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Participatory photo mapping (PPM): Exploring an integrated method for health and place research with young people

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ABSTRACT

In this manuscript we detail the application and utility of participatory photo mapping (PPM) for studying the implications of place for the health of children. PPM is a transdisciplinary approach that integrates digital tools, narrative interviewing and participatory protocols in order to produce knowledge that can be shared and acted upon by community-based health research partnerships. In discussing the application, strengths, and weaknesses of this method, we relate our own experiences with using PPM for a recent study of neighborhood health and safety that involved young people from a variety of age groups in Madison, Wisconsin. The resultant maps were persuasive presentation tools and provided guidance for community-based interventions.

Increasing interest by researchers, policymakers, practitioners, and community stakeholders regarding people's experience of health and place has been prompted by general concern about health disparities (Schulz et al., 2005), health variation across geographic units (Macintyre et al., 2002) and, in particular, the relationship between the built environment and health outcomes (Weich et al., 2002; Northridge et al., 2003; Jackson, 2003; Killingsworth et al., 2003). In light of these interests and concerns, this paper details the application and utility of participatory photo mapping (PPM) for studying the implications of place for the health of children. PPM integrates a set of digital tools and participatory research protocols that enables transdisciplinary community-based health partnerships to produce shared knowledge that can benefit the design of place-based interventions and policies.

Our discussion of PPM is organized into several parts. We begin by reviewing issues within the health and place literature that motivate the need for PPM. Next, we detail the PPM method in terms of its theoretical foundations—and consider its advantages over other methods—and discuss steps for its actual application and implementation. From there, we consider the theoretical and practical foundation for using PPM with young people and offer our own experiences with using PPM to conduct a study of the implications of place for the health and well-being of young people in a socioeconomically disadvantaged and residentially segregated area of Madison, Wisconsin. Next, we consider the limitations of PPM in light of our work and the limitations of other methods and approaches from which PPM draws. Finally, we conclude by considering the prospects of PPM for informing future transdisciplinary, participatory inquiry into the health implications of place.

Background

A growing body of research has demonstrated the extent to which specific aspects of the built environment are associated with specific health outcomes (Galea et al., 2005; Rundle et al., 2007; McGinn et al., 2007; Frank et al., 2007; Saelens et al., 2007; Lovasi et al., 2008; Wood et al., 2008). Although the term "built environment" varies in its usage, we use it here to refer to all formal and informal outdoor and indoor spaces that are planned, designed, built or managed by people, and that are made meaningful through everyday lived experience. For example, high residential density, mixed land use, high street connectivity, and improved aesthetics and safety are recognized as important environmental correlates of higher rates of physical activity and

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lower body-mass index (BMI) among residents (Saelens et al., 2003). Such findings have focused attention to the role urban planning and community design play in producing more healthful places in which to live, work, and play (Jackson, 2003; Dannenberg et al., 2003).

In addition, there is an increasing emphasis on place-based interventions—motivated by the rationale that, in order to produce positive health outcomes, intervening with individuals–or even with populations–may not be enough (Aronson et al., 2007). As asserted recently by the US Centers for Disease Control and Prevention, attention needs to focus on the goal of healthy people in healthy communities (Kochtitzky et al., 2006). Thus, contextual knowledge about the nature and use of the built environment is critical for planning appropriate interventions likely to increase active living (Schulz et al., 2005; Srinivasan et al., 2003). Integrating health and human behavior research with community design creates a more complete picture of community health (Glanz and Hoelscher, 2004).

The role of transdisciplinary research on place and health

Within the study of health and place, there is an emerging consensus that transdisciplinary research produces a better understanding of the connections between place and health (Jackson, 2003; King et al., 2002). Transdisciplinarity occurs when team members from different disciplines "work together to develop a shared conceptual framework that integrates and extends discipline-based concepts, theories, and methods to address a common research topic" (Stokols, 2006, p. 67; Rosenfield, 1992). Consequently, transdisciplinary partnerships are well positioned to effect positive change, in part, by challenging prevailing (often discipline-specific) paradigms (Killingsworth et al., 2003).

