Parks and Public Health in Los Angeles County

A Cities and Communities Report

May 2016

County of Los Angeles Public Health

EXECUTIVE SUMMARY

The availability of parks and associated recreational programs can have important public health benefits, including increased physical activity and reduced obesity and chronic disease as well as other positive health and environmental impacts. Unfortunately, Los Angeles County is relatively park poor compared with many other urban jurisdictions in the United States. The objective of this study was to assess park space per capita in relation to premature mortality from cardiovascular disease (heart disease and stroke) and diabetes, childhood obesity prevalence, community level economic hardship, and race/ethnicity in cities and unincorporated communities across Los Angeles County. Large geographic disparities in park space per capita were observed. Cities and communities with less park space per capita on average had higher rates of premature mortality from cardiovascular disease and diabetes, higher prevalence of childhood obesity, and greater economic hardship compared with cities and communities with more park space per capita. African Americans and Latinos were more likely than Asians and Whites to live in cities and communities with less park space per capita. The findings highlight current socioeconomic and racial/ethnic inequities in park space availability across Los Angeles County and suggest that prioritization of resources for park expansion in communities with less park space could help reduce health disparities in the county.

INTRODUCTION

The availability of parks and associated recreational programs impacts the public's health. Parks can be a focal point for promoting physical activity among both children and adults through recreational programs and structured activities such as walking groups.[1] Evidence also suggests that people who live close to park and recreation facilities have lower rates of obesity, and engage in more physical activity than those who do not. For example, a ten-year study of over 3,000 children in southern California found that those living near parks and recreational programs had lower rates of obesity at 18 years of age than comparable children who lived further away.[2]

Regular physical activity, even at moderate levels (e.g., brisk walking or dancing), has profound health benefits, protecting against heart disease, stroke, diabetes, depression, and many types of cancer. These health benefits also accrue among persons who are overweight or obese, even when they are unable to lose weight. Because of these health benefits, physical activity can improve quality of life, increase productivity, and reduce health care costs.

Parks can also contribute to improved health in other important ways. For example, in communities beset by violence, parks can serve as a platform for violence prevention efforts. This is exemplified both by the City of Los Angeles' Summer Night Lights Program and the County's Parks After Dark (PAD) initiative, which provide expanded youth and adult programming at parks on summer evenings. These parks-related interventions have had documented success in reducing serious and violent crime in surrounding neighborhoods.[3] In addition, evaluation of the PAD initiative has found it to be immensely popular among community members, having increased perceptions of safety, improved relations between law enforcement and community members, and increased community cohesion, which leads to stronger social support networks that further improve health.

Parks can also serve as locations for outreach to increase access to and enrollment in health and social services, youth development programs, employment events/job fairs, and nutrition assistance programs. Park facilities can serve as meeting places for local residents to address health and social issues in their communities. Parks can also provide space for community gardens and farmers' markets, thereby increasing community access to fresh produce, a major issue in many economically disadvantaged neighborhoods with high rates of obesity and diabetes.

Parks also have environmental benefits that can protect and improve health. For example, parks can reduce the impacts of heat waves by providing shade and ameliorating the "heat island effect" experienced in urban settings where asphalt and other hard surfaces reflect and intensify the heat.[4] Trees in parks, in particular, can mitigate urban heat islands directly by shading heat-absorbing surfaces.[5] Further, parks can be designed in ways that increase sustainability by creating permeable surfaces that absorb rain water and replenish groundwater; capturing rain water through cisterns or rain barrels so water can be used for grounds maintenance; allowing for habitat restoration; and reducing storm water run-off.[6, 7]

Despite these abundant health and environmental benefits, Los Angeles County is relatively park poor compared to many other urban settings in the United States.[8] Across the county, marked disparities have been reported in the amount of park space available for local residents.[9] In addition, relatively little is known about the quality of facilities and availability of recreational programs in parks and how these may vary across cities and communities.

In 2015, the County of Los Angeles Department of Parks and Recreation initiated a countywide assessment of the need for parks and recreational facilities (Parks Needs Assessment) in both cities and unincorporated areas. The goal of the Parks Needs Assessment was to engage all communities within the county in a collaborative process to gather data and input for future decision-making on parks and recreation. The results of the assessment provide valuable information on existing park and recreation assets, and will help determine how to best improve and expand these assets and make them more accessible. The Parks Needs Assessment final report (May 2016) identifies, prioritizes, and provides estimated costs for potential park projects within each of the county's study areas.

The County Department of Public Health has prepared this additional report to provide further information on the important relationships between parks and public health. The report provides data on selected health outcomes, demographic characteristics, and socioeconomic conditions in cities and communities across the county in relation to park space per capita. The report is intended as a complement to the Parks Needs Assessment Report. However, because different methodologies were used to calculate park space per capita, some results may not be directly comparable across the two reports.

STUDY METHODS

Defining cities and communities within Los Angeles County:

City boundaries were defined using the 2010 U.S. Census of Incorporated Places. Because of the large size of the City of Los Angeles, results were further broken down by Los Angeles City Council Districts. In areas of the County outside of cities (i.e., unincorporated areas), communities were defined using U.S. Census Designated Place boundaries. To ensure numerical stability of rate calculations, cities and communities with population below 10,000 were excluded from this study. Based on this methodology, a total of 120 geographic areas, including the 88 cities, Council Districts in the City of Los Angeles, and unincorporated communities, henceforth referred to as cities/communities, were included in the analysis.

