Orange County
Geographic Health Profile:
Birth Indicators (2000–2010)

Orange County
HEALTH CARE AGENCY
Mark Refowitz, Director

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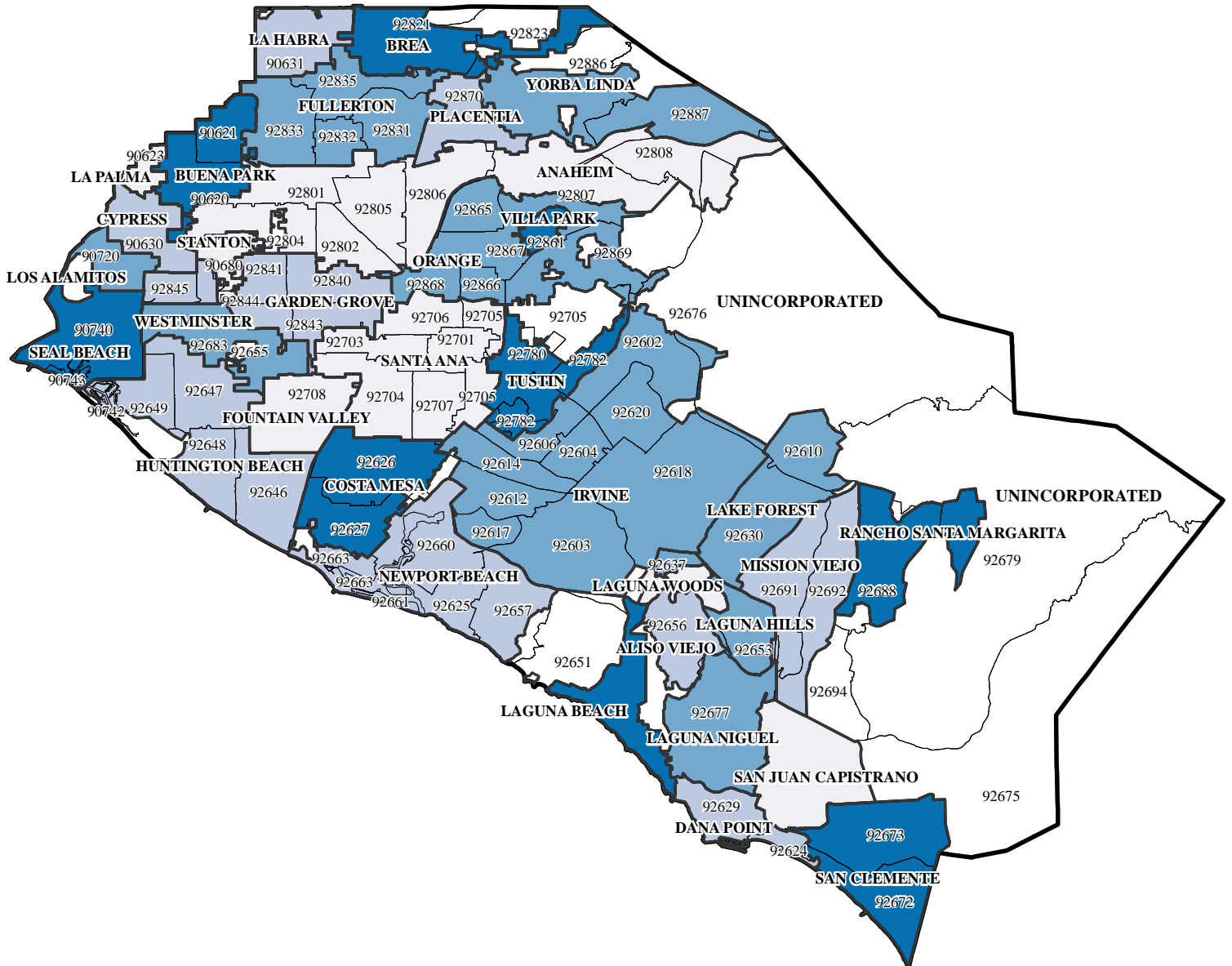David D. Thiessen, MS, Chief

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Orange County ZIP Codes & Cities

LA HABRA
90631

92821
BREA
92823
92886
92835
92870
YORBA LINDA
FULLERTON
PLACENTIA
92887
90621
92833
92831
92832
90623
92808
LA PALMA
BUENA PARK
ANAHEIM
92801
90620
92806
92807
CYPRESS
92805
92865
VILLA PARK
90630
92861
92869
STANTON
92804
92802
92867
UNINCORPORATED
90720
92868
92866
92676
90680
92841
ORANGE
LOS ALAMITOS
92840
92845
92844
GARDEN GROVE
92602
92843
92706
92705
92780
90740
92683
92701
92782
SEAL BEACH
92655
TUSTIN
90743
SANTA ANA
92620
90742
92649
92647
92703
92782
92648
92708
92704
92707
92705
92606
92604
HUNTINGTON BEACH
92626
92614
92618
92646
COSTA MESA
92612
IRVINE
92610
92627
92617
92603
LAKE FOREST
92660
92630
RANCHO SANTA MARGARITA
92663
NEWPORT BEACH
92637
MISSION VIEJO
92688
UNINCORPORATED
92663
LAGUNA WOODS
92691
92692
92661
92625
92657
92656
LAGUNA HILLS
92679
92651
ALISO VIEJO
92653
92694
LAGUNA BEACH
92677
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
92629
92675
DANA POINT
92673
92624
SAN CLEMENTE
92672

Orange County Geographic Health Profile: Birth Indicators (2000—2010)

Table of Contents

Birth Indicators

Introduction

Birth plays a major role in the formulation, implementation, and dispersion of health care, as well as social and economic services. One of the major goals of health services is to promote a risk free and positive birth outcome, and to minimize the cost resulting from complications of pregnancy and birth. This report presents data on births and birth rates and selected maternal and infant health characteristics for Orange County, California. The findings are based on all registered vital records occurring in calendar year 2010, which were received and processed by the California Department Public of Health. Specific birth indicators presented in this report include birth rate, fertility rate, births to adolescent mothers, pre-term birth rates, low birth weight, prenatal care, deliveries by cesarean section, breastfeeding initiation and infant mortality. The goal of this report is to identify disparities and areas of need wherever they might exist in order to improve birth outcomes for all Orange County babies.

California and Orange County trend data for selected birth indicators from 2000 to 2010 were obtained using registered vital records from the California Department of Public Health (CDPH). Birth rate, fertility rate, and adolescent birth rate for 2000 through 2010 shown in this report have been revised using Department of Finance population estimates based on the 2000 and 2010 Census, to provide for more accurate rates for the period. National trend data for selected birth indicators from 2000 to 2010 were obtained using National Vital Stats from the Centers for Disease Control and Preventions (CDC). Wherever possible, additional comparisons are made using statewide and national data and Healthy People 2010 and 2020 national objectives.

All birth indicators with city breakout tables, ZIP code maps and subgroup tables (maternal race/ethnicity and maternal age) were based on 2010 birth data. City and ZIP code data were based on mother's residence at time of the birth of their baby. In some situations, the data in a geographic area or other breakout may have a very small sample size, which can make the data unstable and thus, should be interpreted with caution. When this was the case, or if data were missing for a geographic area, the impacted area was not included in the tables or noted on the maps. Typically, data were suppressed if there were less than 25 cases, or in the case of rate calculations, the denominator was less than 25 residents. Data for sites with zero cases were not suppressed provided the denominator was 25 or greater.

Mapping software, Arc Geographic Information System (ArcGIS) from ESRI, was used with city and ZIP code boundaries for Orange County provided by NAVTEQ. NAVTEQ distinguishes ZIP codes for unique organizations and post office boxes as points on the map without geographic boundaries. For example, the University of California, Irvine (ZIP code 92697) is designated as a unique organization by NAVTEQ. Thus, birth data for this ZIP code and other unique organizations and P.O. Boxes classified by NAVTEQ as points do not appear in the maps in this report.
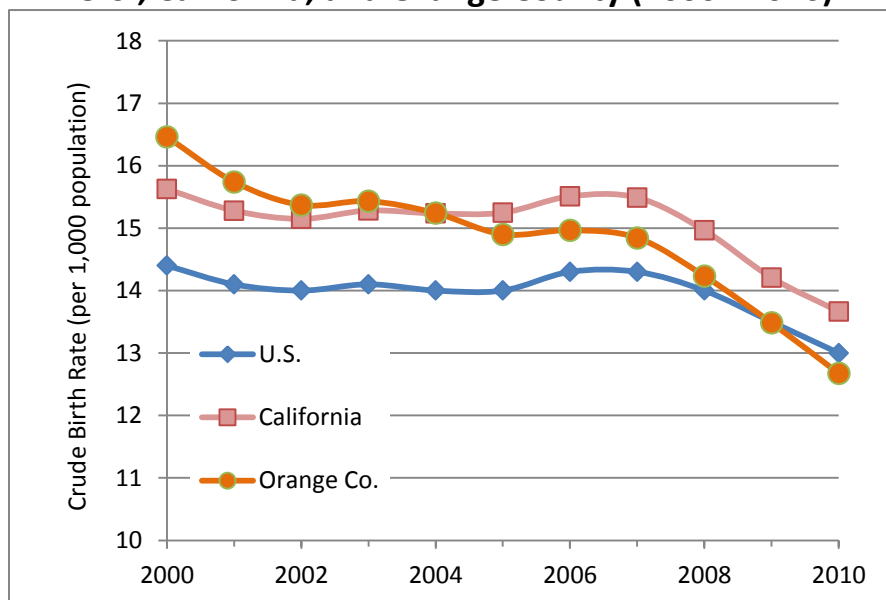
Birth Rate

Description of Indicator: This indicator, also referred to as the crude birth rate, is based on the number of live births as a proportion of the total population (number of births in a year per 1,000 residents). A live birth is defined as the complete expulsion or extraction from its mother of a newborn (irrespective of the duration of gestation) which, after such separation, exhibits any sign of life, such as respiration, heartbeat, umbilical pulsation, or movement of voluntary muscles. A live birth is not always a viable birth. This definition was formulated by the World Health Organization (WHO) in 1950, and is set forth in the California Administrative code, Title 17, Chapter 1, Article 3.

Importance: The birth rate is a predictor of population growth for a specific geographic area, especially when compared to the death rate.

Trends: National, state and county birth rates did not change much in the first part of the decade, however, birth rates started to trend down starting from 2008, which was the onset of the Great Recession.[1] By 2010 the U.S., California and Orange County all saw a ten year low in birth rates. The national birth rate dropped 10% from 2000 (14.4 births per 1,000 population) to 2010 (13.0 per 1,000 population). California's birth rate dropped 12% from 15.6 births per 1,000 population in 2000 to 13.7 per 1,000 population in 2010. In 2010, there were 38,237 births to Orange County residents. Orange County's birth rate saw the largest decline of 23%, from 16.5 births per 1,000 population in 2000 to its lowest rate of 12.7 per 1,000 population in 2010. At the beginning of the decade, Orange County's birth rate was well above both national and state rates. After 2004, however, Orange County's birth rate dropped below California's birth rate, and by 2010 it also dropped below the national birth rate (**Figure 1**).

Figure 1: Crude Birth Rate
U.S., California, and Orange County (2000 - 2010)

Geography: The geographic distribution of Orange County's birth rate provides an important view regarding where most births are occurring, allowing for more accurate distribution of resources and education efforts. The table at right summarizes the birth rate per 1,000 residents by the birth mother's city of residence.

In 2010, nearly one in three (31%) births in Orange County were to mothers residing in the two cities of Santa Ana (16.3%; n=6,232) or Anaheim (14.4%; n=5,492). These two cities also had the highest birth rates with 19.2 births per 1,000 residents in Santa Ana, followed by Anaheim with 16.3 births per 1,000 residents. Laguna Woods, a retirement community, had the lowest birth rate at 0.3 per 1,000 residents (**Table 1**).
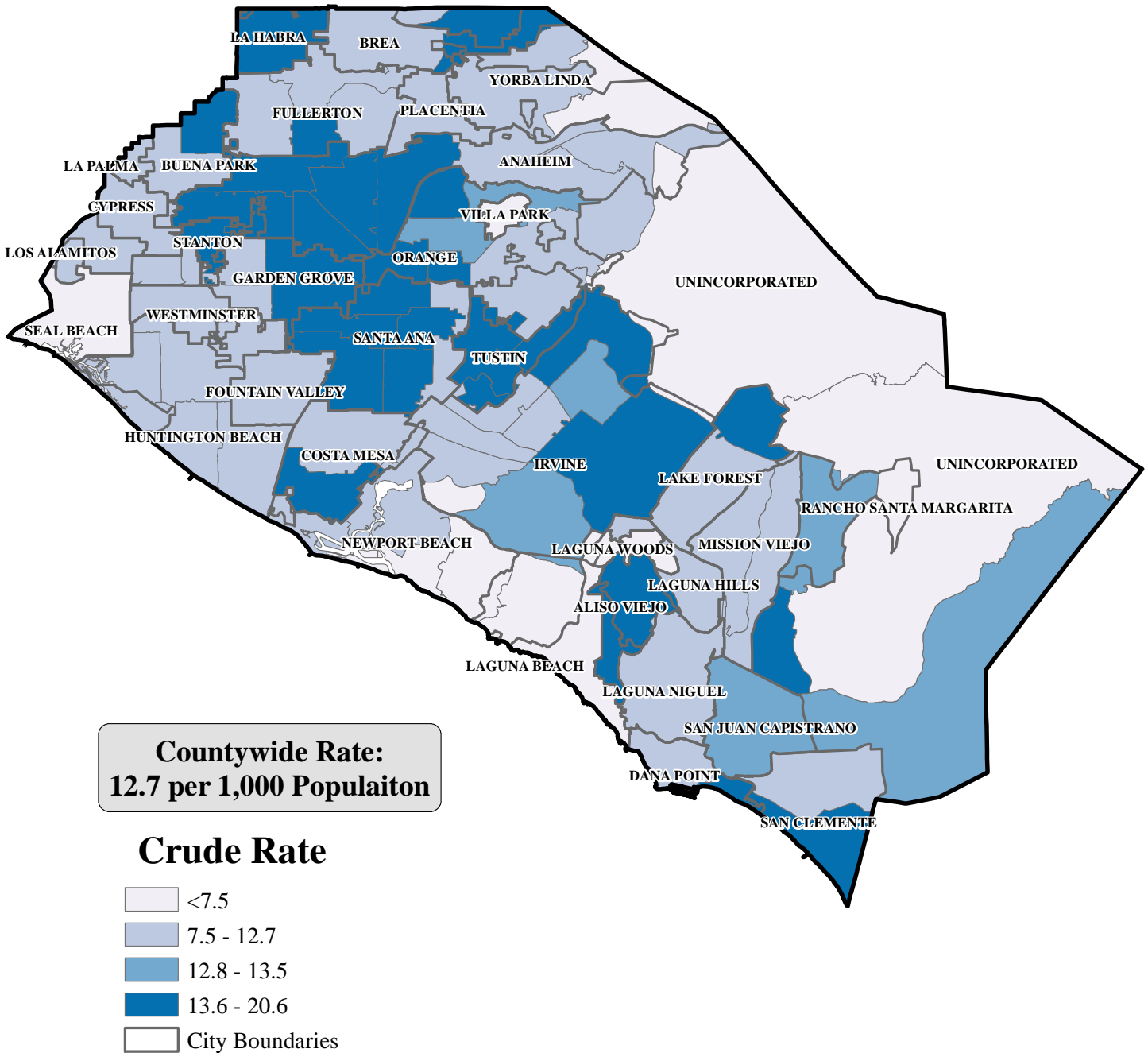
The map on the following page presents the birth rate by ZIP code of residence in 2010 for Orange County. When compared across ZIP codes, the rate ranged from a high of 20.7 per 1,000 residents for ZIP code 92701 in Santa Ana to a low of 4.4 births per 1,000 residents in Balboa Island ZIP code 92662.

Table 1: Crude Birth Rate by City (2010)

City	Birth Rate per 1,000 Population
Santa Ana	19.2
Anaheim	16.3
San Clemente	15.6
Tustin	15.6
Aliso Viejo	15.0
La Habra	14.4
Costa Mesa	14.2
Orange	13.9
California	13.7
Garden Grove	13.7
Los Alamitos	13.4
San Juan Capistrano	13.1
United States	13.0
Buena Park	13.0
Orange County	12.7
Stanton	12.6
Placentia	12.6
Rancho Santa Margarita	12.0
Irvine	11.7
Brea	11.5
Fullerton	11.2
Unincorporated	11.2
Westminster	10.7
Huntington Beach	10.3
Laguna Hills	9.8
Dana Point	9.6
Laguna Niguel	9.4
Mission Viejo	9.2
Cypress	9.0
Lake Forest	8.7
Yorba Linda	8.7
La Palma	8.6
Fountain Valley	7.9
Newport Beach	7.5
Laguna Beach	7.2
Seal Beach	5.2
Villa Park	4.5
Laguna Woods	0.3

Orange County Crude Birth Rate (2010)
Rate per 1,000 Population

Countywide Rate: 12.7 per 1,000 Populaiton

Crude Rate

- <7.5
- 7.5 - 12.7
- 12.8 - 13.5
- 13.6 - 20.6
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: Hispanics, with half (49.5%) of all births in 2010, had the highest birth rate at 18.7 per 1,000 population. This was the only racial/ethnic group to have a higher birth rate than the countywide birth rate of 12.7 per 1,000 population and the California birth rate of 13.7 births per 1,000 population. Asian/Pacific Islanders had the next highest birth rate of 12.1 per 1,000 population. The birth rate among Blacks was 11.1 per 1,000. Whites, while having nearly one-third of all births (30.6%), had the lowest birth rate, of the four main groups, at 8.8 per 1,000 population (**Table 2**).

Table 2: Crude Births by Maternal Race/Ethnicity (2010)

	Number of Births	% of Births	Population (2010)	Rate/1,000 population
Hispanic	18,930	49.5%	1,012,973	18.7
Asian/PI	6,551	17.1%	540,834	12.1
Black	489	1.3%	44,000	11.1
White	11,711	30.6%	1,328,499	8.8
Other/Unknown	556	1.5%	83,926	6.6
Countywide 2010	**38,237**	**100.0%**	**3,010,232**	**12.7**
Statewide 2010				**13.7**
HP 2010				**N/A**
HP 2020				**N/A**

Maternal Age Groups: In 2010, the vast majority of births occurred among women ages 20-39 years (88.8%; n=33,983), with birth rates ranging from 30.1 to 54.7 per 1,000 population for this age group (**Table 3**). Women 30-34 years had the highest percentage of births (28.3%) and the highest birth rate (54.7 per 1,000 population). The birth rate for females 40+ years of age was the lowest at 1.3 per 1,000 population and accounted for only 4.5% of all births, followed by females under 20 years of age with 3.0 births per 1,000 population (**Table 3**).

Table 3: Crude Births by Maternal Age Group (2010)

|	Number of Births	% of Births	Population (2010)	Rate/1,000 population
Under 20 years	2,515	6.6%	828,442	3.0
20-24 years	6,431	16.8%	213,691	30.1
25-29 years	10,082	26.4%	215,396	46.8
30-34 years	10,839	28.3%	198,168	54.7
35-39 years	6,631	17.3%	213,591	31.0
40+ years	1,732	4.5%	1,340,945	1.3
Unknown	7	0.0%	0	-
Countywide	**38,237**	**100.0%**	**3,010,232**	**12.7**

Fertility Rate

Description of Indicator: The fertility rate measures the proportion of live births occurring per 1,000 females between 15 to 44 years of age in a particular year.

Importance: The fertility rate is a more precise measure of tracking birth rate patterns than the crude birth rate. While the crude birth rate and the fertility rate both look at the total number of live births among the population, the crude birth rate is calculated using the total population including the young, old, male and female. Fertility rate is calculated using only females of reproductive age – defined as ages 15 through 44 years. The result is a more sensitive indicator with which to study population growth and change.