While transdisciplinary approaches have typically included only researchers, for place-based studies or initiatives, increased attention has been paid toward the inclusion of community residents or stakeholders in such efforts as well (Israel et al., 1998; Minkler et al., 2003). Given that residents hold the most immediate and comprehensive knowledge of their own particular contexts, the active involvement of residents in place-based approaches to health promotion is critical for generating applicable findings (Northridge et al., 2003). Consequently, community-based participatory research (CBPR) has created conduits for knowledge exchange between and among various researcher, practitioner and stakeholder groups (Adams et al., 2004; Stokols, 2006).

Even though these transdisciplinary community-based approaches offer many advantages, one persistent challenge grows from the disparate ways team members understand, discuss and address health issues (Giacomini, 2004). Often a common conceptual framework among all collaborators is lacking (Carpiano and Daley, 2006a, b). This situation creates problems not only for the design and conduct of the research, but for communicating the findings to lay audiences and policymakers and offering recommendations for future interventions (Stokols, 2006). Nevertheless, numerous authors have recognized that focusing on the lived experiences of health and place is a key step to overcoming such difficulties (Israel et al., 2006; Frohlich et al., 2001, 2002; Cummins et al., 2007).

Consistent with such recognition, we contend that a methodological approach that captures the lived experience of health *and* place can provide a useful tool for addressing health disparities and related issues within a transdisciplinary framework. The aim of this paper is to detail such a method—participatory photo mapping. Our discussion of the utility of this method focuses specifically on its application with respect to identifying and addressing neighborhood-based health and safety issues of children and youth—a group for which research on the built environment has focused considerable attention (e.g., Hoefer et al., 2002; Davison and Lawson, 2006; Sallis and Glanz, 2006).

The PPM method

PPM is presented here as an integrated suite of digital tools, narrative interviews and participatory research protocols that enable transdisciplinary community-based health partnerships to produce shared practical knowledge. PPM is built upon successful techniques developed to facilitate public participation in researching, planning and implementing strategies to improve well-being. These techniques include participatory photography, photo elicitation interviews and public participation geographic information systems (PPGIS). PPM combines these strategies through analysis of a comprehensive set of images, narratives and other qualitative data produced by participating community residents. Using handheld global positioning system (GPS) units these qualitative data are linked to specific locations. This procedure enables the integration of experiential data with spatial data (e.g., crime, housing or transportation data) by incorporating both into a geographic information system (GIS) for mapping and analysis. The GIS becomes the framework for displaying, analyzing and tracking neighborhood-level information. Consequently, collecting data from the widest variety of sources, using the widest variety of methods, produces the most complete picture of people's experience of health and place (Morrow, 2001; Lambert and McKevitt, 2002).

Our experience with PPM emerged from the efforts of the community based health research group—a transdisciplinary collaborative involving community residents and practitioners from south Madison (Wisconsin) and researchers from the University of Wisconsin. The Youth Mapping for Safe and Healthy Neighborhoods Initiative was a project undertaken by the group to increase social capacity for addressing health disparities. This community-based health research project engaged young people, ages 10–18, in addressing their experience of health and place. Several University of Wisconsin researchers (from the Departments of Landscape Architecture, Family Medicine and Population Health Sciences) partnered with a local youth-serving organization (Boys & Girls Club of Dane County) on a multi-phase after-school project. The purpose of the project was to work together to identify built environmental features of the south Madison neighborhood that either promoted or put at risk the health of residents. A further goal was to present the findings to decision-makers from the local community and the city of Madison.

The theoretical foundations for PPM

Lived experience

PPM is a research strategy for studying the inter-related aspects of lived experience in an integrative manner. A fundamental premise of PPM is that 'lived experience' itself cannot be reduced to only one aspect. This principle is grounded in interpretive and phenomenological social theory, both of which are concerned with how people interpret, understand, and navigate their environments (e.g., see Kearns and Moon, 2002; Kusenbach, 2003; Matthews et al., 2006; Carpiano, 2007, 2008). We contend that everyday knowledge of social places is a nexus of locational, visual and narrative forms of knowledge. In other words, people's lived experiences consist of cognition of location,

remembered images and storied accounts of events. Hence, their everyday knowledge of health and place is typically multi-faceted and often tacit.

