Introduction
Non-Alcoholic Fatty Liver Disease (NAFLD) is the most common chronic liver disease in children and adults. The prevalence is increasing in adolescents worldwide, potentially related to the increase in childhood obesity. NAFLD has severe progression to fibrosis, cirrhosis and hepatocellular carcinoma. It is a risk factor for heart disease, liver related morbidity, and is becoming the number one indication of liver transplantation. Etiological factors are thought to be obesity, diabetes, Metabolic Syndrome (MetS) but are largely unexamined in the adolescent population. An unexplored potential risk factor for pediatric NAFLD is food insecurity which has established associations with poor diet and obesity.

Research Questions
In a cross-sectional analysis of 12y-19y: 1) Is food in security linked to NAFLD? 2) Do risk factors vary by race/ethnicity?

Methods
• Sample: n=4714, NHANES 2001-2006
• Dependent Variable: >30 u/L of liver enzyme aminotransferase (ALT), surrogate marker of NAFLD in lieu of Gold Standard liver biopsy or imaging
• Variables: Sex, Race/Ethnicity, C-Reactive Protein (CRP), Body Mass Index (BMI), Dietary Inflammatory Index (DII), Food Security (Child, Adult, Household)
• Analysis: Chi-Square tests among categorical variables; and, Logistic Regression to estimate Odds Ratios (ORs and 95% CI) of NAFLD status in relation to putative risk factors.

Discussion and Conclusions
NAFLD prevalence was higher in Non-Hispanic Blacks in comparison to Non-Hispanic Whites, and future studies are suggested to identify underlying factors linked to race that would pre-dispose to adolescent onset of liver disease. Likewise, a pro-inflammatory diet appears to be a risk factor for elevated ALT in this age group. In contrast, neither food security nor obesity was associated with NAFLD suggesting that quality of diet is more influential. Overall, more work is needed to understand the causes of adolescent onset NAFLD so that evidence-based public health interventions and messages can be developed to stem the emerging epidemic in young people.

Table 1: Demographic and Clinicopathological Factors of participants age 12-19 by ALT status in NHANES 2001-06 (n=4714)

<table>
<thead>
<tr>
<th>Sex</th>
<th>Normal (n=2011)</th>
<th>High (n=293)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1998 (82.8%)</td>
<td>414 (17.2%)</td>
<td>.521</td>
</tr>
<tr>
<td>Female</td>
<td>390 (85.5%)</td>
<td>79 (14.5%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Normal (n=2153)</th>
<th>High (n=293)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Hispanic Black</td>
<td>1129 (85.9%)</td>
<td>205 (14.1%)</td>
<td>.055</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1655 (83.3%)</td>
<td>296 (16.1%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>153 (82.7%)</td>
<td>31 (17.3%)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Summary of Key Findings

Prevalence of NAFLD varied by race/ethnicity
- Non-Hispanic Blacks had the highest elevated ALT of 18.8% in comparison to Non-Hispanic Blacks at 15.0%, Hispanics at 16.3% and other at 17.3% (p<0.05).
- Non-Hispanic Blacks had 25% higher likelihood of NAFLD compared to Non-Hispanic Whites (95% CI 1.00-1.57).

Food Insecurity
- Adolescents characterized as having reduced quality or quantity of food appeared less likely to have elevated ALT compared to children rated as unaffected by insecurity (OR=0.63, 95% CI 0.37-1.09).
- Adolescents characterized on the adult scale as being marginally insecure were at a possible reduced risk compared to those fully secure (OR=0.95, 95% CI 1.51-1.33).
- Using the household level assessment, adolescents marginally food insecure were at possible increased risk for elevated ALT compared to the fully secure (OR=2.08, 95% CI 1.00-4.41).

Other
- No significant findings for CRP and BMI, known metabolic indicators of diabetes and obesity, when compared to elevated ALT for prevalence. Increased DII score was linked to risk of elevated ALT.

Table 3: Predictors of ALT Status in participants age 12-19 in NHANES 2001-06 (n=4714)

Dietary Inflammatory Index, Food Security, Race, and Adolescent Non-Alcoholic Fatty Liver Disease in NHANES 2001-06
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