Identifying Dental Deserts in the Los Angeles County Safety Net using GIS Maps

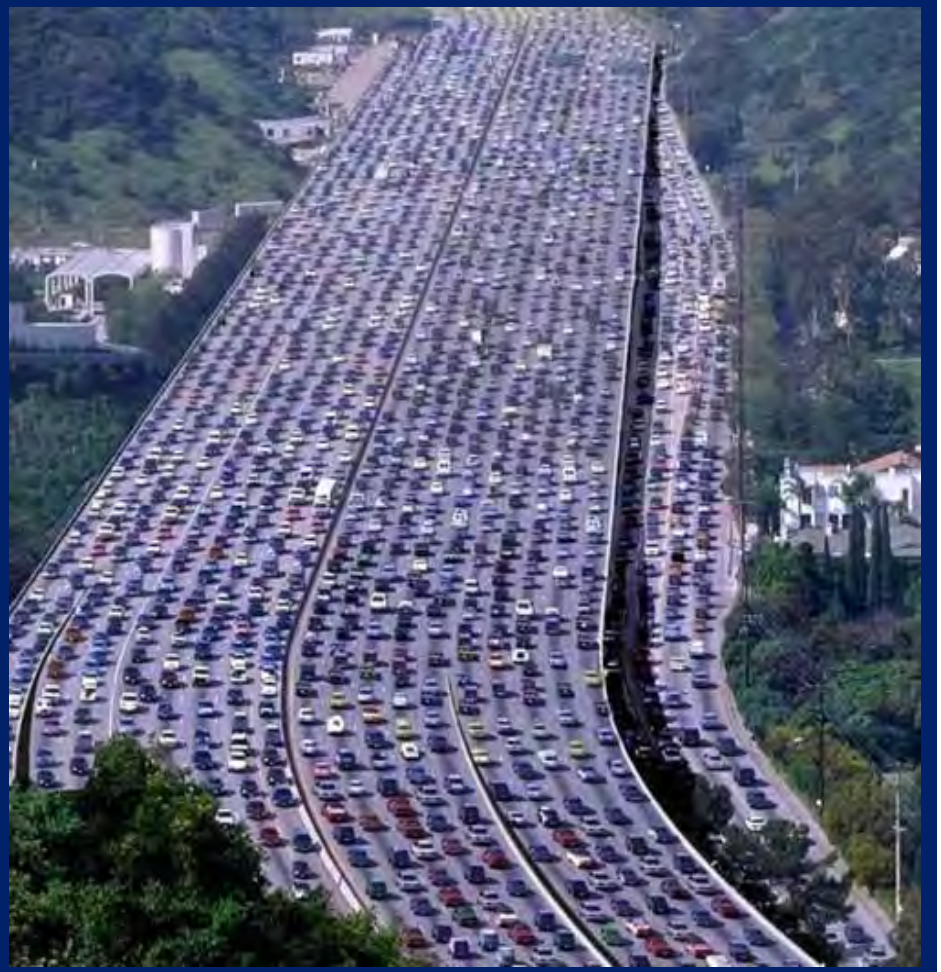
Maritza Cabezas, DDS, MPH
Dental Director
Oral Health Program

Background:

- Los Angeles County is the most populous and most diverse county in the US.

- How can issues related to access to dental care be addressed based on data and facts in such a complex system?

Q: How can someone plan for dental expansion in this vast and complex environment?



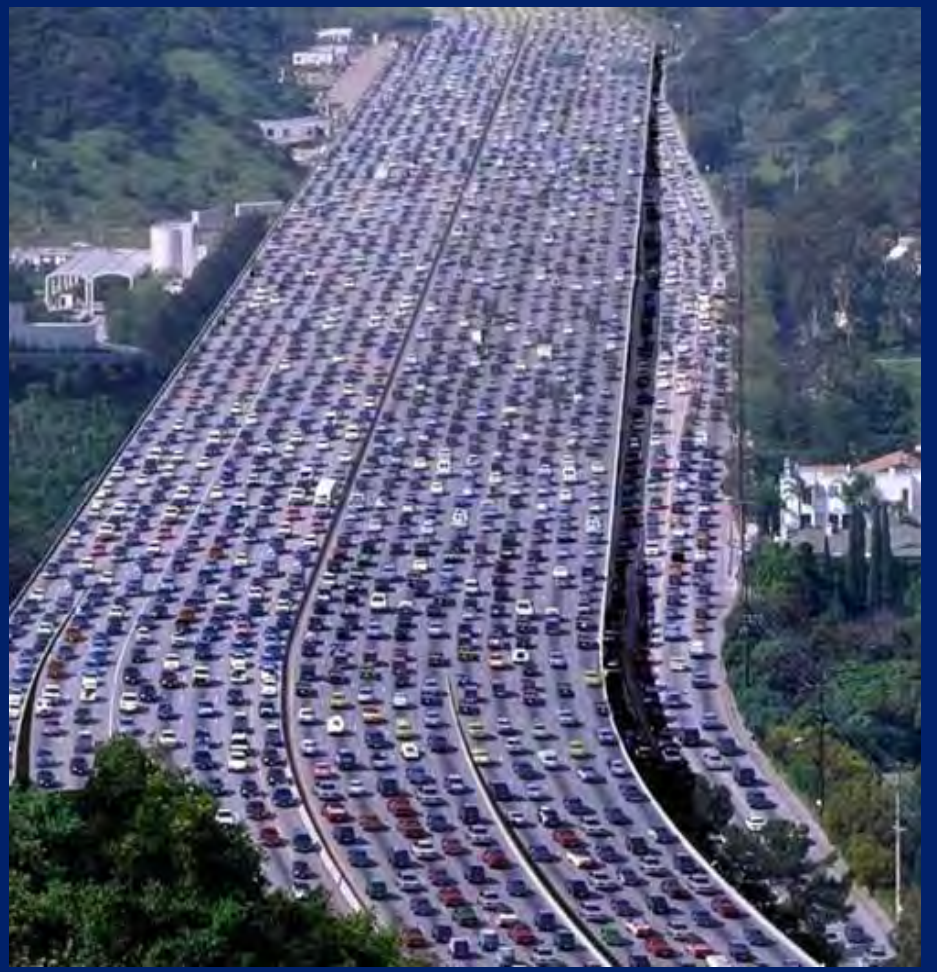
Facts About Los Angeles County:

- LA County:
  - Population: estimated to be more than 10 million
  - The most populous and most diverse county in the US
  - Size: 4,058 square miles
  - The county is larger than the combined areas of the states of Rhode Island and Delaware
- Cities in Los Angeles County:
  - There are 88 cities in LA County
  - LA City is the 2nd most populous city in the United States (New York City is the most, but consists of 5 boroughs/counties)

Facts About Los Angeles County:

- Approximately 10% of county residents live outside of the 88 cities in unincorporated areas (137)
- The population of Los Angeles County is larger than 41 of the 50 states.
- More that 25% of California residents live in LAC
- Population density is very high: 2,420 people per square mile
- Los Angeles County has the highest number of millionaires and the largest number of homeless people of any county in the US

Q: How can someone plan for dental expansion in this vast and complex environment?



Answer: Using a **Geographic Information System** (**GIS**) Map with applicable Data sets.

The Power of Mapping:

GIS lets us visualize, question, analyze, and interpret data to understand relationships, patterns, and trends.

Objectives:

- Show how this complex system of dental care delivery can be analyzed by using GIS maps
- Define ***Dental Deserts (DD)***
- Illustrated the steps used to identify the Dental Deserts
- Demonstrate how GIS helped with the identification of Dental Deserts
- Discuss next steps

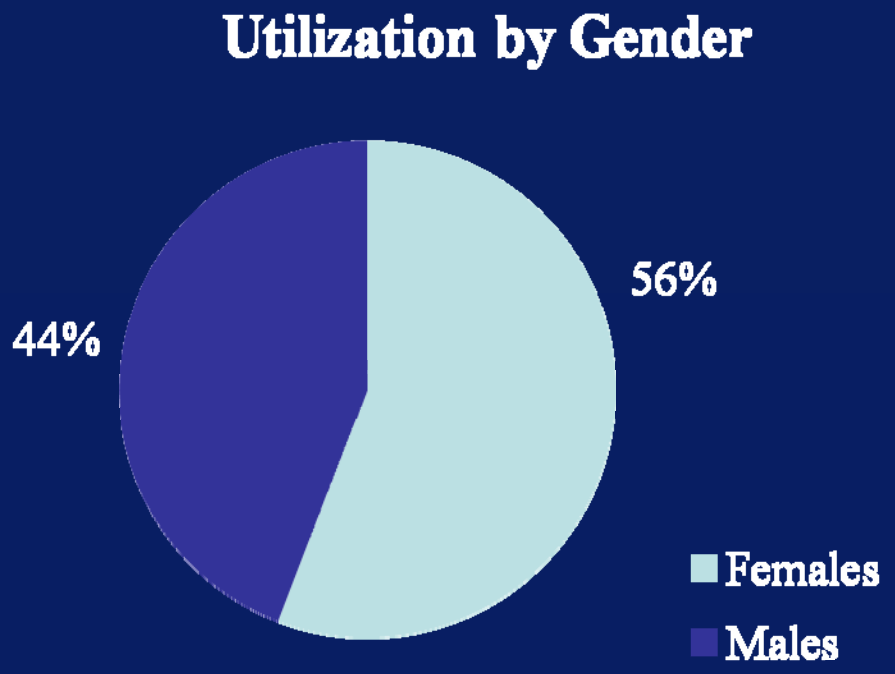
Demographics:

Who utilizes LAC DHS Dental Clinics?

