California Communities Environmental Health Screening Tool (*CalEnviroScreen*)

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PEER REVIEWER QUALIFICATIONS

Education

- BS UC Davis 1979 (Agricultural Economics)
- MS UC Davis 1980 (Agricultural Economics)
- MPP 1982 (Kennedy School of Government)
- PhD 1989 (Harvard University)

Relevant Technical Experience

- US Office of Management and Budget (1988-98)
- Wrote government-wide guidelines for regulatory impact analysis (1990) and risk analysis (1995)
- Extensive service to professional societies
- Regular peer reviewer for multiple journals

RESPONSES TO CHARGE QUESTIONS

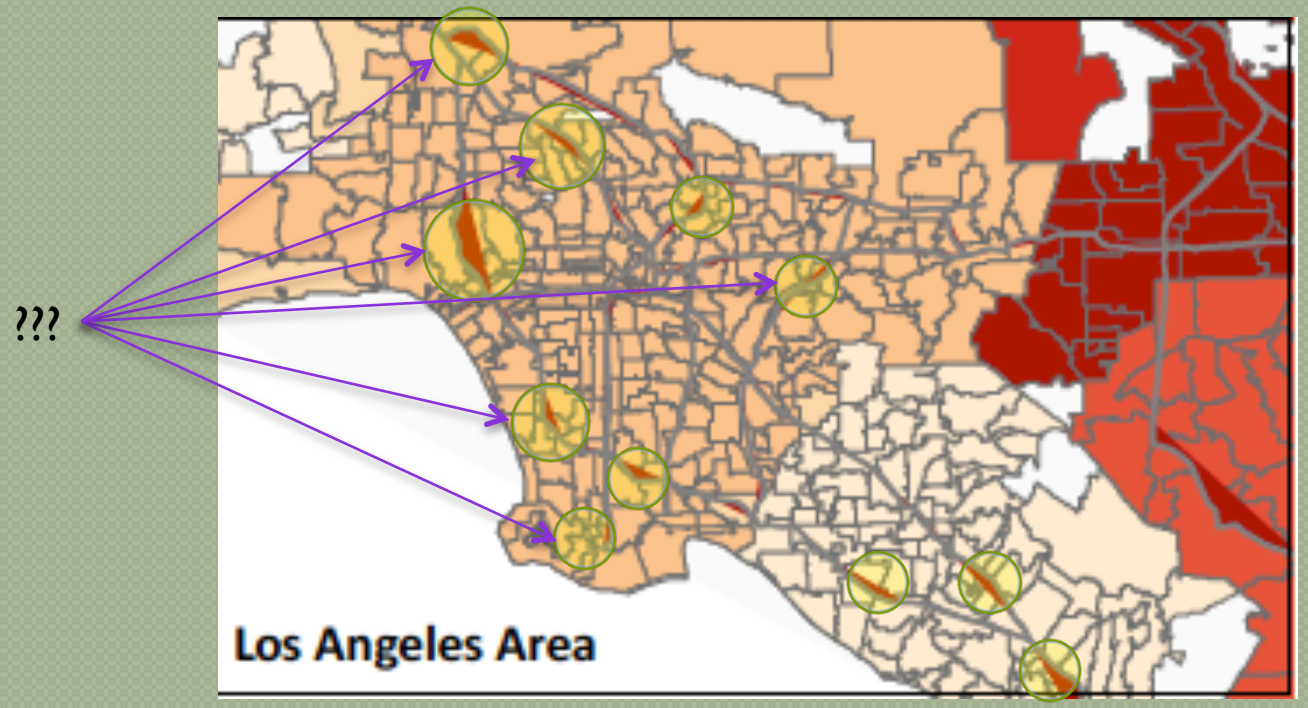
Selection of Indicators [1]

- Problematic exposure indicators
  - Pesticides (lb/mi^2)
    - Mass ≠ exposure
    - Mass rate ≠ exposure
  - TRI releases:
    - Mass ≠ exposure
    - Uncertainty, excess precision and bias in reporting
  - Traffic density
    - Exposure to what?
    - If it's about particulates, then zip code assignment is much too coarse and will result in misclassification

Selection of Indicators [2]

- Problematic public health indicators
  - Chronic health conditions
    - Limited environmental component
    - Assigned to last zip code means misclassification
    - County scale data?
  - Cancer and heart disease
    - Incidence or mortality?
  - Low-birth weight infants
    - Sensitive to small sample sizes by zip code (min=5)
    - Sensitive to age of mother

Cancer Mortality in LA Area
What Are these Hot Spots?



Source: Draft Report at 27.

