). Physical activity has been reported not only to increase in outdoor spaces, but also to change in quality when those outdoor areas are green spaces (Cooper, Page, Wheeler, Hillsdon, Griew, & Jago, 2010). The same exercise done in nature (“green exercise”) results in reduced aggression, anger, fatigue, and sadness, and improved attention and cognition (Bowler, Buyung-Ali, Knight, & Pullin, 2010) compared to when it occurs in a built or indoor environment. Green areas on elementary school property support improved motor coordination, and social and emotional development as compared to exclusively asphalt playgrounds (Cooper, Page, Wheeler, Hillsdon, Griew, Jago, & 2010; Fjortoft, Lofman, & Halvorsen Thoren, 2010; Hart, 1998).

Public health-park alliances, while not fully documented, are prevalent and increasing (Mowen, Payne, Orsega-Smith, & Godney, 2009). Park agencies have been attractive partners for public health departments because local parks are the most readily available, or sometimes the only, source of physical activity for local communities (Bedimo-Rung, Mowen, & Cohen, 2005; Floyd, Crespo, & Sallis, 2008; Kaczynski & Henderson, 2008). Park agencies are motivated to partner with health departments because they would like to grow the number of users, increase their relevance, and foster future environmental stewards (Cohen, McKenzie, Sehgal, Williamson, Golinelli, & Lurie, 2007; Kruger, 2008). Park agencies have researched how to increase park use by changing park structure, programs offered, and staffing (Bedimo-Rung, Mowen, & Cohen, 2005; Kaczynski, Potwarka, & Saelens, 2008). Best practices for integrating nature into health care departments remain to be determined. It is unknown whether public health professionals at the local level are aware of the health benefits of nature, the role of parks in providing access to nature, or if they are prepared and willing to advise the public about the health benefits of nature. The capacity for public health departments to implement partnerships for nature contact is unknown. Likewise, we are not aware of any existing theoretical framework that might guide these partnerships.

As many public health departments care for safety-net populations, this article focuses on how to implement the APHA recommendations for low-income and diverse communities that, at baseline, lack access to green space (Taylor, Floyd, Whitt-Glover, & Brooks, 2007). Park, recreation, and leisure scientists have identified common barriers to getting outdoors (Department of the Interior 1999; Jackson, 1988; Meeker, Woods, & Lucas, 1973; Rodriguez, Roberts, & National Park Service, 2002; Washburne, 1978). Lack of time, lack of access, and not feeling comfortable or welcome are documented barriers for low-income groups. The number of constraints discouraging people from leaving home for leisure experiences increases for individuals with lower socioeconomic status (Shores, Scott, & Floyd, 2007). Marginalized populations of color often have added constraints such as lack of familiarity and perceived racism (Roberts & Chitewere, 2011). Alleviating only one barrier (for example, waiving or reducing an entry fee to a park) does not necessarily lead to increased park visitation (More & Stevens, 2000).

In 2013, the San Francisco Department of Public Health (SFDPH) partnered with local park agencies to increase access to nature for low-income populations of color. They undertook several initiatives, one of which was a pilot project that included “park prescriptions” at a public health clinic. One resulting hypothesis from the pilot project was that health professionals are more likely to recommend nature to their patients if they themselves have knowledge about the health benefits of nature. Another hypothesis was that health professionals were also more likely to recommend nature if they have knowledge

about where exactly to refer patients, or if they felt that parks would welcome low-income patients. In order to inform the further design of collaborative strategies, SFDPH sought to test these hypothesis as well as to gather more detailed information was needed about the current public health system capacity for partnership and impact. The aims of this study were therefore to

1. test the hypothesis that the likelihood of health professionals referring patients to parks for nature is associated with their knowledge and beliefs about parks,
2. determine the capacity of a local public health department to implement the APHA recommendations, and
3. create a framework for increasing access to nature through park use via health departments.