Who are our patients?

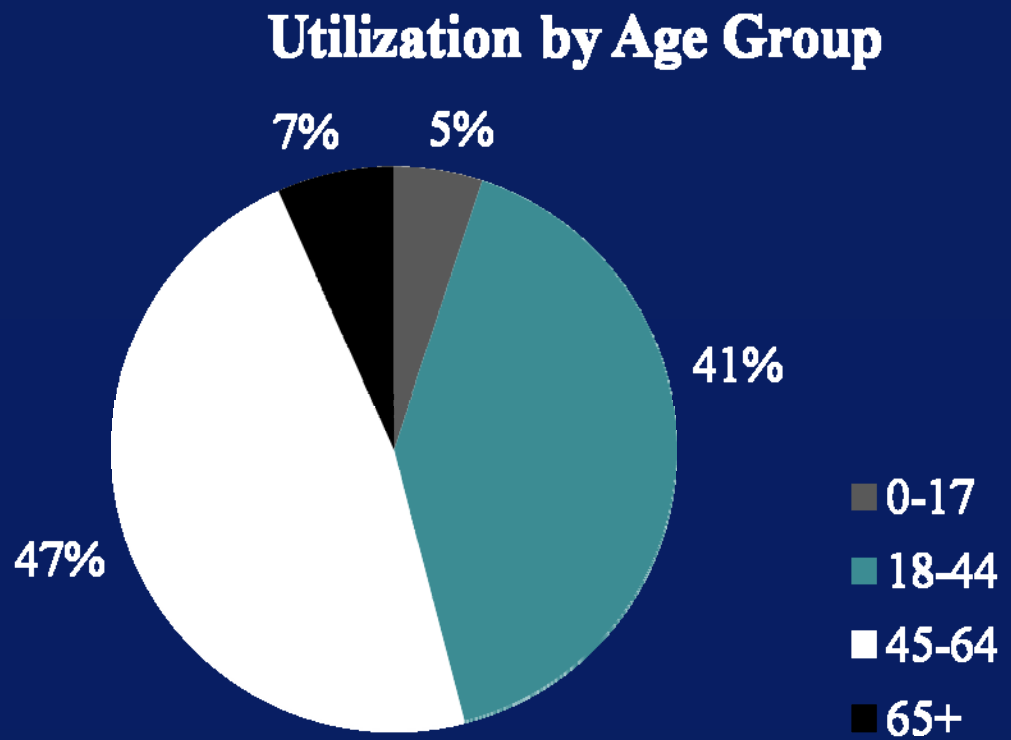
Patient Demographics: GENDER

Number of Patients (FY 2012-13)		
Gender	**Number**	**Percent**
Female	16,513	55.8
Male	13,060	44.2
Unknown	2	0.0
TOTAL	**29,575**	**100.0**



Patient Demographics: AGE

Number of Patients (FY 2012-13)		
Age Group	**Number**	**Percent**
0-107	122	0.4
5-14	753	2.6
15-17	609	2.1
18-24	2,310	7.8
25-34	4,589	15.5
35-44	5,189	17.6
45-54	7,094	24.0
55-64	6,919	23.4
65+	1,990	6.7
TOTAL	**29,575**	**100.0**



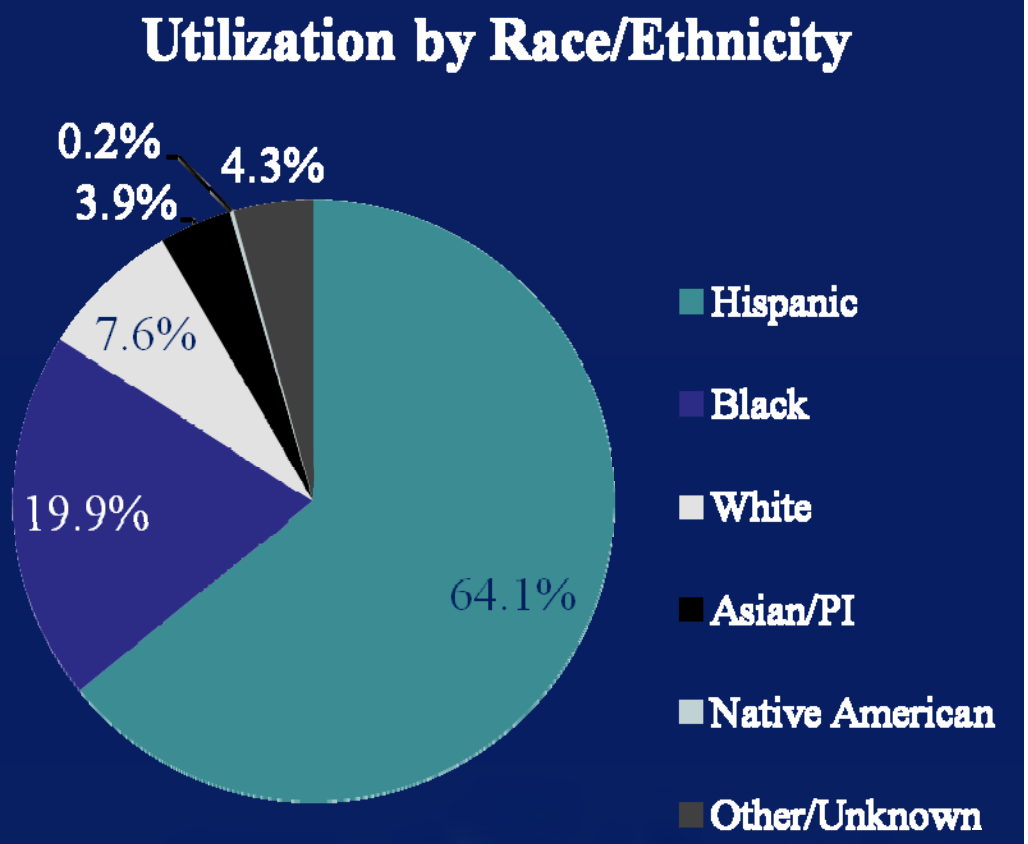
Slide 12

NB2 WHy did you decide to break up the pie chart into the 4 age groups? is that based on something?
Noel Barakat, 3/16/2016

NB6

Patient Demographics: RACE/ETHNICITY

Number of Patients (FY 2012-13)		
Race/Ethnicity	**Number**	**Percent**
Hispanic	18,956	64.1
Black	5,892	19.9
White	2,242	7.6
Asian/Pi	1,151	3.9
Native American	71	0.2
Other/Unknown	1,263	4.3
TOTAL	**29,575**	**100.0**

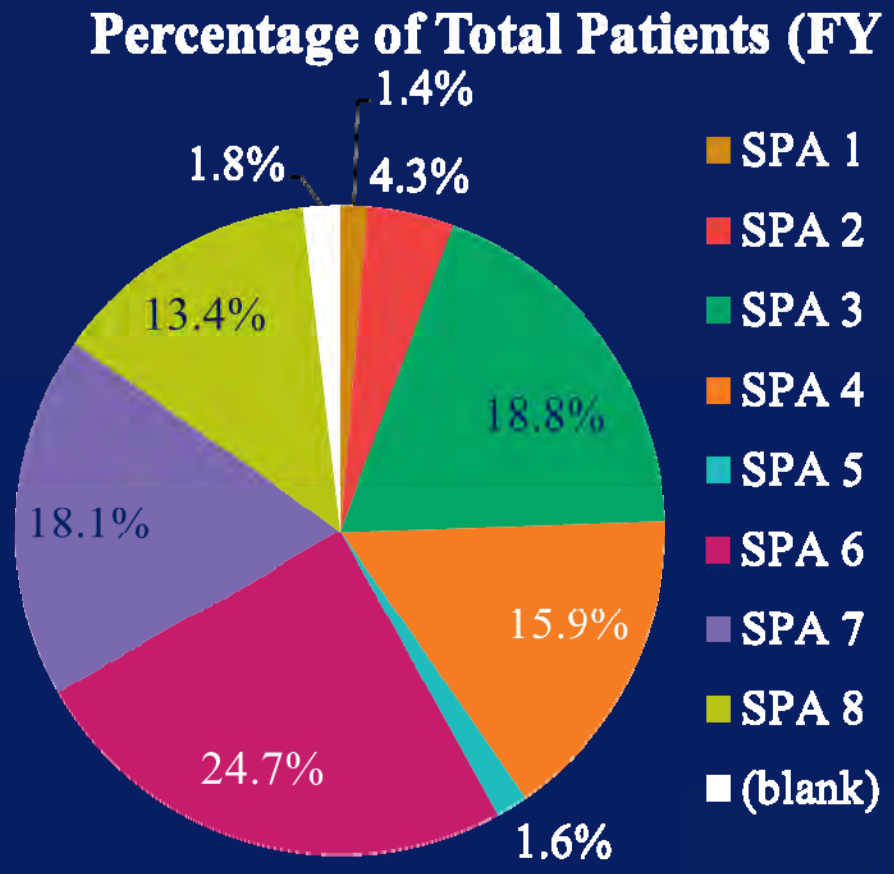


Slide 13

NB6 if you can do it easily, I think it would help to have the color coding on the table match the color coding of the pie chart. but its not a big deal if it is too cumbersome to do.

