



September 15, 2014

City of Long Beach  
Department of Health  
and Human Services

Los Angeles County  
Department of Public Health

City of Pasadena  
Department of Public Health

County of Riverside  
Department of Public Health

Santa Barbara County  
Department of Public Health

San Bernardino County  
Department of Public Health

San Diego County  
Public Health Services

Ventura County  
Public Health

Secretary Matt Rodriguez  
California Environmental Protection Agency  
P.O. Box 2815  
Sacramento, CA 95812-2815

Chairman Mary Nichols  
Air Resources Board  
P.O. Box 2815  
Sacramento, CA 95812

Dear Secretary Rodriguez and Chairman Nichols:

This letter is being sent on behalf of two regional alliances of Public Health Department representatives from across the State of California, actively advancing chronic disease prevention and health equity through a health in all policies approach. We welcome the opportunity to comment on the recent documents released by the CalEPA/ARB regarding the identification of disadvantaged communities for the purpose of prioritizing investment of the Greenhouse Gas Reduction Funds per SB 535. We understand that the implementation of this legislation is progressing under rapid timelines and appreciate the Air Resources Board's commitment to nonetheless provide thoughtful deliberation to address public feedback.

As public health professionals engaged in efforts to reduce the stark disparities in health that exist across California, an important focus of our work is identifying and improving conditions in health disadvantaged communities. Evidence suggests that social factors, which include income, unemployment, education and rent burden, are the most significant drivers of health and wellbeing<sup>1</sup>. We are concerned that neither Method 1 (overall CalEnviroScreen (CES) score) nor the other alternate methods presented in the recently released methodology report, "Approaches to Identifying Disadvantaged Communities", adequately identify populations that are highly disadvantaged based on these social factors, collectively referred to as the social determinants of health.

The importance of employing a methodology that adequately identifies and weights disadvantage based on the social determinants of health is further elevated given the importance community stakeholders place on income, unemployment, education and rent burden in defining the common needs of disadvantaged communities. In Table 3 "Common Needs of Disadvantaged Communities (As Identified by Community Advocates)" of the August 22, 2014



Alameda County  
Public Health Department

City of Berkeley  
Public Health Department

Contra Costa  
County Health Services

Marin County  
Health and Human Services

Napa County  
Public Health Department

City and County of San Francisco  
Department of Public Health

San Mateo County  
Public Health, Policy and Planning

Santa Clara County  
Public Health Department

Solano County  
Public Health Department

Sonoma County  
Department of Health Services

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<sup>1</sup>JS Burden of Disease Collaborators. The state of US health, 1990-2010: burden of diseases, injuries, and risk factors. *JAMA*. 2013 Aug 14; 310(6):591-608.

document “Investments to Benefit Disadvantaged Communities,” the bulk of the needs given are economic—improved jobs to increase family income, better workforce preparation, reduced housing and energy costs and improved transportation access. The needs that are not economic are couched in economic terms—health harms like asthma and obesity are “suffered disproportionately by low-income residents/ communities.”

Stakeholders understand what the scientific evidence clearly demonstrates; that social determinants are the largest contributor to health and quality of life. The Public Health Alliance of Southern California, with technical assistance from the California Department of Public Health (CDPH), has conducted an analysis to determine whether communities identified as disadvantaged based on a high (top 15%) overall CES score are also the most disadvantaged (top 15%) in terms of poverty. Our analysis suggests that only 56.5% of these most impoverished (top 15%) census tracts would be identified as disadvantaged based on their top 15% overall CES Score (please see analysis (a) Poverty in the attachment below, “Poverty, Population Characteristics and CES 2.0”). Further, only 52.5% of census tracts identified as disadvantaged based on the overall CES score fell into the top 15% of census tracts based on poverty level. Both of these results suggest deficiencies in how the tool is being used to identify socioeconomic vulnerability and, hence, public health disadvantage.

A second analysis (see Attachment below, analysis (b) “Population Characteristics”) also suggests a relatively poor statistical correlation between pollution-burden and population characteristics, as currently measured, among census tracts in CES 2.0. Only 61.8% of the census tracts with a top 15% population characteristic score are also in the top 15% in terms of their overall CalEnviroScreen Score. This poor statistical correlation can be seen visually in Figure 2 of “Approaches to Identifying Disadvantaged Communities” report where the scatterplot diagram for method 1, overall CalEnviroScreen Score does not show a linear clustering (i.e., pollution burden scores tracking equally with population characteristic scores) but rather a diffuse cloud, with many communities that score high on one criteria but not on another.