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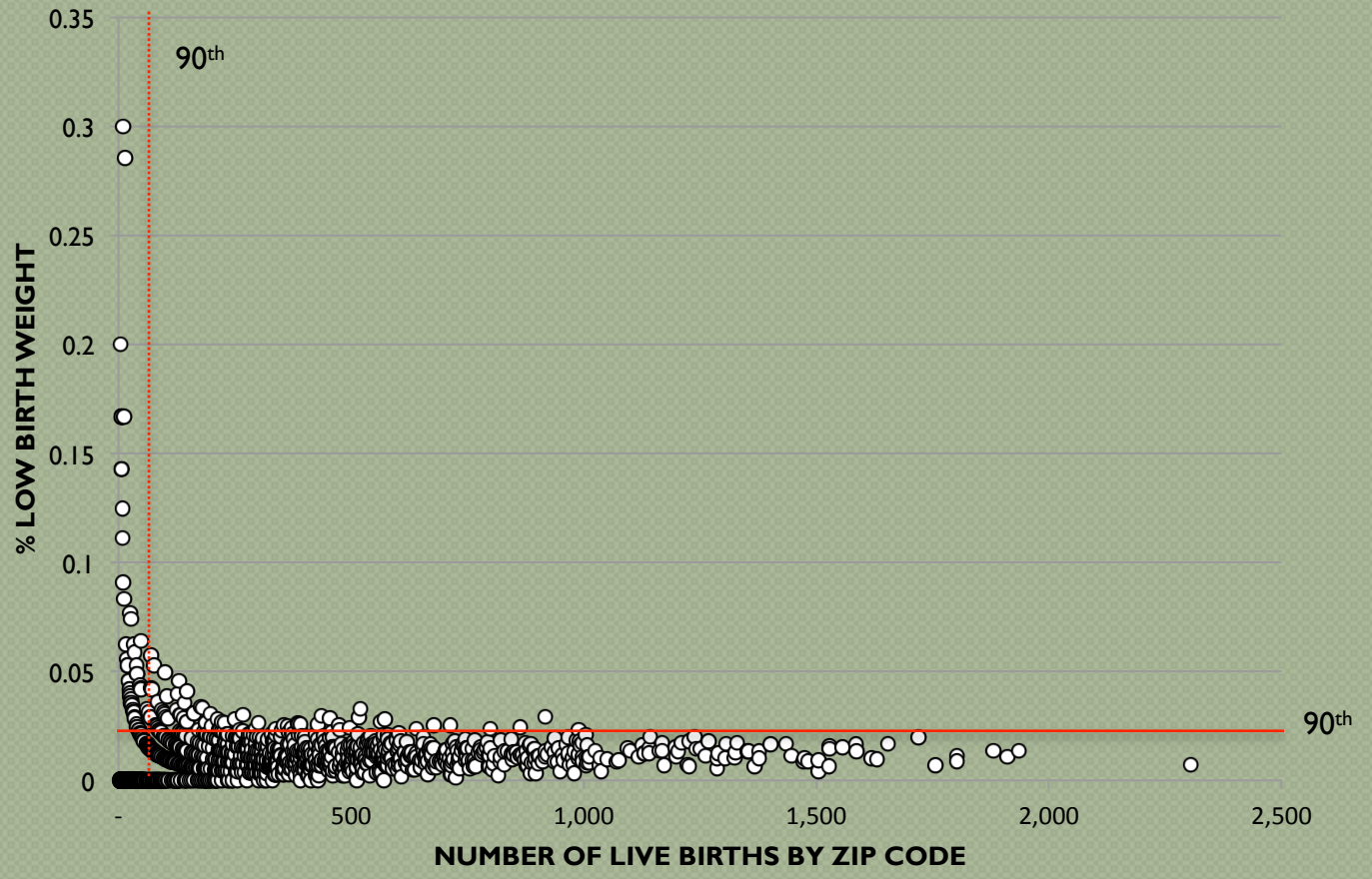
Percent Low Birth Weight by Number of Live Births in Zip Codes (2010)



Source: California Department of Public Health

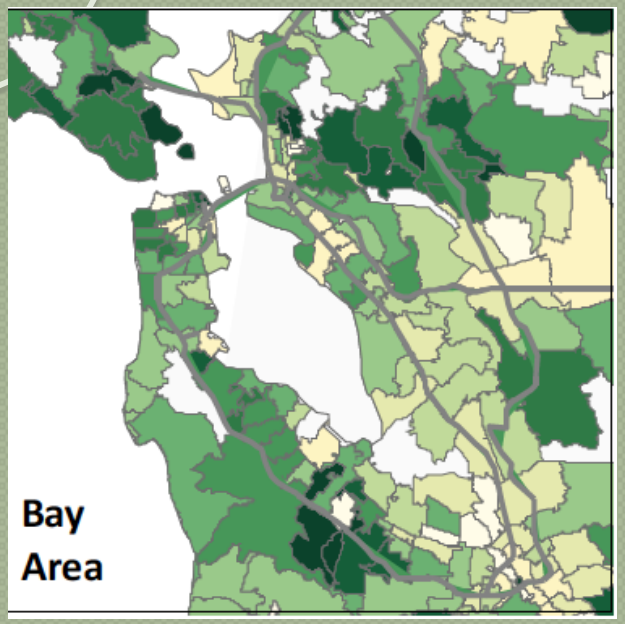
Selection of Indicators [3]

