



Ciclovía participation and impacts in San Diego, CA: The first CicloSDias



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ABSTRACT

Objective: Ciclovía or Open Streets initiatives support physical activity through cycling/rolling, and walking/running. We evaluated San Diego's first Open Streets event, CicloSDias, to document attendance, reach and marketing, and effects on social cohesion, businesses, and physical activity.

Methods: The comprehensive evaluation consisted of a city-wide survey 1 week before and after the event ($n = 805$), counts of event attendees, and surveys of event attendees ($n = 713$) and businesses ($n = 26$).

Results: An estimated 8311 people attended the event. Attendees had an average of 144 min ($SD = 85$) of physical activity, 97% met the 30 min/day guideline, and 39% met the 150 min/week guideline during the event. 27% of attendees would have been inactive without the event. Awareness of the event was 10% before and 26% after the event. When comparing event attendees to San Diego residents, Latinos and non-White race/ethnicities were under-represented. Restaurants/pubs, services, and most retail stores excluding liquor stores and food markets reported positive or neutral impacts on business.

Conclusion: Open Street initiatives are promising ways to promote physical activity and are desired by the community. Positive effects were observed for physical activity, social cohesion, and businesses, though reach should be expanded to include more underserved community members. Evaluating Open Streets is important for sustaining and improving these efforts.

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Introduction

Though there are numerous effective physical activity interventions at the population level (Mozaffarian et al., 2012), additional approaches are needed because fewer than 10% of US adults meet physical activity guidelines set by the US Department of Health and Human Services (Tucker et al., 2011; HHS, 2008). There is recent interest among public health researchers and city officials in the US in "Open Streets" initiatives (Lankenau et al., 2012; Open Streets Programs). Open Streets events are modeled after the Ciclovía public recreation events that originated in Bogota, Colombia and aim to encourage physical activity, improve air quality, promote community building, and provide more equitable use of streets (Open Streets Project, 2014). The initiatives involve temporarily closing selected streets to motorized vehicles to prioritize cycling, walking, running, or rolling (i.e. skateboarding or rollerblading) (Sarmiento et al., 2010). These initiatives are called Ciclovía in Latin America, Open Streets in North America, and individual cities name their city-specific Open Streets; for instance San Diego's Open Streets event is branded as CicloSDias.

In 2005, the Centers for Disease Control and Prevention's (CDC) World Health Organization Collaborating Center helped found the Ciclovías Network of the Americas, often referred to as the Open Streets initiative, as a means of promoting physical activity throughout the US (Lankenau et al., 2012). These Open Streets events initially aimed to provide a sense of community, improved safety and economic development by "taking back the streets" from automobile use. Popularity of Open Streets events is growing across the US. Between 2007 and 2013, over 90 cities hosted one or more events (Open Streets Project, 2014). The cities hosting these events have been diverse in regard to both sociodemographic and urban characteristics (Hipp et al., 2013; Hipp et al., 2014).

As Open Streets initiatives continue to gain popularity, evaluation becomes increasingly important (Hipp et al., 2013; Reis et al., 2013; Zieff et al., 2013). Evaluation is needed to document impacts relevant to public health, as well as other process and outcome measures to provide organizers with feedback on how to improve events and make events sustainable. Though some events have been evaluated with surveys of event attendees to assess characteristics and physical activity, as well as direct observations of physical activity (Hipp et al., 2013; Sarmiento et al., 2010; Zieff et al., 2013), most have not been evaluated beyond estimating attendance.

The aim of the current study was to conduct a comprehensive evaluation of San Diego's inaugural Open Streets event, CicloSDias. The evaluation aimed to gauge CicloSDias' reach and effect on health, equity,

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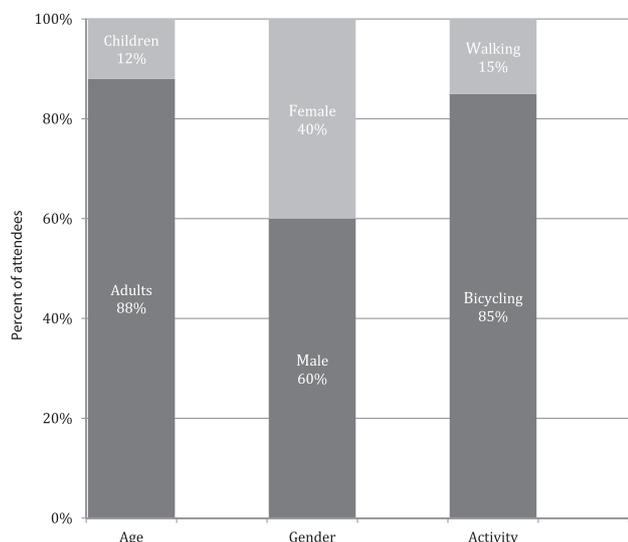


Fig. 1. Characteristics of participants at the August 2013 first Open Streets event in San Diego, CA (CicloSDias) from observation counts.

and economic development, with the goal being to inform future planning and implementation of Open Streets events across the country. Similar to other evaluations (Hipp et al., 2013; Zieff et al., 2013), the present evaluation included direct observations of event attendees to estimate attendance and physical activity, and surveys of event attendees to assess demographic characteristics and physical activity. Similar to the evaluation of San Francisco’s Open Streets, businesses along the route were surveyed to document effects on business activity (Zieff et al., 2013). A novel contribution was to assess the marketing reach through city-wide surveys conducted directly before and after the event.

