CDC

many voices-one vision

Environmental Public Health Tracking Conference

Wyndham Philadelphia | March 24-26, 2004

The Alameda County Demonstration Project in Environmental Public Health Tracking

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- Paul English, PhD MPH, Principal Investigator
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- Craig Wolff, MS Eng, IT/GIS Manager, CEHTP

Environmental Health Investigations Branch
Division of Environmental and Occupational Disease Control
California Department of Health Services

National Center for Environmental Health

Alameda County Demonstration Project

- **Philadelphia, 2004 presentations:**
  - ***Eric Roberts (Wed, 1:30 pm):*** **Demonstration project overview**
  - ***Michelle Wong (Wed, 6:00 pm):*** **Stakeholder characteristics, findings, and conclusions from participation in first demonstration project meeting**
  - ***Paul English (Thurs, 11:00 am):*** **Visualization and analytic methods for the tracking of birth outcomes and traffic exposure**

The (concrete) Process of EPHT

Disparate sources of data

- *coordinate between agencies*
- *develop IT infrastructure*
- *format and process data*

Useable datasets

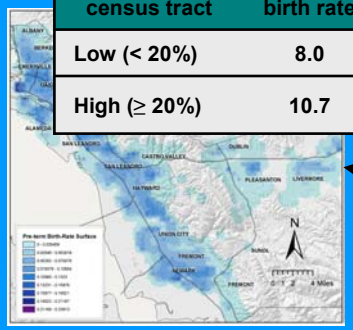
- *tabulation*
- *statistical analysis*
- *map making*

Results

- *stakeholder input*
- *develop and field test materials*
- *create mechanisms for access and dissemination*

Information for action

Poverty rate in mother's census tract	Preterm birth rate	95%-CI
Low (< 20%)	8.0	7.5 – 8.4
High (≥ 20%)	10.7	9.8 – 11.7



Alameda County Demonstration Project

- **Where:** Alameda County
- **When:** 2001
- **What to track:**
  - Adverse birth outcomes
  - Asthma
  - Traffic pollution exposure

Stakeholder Meeting Sequence

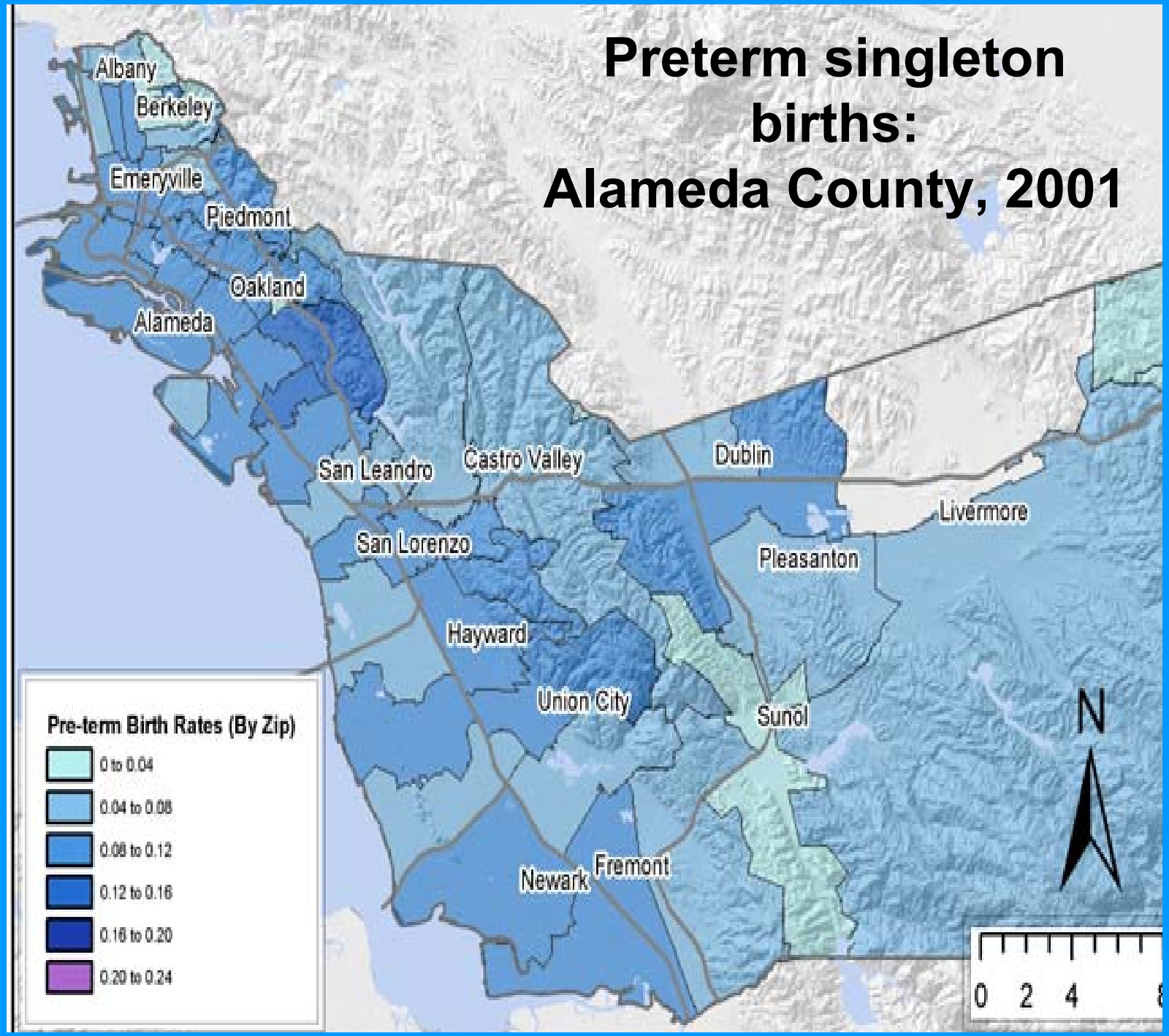
- ***Jan-04***: Introduction; birth outcomes findings
- ***May-04***: Asthma findings; review birth outcomes materials
- ***Sep-04***: Traffic findings; review asthma materials
- ***Jan-05***: Associations between traffic and health; review traffic materials
- ***May-05***: Review associations materials; wrap-up