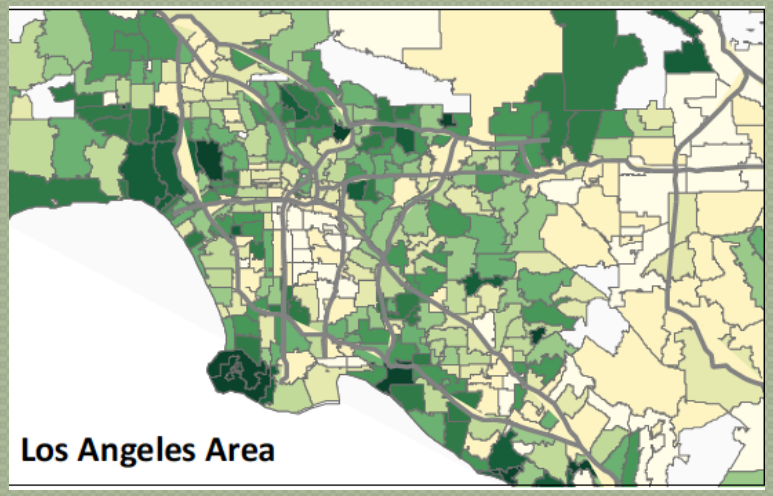
- Problematic environmental indicators
  - What do these indicators actually measure?
    - Cleanup sites and LUSTs?
    - Impaired water bodies?
    - Leaking underground storage tanks?
    - Hazardous waste facilities?

Selection of Indicators [4]

- Problematic sensitive population indicators
  - % of population > 65 yrs
    - Correlated with places people choose to retire
      - Should retirement choices influence EJ screening score?
    - Correlated with high income, very expensive real estate, places few young families can afford to live
      - Los Angeles: Palos Verdes, Tujunga Canyon, Bel Air
      - Bay Area: Sausalito, Tiburon, Belmont, Sunnyvale, Monterey, Carmel

‘Elderly’ Indicator Gives High Weights to Wealthy Zip Codes





Source: Draft report at p. 47.

Selection of Indicators [5]

- Problematic socioeconomic factors
  - Educational attainment
    - Highly correlated with income
    - School quality might be a superior indicator
  - Income
    - Not adjusted for cost of living
    - $50k/yr in Redondo Beach ≠ $50k/yr in Redding
  - Poverty
    - Highly correlated with income
  - Race/ethnicity
    - Are these independent factors?

Scoring of Indicators

- Additively across indicators implies equal weight <u>by decile</u>
  - 80^{th} % > 65y = 80^{th} 80% < 5y = 80^{th} % < 2xPL
- Multicollinearity across indicators implies multiple weights on same phenomenon
- Multiplication by sensitivity and SES may yield unpredictable, unintended, or bizarre results

Strengths	Weaknesses
• Data are convenient	• Data are not demonstrably relevant and appropriate
• Geo units are intuitive appealing	• Geo units may not be valid; if valid, will differ by indicator
• Relative scale is simple	• Relative scale means population variability id inherently bad, and EJ concerns cannot be overcome
• Deciles are simple	• Deciles mean very small differences are meaningful
• Arithmetic operators are simple to apply	• Arithmetic operators have no scientific or logical antecedent

Model

RESPONSES TO OTHER QUESTIONS

Unresolved Overarching Methodological Problems

- Is geographic assignment appropriate?
- Are zip codes the right geographic units?
- Are deciles the right granularity?
- Can deciles across indicators be added?
- Is multiple weighting of same/similar phenomena intended? Desirable?
- Are substantial false positives acceptable?

Unresolved Interpretative Problems

- Is relative scoring appropriate?
- What are smallest meaningful effect sizes?
- What are smallest meaningful cross-sectional differences?
- How will policy uses affect scores?

Unresolved Policy Issues [1]

- No criteria for expansion (i.e., increasing the number of components) or updating (i.e., the substitution of new for old data)
- How to apply
  - Screening tools should only be used to exclude matters below policy concern
  - Draft report implies use in lieu of actual EJ assessment
    - 'No use for regulatory purposes'
    - But permitting uses are regulatory uses

Unresolved Policy Issues [2]

- Could implementation harm EJ communities?
  - Actions that increase the cost of private sector *capital* in EJ communities will
    - Reduce investment in EJ communities
    - Shift investment to non-EJ communities
  - Actions that increase the cost of private sector *labor* in EJ communities will
    - Reduce wages in EJ communities
    - Increase unemployment in EJ communities

Sensitivity Analysis

- Essential but highly premature
- Things to do first
  - Validate indicators
  - Validate model specification
  - Discern minimum meaningful effect sizes
  - Characterize model uncertainties
  - Characterize propensity of the model to produce false positives and false negatives

Questions?

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