Methods

Description of event and route

San Diego’s first CicloSDias was held Sunday, August 11th, 2013, from 10 AM to 4 PM. The 5.2 mile route cut through four diverse neighborhoods with regard to socioeconomic status and race/ethnicity composition. These neighborhoods were selected with the intent of enhancing low-income minority population involvement through easy access to the route, which was recommended by evaluators of other Ciclovía events (e.g. Hipp et al., 2013). Streets were temporarily closed to motorized vehicles, allowing exclusive use for people to engage in walking, bicycling, and rolling (e.g., skateboards, wheelchairs) for recreation. Volunteer staff and police enforced the road closures and allowed periodic crossing of vehicles. A CicloSDias hub was stationed at each end of the route

and two hubs equally spaced between (4 hubs total), featuring merchandise, booths of non-profit organizations, bike repairs and raffles. The intercept event surveys were administered at each of the 4 hubs.

Overview of evaluation

We used a multiple-method approach to evaluate CicloSDias that included city-wide surveys directly before and after the event, as well as direct observations and surveys of participants and businesses during the event. The study was reviewed by the sponsoring universities’ Institutional Review Boards and declared exempt. The authors have no conflicts of interest to declare.

Participants and procedures

City-wide survey participants

One-week before and after the event, a telephone survey was conducted in the city of San Diego using random digit dialing. Surveys were conducted by a private firm with trained and supervised staff. A higher proportion (50%) of calls were focused in the areas near the CicloSDias route (4 zip codes along the route), because it was hypothesized that people closer to the route would be more aware of the event; the other 50% were non-near (rest of San Diego city) respondents. Twenty-six percent of the calls were answered, and 45% of those who answered completed the survey. Just over 400 respondents completed the survey at each time point (805 total respondents), with independent random samples at each time point. These participants are referred to as *city-wide respondents*.

Intercept event survey participants

Participants of the intercept survey were 713 attendees who stopped at one of the 4 hubs along the route and completed a survey. Event respondents were a convenience sample recruited when they passed by a hub, and though the acceptance rate could not be determined, nearly 10% of estimated attendees participated. These participants are referred to as *event respondents*.

Business survey participants

Surveys were distributed at the end of the event to the businesses along the route. Surveys were directed at the owner, manager or other staff working that day and intended to gauge their perception of CicloSDias’ impact on sales and foot traffic that day. All 100 businesses that were identified along the route were provided the survey with a prepaid envelope to return in the mail. These participants are referred to as *business respondents*.

Measures

City-wide survey

The survey included questions about demographics, bicycle ownership, and awareness of and interest in CicloSDias. The pre- and post-event surveys were virtually identical. Specific items included “Have you heard about the upcoming/recent CicloSDias?” (y/n), and “Would you be interested in having a CicloSDias in your neighborhood?” (y/n). The interviews were conducted in either English or Spanish.

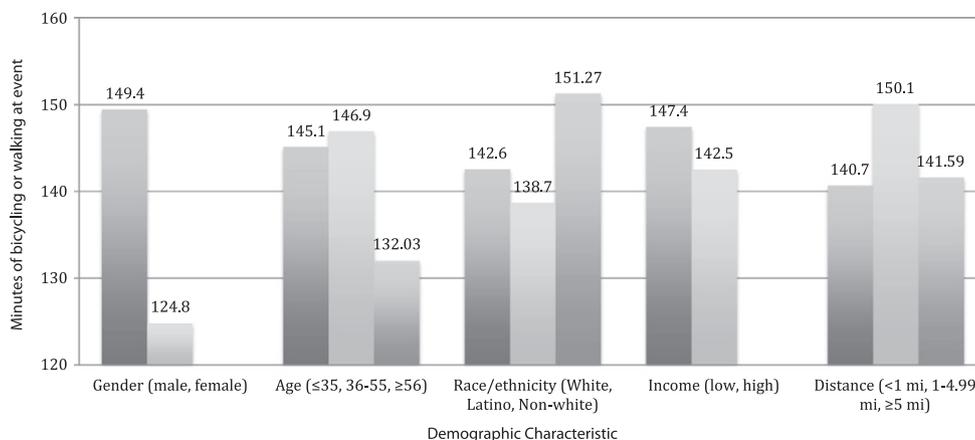


Fig. 2. Number of minutes of PA at the event by demographic characteristic.

Observational counts

Direct observations were conducted at three locations along the route (northern end, middle, and southern end). A count form was used to record attendees' gender, age (adult or child), and activity (cycling, walking or other), which is similar to the observational evaluation method used in other Open Streets events (Hipp et al., 2013). The overall attendance was estimated using the highest 5-hour count obtained from the three count stations (6926 attendees counted at the station in the middle of the route). Since the event lasted a total of 6 h, an hourly estimate was calculated for the middle station (6926 attendees divided by 5 h equals 1385 attendees per hour), and added to the 5-hour observed count (6926 attendees plus 1385 attendees equals 8311 attendees). The present study used the count data to present descriptives on attendance of event and physical activity observed. More specific details on counts by mode of travel and gender are available in a final report (available at http://sallis.ucsd.edu/Documents/Measures_documents/CicloSDias%attendance%resport%-%North%Park.pdf; Ryan, 2013).

