Health Disparities associated with Salmonella Infections
Harris County (excluding Houston), TX  2000, 2005 and 2010

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Background

Salmonella infections are reportable in Texas and burden significantly the Harris County population. Harris County Public Health (HCPH) is a local health department serving approximately two million people, residents of Harris County outside the City of Houston. Salmonellosis cases reported to HCPH in 2000, 2005 and 2010 were used for this analysis of socioeconomic disparities in incidence of disease.

Objective

To study the effect of socioeconomic health disparities at the neighborhood level in Salmonella incidence using GIS and census tract level socioeconomic data.

Methods

• A total of 726 of 748 (97%) Salmonella cases reported to HCPH in 2000, 2005 and 2010 were geocoded using ArcGIS version 10.0.

• Cases were linked to census tracts and arranged into 4 categories based on percent of the census tract population living below the federal poverty as follows: 0 – 4.9%, 5 – 9.9%, 10 – 19.9%, and 20%*.

• Age-adjusted incidence rates (per 100,000 population) and confidence intervals (CI) were calculated for each category**. STATA/SE version 11.1 was used for analysis.

• Poisson regression was used to test statistical significance.

* Using the methodology recommended by the Harris County Public Health Disparities Geocoding Project. http://www.hcph.harvard.edu/geocodingproject/

**2000 decennial census population data and 2010 American Community Survey (ACS) population data were used

Results

Age-Adjusted Rate of Salmonella Infections by Percent of Population under Federal Poverty Level
Harris County, (excluding Houston), TX 2000, 2005 and 2010

Age-Specific Rate of Salmonella Infections by Percent of Population under Federal Poverty Level
Harris County, (excluding Houston), TX 2000

Age-Specific Rate of Salmonella Infections by Percent of Population under Federal Poverty Level
Harris County, (excluding Houston), TX 2005

Age-Specific Rate of Salmonella Infections by Percent of Population under Federal Poverty Level
Harris County, (excluding Houston), TX 2010

Conclusions

• The number of Salmonellosis cases reported and the age-adjusted incidence rate for 2000, 2005 and 2010 was 129 (6.7/100,000), 269 (rate: 10.9/100,000) and 328 (rate: 13.2/100,000), respectively.

• The incidence difference between the wealthiest and poorest groups increased from 4.0 in 2000 to 9.1 in 2010.

• The association of higher Salmonellosis incidence rate with lower census tract-level poverty was found for all age groups.

• A Poisson regression model also demonstrated the following trend: individuals living in CTs with poverty rate of ≥20% had a 45% reduction in Salmonellosis rate compared to individuals living in CTs with <5% poverty rate (result not presented).

Summary

• The Salmonellosis incidence rate was consistently inversely associated with census-tract level poverty for the studied surveillance years (2000, 2005, 2010)

• For each time period studied, the rate for the wealthiest census-tracts was about twice that of the lowest census-tract poverty level

• The incidence of Salmonellosis significantly increased at a rate of about 42% every 5-year period

• Education regarding risk of Salmonellosis should be given to all Harris County residents with an emphasis on those in the highest socio-economic strata

• Risk factors most common among individuals with the highest socio-economic strata should be understood better

<table>
<thead>
<tr>
<th>Year</th>
<th>Poverty Level</th>
<th>Crude Rate</th>
<th>Adjusted Rate</th>
<th>Confidence Interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0 - 4.9%</td>
<td>20.7</td>
<td>18.6</td>
<td>16.4 - 21.2</td>
</tr>
<tr>
<td>2005</td>
<td>5 - 9.9%</td>
<td>21.0</td>
<td>19.6</td>
<td>17.4 - 22.3</td>
</tr>
<tr>
<td>2010</td>
<td>10 - 19.9%</td>
<td>22.0</td>
<td>20.5</td>
<td>18.3 - 22.5</td>
</tr>
</tbody>
</table>

Poisson coefficient, incidence rate ratio (IRR) and p value for Salmonella incidence rate (IR) in 2000, 2005 and 2010 Harris County (excluding Houston) TX

<table>
<thead>
<tr>
<th>Trend of Salmonellosis rates</th>
<th>2000, 2005 and 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poisson Coefficient</td>
<td>0.0699516</td>
</tr>
<tr>
<td>IRR</td>
<td>1.48724176</td>
</tr>
<tr>
<td>p-value</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Notes in the table are crude only adjusted for poverty group and age group as they would be in a regression model.