## Methods

We conducted a descriptive cross-sectional survey with quantitative and qualitative components. The quantitative survey was conducted in October 2014, two weeks before an all-staff training about nature and health. Qualitative data were gathered during group discussions on the day of the training.

### Study Population

All full-time staff members ( $n = 164$ ) assigned to the Division of Maternal, Child and Adolescent Health (MCAH) branch of SFDPH were eligible to participate in the study. MCAH employees represent a range of public health professionals with a core function of addressing health inequities for women and children, including those with special needs. The division operates as a bridge between communities and clinics, with programs that provide direct patient care, outreach for high-risk populations, linkage of patients to community services, and clinical supports such as health professional training. Although MCAH does not represent the entire San Francisco public health system, they are at the forefront of the clinic-community public health interface, providing the important link between individuals and services at a critical time for public health intervention early in the course of life.

### Park Agencies

San Francisco has more than 5,000 park acres administered by three separate park agencies (San Francisco Recreation and Parks, The National Park Service, and California State Parks). Throughout San Francisco, 145 people are served per acre of parks. Maps of social inequities mirror maps of park needs in San Francisco (Trust for Public Land, 2014).

### Survey Procedures and Variables

Closed-ended questions used a Likert-type scale and covered knowledge about the physical, mental and social health benefits of nature, knowledge of specific walks or activities in nature to recommend, attitudes about whether patients currently spend time in natural parks, whether low-income patients feel welcome in natural parks, whether patients will follow their recommendation to visit parks, and current practices recommending a visit a park to enjoy nature. The phrases “nature,” “visit to a park to enjoy nature” and “natural park” were chosen after field testing. While not all parks have nature and not all nature is found in parks, we informed participants that we were discussing outdoor open spaces in parks with natural components. Two open-ended questions were included at the end of the survey:

1. What do you advise park leaders do in order to improve community health?
2. What do you advise health leaders do to improve community health through parks and nature?

### **Breakout Group Discussions**

During the all-staff meeting, MCAH employees were assigned to one of 15 groups, each including six to ten health practitioner participants and one or two staff members from San Francisco Recreation and Parks and/or the National Park Service. Each group focused its discussion on a case study based on a particular health outcome or vulnerable population group. Small group participants reported back to the larger group with answers to the following questions:

1. List three ways in which health and parks can cooperate to better serve the family in this case study.
2. List three ways parks can better serve the populations you work with.
3. List the community partners you plan to share [information about health/parks partnerships with] in the next three months.

### **Data Analysis**

We analyzed the quantitative data using STATA 10 (College Station, TX) and present them as descriptive statistics. We used logistic regression to test the relative odds that the current practice of recommending time in parks for nature was associated with knowledge and attitudes. For hypothesis testing, and for presentation in the text, the five-level categorical variables were collapsed into dichotomous variables (very or extremely vs. somewhat, slightly, or not at all).

Qualitative data from the survey and transcripts of small group discussions were imported into Dedoose software (SocioCultural Research Consultants, Los Angeles, CA). One member of the research team read over each of the transcripts three times. At the first reading, she noted the main points and created a list of codes. During the second reading, she grouped the codes according to themes. These themes were then presented to a team of representatives from SFDPH and a park agency partner and modified based on their feedback. On third reading, the team member applied the revised codes. These themes were then organized into a logic model and a socio-ecological model using the Center for Disease Control and Prevention's (CDC) framework (Center for Disease Control 2015). The socio-ecological model described by the CDC considers the interaction between individual, relationship, community, and societal factors. The framework shows how factors at one level influence factors at other levels and the potential impact of preventive measures at multiple levels. Once conclusions were made and figures drafted, they were presented to the research team and went through several iterations of feedback and revision from researchers and SFDPH.

### **Ethical Considerations**

SFDPH collected these data for program planning purposes. All data were anonymous with no identifying information gathered; the study was therefore deemed exempt from human subjects' approval by the UCSF Benioff Children's Hospital Oakland Investigational Review Board.