Intercept surveys

The intercept survey covered five domains: (1) travel to/from the event (How did you get to CicloSDias today?), (2) reach and marketing of the event (What is your home zip code? How did you hear about CicloSDias?), (3) time spent walking and bicycling both during the event and during a typical week (during the past 7 days, indicate how long you spent doing the following activities for leisure or for transportation), (4) purchasing behaviors at the event (Did you or do you plan to shop during CicloSDias?), and (5) basic demographics (surveys available at http://sallis.ucsd.edu/measure_CicloSDias.html). Surveys were available in both English and Spanish, and survey participants could either fill out a hard copy available at a hub or access the survey online (hosted by SurveyMonkey). Survey questions about the time spent walking or biking during the event were used to compute the physical activity of event respondents.

Business surveys

An 8-question survey covered 4 areas: (1) Type of business (What type of business is this?), (2) special hours or promotions due to the event (Did your business open specially for CicloSDias or extend open hours?), (3) sales and visitors (How did your sales and the number of people who visited your business during CicloSDias compare to a typical Sunday?), and (4) overall impact (Overall, how did CicloSDias impact your business?). The response options were based on a 5-point scale, requiring businesses to compare the day of the event with a typical Sunday (1 = "much worse," 3 = "about the same" and 5 = "much better.") Surveys were distributed to each business with pre-paid postage or were available online (by SurveyMonkey).

Census data

Area demographic data were obtained from the 2010 US Census fact finding system (United States Census, 2014).

Distance from the event

The shortest path between the event and the intercept survey respondents' residential zip code centroid was determined using the roadway network, and the distances were measured in GIS using Network Analyst.

Analyses

Chi square tests were used to compare the demographic characteristics of the event respondents to those of the city-wide respondents, San Diego city residents, San Diego county residents, and residents living in the four zip codes along the CicloSDias route. Chi square tests were used to investigate demographic and geographic differences in awareness of the event (from the city-wide survey) and method of hearing about the event (from the event-survey). Spearman correlations were calculated among all methods of hearing about the event to investigate overlap in marketing strategies. ANOVA was used to investigate demographic and geographic differences in bicycling/rolling and walking/running during the event and on a typical week. Chi square tests were used to investigate demographic and geographic differences in the percent of respondents who would have been inactive if not for the event, who met physical activity guidelines during the event, and who purchased food or shopped during the event. Business impacts (from the business survey) were assessed using chi squared tests to investigate differences in impacts by type of business. Demographic and geographic differences in desire for future Open Streets events (from the city-wide survey) were assessed using chi squared tests.

Results

Event attendance

An estimated 8311 people attended the event based on the observational counts. There was a fairly even mix of males and females, with about 40% of those observed being female and 12% of those observed being children (Fig. 1). A greater proportion of event respondents were White non-Hispanic and in the younger (18–35) age group as compared to city-wide respondents, San Diego city residents, San Diego county residents, and residents living in the four zip codes along the CicloSDias route (Table 1). Event respondents reached CicloSDias by four modes: 61% bicycled, 10% walked or ran, 28% used automobiles and 1% used public transportation.

Awareness and marketing

Ten percent of city-wide respondents were aware of CicloSDias the week before the event, and 26% were aware of CicloSDias the week after the event (Table 2). Men and those who owned a bike were

Table 1
Demographics of event & city-wide respondents compared to area around the route, San Diego city and San Diego county.

	Event respondents	City-wide respondents	SD city	SD county	4 zip codes along route
Total	713	809	1,307,402	3,095,313	189,174
Gender					
Male	346 (41%)	365 (45%)	660,626 (51%)	1,553,679 (50%)	95,367 (50%)
Female	332 (49%)	444 (55%)	646,776 (49%)	1,542,634 (50%)	93,807 (50%)
χ^2 ; p (reference is event respondents)	-	$\chi^2 = 4.94$; p = .026	$\chi^2 = 0.05$; p = .824	$\chi^2 = 0.16$; p = .689	$\chi^2 = 0.08$; p = 0.777
Age					
Category 1 event: 18–35; census: 19–34 years	231 (42%)	174 (22%)	358,234 (36%)	741,672 (33%)	53,329 (39%)
Category 2 event: 36–55; census: 35–54 years	300 (55%)	231 (29%)	355,743 (36%)	851,337 (37%)	54,289 (39%)
Category 3 event: >56 years; census: >55 years	17 (3%)	400 (49%)	271,402 (28%)	681,041 (30%)	30,410 (22%)
χ^2 ; p (reference is event respondents)	-	$\chi^2 = 331.9$; p < .001	$\chi^2 = 176.6$; p < .001	$\chi^2 = 191.0$; p < .001	$\chi^2 = 123.7$; p < .001
Race/ethnicity					
White Non-Hispanic	459 (69%)	459 (59%)	589,702 (45%)	1,500,047 (48%)	54,412 (29%)
Latino	95 (15%)	174 (22%)	376,020 (29%)	991,348 (32%)	89,343 (47%)
Non-White	103 (16%)	148 (19%)	341,680 (26%)	603,918 (20%)	45,419 (24%)
χ^2 ; p (reference is event respondents)	-	$\chi^2 = 20.7$; p < .001	$\chi^2 = 163.4$; p < .001	$\chi^2 = 130.3$; p < .001	$\chi^2 = 550.8$; p < .001

Table 2
City-wide respondents' awareness of event (pre and post; N = 805).