The fundamental approach utilized in CalEnviroScreen (CES), to incorporate both pollution burden and social determinant criteria into a single score through multiplication, creates a number of methodological concerns. First, the multipliers don’t always reflect identified biologic or risk interactions between pollution and population characteristic factors. Additionally, the assignment of weights such that an equal 10 point scale is given to both the pollution burden and population characteristics means that the primary (social) determinants of health are undervalued based on their proportional contribution to health outcomes, and that pollution burden is disproportionately over-weighted. Finally, the population characteristic score includes health outcomes strongly associated with environmental exposures while omitting critical chronic disease health outcomes that contribute to the majority of healthcare expenditures<sup>2</sup>.

This analysis is not meant to suggest that pollution burden should be discarded as a measure of disadvantage. Instead, it suggests that pollution burden and population characteristic data are independent and should be weighted according to their share of attributable mortality and morbidity in the United States<sup>1</sup>.

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<sup>2</sup>Galea S, Tracy M, Hoggatt KJ, DiMaggio C, Karpati A. Estimated deaths attributable to social factors in the United States. *Am J Public Health.* 2011;101:1456-1465.

Our two Alliances are currently developing an evidence-based method for identifying health disadvantaged communities. This is a deliberate process undergoing scientific review, and as such is not expected to be completed prior to ARB's September decision point. Given that, we understand that our index will not be considered as a qualifying option in this first year's criteria. However, we want to ensure that in future years, an evidence-based health disadvantage metric is included into the methodology for defining disadvantaged communities.

In the development of future year's disadvantaged community identification methodology and allocation protocols, we would suggest the formation of a working group that includes representatives from public health and low-income communities to provide input on the implementation of SB 535, ranging from continued refinement in the identification of disadvantaged communities, to SB 535 guidance document updates, and the evaluation of the effectiveness of awarded projects in addressing disadvantage. This will provide critical input needed to both effectively achieve greenhouse gas targets and maximize benefits to disadvantaged communities.

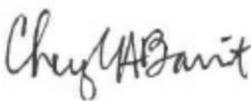
For the purposes of this year's allocation only, we ask CalEPA/ ARB to consider the use of a one-time temporary measure that weights the current CES indicators based on the relative magnitudes of their demonstrated impacts on health and well-being as reflected in the research literature.

Thank you for your consideration of our comments. There is a tremendous opportunity to effectively address climate change and to create transformative change in disadvantaged communities across California. We welcome the opportunity to partner with CalEPA/ARB now and in the future to ensure that we meet or exceed greenhouse gas targets while optimizing the greatest evidence-based co-benefits for disadvantaged communities.

Sincerely,



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## Summary

The Public Health Alliance of Southern California conducted several analyses to understand the degree to which high overall CalEnviroScreen (CES) 2.0 scores co-occur with high poverty and high overall population characteristics scores, as presented in the CES 2.0 tool among California census tracts. Two analyses were conducted:

(a) **Poverty:** Analyzed what proportion of the most impoverished census tracts in the state (those in the upper 15%) are *also* identified as being in the top 15% of overall CES 2.0 scores.<sup>1</sup> Our analysis suggests that only 56.5% of these most impoverished census tracts are also in the top 15% of overall CES 2.0 scores.

(b) **Population Characteristics:** Analyzed what proportion of census tracts with the highest 15% of overall population characteristics scores are *also* identified as being in the top 15% of overall CES 2.0 scores. Our analysis indicates that 61.8% of the census tracts with the highest (top 15%) Population Characteristics Scores are also in the top 15% in terms of their overall CES Score.

## Methods

CalEnviroScreen 2.0 data were downloaded from the CalEPA website ([http://oehha.ca.gov/ej/CalEnviroScreen\\_v2%200.xlsx](http://oehha.ca.gov/ej/CalEnviroScreen_v2%200.xlsx), Accessed 4/21/2014). Census tracts were cross tabulated for agreement between high CES 2.0 Score (yes/no) status (in the highest 15<sup>th</sup> percentile) and (a) high poverty (yes/no) status (in the highest 15<sup>th</sup> percentile) or (b) high population characteristics summary score (yes/no) status (in the highest 15<sup>th</sup> percentile). The population characteristics summary score factored young and old demographics, poverty, unemployment, low educational attainment, linguistic isolation, asthma emergency room visits and prevalence of low birth weight.