### **Results**

#### **Survey**

Of 164 eligible MCAH staff members, 108 (66%) responded to the survey. One third of the survey respondents were public health nurses, representing a variety of roles, and 3% of the respondents were physicians. Eleven (10%) did not provide direct patient care (Table 1).

**Table 1**  
*Roles of Public Health Professionals Surveyed Regarding Knowledge, Attitudes, and Practices about Nature, San Francisco, California, 2014*

<b>Role</b>	<b>Number (%)</b>	<b>Number not providing direct client care</b>
Administrative (Program Coordinators, Eligibility Specialists, Epidemiologists)	17 (16)	6
Public Health or other Nurse	40 (37)	1
Physical or Occupational Therapist	15 (14)	0
Health Educator/Worker	19 (18)	3
Social Worker	2 (2)	0
Student	1 (1)	0
Dietitian	6 (6)	0
Other provider (Dental Hygiene, Audiometry, other)	4 (4)	1
Physician	3 (3)	0
Missing	1 (1)	0
Total	108	11

MCAH public health professional knowledge and attitudes, and behaviors are presented in Table 2. Sixty percent were knowledgeable about the physical health benefits of nature, 61% about the mental health benefits, and 44% about the social health benefits; only 25% knew about a specific walk or activity in nature that they could recommend to patients.

Although 81% of 97 direct service providers believed patients would improve their health by increasing time in nature, only 11% believed their patients regularly visited parks, only 16% believed patients would follow their recommendation to spend time in nature.

When asked how often they recommend a visit to a park in order to enjoy nature, 26% answered always or often. Health professionals who were knowledgeable about physical health benefits were four times more likely to recommend parks to enjoy nature than health professionals who were less knowledgeable (4.4, 95% CI: 1.4-14.2). Health professionals who were knowledgeable about mental health benefits were four times more likely to recommend parks to enjoy nature than health professionals who were less knowledgeable (OR 4.70, 95% CI 1.47, 15). Health professionals who were knowledgeable about social health benefits were three times as likely to recommend parks to enjoy nature compared to health professionals who were less knowledgeable (OR 3.54, 95% CI 1.35, 9.3).

Fifty percent (50%) of the health professionals who knew about a specific walk or activity in nature regularly recommended parks to enjoy nature, compared to 18% of those who did not know of a specific walk or activity (OR 4.44, 95% CI 1.39, 14). Health professionals who thought that low-income and ethnic groups feel welcome in parks were more likely to recommend them to patients (OR 3.5, 95% CI 1.21, 10).

### **Small Group Discussions**

One hundred twenty staff members (73%) attended the all-day meeting and participated in the group discussions. Qualitative data identified three salient themes.

**Table 2**  
*Public Health Professional Knowledge and Attitudes Regarding Nature, San Francisco, California, 2014*

	Not at all	Slightly	Somewhat	Very	Extremely
<b>How knowledgeable are you of the following? N = 108</b>					
Specific physical health improvements in nature	3%	6%	31%	40%	20%
Specific mental health improvements in nature	2%	7%	3%	38%	23%
Specific social health benefits of group activity in nature	4%	12%	40%	26%	18%
Specific walks or other activities in nature that you can recommend in SF	11%	10%	33%	14%	11%
<b>How much do you agree with the following? N = 97</b>					
Many of my patients would improve their health by increasing time in nature.	0%	2%	12%	36%	45%
Many of my patients regularly visit parks.	13%	36%	26%	8%	3%
Many of my patients feel that the parks are welcoming to low-income and ethnic groups.	6%	25%	30%	13%	6%
Many of my patients would follow my recommendation to visit a natural park within the next month.	2%	20%	44%	12%	4%

**Enthusiasm for collaboration.** The majority of participating SFDPH MCAH health professionals expressed an enthusiasm for partnerships with park agencies. Information about where and how patients can access nature in local parks was of particular value. Participants were interested in the mental health and stress-related applications of nature in health, for themselves and patients. Several participants felt mental health benefits of nature would resonate well with patients. One participant stated: “Less focus on physical exercise, more focus on nature.” As others stated:

Appreciate this collaboration! ‘Green time’ is essential! Inspired to incorporate this in our program culture for staff and patients.