	% of total sample	% heard of event	
		Before the event (n = 401)	After the event (n = 404)
Total	–	41 (10.1%)	105 (26.0%)
<i>Gender</i>			
Male	365 (45.1%)	25 (14.0%)	54 (28.9%)
Female	444 (54.9%)	16 (7.0%)	51 (23.5%)
χ^2 ; p	–	$\chi^2 = 5.37$; p = .021	$\chi^2 = 1.51$; p = .219
<i>Age</i>			
≤35 years	174 (21.5%)	8 (8.8%)	23 (27.7%)
36–50 years	231 (28.6%)	13 (10.9%)	22 (19.6%)
≥51 years	400 (49.4%)	19 (9.8%)	59 (28.6%)
χ^2 ; p	–	$\chi^2 = 0.27$; p = .875	$\chi^2 = 3.32$; p = .199
<i>Race/ethnicity</i>			
White	459 (56.7%)	20 (9.1%)	63 (26.4%)
Latino	174 (21.5%)	12 (13.2%)	22 (26.5%)
Non-White	148 (18.3%)	5 (6.2%)	15 (22.4%)
χ^2 ; p	–	$\chi^2 = 2.54$; p = .281	$\chi^2 = 0.47$; p = .792
<i>Income</i>			
Low	312 (38.7%)	13 (8.1%)	36 (23.7%)
High	382 (47.3%)	24 (12.8%)	50 (25.8%)
χ^2 ; p	–	$\chi^2 = 1.96$; p = .162	$\chi^2 = 0.20$; p = .655
<i>Owns a bike</i>			
Yes	410 (50.7%)	30 (14.4%)	61 (30.2%)
No	399 (49.3%)	11 (5.6%)	44 (21.8%)
χ^2 ; p	–	$\chi^2 = 8.69$; p = .003	$\chi^2 = 3.72$; p = .054
<i>Distance from the route</i>			
<2 miles	231 (28.6%)	15 (12.0%)	33 (31.1%)
2–6.99 miles	308 (38.1%)	16 (11.2%)	44 (26.7%)
≥7 miles	266 (32.9%)	9 (6.8%)	28 (31.1%)
χ^2 ; p	–	$\chi^2 = 2.33$; p = .312	$\chi^2 = 3.18$; p = .204

more likely to be aware of CiclosDias. Awareness did not differ by race/ethnicity, income, or geographic location.

The most common methods by which event respondents heard about the event were a friend, family or coworker, an email blast, social media and/or a flyer or poster (Table 3). Hearing about the event from the CiclosDias website was more common for those who lived further from the event, whereas seeing a flyer or poster was more common for those living near the event. The highest correlations among the marketing methods were for hearing about the event from a community organization and hearing about it from an email blast ($r = .11$) or a flier ($r = .08$), and hearing about the event on social media and hearing about it from a friend, family or coworker ($r = .12$) or the CiclosDias website ($r = .14$).

Physical activity

Direct observations indicated 85% of attendees were bicycling and 15% were walking. Event respondents reported engaging in an average of 144 (SD = 85) minutes of physical activity during the event (Table 4; Fig. 2). Ninety-seven percent of event respondents met the 30 min/day and 39% met the 150 min/week physical activity guideline during the event. Minutes of physical activity and meeting the 30 or 150 minute physical activity guideline during the event did not differ by gender, age, race/ethnicity or income. Event respondents who were Latino or non-White, younger, or with a lower income reported being more likely to be inactive if the event had not occurred.

Business impacts

Eighty one percent of event respondents reported purchasing food or drink during the event, and 50.5% reported shopping, with higher

income respondents being more likely to purchase food or drink ($p = .011$) and shop ($p = .014$) than those with lower incomes.

Over 50% of business respondents (N = 26), reported that compared to a typical Sunday, the overall impact of CiclosDias was neutral or positive. Restaurants/pubs and retail businesses appeared to report more positive impacts than service and grocery/liquor businesses, but these findings were nonsignificant due to the small sample size (Fig. 3).

Interest in future events

Fifty-eight percent of city-wide respondents reported interest in having a CiclosDias in their neighborhood. Desire for future events was highest among those who owned a bicycle, Latinos and non-Whites, and those in the younger age group (Table 5).

Discussion

The first CiclosDias was successful in terms of allowing thousands of individuals to experience their communities in a different way; i.e. transforming the streets into an urban park for people to engage in physical activity. The event drew an estimated 8300 participants, which is less than 1% of the San Diego city population of 1,307,402 people (United States Census, 2014). These attendance rates were similar to several other cities' inaugural Open Streets, including Santa Cruz, CA and Denver, CO and greater than many cities' inaugural events, such as Atlanta, GA, Baltimore, MD, Oakland, CA and St. Louis, MO (Atlanta Bicycle Coalition, 2014; Open Streets Project, 2014; Hipp et al., 2013). However, comparisons are uncertain due to variations in the sizes of cities, lengths of routes, and methods of estimating attendance.

Physical activity

Given that only 26% of San Diego County adults reported meeting the 150-min per week physical activity guidelines (CHIS, 2009), the present evaluation shows that CiclosDias created an opportunity for almost all event respondents to meet the 30 min a day physical activity guideline, with an average of 144 min of physical activity at the event per respondent. The potential for CiclosDias to impact the physical activity of community members is promising, particularly considering that 27% stated that they would have been inactive had there been no event. The public, social, fun-oriented CiclosDias appeared to attract people who would have otherwise been inactive. To have an impact on public health, CiclosDias would need to become a regular event and attract more people to be physically active. In an evaluation of participant physical activity during the San Francisco Open Streets, Zieff et al. (2014) concluded that participants engaged in about 1 hour of moderate physical activity, there were differences in first-time attendees vs. multiple-time attendees and a regular schedule is needed to maintain the trend towards increased physical activity.

