OBESITY

and Related Mortality in Los Angeles County

A Cities and Communities Health Report

Office of Health Assessment and Epidemiology
September 2011

County of Los Angeles Public Health

DIRECTOR'S MESSAGE

The obesity epidemic continues to threaten the public's health. Over the past three decades, obesity prevalence in the United States has doubled among adults and tripled among children.[1] In Los Angeles County, the prevalence of adult obesity increased from 13.6% in 1997 to 22.2% in 2007, while obesity rates among school-aged children increased from 18.9% in 1999 to 23.0% in 2008. Although recent data signal a possible leveling of the obesity trend nationwide,[2-4] continued efforts are needed not just to prevent future increases, but also to decrease obesity rates below current epidemic levels.

Marked geographic disparities in obesity rates have been observed throughout the County. As documented in this report, both adults and school-aged children from socioeconomically disadvantaged communities have significantly higher obesity rates than their counterparts living in more affluent communities. The similar geographic pattern observed for adult and child obesity suggests common risk factors shared by both groups.

Obesity results from an interactive mix of biological, behavioral, environmental, and socioeconomic factors. Racial/ethnic composition of communities may account for some of the geographic variation observed as obesity prevalence differs greatly by race/ethnicity. Neighborhood socioeconomic conditions also contribute to the geographic variation; economic hardship is one of the major underlying factors contributing to the obesity epidemic. Families living in low-income neighborhoods tend to have limited access to affordable nutritious foods, safe playgrounds or parks, and timely medical care, challenging their ability to lead healthy and active life styles.[5]

Obesity has emerged as a major driving force of health care costs.[6] In 2006, the economic burden of overweight and obesity in the County was estimated at $6.0 billion, including $3.6 billion in health care costs and $2.4 billion in costs due to lost productivity.[7] The high health care costs result mainly from the fact that obesity increases risk for a large number of chronic conditions including diabetes, stroke, and coronary heart disease.[1] In this report, we explore correlations between adult obesity prevalence and mortality rates for diabetes, stroke, and coronary heart disease at the city/community level.

The Department of Public Health is working closely with health care providers, local communities, schools, and businesses to reduce obesity prevalence among County residents. We hope the information provided in this report will support these efforts to combat the obesity epidemic by providing our partners with data essential for community assessment and policy development.

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STUDY METHODS

Defining Cities and Communities within Los Angeles County

To delineate the geographic areas used in the study, the Census 2000 Incorporated Places and Census Designated Places were used to define boundaries for cities and communities, respectively. Because of its large size, the City of Los Angeles was further categorized by Council Districts. This report focuses on cities and communities with discrete boundaries and with a population size of 5,000 or more.

Estimating Obesity Prevalence among Adults

To determine obesity prevalence for cities and communities, we used a model-based small area estimation method (see Appendix).[8] Three data sources were used in the calculations: the 2007 Los Angeles County Health Survey (LACHS), the 2000 Census, and the 2007 Population Estimates and Projection System (PEPS). A body mass index (BMI) ≥ 30 kg/m^2 was considered obese.[9]

Estimating Obesity Prevalence among Youth

The prevalence of child obesity was determined using BMI measurements of 5th-, 7th-, and 9th-grade public school children from the California Physical Fitness Testing Program. Based on the Centers for Disease Control and Prevention growth charts, children were considered obese if their BMI exceeded the 95th percentile by age and gender. Data from the 2007-2008 school year data were used for this report.

Estimating Diabetes, Stroke, and Coronary Heart Disease Mortality

We calculated mortality rates for diabetes, stroke, and coronary heart disease (CHD) using underlying cause of death from 2004-2008 Los Angeles County mortality records. Five years of mortality data were aggregated in order to obtain stable estimates. Data were age-adjusted using the 2000 U.S. population as a standard.

Estimating Economic Hardship

Social and economic conditions in the community influence health and are closely linked with obesity. To evaluate socioeconomic conditions within a community, we used a measurement called the Economic Hardship Index (see Appendix).[10] The 2000 U.S. Census Data were used to calculate the index for this report. The index can range from 1 to 100, with a higher index representing a greater level of economic hardship.[11]

Correlation Analysis

At the city/community level, we analyzed the correlations between the prevalence of adult obesity and child obesity. In addition, we assessed the correlations between the prevalence of adult obesity and mortality rates for diabetes, stroke, and CHD. Since economic hardship influences both the prevalence of adult obesity and mortality rates, we also assessed the correlations between adult obesity and deaths controlling for economic hardship.

To facilitate comparisons across localities, we provide rankings from lowest to highest for each indicator and aggregate rankings into quartiles. The 1st quartile consists of 25% of cities and communities with the lowest rates, while the 4th quartile comprises 25% of cities and communities with the highest rates.