Quantifying park space per capita:

Park space was approximated from the Land Types digital database (LA County GIS Data Portal http://egis3.lacounty.gov/dataportal/2015/01/08/la-county-land-types/) by selecting Regional Parks and Gardens and Recreational Centers features. Only park areas located within city or community boundaries were included. Natural areas and wildlife sanctuaries (including the Santa Monica and San Gabriel mountain recreational areas), beaches and marinas, and historical parks were excluded from the analysis.

Park space per capita was calculated to indicate park acres per 1,000 population (Census 2010). Each city and community was then assigned a rank based on its park space per capita ratio, with 1 having the most and 120 having the least park space per capita.

Quantifying premature mortality from cardiovascular disease and diabetes:

"Premature mortality" was defined as any death before the age of 75 years, a standard cut-off used in public health studies. Therefore, if a person died at age 45 years, he or she was considered to have lost 30 years of life. A person who died at age 72 years was considered to have lost three years.

All deaths in the County in 2009-2011 in which coronary heart disease (ICD10 codes I20-I25) or stroke (ICD10 codes I60-I69) was listed on the death certificate as the underlying cause of death were considered deaths from cardiovascular disease. Deaths from diabetes mellitus (ICD10 codes E10-E14) were those in which diabetes was listed as the underlying cause of death. The rate of premature death was calculated by dividing the total number of years of life lost in a given city or community, referred to as years of potential life lost (YPLLs), by the size of the population under the age of 75 years. The rates were annualized and age-adjusted to the 2000 US standard population to account for differences in age distributions of different populations. Cities/communities were ranked, with a ranking of 1 corresponding to the lowest (or best) rate of premature mortality and a ranking of 120 corresponding to the highest (or worst) rate of premature mortality.

Quantifying the prevalence of childhood obesity:

The prevalence of childhood obesity was estimated using 2009-2010 school year data from the California Physical Fitness Testing Program on measured height and weight in 5th graders attending public schools in Los Angeles County. This data was obtained from the California Department of Education, and the location of the public school where the child was in attendance was used to determine the prevalence of obesity for a city or community. Body mass index (BMI) was calculated from the height and weight measurements. Children were classified as obese if their BMI was at or above the 95th percentile for their gender and age using growth charts from the Centers for Disease Control and Prevention. In cities or communities with less than 50 students with BMI data, results on childhood obesity prevalence were not considered reliable and are therefore not presented. Cities/communities were ranked in the same manner as was done with premature mortality described above.

Quantifying community economic hardship:

Social and economic conditions in a community have been shown to be a powerful influence on health. Therefore, to assess this potential health vulnerability, a measure called the Economic Hardship Index was used for the analysis. The Index is scored by combining six indicators:

1) crowded housing, defined as the percent of occupied housing units with more than one person per room
2) percent of population living below the federal poverty level
3) percent of persons over the age of 16 years that are unemployed
4) percent of persons over the age of 25 years with less than a high school education
5) dependency, defined as the percent of the population under 18 or over 64 years of age
6) income per capita.

The Index score represents the average of the standardized ratios of all six component variables. Data for these indicators were obtained from the U.S. Census' American Community Survey, 2008-2012 5-year estimates. Scores on the index can range from 1 to 100, with a higher index number representing a greater level of economic hardship. In the present analysis, scores for this compilation ranged from 13 to 83.

Estimating racial/ethnic variation in park space proximity:

Racial and ethnic groups display marked differences in life expectancy, disease burden, and health risks. To examine how racial/ethnic groups (White, African American, Asian, and Latino) may be disproportionately impacted by greater or lesser proximity to park space, cities/communities were aggregated into quartiles based on park space per capita (quartile 1 included cities/communities with the most park space per capita and quartile 4 included cities/communities with the least park space per capita). The percentage of each racial/ethnic population that resided in cities/communities within each quartile was then calculated and compared across racial/ethnic groups.

RESULTS

Park space per capita varied widely across the cities/communities, with San Dimas and Malibu having the most park space (56.0 and 55.5 acres per 1,000 population, respectively), and 17 cities/communities having less than 0.5 acres per 1,000 population (Table 1). Within the City of Los Angeles, Council Districts 11 and 4 had the most park space per capita (35.1 and 16.8 acres per 1,000, respectively), while Council Districts 5, 8, 9, 10, and 13 all had less than 1.0 acre per 1,000 population.

A negative correlation was found between city/community economic hardship and park space per capita (i.e., as economic hardship increased, park space per capita decreased).[11] The maps presented in Figure 1a and 1b provide a spatial representation of this correlation.

Rates of premature mortality from cardiovascular disease and diabetes and prevalence of childhood obesity were inversely related to park space per capita (i.e., as park space per capita decreased, premature mortality from cardiovascular disease and diabetes and prevalence of childhood obesity increased; Table 2). This relationship was most pronounced for diabetes premature mortality, with those living in cities/communities with the least park space per capita having nearly double the rate of premature mortality (189 years of potential life lost per 100,000 population) as those living in cities/communities with the most park space per capita (96 years of potential life lost per 100,000 population).

Park space per capita was also associated with race/ethnicity (Figure 2). African Americans and Latinos were more likely to reside in cities/communities with less park space per capita (56% and 50%, respectively, resided in cities/communities in quartiles 3 and 4) compared to Whites and Asians (27% and 36%, respectively, resided in cities/communities in quartiles 3 and 4).