Noel Barakat, 3/16/2016

Patient Demographics:
Patients by Service Planning Area (SPA)

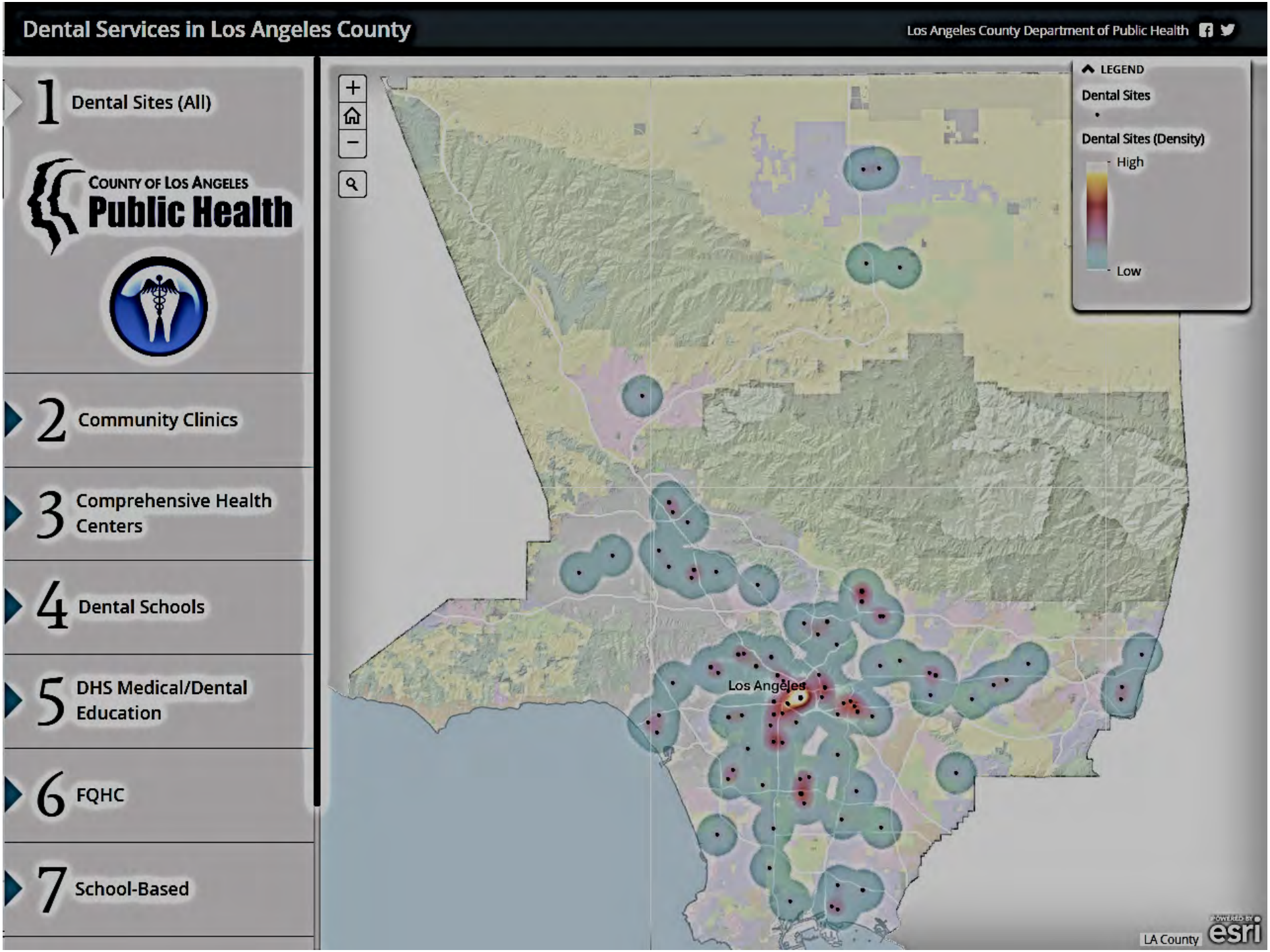


Types of Dental Clinics Included in Map:

1. My Health LA (MHLA) Clinics
2. Comprehensive Health Centers (CHC)
3. Graduate Medical/Dental Education Institutions
4. Federally Qualified Health Centers (FQHCs)
5. Community Clinics
6. Dental Schools
7. School Based Clinics
8. Clinics that treat only HIV patients
9. Clinics that treat only Children

Initial Data and First GIS Map

At first glance the map portrayal of Access to dental care was deceiving….


Dental Services in Los Angeles County
Los Angeles County Department of Public Health
1 Dental Sites (All)
County of Los Angeles
Public Health
2 Community Clinics
3 Comprehensive Health Centers
4 Dental Schools
5 DHS Medical/Dental Education
6 FQHC
7 School-Based
LEGEND
Dental Sites
Dental Sites (Density)
High
Low
Los Angeles
LA County
esri

Looking for Need and Disparities….