Event attendees

There was a fairly even mix of women and men, with a modest percentage of children (12%). City-wide respondents who owned bicycles were significantly (pre-event sample) or marginally significantly (post-event sample) more aware of the event. It is likely that people who own bicycles pay more attention to events involving bicycling. When event respondent demographics were compared to the surrounding population, it was evident that event respondents were not representative of San Diego county or city, nor the area around the route. Though the route was designed to intersect diverse neighborhoods in the hopes of providing physical activity opportunities to populations at high risk of chronic diseases, CiclosDias attendees were primarily White non-Hispanic. Based on these findings, event organizers are encouraged to find ways to attract more participants from diverse and disadvantaged communities. Strategies could include

Table 3
Differences in methods event respondents heard about CiclosDias (N = 678).

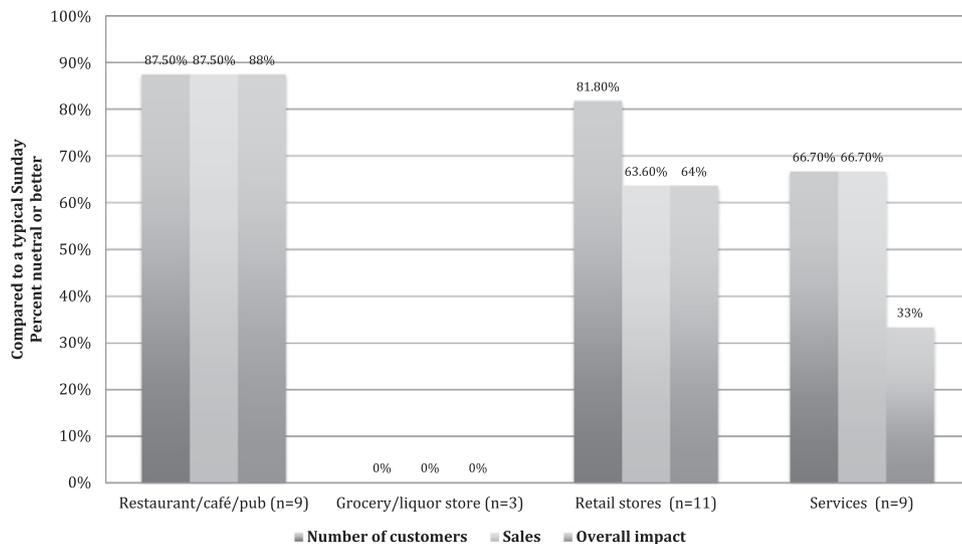
	% of total sample	% of respondents who heard about the event via each marketing source									
		Social media	CicloSDias website	Internet search	Radio	TV	Friend/family/coworker	Flyer or poster	Community organization	Email blast	Just happened upon it
Total	–	167 (24.6%)	85 (12.5%)	50 (7.4%)	23 (3.4%)	28 (4.1%)	257 (37.9%)	167 (24.6%)	116 (17.1%)	241 (35.5%)	42 (6.2%)
<i>Gender</i>											
Male	346 (51.0%)	93 (26.9%)	50 (14.5%)	29 (8.4%)	12 (3.5%)	9 (2.6%)	117 (33.8%)	80 (23.1%)	56 (16.2%)	128 (37.0%)	25 (7.2%)
Female	332 (49.0%)	74 (22.3%)	35 (10.5%)	21 (6.3%)	11 (3.3%)	19 (5.7%)	140 (42.2%)	87 (26.2%)	60 (18.1%)	113 (34.0%)	17 (5.1%)
χ^2 ; p	–	$\chi^2 = 1.92$; p = .166	$\chi^2 = 2.36$; p = .124	$\chi^2 = 1.05$; p = .306	$\chi^2 = 0.01$; p = .911	$\chi^2 = 4.17$; p = .041	$\chi^2 = 5.02$; p = .025	$\chi^2 = 87$; p = .352	$\chi^2 = 0.43$; p = .514	$\chi^2 = 0.65$; p = .421	$\chi^2 = 1.29$; p = .256
<i>Age</i>											
≤35 years	231 (32.4%)	80 (34.6%)	27 (11.7%)	17 (7.4%)	8 (3.5%)	13 (5.6%)	118 (51.1%)	54 (23.5%)	82 (35.5%)	8 (3.5%)	8 (3.5%)
36–55 years	300 (42.1%)	69 (23.0%)	35 (11.7%)	22 (7.3%)	12 (4.0%)	9 (3.0%)	94 (31.3%)	76 (25.3%)	104 (34.7%)	22 (7.3%)	22 (7.3%)
≥56 years	147 (20.6%)	19 (12.9%)	22 (15.0%)	11 (7.5%)	3 (2.0%)	6 (4.1%)	44 (29.9%)	39 (26.5%)	57 (38.8%)	12 (8.2%)	12 (8.2%)
χ^2 ; p	–	$\chi^2 = 23.62$; p < .001	$\chi^2 = 1.15$; p = .563	$\chi^2 = 0.003$; p = .998	$\chi^2 = 1.16$; p = .560	$\chi^2 = 2.27$; p = .325	$\chi^2 = 26.55$; p < .001	$\chi^2 = 0.53$; p = .769	$\chi^2 = 0.04$; p = .981	$\chi^2 = 0.74$; p = .690	$\chi^2 = 4.62$; p = .099
<i>Race/ethnicity</i>											
White	459 (69.9%)	106 (23.1%)	58 (12.6%)	34 (7.4%)	15 (3.3%)	15 (3.3%)	168 (36.6%)	118 (25.7%)	88 (19.2%)	171 (37.3%)	32 (7.0%)
Latino	95 (14.5%)	27 (28.4%)	7 (7.4%)	8 (8.4%)	6 (6.3%)	7 (7.4%)	43 (45.3%)	26 (27.4%)	14 (14.7%)	27 (28.4%)	4 (4.2%)
Non-White	103 (15.7%)	31 (30.1%)	17 (16.5%)	8 (7.8%)	2 (1.9%)	6 (5.8%)	40 (38.8%)	19 (18.4%)	12 (11.7%)	28 (36.9%)	5 (4.9%)
χ^2 ; p	–	$\chi^2 = 2.91$; p = .233	$\chi^2 = 3.81$; p = .149	$\chi^2 = 0.12$; p = .942	$\chi^2 = 3.04$; p = .218	$\chi^2 = 3.96$; p = .137	$\chi^2 = 2.52$; p = .283	$\chi^2 = 2.88$; p = .251	$\chi^2 = 3.85$; p = .146	$\chi^2 = 2.72$; p = .308	$\chi^2 = 1.43$; p = .490
<i>Income</i>											
Low	202 (30.8%)	50 (24.8%)	28 (13.9%)	11 (5.4%)	4 (2.0%)	12 (5.9%)	85 (42.1%)	52 (25.7%)	32 (15.8%)	72 (35.6%)	12 (5.9%)
High	453 (69.2%)	112 (24.7%)	50 (11.0%)	38 (8.4%)	19 (4.2%)	14 (3.1%)	162 (35.8%)	111 (24.5%)	79 (17.4%)	162 (35.8%)	29 (6.4%)
χ^2 ; p	–	$\chi^2 = 0.00$; p = .994	$\chi^2 = 1.06$; p = .303	$\chi^2 = 1.75$; p = .186	$\chi^2 = 2.02$; p = .155	$\chi^2 = 2.98$; p = .084	$\chi^2 = 2.37$; p = .123	$\chi^2 = 0.12$; p = .735	$\chi^2 = 0.25$; p = .615	$\chi^2 = 0.001$; p = .977	$\chi^2 = 0.05$; p = .822
<i>Distance</i>											
<1 mile	199 (29.8%)	50 (25.1%)	17 (8.5%)	12 (6.0%)	9 (4.5%)	5 (2.5%)	68 (34.2%)	69 (34.7%)	33 (16.6%)	64 (32.2%)	17 (8.5%)
1–4.99 miles	264 (39.5%)	71 (26.9%)	27 (10.2%)	20 (7.6%)	8 (3.0%)	9 (3.4%)	101 (38.3%)	71 (26.9%)	46 (17.4%)	102 (38.6%)	18 (6.8%)
≥5 miles	205 (30.7%)	42 (20.5%)	37 (18.0%)	17 (8.3%)	9 (4.4%)	12 (5.9%)	79 (38.5%)	30 (14.6%)	34 (16.6%)	78 (38.0%)	10 (4.9%)
χ^2 ; p	–	$\chi^2 = 2.65$; p = .266	$\chi^2 = 10.04$; p = .007	$\chi^2 = 0.80$; p = .671	$\chi^2 = 0.87$; p = .647	3.27; p = .193	$\chi^2 = 1.06$; p = .587	$\chi^2 = 21.85$; p < .001	$\chi^2 = 0.08$; p = .961	$\chi^2 = 2.35$; p = .309	$\chi^2 = 2.16$; p = .339