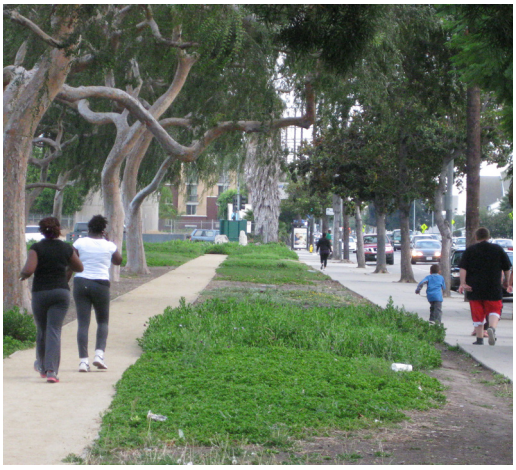

TABLE 1: Park space per capita, premature mortality from cardiovascular disease and diabetes, childhood obesity prevalence, and economic hardship, by city/community, Los Angeles County.

CITY OR COMMUNITY	PARK SPACE		CARDIOVASCULAR DISEASE PREMATURE MORTALITY		DIABETES PREMATURE MORTALITY		CHILDHOOD OBESITY PREVALENCE		ECONOMIC HARDSHIP INDEX	
	ACRES per 1,000	RANK (N=120)	YEARS OF POTENTIAL LIFE LOST PER 100,000	RANK (N=120)	YEARS OF POTENTIAL LIFE LOST PER 100,000	RANK (N=120)	PERCENT	RANK (N=113)	PERCENT	RANK (N=120)
Agoura Hills	2.4	35	246.6	4	17.4	9	7.3‡	6	26.5	14
Alhambra	0.8	82	438.0	28	98.5	46	19.6	37	41.1	48
Altadena*	1.1	66	436.0	27	63.3	32	32.7‡	84	37.5	46
Arcadia	2.0	43	431.9	25	49.1	20	9.1	9	31.5	27
Artesia	1.0	75	718.0	87	72.8	37	37.6‡	111	44.2	56
Avocado Heights*	1.6	49	738.7	89	260.4	104	26.1‡	58	56.0	82
Azusa	1.1	67	640.3	68	181.3	83	28.1	65	50.2	68
Baldwin Park	0.3	110	718.5	88	139.6	60	31.0	76	65.3	99
Bell	0.2	114	541.4	50	271.6	107	33.2	92	77.6	112
Bell Gardens	1.7	47	747.7	92	266.0	106	39.5	112	78.6	114
Bellflower	0.6	90	1062.2	116	192.5	86	25.9	57	52.3	74
Beverly Hills	2.8	29	322.1	12	23.5	11	6.1	4	27.1	17
Burbank	8.5	10	494.2	40	59.4	28	--	--	34.6	33
Calabasas	3.5	23	276.8	8	1.3	2	4.0	2	24.1	10
Carson	1.6	50	698.2	83	239.1	101	30.3	74	46.9	60
Castaic*	2.1	42	679.5	79	184.9	84	11.3	16	30.1	25
Cerritos	3.6	21	377.9	20	36.8	16	13.9	22	33.5	31
Citrus*	0.5	100	382.0	23	169.6	77	--	--	45.4	58
Claremont	3.6	22	714.5	86	48.8	19	16.3	30	34.6	32
Commerce	2.4	36	836.0	101	310.6	112	32.7‡	86	69.7	105
Compton	0.6	88	974.5	111	289.8	110	33.0	90	74.2	109
Covina	1.2	64	784.8	96	245.4	102	25.4	56	45.0	57
Cudahy	0.7	86	474.8	34	175.2	80	31.4	78	82.2	119
Culver City	2.9	26	471.3	32	61.2	30	16.8	31	29.2	23
Del Aire*	0.7	87	552.2	53	102.1	47	21.7‡	41	34.8	34
Diamond Bar	5.2	14	336.8	14	50.4	21	17.6	33	28.1	20
Downey	0.9	76	583.8	58	142.2	61	23.9	50	48.5	66
Duarte	2.2	40	679.1	78	157.3	69	19.0‡	35	43.6	55
East Los Angeles*	0.7	85	653.6	71	324.7	115	34.3	101	75.1	110

East Rancho Dominguez*	0.4	108		993.2	112		408.1	117		--	--		73.1	107	
East San Gabriel*	0	119		433.7	26		103.0	49		11.6‡	18		32.7	29	
El Monte	0.4	105		771.6	94		171.5	78		33.5	96		67.5	101	
El Segundo	2.5	33		366.9	19		5.0	4		14.4‡	24		23.5	9	
Florence-Graham*	1.1	70		800.5	98		157.9	70		36.1	105		78.2	113	
Gardena	0.9	77		870.0	103		166.1	76		28.0	64		48.0	64	
Glendale	8.8	7		488.3	38		48.0	18		25.3	55		41.5	50	
Glendora	1.4	57		340.2	15		116.9	52		15.7	28		35.4	36	
Hacienda Heights*	5.4	13		287.4	9		127.4	57		22.4	44		36.3	38	
Hawaiian Gardens	0.1	115		495.5	41		436.6	119		27.4‡	63		61.5	92	
Hawthorne	0.4	102		773.7	95		160.8	73		31.5	79		51.5	72	
Hermosa Beach	2.4	38		329.4	13		77.9	39		11.0‡	15		13.2	1	
Huntington Park	0.9	80		546.3	51		190.1	85		31.2	77		81.8	118	
Inglewood	0.8	81		914.8	106		172.9	79		30.1	72		55.2	80	
La Canada Flintridge	7.4	11		275.1	6		28.9	13		8.8	8		21.2	6	
La Crescenta-Montrose*	0.4	103		614.6	61		18.3	10		12.0	19		29.0	22	
La Mirada	4.0	18		625.4	63		60.9	29		23.1	45		38.8	47	
La Puente	0.6	94		513.7	42		232.2	98		28.4	68		56.1	83	
La Verne	2.9	27		566.2	55		160.0	72		14.5	25		35.4	35	
Lake Los Angeles*	8.8	8		1128.1	118		212.9	91		--	--		63.1	98	
Lakewood	2.3	39		645.8	70		126.0	56		23.4	47		36.8	41	
Lancaster	1.5	55		966.7	110		289.7	109		25.1	53		50.5	70	
Lawndale	0.4	109		528.0	46		206.7	90		26.8	61		55.1	79	
Lennox*	0.2	113		663.2	73		180.2	82		--	--		76.1	111	
Lomita	0.5	97		558.6	54		96.9	45		30.4	75		36.5	40	
Long Beach	2.8	30		937.4	109		155.7	65		26.4	59		50.1	67	
Los Angeles City, All Districts															
LACD 1	2.9	25		640.2	66		151.3	62		33.0	88		72.5	106	
LACD 2	1.5	52		665.2	74		102.8	48		34.3	100		47.5	61	
LACD 3	2.5	34		531.4	47		84.9	43		23.7	48		43.4	54	
LACD 4	16.8	4		473.0	33		66.7	34		22.2	43		27.7	19	