FINDINGS

Overall, adult obesity rates in the County increased from 13.6% in 1997 to 22.2% in 2007, while the obesity rates among school-aged children increased from 18.9% in 1999 to 23.0% in 2008. While deaths from coronary heart disease and stroke have declined slightly in recent years, CHD, stroke, and diabetes have remained the #1, #2, and #6 leading causes of death in the County since 1999, respectively.[12] All three diseases also rank among the leading causes of premature death, defined as death before age 75 years.

Marked racial/ethnic disparities exist for obesity and death from obesity-related causes. Latinos (29.4%) and African Americans (29.2%) have much higher adult obesity rates than whites (17.6%) and Asians/Pacific Islanders (8.9%). Among school-aged children, Pacific Islanders (37.1%) and Latinos (27.5%) have the highest obesity rates. In addition, African Americans experience higher mortality from diabetes, stroke, and CHD than other racial/ethnic groups.

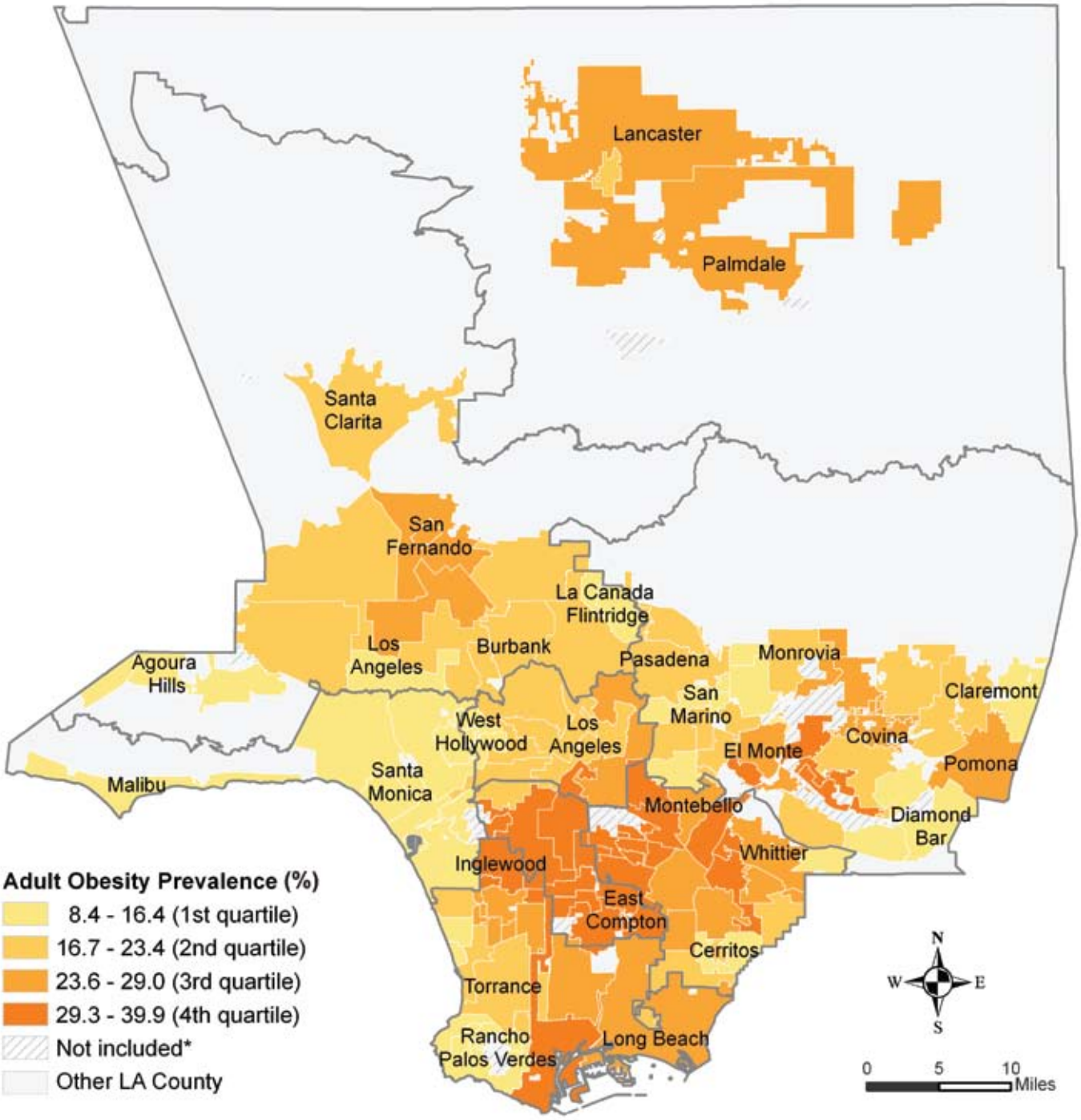
Table 1 (pages 6-8) presents the rates and rankings of adult and child obesity and mortality for diabetes, stroke, and CHD for 81 cities, 15 Los Angeles City Council Districts, and 32 unincorporated communities.