An extension of this theoretical position is the methodological recognition that it is not possible to simply venture out into the field and directly access people's lived experiences. Instead, we have to actively and methodically interpret people's experience through representations that they share with us. Specifically, people can indicate where experiences occurred (via maps), what experience looked like (via photos or drawings) and how experiences unfolded (via narratives). From such representations produced, and made available, by participants, researchers can in turn strive to understand the lived experience of community members. By drawing on maps, photographs and narratives in an integrative manner, PPM increases our capacity to pull together the three dimensions of people's lived experience with health and place. In this respect, it has an advantage over approaches that focus on only one or two of the experiential dimensions.

Participatory traditions

In addition to this underlying principle of lived experience, PPM also has foundations in three participatory methodological traditions. These traditions are participatory photography, public participation GIS and CBPR frameworks.

The first participatory tradition of PPM—participatory photography—entails the use of photographs generated by community members. There is a long research tradition of photo elicitation dating back to Collier's pioneering work in the 1950s. Reviews of this body of work appear in (Harper, 1998, 2002; Proser, 1998; Hurworth, 2003; Moore et al., 2008; Packard, 2008). Keller et al. (2008) demonstrated the utility of visual methods for community-based health research and Oliffe and Bottorff (2007) used participatory photo elicitation to understand men's experience of living with prostate cancer. The practice has proven particularly successful in engaging young people in environmental assessment (Driskell, 2002; Hart, 1997; Tunstall et al., 2004; Chawla, 2002) and in urban planning and environmental design (Schiavo, 1987; Buss, 1995; Schratz and Steiner-Loffler, 1998; Elsley, 2004; Loeffler, 2004; Rudkin and Davis, 2007).

Although some researchers caution about using photography to address issues that are difficult to visualize, such as "peace and quiet" (Tunstall et al., 2004), others argue that the very act of framing photographs helps participants see everyday practices in new ways (Yamashita, 2002). The use of photography requires that participants distance themselves somewhat from embodied experience, taking on the role of contemplative "quasi-outsider," which in turn invites deeper reflection and more meaningful interpretation of events and circumstances.

"Photovoice" has recently emerged as a popular photo elicitation protocol in public health research that formalizes this reflection, using photographs to guide discussions that generate themes, issues and theories that are then presented to policy-makers (Wang and Burris, 1997; Wang et al., 2004; Wang and Pies, 2004; Baker and Wang, 2006; Castleden, et al., 2008). PPM builds on all of these photo elicitation strategies, rather than adopting any one specific protocol. Participatory photography and photo elicitation methods offer a task-oriented practice that engages people in research about their own experiences of health and place.

The second participatory tradition of PPM—community mapping—provides insights into the spatial relations of health and place. Coen and Ross (2006), for example, demonstrated that lower quality parks (those with fewer choices, poor maintenance and more incivilities) are located in areas where people tend to have poorer health outcomes. Similarly, Kwate (2008) linked fast-food restaurant density to racial segregation through simple spatial analysis. Although community mapping techniques have been developed over a long time, recent efforts have focused on public participation in employing geographic information systems (GIS). PPGIS help people articulate the spatial dimensions of their lived experiences (Kretzmann and McKnight, 1997; Craig et al., 2002). It is beyond the scope of this paper to detail the PPGIS research literature, in part because several excellent reviews already exist (e.g., see Elwood, 2006a, b; Sieber, 2006; Ghose, 2007). PPGIS practitioners insist that community residents be involved in all levels of decision making, from deciding what (if anything) gets mapped, to how spatial information is interpreted and distributed and for what purposes (Craig et al., 2002). Regardless of format, all community mapping efforts help people track economic, social and health trends, document change over space and time and visualize spatial phenomena such as variable distributions and densities (Aronson et al., 2007).

The third participatory tradition of PPM—community participation—ensure that PPM incorporates the insights and desires of community residents in every stage of the process. Its success is built on evaluations of CBPR practices recommending that people are involved in:

- generating data about their own lives,
- interpreting data and in highlighting multiple or conflicting interpretations,
- presenting results to decision makers,
- developing and participating in specific actions, and
- evaluating outcomes and improving future efforts.

Community involvement allows people to emphasize issues that they think are important in terms of public health, which may not be the same as what researchers or practitioners think is important. Disagreement, when present, creates an opportunity for researchers and community members to come to a mutual understanding and work together to develop a plan of action. For example, using CBPR methods, Wang (2004) uncovered gaps between the medical/public health view of child/maternal health (which emphasized birth weight) and community views (which emphasized safe places for children to play). We know that young people are often as knowledgeable about their neighborhood as the adults who police it (Dennis Jr., 2006); having these groups work collaboratively promises better outcomes than each working alone.