Trends: In the first half of the decade, the fertility rate in the U.S. and California showed a slight increase, while in Orange County the rate remained relatively level after a peak in 2000. With the onset of the Great Recession in 2008, however, the fertility rates for all three declined markedly to reach the ten year low in 2010 (**Figure 2**). In 2010, the U.S. fertility rate declined to its ten year low of 64.1 per 1,000 women aged 15-44, 3% less than in 2000 and 8% less than the peak fertility rate in 2007 (69.3). California's fertility rate has declined 8% since 2000, and down 11% from a small peak in 2007 (72.2 per 1,000 females, 15-44 years; **Figure 2**). Orange County's fertility rate has decreased even more substantially. In 2010, Orange County's fertility rate was 59 per 1,000 females 15-44 years, down 18% from 2000 (71.8 births per 1,000 females 15-44 years).

Figure 2: Fertility Rate
U.S., California, and Orange County (2000 - 2010)
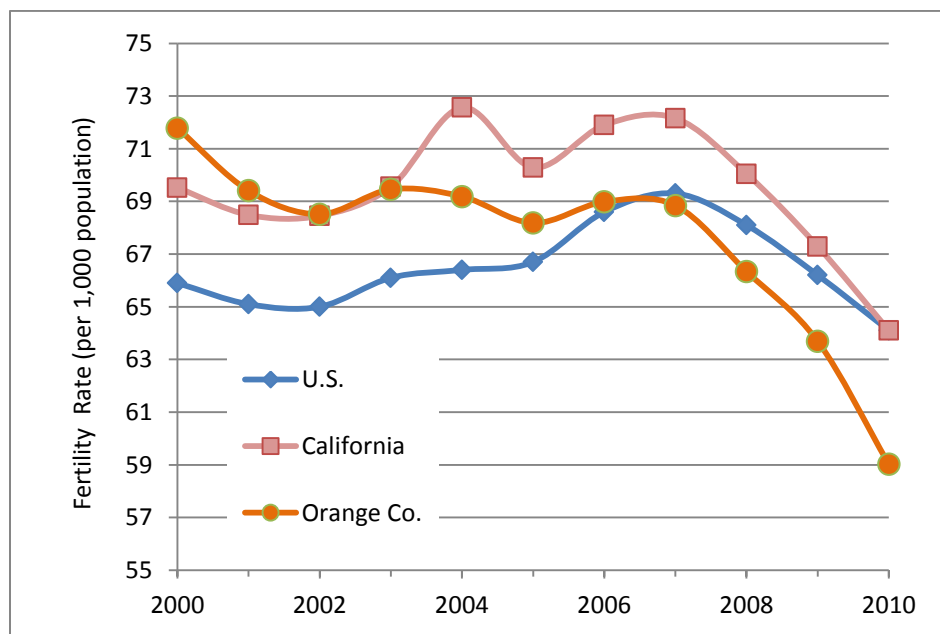
Geography: The geographic distribution of Orange County's fertility rate provides an important view regarding where births are occurring to female residents 15 to 44 years of age. **Table 4** at right summarizes the birth rate per 1,000 female residents 15 to 44 years of age by city of residence.

Fertility rates ranged from a high of 83.7 for San Clemente to a low of 3.4 births per 1,000 females 15-44 years for Laguna Woods. San Clemente and five other cities maintained fertility rates well above the 2010 rates of the national and state levels (both 64.1 per 1,000 females 15-44 years). Laguna Woods and the other cities with low fertility rates included some of the more affluent cities in the county such as Villa Park (32.1), Newport Beach (39.9), Seal Beach (41.1) and Fountain Valley (42.7).
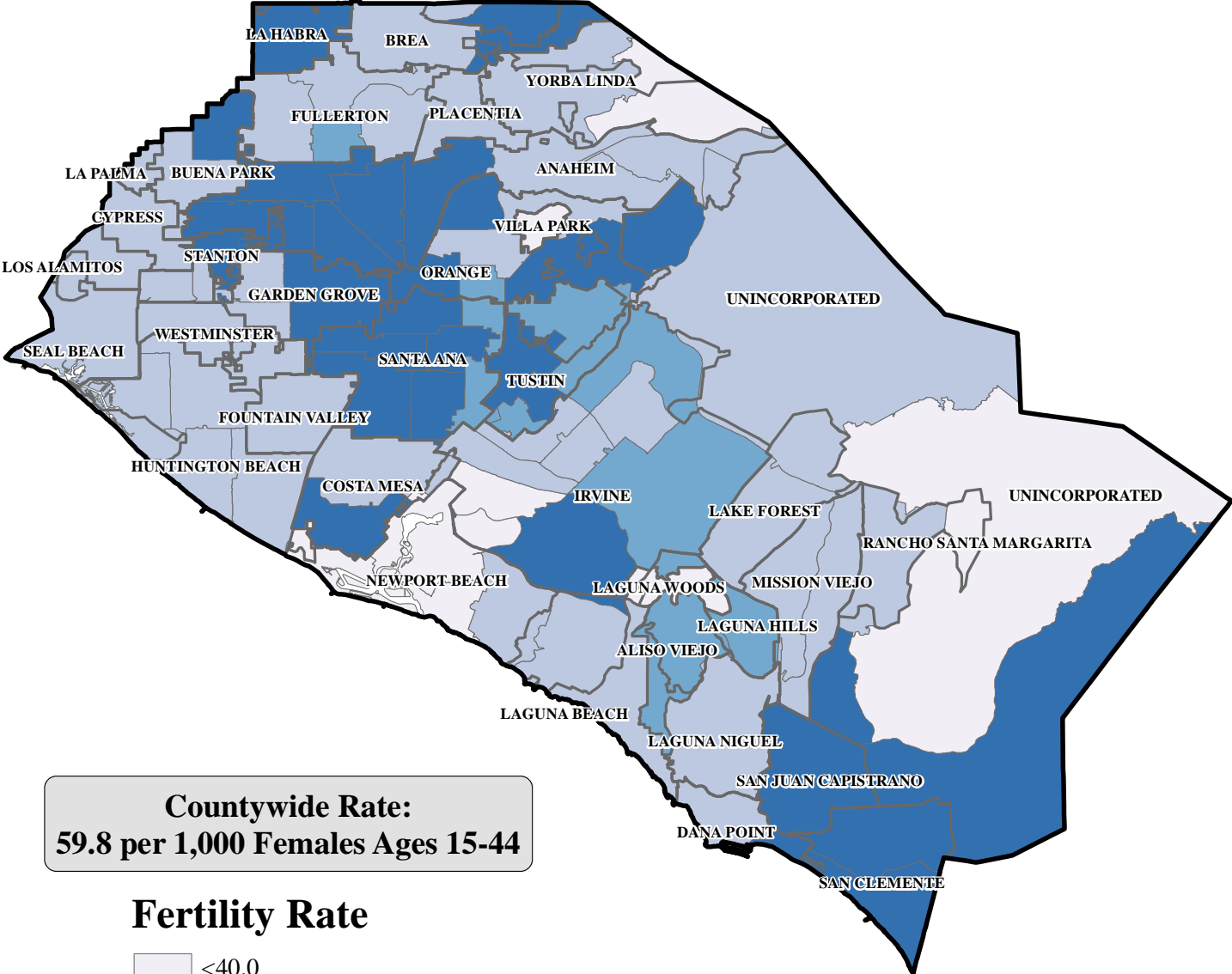
The map on the following page presents the 2010 fertility rate by ZIP code of residence for females 15 to 44 years of age. The ZIP code with the lowest fertility rate was 92617 in Irvine with a fertility rate of 16.1 births per 1,000 female residents 15-44 years of age. San Clemente ZIP code 92672 had the highest fertility rate of 99.5 births per 1,000 female residents 15-44 years of age.

Table 4: Fertility Rate by City (2010)

City	Fertility Rate per 1,000 Females, 15-44 Years
San Clemente	83.7
Santa Ana	82.9
San Juan Capistrano	74.6
Anaheim	72.9
Tustin	66.0
La Habra	65.7
United States	**64.1**
California	**64.1**
Orange	64.0
Los Alamitos	63.5
Garden Grove	63.4
Aliso Viejo	60.2
Placentia	60.1
Buena Park	60.0
Orange County	**59.8**
Unincorporated	59.3
Costa Mesa	59.2
Stanton	57.4
Brea	55.7
Dana Point	54.9
Rancho Santa Margarita	54.7
Westminster	53.0
Laguna Niguel	52.1
Laguna Hills	51.9
Huntington Beach	51.4
Mission Viejo	51.0
Fullerton	49.4
Yorba Linda	47.9
Irvine	46.5
Laguna Beach	45.5
Cypress	44.6
La Palma	44.2
Fountain Valley	42.7
Lake Forest	42.4
Seal Beach	41.1
Newport Beach	39.9
Villa Park	32.1
Laguna Woods	3.4

Orange County Fertility Rate (2010)
Rate per 1,000 Females Ages 15-44

LA HABRA
BREA
YORBA LINDA
FULLERTON
PLACENTIA
LA PALMA
BUENA PARK
ANAHEIM
CYPRESS
VILLA PARK
STANTON
LOS ALAMITOS
GARDEN GROVE
ORANGE
UNINCORPORATED
WESTMINSTER
SEAL BEACH
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
IRVINE
LAKE FOREST
UNINCORPORATED
RANCHO SANTA MARGARITA
NEWPORT BEACH
LAGUNA WOODS
MISSION VIEJO
LAGUNA HILLS
ALISO VIEJO
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE

Countywide Rate:
59.8 per 1,000 Females Ages 15-44

Fertility Rate

|	
	<40.0
	40.0 - 59.8
	59.9 - 63.3
	63.4 - 99.8
	City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: The fertility rate within race/ethnicity (**Table 5**) had a slightly different distribution than that of the crude birth rates in **Table 2**. Hispanic women had the highest fertility rate of 76.2 per 1,000 live births among women 15-44 years of age. Unlike crude birth rate, Blacks had a slightly higher fertility rate (52.0 per 1,000) than Asian/Pacific Islanders (51.4 per 1,000). Whites had the lowest fertility rate of 49.7 per 1,000 live births among women 15-44 years of age.

Table 5: Fertility Rate, Females 15 to 44 Years, by Maternal Race/Ethnicity (2010)

|	Number of Births	% of Births	Female Population (15-44 years)	Rate/1,000 Females 15-44 years
Hispanic	18,930	49.5%	248,322	76.2
Black	489	1.3%	9,398	52.0
Asian/PI	6,551	17.1%	127,416	51.4
White	11,711	30.6%	235,746	49.7
Other/Unknown	556	1.5%	18,142	30.6
Countywide 2010	**38,237**	**100.0%**	**639,024**	**59.8**
Statewide 2010				**64.1**
HP 2010				**N/A**
HP 2020				**N/A**
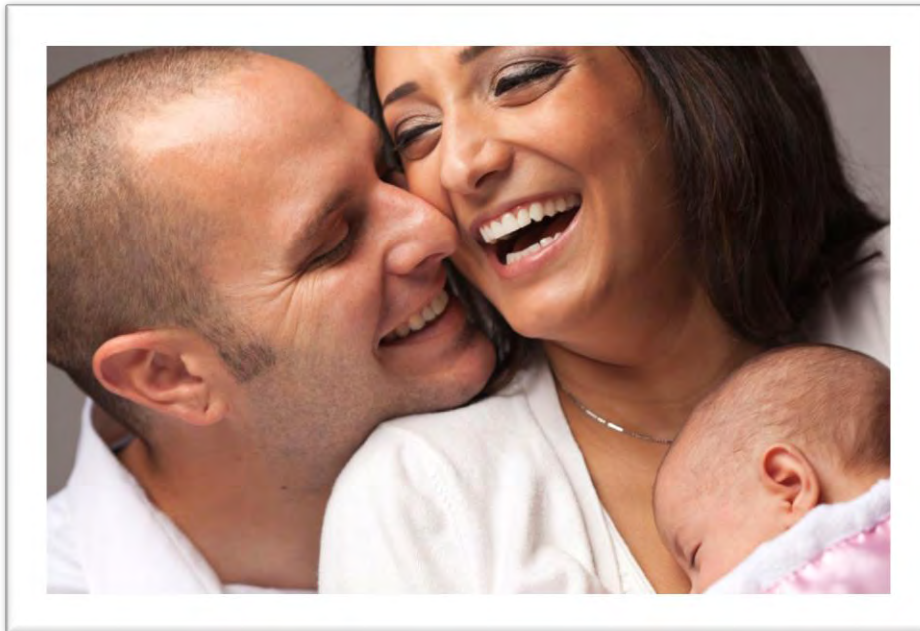
Births to Adolescent Mothers

Description of Indicator: Adolescent birth rates are defined in this report as the number of live births per 1,000 adolescent females aged 15 to 19 years.

Importance: Births to adolescent mothers are considered not only medically risky, but also a social burden.[2] These births pose medical and social problems for the mother, as well as her infant and the community. For example, adolescent mothers are less likely to get or stay married, less likely to complete high school or college, and more likely to require public assistance.[3]

Trends: Births to adolescent females have been systematically decreasing over the past decade, at the national, state, and local levels (after remaining somewhat level for a couple of years, mid-decade). The U.S. adolescent birth rate dropped 28% over the decade and was 34.2 per 1,000 females 15-19 years in 2010. Similarly, the rate in California has dropped 33% since 2000 and was 31.5 per 1,000 females 15-19 years in 2010. In 2010, approximately 6% (n=2,479) of the total births in Orange County were to females 15-19 years of age. In the past decade, Orange County's birth rates for females 15-19 years have been consistently below the national and state adolescent birth rates. Orange County started with a lower adolescent birth rate of 38.3 in 2000 and has experienced the largest drop of 42% for a ten year low of 22.4 births per 1,000 females 15-19 years of age (**Figure 3**). There are no Healthy People 2010 or 2020 objectives for adolescent birth rates.

Figure 3: Adolescent Births (Females, 15-19 years) U.S., California, and Orange County (2000 - 2010)
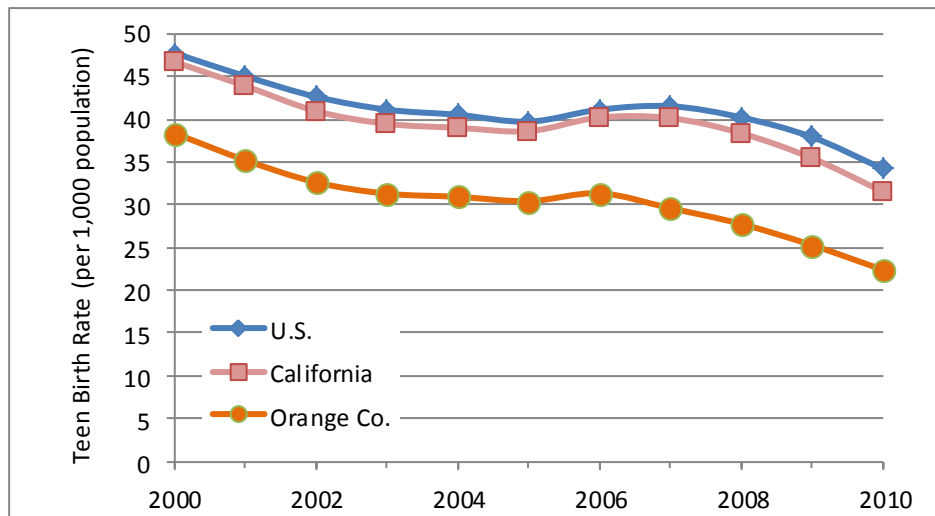
Geography: The geographic distribution of Orange County's births to adolescent mothers provides an important overview of where these babies are being born, allowing for more accurate distribution of resources, prevention and education efforts. **Table 6** at right summarizes the adolescent birth rate (females 15 to 19 years) in 2010 by mother's city of residence. Substantial variations in adolescent birth rates occur across Orange County.

Orange County had a wide range of adolescent birth rates in 2010, from 53.5 births per 1,000 females 15-19 years of age in Santa Ana to a low of zero adolescent births in Villa Park and Laguna Woods. Nine cities, with higher adolescent birth rates than the county-wide rate of 22.4, were located in North and Central Orange County. The cities with the lowest adolescent birth rates included some of the more affluent cities such as Villa Park, Laguna Woods, Newport Beach (1.9), Seal Beach (2.1), and Irvine (2.4).
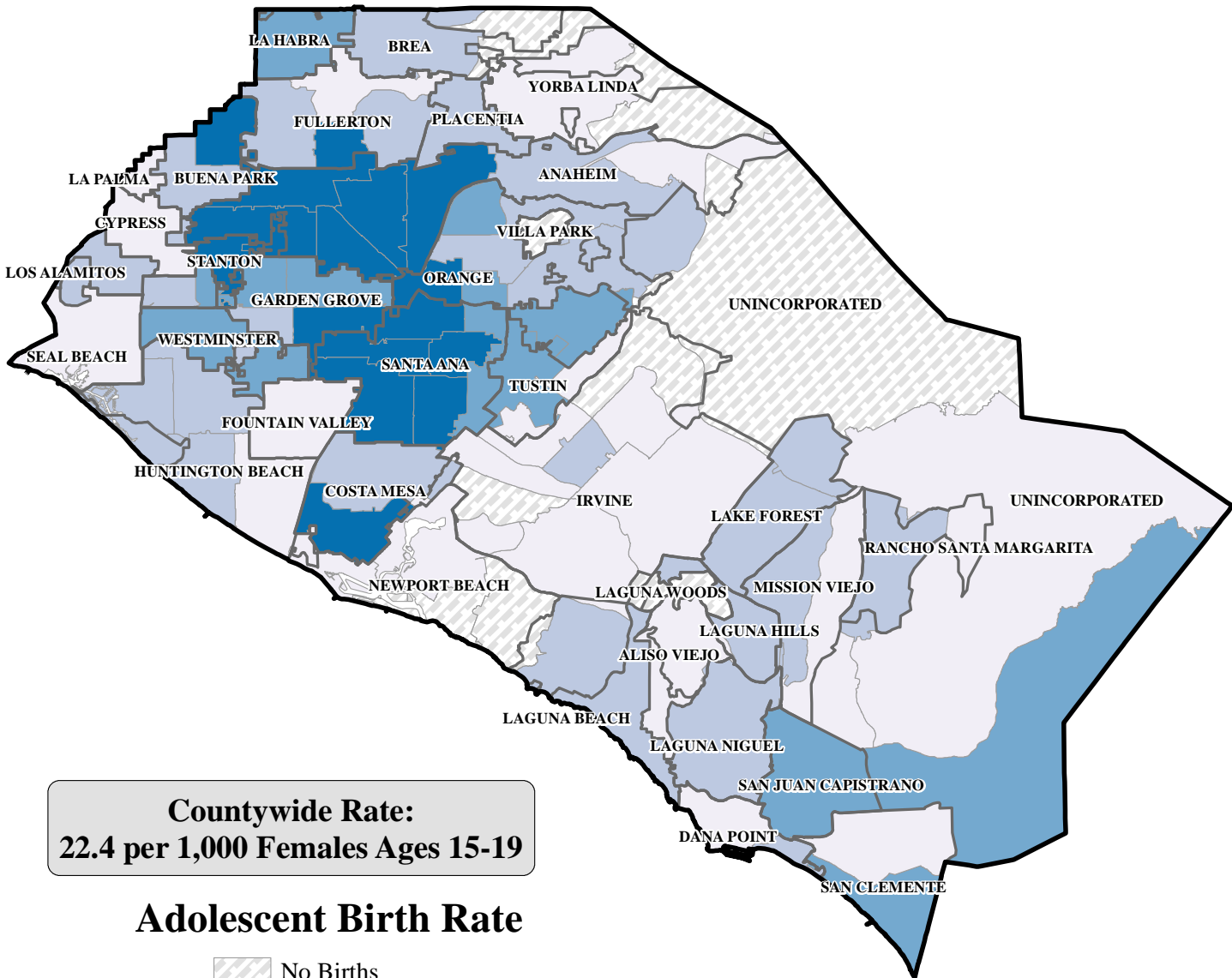
The map on the following page presents 2010 birth rate to adolescent mothers 15 to 19 years of age by ZIP code of residence. When examined across ZIP codes, twelve ZIP codes in the cities of Irvine (92602, 92697), Laguna Woods (92637), Newport Beach (92657, 92661, and 92662), Villa Park (92861), Yorba Linda (92887), and unincorporated areas had zero adolescent births. The ZIP codes 92701 and 92703 in Santa Ana had the highest adolescent birth rates of 65.1 and 60.6 births per 1,000 females, age 15-19, respectively.

