A Regional-level Comparison of the Cost of Food Safety Failures
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Abstract: Food safety failures can have dramatic effects on public health triggering policy interventions. Once policy is in place, the effectiveness of control should be monitored. Two major outcomes of food safety failures - outbreaks and recalls - are often used as proxies of control in food safety economics research. Due to data limitations, or because of a particular policy focus, most studies of the effectiveness of food safety controls have been conducted at a national level. It is unclear what regional or state differences may be lost in this aggregation. As one common metric of the economic impact of food safety failures on consumers, Kuchler and Golan (1999) discuss the cost of illness (COI) approach, which will be employed in this research. COI calculates the consumer burden which is a lower bound of the cost of food safety failures. Other elements of the burden to society include government and firm costs. This poster compares such disaggregated cost elements to inform policy evaluations. The information contained in recall and outbreak databases at a regional level will be compared and linked to covariates to highlight patterns of policy effectiveness. Preliminary results suggest similar patterns of food safety failure costs are indicated using both sets of information in many portions of the US. However, in other regions the two forms of food safety failures lead to very different estimates of the cost burden, suggesting the need to impose weights in policy effectiveness studies.

Discussion/References

1. There is a need to consider regional characteristics of the costs of food safety failures.
2. From the production side, recall quantity is an internal shock, outbreaks are external shocks.
3. Both types of food safety failures are related to each other.
4. Regional and time series differences.
5. Midwest and South exhibit considerably impacts of both types of food safety failures, especially in the case of Salmonella.
6. Midwestern and South present the possibility of similar result with Salmonella case.
7. Useful to evaluate other pathogens in future research.


Cost of illness (COI):

\[ \text{COI} = \sum_{i=1}^{n} s_i \]

where \( s_i \) is actual cost, \( n \) is number of people

COI approach: linear weighted calculation of consumer’s cost

Outbreaks and Recalls (1990s-2002)

- South and West regions have large share of all outbreaks since 1996
- Prior to late 90’s, the Midwest region saw a large share of outbreaks and recalls
- After 2000 the South saw an increased in recall

Why Salmonella?

- Both recalls and outbreaks have Salmonella as a common source of food safety failure
- Recalls from Salmonella: over 1% in the whole recalls and especially over 10% in 1995

Application of the simple bilateral externality model:

\[ \text{TCOI}_i = \text{TCOI}_{sam} + \text{TCOI}_{sam} \]

\[ \text{TCOI}_{sam} = \alpha \text{TCOIs} + \ldots \]

\[ \text{TCOIs} = \text{TCOIs} + \ldots \]

Point estimation result

<table>
<thead>
<tr>
<th>Variable</th>
<th>Outbreaks Estimates</th>
<th>Outbreaks Std.</th>
<th>Recalls Estimates</th>
<th>Recalls Std.</th>
</tr>
</thead>
<tbody>
<tr>
<td>West</td>
<td>0.2576**</td>
<td>0.2436</td>
<td>0.7262**</td>
<td>0.5136</td>
</tr>
<tr>
<td>Northeast</td>
<td>0.2303**</td>
<td>0.2893</td>
<td>0.1963**</td>
<td>0.6919**</td>
</tr>
<tr>
<td>Midwest</td>
<td>0.2221**</td>
<td>0.2430</td>
<td>2.0231**</td>
<td>1.0156**</td>
</tr>
<tr>
<td>South</td>
<td>0.4905**</td>
<td>0.2711</td>
<td>0.8208**</td>
<td>0.5439**</td>
</tr>
</tbody>
</table>

** Significant at 95% confidence level

Assumption:
- For comparison of regional level between outbreaks and recalls from Salmonella, the time variant is left out – pooling data.
- The logarithm of COI, recalled amount, and recovered amount are used.

OLS estimation:
- Instead of weighted average point estimates, OLS method is used with regional dummies.

Implication:
- In the West and Midwest areas, both food safety failures should be considered.
- It is obvious to recognize that outbreaks are contributing significantly to the food safety failure – because of different error terms in two regression equations, it is difficult to compare the efficiency.