I think that this is a great start and looking forward to greater collaboration. Please note: . . . I think that it is not welcoming to assume weight loss is a goal . . . To make the walks genuinely welcoming to people of all sizes, I think it is important to de-emphasize weight and weight loss and focus on other health benefits. I know of several community-based groups that advocate for, and inform community members about opportunities for exercise that won’t if there is weight bias.

**Emphasis on reinforcing behavior change.** SFDPH MCAH health professionals demonstrated pragmatism about their role in helping patients integrate nature into daily

life. Participants explained that their patients face considerable barriers and may require efforts above and beyond a health professional recommendation in order to get to parks. They expressed that a health professional’s recommendation for nature should be met with other staff in the clinic who support patients in following the recommendation. Other respondents expressed reservations about “park prescription” type programs. It was noted that “these will require buy-in and engagement by clinic staff and depend on the health professional and their commitment to this idea.”

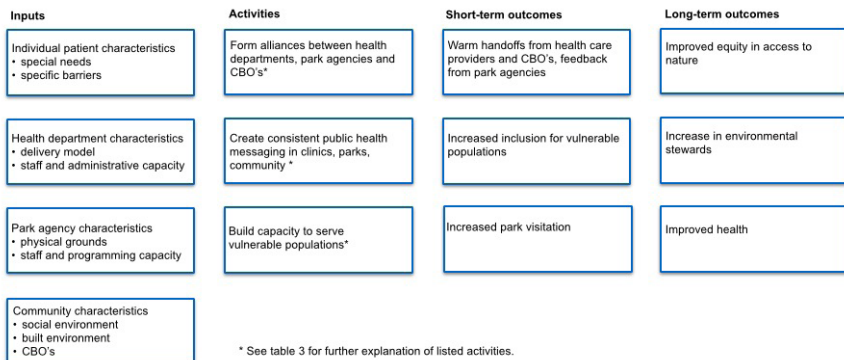
The populations mentioned that would require support in getting to parks included families, mothers (especially mothers in the perinatal period), physically or mentally disabled, children with developmental or behavioral issues, anyone who is prior to physically or mentally disabled, and the elderly. Specific barriers listed by participants included lack of awareness, how culturally welcoming the parks appeared, language barriers, access to nature, crime in outdoor spaces, safety from traffic for pedestrians in San Francisco, transportation, and the cost. This quote demonstrates concern with cost:

I believe the field nurses need a tool that will bridge the parks programs and resources to our particular marginalized population, such as scholarships . . . and programs our clients will qualify for.

In addition to these barriers, MCAH patients were felt to benefit from special programming and accommodations in order to feel comfortable at parks. Respondents expressed concerns about the presence of drinking fountains, wheelchair routes, parking, breastfeeding accommodations, and suggested family friendly programming, prenatal programs, programs for new mothers, toddlers, and elderly, and buddy supports for children with disabilities.

A diversity of ideas were generated on how to support and reinforce nature-related behaviors in a low income or otherwise vulnerable patient. Suggestions are summarized in the form of a logic model in Figure 1. The model starts by considering the assets found in not only in the individual, but also in health and park partners, and with partnering community-based organizations (CBOs). SFDPH MCAH has numerous pre-existing partnerships with CBOs, and respondents felt these partnerships would bolster a health professional’s recommendation to spend time in nature. Specific potential partners listed include Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) Supplemental Nutrition Program program, Family Resource Network Centers, low-income childcare centers, family associations, school districts, Boys and Girls Clubs, senior centers, community resource centers, and faith communities. These quotes demonstrate the potential role for CBOs:

We need to go to the community and to community events to engage our clients with park programs.