Table 6: Births to Adolescents by City (2010)

City	Adolescent Birth Rate per 1,000 Females, 15-19
Santa Ana	53.5
Anaheim	41.2
United States	34.2
La Habra	32.9
Stanton	32.7
California	31.5
Garden Grove	27.9
Costa Mesa	25.6
Tustin	24.9
Orange	23.5
Westminster	22.9
Orange County	22.4
Buena Park	22.0
Placentia	21.3
San Juan Capistrano	20.3
San Clemente	18.6
Fullerton	17.1
Los Alamitos	16.2
Laguna Hills	13.6
Lake Forest	12.5
Huntington Beach	11.9
Rancho Santa Margarita	9.5
Brea	9.0
Laguna Beach	7.5
Mission Viejo	7.5
Dana Point	7.5
Laguna Niguel	7.4
Fountain Valley	7.0
La Palma	7.0
Cypress	6.2
Aliso Viejo	4.7
Unincorporated	4.4
Yorba Linda	3.9
Irvine	2.4
Seal Beach	2.1
Newport Beach	1.9
Laguna Woods	0.0
Villa Park	0.0

Orange County Adolescent Birth Rate (2010)
Rate per 1,000 Females Ages 15-19

LA HABRA
BREA
YORBA LINDA
FULLERTON
PLACENTIA
LA PALMA
BUENA PARK
ANAHEIM
CYPRESS
VILLA PARK
STANTON
LOS ALAMITOS
ORANGE
GARDEN GROVE
UNINCORPORATED
WESTMINSTER
SEAL BEACH
SANTA ANA
FOUNTAIN VALLEY
TUSTIN
HUNTINGTON BEACH
COSTA MESA
UNINCORPORATED
IRVINE
LAKE FOREST
RANCHO SANTA MARGARITA
NEWPORT BEACH
LAGUNA WOODS
MISSION VIEJO
LAGUNA HILLS
ALISO VIEJO
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE

Countywide Rate:
22.4 per 1,000 Females Ages 15-19

Adolescent Birth Rate

- No Births
- <7.4
- 7.4 - 22.4
- 22.5 - 33.1
- 33.2 - 64.6
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: The adolescent birth rate for Orange County females 15-19 years of age varied by race/ethnicity. Hispanics made up the highest percentage of adolescent births (85.5%) and they also had the highest birth rate (44.3 births per 1,000 females age 15-19) compared to any other race/ethnic group. Black adolescents contributed only 1% of all adolescent births, but had the second highest adolescent birth rate at 18.7 per 1,000 births to females age 15-19. Whites had a rate of 6.6 births per 1,000 females 15-19 years. Asian/Pacific Islanders had the lowest rate of births to adolescent mothers at 3.2 births per 1,000 females, age 15-19 years (**Table 7**).

Table 7: Adolescent Births (Females, 15-19 years), by Maternal Race/Ethnicity (2010)

|	Number of Adolescent Births	% of Adolescent Births	Female Population (15-19 years)	Rate/1,000 Females 15-19 years
Hispanic	2,114	85.3%	47,689	44.3
Black	32	1.3%	1,711	18.7
White	256	10.3%	38,618	6.6
Asian/PI	58	2.3%	18,017	3.2
Unknown	19	0.8%	4,446	4.3
Countywide 2010	**2,479**	**100.0%**	**110,481**	**22.4**
Statewide 2010				**31.5**
HP 2010				**N/A**
HP 2020				**N/A**

Adolescent birth rates differ substantially by age. Most young moms who give birth are 18-19 years of age as compared to 15-17 years old. The following section shows the differences in the Orange County adolescent birth rates for the two age subgroups: females 15-17 years and 18-19 years. The birth rates for mothers 15-17 years old and 18-19 years old have both declined in the past decade. However, the annual birth rates, 10-year trends, and rates by race/ethnicity differ for these two age subgroups.

In 2010, a total of 806 babies were born to females aged 15-17 years in Orange County, for an average live birth rate of 12.2 per 1,000 females in this age group. The adolescent birth rate fell 43% from a decade ago (21.4 births per 1,000 females 15-17 years in 2000). From 2000 to 2002, adolescent birth rates for females 15-17 had the sharpest decline of 20%. From 2003 to 2010, there was a more gradual decline of 29% in birth rate for this age group in Orange County. National and California birth rates for females 15-17 years were very similar in the past decade. Both state and national adolescent birth rates for females 15-17 years have declined: 36% for U.S. and 38% for California, since 2000, to a low of 17.3 nationally and 16.4 per 1,000 females 15-17 years for the state (**Figure 4**).

Figure 4: Adolescent Births (Females, 15-17 years) U.S., California, and Orange County (2000 - 2010)
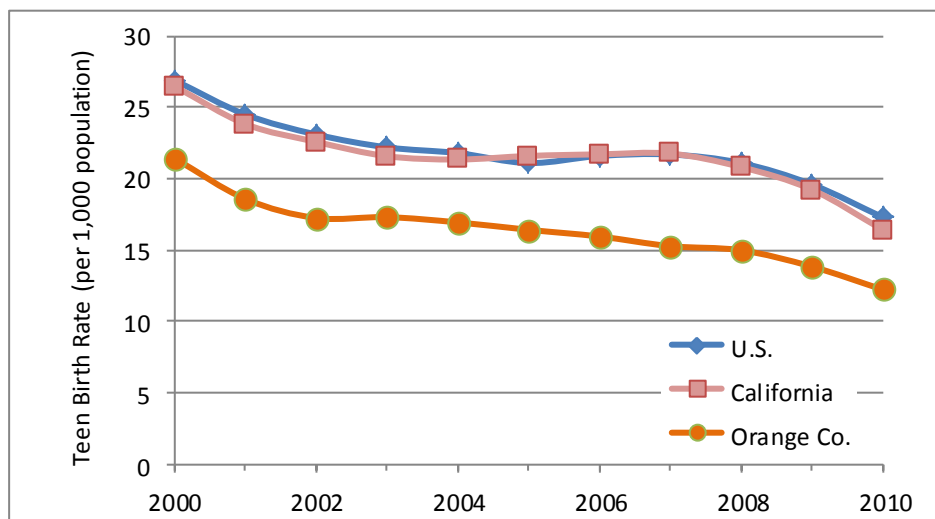
For adolescents, 15-17 years, Hispanics accounted for 91% of all births and had the highest birth rate of 25.3 births per 1,000 females 15-17 years. The Hispanic birth rate was higher than both the county (12.2) and state (16.4) birth rates for this age group. The other race/ethnicity groups all had much lower birth rates (less than 5 births per 1,000 females 15-17 years) than county and state birth rates. Asian/Pacific Islanders had the second lowest percent of births to females 15-17 years with 1.9% of all births and they had the lowest birth rate of 1.5 births per 1,000 female 15-17 years (**Table 8**).
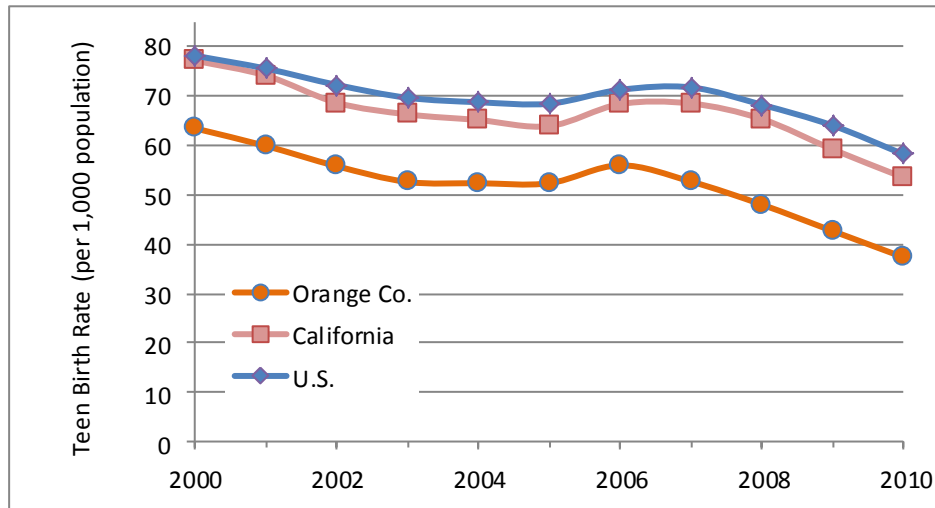
Table 8: Adolescent Births (Females, 15-17 years), by Maternal Race/Ethnicity (2010)

	Number of Adolescent Births	*% of Adolescent Births*	*Female Population (15-17 years)*	*Rate/1,000 Females 15-17 years*
Hispanic	730	90.6%	28,863	25.3
Black	4	0.5%	968	4.1*
White	52	6.5%	23,277	2.2
Asian/PI	15	1.9%	10,230	1.5*
Unknown	5	0.6%	2,705	1.8*
Countywide 2010	**806**	**100.0%**	**66,043**	**12.2**
Statewide 2010				**16.4**
HP 2010				**N/A**
HP 2020				**N/A**

*Rates based on small numbers of cases can vary substantially from year to year and should be interpreted with caution.

In 2010, there were 1,673 live births to females 18-19 years in Orange County for a birth rate of 37.4 per 1,000 females in this age group. Birth rates fell 41% from 2000 (63.4 per 1,000 females 18-19 years). From 2000 to 2003, there was a 17% decline in birth rates. Birth rates remained relatively unchanged from 2003 to 2005. While from 2006 to 2010, the annual birth rates have been consistently declining having dropped 33%. Over the past decade, the Orange County birth rate for females 18-19 years has been consistently below the national and state birth rates. Nationally adolescent birth rates have decreased 26% from 2000 (78.1) to its current low of 58.2 births per 1,000 female 18-19 years. Similarly, the California rate has declined 31% to its current low of 53.5 births per 1,000 female 18-19 years (**Figure 5**).

Figure 5: Adolescent Births (Females, 18-19 years) U.S., California, and Orange County (2000 - 2010)

The distribution of births among adolescents 18-19 years was slightly different than for adolescents 15-17 years. Hispanics still had the highest birth rate of 73.5 per 1,000 females 18-19 years (**Table 9**). Further, Blacks followed with a birth rate of 37.7 per 1,000 females 18-19 years. Both Hispanics and Blacks had birth rates at or above the county birth rate for this age group. When compared with the county, whites had a much lower birth rate of 13.3. Meanwhile, Asian/PI had the lowest rates of any group, at 5.5 births per 1,000 females 18-19 years.

Table 9: Adolescent Births (Females, 18-19 years), by Maternal Race/Ethnicity (2010)

|	*Number of Adolescent Births*	*% of Adolescent Births*	*Female Population (18-19 years)*	*Rate/1,000 Females 18-19 years*
Hispanic	1,384	82.7%	18,825	73.5
Black	28	1.7%	743	37.7
White	204	12.2%	15,341	13.3
Asian/PI	43	2.6%	7,787	5.5
Unknown	14	0.8%	1,741	8.0
Countywide 2010	**1,673**	**100.0%**	**44,437**	**37.6**
Statewide 2010				**31.5**
HP 2010				**N/A**
HP 2020				**N/A**

Pre-Term Birth Rate

Description of Indicator: Pre-term birth or premature birth is defined as the delivery of a baby at least three weeks before a baby's due date or less than 37 weeks gestation; full term is 40 weeks. Pre-term births are reported as a percentage of infants born before 37 weeks of gestation over the total number of births in a calendar year.

Importance: Pre-term births are a concern as they are often associated with low birth weight and other complications of pregnancy, labor and delivery. Disorders related to pre-term birth and low birth weight are the second leading cause of infant death in the U.S.[4] More recently, the March of Dimes has begun to recommend differentiating between early term and full-term births (37-38 vs. 39-41 weeks, respectively). Additional time *in-utero* allows for important neonatal develop (e.g., brain, lungs) and reduced morbidity and mortality.

Trends: In Orange County (OC), the pre-term birth rate has been relatively unchanged with only slight variations from year to year (**Figure 6**). In 2010, 9.1% (3,412) of infants in OC were pre-term compared to 10.0% in California and 12.0% in the nation. Between 2000 and 2010, the rate of infants born pre-term declined 4.2% from 9.5% (2000) to 9.1% (2010). In the past decade, pre-term birth rates in the county have been consistently lower than national and state pre-term birth rates. The national goal, to reduce pre-term births, has become less ambitious. The Healthy People 2010 objective 16-11a seeks to reduce the total percentage of infants born pre-term (infant born at <37 weeks) to 7.6% of live births. For Healthy People 2020 objective (MICH-9.1, with the same definition), the target was revised to a more attainable 11.4%. National, state and countywide pre-term birth rates did not meet HP 2010 target, but California and county pre-term rates have consistently met the HP 2020 target (**Figure 6**).

Figure 6: Pre-Term Birth Rate
U.S., California, and Orange County (2000 – 2010)
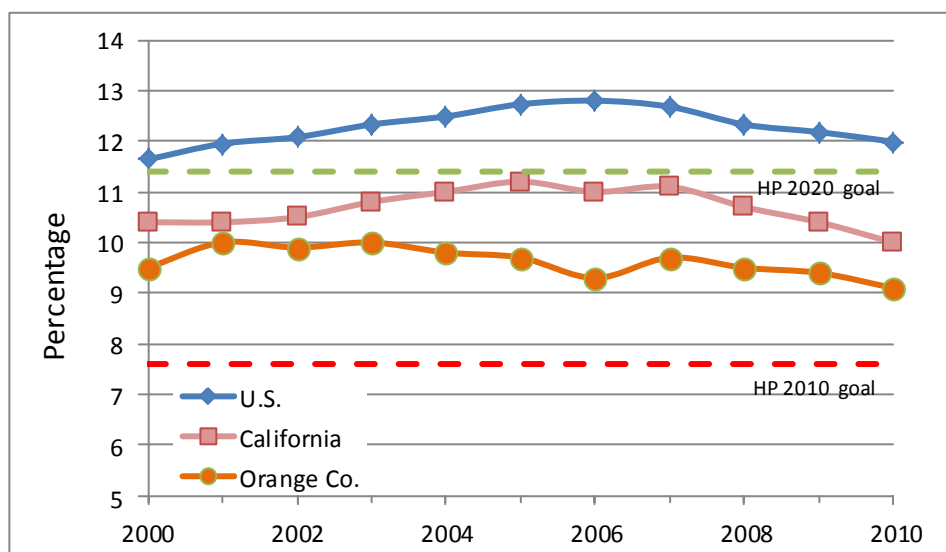
Geography: The geographic distribution of Orange County's pre-term birth rates provide for more accurate distribution of resources and education efforts. **Table 10** at right summarizes the percentage of pre-term births by mother's city of residence.

La Palma had the lowest pre-term birth rate of 6.8%, followed by Laguna Niguel with 7.5% and San Juan Capistrano with 7.5%. These three cities were the only cities in Orange County to meet the HP 2010 goal of no more than 7.6% pre-term births. Villa Park, which had the highest pre-term birth rate of 19.2%, was the only city to have a rate higher than the national rate of 12.0% and the only city to not meet the HP 2020 goal of no more than 11.4% of pre-term births.*

The map on the following page presents the percentage of pre-term births in 2010 by ZIP code of residence. The ZIP code 92606 in Irvine had the lowest percentage of pre-term births at 3.2%. The ZIP code 92861 (Villa Park) had the highest percentage of pre-term births (19.2%). This was followed by three ZIP codes in Anaheim, 92802 (12.1%), 92807 (11.7) and 92808 (11.5%). These ZIP codes were all higher than the HP 2020 goal of no more than 11.4% of births.
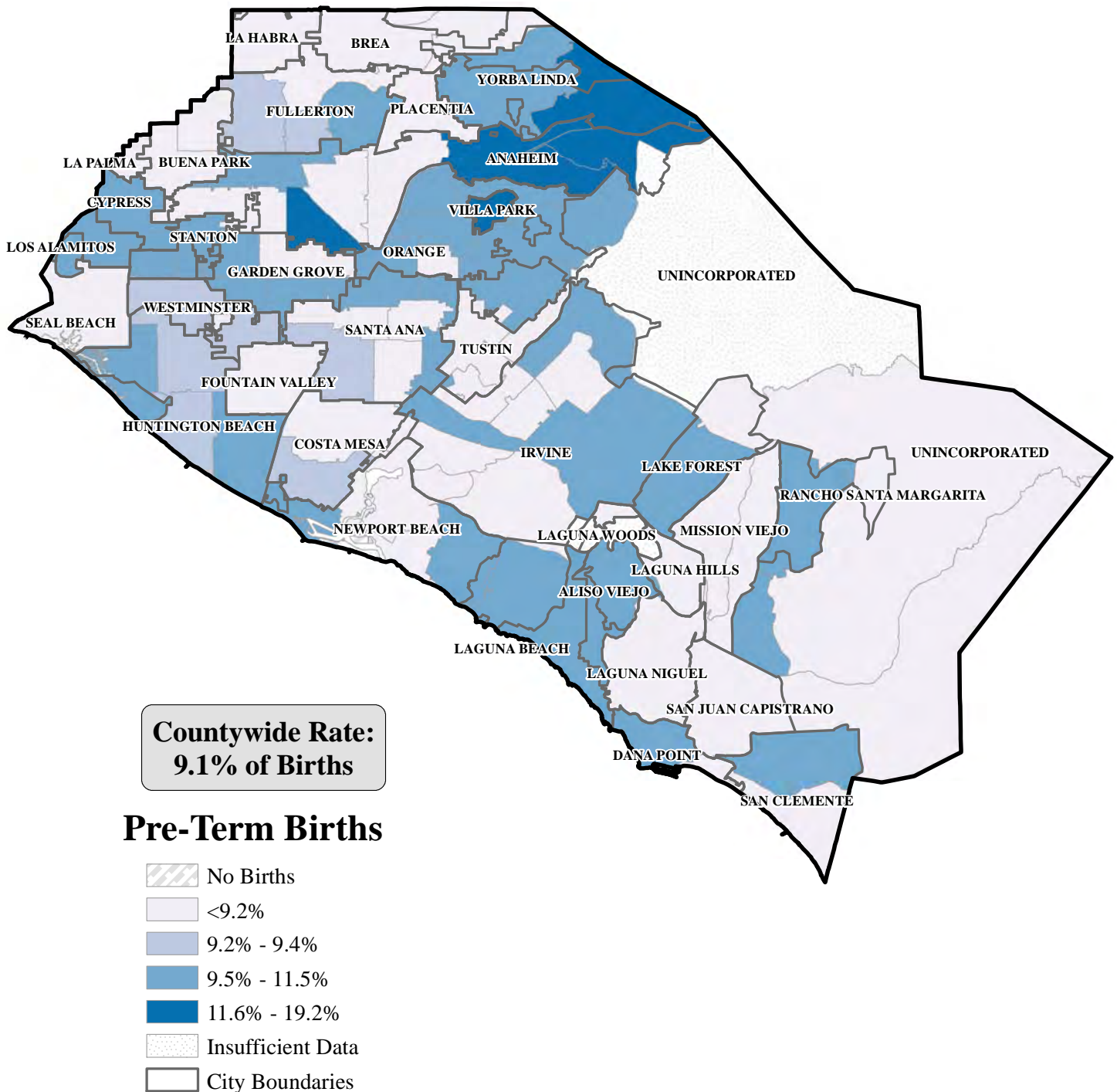

*Note that Villa Park has a relatively low number of births each year which can lead to greater variability in birth outcome prevalence rates. In 2010, Villa Park had a disproportionate number of multiple births (twins) that resulted in a relatively high rate of pre-term and low birth weight babies.