* indicates unincorporated city as defined by the US Census Designated Place boundaries

-- indicates the data were not available, or results were suppressed due to number of students with BMI-related information being <50

‡ Estimate may be unstable and should be interpreted with caution due to small number of students with BMI-related information in this stratum.

NOTE: YPLL-75 rates are derived from multi-year 2009-2011 death data, and 2010 population estimates.

1st quartile (rank 1-30) 2nd quartile (rank 31-60)
3rd quartile (rank 61-90) 4th quartile (rank 91-120)

TABLE 1: Park space per capita, premature mortality from cardiovascular disease and diabetes, childhood obesity prevalence, and economic hardship, by city/community, Los Angeles County.

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	ACRES per 1,000	RANK (N=120)	YEARS OF POTENTIAL LIFE LOST PER 100,000	RANK (N=120)	YEARS OF POTENTIAL LIFE LOST PER 100,000	RANK (N=120)	PERCENT	RANK (N=113)	PERCENT	RANK (N=120)
LACD 5	0.6	93	341.0	16	51.3	24	12.5	20	26.7	16
LACD 6	1.9	45	835.2	100	123.7	55	34.4	102	62.6	95
LACD 7	2.9	24	672.2	75	151.5	63	32.5	82	56.1	84
LACD 8	0.5	96	1199.1	119	318.1	114	35.5	104	67.3	100
LACD 9	0.4	107	1027.3	114	235.7	99	33.3	93	82.9	120
LACD 10	0.6	89	893.3	104	157.2	68	32.4	81	58.1	88
LACD 11	35.1	3	379.5	22	54.3	27	19.9	38	25.8	11
LACD 12	2.6	32	551.1	52	109.9	50	23.2	46	36.5	39
LACD 13	0.9	78	740.2	90	153.6	64	34.2	99	57.1	86
LACD 14	1.1	68	787.0	97	216.1	93	33.4	95	61.1	91
LACD 15	2.4	37	841.3	102	179.4	81	32.6	83	61.6	94
Lynwood	0.6	91	919.6	107	165.5	74	--	--	73.9	108
Malibu	55.5	2	354.7	18	0	1	8.3‡	7	20.5	4
Manhattan Beach	2.1	41	291.6	10	2.6	3	2.9	1	15.9	2
Maywood	0.3	112	491.3	39	334.1	116	33.3	94	79.3	116
Monrovia	1.0	72	644.6	69	95.6	44	24.9	52	35.5	37
Montebello	1.3	58	640.2	67	197.4	87	29.2	69	52.2	73
Monterey Park	1.5	54	444.3	29	62.1	31	14.8	27	48.4	65
Norwalk	0.9	79	750.3	93	165.8	75	29.3	70	54.1	77
Palmdale	1.7	48	694.8	81	236.2	100	24.4	51	56.9	85
Palos Verdes Estates	0.1	117	146.7	1	11.8	7	5.5	3	18.3	3
Paramount	1.0	74	805.5	99	301.0	111	31.8	80	68.5	103
Pasadena	2.8	28	567.4	56	51.3	25	28.4	66	37.2	44
Pico Rivera	1.3	60	620.9	62	112.6	51	29.4	71	54.0	76
Pomona	1.5	53	902.4	105	159.2	71	32.8	87	61.6	93
Quartz Hill*	1.3	63	1062.7	117	228.7	96	9.6‡	10	47.6	62
Rancho Palos Verdes	10.0	5	295.3	11	10.8	6	11.6	17	26.3	13
Redondo Beach	1.3	62	483.4	37	46.3	17	16.0	29	21.7	7
Rosemead	1.1	69	569.5	57	33.8	15	21.1	39	57.4	87