PPM unfolds in a four step iterative process. In step one, participants are provided digital cameras and GPS units with which to take pictures of their neighborhood, documenting routine use of community and recreation environments. In the second step, the photos become the objects of interviews in which individual and collective narratives are attached to particular images. In step three, the images are mapped as part of a neighborhood-level GIS that may include other spatial data. This step produces a qualitative/quantitative GIS focused on the experience of health and place. Finally, step four involves actions aimed at policy and decision makers identified by the participants.

In summary, PPM combines participatory photography, community mapping, and lived experience interviews in order to capture both the *qualitative* and *quantitative* dimensions of people's experience of place and health. In light of Wood and Fels (1992) persuasive argument that all maps serve specific interests, PPM is a visual tool that serves the shared interests of a broad audience that includes community-based transdisciplinary groups working together to support healthy people in healthy

places. PPM allows us to create maps that are useful in conveying information to a diverse set of stakeholders.

The practical foundation for using PPM with young people

As a method for engaging young people in research about their own lives, photography has been found to be superior to both writing and drawing because these other methods produce feelings of self-consciousness, often to the point where concern about drawing or writing well discourages participation (Gabhainn and Sixsmith, 2006). Many researchers and practitioners employ participatory photography in their community-based work because the practice has particular advantages for engaging young people in research. Factors cited include the following attributes:

- It is a user-friendly technology (Aitken and Wingate, 1993).
- It is fun, easy to master, tangible and child-centered (Cook and Hess, 2007).
- It provides an opportunity for participants to feel valued and taken seriously; providing a non-evaluative and non-judgmental environment; providing narrative autonomy; and producing a tangible product (Foster-Fishman et al., 2005).
- It provides a useful medium for helping young people explore abstract questions such as "who are you"? (Ziller, 1990).
- It is useful method for exploring what young people find salient about places (Tunstall et al., 2004).
- It is a "silent tool" that helps even very young children find a voice (Clark, 2003).

The authors developed the PPM method while implementing the Youth Mapping for Safe and Healthy Neighborhoods Initiative, a pilot study that engaged young people in assessing the health and safety of their neighborhood. The first phase of the project involved groups of children looking at aerial photographs of the neighborhood. We worked with three groups of young people based on age (about 50 participants total over all phases): upper elementary school (age 10–11 years), middle school (age 12–14 years) and high school (age 15–18 years). They discussed places they knew, where they spent time, and where they lived and played. Here the young people provided the research team with a broad overview of what it was like to grow up in their neighborhood. As the project progressed we become more and more specific about perceptions and experiences of health and safety.

Phase two engaged the young people in documenting their own experience of the neighborhood through digital photography, focusing particularly on their routine use of community and recreation environments. Because researchers walked with the young people, they were able to observe them in their own place creating an added layer of information. Participating young people used GPS units to track their neighborhood walks and the researchers used software to place photographs along the routes in a GIS (ESRI's ArcGIS 9.2). Several iterative focus group sessions produced explanatory narratives for the photographs. These discussions often produced multiple interpretations (e.g., by different age groups) of the same images, which in turn allowed more nuanced themes to emerge. Through a series of sorting exercises, participating children selected the photographs that best represented their shared experience of health and safety in the neighborhood. These geocoded photographs and narratives were then mapped using a GIS.

Phase three involved the young people and researchers in co-presenting these mapped photographs and narratives to various adult decision-makers including: (1) district police officers, (2) clinicians and staff from two local health care clinics, (3) neighborhood residents and community leaders, and (4) newspaper reporters. Outcomes included changes in the way community police officers interact with neighborhood youth, youth-led neighborhood tours for local clinic staff, and physical improvements to neighborhood parks and pedestrian infrastructure.