Adult obesity prevalence varied considerably across cities and communities, with the lowest in San Marino (8.4%) and the highest in East Compton (39.9%), an almost fivefold difference. The prevalence was strongly correlated with economic hardship (correlation coefficient [r]=0.87, $p<0.0001$), with higher obesity prevalence generally found in cities and communities with greater economic hardship. Although areas with high adult obesity rates appeared to concentrate in certain geographic locations, the prevalence of obesity sometimes varied greatly among different cities in the same Service Planning Area (Figure 1).

The prevalence of child obesity also varied significantly among cities and communities, from a low of 3.4% in Manhattan Beach to a high of 38.7% in Walnut Park, and was also found to be strongly correlated with economic hardship ($r=0.86$, $p<0.0001$). Additionally, we observed a strong correlation between the rates of adult obesity and child obesity ($r=0.84$, $p<0.0001$).

Obese adults are at risk for developing many chronic conditions. We examined correlations between the prevalence of adult obesity and the mortality rates for diabetes, stroke, and CHD with and without controlling for economic hardship. We found a strong correlation ($r=0.83$, $p<0.0001$) between the prevalence of adult obesity and the diabetes mortality rate. The strength of the correlation was reduced, but still moderate ($r=0.55$, $p<0.0001$), after controlling for economic hardship. The prevalence of adult obesity was also moderately correlated with mortality rates for stroke ($r=0.42$, $p<0.0001$) and CHD ($r=0.45$, $p<0.0001$). These correlations remained moderate after controlling for economic hardship ($r=0.40$, $p<0.0001$ for stroke; $r=0.39$, $p<0.0001$ for CHD). In addition, economic hardship was correlated strongly with diabetes mortality ($r=0.75$, $p<0.0001$) and moderately with mortality rates for stroke ($r=0.26$, $p=0.0057$) and CHD ($r=0.31$, $p<0.0004$).

Figure 1: Adult Obesity Prevalence by City and Community, Los Angeles County, 2007



* Population < 5,000 and communities with non-discrete boundaries

Table 1: Adult and Child Obesity, and Mortality Rates for Diabetes, Stroke, and Coronary Heart Disease by City and Community, Los Angeles County

City/Community	Adult Obesity Prevalence 2007†			Child Obesity Prevalence 2008¶		Diabetes Mortality 2004-2008		Stroke Mortality 2004-2008		CHD Mortality 2004-2008	
	Percent	95% CI	Rank & Quartile	Percent	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile
Los Angeles County	**23.9§**	**22.5-25.2**	**n/a**	**23.0**	**n/a**	**25**	**n/a**	**40**	**n/a**	**161**	**n/a**
Agoura Hills	13.4	11.4-15.8	18	5.3	4	–	–	48	96	143	48
Alhambra	16.7	14.7-19.3	33	16.2	33	22	31	37	36	138	43
Alondra Park	27.1	23.9-30.9	85	31.3*	112	–	–	–	–	177	97
Altadena	20.4	17.7-23.7	49	25.8*	71	17	12	40	58	147	55
Arcadia	13.9	12.3-15.9	19	10.1	12	13	4	32	16	123	22
Artesia	20.9	18.3-24.2	53	25.5*	70	32	70	46	91	166	83
Avocado Heights	26.2	23.2-29.6	81	29.3*	103	48	97	52	103	168	84
Azusa	27.0	24.1-30.2	83	24.6	67	33	75	37	36	165	82
Baldwin Park	29.4	25.8-33.4	99	28.7	94	28	50	37	36	156	65
Bell	29.4	25.3-33.9	99	29.0	97	40	87	35	26	129	27
Bell Gardens	29.4	25.4-33.9	99	29.4	104	45	94	41	69	175	95
Bellflower	25.2	21.8-29.1	74	23.4	64	31	66	43	83	197	114
Beverly Hills	10.4	8.4-12.9	4	5.4	5	12	1	30	10	98	5
Burbank	18.5	16.2-21.1	42	16.9	35	15	7	41	69	157	70
Calabasas	12.3	10.5-14.5	10	5.0	2	–	–	–	–	220	126
Carson	24.7	21.1-29.1	71	25.8	71	29	54	46	91	156	65
Cerritos	12.4	9.9-15.8	13	15.2	30	22	31	38	45	136	37
Charter Oak	23.8	20.6-27.6	66	–	–	30	63	39	53	173	92
Citrus	27.2	24.3-30.6	86	21.3*	53	30	63	40	58	188	107
Claremont	14.2	12.2-16.6	21	14.6	25	20	20	37	36	195	111
Commerce	30.2	26.6-34.1	109	31.3*	112	38	82	–	–	157	70
Compton	39.1	34.1-44.4	125	29.0	97	51	99	61	110	211	120
Covina	25.2	21.6-29.2	74	21.1	50	30	63	40	58	151	60
Cudahy	29.5	25.4-34.0	104	29.2	101	39	84	39	53	137	41
Culver City	14.7	12.3-17.7	23	16.2	33	24	35	41	69	153	64
Del Aire	26.6	23.2-30.5	82	20.2*	46	–	–	40	58	158	72
Diamond Bar	14.8	12.9-17.2	24	13.9	23	21	30	34	21	133	35
Downey	24.3	21.3-27.9	69	21.2	51	28	50	42	75	159	74
Duarte	24.2	21.6-27.3	68	20.1	44	20	20	40	58	194	110
East Compton	39.9	35.0-45.1	127	–	–	–	–	59	108	201	116
East La Mirada	25.9	22.3-30.1	76	23.2	62	–	–	42	75	169	86
East Los Angeles	30.9	27.1-35.3	112	32.9	116	40	87	41	69	145	51
East Pasadena	16.0	14.0-18.4	29	–	–	–	–	–	–	105	9
East San Gabriel	15.2	13.5-17.4	26	13.7*	22	–	–	34	21	112	11
El Monte	27.9	24.6-31.5	89	28.3	92	28	50	36	30	156	65
El Segundo	16.8	14.3-19.9	35	11.4	15	–	–	44	86	164	79
Florence-Graham	38.7	34.5-43.2	124	31.0	110	45	94	38	45	180	100
Gardena	25.0	22.1-28.6	73	27.3	81	31	66	40	58	164	79
Glendale	17.2	15.2-19.7	38	18.2	38	20	20	34	21	151	60
Glendora	21.3	18.6-24.4	55	10.9	14	20	20	40	58	189	108