CES 2.0 Score	Percentile (a) Poverty and (b) Population Characteristics Score	
	Top 15%	Bottom 85%
Top 15%	a	b
Bottom 85%	c	d

This analysis was implemented using SAS (Version 9.3) statistical package. Technical assistance in this analysis was provided by the California Department of Public Health.

<sup>1</sup> As described in Office of Environmental Health Hazard Assessment. *Approaches to Identifying Disadvantaged Communities*. Oakland, CA: California Environmental Protection Agency. August 2014.  
<http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/workshops/calepaapproaches-to-identify-disadvantaged-communities-aug2014.pdf>

**(a) Poverty Analysis**

CalEnviroScreen (CES) 2.0 Upper 15% Classification by Poverty Upper 15% Classification California Census Tracts				
CES 2.0		Poverty		Total
		TOP 15%	BOTTOM 85%	
TOP 15%	Count	628	568	1196
	% in CES2.0 Group	52.5%	47.5%	
	% in Poverty Group	56.5%	8.3%	
BOTTOM 85%	Count	483	6254	6737
	% in CES2.0 Group	7.2%	92.8%	
	% in Poverty Group	43.5%	91.7%	
Total		1111	6822	7933

Agreement statistics of Poverty (reference) and CES 2.0 (screening)		
Agreement statistic	Percent	Interpretation for CES 2.0
Sensitivity (%)	56.5%	Proportion of CTs in upper 15% for poverty who are ALSO in upper 15% for CES 2.0
Positive predictive value (%)	52.5%	Proportion of CTs in upper 15% for CES 2.0 who are ALSO upper 15% for poverty

**Results:** Our analysis suggests that only 56.5% of these most impoverished census tracts are also in the top 15% as defined by CES 2.0, overall CalEnviroScreen Score (see *Sensitivity (%)* in table above). 52.6% of the census tracts in the upper 15% for CES 2.0 are also in the upper 15% for poverty.

**(b) Population Characteristics Analysis:**

Population Characteristics	
Sensitive Populations Indicators	Children and Elderly Low Birth-Weight Births Asthma Emergency Departmental Visits
Socioeconomic Factors Indicators	Educational Attainment Linguistic Isolation Poverty Unemployment

The Public Health Alliance with technical assistance from California Department of Public Health has conducted an analysis of the correlation between CES 2.0 Score and the overall “Population Characteristics” score. In addition to the “Socioeconomic Factor Indicators,” the population characteristic score includes “Sensitive Population Indicators” including Children and Elderly, Low Birth-Weight births, and Asthma Emergency Department visits as indicated in the graphic at left from the CES 2.0 report.

In a document released in August 2014 titled “Approaches to Identifying Disadvantaged Communities,” proposed ‘Method 3’ would identify communities based on the Population Characteristics score alone. This analysis studies how this method of identifying disadvantage would correlate to ‘Method 1’ proposed in the document, overall CES 2.0 score.

CalEnviroScreen (CES) 2.0 Upper 15% Classification by Population Characteristics Upper 15% Classification				
Census Tracts				
CES 2.0		Population Characteristics		Total
		TOP 15%	BOTTOM 85%	
TOP 15%	Count	690	506	1196
	% in CES2.0 Group	57.7%	42.3%	
	% in Poverty Group	61.8%	7.4%	
BOTTOM 85%	Count	427	6,350	6777
	% in CES2.0 Group	6.3%	93.6%	
	% in Poverty Group	38.2%	92.6%	
Total		1117	6856	7973
Agreement statistics of Population Characteristics (reference) and CES 2.0 (screening)				
Agreement statistic	Percent	Interpretation for CES 2.0		
Sensitivity (%)	61.8%	Proportion of CTs in upper 15% for Population Characteristics who are ALSO in upper 15% for CES 2.0		
Positive predictive value (%)	57.7%	Proportion of CTs in upper 15% for CES 2.0 who are ALSO upper 15% for Population Characteristics		

Technical Assistance Provided by CDPH.

**Results:** Our analysis finds that less than 62% of the census tracts identified by methodology 3 as being the most vulnerable due to population characteristics are *also* in the top 15% of CES 2.0 scores. Putting this another way, Method 1 (overall CES score) only positively identifies the most population-characteristic-disadvantaged census tracts 57.7% of the time. This indicates a relatively poor statistical correlation between pollution-burden and population characteristics, as currently measured in CES 2.0