Data Source for Birth Outcomes

- Birth certificates (Vital Records) collected by counties and some municipalities
- File (without names or SSNs) obtained from California Center for Health Statistics
- All births in 2001 where mother resided in Alameda County were included (n= 22,041)
- Singletons only (no twins or triplets)
- 96.1% of maternal addresses were successfully geocoded
- Final sample size was 19,540

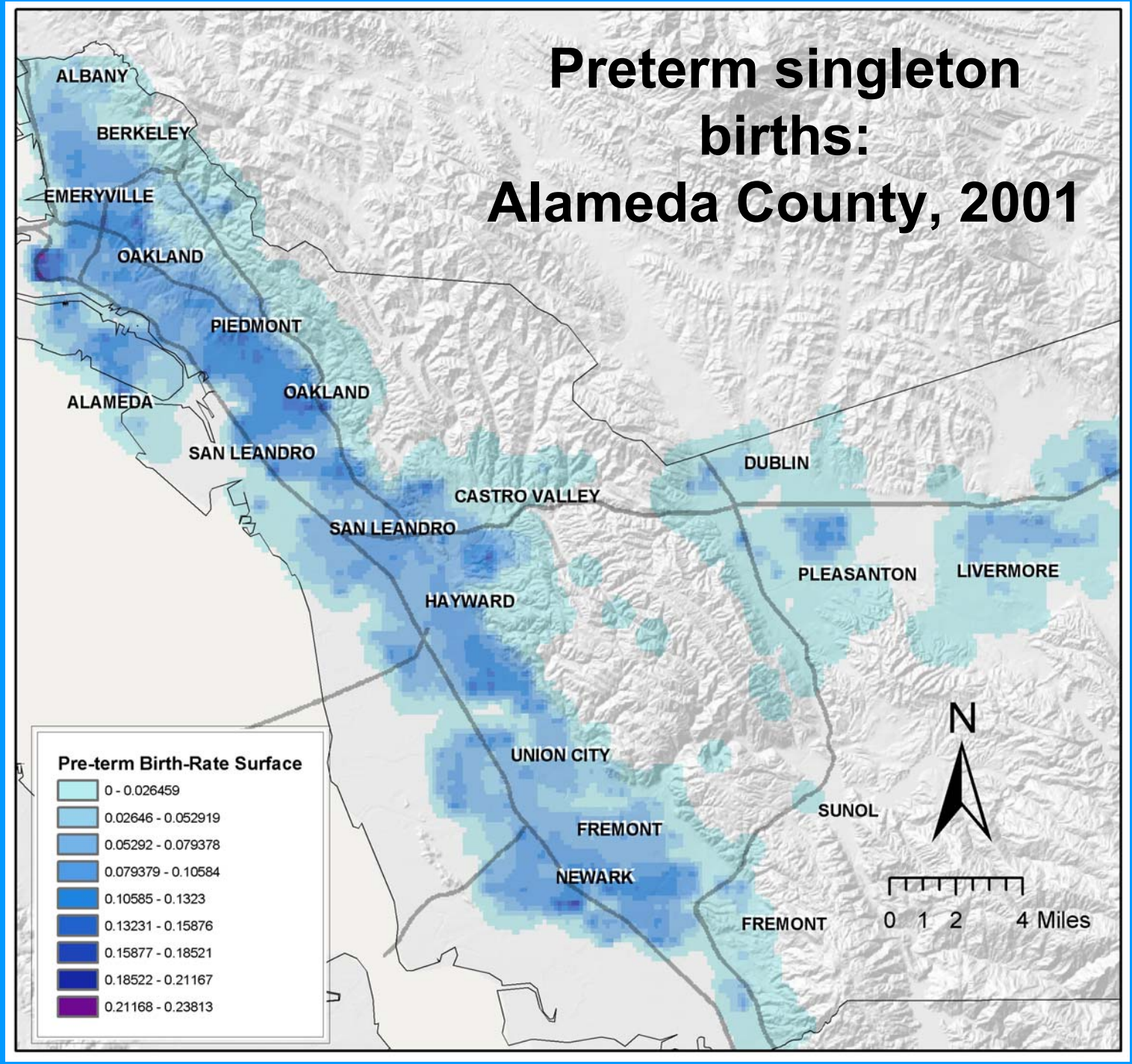
Results

- Overall, the *preterm birth rate* was 8.5% (Confidence interval 8.2-8.9)
- Overall, the *term-low birthweight rate* was 2.5% (Confidence interval 2.2-2.7)
- Previously documented racial and SES disparities were clearly evident in this sample


Preterm singleton births:
Alameda County, 2001
Albany
Berkeley
Emeryville
Piedmont
Oakland
Alameda
San Leandro
Castro Valley
Dublin
Livermore
San Lorenzo
Pleasanton
Hayward
Union City
Sunol
Newark
Fremont
Pre-term Birth Rates (By Zip)
0 to 0.04
0.04 to 0.08
0.08 to 0.12
0.12 to 0.16
0.16 to 0.20
0.20 to 0.24
N
0 2 4