† Adult obesity is defined as having a body mass index (BMI) of 30 kg/m² or above.

¶ Child obesity is defined as having a gender-specific BMI-for-age of 95th percentile or above.

§ County overall estimate for adult obesity is slightly different from previously reported because we factored in follow-up height and weight questions.

n/a not applicable

* Interpret with caution: Estimate is based on a student group size of less than 500.

– Data not presented: Child obesity data are due to small student group sizes (<50); mortality data are due to limited number of deaths (<20).

1st quartile (0-24th percentile) 2nd quartile (25th-49th percentile) 3rd quartile (50th-74th percentile) 4th quartile (75th-100th percentile)

Table 1 – Continued

City/Community	Adult Obesity Prevalence 2007†			Child Obesity Prevalence 2008¶		Diabetes Mortality 2004-2008		Stroke Mortality 2004-2008		CHD Mortality 2004-2008	
	Percent	95% CI	Rank & Quartile	Percent	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile
Hacienda Heights	19.2	16.9-21.8	44	20.0	42	20	20	29	5	119	18
Hawaiian Gardens	27.0	24.0-30.5	83	33.4*	117	–	–	–	–	114	13
Hawthorne	28.6	25.2-32.5	94	25.9	73	24	35	44	86	185	104
Hermosa Beach	12.7	10.1-16.1	16	5.1*	3	–	–	42	75	132	33
Huntington Park	29.3	25.3-33.8	97	30.3	107	44	93	29	5	136	37
Inglewood	29.6	26.4-33.4	105	26.8	78	36	79	48	96	215	123
La Canada Flintridge	10.1	8.3-12.5	3	8.5*	10	–	–	34	21	116	17
La Crescenta-Montrose	15.2	13.5-17.2	26	9.6	11	–	–	38	45	146	53
La Habra Heights	15.8	13.4-18.9	28	–	–	–	–	44	86	138	43
La Mirada	20.8	17.8-24.4	52	17.6	36	20	20	36	30	152	63
La Puente	31.2	27.1-35.6	115	27.8	87	32	70	28	4	119	18
La Verne	19.8	17.5-22.6	46	12.6	19	24	35	38	45	169	86
Lake Los Angeles	28.9	24.3-34.1	95	25.1*	69	–	–	–	–	219	124
Lakewood	21.2	18.2-24.9	54	20.9	49	24	35	39	53	160	75
Lancaster	26.0	22.0-30.7	77	21.2	51	41	90	55	105	212	121
Lawndale	28.4	24.9-32.4	92	22.9	59	22	31	37	36	151	60
Lennox	32.6	28.2-37.6	116	–	–	32	70	40	58	130	29
Lomita	23.3	20.3-26.7	61	27.2	79	23	34	33	18	150	59
Long Beach	24.5	21.4-28.0	70	21.5	56	24	35	43	83	199	115
Los Angeles (City of) ‡	22.4	21.0-24.1	n/a	25.4	n/a	24	n/a	39	n/a	161	n/a
LA City Council District 1	23.3	20.4-26.7	61	27.8	87	29	54	37	36	138	43
LA City Council District 2	20.5	18.5-22.9	50	22.5	56	20	20	36	30	187	106
LA City Council District 3	18.8	17.0-20.8	43	18.2	38	20	20	41	69	169	86
LA City Council District 4	16.4	14.4-18.9	32	22.9	59	15	7	33	18	137	41
LA City Council District 5	12.3	11.0-13.9	10	18.9	40	15	7	31	14	129	27
LA City Council District 6	24.9	22.3-27.8	72	27.6	84	24	35	36	30	169	86
LA City Council District 7	26.1	23.3-29.4	79	29.1	100	32	70	40	58	179	99
LA City Council District 8	35.1	30.8-40.0	119	30.1	106	43	92	59	108	219	124
LA City Council District 9	36.7	32.6-41.2	122	29.5	105	39	84	48	96	190	109
LA City Council District 10	23.4	21.1-26.0	63	28.1	91	26	45	45	90	174	94
LA City Council District 11	12.3	10.4-14.7	10	20.0	42	14	5	36	30	123	22
LA City Council District 12	17.5	15.8-19.6	39	21.3	53	19	16	37	36	184	102
LA City Council District 13	20.6	18.0-23.8	51	27.6	84	25	42	35	26	144	50
LA City Council District 14	23.8	20.6-27.6	66	26.4	76	29	54	34	21	141	46
LA City Council District 15	30.4	27.8-33.4	110	27.8	87	29	54	48	96	178	98
Lynwood	37.8	32.5-43.4	123	27.7	86	29	54	58	107	195	111
Malibu	10.4	8.4-12.9	4	5.9*	6	–	–	–	–	78	1
Manhattan Beach	12.5	9.9-15.9	14	3.4	1	–	–	38	45	93	3
Marina del Rey	9.9	7.9-12.4	2	–	–	–	–	–	–	147	55
Maywood	30.1	25.8-34.9	107	28.7	94	49	98	–	–	181	101
Monrovia	22.4	19.8-25.5	57	20.4	47	27	48	42	75	162	76
Montebello	26.0	23.0-29.4	77	23.3*	63	36	79	36	30	156	65
Monterey Park	16.1	14.2-18.5	30	15.8	31	19	16	30	10	107	10
Norwalk	27.2	23.9-31.1	86	26.0	75	34	77	40	58	175	95