**Figure 1.** Logic model to reinforce health care professional referrals to nature. Based on suggestions from public health professionals in San Francisco, California, 2014.



We need to engage community leadership to plan programs like family reunions, neighborhood reunions, parent-child activities in parks.

The logic model's suggested activities fall into into three general categories and are described in further detail in Table 3. Resulting short term goals included increased communication about patients between partnering agencies through warm handoffs and feedback, inclusion for vulnerable populations in parks, and increased park visits for the patient. Warm hand-offs were described as an active effort from health care health professionals and community-based organizations to mobilize patients, as well as a clear

**Table 3**  
*Activities for Health Departments, Park Agencies, and Community-Based Organizations to Promote Health through Nature. Summarized from suggestions given by public health professionals, San Francisco, California, 2014.*

<b>Activity</b>	<b>Public Health Department</b>	<b>Park Agency</b>	<b>Community-Based Organization (CBO)</b>
<b>Form alliances between health departments, park agencies, and CBOs</b>	Health professionals and park staff work together to overcome patients' specific barriers	Identify a specific park staff as health liaison by name and phone number	CBOs assist with recruitment and overcoming patient barriers through pre-existing social networks
	Health professionals communicate with park staff when patients are referred	Give feedback to health professionals or CBOs when patients participate	Health professionals visit CBOs to recommend nature
<b>Create consistent public health messaging in clinics, parks, communities</b>	Provide easy-to-use and easily reproducible materials: <ul style="list-style-type: none"> <li>• Maps specific to health professionals' patients</li> <li>• Databases for finding parks</li> <li>• Prescription pads</li> </ul>	Provide consistent and reliable programming for health professionals to recommend (e.g., same day each month)	Spread the word via: <ul style="list-style-type: none"> <li>• Traditional and ethnic media, public service announcements</li> <li>• Social media</li> <li>• Billboards</li> <li>• Politician endorsements</li> <li>• Businesses partnerships</li> </ul>
		Sponsor website with resources targeted toward health health professionals	
<b>Build capacity to serve vulnerable populations</b>	Park staff lead trainings for health professionals on: <ul style="list-style-type: none"> <li>• indications for nature referrals</li> <li>• where, when, how low income patients can find nature in local parks</li> </ul>	Health professionals lead trainings for park staff on health equity and issues facing vulnerable populations	Empower community members as leaders
		Develop inclusive programming for low-income populations of color and those with special needs.	Allow neighborhoods to participate in environmental stewardship outings for health

welcome from park agencies that receive them. Paraprofessionals could be helpful in encouraging behavior change via targeted discussion and case management if a physician or nurse practitioner is busy. It is of note that MCAH SFDPH health professionals did not limit these paraprofessionals to health professionals. Case management, whether done by a clinician, community member, or park personnel, was valued to help patients work through barriers to time in nature. Examples of suggested case management included park ranger visits to health clinics for patient education and to meet patients, transportation to and from clinics and community-based organizations. A plan for monitoring or providing follow up information to referring health professionals or community-based organizations was also deemed valuable. Several quotes demonstrate the recommendation for facilitating behavior change:

It would be great to directly connect our clients with specific park personnel for a ‘warm hand off.’

[We can] partner with [the] park and recreation department to coordinate programs for clients and/or facilitate participation in existing programs.

[Parks need to] have a community liaison that is willing to come out to our programs and present information about parks. You may already have it, but I don’t know how that works.

In addition to improved health, other long-term outcomes mentioned included creating environmental stewards and increased equity in access to nature.