Table 10: Pre-Term Birth by City (2010)

City	Pre-Term Birth Percent
Villa Park*	19.2%
United States	**12.0%**
Healthy People 2020 Goal	**11.4%**
Yorba Linda	11.5%
Cypress	10.4%
Garden Grove	10.1%
Huntington Beach	10.0%
California	**9.9%**
Lake Forest	9.9%
Laguna Beach	9.9%
Los Alamitos	9.9%
Stanton	9.7%
Aliso Viejo	9.6%
Anaheim	9.6%
Orange	9.6%
Rancho Santa Margarita	9.6%
Fullerton	9.2%
Westminster	9.2%
Orange County	**9.1%**
Dana Point	9.1%
Laguna Hills	9.1%
Unincorporated	9.1%
Costa Mesa	9.0%
Newport Beach	9.0%
San Clemente	9.0%
Seal Beach	8.8%
La Habra	8.7%
Santa Ana	8.7%
Placentia	8.4%
Tustin	8.1%
Brea	8.0%
Buena Park	8.0%
Mission Viejo	8.0%
Irvine	7.9%
Fountain Valley	7.7%
Healthy People 2010 Goal	**7.6%**
Laguna Niguel	7.5%
San Juan Capistrano	7.5%
La Palma	6.8%

Orange County Pre-Term Births (2010)
(<37 Weeks Gestation)

LA HABRA
BREA
YORBA LINDA
FULLERTON
PLACENTIA
LA PALMA
BUENA PARK
ANAHEIM
CYPRESS
VILLA PARK
STANTON
LOS ALAMITOS
ORANGE
GARDEN GROVE
UNINCORPORATED
SEAL BEACH
WESTMINSTER
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
IRVINE
UNINCORPORATED
LAKE FOREST
RANCHO SANTA MARGARITA
NEWPORT BEACH
LAGUNA WOODS
MISSION VIEJO
LAGUNA HILLS
ALISO VIEJO
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE

**Countywide Rate:
9.1% of Births**

Pre-Term Births

- No Births
- <9.2%
- 9.2% - 9.4%
- 9.5% - 11.5%
- 11.6% - 19.2%
- Insufficient Data
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: Blacks had the highest percentage of women with a pre-term delivery (13.7%); though this was the smallest group accounting for only 1.9% of all pre-term births. Whites had the second highest percentage (9.3%) of pre-term births, while 9.0% of Hispanic women and 8.5% of Asian/Pacific Islanders had pre-term births. No racial/ethnic group met the HP 2010 goal of no more than 7.6% of pre-term births. However, White, Hispanic and Asian/PI women have all met the HP 2020 goal for pre-term births **(Table 11)**.

Table 11: Pre-Term Births by Maternal Race/Ethnicity (2010)

	Number of Pre-Term Births	*% of Births*	*Number of Births**	*% of Births Pre-Term Births*
Black	66	1.9%	482	13.7%
White	1,069	31.3%	11,545	9.3%
Hispanic	1,669	48.9%	18,574	9.0%
Asian/PI	545	16.0%	6,440	8.5%
Other/Unknown	63	1.8%	535	11.8%
Countywide 2010	**3,412**	**100.0%**	**37,576**	**9.1%**
Statewide 2010				**9.9%**
HP 2010				**7.6%**
HP 2020				**11.4%**

*Totals may not match those presented elsewhere, includes only those cases where gestational age was known.

Maternal Age Groups: The number and percentage of pre-term births are presented below in **Table 12** by maternal age. Women 25-29 years of age had the lowest percentage of pre-term births with 7.5%; the only age group to meet the HP 2010 goal of no more than 7.6% pre-term births. Women 40 years and older had the highest percentage of pre-term births with 14.6%; this is the only age group to not meet the HP 2020 goal of no more than 11.4% pre-term births.

Table 12: Pre-Term Births by Maternal Age Group (2010)

	Number of Pre-Term Births	*% of Births*	*Number of Births**	*% of Births Pre-Term Births*
Under 20 years	245	7.2%	2,453	10.0%
20-24 years	518	15.2%	6,291	8.2%
25-29 years	745	21.8%	9,902	7.5%
30-34 years	951	27.9%	10,678	8.9%
35-39 years	703	20.6%	6,547	10.7%
40+ years	249	7.3%	1,703	14.6%
Unknown	1	0.0%	2	-
Countywide 2010	**3,412**	**100.0%**	**37,576**	**9.1%**
Statewide 2010				**9.9%**
HP 2010				**7.6%**
HP 2020				**11.4%**

*Totals may not match those presented elsewhere; includes only those cases where gestational age was reported.
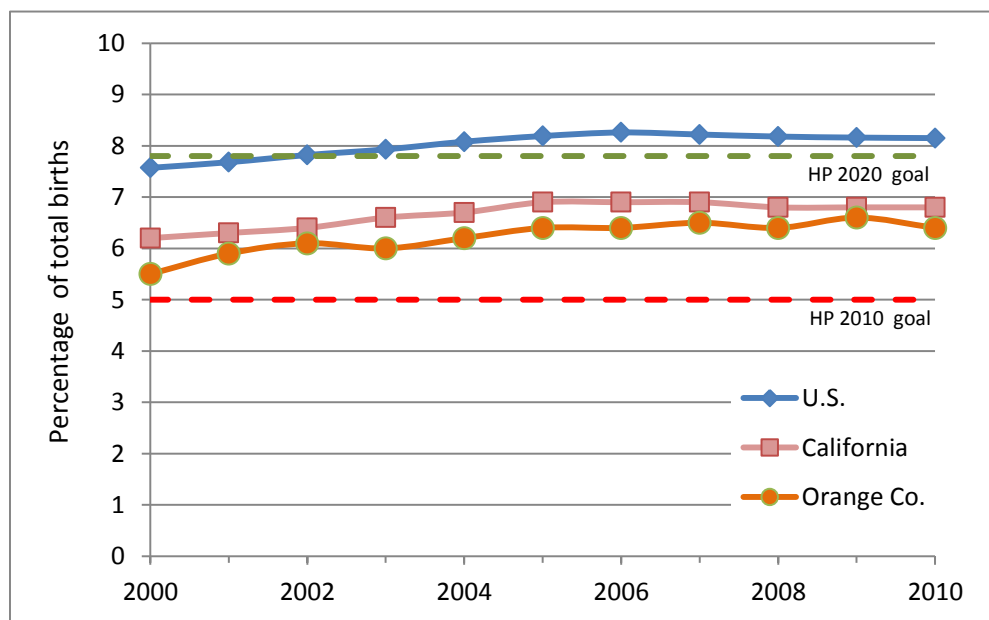
Low Birth Weight

Description of Indicator: A low birth weight infant is defined as an infant weighing less than 2,500 grams at birth, or approximately 5.5 pounds. The low birth weight rate is the proportion of babies weighing less than 2,500 grams to the total number of births. This indicator is based on the number of live births, and is shown in percentage of live births.

Importance: Low birth weight is associated with multiple risk factors such as inadequate prenatal care, poor nutrition, smoking or substance use which can put these infants at risk for developmental delays, disabilities, and other illness.[5] In addition, there often are additional economic and social costs associated with the treatment and care for low birth weight babies.

Trends: National, state and county data showed a slight increase in the percentages of low birth weight babies in the past decade. In Orange County, the percentage of low birth weight babies in 2010 was 6.4%, an increase of 16% from 2000 when it was 5.5%. In the past decade, the countywide rate of low birth weight babies has been consistently below the national and state rates. The U.S. had the highest percentage of low birth weight babies with 8.2% in 2010, an increase of 8% from 2000 (7.6%). California had 6.8% of low birth weight babies in 2010, an increase of 10% from 2000 (6.2%). National goals to reduce low birth weight infants have were reassessed and adjusted to be more realistic. Healthy People 2010 objective 16-1a seeks to reduce low birth weight infants to 5% of live births. Healthy People 2020 objective MICH-8.1, with the same definition, was revised to 7.8% of live births. U.S., California and Orange County were not able to meet the HP 2010 target; however, both California and Orange County have met the HP 2020 target.

**Figure 7: Low Birth Weight Infant
U.S., California, and Orange County (2000 - 2010)**

Geography: The geographic distribution of Orange County's low birth weight babies provides an important view of where these babies are being born, allowing for more accurate distribution of resources and education efforts. **Table 13** at right summarizes the percentage of low birth weight babies in 2010 by mother's city of residence.

Six cities had a higher percentage of low birth weight babies than the HP 2020 goal of no more than 7.8%. Villa Park led the county with 15.4% of live births resulting in low birth weight.* This was followed by Los Alamitos (10.5%), Seal Beach (10.4%), Cypress (8.6%), Yorba Linda (8.6%) and Lake Forest (7.9%). San Juan Capistrano had the lowest percentage of live births resulting in low birth weight (4.8%), which was the only city to meet the HP 2010 goal to reduce the percentage of low birth weights to < 5.0%.
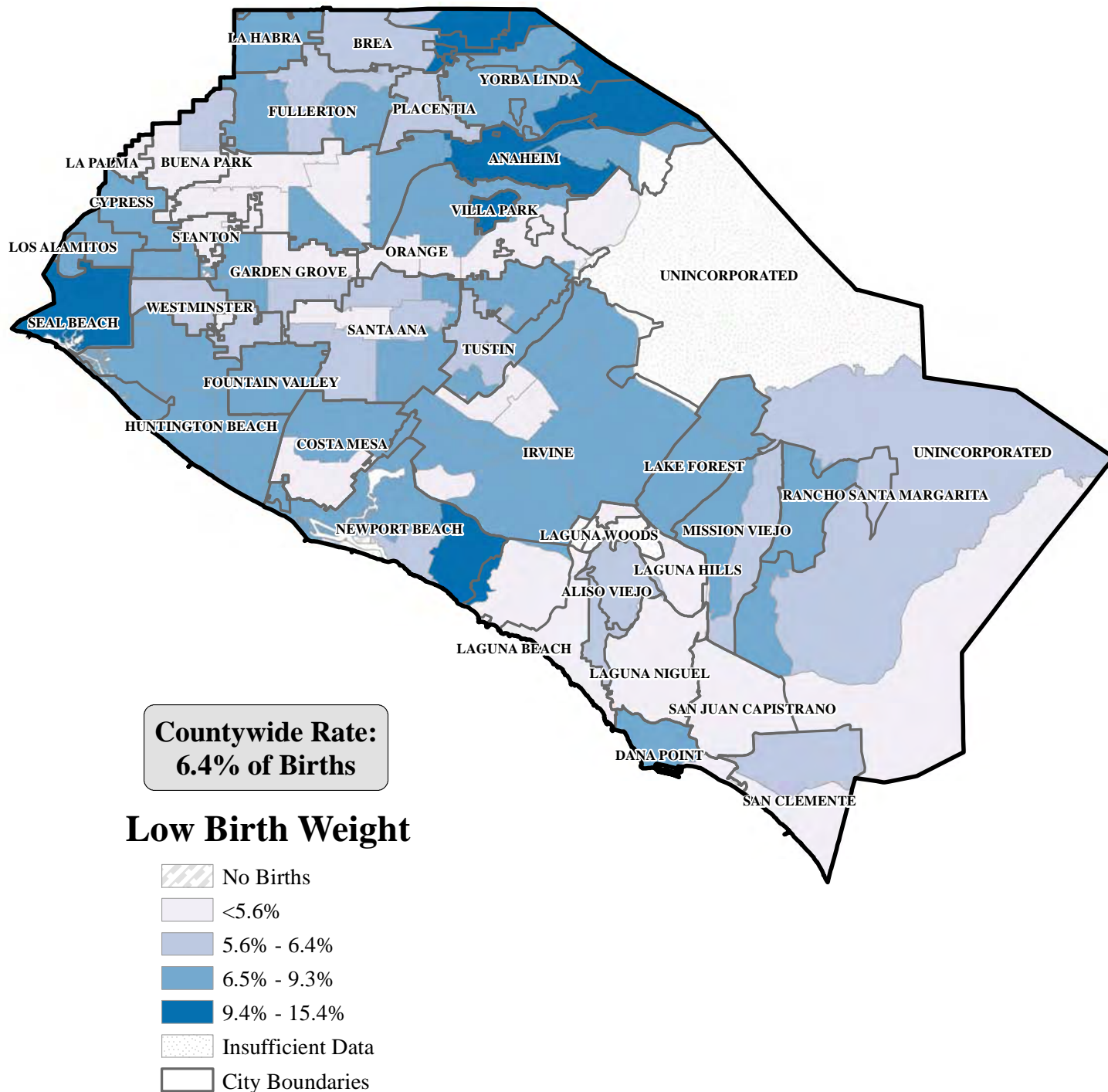
The map on the following page presents the percent of babies in 2010 with low birth weight by mother's ZIP code of residence. Several ZIP codes met the HP 2010 goal of no more 5% low birth weight babies. The ZIP code with the lowest percentage of low birth weight babies was 92624 in San Juan Capistrano with 3.2%; one of only six ZIP codes to meet the HP 2010 goal. The ZIP codes with the highest percentage of low birth weight babies were spread throughout the county, the highest percentages were found in ZIP codes corresponding to Villa Park (92861) with 15.4%, Yorba Linda (92887) with 11.8%, and Newport Beach (92657) with 11.2% low birth weight babies.

*Note that Villa Park has a relatively low number of births each year which can lead to greater variability in birth outcome prevalence rates. In 2010, Villa Park had a disproportionate number of multiple births (twins) that resulted in a relatively high rate of pre-term and low birth weight babies.

Table 13: Low Birth Weight Babies by City (2010)

City	Low Birth Weight Percent
Villa Park*	15.4%
Los Alamitos	10.5%
Seal Beach	10.4%
Cypress	8.6%
Yorba Linda	8.6%
United States	**8.2%**
Lake Forest	7.9%
Healthy People 2020 Goal	**7.8%**
Fountain Valley	7.6%
Rancho Santa Margarita	7.5%
Huntington Beach	7.3%
Irvine	7.1%
Newport Beach	7.1%
Unincorporated	7.0%
Fullerton	6.9%
California	**6.8%**
La Habra	6.8%
Tustin	6.7%
Brea	6.7%
Dana Point	6.5%
Mission Viejo	6.5%
Orange County	**6.4%**
Westminster	6.2%
Anaheim	6.2%
Garden Grove	6.2%
Aliso Viejo	6.1%
Placentia	6.1%
Santa Ana	6.1%
La Palma	6.0%
Costa Mesa	5.9%
Orange	5.8%
Laguna Beach	5.5%
San Clemente	5.4%
Laguna Niguel	5.4%
Stanton	5.4%
Buena Park	5.3%
Laguna Hills	5.1%
Healthy People 2010 Goal	**5.0%**
San Juan Capistrano	4.8%

Orange County Low Birth Weight (2010)
(Birth Weight <2,500 g)

Countywide Rate: 6.4% of Births

Low Birth Weight

▨	No Births
░	<5.6%
▨	5.6% - 6.4%
▨	6.5% - 9.3%
▨	9.4% - 15.4%
⠿	Insufficient Data
☐	City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: All race/ethnic groups in Orange County had a higher percentage of low birth weight babies in 2010 than the HP 2010 goal of 5.0%. As shown in **Table 14**, Black mothers had the highest percentage of low birth weight babies at 12.3% for their racial/ethnic group, while they account for only 2.4% of all low birth weight babies in Orange County. Asian/Pacific Islanders had the second highest percentage of low birth weight babies at 7.7%, followed by Whites at 6.3%. Hispanic mothers had the lowest percentage of low birth weight babies at 5.8%.

With the application of the Healthy People 2020 objective of 7.8% or fewer low birth weight births, only Hispanics and Whites clearly meet the target. Asian/Pacific Islanders are just slightly lower than the goal, while Blacks are markedly higher than the goal.

Table 14: Low Birth Weight Babies by Maternal Race/Ethnicity (2010)

	Number of Low Birth Weight	% of All Low Birth Weight Babies	Number of Births	% Low Birth Weight
Black	60	2.4%	489	12.3%
Asian/PI	507	20.6%	6,551	7.7%
White	734	29.8%	11,711	6.3%
Hispanic	1,103	44.8%	18,930	5.8%
Other/Unknown	58	2.4%	556	10.4%
Countywide 2010	**2,462**	**100.0%**	**38,237**	**6.4%**
Statewide 2010				**6.8%**
HP 2010				**5.0%**
HP 2020				**7.8%**

Maternal Age Groups: The number and percentage of low birth weight babies are presented below in **Table 15** by maternal age. No maternal age group in Orange County met the HP 2010 target of no more than 5.0% low birth weight babies. All age groups under 35 years achieved the HP 2020 target of 7.8% low birth weight babies or less, while age groups 35 years and older are higher than this target. Women aged 25-29 years had the lowest percentage of low birth weight babies at 5.4%. The percentage increased systematically with maternal age. Mothers 40 years and over had the highest percentage of low birth weight babies at 10%.

Table 15: Low Birth Weight Babies by Maternal Age Group (2010)

|	Number of Low Birth Weight	% of All Low Birth Weight Babies	Number of Births	% Low Birth Weight within Age Group
Under 20 years	184	7.5%	2,515	7.3%
20-24 years	361	14.7%	6,431	5.6%
25-29 years	544	22.1%	10,082	5.4%
30-34 years	671	27.3%	10,839	6.2%
35-39 years	523	21.2%	6,631	7.9%
40+ years	178	7.2%	1,732	10.3%
Unknown	1	0.0%	7	-
Countywide 2010	**2,462**	**100.0%**	**38,237**	**6.4%**
Statewide 2010				**6.8%**
HP 2010				**5.0%**
HP 2020				**7.8%**

Prenatal Care

Description of Indicator: Prenatal care received by the mother beginning in the first trimester before 12 weeks (3 months) of gestation is defined as early prenatal care. The percent of births where mother receives early prenatal care is calculated by dividing the number of births that had early prenatal care by the total number of births.

Importance: Early prenatal care provides an excellent opportunity to detect and treat maternal and fetal medical problems, as well as to offer counseling on healthy life-style and behaviors, thus promoting a positive birth outcome. This indicator is based on the total number of live births and is presented in percentages.

Trends: In 2010, 89.0% of births in Orange County had early prenatal care, relatively unchanged from a decade ago (88.1%) following a dip starting in 2007 that corresponded with the recession and concomitant loss of health insurance. By comparison, the percentages of early prenatal care for California decreased slightly during the last decade from 83.1% in 2000 to 81.7% in 2010. The national goal for early prenatal care has become less ambitious. The Healthy People 2010 objective 16-06a seeks to increase the proportion of pregnant women who receive prenatal care beginning in the first trimester of pregnancy to 90%. Healthy People 2020 objective MICH-10.1, with the same definition, was revised to 77.9%. In 2010, U.S., California and Orange County did not meet the HP 2010 target of 90%; however, all three did meet the revised HP 2020 target of 77.9% (**Figure 8**).

Figure 8: Early Prenatal Care
U.S., California, and Orange County (2000 - 2010)
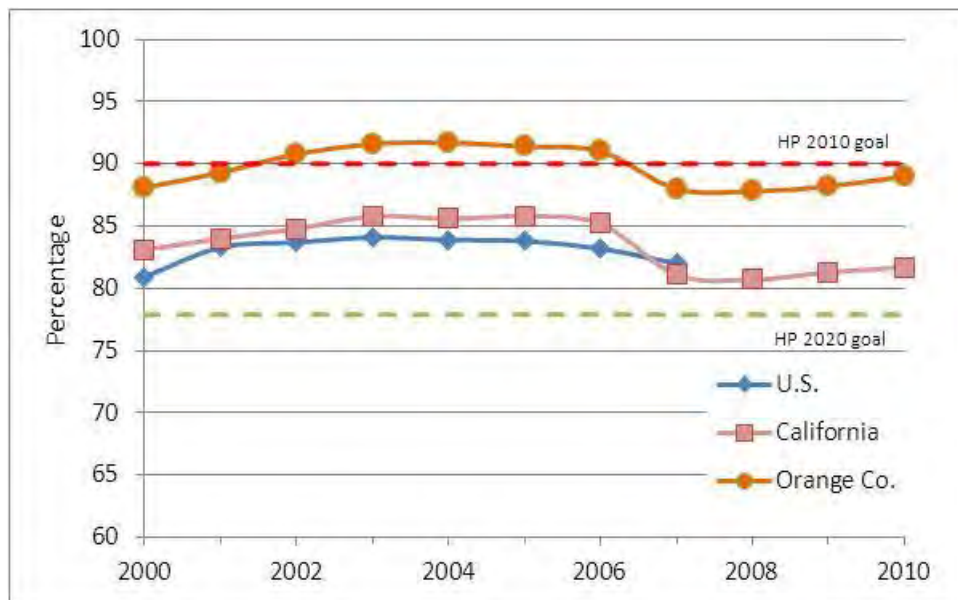
Geography: The geographic distribution of Orange County pregnancies with early prenatal care provides an important overview of where outreach and education may be beneficial to promote early prenatal care. **Table 16** at right summarizes the percent first trimester prenatal care for pregnant women in 2010 by mother's city of resident.