‡ Rankings are provided for the 15 Los Angeles City Council Districts rather than for the city in its entirety

1st quartile (0-24th percentile) 2nd quartile (25th-49th percentile) 3rd quartile (50th-74th percentile) 4th quartile (75th-100th percentile)

Table 1 – Continued

City/Community	Adult Obesity Prevalence 2007†			Child Obesity Prevalence 2008¶		Diabetes Mortality 2004-2008		Stroke Mortality 2004-2008		CHD Mortality 2004-2008	
	Percent	95% CI	Rank & Quartile	Percent	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile	Death Rate per 100,000	Rank & Quartile
Palmdale	26.1	22.1-30.7	79	23.1	61	34	77	50	101	186	105
Palos Verdes Estates	11.8	9.3-15.2	6	7.3	7	–	–	31	14	115	16
Paramount	35.5	30.5-41.0	121	27.3	81	29	54	47	94	162	76
Pasadena	19.4	16.9-22.4	45	20.7	48	14	5	33	18	143	48
Pico Rivera	30.9	27.0-35.4	112	25.9	73	39	84	46	91	149	58
Pomona	27.3	24.4-30.7	88	28.6	93	42	91	42	75	184	102
Quartz Hill	23.1	19.3-27.7	60	15.1	28	28	50	62	111	203	117
Rancho Palos Verdes	12.7	10.4-15.6	16	14.1	24	12	1	30	10	134	36
Redondo Beach	16.7	14.5-19.5	33	15.1	28	18	14	47	94	147	55
Rolling Hills Estates	11.9	9.5-15.2	7	8.4	9	–	–	–	–	114	13
Rosemead	20.1	17.9-22.8	48	20.1	44	20	20	39	53	128	26
Rowland Heights	16.3	14.5-18.5	31	18.9	40	18	14	37	36	99	7
San Dimas	19.8	17.4-22.6	46	17.6	36	29	54	38	45	205	119
San Fernando	28.5	24.5-33.0	93	27.4	83	52	100	41	69	164	79
San Gabriel	17.1	15.0-19.6	37	16.0	32	19	16	50	101	130	29
San Marino	8.4	6.6-10.9	1	7.8*	8	–	–	21	1	98	5
Santa Clarita	18.4	16.4-20.8	41	14.9	27	17	12	52	103	158	72
Santa Fe Springs	29.4	25.4-34.0	99	24.1	66	31	66	35	26	173	92
Santa Monica	11.9	9.9-14.4	7	12.7	20	12	1	43	83	146	53
Sierra Madre	15.0	12.8-17.7	25	12.7*	20	–	–	32	16	113	12
Signal Hill	23.4	19.4-28.4	63	27.9*	90	–	–	–	–	203	117
South El Monte	29.8	25.8-34.1	106	34.5	118	59	101	49	100	126	25
South Gate	30.1	26.1-34.5	107	30.7	109	32	70	29	5	131	32
South Pasadena	11.9	9.9-14.5	7	10.2	13	–	–	27	3	120	20
South San Gabriel	21.5	19.2-24.3	56	–	–	19	16	30	10	114	13
South San Jose Hills	31.0	27.1-35.2	114	24.7	68	26	45	29	5	93	3
South Whittier	28.0	24.5-32.0	91	29.0	97	29	54	42	75	163	78
Temple City	16.9	15.0-19.3	36	14.8	26	24	35	35	26	156	65
Torrance	17.8	15.5-20.5	40	12.5	18	15	7	39	53	145	51
Valinda	29.0	25.4-33.1	96	28.7*	94	25	42	55	105	124	24
View Park-Windsor Hills	33.0	27.3-39.6	117	26.4*	76	33	75	44	86	172	90
Vincent	27.9	24.3-31.9	89	32.2*	115	27	48	42	75	130	29
Walnut	13.9	11.9-16.3	19	12.4	17	20	20	37	36	122	21
Walnut Park	29.3	25.3-33.9	97	38.7*	119	38	82	–	–	102	8
West Athens	33.2	28.4-38.6	118	30.6	108	–	–	82	114	228	127
West Carson	22.4	19.6-25.9	57	31.4*	114	26	45	38	45	172	90
West Covina	22.4	19.8-25.5	57	21.4	55	25	42	42	75	132	33
West Hollywood	14.5	12.1-17.6	22	–	–	15	7	25	2	141	46
West Puente Valley	30.5	26.3-34.9	111	27.2	79	31	66	29	5	136	37
West Whittier-Los Nietos	29.4	25.7-33.7	99	31.1	111	36	79	38	45	136	37
Westlake Village	12.5	10.5-14.9	14	12.1*	16	–	–	–	–	92	2
Westmont	35.4	30.4-41.2	120	22.6	58	47	96	69	113	213	122
Whittier	23.6	20.7-26.9	65	23.4	64	29	54	40	58	168	84
Willowbrook	39.5	34.3-45.0	126	29.2	101	40	87	65	112	196	113