Rowland Heights*	9.5	6		350.5	17		79.8	41		21.2	40		37.4	45	
San Dimas	56.0	1		694.7	80		50.9	23		19.6	36		32.0	28	
San Fernando	1.0	71		527.1	45		131.2	58		36.9	109		62.7	97	
San Gabriel	0.4	106		635.1	65		79.8	40		17.4	32		42.5	53	
San Marino	2.0	44		261.3	5		9.3	5		6.6‡	5		21.0	5	
Santa Clarita	4.4	16		480.9	36		53.5	26		14.2	23		37.1	43	
Santa Fe Springs	4.2	17		743.2	91		213.3	92		33.9	97		54.1	78	
Santa Monica	1.3	61		515.0	43		84.6	42		9.8	11		25.9	12	
Sierra Madre	3.9	19		193.7	2		28.1	12		13.1‡	21		30.5	26	
Signal Hill	4.5	15		936.3	108		0	1		23.9‡	49		41.2	49	
South El Monte	1.1	65		625.6	64		318.1	113		33.9	98		62.7	96	
South Gate	1.3	59		675.5	77		155.7	66		36.5	107		69.0	104	
South Pasadena	1.6	51		450.3	30		13.0	8		10.7	13		26.6	15	
South San Jose Hills*	0.3	111		714.1	85		123.1	53		26.8	60		59.8	90	
South Whittier*	0.6	95		657.9	72		198.0	89		33.1	91		51.2	71	
Stevenson Ranch*	2.6	31		201.4	3		31.1	14		10.1	12		28.4	21	
Sun Village*	0.8	83		1033.9	115		280.0	108		25.2‡	54		55.4	81	
Temple City	0.5	98		378.0	21		68.7	35		19.0	34		36.9	42	
Torrance	1.9	46		476.4	35		76.9	38		10.9	14		32.9	30	
Valinda*	0.4	104		597.2	60		69.1	36		37.5	110		52.8	75	
View Park-Windsor Hills*	8.7	9		536.6	48		197.9	88		21.8	42		29.9	24	
Vincent*	0.6	92		526.6	44		64.5	33		36.9‡	108		47.7	63	
Walnut	7.0	12		275.4	7		50.6	22		14.6	26		27.7	18	
Walnut Park*	0.1	116		420.7	24		247.7	103		35.0‡	103		79.2	115	
West Carson*	0	119		540.1	49		155.8	67		41.4‡	113		42.1	52	
West Covina	1.4	56		709.4	84		226.9	94		27.0	62		45.5	59	
West Hollywood	0.5	99		451.7	31		131.6	59		--	--		22.2	8	
West Puente Valley*	0.7	84		696.2	82		230.0	97		30.2	73		58.4	89	
West Whittier-Los Nietos*	0.5	101		591.8	59		227.8	95		36.2	106		50.5	69	
Westmont*	0.1	118		1368.1	120		417.6	118		33.0	89		68.2	102	
Whittier	1.0	73		674.5	76		123.5	54		28.4	67		41.6	51	
Willowbrook*	3.9	20		1022.7	113		265.1	105		32.7	85		81.6	117	

* indicates unincorporated city as defined by the US Census Designated Place boundaries

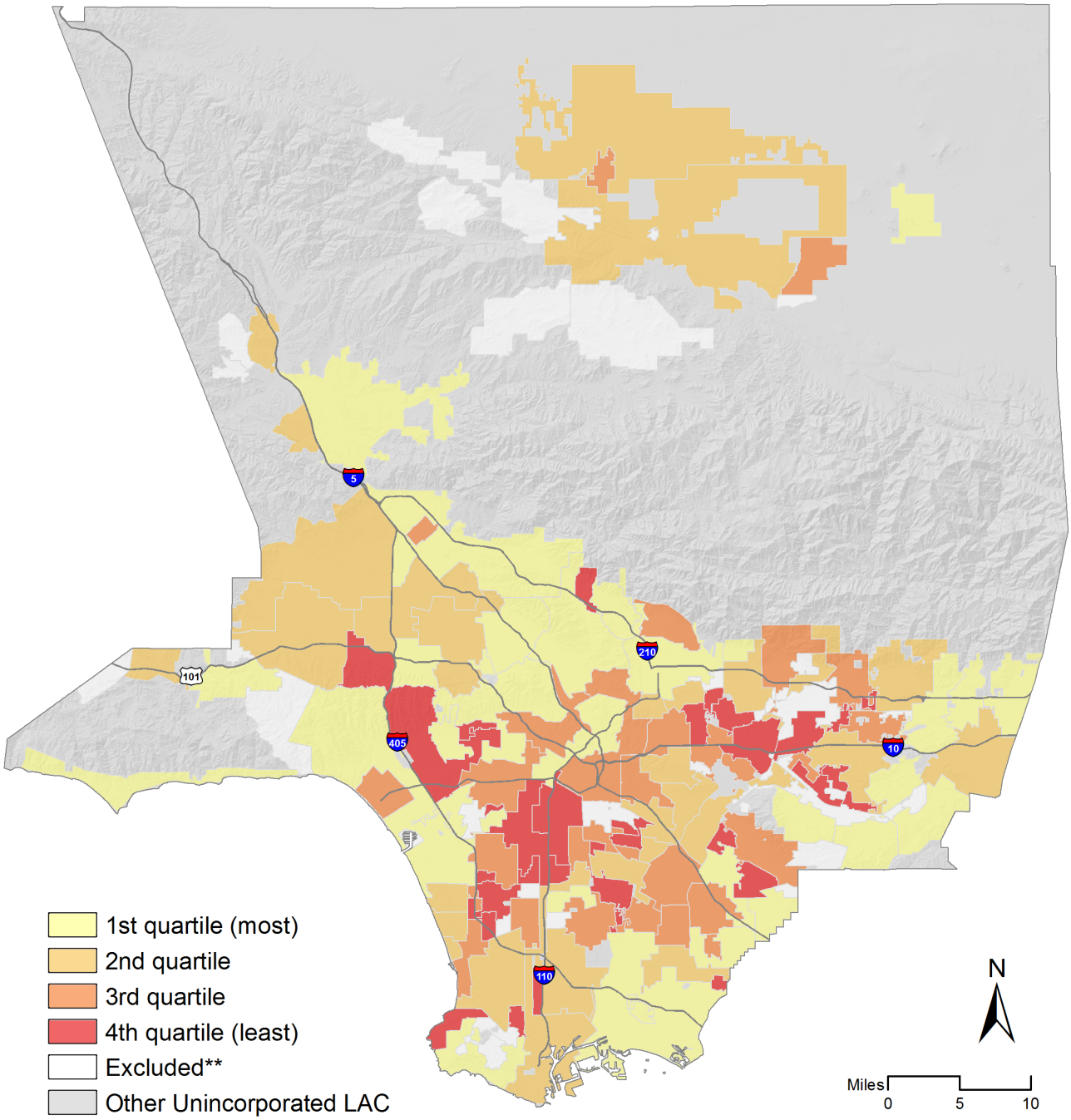
-- indicates the data were not available, or results were suppressed due to number of students with BMI-related information being <50