The percentage early prenatal care ranged from a high of 95.5% in Irvine and unincorporated areas to a low of 85.1% in Westminster. Although the county prenatal care rate was just below the HP 2010 objective for this indicator, seventeen cities and the unincorporated areas within Orange County achieved or exceeded the goal of more than 90% of pregnancies with early prenatal care. Orange County and all the cities within the county, met the HP 2020 goal of 77.9% or better for this indicator.

The map on the following page presents the percentage of pregnancies with early prenatal care in 2010 by mother's ZIP code of residence. A ZIP code in Brea (92823) had the highest percentage with 97.9% of all pregnancies with early care. Garden Grove ZIP code (92844) had the lowest percentage of pregnancies (89.3%) with early prenatal care.
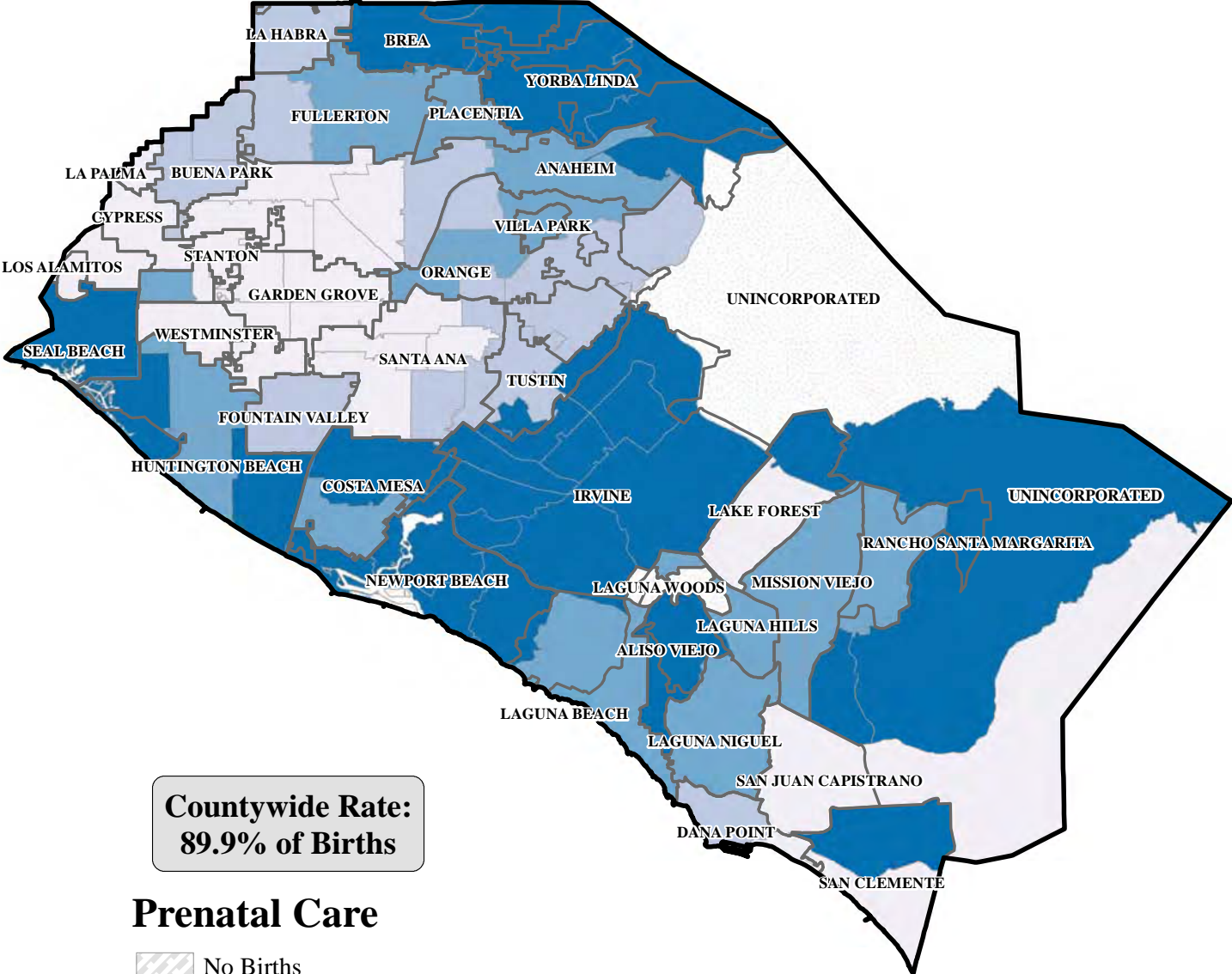
Table 16: Prenatal (1st Trimester) Care by City (2010)

City	Prenatal Care w/in 1st Trimester
Irvine	95.5%
Unincorporated	95.5%
Newport Beach	95.3%
Aliso Viejo	94.4%
Yorba Linda	94.4%
Brea	94.1%
Seal Beach	94.0%
Laguna Beach	93.2%
Rancho Santa Margarita	93.0%
Costa Mesa	92.8%
Huntington Beach	92.7%
Villa Park	92.3%
Laguna Niguel	92.2%
Mission Viejo	91.5%
Placentia	91.3%
Tustin	90.8%
Fullerton	90.7%
Orange	90.5%
Healthy People 2010 Goal	**90.0%**
Laguna Hills	89.9%
Orange County	**89.9%**
Buena Park	88.9%
Fountain Valley	88.9%
San Clemente	88.8%
La Habra	88.4%
Lake Forest	87.9%
Anaheim	87.8%
Dana Point	87.5%
Santa Ana	87.2%
La Palma	86.8%
Garden Grove	86.8%
San Juan Capistrano	86.7%
Cypress	86.3%
Los Alamitos	85.8%
Stanton	85.7%
Westminster	85.1%
California	**81.7%**
United States	**n/a**
Healthy People 2020 Goal	**77.9%**

Orange County Onset of Prenatal Care (2010) Prenatal Care Initiated within 1st Trimester

Countywide Rate: 89.9% of Births

Prenatal Care

- No Births
- <88.1%
- 88.2% - 89.9%
- 90.0% - 93.5%
- 93.6% - 97.8%
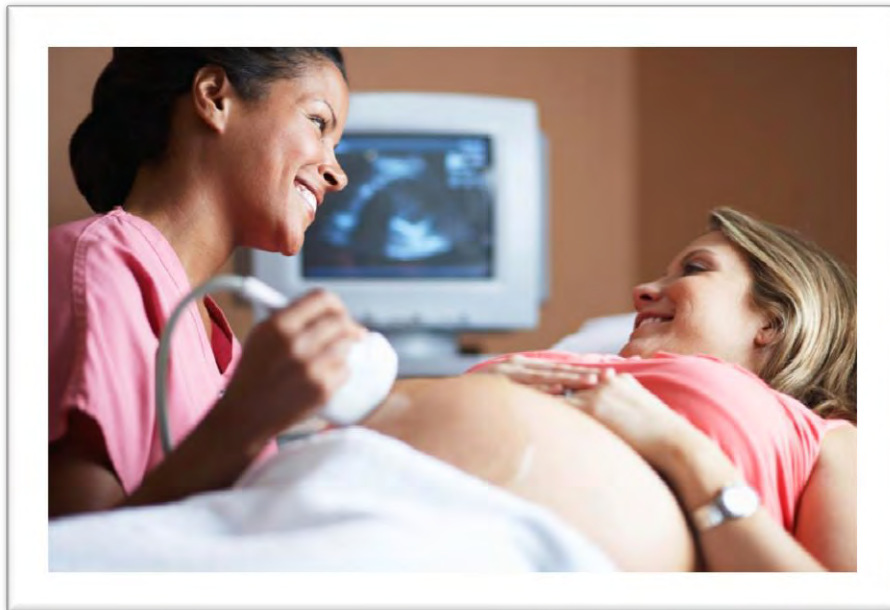- Insufficient Data
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: Within each race/ethnicity, Hispanic had the lowest percentage of women who early prenatal care (87.2%) in 2010. Black women followed closely with the second lowest percentage at 87.4% of births with early prenatal care. Notably, Hispanic mothers accounted for 62% of all births with late or no prenatal care. Whites had 93.5% and Asian/Pacific Islanders had the highest percentage of women at 92% initiating prenatal care during the first trimester (**Table 17**). Asian/Pacific Islander and White women met the HP 2010 objective of 90% of greater with early prenatal care. All race/ethnic groups met the HP 2020 objective of at least 77.9% of women with early prenatal care.

Table 17: Prenatal Care in 1st Trimester by Maternal Race/Ethnicity (2010)

	# Receiving Prenatal Care in 1st Trimester	% of Births	Number of Births	% Receiving Prenatal Care in 1st Trimester
Black	417	1.2%	477	87.4%
Hispanic	16,356	48.1%	18,765	87.2%
Asian/PI	5,983	17.6%	6,502	92.0%
White	10,819	31.8%	11,575	93.5%
Other/Unknown	443	1.3%	539	82.2%
Countywide 2010	**34,018**	**100.0%**	**37,858**	**89.9%**
Statewide 2010				**81.7%**
HP 2010				**90.0%**
HP 2020				**77.9%**

*Totals and rates include only those cases where prenatal care initiation was known.

Maternal Age Groups: The number and percentage of early prenatal care pregnancies are presented below in **Table 18** by maternal age for 2010. Mothers under 20 years had the lowest rate of early prenatal care at 75%. In contrast, women 30 and over tended to have the highest rates of early prenatal care, typically over 92%. Mothers in Orange County 25 years and older met the HP 2010 target of 90% with early prenatal care pregnancies, while mothers 24 years and younger did not meet the HP 2010 goal. All age groups, except for mothers under 20 years, met the HP 2020 goals of 77.9% of pregnancies with early prenatal care.

Table 18: Prenatal Care in 1st Trimester by Maternal Age Group (2010)

	# Receiving Prenatal Care in 1st Trimester	% of Births	Number of Births	% Receiving Prenatal Care in 1st Trimester
Under 20 years	1,846	5.4%	2,461	75.0%
20-24 years	5,457	16.0%	6,364	85.7%
25-29 years	9,100	26.8%	9,994	91.1%
30-34 years	9,981	29.3%	10,748	92.9%
35-39 years	6,067	17.8%	6,579	92.2%
40+ years	1,566	4.6%	1,711	91.5%
Unknown	1	0.0%	1	-
Countywide 2010	**34,018**	**100.0%**	**37,858**	**89.9%**
Statewide 2010				**81.7%**
HP 2010				**90.0%**
HP 2020				**77.9%**

*Totals and rates include only those cases where prenatal care initiation was known.
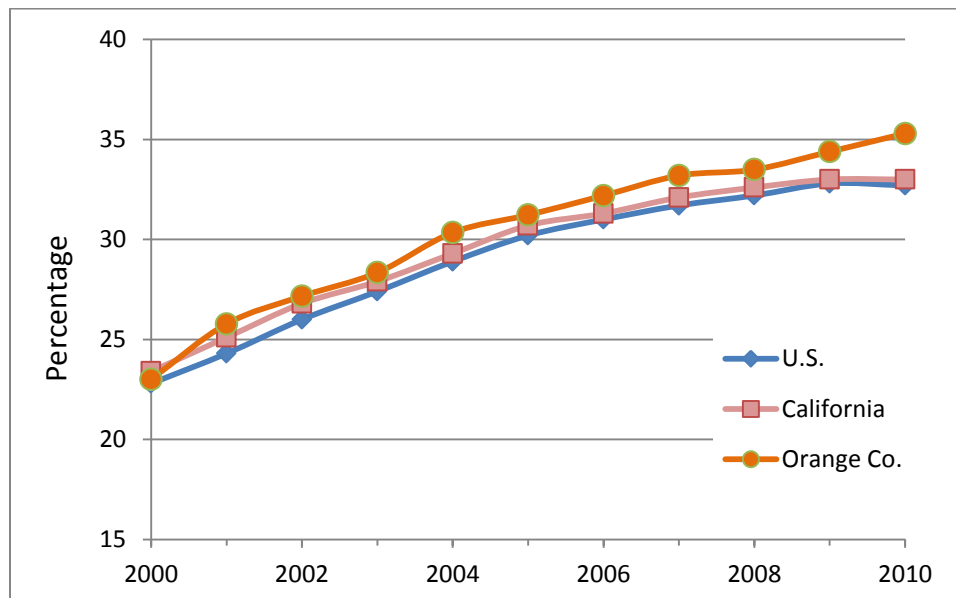
Deliveries by Cesarean Section

Description of Indicator: Cesarean Section or C-Section is a method of delivery using a surgical procedure; an incision is made through the mother's abdomen and uterus to deliver her baby. This section presents data for percentage of all cesarean births out of the total number of live births in Orange County. A cesarean delivery is considered to be elective when there is no medical indication and the mother is considered to be at low-risk: >37 weeks gestation, singleton (not a multiple pregnancy), and fetus presents in a vertex position (downward facing head in the birth canal).

Importance: Cesarean delivery trends are a warranted concern as research suggests that mothers who undergo the procedure experience greater morbidity and mortality rates, including being at greater risk for developing blood clots and infections.[6]

Trends: Cesarean deliveries have increased systematically in the past ten years for the U.S., California and Orange County (**Figure 9**). This increase in cesarean deliveries also includes mothers who undergo elective cesarean deliveries.[7] Orange County tends to have slightly higher percentage of cesarean deliveries than both California and U.S. In 2010, there were 13,495 cesarean births countywide. In other words, slightly more than one third of all deliveries in Orange County were cesarean deliveries (35.3%), an increase of 54% from a decade ago when the rate was 23%. In 2010, California and the U.S. both had similar rates of cesarean deliveries (33%), an increase of 41% from 2000 (23.4%) for California and an increase of 43% from a decade ago (22.8%) for the U.S. There are no Healthy People 2010 and 2020 objectives for total cesarean deliveries.

Figure 9: Cesarean Deliveries
U.S., California, and Orange County (2000 - 2010)

Geography: The geographic distribution of Orange County's births by cesarean deliveries provides an important overview of where mothers who have this method of delivery reside. **Table 19** at right summarizes the cesarean births for 2010 by mother's city of residence. Elsewhere we have presented cesarean delivery rates by birthing hospital.[10]
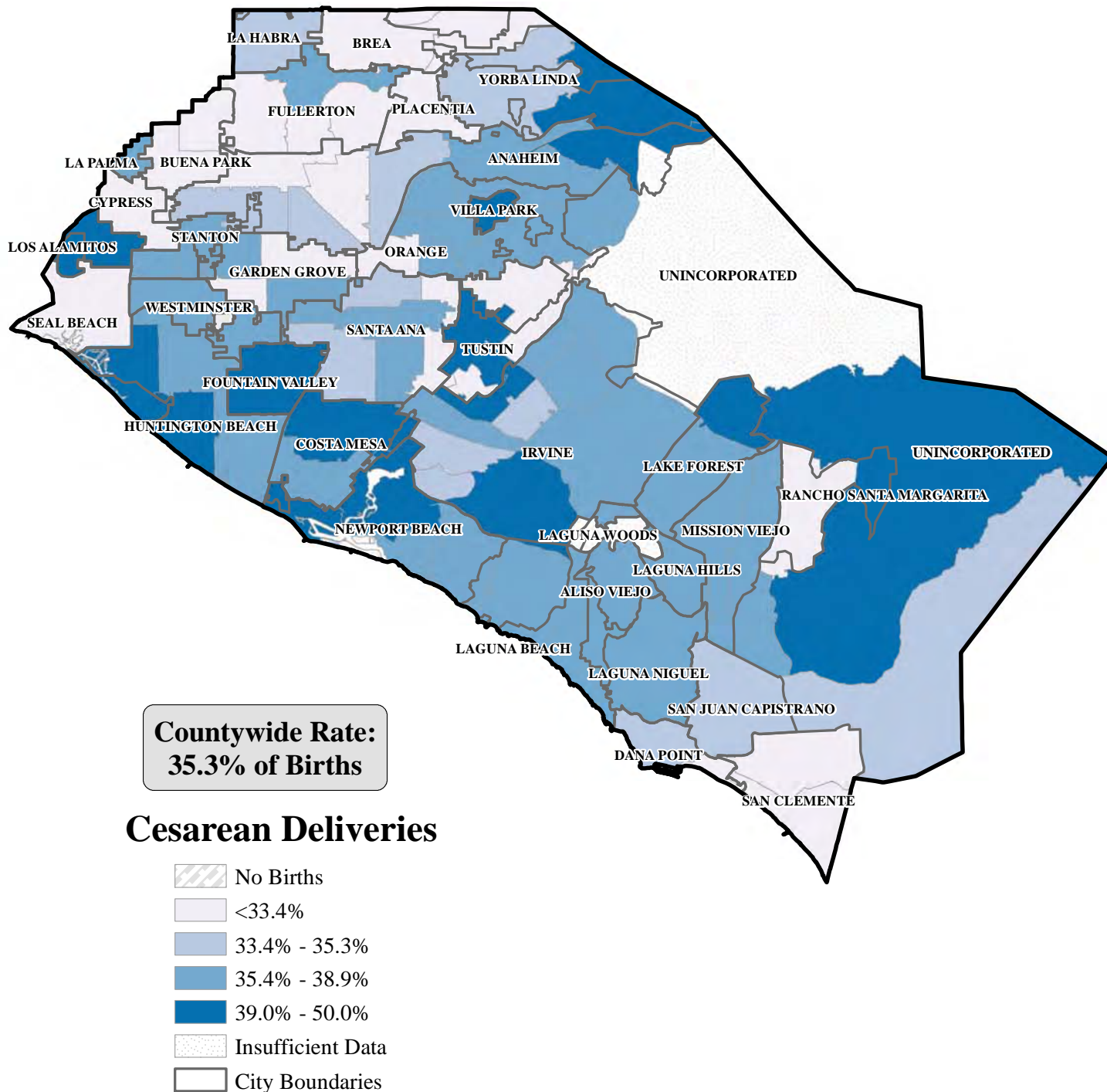
Twenty cities and the unincorporated areas have a higher percentage of cesarean deliveries than the county in general. Villa Park led the group with half (50%) of all births delivered by cesarean. Placentia had the lowest percentage of cesarean births at 28.7%.

The following map presents the percentage of live births delivered by cesarean in 2010 by mother's ZIP code of residence. Similar to city-level data, when compared across ZIP codes, the rates ranged from a low of 28.7% for ZIP code 92870 (Placentia), to a high of 50% for ZIP code 92861 (Villa Park).

Table 19: Cesarean Deliveries by City (2010)

City	Cesarean Birth Percent
Villa Park	50.0%
Los Alamitos	43.1%
Newport Beach	40.9%
Fountain Valley	39.8%
Costa Mesa	38.3%
Huntington Beach	37.7%
Lake Forest	37.7%
Tustin	37.6%
Irvine	37.4%
Unincorporated	37.4%
La Palma	37.3%
Westminster	37.2%
Laguna Niguel	37.2%
Aliso Viejo	36.7%
Stanton	36.6%
Orange	36.4%
Yorba Linda	36.3%
Laguna Hills	36.1%
Laguna Beach	36.0%
Santa Ana	35.6%
Mission Viejo	35.5%
Orange County	**35.3%**
San Juan Capistrano	34.8%
Dana Point	34.3%
Garden Grove	33.9%
Anaheim	33.8%
La Habra	33.7%
California	**33.0%**
Cypress	32.9%
Seal Beach	32.8%
United States	**32.7%**
Rancho Santa Margarita	32.0%
Fullerton	31.7%
San Clemente	31.6%
Brea	30.0%
Buena Park	29.6%
Placentia	28.7%

Orange County Cesarean Deliveries (2010)

Countywide Rate: 35.3% of Births

Cesarean Deliveries

- No Births
- <33.4%
- 33.4% - 35.3%
- 35.4% - 38.9%
- 39.0% - 50.0%
- Insufficient Data
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: Cesarean delivery rates varied by race/ethnicity in 2010 for Orange County (**Table 20**). Black women were more likely to deliver by cesarean (40.7%) than other race/ethnic groups in Orange County. Whites had the second highest percentage (36.6%) of cesarean deliveries. Hispanic and Asian Pacific Islander women had similar percentage of cesarean delivers (34.6% and 34.4%, respectively).