Table 4
Physical activity of event respondents at CicloSDias compared to non-event days.

	Mean (SE) during the event minutes of walking, running, bicycling, rolling	Mean (SE) typical week minutes of walking, running, bicycling, rolling	% would have been inactive if no event	% met 30 min/day PA guideline during the event	% met 150 min/week PA guideline during the event
N	N = 221	N = 249	N = 673	N = 221	N = 221
Total	143.92 (84.85)	418.99 (331.42)	182 (27.0%)	213 (97.3%)	85 (38.8%)
<i>Gender</i>					
Male	149.44 (8.10)	495.35 (28.27)	83 (25.2%)	106 (96.4%)	45 (40.9%)
Female	124.8 (8.14)	332.09 (29.80)	91 (29.0%)	107 (98.2%)	40 (36.7%)
F; p	F = 1.05; p = .308	F = 15.80; p < .001	–	–	–
χ ² ; p	–	–	χ ² = 1.20; p = .274	χ ² = 0.67; p = .162	χ ² = 0.41; p = .522
<i>Age</i>					
≤35 years	145.09 (9.08)	424.56 (35.11)	75 (33.9%)	84 (95.5%)	36 (40.9%)
36–55 years	146.91 (8.83)	401.66 (32.05)	69 (24.3%)	92 (98.9%)	36 (38.7%)
≥56 years	132.03 (13.82)	436.25 (48.07)	29 (21.0%)	37 (97.4%)	13 (34.2%)
F; p	F = 0.43; p = .648	F = 0.22; p = .804	–	–	–
χ ² ; p	–	–	χ ² = 8.97; p = .011	χ ² = 2.05; p = .360	χ ² = 0.50; p = .778
<i>Race/ethnicity</i>					
White	142.55 (6.96)	428.00 (26.19)	93 (21.7%)	148 (97.4%)	57 (37.5%)
Latino	138.65 (16.83)	367.55 (60.42)	43 (46.2%)	24 (92.3%)	9 (34.5%)
Non-White	151.27 (14.51)	437.74 (51.91)	35 (34.3%)	35 (100%)	17 (48.6%)
F; p	F = 0.20; p = .823	F = 0.48; p = .620	–	–	–
χ ² ; p	–	–	χ ² = 25.93; p < .001	χ ² = 3.29; p = .193	χ ² = 1.70; p = .427
<i>Income</i>					
Low	147.43 (10.36)	471.41 (38.76)	68 (34.9%)	66 (97.1%)	29 (42.6%)
High	142.51 (7.02)	397.02 (25.2)	97 (22.7%)	144 (97.3%)	55 (37.2%)
F; p	F = 0.15; p = .695	F = 2.59; p = .109	–	–	–
χ ² ; p	–	–	χ ² = 10.26; p = .001	χ ² = 0.01; p = .921	χ ² = 0.59; p = .442
<i>Distance</i>					
<1 mile	140.65 (10.36)	417.43 (39.41)	50 (26.6%)	67 (97.1%)	22 (31.9%)
1–4.99 miles	150.07 (10.08)	410.05 (37.22)	71 (28.5%)	73 (100.0%)	31 (42.5%)
≥5 miles	141.59 (11.02)	441.0 (39.68)	52 (26.7%)	59 (96.7%)	24 (39.6%)
F; p	F = 0.26; p = .774	F = 0.17; p < .001	–	–	–
χ ² ; p	–	–	χ ² = 0.27; p = .874	χ ² = 2.32; p = .314	χ ² = 1.76; p = .415