**Awareness of a socioecological system affecting nature and health.** While many suggestions were given to reinforce individual behavior change, another dominant theme was that individual behavior would need to be supported by broad base systems change in order to be successful and sustainable. Like with other health behaviors, the surveyed health professionals viewed individual choices about nature in the context of an individual’s environments, as demonstrated in this quote:

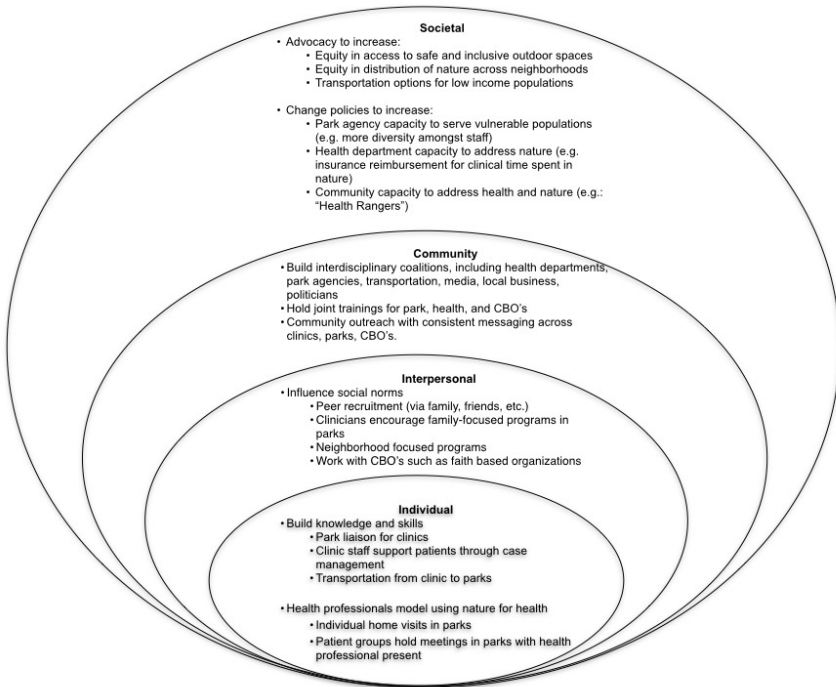
It seems there will still be significant work to develop the infrastructure to allow [health/parks partnerships] to reach the target population of lower socioeconomic status. But if [there is] continued push and commitment from health professionals, public health agencies, transportation agencies, and parks services, there will be a time when [parks] will be a critical program in the health of the local population.

Multiple levels of systems change were suggested to augment public health efforts to increase nature exposure; these are summarized in Figure 2. At the individual level, strategies to build client knowledge dovetail with the recommendations shown in the logic model in Figure 1. Some participants saw health professionals as respected community members who can model outdoor behavior by holding clinic visits, home visits, and group classes outdoors in nature. At the interpersonal level, strategies were listed to influence social norms. At the community level, interdisciplinary coalitions were valued, especially with transportation agencies and the media. At the societal level, systems changes were valued if they would make nature more accessible to vulnerable populations. Participants perceived inequity in the current distribution of natural resources and a need for advocacy in order to expect patients to spend more time in parks. Several respondents reflected this sentiment:

[We need] greater accessibility—more resources in poor neighborhoods.

Golden Gate is beautiful, but it is usually filled with tourists.

[We] need to . . .keep our community parks safe and accessible to all people.



**Figure 2.** A socioecological model to promote nature for health. Summarized from suggestions given by public health professionals in San Francisco, California, 2014.

Respondents suggested advocacy and policy changes which included the following recommendation:

I think it is important for park staff to reflect the underserved communities of color. Having more park staff that reflect those communities to outreach and share inspirational stories . . . will help get isolated families out of their neighborhoods and into the parks.

