Transition to a market economy and C-reactive protein concentrations among rural communities in Hainan Island, China.

I. Introduction

Health problems due to urbanization are not only an issue in urban areas of developed countries. Due to improved modes of transportation, people in the most remote areas of the world have access to an “urban” lifestyle. Consequently, rural areas have begun to suffer from an increased prevalence of chronic diseases.

Although an increasing number of studies have focused on the health impact of urbanization in China, the situation in rural areas remains unclear. We conducted a study in rural communities of Hainan Island, China, where local residents have experienced a rapid lifestyle change in the last 20 years.

We collected dried blood samples and measured C-reactive protein (CRP), a biomarker of future cardiovascular disease (CVD).

II. Methods

Research Location

Hainan Island is located south of mainland China (Fig. 1). The population of the province was 8.6 million in 2010, the majority of the population are Han (83%), followed by ethnic minorities such as Li (16%). Hainan province was designated as a Special Economic Zone in 1988 and received large investments from mainland China and overseas.

We used a two-level random intercept multilevel model with individuals (level 1) nested within community (level 2).

III. Results

Table 2. Basic characteristics of the study participants.

<table>
<thead>
<tr>
<th></th>
<th>Male (N=811)</th>
<th>Female (N=886)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean [SD]</td>
<td>Mean [SD]</td>
</tr>
<tr>
<td>BMI</td>
<td>21.2 [2.9]</td>
<td>20.7 [3.1]</td>
</tr>
<tr>
<td>CRP (log mg/L)</td>
<td>-0.3 [0.5]</td>
<td>-0.4 [0.5]</td>
</tr>
<tr>
<td>&gt; 3 mg/L (n [%])</td>
<td>135 [16.6%]</td>
<td>117 [13.2%]</td>
</tr>
</tbody>
</table>

[1] Association between CRP concentrations and the extent of economic development (indexed as average household income in each community)

Average income of households in each community ranged from 1579 to 8400 RMB (1 RMB = 0.15 USD as of Nov., 2010). The association of average income with CRP was positive (Pearson $r = 0.09$, $p < 0.001$).

IV. Summary of Findings

Although the extent of economic development, as indexed by average annual income of households in each community, showed a six-fold difference, the association between CRP concentrations and individual lifestyle was stronger than that at the community-level of economic development. This result suggests that inter-individual variation in lifestyle explains the variation in CRP concentrations better than location of residence.

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