increasing targeted outreach through partnerships with ethnic-specific media outlets, more promotion in stores and clinics in disadvantaged neighborhoods, promoting event attendance through partnerships with employers of highly diverse employees, and engaging ongoing advisors from underserved communities. Furthermore, a community-based participatory model could be used to allow community members to have input into event planning and execution (Minkler and Wallerstein, 2010).

Demographics of CicloSDias attendees were similar to demographics of bicyclists in general. Cyclists were usually younger than non-cyclists (Sallis et al., 2013), which may partially explain the low number of middle-aged and older-adults at CicloSDias. Many families with children attended, but more effort is needed to improve attendance by older adults. Although the racial/ethnic diversity was not representative of the area, the fact that nearly one-third of event respondents were Latino or non-White demonstrates CicloSDias interest within



*Note: chi-squared tests were run to compare responses by business type and there were no significant differences

Fig. 3. Business types responses to the impact of CicloSDias. *Note: chi-squared tests were run to compare responses by business type and there were no significant differences.

Table 5
City-wide respondents desire to have a similar event in their own neighborhood.

Demographic characteristic	Desire to have the event (yes)
Total	466 (57.6%)
Gender	
Male	216 (59.2%)
Female	149 (40.8%)
χ^2 ; p	$\chi^2 = 0.68$; p = .411
Age	
≤35 years	133 (76.4%)
36–50 years	154 (66.7%)
≥51 years	178 (44.5%)
χ^2 ; p	$\chi^2 = 61.22$; p < .001
Race/ethnicity	
White	238 (51.9%)
Latino	119 (68.4%)
Non-White	100 (67.6%)
χ^2 ; p	$\chi^2 = 20.38$; p < .001
Income	
Low	198 (63.5%)
High	225 (58.9%)
χ^2 ; p	$\chi^2 = 1.50$; p = .221
Owens a bike	
Yes	275 (67.1%)
No	191 (47.9%)
χ^2 ; p	$\chi^2 = 30.53$; p < .001
Distance from route	
<2 miles	150 (64.9%)
2–6.99 miles	162 (52.6%)
≥7 miles	152 (57.1%)
χ^2 ; p	$\chi^2 = 9.27$; p = .016

racial/ethnic minority populations. This was further reinforced by the finding from the city-wide survey that Latino and non-White respondents were more likely than White respondents to want a similar event in their neighborhoods.

In some cities Open Streets events did not draw a significant number of racial/ethnic minorities (e.g., Hipp et al., 2013). It appears that placing the route in a diverse area is not sufficient to attract minority

community members to participate, though this could be partially explained by other barriers such as not owning a bicycle. In San Francisco, the race/ethnicity of attendees was representative of the city (Zieff et al., 2014), which reinforces that the interest exists among racial/ethnic minorities and it is possible to engage these communities.

Awareness and marketing

A limited budget was available for a marketing campaign that consisted of print ads, fliers around the route neighborhoods, posters hung in businesses, social media and TV news segments. Findings from the telephone survey demonstrated that only 10% of city-wide respondents had heard of the event before it occurred, and awareness was no higher (12%) among those who lived within 2 miles of the route. Awareness was similarly low across all race/ethnicities, yet the majority of city-wide respondents were White non-Hispanic. The need for improved marketing is evident, particularly targeting the communities nearest the route.

Potential areas to focus marketing efforts on include the four methods that the highest number of event respondents endorsed: friend, family or co-worker; email blast; social media; and flier. Sub-populations need to be targeted to attract event attendees representative of the surrounding neighborhoods. There did not appear to be significant overlap among the marketing methods, with the exception that social media appeared to be a way to get more people to visit the CicloSDias website and that many attendees heard about the event from both family/friends and social media. Marketing strategies can sometimes be redundant, but the modest marketing efforts for CicloSDias probably reduced the possibility of overlap.

Business impact

The majority of business respondents indicated overall positive impacts. Interestingly, the evaluation of the 2nd CicloSDias found businesses that held a promotional activity during CicloSDias (e.g.