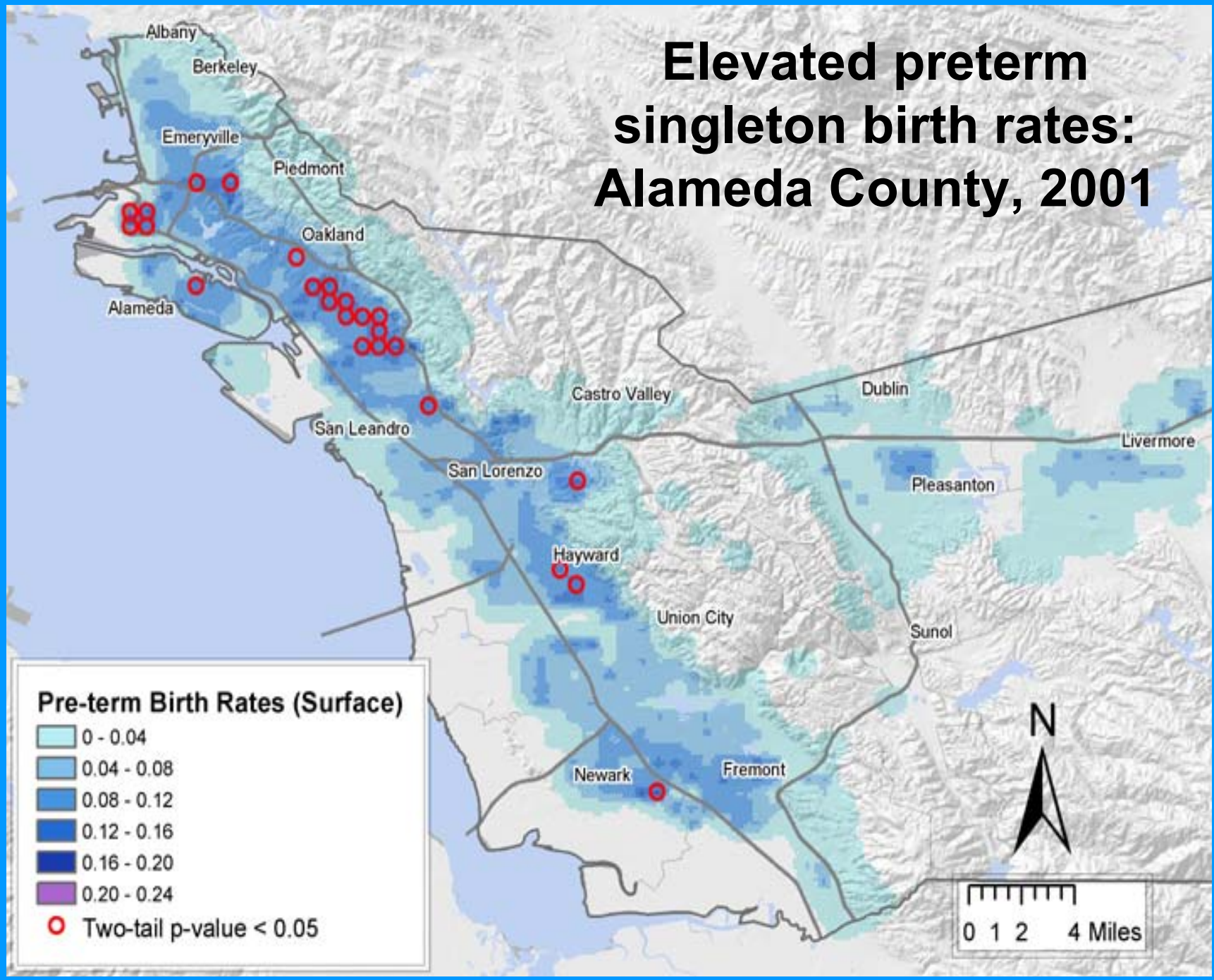
Problems with zip code maps

- Prefer higher resolution for Tracking purposes
- Crossing the street from one zip code to another should not appear to take you from one level of risk to another
- Interested in multiple ways to visualize data for use in discussions with stakeholders


Preterm singleton births:
Alameda County, 2001
ALBANY
BERKELEY
EMERYVILLE
OAKLAND
PIEDMONT
OAKLAND
ALAMEDA
SAN LEANDRO
CASTRO VALLEY
SAN LEANDRO
HAYWARD
DUBLIN
PLEASANTON
LIVERMORE
UNION CITY
FREMONT
NEWARK
SUNOL
FREMONT
Pre-term Birth-Rate Surface
0 - 0.026459
0.02646 - 0.052919
0.05292 - 0.079378
0.079379 - 0.10584
0.10585 - 0.1323
0.13231 - 0.15876
0.15877 - 0.18521
0.18522 - 0.21167
0.21168 - 0.23813
N
0 1 2 4 Miles

Smoothed maps

- Representation of statistical significance:
  - Some “hot spots” may be random variation
  - Spatial autocorrelation and overlapping area buffers violate assumption of independence of rates
  - Monte Carlo simulation used to calculate significance


Elevated preterm singleton birth rates: Alameda County, 2001
Albany
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Emeryville
Piedmont
Oakland
Alameda
Castro Valley
San Leandro
San Lorenzo
Hayward
Union City
Newark
Fremont
Dublin
Livermore
Pleasanton
Sunol
Pre-term Birth Rates (Surface)
0 - 0.04
0.04 - 0.08
0.08 - 0.12
0.12 - 0.16
0.16 - 0.20
0.20 - 0.24
Two-tail p-value < 0.05
N
0 1 2 4 Miles

Different challenges: Representing Asthma

- Diagnosis based on a constellation of symptoms and findings—need a survey (+/- physical exam) to determine prevalence
- School nursing infrastructure (e.g. Massachusetts) not available in California
- For this project we are interested in ongoing surveillance systems

