Modeling Transitions Among BMI States
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Introduction
• A living person can be put into 1 of 4 states – underweight, normal, overweight, or obese, determined by BMI
• Looking at transitions in a population could shed light on how a typical person moves among BMI states as he/she ages
• China is an ideal country for this analysis since both underweight and overweight exist to a noticeable extent and both are public health issues

Research Question
• Investigate such transitions among BMI states, specifically …
  1. Compare BMI transition probabilities in 2 different time periods
  2. Investigate length of time in BMI states
  3. Sensitivity analyses

Data
• China Health and Nutrition Survey (CHNS)
• By WHO standards:

<table>
<thead>
<tr>
<th>BMI</th>
<th>BMI Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 18.5 kg/m²</td>
<td>Underweight</td>
</tr>
<tr>
<td>18.5 – 25 kg/m²</td>
<td>Normal</td>
</tr>
<tr>
<td>25 – 30 kg/m²</td>
<td>Overweight</td>
</tr>
<tr>
<td>&gt; 30 kg/m²</td>
<td>Obese</td>
</tr>
</tbody>
</table>

Comparisons
• Ages 20 – 49 at beginning of each period
• Empirically calculate, for quinquennial age intervals, age-specific transition probabilities among BMI states and each BMI state → death
• Decreased transition probabilities of different state → normal state
• Increased transition probabilities of different state → overweight or obese states
• Increased transition probabilities of normal state → different state

Time in States
• 2006 – 2011
• Ages 20 – 79 at beginning of period
• Empirically calculate 5-year age-specific transition probabilities
• Projected future life time in each state
• Generally, regardless of the BMI state someone starts in, most time spent in the normal state

Conclusion
• More transitions into overweight and obese states and fewer into normal state over 2 decades
• Most of life spent in normal state, regardless of starting BMI state – promising from a policy standpoint
• Economically, policies to reduce underweight and overweight prevalence should be directed toward the young demographic who have more future productive years

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