Table 20: Cesarean Deliveries by Maternal Race/Ethnicity (2010)

	Number of Cesarean Deliveries	*% of Cesarean Deliveries*	*Number of Deliveries*	*% of Deliveries by Cesarean*
Black	199	1.5%	489	40.7%
White	4,286	31.8%	11,711	36.6%
Hispanic	6,559	48.6%	18,930	34.6%
Asian/PI	2,251	16.7%	6,551	34.4%
Other/Unknown	200	1.5%	556	36.0%
Countywide 2010	**13,495**	**100.0%**	**38,237**	**35.3%**
Statewide 2010				**33.0%**
HP 2010				**N/A**
HP 2020				**N/A**

Maternal Age Groups: The number and percentage of cesarean deliveries are presented below in **Table 16** by maternal age. Older women were more likely to deliver by cesarean: women aged 40+ years were more than twice as likely as women under 20 years (55% compared to 22%) to have a cesarean delivery.

Table 21: Cesarean Deliveries by Maternal Age Group (2010)

	Number of Cesarean Deliveries	*% of Cesarean Deliveries*	*Number of Deliveries*	*% of Deliveries by Cesarean*
Under 20 years	558	4.1%	2,515	22.2%
20-24 years	1,842	13.6%	6,431	28.6%
25-29 years	3,243	24.0%	10,082	32.2%
30-34 years	3,970	29.4%	10,839	36.6%
35-39 years	2,929	21.7%	6,631	44.2%
40+ years	952	7.1%	1,732	55.0%
Unknown	1	0.0%	7	-
Countywide 2010	**13,495**	**100.0%**	**38,237**	**35.3%**
Statewide 2010				**33.0%**
HP 2010				**N/A**
HP 2020				**N/A**

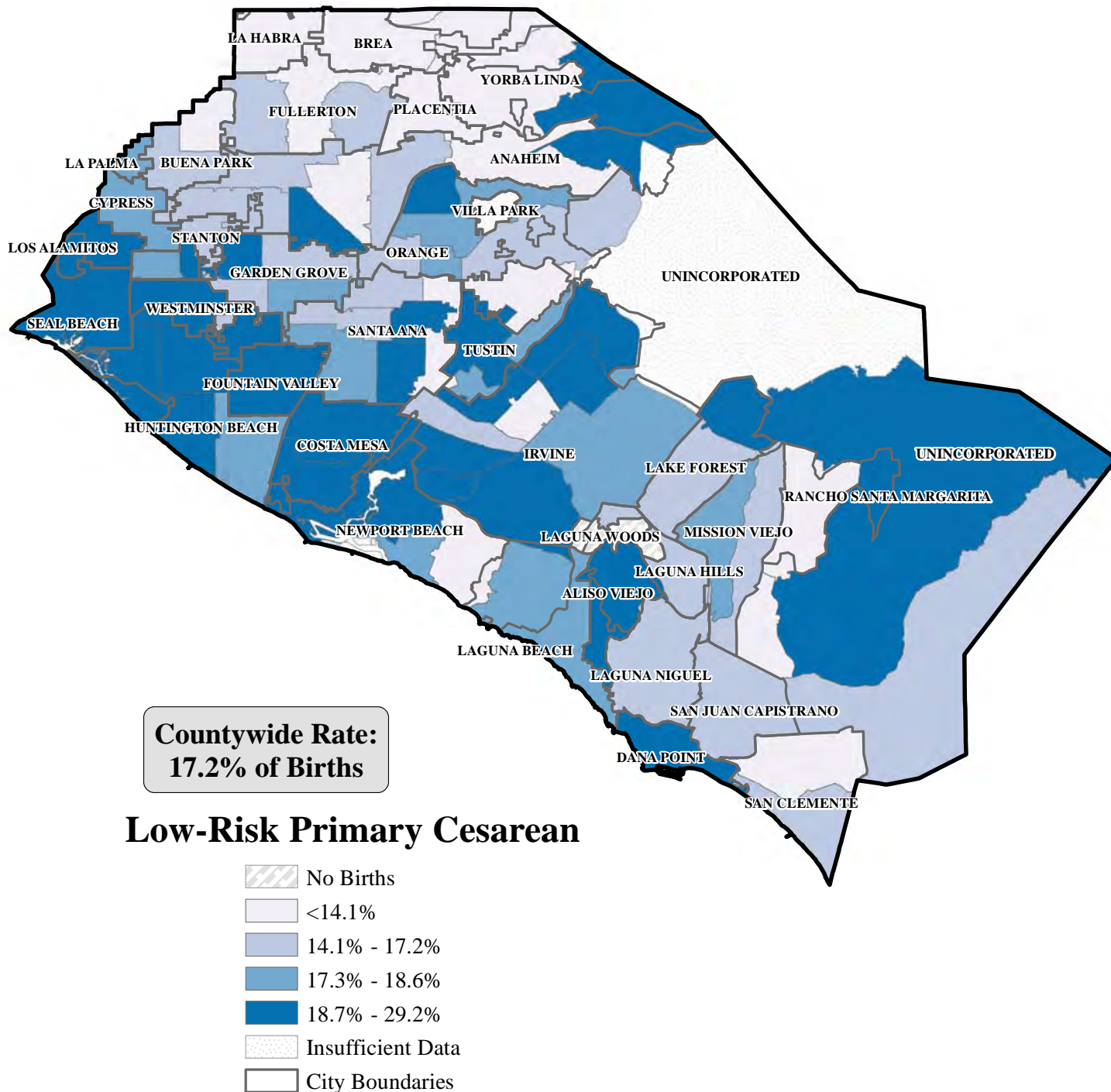## Elective Cesarean Deliveries to Low-Risk Mothers

Description of Indicator: This section presents the percentage of elective, first time cesarean deliveries for low-risk women. The denominator for this indicator is the number of live births to low-risk females who <u>have not</u> had a prior cesarean delivery. A cesarean delivery is considered to be elective when there is no medical indication and the mother is considered to be at low-risk: >37 weeks gestation, singleton (not a multiple pregnancy), and fetus presents in a vertex position (downward facing head in the birth canal). First time, refers to first time cesarean section if the mother had no previous deliveries.

Importance: By looking at elective cesarean delivery and excluding higher risk pregnancies, which are more likely to require cesarean delivery, we can more accurately identify changes in cesarean rates for women who have the least medical likelihood of needing a surgical delivery. Low-risk women giving birth for the first time who have a cesarean delivery are more likely to have a subsequent cesarean delivery. This trend has implications not only for a woman's entire reproductive life, but also for infants and the entire health care system.

Trends: In 2010, there were 26,629 low-risks births in Orange County. Of these births, 4,572 or 17.2% had cesarean deliveries.   National goals to reduce cesareans have become less ambitious. The Healthy People 2010 goal objective[8] was to reduce the cesarean births among low-risk (full-term, singleton, vertex presentation) with no prior cesarean births to 15%. For Healthy People 2020 objective, with the same definition, the target was revised to 23.9%.[9] Orange County did not meet the HP 2010 target; however, it has met the HP 2020 target.

Geography: The following map shows the geographic distribution of Orange County's cesarean births by ZIP codes for women with low-risk and no prior cesarean for 2010. This information provides an important overview of where this presumptive elective method of delivery is being performed, allowing for more accurate distribution of resources, prevention and education efforts. **Table 24A** on a later page shows that the majority of cities (23) in the county did not meet the HP 2010 target of no more than 15% low-risk primary cesarean deliveries. However, all cities met the less stringent HP 2020 target of 23.9% low-risk, primary cesarean deliveries.

Orange County Cesarean Deliveries (2010)
(Low-Risk First Time Cesarean Delivery)

**Countywide Rate:
17.2% of Births**

Low-Risk Primary Cesarean

- No Births
- <14.1%
- 14.1% - 17.2%
- 17.3% - 18.6%
- 18.7% - 29.2%
- Insufficient Data
- City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Maternal Race/Ethnicity: In 2010, Black women who were low-risk and had no prior cesarean were more likely to deliver by cesarean (24.6%) than other race/ethnic groups in Orange County (**Table 22**). White and Asian Pacific Islander women in this population had the next highest percentages (18.2% and 18.0%, respectively) of cesarean deliveries, followed by Hispanic women (16.0%). With the exception of Black women, all race/ethnic groups met the HP 2020 target for this objective.

Table 22: Cesarean Deliveries (Low-Risk & No Previous Cesarean) by Mother's Race/Ethnicity (2010)

	Number of Low-Risk First Time Cesarean Deliveries	% of Low-Risk First Time Cesarean Deliveries	Number of Low-Risk Deliveries	% of Low-Risk Deliveries by Cesarean
Black	77	1.7%	313	24.6%
White	1,479	32.3%	8,116	18.2%
Asian/PI	847	18.5%	4,694	18.0%
Hispanic	2,103	46.0%	13,143	16.0%
Other/Unknown	66	1.4%	363	18.2%
Countywide 2010	**4,572**	**100.0%**	**26,629**	**17.2%**
Statewide 2010				**N/A**
HP 2010				**15.0%**
HP 2020				**23.9%**

Maternal Age Groups: The number and percentage of cesarean deliveries to low-risk and no previous cesarean are presented below in **Table 23** by maternal age. Older women, 40 years and older, who were low-risk (with no prior cesareans) were most likely to deliver by cesarean (27.0%). They were also the only group to not meet the HP 2020 target. Mothers 25-29 years had the lowest percentage of cesareans (15.5%) for those who were low-risk with no prior cesarean.

Table 23: Cesarean Deliveries (Low-Risk & No Previous Cesarean) by Maternal Age Group (2010)

	Number of Low-Risk First Time Cesarean Deliveries	% of Low-Risk First Time Cesarean Deliveries	Number of Low-Risk Deliveries	% of Low-Risk Deliveries by Cesarean
Under 20 years	354	7.7%	2,056	17.2%
20-24 years	802	17.5%	4,901	16.4%
25-29 years	1,138	24.9%	7,342	15.5%
30-34 years	1,226	26.8%	7,343	16.7%
35-39 years	802	17.5%	4,061	19.7%
40+ years	250	5.5%	925	27.0%
Unknown	0	0.0%	1	-
Countywide 2010	**4,572**	**100.0%**	**26,629**	**17.2%**
Statewide 2010				**N/A**
HP 2010				**15.0%**
HP 2020				**23.9%**

Elective, Repeat Cesarean Deliveries

Description of Indicator: The following section presents the number of births delivered by cesarean in 2010 to low-risk females <u>with</u> a prior cesarean delivery. The denominator for this indicator is the number of live births to low-risk females with a prior cesarean birth. A cesarean delivery is considered to be elective when there is no medical indication and the mother is considered to be at low-risk: >37 weeks gestation, singleton (not a multiple pregnancy), and fetus presents in a vertex position (downward facing head in the birth canal). Repeat cesarean delivery refers to a prior cesarean birth.
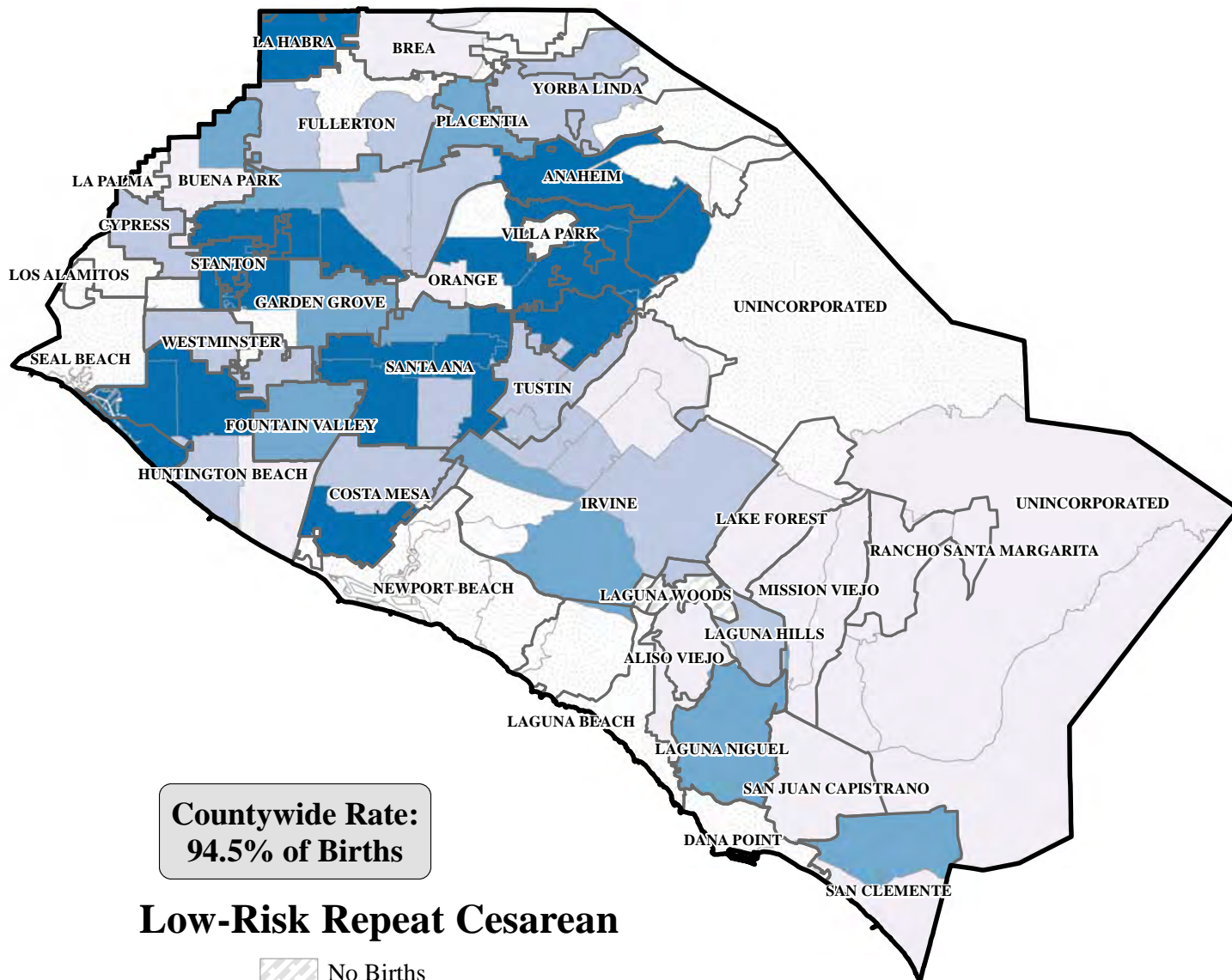
Importance: Cesarean deliveries for women who are at low-risk and with prior cesarean are at increased risk complications and morbidity.[10]

Trends: In 2010, there were 3,636 low-risks prior/repeat cesarean births in Orange County. Of these low-risk prior Cesareans births, 3,436 or 94.5% had cesarean deliveries. National goals to reduce cesareans have become less ambitious. The Healthy People 2010 goal for objective 16.9b[11] was to reduce the cesarean births among low-risk (full-term, singleton, vertex presentation) with prior cesarean births to 63.0%. For this Healthy People 2020 objective, with the same definition, the target was revised to 81.7%.[12] Orange County has not met HP 2010 nor HP 2020 targets for this objective with respect to repeat cesarean deliveries.

Geography: The following map shows the geographic distribution of Orange County's cesarean births by ZIP code for women with low risk and a prior cesarean. This information provides an important overview of where these elective methods of deliveries are being performed. Twenty-one (21) ZIP codes across several cities in the county had 100% repeat cesarean for women who were otherwise defined as low-risk. Essentially all Orange County ZIP codes were above the HP 2020 target of no more than 81.7% repeat, low-risk cesarean deliveries.

Table 24B, on a later page, shows that all cities (with a stable enough number of cases) failed to meet either of the Healthy People low-risk repeat cesarean delivery targets (HP 2010: 63%; or the more relaxed HP 2020: 81.7%). The city with the lowest percentage, Mission Viejo, had a rate of 86.4%, well above the target.

Orange County Cesarean Births (2010)
(Low-Risk Repeat Cesarean Delivery)

Countywide Rate: 94.5% of Births

Low-Risk Repeat Cesarean

- ▨ No Births
- ☐ 84.4% - 92.0%
- ☐ 92.1% - 94.5%
- ☐ 94.6% - 96.7%
- ■ 96.8% - 100.0%
- ▦ Insufficient Data
- ☐ City Boundaries

Source: 2010 Orange County Statistical Master Birth File

Table 24: (A) Low-Risk Cesarean Deliveries and (B) Low Risk, Repeat Cesarean by City (2010)

A: Low-Risk Primary Cesarean by City	Percentage	B: Low-Risk Repeat Cesarean by City	Percentage
Healthy People 2020 Goal	**23.9%**	Stanton	100.0%
Newport Beach	22.5%	Newport Beach	98.4%
Fountain Valley	21.6%	Fountain Valley	98.0%
Huntington Beach	21.5%	Orange	97.7%
Costa Mesa	20.8%	La Habra	97.4%
Los Alamitos	20.7%	Santa Ana	96.5%
Dana Point	20.7%	Costa Mesa	96.4%
Aliso Viejo	20.3%	Anaheim	96.2%
Tustin	20.2%	Placentia	95.7%
Irvine	19.9%	Garden Grove	95.3%
Westminster	19.5%	Laguna Niguel	95.1%
Seal Beach	19.0%	Huntington Beach	95.1%
Laguna Beach	17.9%	**Orange County**	**94.5%**
Mission Viejo	17.6%	Irvine	94.1%
Orange	17.5%	Yorba Linda	93.8%
Cypress	17.5%	Cypress	93.5%
La Palma	17.3%	Buena Park	93.1%
Orange County	**17.2%**	Tustin	92.8%
Santa Ana	17.0%	Laguna Hills	92.6%
Laguna Niguel	17.0%	Westminster	92.3%
Lake Forest	16.9%	San Clemente	91.7%
Garden Grove	16.8%	Fullerton	91.6%
Unincorporated	16.8%	San Juan Capistrano	90.9%
Laguna Hills	16.6%	Aliso Viejo	89.7%
Stanton	16.1%	Rancho Santa Margarita	89.1%
Anaheim	16.0%	Brea	89.1%
Healthy People 2010 Goal	**15.0%**	Unincorporated	88.5%
Yorba Linda	14.6%	Lake Forest	88.4%
San Juan Capistrano	14.5%	Mission Viejo	86.4%
San Clemente	14.0%	**Healthy People 2020 Goal**	**81.7%**
La Habra	13.7%	**Healthy People 2010 Goal**	**63.0%**
Fullerton	13.6%	Seal Beach	Unstable
Buena Park	13.1%	La Palma	Unstable
Rancho Santa Margarita	12.1%	Dana Point	Unstable
Placentia	11.9%	Laguna Beach	Unstable
Brea	10.1%	Laguna Woods	Unstable
Laguna Woods	Unstable	Villa Park	Unstable
Villa Park	Unstable	Los Alamitos	Unstable
California	**#N/A**	**California**	**#N/A**
United States	**#N/A**	**United States**	**#N/A**

Maternal Race/Ethnicity: Interestingly, when looking at low-risk, repeat cesarean deliveries, Hispanic and Asian Pacific Islander women had the highest percentages at 96.2% and 93.2%, respectively (**Table 25**). White women had the next highest percentage (92.9%) of low-risk repeat cesarean deliveries. Black women had the lowest percentage of low-risk and repeat delivery by C-section at 88.6%. No race/ethnic groups have met the HP 2010 (63%) or HP 2020 (81.7%) targets for this objective.

Vaginal births after cesarean (VBAC) refers to women who do not have repeat cesarean deliveries. The corresponding percentages of VBAC are also presented in **Table 25** by maternal race/ethnicity. Only 5.5% of Orange County mothers (n=200) had a VBAC in 2010. Black mothers had the highest VBAC rate of 11.1%, while Hispanic mothers had the lowest at 3.8%.