1st quartile (0-24th percentile) 2nd quartile (25th-49th percentile) 3rd quartile (50th-74th percentile) 4th quartile (75th-100th percentile)

DISCUSSION

Disparities are observed in the prevalence of child and adult obesity across cities and communities in LA County, and these disparities are strongly linked with neighborhood economic hardship. These findings are consistent with our 2007 report which also showed significant variation in the prevalence of childhood obesity across the County.[11] However, the current study expands our understanding of the obesity epidemic in several important ways:

1) The geographic variation in the prevalence of obesity seen among children in LA County is also found for adults, suggesting a common or interconnected set of factors influencing the obesity epidemic in both groups. The strong associations of adult and child obesity with neighborhood economic hardship suggest that economic disadvantage is an important driver of the epidemic across the age spectrum.
2) The obesity epidemic has real health consequences. Adult obesity correlates with mortality from diabetes, stroke, and CHD. The correlation is particularly striking for diabetes mortality, reflecting the strong connection between adult obesity and type 2 diabetes.[13]
3) Neighborhood economic hardship is strongly associated with diabetes mortality and to a lesser degree with mortality rates from stroke and CHD.

Neighborhood socioeconomic conditions shape many of the choices that are available to people. Studies have documented fewer healthy retail food outlets (e.g., full service supermarkets and smaller markets with fresh produce) and higher concentrations of unhealthy food venues (e.g., fast food restaurants and convenience stores) in low-income communities relative to more affluent communities.[14-16] A geospatial analysis in the County found that public schools located in densely commercial, lower-income neighborhoods were more likely to have fast food restaurants located nearby than those in wealthier neighborhoods.[17] In addition, residents of low-income communities, particularly those in urban settings, often have limited access to parks or recreational facilities for physical activity.[11] Results of the 2007 LACHS suggest that concerns about crime and public safety may be another important barrier to physical activity in these communities. Altogether, these environmental conditions challenge the ability of residents of disadvantaged communities to lead healthy and active lives, increasing their risk for obesity.

Even after taking economic hardship into consideration, adult obesity is still moderately associated with mortality from diabetes, stroke, and CHD. In addition, studies have shown that obesity contributes to mobility limitation and disability among older adults.[18-19] Prevention and control of obesity will reduce both morbidity and mortality related to diabetes, stroke, CHD, and overall disability, increasing wellness and longevity among the LA County population, and potentially reducing related health care costs.

Our findings have important implications for obesity prevention and control efforts. The marked geographic disparities and strong association with economic hardship highlight the importance of supplementing Countywide efforts to prevent and reduce obesity with focused interventions in low-income communities. These interventions must include not only public education but also the engagement of city policymakers and their community constituents to address the underlying social and environmental conditions that contribute to physical inactivity and poor nutrition.

DISCUSSION, CONTINUED

A number of anti-obesity efforts are currently underway in the County. The Department of Public Health received a two-year $15.9 million grant in 2010 from the Centers for Disease Control and Prevention to improve nutrition, increase physical activity, and reduce obesity in the County, particularly in communities most impacted by the epidemic. The focus of the project, RENEW LA County (see page 12), is on policy, systems, and environmental change strategies to **make the healthy choice the easy choice** in communities where conditions often make these choices very difficult. The success and sustainability of this project and related efforts in the County will depend upon the participation of a broad range of stakeholders, including local residents and community organizations, schools, cities, other public agencies, public and private employers, and the health care community.

