Hypothesis Testing - Age Neonatal

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```python
[1]: import numpy as np
     from scipy.stats import chi2_contingency
     import scipy.stats as stats
```

1 Neonatal Deaths: Chi Squared Tests (Income, Region, Race)

1.1 Race

```python
[2]: # Create a contingency table
     observed_data = np.array([[297,118582],
                               [2100,473638],
                               [1470,581331],
                               [48,23984],
                               [793,176429],
                               [3070,1315460]])
```

```python
[3]: # Perform the chi-squared test
     chi2, p, dof, expected = chi2_contingency(observed_data)
```

```python
[4]: chi2
```

```
[4]: 724.1498538735071
```

```python
[5]: p
```

```
[5]: 2.9458906253470425e-154
```

```python
[8]: # Check the p-value to determine statistical significance
     alpha = 0.05  # Set your chosen significance level
     if p < alpha:
         print("Reject the null hypothesis: The number of neonatal death cases is␣
      ↪dependent on race.")
     else:
         print("Fail to reject the null hypothesis: The number of neonatal death␣
      ↪cases is independent of race.")
```

```
Reject the null hypothesis: The number of neonatal death cases is dependent on
race.
```

1.2 Region

```
[9]: # Create a contingency table
     observed_data = np.array([[1903,662183],
                               [4118,1171321],
                               [910,388745],
                               [2051,674419]])
```

```
[10]: # Perform the chi-squared test
      chi2, p, dof, expected = chi2_contingency(observed_data)
```

```
[11]: chi2
```

```
[11]: 148.76816473980756
```

```
[12]: p
```

```
[12]: 4.858351583892842e-32
```

```
[13]: # Check the p-value to determine statistical significance
      alpha = 0.05  # Set your chosen significance level
      if p < alpha:
          print("Reject the null hypothesis: The number of neonatal death cases is␣
       ↪dependent on region.")
      else:
          print("Fail to reject the null hypothesis: The number of neonatal death␣
       ↪cases is independent of region.")
```

```
Reject the null hypothesis: The number of alcohol abuse cases is dependent on
region.
```

1.3 Income

```
[14]: # Create a contingency table
      observed_data = np.array([[1343,557524],
                                [2200,776811],
                                [2264,677935],
                                [3175,884398]])
```

```
[15]: # Perform the chi-squared test
      chi2, p, dof, expected = chi2_contingency(observed_data)
```

```
[16]: chi2
```

```
[16]: 184.35151289054085
```

```
[17]: p
```

```
[17]: 1.0131597907224045e-39
```

```python
[19]: # Check the p-value to determine statistical significance
      alpha = 0.05  # Set your chosen significance level
      if p < alpha:
          print("Reject the null hypothesis: The number of neonatal death cases is␣
       ↪dependent on income.")
      else:
          print("Fail to reject the null hypothesis: The number of neonatal death␣
       ↪cases is independent of income.")
```

```
Reject the null hypothesis: The number of neonatal death cases is dependent on
income.
```