Dental Services in Los Angeles County

Los Angeles County Department of Public Health

2 Community Clinics

3 Comprehensive Health Centers

4 Dental Schools

5 DHS Medical/Dental Education

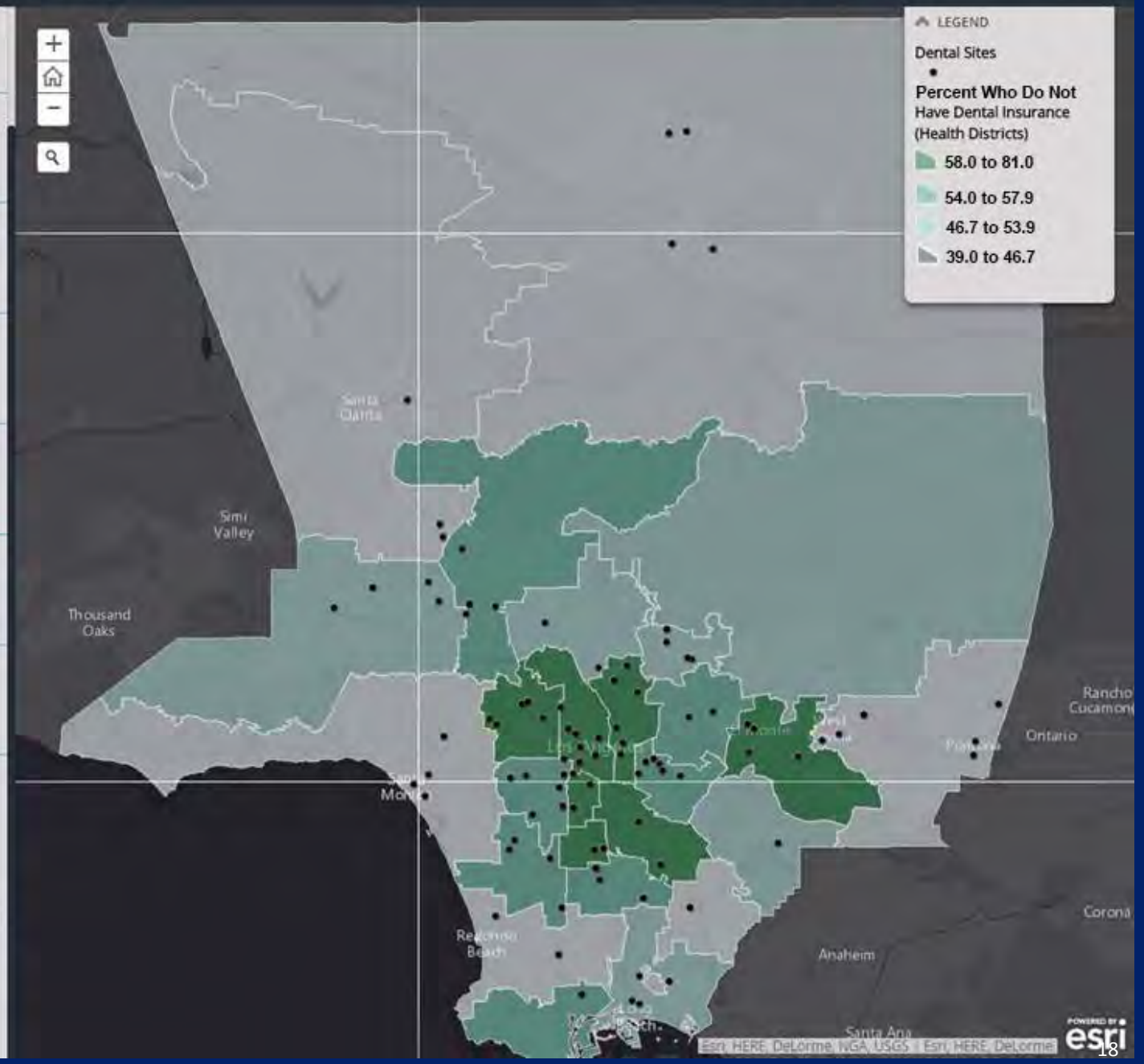
6 FQHC

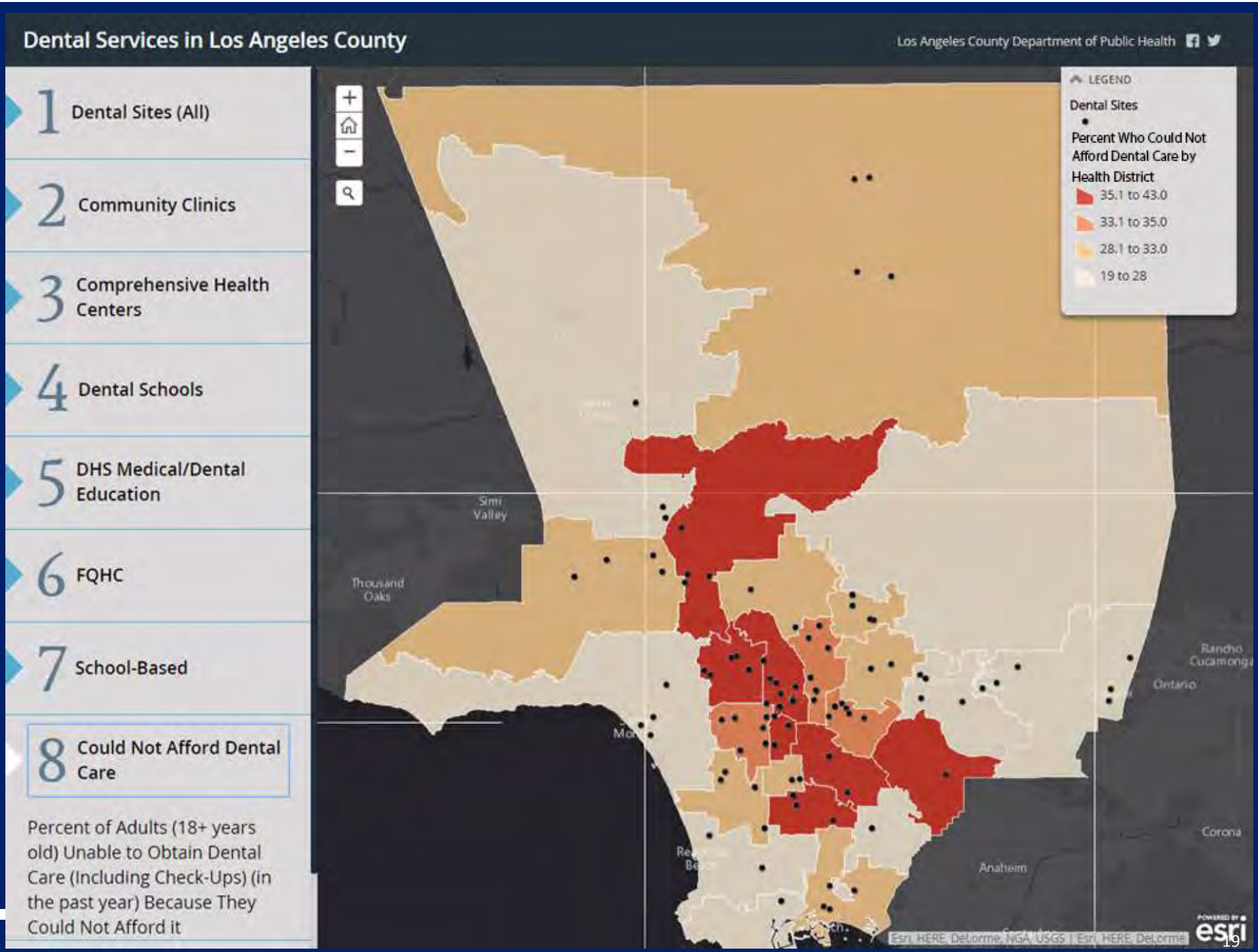
7 School-Based

8 Could Not Afford Dental Care

9 Have Dental Insurance

Percent of Adults (18+ years old) Who **Do Not** Have Dental Insurance Coverage that Pays for Some or All of their Routine Dental Care




Dental Services in Los Angeles County
Los Angeles County Department of Public Health
1 Dental Sites (All)
2 Community Clinics
3 Comprehensive Health Centers
4 Dental Schools
5 DHS Medical/Dental Education
6 FQHC
7 School-Based
8 Could Not Afford Dental Care
Percent of Adults (18+ years old) Unable to Obtain Dental Care (Including Check-Ups) (in the past year) Because They Could Not Afford it
LEGEND
Dental Sites
Percent Who Could Not Afford Dental Care by Health District
35.1 to 43.0
33.1 to 35.0
28.1 to 33.0
19 to 28
Simi Valley
Thousand Oaks
Rancho Cucamonga
Ontario
Corona
Anaheim
Esri, HERE, DeLorme, NGA, USGS | Esri, HERE, DeLorme
esri

Mapping “Dental Deserts”

Mapping Dental Deserts

Definition: Areas in LA County that meet all 3 criteria:

1. Areas with high population density; AND

2. Areas of low-income AND

3. Areas that have no or insufficient dental services.

NB10

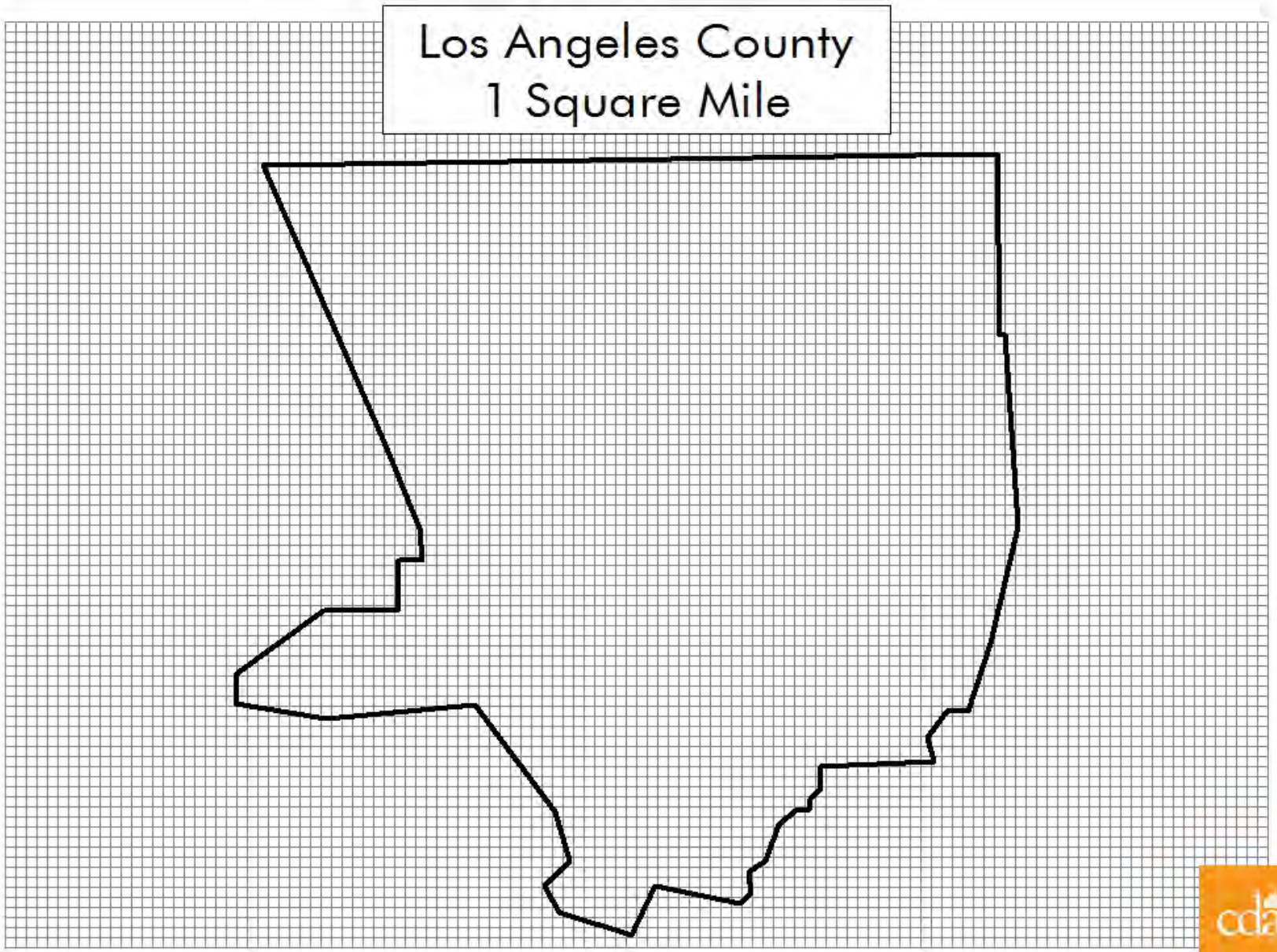
Methods/Sources of Data:

- Maps were created with GIS showing where each facility is located in the LAC area.
- Data provided by the 211 LAC Hot Line,
- My Health LA Database,
- HRSA data on FQHC, and
- City population data was gleaned from the U.S. Census. (Source: 2015 ESRI, Arc GIS)

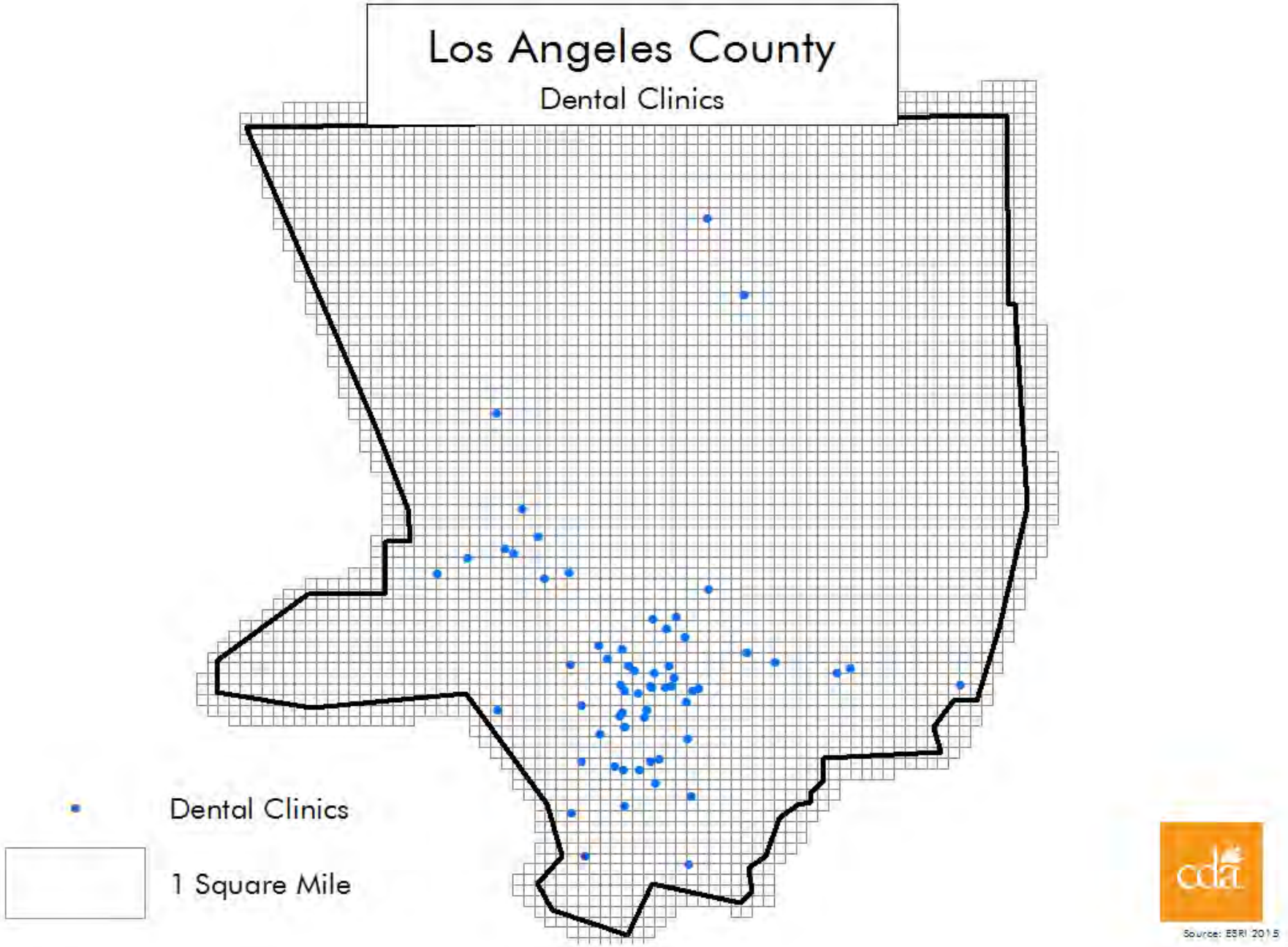
Slide 23

NB10 should this go before the map slides? I think it might help to explain this before you show the maps.
Noel Barakat, 3/16/2016

Los Angeles County
Lancaster
Palmdale
Vincent
Adelanto
Victorville
San Bernardino
Hesperia
Crestline
Santa Clarita
Fillmore
Santa Paula
Ventura
Moorpark
Simi Valley
San Fernando
Los Angeles
Camarillo
Oxnard
Agoura Hills
Calabasas
Thousand Oaks
Port Hueneme
Malibu
Santa Monica
Burbank
La Canada Flintridge
Sierra Madre
Pasadena
Glendale
West Hollywood
Beverly Hills
Los Angeles
Azusa
Glendora
La Verne
Upland
Fontana
Citrus
Pomona
Walnut
Ontario
Bloomington
Colton
Eastvale
Grand Terrace
Walnut Park
Whittier
Norwalk
Norco
Pedley
Jurupa Valley
Lennox
El Segundo
Manhattan Beach
Redondo Beach
Palos Verdes Estates
Gardena
Lakewood
Carson
Lomita
Rancho Palos Verdes
Long Beach
Los Alamitos
Fullerton
Brea
Yorba Linda
Corona
Riverside
Moreno Valley
Anaheim
Stanton
Orange
Tustin
Irvine
Fountain Valley
Santa Ana
Pearblossom Hwy
Angeles Crest Hwy
Pacific Coast Hwy
Roscoe Blvd
Lockwood Valley Rd
Bear Valley Rd
Phelan Rd
W Avenue D
W Avenue I
E Avenue J
E Palmdale Blvd
50th St E
90th St E
170th St E
Source: ESRI 2015



Source: ESRI 2015


Los Angeles County
Dental Clinics
Dental Clinics
1 Square Mile
Source: ESRI 2015

Los Angeles County
One Sq. Mile - Dental Clinics
Dental Clinics
1 Square Mile
Lancaster
Palmdale
Vincent
Adelanto
Victorville
Hesperia
Santa Clarita
Fillmore
Santa Paula
Ventura
Simi Valley
Moorpark
Camarillo
Oxnard
Port Hueneme
Thousand Oaks
Agoura Hills
Calabasas
Malibu
San Fernando
Burbank
Glendale
Pasadena
La Canada Flintridge
Sierra Madre
Azusa
Glendora
La Verne
Upland
Fontana
Crestline
Citrus
Pomona
Walnut
Ontario
Bloomington
Colton
Grand Terrace
Eastvale
Norco
Pedley
Jurupa Valley
Corona
Moreno Valley
Riverside
West Hollywood
Beverly Hills
Los Angeles
Santa Monica
Walnut Park
Whittier
Norwalk
Lennox
El Segundo
Manhattan Beach
Redondo Beach
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Lomita
Los Alamitos
Brea
Yorba Linda
Fullerton
Anaheim
Orange
Stanton
Fountain Valley
Santa Ana
Tustin
Irvine
cda
Source: ESRI 2015

Mapping Dental Deserts

Definition: Areas in LA County that meet all 3 criteria:

1. Areas with high population density; AND

2. Areas of low-income AND

3. Areas that have no or insufficient dental services.

High Density Population:

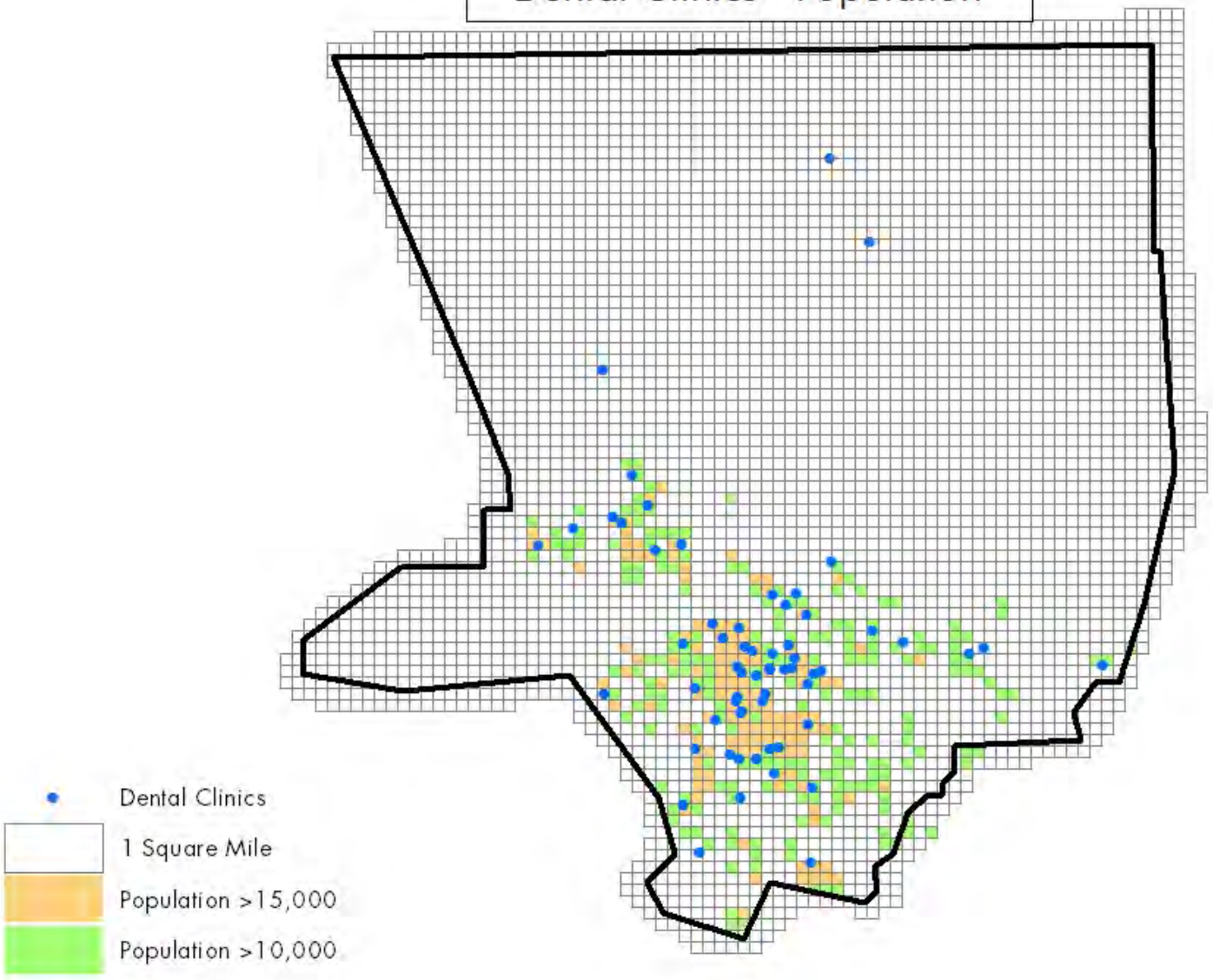
- Clear definition of population density, but not of "high" density. Population density is the total number of people within a defined area.

- Since the 10 most densely populated cities in the US have an average population density of > 10,000 people per square mile, we used that number as the definition of "high" density.

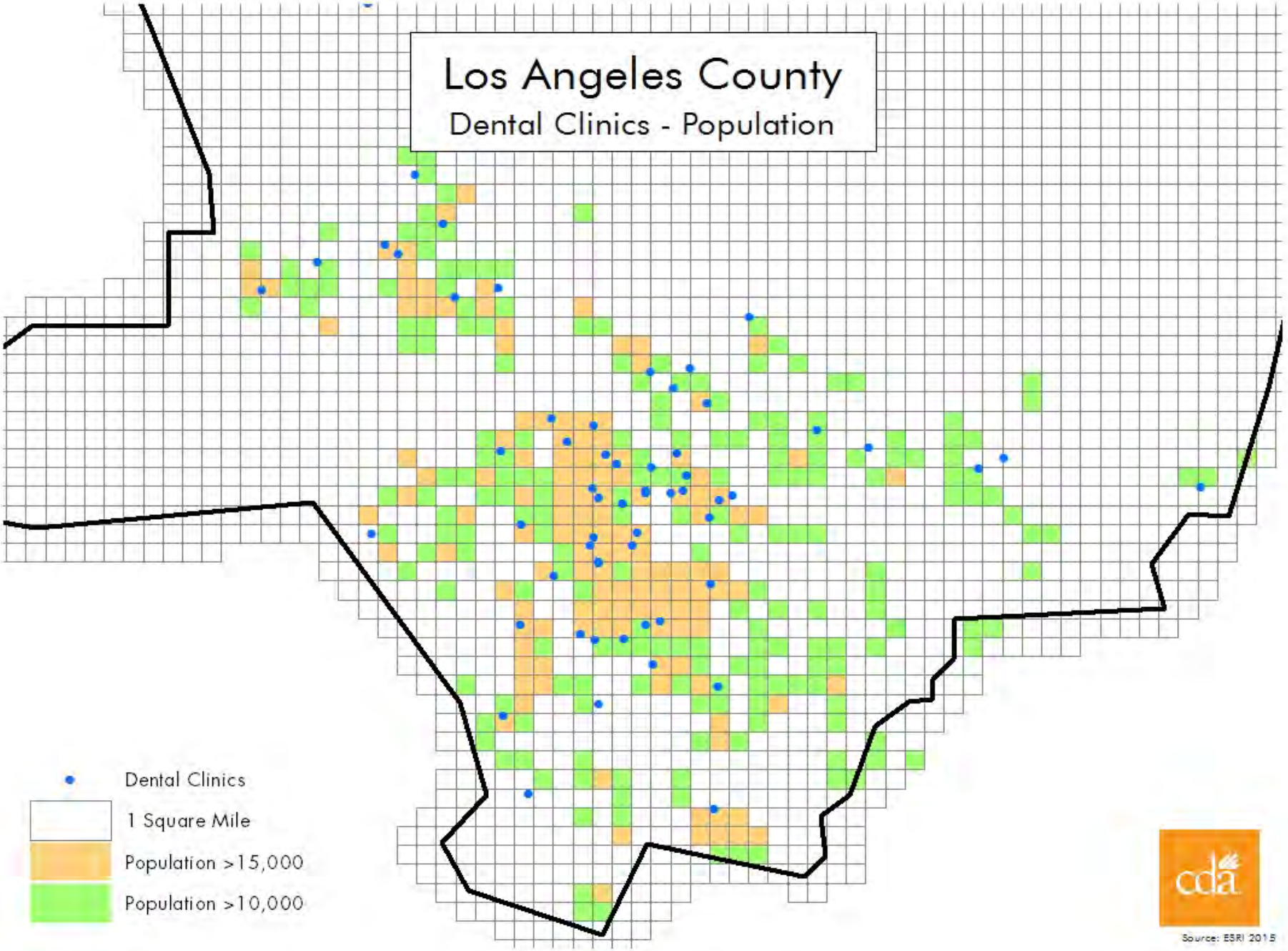
http://www.governing.com/blogs/by-the-numbers/most-densely-populated-cities-data-map.html

Los Angeles County

Dental Clinics - Population



Source: ESRI 2015


Los Angeles County
Dental Clinics - Population
Dental Clinics
1 Square Mile
Population >15,000
Population >10,000
cda
Source: ESRI 2015

Mapping Dental Deserts

Definition: Areas in LA County that meet all 3 criteria:

1. Areas with high population density; AND

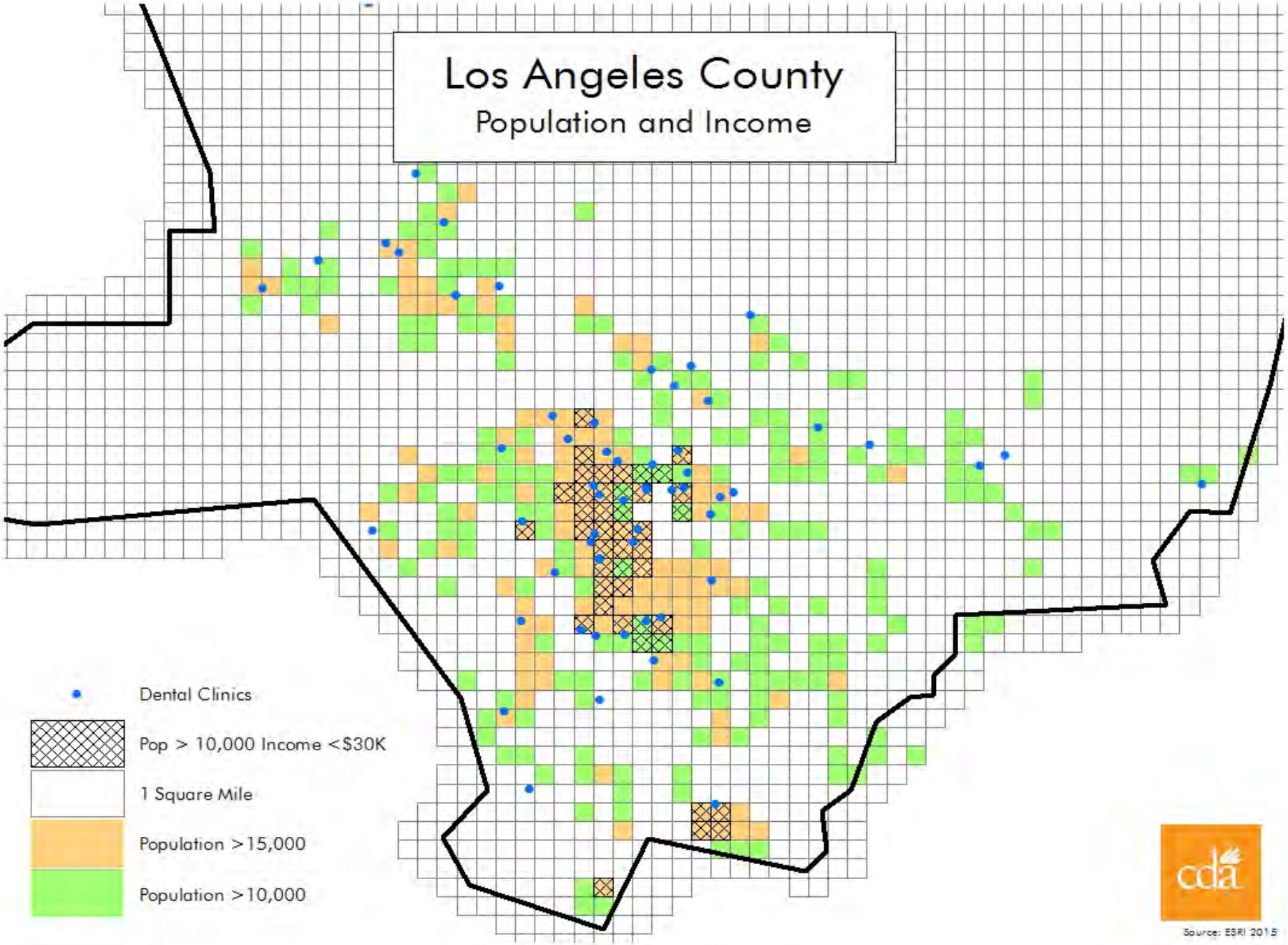
2. Areas of low-income AND

3. Areas that have no or insufficient dental services.

Deciding Low-Income Population:

- If you make less than 138% of the Federal Poverty Level, you qualify for Medi-Cal.

Household Size	100%	133%	138%
1	$11,880	$15,800	$16,394
2	16,020	21,307	22,108
3	20,160	26,813	27,820
4	24,300	32,319	33,534


Los Angeles County
Population and Income
Dental Clinics
Pop > 10,000 Income <$30K
1 Square Mile
Population >15,000
Population >10,000
cda
Source: ESRI 2015

Mapping Dental Deserts

Definition: Areas in LA County that meet all 3 criteria:

1. Areas with high population density; AND

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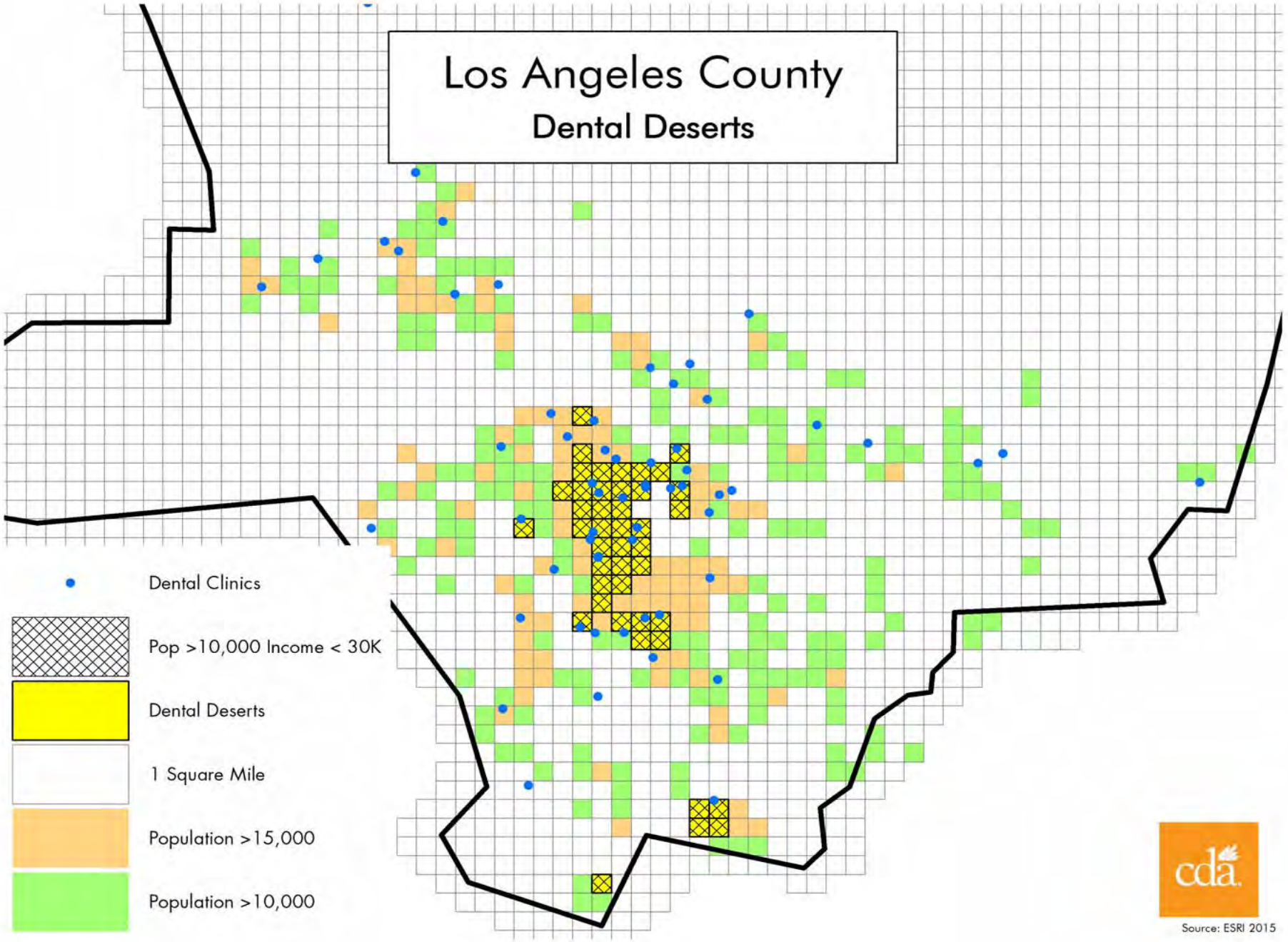
3. Areas that have no or insufficient dental services.

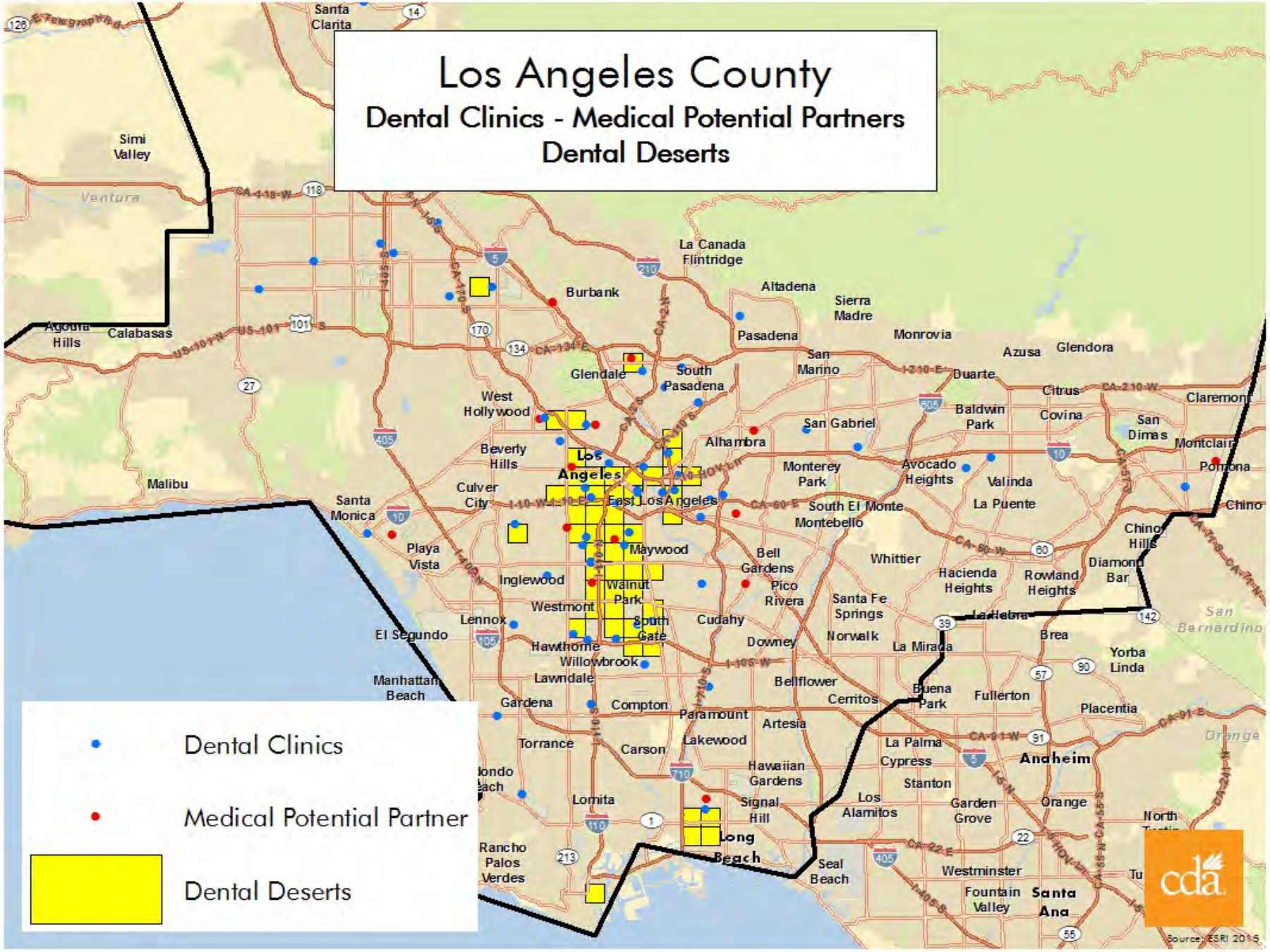
IS THE NUMBER OF CLINICS AND DENTISTS SUFFICIENT FOR THE DEMANDS OF THEIR CATCHMENT AREAS?

