Pregnancies in Los Angeles County

Lucile Dinh
Sherlyn Manzano
Christian Murillo
Tina Nguyen

HSC 503: Advanced Community Health Statistics
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Background

- In 2005, 562,440 mothers gave birth in California.
- In California only 85.9% pregnant women seek prenatal care in their first trimester.
- About 20.3% of women in Los Angeles county do not have health insurance.
- Given these statistics, we wanted to research if having insurance will influence a woman’s health behavior during the course of pregnancy.

Background

- Uninsured women in Los Angeles County
  - 9% White
  - 28.7% Hispanic
  - 14.2% African American
  - 22.4% Asian and Pacific Islander
  - 4.5% Native American

- Minorities are more likely to be uninsured.
- We will be investigating whether race/ethnicity affects a woman’s health behavior during the course of pregnancy.

Data collection methodology

- Data collected from Los Angeles Mommy and Baby (LAMB)
- Retrospective, cross-sectional study
- Purpose of survey
  - Obtain a representative picture of mothers who gave birth in LA County in 2005 by race and ethnicity.
Data collection methodology

- Survey consisted of 80 questions covering five health topics.
  1. Preconception health
  2. Prenatal care and maternal medical conditions
  3. Psychosocial conditions during pregnancy
  4. Behavioral risk factors
  5. Postpartum care and Infant health
Data collection methodology

- 10,250 surveys were mailed out in 2006 to women who gave birth one year ago.
- Surveys were provided in multiple languages: English, Spanish, Chinese, etc.
- Data collected over a span of one year
- 5,200 mothers responded to survey
  - (~50% response rate)
Data collection methodology

- If participants did not complete the survey they were either contacted by phone or face to face to complete the survey.

- Once participants completed the survey they were given a $20 dollar gift certificate to Ralphs.

- They were also entered into a raffle to win a $100 gift certificate to Ralphs.
Research Focus

- We covered four health topics:
  1. Preconception Health
  2. Prenatal Care & Maternal Medical Conditions during pregnancy
  3. Behavioral Risk Factors
  4. Postpartum care
Research Problem

1. Are insurance status and prenatal care during the first trimester independent?
2. Are insurance status and smoking status during pregnancy independent?
3. Is there a difference in postpartum depression between insured and uninsured women?
4. Is there a difference between race/ethnicity and level of postpartum depression?
Research Methodology

- Entered **9.75%** of the collected survey data.

- Systematic sampling
  - Chose every 10th survey submitted

- Total number of surveys entered
  - n= 507

- Statistics Software: SPSS 16.0 for Windows
Distribution Histogram by Race and Insurance Status
1. Are insurance status and prenatal care during the first trimester independent?

- **Method:** chi-square test for statistical independence, $\alpha=0.05$

- **Null Hypothesis** $H_0 = $ insurance status and prenatal care *are independent*.

- **Alternate Hypothesis** $H_1 = $ insurance status and prenatal care *are not independent*.
### Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>Cases</th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td>N</td>
<td>Percent</td>
<td></td>
<td></td>
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<tr>
<td>Insurance Status * Prenatal Care?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninsured</td>
<td>507</td>
<td>100.0%</td>
<td>0</td>
<td>.0%</td>
<td>507</td>
<td>100.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insured</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Insurance Status * Prenatal Care? Crosstabulation

<table>
<thead>
<tr>
<th>Insurance Status</th>
<th>Prenatal Care?</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<tbody>
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<td>None</td>
<td>Total</td>
<td></td>
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<tr>
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<td>40</td>
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<tr>
<td>Total</td>
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<td>40</td>
<td>507</td>
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</table>

### Chi-Square Tests

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>143.159&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
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<tr>
<td>Continuity Correction&lt;sup&gt;a&lt;/sup&gt;</td>
<td>138.532</td>
<td>1</td>
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<td>.000</td>
<td>.000</td>
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<td>Likelihood Ratio</td>
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<tr>
<td>Fisher's Exact Test</td>
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<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Linear-by-Linear Association</td>
<td>142.877</td>
<td>1</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
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<tr>
<td>N of Valid Cases</td>
<td>507</td>
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<td></td>
</tr>
</tbody>
</table>

<sup>a</sup> Computed only for a 2x2 table

<sup>b</sup> 0 cells (.0%) have expected count less than 5. The minimum expected count is 9. 31.
1. Are insurance status and prenatal care during the first trimester independent?