RECOMMENDATIONS^
To Address the Obesity Epidemic

Cities:

- Prioritize parks and other green space in land-use decisions
- Support community recreation programs
- Develop and implement pedestrian and bicycle master plans
- Promote mixed-use development
- Increase public transit options and improve bicycle access between transit stations and surrounding communities
- Create incentives (e.g. streamlining permitting, finding spaces, reducing fees)
  - For restaurants that offer healthy food items and encourage provision of calorie and nutrition information on menus and menu boards
  - For full service supermarkets, farmers' markets, and other businesses that offer affordable, fresh produce
- Promote community gardens
- Establish nutrition standards for foods and beverages purchased by and distributed in city programs or at city facilities

Communities:

- Participate in your city's land-use policy and planning meetings
- Organize walking groups, community bike rides, and other recreational activities
- Promote healthier food options (e.g., outreach to local merchants such as corner store owners and support farmers' markets and community gardens)

RECOMMENDATIONS, CONTINUED

Schools:

- Ensure compliance with state physical education requirements
- Establish joint-use agreements to provide community access to school recreational facilities during non-school hours
- Participate in Safe Routes to School Program to encourage walking and biking to school
- Implement 2009 Institute of Medicine nutrition recommendations for school meals: limit calories; increase fruits, vegetables, and whole grains; and reduce salt
- Ensure compliance with state and federal nutrition requirements on foods and beverages sold in vending machines and other school venues
- Implement new state and federal laws requiring free drinking water in eating areas
- Improve participation in the School Breakfast Program by offering breakfast in the classroom or during recess
- Prohibit marketing of unhealthy foods and beverages on school campuses
- Incorporate skills-based nutrition education into the curriculum using state content standards

Employers:

- Include health benefits that provide incentives for physical activity and healthy eating
- Promote exercise breaks and walking groups
- Provide worksite lactation accommodation policies and programs
- Promote healthy eating in the workplace (e.g., healthy food options in vending machines and when food is served at meetings)
- Serve as a hub for healthy community activities (e.g. host a farmers' market)
- Promote employee wellness programs beyond private employers, instituting programs in schools, cities, and other public agencies to model healthy behaviors to children

Health Care Providers:

- Include body mass index as a part of all physical exams
- Counsel all adults and children who fall into overweight or obese categories
- Establish a referral network (e.g., nutrition counseling; consider group classes and peer-support networks)
- Provide community leadership (e.g., testify at city council meetings, participate in community organizing efforts)

^ This list of recommendations was developed from publications by the Centers for Disease Control and Prevention, the Institute of Medicine and the California Department of Health Services, as well as other leading health organizations.[20-22]

RENEW L.A. County *(**R**enew **E**nvironments for **N**utrition, **E**xercise, and **W**ellness) seeks to implement policy, systems and environmental changes to improve nutrition, increase physical activity and reduce obesity, especially in disadvantaged communities. RENEW L.A. County is made possible by funding from the Department of Health and Human Services through the Los Angeles County Department of Public Health.*

RENEW Community Action Plan Objectives[1]

1. Adopt policies and/or implement environmental changes to increase access to healthy foods and beverages and/or decrease access to sugar-sweetened beverages in eight cities with childhood obesity rates above the county average.

2. Develop and/or implement venue-based food procurement policies in at least five County of Los Angeles program/agencies.

3. Adopt and/or implement food policies to improve the nutritional content of school meals in at least four Los Angeles County school districts, including the Los Angeles Unified School District.

4. Implement policy guidelines in at least 60 preschools in low-income communities in the Los Angeles Universal Preschool network of providers to increase access to healthy foods/beverages, reduce access to unhealthy foods/beverages, and increase opportunities for physical activity.

5. Adopt and implement policies to support breastfeeding in three county hospitals, eight county departments, and two large private employers.

6. Increase teacher capacity to implement physical education requirements at 50-70 public schools in Los Angeles County with high rates of childhood obesity, impacting 25,000-35,000 students.

7. Adopt or strengthen joint-use policies in five school districts and establish joint-use agreements at ten schools in communities with few recreational venues to increase opportunities for free or low-cost physical activity during non-school hours.

8. Adopt land-use and/or transportation policies to increase pedestrian activity and biking in the City of Los Angeles, eight other cities, and the unincorporated areas of the county.

www.choosehealthla.com

[1] All RENEW Objectives to be completed by March 2012.