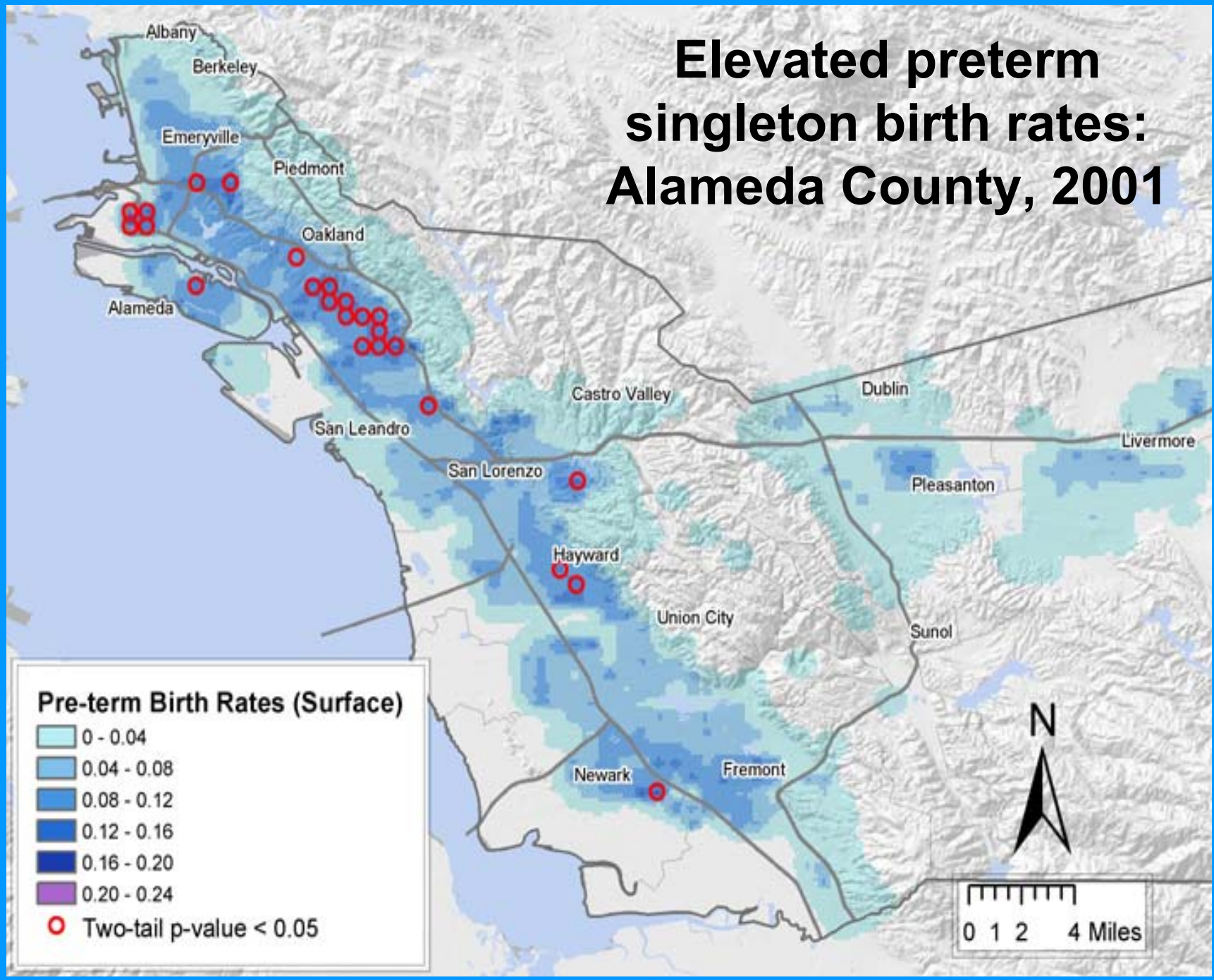
Health utilization data sources for Alameda County

- **Private:** Kaiser-Permanente of Northern California; 577,687 people or 6,030,910 person-months
  - Broadly representative of Alameda County population
- **Public:** Medi-Cal; 227,086 people or 2,203,739 person-months
  - Half of these beneficiaries are enrolled in managed care plans—data for these are very incomplete
  - For this project we will only use fee-for-service beneficiaries
- **Confounding issue:** Kaiser-Permanente clinicians have uniform, higher standard of care; different geographic distribution of patients

Asthma Indicators (c.f. Massachusetts presentation)

Indicator	Expected frequency per 1,000 (pediatric)
Hospitalization	~ 1 – 3
ER visits	~ 4 – 10
Outpatient visits	~ 100
Medication purchases	~ 100 – 600