‡ Estimate may be unstable and should be interpreted with caution due to small number of students with BMI-related information in this stratum.

NOTE: YPLL-75 rates are derived from multi-year 2009-2011 death data, and 2010 population estimates.

1st quartile (rank 1-30) 2nd quartile (rank 31-60)
3rd quartile (rank 61-90) 4th quartile (rank 91-120)

FIGURE 1A. Map of park space* per capita by city and community, Los Angeles County.



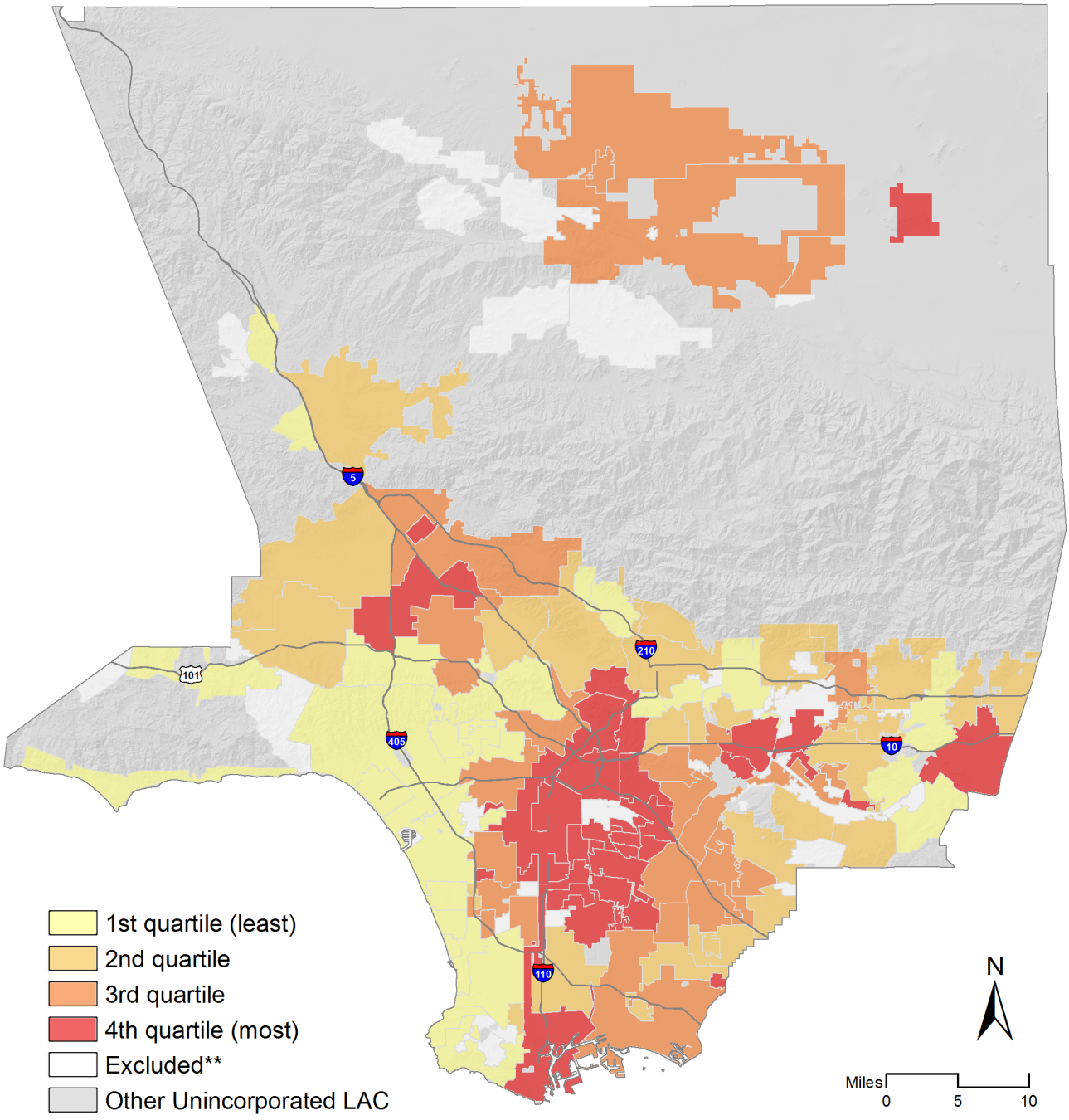
* Acres per 1,000 population
** Population below 10,000

Source: LA County GIS Data Portal, US Census Bureau

County of Los Angeles Public Health

LA County DPH, Office of Health Assessment and Epidemiology, 3/2016

FIGURE 1B. Map of economic hardship index* by city and community, Los Angeles County.