INFORMATION ON THE WEB

LOCAL

Los Angeles County Department of Public Health, www.publichealth.lacounty.gov
Health Assessment Unit, www.publichealth.lacounty.gov/ha
Epidemiology Unit, www.publichealth.lacounty.gov/epi
Data Collection and Analysis Unit, www.publichealth.lacounty.gov/dca

- These 3 units compose the **Office of Health Assessment and Epidemiology**. They work to ensure the availability of high-quality, comprehensive health data about the Los Angeles County population, and facilitate its use for public health assessment, policy development, and program planning and evaluation.

Division of Chronic Disease and Injury Prevention, www.publichealth.lacounty.gov/chronic

- The Division works to improve health and decrease health disparities in Los Angeles County by reducing the occurrence, severity, and consequences of chronic diseases and injuries. Its Nutrition Program, PLACE Program, and Physical Activity and Cardiovascular Health Program work closely with local communities and other agencies on obesity prevention and control.

STATE

California Department of Public Health, www.cdph.ca.gov
California Obesity Prevention Program, www.cdph.ca.gov/programs/COPP

- The program works towards the goal of increasing physical activity, improving nutrition, and preventing obesity among all Californians.

California Project Lean, www.californiaprojectlean.org

- The project works to increase opportunities for healthy eating and physical activity in communities across California to reduce the prevalence of obesity and chronic diseases such as heart disease, cancer, stroke, osteoporosis, and diabetes.

California Active Communities, www.caactivecommunities.org

- The organization works through strategic alliances with key stakeholders to create opportunities for safe, everyday physical activity through environmental and policy change strategies.

NATIONAL

Centers for Disease Control and Prevention, www.cdc.gov
Division of Nutrition, Physical Activity and Obesity www.cdc.gov/nccdphp/dnpao

- The Division takes a public health approach to address the role of nutrition and physical activity in improving the public's health and preventing and controlling chronic diseases.

Let's Move, www.letsmove.gov

- It is a comprehensive initiative, launched by First Lady Michelle Obama, dedicated to solving the challenge of childhood obesity within a generation, so that children born today will grow up healthier and be able to pursue their dreams.

ObesityInAmerica.Org, www.obesityinamerica.org

- It serves as the one-stop clearinghouse for the general public and reporters seeking information on the key scientific trends and advancements that may one day lead to a slimmer, fitter America, across all demographic lines.

APPENDIX

Estimating Obesity Prevalence among Adults

A model-based small area estimation (SAE) method was used to calculate adult obesity rates at the city/community level. Among the data sources used in the estimation, the LACHS provided data on individual weight, height, and demographic characteristics. Neighborhood characteristic variables were extracted from the Census. PEPS data provided population counts for cities and communities of interest.

The SAE method started with modeling obesity prevalence in association with individual demographics and neighborhood characteristics. Based on self-reported weight and height data, body mass index (BMI) was calculated. Adults (18+ years old) with a BMI ≥ 30 kg/m^2 were considered obese.[9] In the 2007 LACHS, respondents who initially reported 'Do not know' or 'Refused' to weight or height questions were further queried by a set of follow-up questions with regard to weight or height cut-offs, which were then categorized as obese, overweight, normal weight, or underweight. Notably, the overall County prevalence reported here is slightly different from that reported elsewhere because the follow-up questions were not previously taken into consideration. Individual demographics included in the modeling were age, sex, race/ethnicity, and household income. Neighborhood characteristics were selected from variables representing neighborhood population composition, citizenship, language proficiency, income, education attainment, and housing occupancy. The associations were assessed via logistic regression models with adjustment for survey sampling weights.

The associations established at the County level were then used to calculate the number of obese adults by applying regression model estimates to the PEPS data. To calculate obesity prevalence for the cities and communities of interest, the estimated number of obese persons were divided by the population count. A bootstrapping method was used to estimate 95% confidence intervals (95% CI).

Due to limited accuracy of population counts for small cities and communities, estimates for areas with a population size less than 5,000 are not presented. These cities are: **Avalon, Bradbury, Hidden Hills, Industry, Irwindale, Rolling Hills**, and **Vernon**; and communities are: **Desert View Highlands, Ladera Heights, Mayflower Village, North El Monte**, and **West Compton**. Additionally, the communities of **Acton, Littlerock**, and **Val Verde** have non-discrete boundaries, prohibiting small area estimation.

The Economic Hardship Index

The index is scored by combining six indicators:

1. crowded housing (percent occupied housing units with more than one person per room)
2. percent of persons living below the federal poverty level
3. percent of persons over the age of 16 years who are unemployed
4. percent of persons over the age of 25 years without a high school education
5. dependency (percent of the population under 18 or over 64 years of age)
6. per capita income

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Acknowledgments: Special thanks to Hongjian Yu, PhD of the UCLA Center for Health Policy Research for his assistance in developing the methodology; and to Loren Lieb, Matthew Redelings, and Sun Lee from the Data Collection and Analysis Unit for their assistance with providing the mortality data.

Suggested Citation: Los Angeles County Department of Public Health, Office of Health Assessment and Epidemiology. *Obesity and Related Mortality in Los Angeles County: A Cities and Communities Health Report*; September 2011.