Table 6
Recommendations for improving Open Streets events based on findings from the CicloSDias evaluation.

Broad recommendation	Specific examples from CicloSDias
Select routes through diverse neighborhoods	<ul style="list-style-type: none"> • Routes should go through diverse residential neighborhoods in terms of race/ethnicity and income to enhance health equity • Routing through commercial areas, particularly those with retail or bars/restaurants can build support of businesses
Engage businesses along the route	<ul style="list-style-type: none"> • Consider public transit routes nearby/along the route • Gain early buy-in, ideally through working with existing neighborhood business associations • Provide ample warning that streets will be closed and support businesses to devise solutions to changes in customer access and parking • Encourage special promotions leading to the event (e.g. “decorated bike parade” night 1–2 weeks prior). • Encourage special promotions to improve business’s sales on the day of the event • Provide fliers/materials for businesses to hang inside their businesses to promote the event • Invite businesses to play a leadership role in planning CicloSDias
Target recruitment of racial/ethnic groups that were underrepresented	<ul style="list-style-type: none"> • Identify and utilize strategies that effectively recruit minorities and/or low-income participants, including ads in ethnic-specific media and outreach to community organizations • Providing bicycle rentals may be helpful since bicycle ownership rates are lower among Latinos and non-Whites.
Target recruitment of age groups that were underrepresented (i.e., older adults)	<ul style="list-style-type: none"> • Utilize targeted marketing to inform older adults of the event, beyond social media and email blasts which targeted the younger attendees • Provide information at senior centers and retirement communities, including providing transportation to the event
Plan for sustainability and ongoing funding	<ul style="list-style-type: none"> • Encourage whole family events, e.g. “bring your grandkids” • Plan Open Streets events in communities which expressed the most support, then expand route options as more communities develop interest • Hold fund-raisers in the targeted communities to partially support their local events • Gain support for Open Streets initiatives from city officials and the Chamber of Commerce to help with businesses
Understand barriers and facilitators through different perspectives	<ul style="list-style-type: none"> • Hold focus groups in communities with a high proportion of Latino or non-White residents • Conduct pre- and post-surveys of businesses along the route to assess anticipated barriers and business impact • Conduct pre- and post-surveys of residents along the route to assess awareness and support

table out front, live music, giveaways, sales) were much more likely to report a positive impact (CicloSDias San Diego, 2014). Zieff and Chaudhuri (2013) found that although only 20% of businesses engaged in a promotional activity in San Francisco's events, those who did reported almost a 2/3 increase in revenue. Though business support may be politically useful, it is possible that the support of businesses is not critical for the event to be successful and sustainable, especially if general community support is substantial.

Limitations

Because CicloSDias was not designed as an intervention study, there are limitations associated with an uncontrolled evaluation. Event respondents were self-selected by attending the event and agreeing to fill out the survey, and this could have increased response bias. Since event respondents consisted of a convenience sample, survey respondents may not have been representative of all attendees. Because the survey was administered via paper and pencil, questions were often skipped. Zip code centroids were used to obtain distance between attendees' homes and the event route. While collecting addresses would have provided more accurate distance information, addresses were not asked because of concerns about missing data.

Overall attendance was estimated from the count station in the middle of the route that had the highest attendance. It is likely that some event attendees were counted multiple times; thus attendance could have been overestimated. Estimating attendance is challenging as there is no standardized and agreed upon method of making estimates, making comparisons with other cities' events difficult.

Though random digit dialing was used to obtain two random samples for the pre- and post-city-wide respondents, the response rate was modest. The low ownership of landlines could have contributed to an unrepresentative sample. The low response rate of businesses, 26 of 100, is likely not representative. We did not collect data from non-responders so we could not compare business respondents to non-respondents. The way the sales and impact questions were phrased (i.e., more subjective than objective) could have increased response bias, which could be avoided in future studies by using pre- and post-surveys with more objective questions (e.g. Zieff and Chaudhuri, 2013). However, these data can be more difficult to collect. We were able to significantly improve the business response rate for the 2nd CicloSDias evaluation (San Diego CicloSDias, 2014) by walking door-to-door to interview business staff after the event.

Conclusions

Our findings indicate that Open Streets can have positive effects on public health. To adequately support reducing health disparities, strategies are needed to reach more underserved community members and particularly inactive individuals. Because of the growing interest in Open Streets initiatives as a source of physical activity and community connectivity, the present study is timely. Already over 90 cities in the US have held Open Streets events between 2007 and 2013 (Open Streets Project, 2014), yet no comprehensive evaluations that included a city-wide survey sample were found. Other cities are encouraged to evaluate events with multiple methods to inform future events and to highlight areas to target to make Open Street initiatives more successful. Specific characteristics that have been identified that make Open Streets initiatives more successful include community buy-in, funding, route selection and staffing/volunteers (Zieff et al., 2013). Recommendations

for improving future CicloSDias events are summarized in Table 6, and many may be relevant for other cities' events.

The multi-method evaluation identified strengths and weakness of the first CicloSDias. Findings from the present evaluation demonstrate that the first CicloSDias led to opportunities for physical activity, particularly in high amounts (an average of 144 min/person). Unanswered questions should be addressed by future evaluations. What marketing strategies can be effective in generating high attendance for Open Streets, especially among those less physically active? What are the social, environmental, and economic advantages and disadvantages of Open Streets initiatives? What processes can lead to regular Open Streets and sustained funding?

Conflict of interest

The authors declare that there are no conflicts of interests.

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