



Birth Outcome Findings

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Plan

1. Introduction
2. Methods
3. Numeric results
4. Maps
5. Discussion (group)
6. GIS demonstration (upstairs)
7. Feedback activity (group)

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Notes

- If you have experience or knowledge in these topics, please contribute!
- If you have questions about this material, please ask!

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Adverse Birth Outcomes

- Nationwide, 12.0% of babies are born early, while 7.8% are low birthweight
- Social justice perspective:
 - Among singleton births nationwide, African-American women are almost twice as likely to give birth preterm; if the baby is term, it is almost twice as likely to be low birthweight
 - Women living in low-income neighborhoods in New York City are almost twice as likely to have a low birthweight infant than those in high-income neighborhoods

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Definitions

- **Preterm:** Born prior to 37 weeks of gestation (about 8.5 months)
- **Low birthweight:** Less than 2,500 grams at birth (about 5.5 pounds)
- **Term low birthweight:** Born at 37 weeks or later *and* less than 2,500 grams

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Definitions

- Most low birthweight babies are born small *because they are born preterm.*
- A smaller number are preterm but did not grow well during gestation; these are the *term low birthweight* births.

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Adverse Birth Outcomes

- Both preterm and low birthweight include a spectrum of births:
 - Those born just a few days early or a few ounces under the limit may have few problems
 - Those born many weeks early and/or extremely small usually have many problems

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Problems of Adverse Birth Outcomes (extreme cases)

- Those born close to 24 weeks have lungs that have not fully developed
 - Breathing oxygen, even through a respirator, at this time can lead to the growth of fibrous tissue and inflammation in the lungs
- Blood vessels in the brain are not fully developed
 - During the first few days, these babies have a high risk of bleeding into their brain, causing long-term disability or death

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Problems of Adverse Birth Outcomes (extreme cases)

- Blood vessels to the intestines are not yet fully developed
 - During the first several weeks of life, portions of the gut can suddenly lose oxygen, requiring emergency surgery
- Exposure of high levels of oxygen during intensive care can damage the developing retina, leading to visual impairment

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Problems of Adverse Birth Outcomes (extreme cases)

- VERY rough on parents (fear, altered expectations, bonding issues, financial hardship)
- Elevated risk of death or lifelong disability
- Costs hundreds of thousands of dollars for first few months of care

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Adverse Birth Outcomes

- Some things we know are associated with preterm birth and/or low birthweight:
 - Certain infections
 - Cigarette smoking
 - Poor nutrition
 - Little or no medical care during pregnancy
 - Stress
 - Twin and triplet gestation

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Adverse Birth Outcomes

- Can environmental toxins play a role in birth outcomes?
 - Carbon monoxide, suspended particulates, and ozone exposures have all been associated with low birthweight and preterm birth
 - One study found mothers living close to major roadways in LA were 10-20% more likely to have preterm or term-low birthweight births

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Methods and Results

- During the feedback activity, we will be asking you how these results should best be presented to facilitate your activities
- For simplicity, we will concentrate on preterm births

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Data Source

- 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

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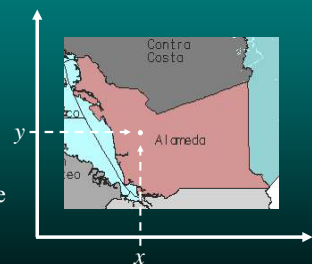
Methods to discuss

1. Geocoding
2. Statistical significance

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Why geocode?

- Geocoding assigns to every birth record:
 - The **zip code** of residence
 - The **census tract**
 - The **block group**
 - x and y coordinates
- This helps us to analyze and visualize the results (more on that later)



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Reporting statistical significance

When we see a community has more preterm birth than usual, we need to answer the question:

Is this because of random chance?

OR

Do we need to be writing our representatives because something is going on here?

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Reporting statistical significance

- **Statistically significant** means that the results are unlikely to be due to random chance, and are likely to be similar if you repeat the analysis with new data
- **Confidence intervals (“95%-CI”)** means that the real rate is likely to be somewhere in this range

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Reporting statistical significance

“In our sample, African-Americans had more than twice the rate of preterm birth than European-Americans, a **statistically significant difference**.”