Examples of the utility of PPM method in research with young people

In general, the pilot project revealed that youth involvement with PPM helped all of us identify assets and barriers to health and safety in a community. When the project began, the research team wanted to gain a better understanding of how young people perceive health and safety broadly defined. The end of the project presented surprising results that raised additional questions. For example, we were not expecting to discover that many young people do not eat fresh fruits and vegetables even within a supportive nutrition environment. Our work has led us to pursue additional research questions focused on the lack of intake of fresh food in rich nutrition environments, the lack of physical activity in supportive recreation environments and how a sense of feeling welcome or unwelcome in public spaces plays a role in the health and safety of a community. Two specific examples from the Youth Mapping for Safe and Healthy Neighborhoods Initiative illustrate the usefulness of the PPM method for uncovering the complexities of people's experience of health and place.

Food and nutrition

One theme emerging from the focus group sessions centered on food and nutrition as experienced by participating young people. The map (Fig. 1) shows the location of youth-captured images and associated themes related to foods, together with a parcel-level GIS map of the neighborhood. These include restaurants, convenience stores, small markets and grocers, as well as a weekly farmers' market and a large community garden including a children's gardening program. By any objective standard (e.g., proximity), this neighborhood is rich with opportunities for healthy consumption of fresh fruit and vegetables.

Participating young people reported that they spend about $10.00 (USD) per week on food in the neighborhood. It is not surprising, perhaps, that they rarely purchased fresh foods, preferring instead to consume snacks, sodas and meals from the many fast-food restaurants nearby. The PPM method helped reveal the complex processes guiding young people's seemingly simple food preferences. Photographs of fried chicken (Plate 1) were the most frequently captured image for any age group. For some, this was simply the food they liked best. Others had fond emotional associations with the type of restaurant serving the food. For example, it reminded some kids of their previous neighborhood in Chicago, which is approximately a 2.5-h drive from Madison. Furthermore, the researchers observed that the restaurant was part of a group of businesses frequented by other young people in the neighborhood, including a dance studio and a convenience store, as well as informal sales of shoes, DVDs and the like from cars in the parking lot. In many ways, this was a much more welcoming environment for local African-American teens compared to other businesses in the neighborhood where they reported frequent harassment, discrimination and distrust (identified on the map as "unwelcoming"). Likewise, perceptions confound healthy food choices in the neighborhood. In one telling example, when images of the farmers' market were discussed (see Plate 2), the fresh food was described as "nasty."

Fig. 1. *Mapping Photographs and Themes.* This GIS map of the food environment for south Madison youth shows the location of participant-captured images of food outlets together with themes that emerged during the photo elicitation focus group sessions. Maps such as this were a crucial component of public presentations to stakeholders and policymakers, often leading to direct actions in the neighborhoods such as improved community-police relations, enhanced pedestrian infrastructure and increased recreational programming in local parks.

Although coordinated by an African-American farmer—a long-time neighborhood resident keen to engage local African-American youth in growing, cooking and eating organic produce—other cultural and social factors shaped a more negative view of food available at the farmers' market.

Open space and safety

Another example of the usefulness of the PPM method relates to the theme of open space and safety in the neighborhood. Again, by any objective measure, the neighborhood provides a richly supportive environment for physical activity. Shaded tree-lined sidewalks connect the many formal and informal recreation settings in the neighborhood. Features that predict greater physical activity (mixed land-uses and multi-use greenway trails, for example) are present, well-design and well-maintained.

Discussion of photographs, however, linked crime events and fear of crime more generally to many of these spaces. Tragic shootings, although extremely rare, remain present in the landscape through media saturation and maintenance of informal memorials (e.g., flowers placed at one street corner where a fatal shooting occurred). During focus group sessions, the young people talked in detail about how they negotiated risk in ways that altered—but did not prevent

Plate 1. Fried chicken was the most popular food choice among participating youth for variety of reasons, despite their health concerns about fried food in general. Photo elicitation interviews revealed that the restaurant was an important social and cultural hub of the neighborhood.

Plate 2. The southside farmer's market is coordinated by a long-time African-American neighborhood resident who is interested in promoting healthy foods to low-income families within walking distance of the market. Youth participating in the focus groups, however, used words such as "nasty" to describe their distaste for farm-grown produce. Using PPM highlighted the distinction between proximity to healthy foods and actual intake of healthy foods.

or restrict—their active use of these public spaces. Still, photographs of adults were rare in these parks, except for those very few adults leading recreation programs or using the basketball courts. In addition, although the neighborhood is racially and ethnically diverse, photos of non-African Americans were rare.