- Conclusion: Reject the null hypothesis because the Pearson chi squared (Asymp. Sig) significance, 0.000 is lower than 0.05 level of significance.

- Having insurance and prenatal care are not independent at the $\alpha=0.05$ level of significance.
2. Are insurance status and smoking status during pregnancy independent?

- **Method:** chi-square test for statistical independence, $\alpha=0.05$
- **Null Hypothesis** $H_0 = \text{insurance status and smoking during pregnancy are independent.}$
- **Alternate Hypothesis** $H_1 = \text{insurance status and smoking during pregnancy are not independent.}$
### Case Processing Summary

<table>
<thead>
<tr>
<th></th>
<th>Valid</th>
<th>Missing</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Percent</td>
<td>N</td>
</tr>
<tr>
<td>Insurance Status * Smoking Status during Pregnancy</td>
<td>507</td>
<td>100.0%</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>507</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>

### Insurance Status * Smoking Status during Pregnancy Crosstabsutation

<table>
<thead>
<tr>
<th>Insurance Status</th>
<th>Smoking Status during Pregnancy</th>
<th>Did not smoke</th>
<th>Smoked</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uninsured</td>
<td>Count</td>
<td>95</td>
<td>23</td>
<td>118</td>
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<tr>
<td></td>
<td>Expected Count</td>
<td>112.6</td>
<td>5.4</td>
<td>118.0</td>
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<tr>
<td>Insured</td>
<td>Count</td>
<td>389</td>
<td>0</td>
<td>389</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>371.4</td>
<td>17.6</td>
<td>389.0</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>484</td>
<td>23</td>
<td>507</td>
</tr>
<tr>
<td></td>
<td>Expected Count</td>
<td>484.0</td>
<td>23.0</td>
<td>507.0</td>
</tr>
</tbody>
</table>

### Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>df</th>
<th>Asymp. Sig. (2-sided)</th>
<th>Exact Sig. (2-sided)</th>
<th>Exact Sig. (1-sided)</th>
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</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>79.425b</td>
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<tr>
<td>Continuity Correction</td>
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<tr>
<td>Likelihood Ratio</td>
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<tr>
<td>Fisher's Exact Test</td>
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</tr>
<tr>
<td>Linear-by-Linear</td>
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<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Association</td>
<td></td>
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<td>.000</td>
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<td></td>
</tr>
</tbody>
</table>

a. Computed only for a 2x2 table

b. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.

35.
2. Are insurance status and smoking status during pregnancy independent?

- **Conclusion:** Reject the null hypothesis because the Pearson chi squared (Asymp. Sig) significance, 0.000 is lower than 0.05 level of significance.

- Insurance status and smoking during pregnancy are **not independent**.
3. Is there a difference in postpartum depression between insured and uninsured women?
3. Is there a difference in postpartum depression between insured and uninsured women?

- **Method:** Hypothesis test for two independent samples, $\alpha=0.05$
- **Null Hypothesis** $H_0: \mu_{\text{insured}} = \mu_{\text{uninsured}}$
  - Postpartum depression is the same for both the insured and uninsured.
- **Alternate Hypothesis** $H_1: \mu_{\text{insured}} \neq \mu_{\text{uninsured}}$
  - Postpartum depression is not the same for the insured and uninsured.

- 0 = no depression
- 1 = little depression
- 2 = moderate depression
- 3 = severe depression
3. Is there a difference in postpartum depression between insured and uninsured women?

### Group Statistics

<table>
<thead>
<tr>
<th>Insurance Status</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uninsured</td>
<td>113</td>
<td>.15</td>
<td>.361</td>
<td>.033</td>
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<tr>
<td>Insured</td>
<td>249</td>
<td>.98</td>
<td>.869</td>
<td>.054</td>
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</tbody>
</table>

### Independent Samples Test

<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postpartum Depression</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances</td>
<td>F: 38.277, Sig: .000</td>
<td>t: -10.047 (2-tailed)</td>
<td>Mean Difference: -.827, Std. Error: .082</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower: -.989, Upper: -.665</td>
</tr>
<tr>
<td>Equal variances not</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Is there a difference in postpartum depression between insured and uninsured women?