MEANS

This difference is not random chance, and if we make the same calculations using next year’s data, we’re likely to get a similar result.

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Reporting statistical significance

“The preterm birth rate in my community is 10%, with a confidence interval of 8 to 12%.”

MEANS

We calculated 10%, but the real rate is most likely to be somewhere between 8 and 12%.

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Findings: Alameda County, 2001

- 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)

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Racial and Ethnic Disparities

Mother’s race/ethnicity	Preterm birth rate	95%-CI
African-American	13.3	12.1 – 14.6
Asian-American	7.1	6.2 – 8.1
European-American	7.3	6.6 – 8.0
Latina	8.0	7.7 – 9.1
Native American	---	---
Pacific Islander	8.2	7.2 – 9.3

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Income Disparities

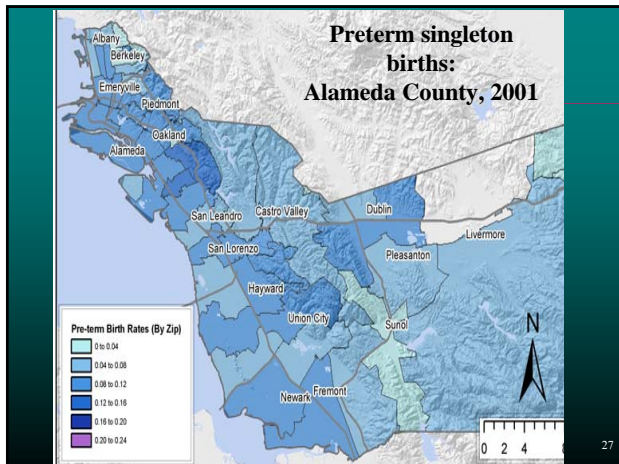
Poverty rate in mother's census tract	Preterm birth rate	95%-CI
Low (< 20%)	8.0	7.5 – 8.4
High (≥ 20%)	10.7	9.8 – 11.7

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Differences between zip codes

Mother's zip code	Preterm birth rate	95%-CI
94618	4.5	2.4 – 8.3
94536	7.4	5.9 – 9.3
94544	9.7	8.2 – 11.4
94605	13.6	11.2 – 16.6

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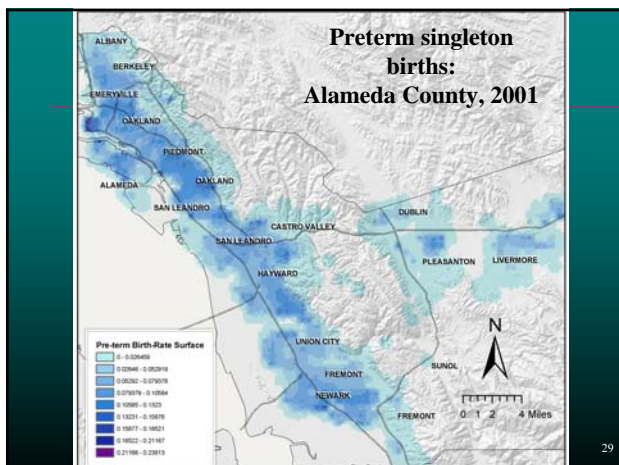


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Problems with zip code maps

- Small communities with very high or low rates do not show up within zip codes
- Crossing the street from one zip code to another should not appear to take you from one level of risk to another
- Some large zip codes have very few people living in them
- Solution: “smoothed” maps based on geocoded address data

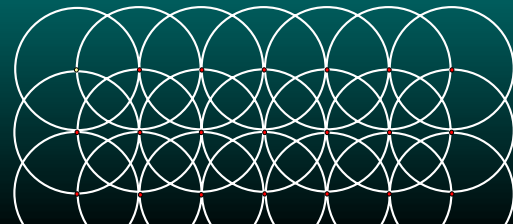
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Smoothed maps

- Ignore the zip code (or any other) boundaries
- Calculate small area rates at regular intervals.



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