Summary of PPM utility

In both examples, PPM produced a better understanding of the nutrition environment and open space in the neighborhood than what is revealed through mapping objective built environment measures in GIS alone. Together, the qualitative and quantitative dimensions of young people's experience of health and place provided a more complete foundation on which to build successful prevention programs. Furthermore, involving young people directly in these efforts offered an opportunity for young people to voice the concerns to a group of listening adults and helped demystify the process by which adults made decisions affecting the neighborhood.

Outcomes included youth-guided tours with local health care providers. While presenting findings to the local health clinic, we found that there appears to be a disconnect between south Madison residents and the health professionals that provide services in this neighborhood. Our proposal to conduct walking tours guided by youth found interest from two local clinics. A series of tours were coordinated with participants in the Youth Mapping for Safe and Healthy Neighborhoods Initiative. The tours have become a standard orientation feature for new family medicine residents at one of the clinics.

The PPM process has also enabled multiple agencies, such as the local health department and city planners, to learn about residents' experiences of health and place. For example, the PPM method was incorporated into a walking audit project for a new local park. The photographs the youth took were used to present issues to City and Town agencies to inform action planning. This work has also raised the profile of emerging issues in other neighborhoods, where PPM has been used to compile a list of pedestrian infrastructure recommendations.

Limitations of participatory photo mapping

PPM is a valuable tool for community-based research, yet, like any other methodology, it possesses technical, pragmatic and ethical limitations. Although PPM provides a system for collecting and mapping qualitative neighborhood data, there is still a need, as Northridge et al. (2003) has argued, for more quantitative measures of the built environment. Photographs alone are also problematic; they do not represent reality any more than other media (Cook and Hess, 2007) and their meaning is notoriously unstable—open to misinterpretation, contestation or abuse (Dennis Jr., 2004). In our early work with PPM, we produced many more photographs than we had time to fully integrate with participant narratives. Although the research team found many of these images compelling, we felt bound by our commitment to only use images with attached participant narratives. We have since modified our approach to produce fewer images and more discussion. Conversely, the images that sparked the most discussion often had as their subject some sort of illicit or illegal activity. Although the team quickly agreed to delete these images, memories of the discussions remained and were difficult to ignore.

Finally, PPM—like other community-based methods—must move beyond simply reporting results to policymakers and toward suggesting specific strategies and developing direct interventions (Lopez and Hynes, 2006). We have attempted to overcome this last obstacle by emphasizing the ongoing nature of PPM to monitor health and place indicators and by incorporating intervention development, implementation and evaluation into the PPM protocol.

Prospects

Our experience in these pilot projects suggests that the future of PPM is bright. Our assessment of the PPM method revealed the significance of adding a spatial component to familiar photo elicitation methods. A neighborhood is a complex mixes of environmental attributes and social systems and the PPM method helps everyone (i.e. academics, practitioners, policy makers and community residents) share a language and a framework for understanding and addressing the relationship between health and place. In terms of changing health outcomes, the hope is that PPM will lead to changes in the social and built environment and that these changes will be longer lasting than motivational/educational approaches whose benefits have proven transitory (Sallis and Glanz, 2006). Most important, perhaps, PPM has proven an engaging vehicle for community participation. CBPR that generates images such as photographs and maps has added benefits provided by visual, rather than simply textual or numerical, accounts of the experience of health. Visuals help participants express themselves in diverse ways, eliciting different information from different people (Morrow, 2001).

More importantly in our experience, the photographs and maps reinforced our shared conceptual framework, countering the centrifugal forces that Stokols (2006) identified as fragmenting transdisciplinary groups and destroying collaboration. When we retreated too far into our own disciplinary perspectives, the mapped images helped remind us of our shared purpose. Furthermore, the mapped images allowed researchers to share their own interpretations with community participants, bridging the gap between these groups. In this way, all perspectives were given equal weight and the ensuing dialogue produced better understanding among all participants.

Young people, in particular, enthusiastically embrace the method. We were pleased to find that teens—who initially questioned whether anyone would listen to their perspective—were ultimately found to be the most active participants in the project. Recruitment for public presentations has likewise prompted enthusiastic responses. Indeed, we have not been able to keep up with community demand and have turned our attention to developing training materials to enable community organizations to use the method on their own. Our shared hope is that PPM will help realize the goal of healthy people in healthy places.

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