Table 25: Cesarean Deliveries (Low-Risk & with Previous Cesarean) by Maternal Race/Ethnicity (2010)

	Number of Low-Risk Repeat Cesarean Deliveries	*Number of Low-Risk Moms with Prior Cesarean Deliveries*	*% of Low-Risk Repeat Cesareans Deliveries*	*% Vaginal Deliveries after Cesarean (VBAC)*
Hispanic	1,750	1,820	96.2%	3.8%
Asian/PI	605	649	93.2%	6.8%
White	1,002	1,078	92.9%	7.1%
Black	39	44	88.6%	11.4%
Other/Unknown	40	45	88.9%	11.1%
Countywide 2010	**3,436**	**3,636**	**94.5%**	**5.5%**
Statewide 2010			**N/A**	**N/A**
HP 2010			**63.0%**	**-**
HP 2020			**81.7%**	**-**

Maternal Age Groups: The number and percentage of cesarean deliveries to low-risk repeat cesarean deliveries are presented below in **Table 26** by maternal age. Younger women, under 20 and 20-24 years of age, who were low-risk with and had prior cesareans, were most likely to deliver by cesarean (98.2% and 97.1%, respectively). Women 30-34 years and 35-39 years had the lowest percentage of cesareans (93.6% and 93.7%, respectively) for those who were low-risk with prior cesareans. No age groups have met the HP 2010 or HP 2020 targets for this objective.

The corresponding percentages of vaginal births after cesarean (VBAC) are also presented in **Table 26** by maternal age group. Mothers 30-34 and 35-39 years of age had the highest VBAC rates of 6.4% and 6.3%, respectively, in the county in 2010.

Table 26: Cesarean Deliveries (Low-Risk & Previous Cesarean) by Maternal Age Group (2010)

|	*Number of Low-Risk Repeat Cesarean Deliveries*	*Number of Low-Risk Females with Prior Cesarean Deliveries*	*Percent of Low-Risk Repeat Cesareans Deliveries*	*% Vaginal Deliveries after Cesarean (VBAC)*
Under 20 years	56	57	98.2%	1.8%
20-24 years	431	444	97.1%	2.9%
25-29 years	841	886	94.9%	5.4%
30-34 years	1,060	1,133	93.6%	6.4%
35-39 years	812	867	93.7%	6.3%
40+ years	236	249	94.8%	5.2%
Unknown	0	0	-	-
Countywide 2010	**3,436**	**3,636**	**94.5%**	**5.5%**
Statewide 2010			**N/A**	**N/A**
HP 2010			**63.0%**	**-**
HP 2020			**81.7%**	**-**

Breastfeeding Initiation

Description of Indicator: The tables and maps provide the percentage of in-hospital breastfeeding initiation. This percentage includes mothers with a known feeding method of "any" breastfeeding, which is exclusive breast feeding or a combination of breast feeding and formula, within the first 24-48 hours of birth as indicated at time of discharge from the hospital. Healthy People (HP) 2010 (16-19a) and 2020 (MICH-21.1) objectives seek to increase the proportion of mothers who breastfeed their babies in the early postpartum period. The HP goal has increased over time, from 75% in 2010 to 81.9% in 2020.

Importance: Breastfeeding is promoted by the American Academy of Pediatrics, Women, Infants and Children (WIC), and other national and international authorities. Besides being cost effective for families, breastfeeding is associated with fewer episodes of infectious illness among infants, and confers numerous other protective health benefits to both the infant and mother.[13]

Trends: There have been a number of revisions to the Newborn Screening (NBS) form over the years, specifically in 2004, 2008, 2009 and again in 2010. As a result, the data collected for California (CA) and Orange County (OC), which comes from the NBS form, has been revised over time. Therefore, 2010 breastfeeding initiation data should not be compared to data published in years prior to 2010. The 2010 data will now serve as the new baseline for future comparisons and trending of in-hospital breastfeeding practices. In 2010, 92.8% of OC mothers and 90.8% of CA mothers initiated breastfeeding during the first 24 to 48 hours in the hospital (**Figure 10**). Past year breastfeeding data (2000 to 2009) are provided in the figure below to demonstrate that both consistently rated above the HP 2010 and 2020 goals. Nationally, survey data are collected from mothers after discharge, and therefore may not be comparable with CA and OC data. However, breastfeeding initiation has remained relatively unchanged in the past decade fluctuating from 70% to 75% of women initiating breastfeeding.

Figure 10: "Any" In-Hospital Initiated Breastfeeding U.S., California, and Orange County (2000 - 2010)
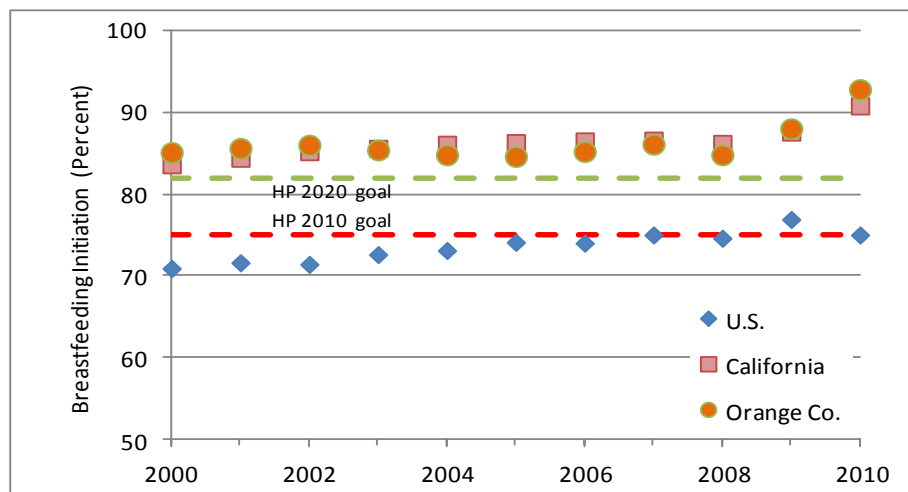
Geography: The geographic distribution of Orange County's "Any" Breastfeeding sections provides an important overview of where these healthy practices are taking place and where additional distribution of resources, and education efforts should be targeted. **Table 27** at right summarizes the "any" breastfeeding data for 2010 by mother's city of residence.

All of the cities in Orange County have met both the HP 2010 and HP 2020 goal for "any" breastfeeding. Many of the more affluent cities had high percentages of breastfeeding, including Laguna Beach which had the highest percentage (97.2%) of "any" breastfeeding followed by Seal Beach (96.3%), Irvine (96.1%), and San Juan Capistrano (96.1%). The cities with the lowest percentage of "any" breastfeeding included La Habra (88.8%), Garden Grove (89.3%) and Cypress (90.4%).
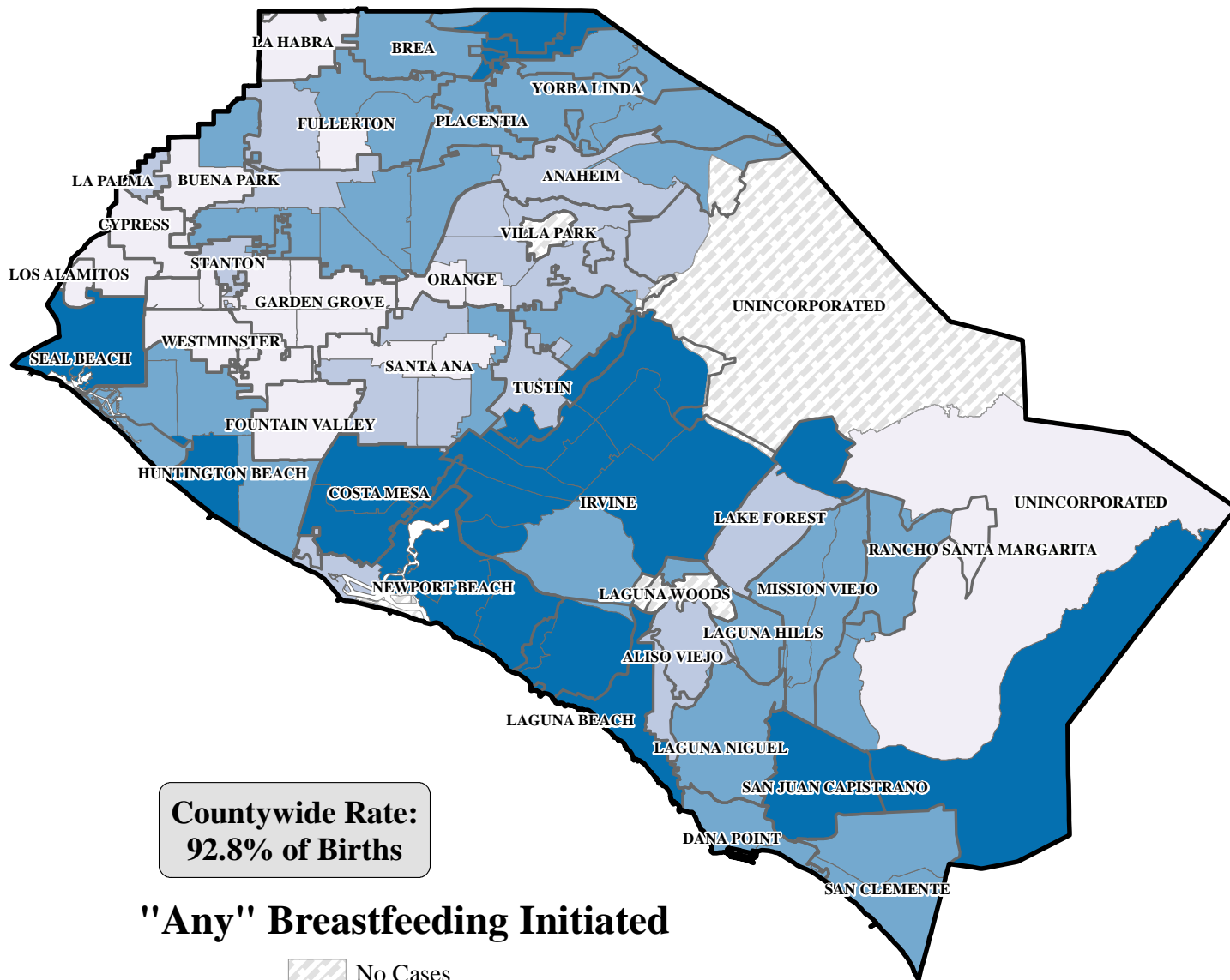
The following map presents the percentage of "any" breastfeeding by ZIP code of residence. When compared across ZIP codes, the rates ranged from a low of 88.4% for ZIP code 92843 in the City of Garden Grove to a high 97.3% of "any" breastfeeding by mothers in ZIP code 92782 in Tustin.

*Note that National data are based on a survey of mothers after discharge; whereas, the data for CA, OC and all cities are based on in-hospital assessments using the Newborn Screening (NBS) form.

Table 27: "Any" Breastfeeding by City (2010)

City	"Any" Breastfeeding Percent
Laguna Beach	97.2%
Seal Beach	96.3%
Irvine	96.1%
San Juan Capistrano	96.1%
Costa Mesa	95.9%
Villa Park	95.5%
Newport Beach	95.3%
Laguna Niguel	94.7%
Placentia	94.6%
Brea	94.4%
Huntington Beach	94.2%
Dana Point	94.2%
San Clemente	94.1%
Tustin	93.9%
Mission Viejo	93.7%
Rancho Santa Margarita	93.7%
Anaheim	93.1%
Laguna Hills	93.1%
Los Alamitos	93.1%
Aliso Viejo	92.9%
Yorba Linda	92.8%
Orange County	**92.8%**
Lake Forest	92.5%
Fullerton	92.3%
Stanton	92.3%
La Palma	91.8%
Buena Park	91.8%
Unincorporated	91.6%
Orange	91.6%
Santa Ana	91.4%
California	**90.8%**
Westminster	90.5%
Fountain Valley	90.5%
Cypress	90.4%
Garden Grove	89.3%
La Habra	88.8%
Healthy People 2020 Goal	**81.9%**
United States*	**75.0%**
Healthy People 2010 Goal	**75.0%**

Orange County "Any" Breastfeeding (2010) ("Any" Breastfeeding* 1st 24-48 hrs of Birth)

LA HABRA
BREA
YORBA LINDA
FULLERTON
PLACENTIA
LA PALMA
BUENA PARK
ANAHEIM
CYPRESS
VILLA PARK
STANTON
LOS ALAMITOS
ORANGE
GARDEN GROVE
UNINCORPORATED
WESTMINSTER
SEAL BEACH
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
IRVINE
LAKE FOREST
UNINCORPORATED
RANCHO SANTA MARGARITA
NEWPORT BEACH
LAGUNA WOODS
MISSION VIEJO
LAGUNA HILLS
ALISO VIEJO
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE

Countywide Rate: 92.8% of Births

"Any" Breastfeeding Initiated

|	
▨	No Cases
☐	85.0% - 91.3%
☐	91.4% - 92.8%
☐	92.9% - 94.9%
■	95.0% - 97.5%
☐	City Boundaries

Source: 2010 California Department of Public Health, Center for Family Health, Genetic Disease Screening Program

*Note: "Any" breastfeeding includes: In-hospital breastfeeding with human milk or breastfeeding with human milk and formula, within the 1st 24-48 hours of birth, among mothers with a known method of feeding.

Maternal Race/Ethnicity: The *Healthy People 2010* (HP 2010) and *Healthy People 2020* (HP 2020) targets for initiating breastfeeding were 75% and 81.9%, respectively. In 2010, all racial/ethnic groups in Orange County met the HP 2010 and HP 2020 targets for "any" breastfeeding. Breastfeeding initiation in Orange County varied only slight by race/ethnicity, ranging from a low of 89.0% for Blacks to a high of 93.1% for Hispanics (**Table 28**).

Table 28: "Any" In-Hospital Breastfeeding by Maternal Race/Ethnicity (2010)

|	*Total Number of Breastfeeding*	*Number "Any" Breastfeeding*	*% "Any" Breastfeeding*
Hispanic	9,677	9,013	93.1%
White	17,301	16,021	92.6%
Asian/PI	5,137	4,749	92.4%
Black	337	300	89.0%
Other/Unknown	2,098	1,966	93.7%
Countywide 2010	**34,550**	**32,049**	**92.8%**
Statewide 2010			**90.8%**
HP 2010			**75.0%**
HP 2020			**81.9%**
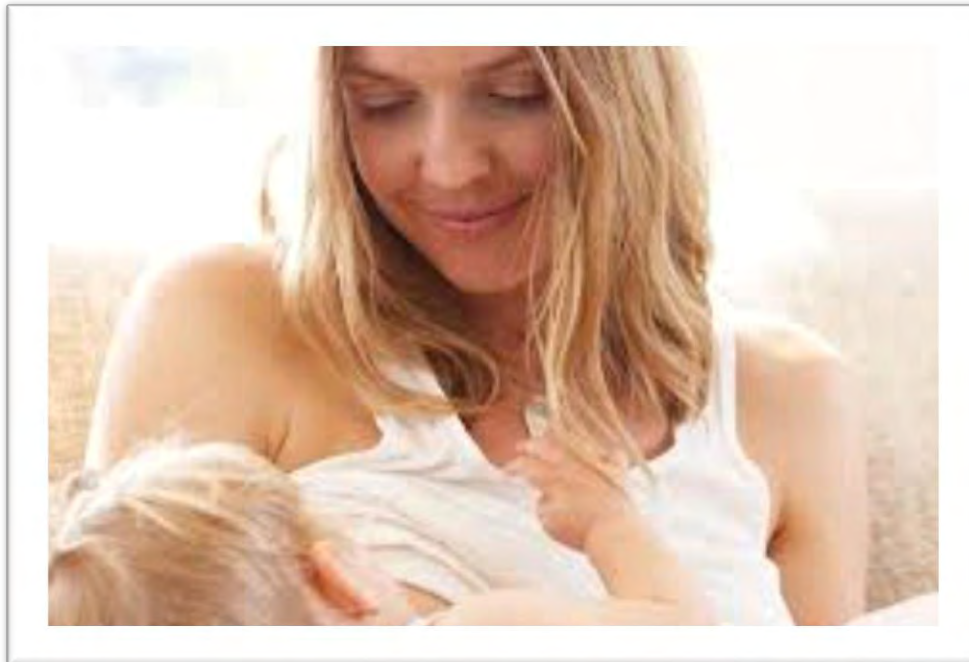
Infant Mortality

Description of Indicator: The infant death rate is based on number of deaths per 1,000 live births under one year of age (under 365 days of age).

Why is this important? The infant mortality rate traditionally has been considered of great significance in public health. A high rate has been taken to indicate unmet health needs and unfavorable environmental factors, such as, income, nutrition, education, sanitation and medical care. The leading causes of infant mortality are congenital abnormalities, maternal complications during pregnancies, short gestation and low birth weight, complication of placenta, cord or membranes, sudden infant death syndrome (SIDS) and other unspecified causes.

Trends: The infant mortality rates in Orange County for the past decade have been fluctuating between 3.8 and 5.1 infant deaths per 1,000 live births. In 2010, the infant death rate in Orange County was a 10-year low of 3.8 deaths per 1,000 live births, down 22% from the rate of 4.9 in 2000. The U.S. infant mortality rate has been consistently higher than California and Orange County. The U.S. infant mortality rate in 2010 was 4.7 deaths per 1,000 live births, a decrease of 32% from 2000 (6.9). California's infant mortality rate in 2010 was 4.7 deaths per 1,000 live births, a decrease of 13% from 2000 (5.4). Orange County's infant mortality rate has consistently been lower than infant mortality rates for the U.S. and California. In 2010, Orange County met the HP 2010 infant mortality target of no more than 4.5 deaths to infants aged less than one year per 1,000 live births. California and Orange County have consistently met the new HP 2020 goal to reduce the rate of infant (<1 year) mortality to no more than 6 infant deaths per 1,000 live births.

Figure 11: Infant Mortality Rate
U.S., California, and Orange County (2000 - 2010)
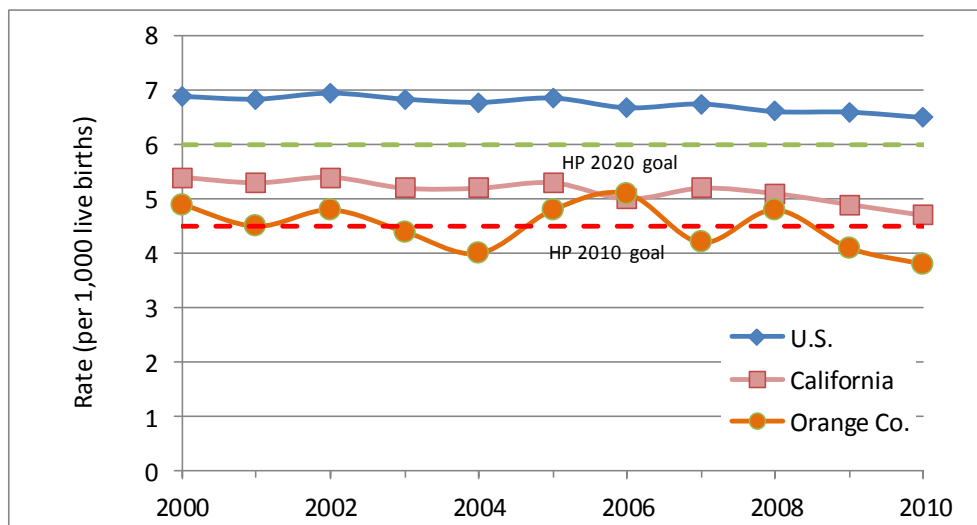
Geography: The geographic distribution of Orange County's infant mortality rate provides an important view of locations with higher rates of infant mortality occurring under 365 days of age, allowing for more accurate distribution of resources and education efforts. **Table 29** at right summarizes the rate of infant mortality per 1,000 live births by mother's city of residence.