* Score based on ACS 2012 5-Year estimates
** Population below 10,000

Source: US Census Bureau

County of Los Angeles Public Health

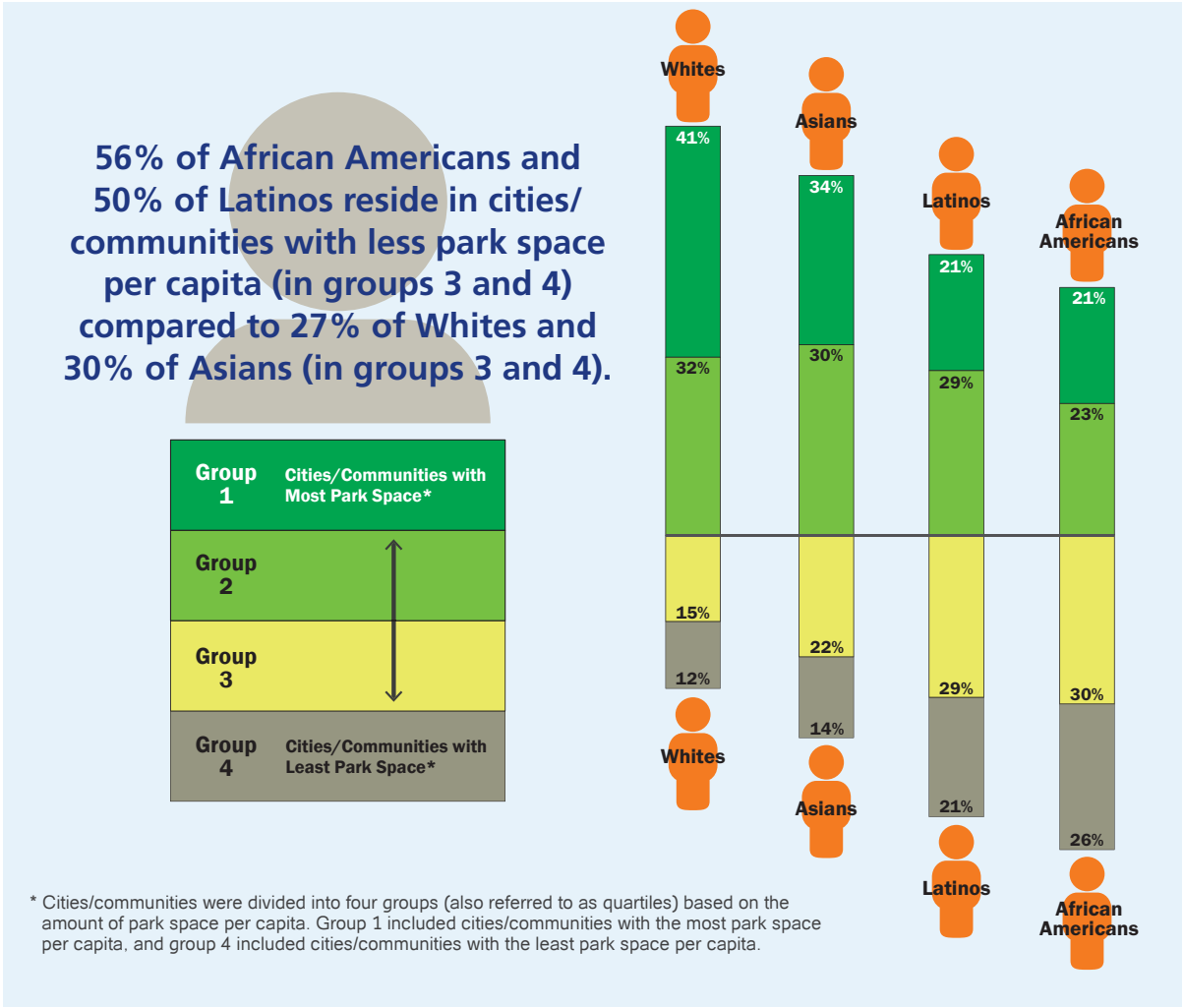
LA County DPH, Office of Health Assessment and Epidemiology, 3/2016

TABLE 2: Rates of premature mortality from cardiovascular disease and diabetes and prevalence of childhood obesity, by park area per capita, Los Angeles County.

PARK AREA PER CAPITA (QUARTILES)	CARDIOVASCULAR DISEASE PREMATURE MORTALITY (YPLLs* PER 100,000)	DIABETES PREMATURE MORTALITY (YPLLs* PER 100,000)	CHILDHOOD OBESITY PREVALENCE
(Most Park Space per Capita) **Quartile 1**	588	96	24%
Quartile 2	667	144	26%
Quartile 3	735	174	30%
Quartile 4 (Least Park Space per Capita)	752	189	31%

*YPLLs - Years of Potential Life Lost

FIGURE 2: Race/ethnicity and park space per capita



* Cities/communities were divided into four groups (also referred to as quartiles) based on the amount of park space per capita. Group 1 included cities/communities with the most park space per capita, and group 4 included cities/communities with the least park space per capita.

DISCUSSION

Recent studies indicate that access to parks and recreational resources is more limited in poor and minority communities, and have highlighted park disparities by class, race, and ethnicity.[9,12] Our study findings are consistent with this literature. We found large disparities in park space per capita across cities and communities in Los Angeles County. Cities and communities with less park space are in many cases further disadvantaged by high levels of economic hardship and high rates of childhood obesity and premature mortality from cardiovascular disease and diabetes. Further, a disproportionately high percentage of African Americans and Latinos live in cities and communities with less park space per capita.