## Discussion

This is the first study, to our knowledge, to explore best practices for public health departments in increasing nature contact for low-income populations. The public health professionals surveyed were aware of the health benefits of nature and were enthusiastic about partnering with park departments in order advise the public about the health benefits of nature. Despite this enthusiasm, we found that few of the participants believed their patients currently make use of parks, few thought their low-income patients feel welcome in parks, and few regularly recommended parks to patients for time in nature. As hypothesized, health professionals that regularly referred patients to parks were more likely to have knowledge about the health benefits of nature, more likely to know of a specific walk or activities in nature to recommend, and were more likely to believe that their low-income patients felt welcome in parks. Educating health professionals about the health benefits of nature, as well as the location of local nature is one way to begin implementing health and parks partnerships.

Future research should investigate what percent of health professionals live and recreate in the neighborhoods they serve, and whether they know about nature that are easily

accessible for patients. One interesting question for future research is whether using nature as an intervention for stress or mental health resonates better with health professionals and patients than its use for obesity prevention and/or management? Although our qualitative data suggest “yes,” more research is needed on public health promotion and marketing strategies.

This study helped determine the capacity of a local public health department to implement the APHA recommendations. Participating health professionals presented an appreciation for the potential benefits of nature in enhancing quality of life for patient health, and even in their own personal health. Our findings suggest that health care departments view themselves as part of a series of partnerships that would be necessary to encourage and sustain outdoor behaviors. They demonstrated a depth of understanding regarding the complexity of barriers facing their patients in experiencing the health benefits of parks and other green space. Rather than thinking of partnerships between health and park departments as a matter of simple referrals (or a park prescription), they made suggestions for in-depth partnerships with park agencies and CBOs and encouraged a feedback loop between agencies. Future research can further explore mechanisms for health professionals to share relevant health information with park agencies, and for park administrators to give feedback about patients to health professionals.

This study is the first to create a framework for increasing access to nature specifically through park use via health departments. Our qualitative findings suggest that public health professionals will value partnerships that address and deal with the root causes of nature deficiency. We surmise that public health professionals view access to nature as a social determinant of health, and come to the table with with an understanding that broader social and economic issues need to be dealt with before, or parallel to, clinical interventions.

Participants expressed interest in not only improved health but equity in the distribution of greenspace as long-term outcomes. The fact that equity in access to nature was a priority in our sample of public health staff is consistent with national findings that disparities in health mirror access to nature (Dahmann, Wolch, Joassart-Marcelli, Reynolds, & Jerrett, 2010). Our study suggests that the public health community, at least in San Francisco, could see itself as allied to those in the environmental justice movement who advocate for increased equity in resource distribution regarding nature. Future research should investigate whether increasing equity of such distribution is, in itself, a public health intervention. The cost effectiveness of partnerships to reinforce patient behavior through case management could be compared with increasing equity in access to greenspace as a public health intervention.

The health care professionals surveyed also considered environmental stewardship as a long-term outcome to their efforts. It is possible that public health departments will be willing to advocate for the importance of park departments in ways other than providing patient referrals—for example, in helping draft legislation on the importance of nature for health. An important area of future research will be to understand whether there is common language between parks and health agencies around health equity and what their collective impacts are or could be.

Limitations of this study include the fact that one county was sampled, and that the largest group of respondents were public health nurses, although they played a variety of roles in the health department. The small sample size limited our ability to explore how the various factors correlate and interact in the quantitative section. However, the sample size was adequate to generate depth and variety in qualitative data. Parks are not the only kind of nature to which low-income populations have access and, in the future, it will be beneficial to include community gardens and other types of settings in the discussion.

Despite these limitations, the strengths of this work are reflected in the representation of an array of opinions of public health employees in a large metropolitan public health department. It is also timely in that health and park agency partnerships are becoming more prevalent and increasing both in this metropolitan area and around the nation.

This study may be the first of its kind to delineate the role public health departments have in promoting health by using nature in low income populations. Our findings

provide ample guidance on how to continue moving toward APHA's call to improve health and wellness through access to nature and insight into what gaps remain in our current understanding of how public health can increase this access as well as enhance greater comfort outdoors overall. Using health professionals' own words, opportunities are described to introduce the importance of nature across multiple contexts in any given community of interest.

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