Seven cities within Orange County did not have any infant deaths in 2010. These cities included Villa Park, Seal Beach, Los Alamitos, Laguna Woods, Laguna Hills, Laguna Beach and Dana Point. Fullerton had the highest infant mortality rate with 8.6 deaths per 1,000 live births. This was followed by La Palma with 7.8, Lake Forest with 7.4, Orange with 7.4, Rancho Santa Margarita with 7.0, and Tustin with 6.8 infant deaths per 1,000 live births. These six cities had the highest infant mortality rate in 2010, higher than the United States and Healthy People 2020 goal.
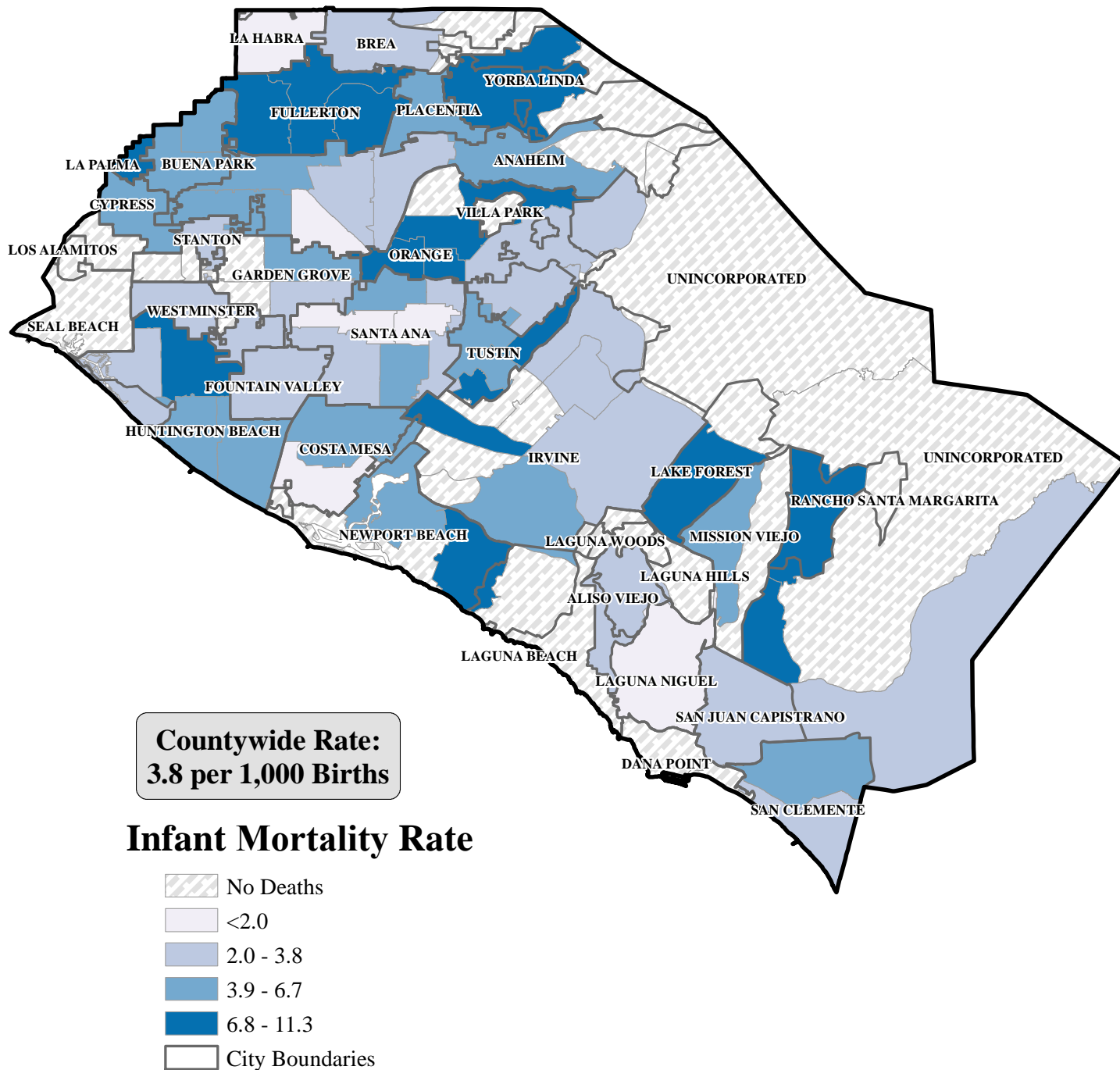
The map on the following page presents the infant mortality rate by mother's ZIP code of resident. ZIP code in 92868, in the city of Orange, had the highest infant mortality rate of 11.4 deaths per 1,000 live births. Twenty-five ZIP codes in various cities in Orange County reported no infant deaths in 2010.

Table 29: Infant Mortality Rate by City (2010)

City	Infant Mortality Rate Per 1,000 Live Birth
Fullerton	8.6
La Palma	7.5
Lake Forest	7.4
Orange	7.4
Rancho Santa Margarita	7.0
Tustin	6.8
United States	**6.5**
Healthy People 2020 Goal	**6.0**
Huntington Beach	5.6
Yorba Linda	5.4
Newport Beach	4.8
Buena Park	4.7
Placentia	4.7
Cypress	4.7
California	**4.7**
Healthy People 2010 Goal	**4.5**
San Clemente	4.0
Unincorporated	4.0
Orange County	**3.8**
Anaheim	3.5
Irvine	3.2
Santa Ana	3.0
Aliso Viejo	2.8
Costa Mesa	2.6
Mission Viejo	2.3
Fountain Valley	2.3
San Juan Capistrano	2.2
Brea	2.2
Garden Grove	2.1
Westminster	2.1
Stanton	2.1
Laguna Niguel	1.7
La Habra	1.2
Dana Point	0.0
Laguna Beach	0.0
Laguna Hills	0.0
Laguna Woods	0.0
Los Alamitos	0.0
Seal Beach	0.0
Villa Park	0.0

Orange County Infant Mortality Rate (2010)
Rate per 1,000 Births

LA HABRA
BREA
YORBA LINDA
FULLERTON
PLACENTIA
LA PALMA
BUENA PARK
ANAHEIM
CYPRESS
VILLA PARK
LOS ALAMITOS
STANTON
GARDEN GROVE
ORANGE
WESTMINSTER
UNINCORPORATED
SEAL BEACH
SANTA ANA
TUSTIN
FOUNTAIN VALLEY
HUNTINGTON BEACH
COSTA MESA
IRVINE
LAKE FOREST
UNINCORPORATED
RANCHO SANTA MARGARITA
NEWPORT BEACH
LAGUNA WOODS
MISSION VIEJO
LAGUNA HILLS
ALISO VIEJO
LAGUNA BEACH
LAGUNA NIGUEL
SAN JUAN CAPISTRANO
DANA POINT
SAN CLEMENTE

**Countywide Rate:
3.8 per 1,000 Births**

Infant Mortality Rate

- No Deaths
- <2.0
- 2.0 - 3.8
- 3.9 - 6.7
- 6.8 - 11.3
- City Boundaries

Source: 2010 Orange County Statistical Master Death File

Maternal Race/Ethnicity: Infant mortality rates by race/ethnicity were analyzed for 2010 and the data showed that all racial/ethnic groups achieved the Healthy People 2010 objective of 4.5 infant deaths or less per 1,000 live births, and the HP 2020 objective of no more than 6.0 deaths per 1,000 live births. Hispanics had the highest infant mortality rate at 4.5 deaths per 1,000 live births. Blacks had the next highest at 4.1 deaths per 1,000 live births and Whites had 3.2 deaths per 1,000 live births. Asian/Pacific Islanders had the lowest infant mortality rate of 2.0 deaths per 1,000 live births (**Table 30**).

Because of the relatively small number of births to Black mothers in Orange County each year (~1% of all OC births or 489), the infant mortality rates show greater variation than other races/ethnicities and should be interpreted with caution. In 2010, there were 2 infant deaths for Blacks in Orange County. Similarly, the number of infant deaths to Asian/Pacific Islander mothers is also low and as such, the rates can vary substantially from year to year and should be interpreted with this caveat in mind.

Table 30: Infant Mortality by Maternal Race/Ethnicity (2010)

	Number of Infant Deaths	% of Infant Deaths	Number of Births	Rate/1,000 Live Births
Hispanic	86	58.5%	18,930	4.5
Black	2	1.4%	489	4.1*
White	38	25.9%	11,711	3.2
Asian/PI	13	8.8%	6,551	2.0*
Other/Unknown	8	5.4%	556	14.4*
Countywide 2010	**147**	**100.0%**	**38,237**	**3.8**
Statewide 2010				**4.7**
HP 2010				**4.5**
HP 2020				**6.0**

*Rates based on small numbers of cases can vary substantially from year to year and should be interpreted with caution.

Table 31 shows the breakdown of infant mortality in 2010 by cause of death. The top three causes of infant death, congenital anomalies (27.9%), maternal complications (12.9%), and short gestation/low birth weight (5.4%), accounted for nearly half (46.2%) of all infant deaths in 2010 in Orange County. Other unspecified causes (n=45) accounted for nearly one-third (30.6%) of all 147 infant deaths that occurred in 2010. It is important to note that a significant proportion of infant deaths may be attributable to causes that are not preventable.

Table 31: Causes of Infant Mortality (2010)

	Number of Deaths	*% of All Births (2010)*
Congenital anomalies	41	27.9%
Maternal Complication During Pregnancy	19	12.9%
Short gestation/Low birth weight	8	5.4%
Comp of placenta, cord, membranes	5	3.4%
Respiratory distress	5	3.4%
Necrotizing enterocolitis of newborn	5	3.4%
Hydrops fetalis (fetal hydrops) not due to hemolytic disease	4	2.7%
Neonatal hemorrhage	3	2.0%
Intrauterine hypoxia and birth asphyxia	3	2.0%
Diseases of circulatory system	2	1.4%
Accidents	2	1.4%
Homicide	2	1.4%
Sudden Infant Death Syndrome (SIDS)	2	1.4%
Bacterial sepsis of newborn	1	0.7%
Other unspecified causes	45	30.6%
Countywide 2010	**147**	**100%**

Birth Outcomes Ranking by City

Description of Indicator: Each city's average ranking across each of the eight birth indicators is presented in **Table 32** relative to each other and to state and nation benchmarks. Following methodology used by the CDC to rank geographic health indicators, the prevalence rate of the birth indicators were ranked numerically from best to worst to simplify identification of the geographic area (i.e., city) with the best or worst ranking.[14] A ranking of (1) indicates the city with the "best" (or most desirable) prevalence. Benchmarks were also ranked relative to Orange County cities in order to demonstrate overall how well each jurisdiction is doing.

For breastfeeding initiation and prenatal care, the most desirable prevalence is the highest value. For instance, the city with the highest breastfeeding initiation prevalence would be ranked (1). For the remaining six birth indicators, the most desirable prevalence is the lowest value. The city with the lowest prevalence of births to adolescent mothers, pre-term birth rate, low birth weight baby, low-risk primary cesareans, low-risk repeat cesareans, and infant mortality would be ranked (1).

Why is this important? An average ranking of the eight birth indicators (births to teens, pre-term, low birth weight, prenatal care, cesarean delivery, breastfeeding, and mortality) provides a way to assess the relative health of a city's newborn babies and identify areas in need of additional resources, education, and/or attention. Regardless of a city's ranking, it is important to note that individual maternal characteristics and health behaviors are the most important determinants of healthy birth outcomes.

While the methodology for comparative ranking based on individual indicators is valid, this average ranking of these eight birth indicators does not take into account the relative (protective) weight of one indicator over another. In the present study all indicators were weighted equally, a methodology that has not been validated independent of this report.

Geography: The geographic distribution of Orange County's average ranking on the eight birth indicators combined is presented in **Table 32** at right and in the map on the following page.

Brea (9.25) and Laguna Nigel (10.63) had the highest average ranking out of Orange County's 34 cities and un-incorporated areas in 2010 – indicating that, on average, these two cities had the best (i.e., most desirable) prevalence rates for the eight birth outcomes.

Cities with the less desirable prevalence rates had, on average, a ranking higher than 21.5. These cities included Santa Ana (21.63), Westminster (21.75), Huntington Beach (21.88), Orange (22.88), Garden Grove (23.00), and Cypress (24.25).
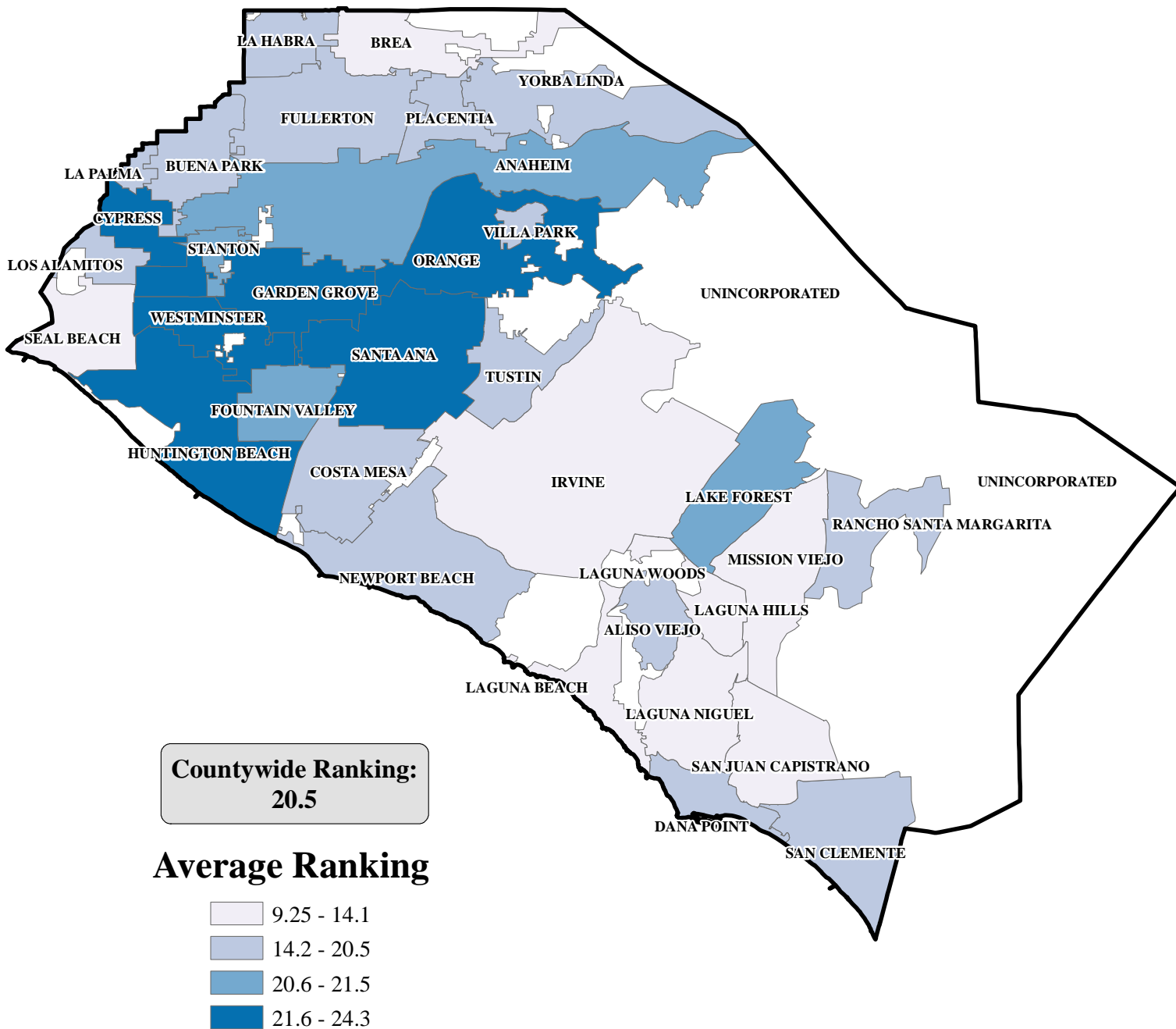
It is important to note, however, that these are relative rankings for Orange County. All cities ranked higher than the average ranking for the U.S. and the state of California. Seven cities ranked higher than the ambitious HP 2010 objectives and all cities ranked higher than the HP 2020 average ranking.

The map on the following page presents the geographic distribution of the average birth outcome ranking. The majority of cities in the southern and northern regions of the county tended to have higher rankings (i.e., more desirable) prevalence rates across the eight birth outcomes described in this report. Cities in central and western parts Orange County tended to have lower average rankings for these birth outcomes.

Table 32: Birth Outcomes Ranking by City

City	Average Ranking
Brea	9.25
Laguna Niguel	10.63
San Juan Capistrano	11.13
Laguna Beach	11.38
Irvine	12.88
Laguna Hills	12.88
Mission Viejo	12.88
Healthy People 2010	**13.57**
Seal Beach	14.13
Unincorporated	14.13
Aliso Viejo	14.50
San Clemente	14.50
Placentia	15.13
Buena Park	15.63
Dana Point	15.63
Rancho Santa Margarita	16.00
La Palma	16.50
Costa Mesa	17.38
Newport Beach	17.50
Yorba Linda	18.63
Fullerton	19.00
Villa Park	19.25
Tustin	19.75
La Habra	20.25
Los Alamitos	20.25
Orange County	**20.50**
Anaheim	20.88
Fountain Valley	21.25
Lake Forest	21.25
Stanton	21.25
Santa Ana	21.63
Westminster	21.75
Huntington Beach	21.88
Orange	22.88
Garden Grove	23.00
Cypress	24.25
Healthy People 2020	**28.00**
California	28.60
United States	32.40

Orange County Birth Outcomes Ranking
By City (2010)

Countywide Ranking:
20.5

Average Ranking

- [ ] 9.25 - 14.1
- [ ] 14.2 - 20.5
- [ ] 20.6 - 21.5
- [ ] 21.6 - 24.3

LA HABRA · BREA · YORBA LINDA · FULLERTON · PLACENTIA · LA PALMA · BUENA PARK · ANAHEIM · CYPRESS · VILLA PARK · STANTON · ORANGE · LOS ALAMITOS · GARDEN GROVE · UNINCORPORATED · WESTMINSTER · SEAL BEACH · SANTA ANA · TUSTIN · FOUNTAIN VALLEY · HUNTINGTON BEACH · COSTA MESA · IRVINE · LAKE FOREST · UNINCORPORATED · RANCHO SANTA MARGARITA · NEWPORT BEACH · LAGUNA WOODS · MISSION VIEJO · LAGUNA HILLS · ALISO VIEJO · LAGUNA BEACH · LAGUNA NIGUEL · SAN JUAN CAPISTRANO · DANA POINT · SAN CLEMENTE

Summary

Overall, Orange County compares well on all birth outcome indicators relative to the U.S. and the state of California (with the exception of the county's high cesarean delivery rates). Orange County has notably lower prevalence rates of preterm birth, low birth weight, births to teens, and infant mortality compared to the state of California and the nation. Prevalence rates of prenatal care and any breastfeeding initiation also compare favorably with the U.S. and California benchmarks for these indicators. Similarly, Orange County has achieved six of the seven Healthy People 2020 goals presented in this report that have a target objective (**Table 33**). The prevalence rates of pre-term births, low birth weight, early prenatal care, low-risk cesareans, any breastfeeding initiation, and infant mortality (green font color) have met the 2020 objective. The one birth indicator that remains to be achieved in Orange County is the repeat cesarean deliveries to low-risk mothers (red font color).

Table 33. Summary of OC Birth Indicators to Healthy People 2020 Goals

Birth Outcome Indicators (2010)	OC	HP2020
Births to Teens (per 1,000 females 15-19)	**22.4**	n/a
Pre-Term Births	**9.1%**	11.4%
Low Birth Weight	**6.4%**	7.8%
Early Prenatal Care	**89.9%**	77.9%
Low-Risk Primary Cesarean	**17.2%**	23.9%
Low-Risk Repeat Cesarean	**94.5%**	81.7%
Any Breastfeeding Initiation	**92.8%**	81.9%
Infant Mortality (per 1,000 live births)	**3.8**	6.0

These successes notwithstanding, it is important for providers and stakeholders to remain vigilant in order to maintain and improve on these areas. As described in this report, pronounced disparities exist across different race/ethnic groups and across different cities in the county. For the remainder of this decade, prenatal health care providers and other stakeholders can strive to serve areas of need and endeavor to reduce disparities wherever they exist in order to improve birth outcomes for all Orange County babies.

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