- **Conclusion:** Reject the null hypothesis because the significance is 0.000 at the $\alpha=0.05$ level of significance.

- There IS a significant difference between insurance status and postpartum depression.
4. Is there a difference between race/ethnicity and postpartum depression?

- **Method:** ANOVA test (analysis of the variance)
- **Null Hypothesis** $H_0: \mu_1=\mu_2=\mu_3=\mu_4=\mu_5$
- **Alternate Hypothesis** $H_1: \mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5$
- This analysis was used to analyze the within and between group differences of race/ethnicity and level of depression.
- **Variables used in coding race:**
  1= White
  2= Hispanic
  3= African American
  4= Asian Pacific Islander
  5= Native American
4. Is there a difference between race/ethnicity and postpartum depression?

**ANOVA**

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
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</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>262.949</td>
<td>4</td>
<td>65.71</td>
<td>6.55</td>
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</tr>
<tr>
<td>Within Groups</td>
<td>252.248</td>
<td>362</td>
<td>0.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>515.197</td>
<td>366</td>
<td></td>
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<td></td>
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</tbody>
</table>

**Multiple Comparisons**

<table>
<thead>
<tr>
<th>(I) Race/Ethnicity</th>
<th>(II) Race/Ethnicity</th>
<th>Mean Difference (I-J)</th>
<th>Std. Error</th>
<th>Sig</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Hispanic</td>
<td>-.100</td>
<td>.115</td>
<td>1.00</td>
<td>-.43</td>
</tr>
<tr>
<td></td>
<td>African American</td>
<td>-.010</td>
<td>.128</td>
<td>1.00</td>
<td>-.37</td>
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<tr>
<td></td>
<td>Asian Pacific Islander</td>
<td>-.012</td>
<td>.129</td>
<td>1.00</td>
<td>-.38</td>
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<tr>
<td></td>
<td>Native American</td>
<td>-.123</td>
<td>.383</td>
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<tr>
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<td>White</td>
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<td>.115</td>
<td>1.00</td>
<td>-.37</td>
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<tr>
<td></td>
<td>African American</td>
<td>.089</td>
<td>.122</td>
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</tr>
<tr>
<td></td>
<td>Asian Pacific Islander</td>
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<td>.125</td>
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<td>-.27</td>
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<tr>
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<td>-.660</td>
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<td>White</td>
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<td>.126</td>
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<td>-.26</td>
</tr>
<tr>
<td></td>
<td>Hispanic</td>
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<td>.122</td>
<td>1.00</td>
<td>-.26</td>
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<tr>
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<td>-.30</td>
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<td>-.170</td>
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<td>Asian Pacific Islander</td>
<td>.111</td>
<td>.386</td>
<td>1.00</td>
<td>-.98</td>
</tr>
</tbody>
</table>
4. Is there a difference between race/ethnicity and postpartum depression?

- **Conclusion:** Fail to reject the null hypothesis
- Surprisingly, there is no difference between race/ethnicity and level of postpartum depression at the $\alpha=0.05$ level of significance.
Conclusion

- Having insurance and prenatal care are not independent.
- Insurance status and smoking during pregnancy are not independent.
- There IS a significant difference between insurance status and postpartum depression
- There is no difference between race/ethnicity and level of postpartum
Question #1

- Which race/ethnicity is more likely to have post partum depression?
  A. White
  B. Hispanic
  C. African American
  D. All of the above are all equally likely
  E. All of the husbands
Question #2

In a chi square test, if insurance status and smoking during pregnancy are not independent, you would…

A. Fail to reject the null hypothesis
B. Accept the null hypothesis
C. Reject the null hypothesis
D. Accept the alternate hypothesis
E. Fail to accept the null hypothesis
F. Both C and D
G. Huh? (ask Professor Watson)