These findings have significant public health implications given the high rates of chronic disease in low income communities and communities of color. Increasing levels of physical activity is an important public health strategy for preventing and managing chronic conditions. Hence, prioritization of park space that provides additional opportunities for physical activity in these communities would address a critical public health need. Expansion of parks in these cities and communities in coordination with other health promotion and disease prevention efforts could help improve the health of these populations and help reduce health inequities. In addition, given the contribution of parks programming in reducing violent crime in communities around parks, expansion of parks programming could also help reduce violence-related trauma.

This study has the following limitations. First, the analysis did not include the quality of existing park space or the availability of associated programming. These factors are clearly important in considering park equity and the potential for parks to improve the public's health. Second, indicators of community safety or measures of public perceptions of community safety were not assessed in the study. Safety is a major factor influencing the likelihood that parks will be accessible and utilized by those in the community. Third, the study did not measure

distances from individual residences to park space but, rather, used park area per capita at the city/community level as a proxy for park proximity.

Lastly, the study was ecologic and cross-sectional in design and, therefore, the associations found between park space per capita and the health conditions included in the study should not be viewed as evidence that limited park space caused these conditions. Rather, these findings may reflect a constellation of conditions in these communities that give rise to health inequities. For this reason, some cities and communities were found to have inconsistent results for park space per capita and the health conditions (e.g., some cities/communities had relatively large amounts of park space per capita but nonetheless had high rates of childhood obesity and premature mortality from cardiovascular disease and diabetes).

These limitations notwithstanding, the study highlights the presence of large inequities in park space across cities and unincorporated communities in Los Angeles County. The findings further underscore the importance of considering these inequities, as well as the burden of chronic disease, local economic conditions, and racial/ethnic population mix in prioritizing future park development and recreational programming.

RECOMMENDATIONS

Prioritize parks resources in the highest need areas

Differences in park distribution are driven, in part, by limited resources for parks in many municipal budgets as well as a dearth of state and federal funding sources for municipal park infrastructure, operations and maintenance, including programming. For example, a 2010 study in the Los Angeles region found that the poorest, most densely populated cities allocated the lowest levels of parks and recreation funding in the region, highlighting the importance of identifying additional funding for these cities.[13] To address inequities, parks funding allocated via grant applications could forego requirements for matching funds from low income communities and technical assistance could be provided to increase the likelihood of success.

Provide recreational programming and include only healthy food and beverages at local parks

The presence of recreational programming has been shown to greatly increase the numbers of persons engaging in moderate to vigorous physical activity in parks and other recreational settings.[14] In addition, by activating outdoor spaces via walking clubs, soccer games, youth sports, and other organized activities, programming can help parks feel safer in communities where the presence of violence and crime are a deterrent to recreational activity. Programming can therefore increase social cohesion as well as increase physical activity. In parks that have vending machines or snack shops, or serve food as part of their programming, provision of foods and beverages meeting specified nutrition standards can help promote healthy diets.[15]

Design parks for safety

The design of parks and recreation facilities can have a direct impact on people's perceptions of safety and their willingness to use a space. Park design should take advantage of opportunities for informal surveillance by people in the area and should reduce the number of isolated places where crime can take place unseen. For example, activity areas can be clustered together with clear sightlines between areas and with washrooms located nearby. The layout of the park should be easily understood, with entrances and exits clearly marked and pathways well connected to destinations. Lighting should help direct pedestrian movement along well-illuminated and frequently-used routes at night. The park perimeter should be inviting so that people can observe pleasing activities visible from the street and are encouraged to enter. Vegetation should be selected so as to not block sightlines once mature.

Provide safe bike and pedestrian access to and between parks

Parks and the streets around them should be designed to encourage easy and comfortable access for all types of users, including those without a car. Bike and pedestrian paths within the park should connect and integrate with public transit stations and the transportation patterns of the surrounding community to encourage maximum use. Primary access routes should be clearly identifiable from the street. Access routes should follow "desire lines," e.g., easy and safe bike and pedestrian access where people want to walk and bike. If possible, the park should function as a shortcut between major destination points to increase visible activity and informal surveillance.

Design parks to increase sustainability

When designing new parks or retrofitting existing parks, every opportunity should be taken to integrate multiple benefits associated with green infrastructure. For example, parks should be designed in ways that increase sustainability by creating permeable surfaces that replenish groundwater sources and reduce storm water run-off or capture rainfall to be used for maintenance. Park design should also reduce greenhouse gas emissions; increase carbon sequestration; reduce the heat island effect; protect habitat and biodiversity; and promote urban agriculture.

Use best-practice mitigation for parks in proximity to freeways and high-volume roadways

Placing parks and active recreational facilities near freeways and high volume roadways may increase health risks associated with exposure to traffic-related pollution. However, there are also substantial health benefits associated with the physical activity that can be undertaken in parks. To address exposure concerns, new parks with playgrounds, athletic fields, courts, and other outdoor facilities designed for moderate to vigorous physical activity, should be sited as far as possible from freeways and high-traffic roads. Parks within 1,500 feet of freeways should adhere to best-practice mitigation measures that minimize exposure to air pollution. These include placing playgrounds, athletic fields, and other outdoor active recreation venues as far as possible from traffic, and planting trees and other vegetation between these venues and traffic sources.

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