What's the acceptable ratio of dentists to patients?

- Centers for Medicare and Medicaid Services recommended ratio of 1 provider for every 1,500 patients.
- California Office of Statewide Health Planning and Development defines a geographic area:
  - Overutilized if the ratio of 1 provider for more than 3,000 patients
  - with unusually high needs: ratio of 1 provider for more than 4,000 patients

- Each dental clinic has an average 2.5 providers
- We will use the Fed's definition of an unusually high needs: ratio of 1 provider for more than 4,000 patients.
- So each clinic's catchment area can serve 10,000 patients.


Los Angeles County
Dental Deserts
Dental Clinics
Pop >10,000 Income < 30K
Dental Deserts
1 Square Mile
Population >15,000
Population >10,000
cda
Source: ESRI 2015


Los Angeles County
Dental Clinics - Medical Potential Partners
Dental Deserts
Dental Clinics
Medical Potential Partner
Dental Deserts
Source: ESRI 2015
cda
Santa Clarita
Simi Valley
Ventura
Agoura Hills
Calabasas
Malibu
Burbank
La Canada Flintridge
Altadena
Sierra Madre
Pasadena
Monrovia
Azusa
Glendora
San Marino
Duarte
Citrus
Claremont
Glendale
South Pasadena
West Hollywood
Baldwin Park
Covina
San Dimas
Montclair
San Gabriel
Alhambra
Beverly Hills
Los Angeles
Monterey Park
Avocado Heights
Valinda
Pomona
Culver City
East Los Angeles
La Puente
Chino
Santa Monica
South El Monte
Montebello
Chino Hills
Playa Vista
Maywood
Bell Gardens
Whittier
Diamond Bar
Inglewood
Walnut Park
Pico Rivera
Hacienda Heights
Rowland Heights
Westmont
Santa Fe Springs
La Habra
Lennox
South Gate
Cudahy
Brea
El Segundo
Hawthorne
Downey
Norwalk
La Mirada
Yorba Linda
Willowbrook
Lawndale
Bellflower
Manhattan Beach
Gardena
Compton
Cerritos
Buena Park
Fullerton
Placentia
Paramount
Artesia
Torrance
Carson
Lakewood
La Palma
Anaheim
Cypress
Hawaiian Gardens
Stanton
Lomita
Signal Hill
Los Alamitos
Garden Grove
Orange
Long Beach
Rancho Palos Verdes
Seal Beach
Westminster
Fountain Valley
Santa Ana
North
San Bernardino
Orange

Findings:

We found areas which clearly fall within our definition of Dental Deserts based on high-density, low income, and inadequacy of dental services.

Compounding the current problem of Dental Deserts…

Ratio per 1,000 residents– Trend in Los Angeles County

2008	2010	2011	2012	2013	2014
0.873	0.726	0.743	0.759	0.777	**0.739**

The number of dentists per capita have decreasing over time.

Additionally…

Data Source: AHRF (HRSA/BHPr)

http://www.healthindicators.gov/Indicators/Dentist-rate-per-100000-population_130/Profile/Data

UCLA Center For Health Policy Research Policy Brief

- Dentists Moving out of State: 4% in 2008 up to 14% in the current survey.

- Dentists Nearing Retirement: Many dentists in the state are nearing retirement.

- Specialization: More and more dentists are leaving general dentistry behind to become a specialist. In 2008, 6% of newly licensed dentists were specialists, up to 13% on 2012.

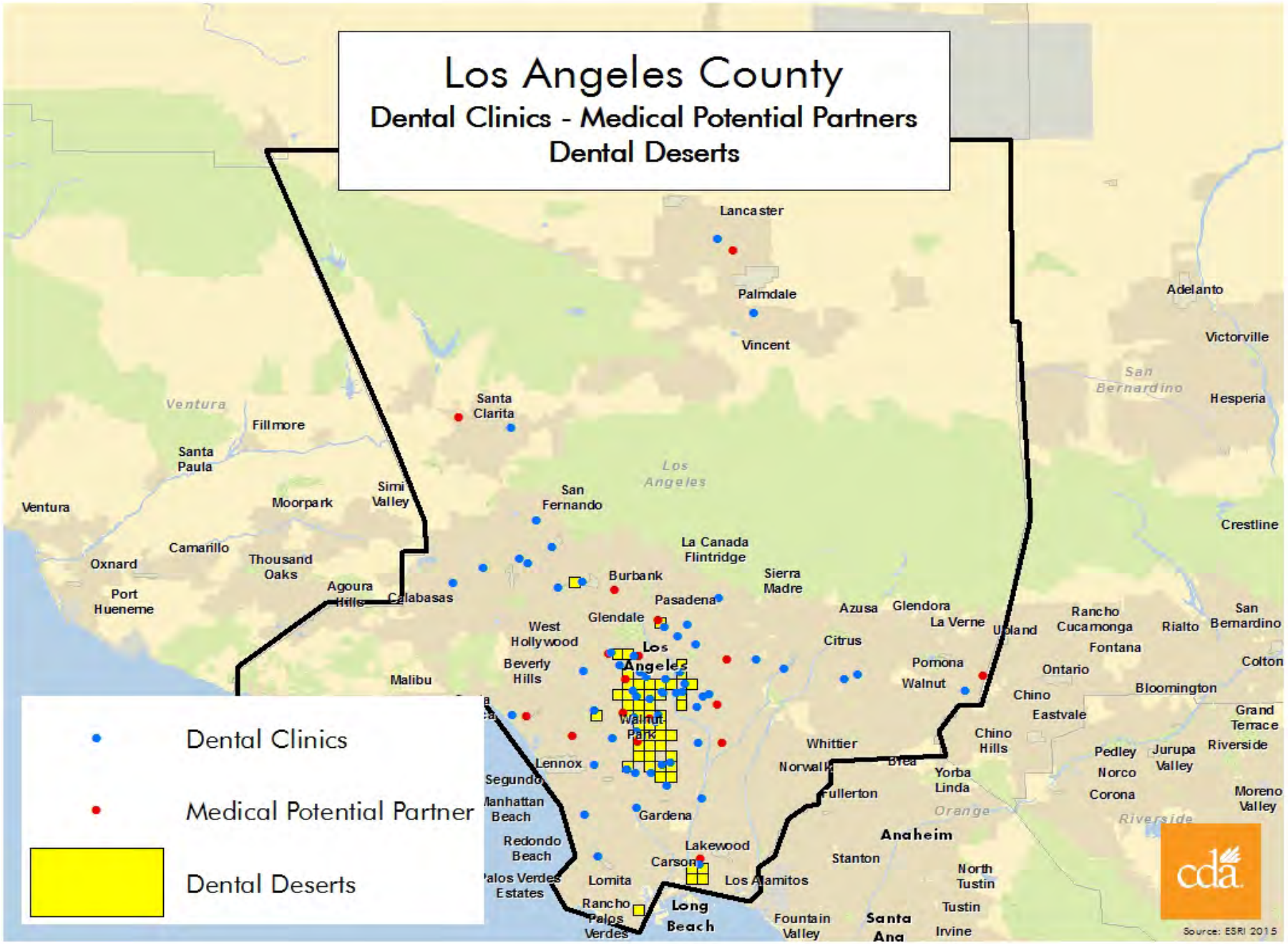
March 2014 Trends in the Supply of Dentists in California

Next Steps:

- Contact the CA Department of Health Care Services (DHCS) to obtain information regarding fee-for-services providers that are actually billing for dental services.

- Engage medical FQHC that could be our potential partners for areas that are truly underserved.

- Expand the loan repayment program (HPSA) to the Dental Deserts to attract additional dentists.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Dental Clinics - Medical Potential Partners
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Rancho Palos Verdes
Long Beach
Redondo Beach
Manhattan Beach
Segundo
Palos Verdes Estates
Fountain Valley
Santa Ana
Irvine
Tustin
North Tustin
cda
Source: ESRI 2015

Conclusion/Learned Lessons:

- GIS maps are ideal tools to illustrate the distribution of dental services and should be a standard tool when planning delivery of dental services and analyzing access to care.

- Must be careful to analyze every data set and scrutinize the results in a careful and unbiased manner.

Acknowledgements:

- California Dental Association (CDA) :

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Questions

Thank you!!

Maritza C. Cabezas, DDS, MPH

mcabezas@ph.lacounty.gov