Comparison: Frequency of preterm birth ~85 per 1,000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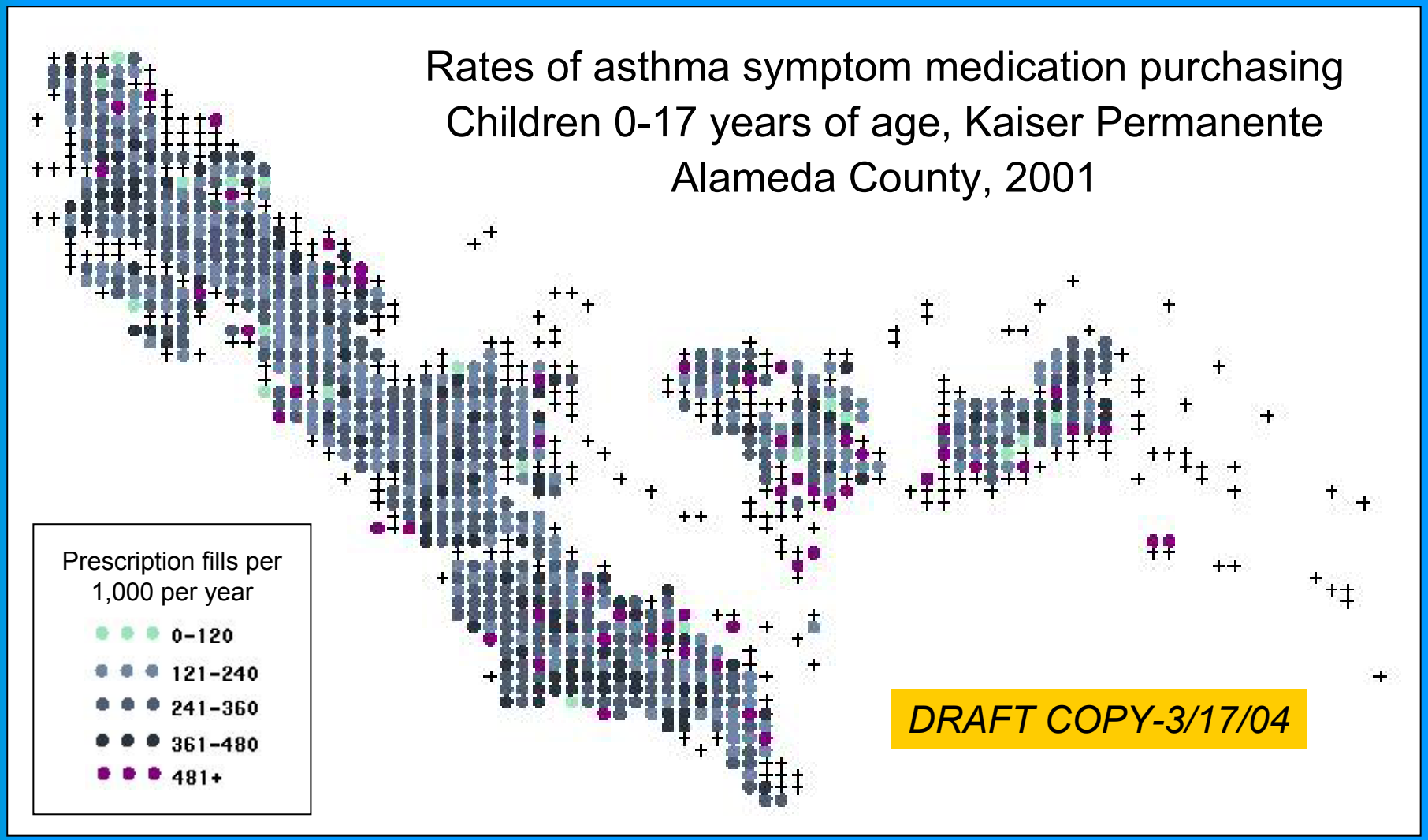
Rates of asthma symptom medication purchasing
Children 0-17 years of age, Kaiser Permanente
Alameda County, 2001
Prescription fills per 1,000 per year
0-120
121-240
241-360
361-480
481+
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Stakeholder meeting results (birth outcomes)

- Wide variety of stakeholders came to meeting with ideas about Tracking and its uses
- Visualization tools (maps, interactive GIS interface) helped to
  - Enable rich discussion about data needs and uses of EPHT
  - Make statistical issues more accessible to stakeholders

Example: Stakeholder information needs

- Stakeholders expressed interest in comparison of health outcomes with
  - School data
  - Air quality data
  - Locations of health care facilities
  - Economic and social characteristics of neighborhoods
- Working concept of environment inclusive of both physical and social surroundings

Next steps…

- Analysis of stakeholder feedback
- Prepare information materials based on feedback
- Incorporate recommendations into ongoing analyses

Thank you…

Funding

Centers for Disease Control and Prevention, Environmental Public Health Tracking Program

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