Social Class Variation, the Effect of the Economic Recession and Childhood Obesity at 3 Years of Age in Ireland

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Impacts of the economic recession after 2008:

- Deterioration of healthcare coverage in many European countries \(^1,^2\)
- Similar health outcomes in families with and without employment \(^3,^4\)
- Increases in poverty predominantly among children \(^5\)
- Child health suffered in various ways \(^6\)
• More than 1 in 5 children **overweight or obese** (IOTF criteria) in Spain, Greece, Ireland, Italy, Slovenia, Portugal, and the United Kingdom (2012) \(^7\)

• **Change of lifestyles** during a recession\(^7\)\(^-\)\(^12\)
  - lower purchase of fruit and vegetables
  - increased consumption of saturated fat, salt, proteins, processed and high calorie dense food

• **Social class is associated with the risk for childhood obesity** \(^13\), \(^14\)
  – Gap between socio-economic groups widened since 2000 \(^15\)-\(^17\)
Objectives

1. To determine early childhood obesity prevalence rates in families from various social classes pre and post the peak of the economic recession in Ireland.

2. To investigate whether social inequalities in childhood obesity exist during a recession.
Methods

Study population

- Infant Cohort of the Growing Up in Ireland National Longitudinal study
- Quantitative interviews

Table 1: Study population

<table>
<thead>
<tr>
<th>Year</th>
<th>Age</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>9 months</td>
<td>11,134</td>
</tr>
<tr>
<td>2011</td>
<td>3 years</td>
<td>9,793</td>
</tr>
</tbody>
</table>
Methods

Analysis

• McNemar’s test to compare prevalence rates of overweight and obesity (OWOB) in various social classes (2008 – 2011)

• Three logistic regression models to identify determinants of obesity:
  1. Presence of obesity at 3 years
  2. Markov-type transition model with children who were *not obese* at 9 months and *obese* at 3 years
  3. Markov-type transition model with children who were *obese* at 9 months and 3 years

• Use of World Health Organization growth criteria (body mass index)
Variables included in the models

Table 2: Measurement of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Measurement (instrument)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>Leicester portable height stick</td>
</tr>
<tr>
<td>Weight (child)</td>
<td>Class III medically approved SECA 835 portable electronic weight scale</td>
</tr>
<tr>
<td>Weight (parents)</td>
<td>Class III medically approved SECA 761 flat mechanical weight scale</td>
</tr>
<tr>
<td>Social class</td>
<td>International Standard Classification of Occupations 1988 (ISCO88)</td>
</tr>
<tr>
<td>Perceived crisis effect</td>
<td>Self-reported 4-fold effect categorisation</td>
</tr>
</tbody>
</table>

**Covariates:**

- Birth characteristics (e.g. weight, delivery type)
- Early development and lifestyle (e.g. breastfeeding, rapid weight gain, sleep)
- Parental factors (e.g. weight, ethnicity, smoking)
- Family characteristics (e.g. parity)
## Prevalence of OWOB

### Overall relative increase of 10.8% in OWOB from 2008 – 2011

### Increases in all OWOB sub-categories (Table 3)

### Table 3: Prevalence of OWOB categories (WHO criteria)

<table>
<thead>
<tr>
<th></th>
<th>Total population</th>
<th>OWOB</th>
<th>Over-weight</th>
<th>Moderate obesity</th>
<th>Severe obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHO</strong></td>
<td>10733</td>
<td>38.9 %</td>
<td>19.4 %</td>
<td>12.4 %</td>
<td>7.1 %</td>
</tr>
<tr>
<td><strong>IOTF</strong></td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>OWOB</th>
<th>Over-weight</th>
<th>Moderate obesity</th>
<th>Severe obesity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WHO</strong></td>
<td>9349</td>
<td>43.1 %</td>
<td>20.4 %</td>
<td>14.4 %</td>
<td>8.3 %</td>
</tr>
<tr>
<td><strong>IOTF</strong></td>
<td>9349</td>
<td>23.6 %</td>
<td>18.4 %</td>
<td>3.8 %</td>
<td>1.4 %</td>
</tr>
</tbody>
</table>
OWOB prevalence in social classes

• Significant increases in OWOB (unadjusted) in most social classes
  • highest absolute increase: non-manual class (6.8%, p<0.001)
  • highest increase in obesity: unskilled class (10.1%, p=0.02) (Figure 1)

Figure 1: Increase in obesity from 2008 to 2011 (WHO criteria)
Economic changes

Figure 2: Distribution of recession effects perceived on the family in social classes
Economic changes

Perception of the crisis effect:

- 36% of households dropped into a lower income quintile in the ‘very significant’ effect group vs. 26% in the significant and 18% in the ‘small’ or ‘no effect’ group
- Similar trends seen per social class (except for the ‘never worked’ class)
- Comparable gradient seen in
  - job losses among primary caregivers (5-21%) and secondary caregivers (8-40%)
  - reduction of working hours (16-28%) and social welfare benefits (45-63%)
  - the families’ ability to afford luxuries (33-75%), basic household items (14-54%), rent or mortgages (2-18%) and to pay utility bills (5-26%)
Regression models

Risk factors – explanatory variables

- **Child characteristics** (female gender, high birth weight, early gestational week)

- **Early development and lifestyle** (early rapid weight gain, obesity at 9 months, little sleep and high TV watching hours at 3 years)

- **Maternal factors** (Asian (but no Chinese) background, smoking during pregnancy, gestational diabetes, OWOB) + **secondary caregiver** OWOB

- **Family characteristics** (rural region)
Regression models

Recession & social class

Model 1 & 2: Risk of obesity at 3 years higher in children whose families perceived a ‘very significant’ effect of the crisis

Model 3 for children who had obesity both at 9 months and at 3 years (n=1573; results not shown):

- No significant change in risk in different social classes
- No significant change in risk in any recession effect group

<table>
<thead>
<tr>
<th>Independent variable</th>
<th>Model 1: Obesity 3 years in all children OR (CI)</th>
<th>Model 2: Obesity 3 years if 9 months not obese OR (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Household class = managerial and technical</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Professional</td>
<td>1.11 (0.92; 1.34)</td>
<td>1.15 (0.92; 1.45)</td>
</tr>
<tr>
<td>Non-manual</td>
<td>1.12 (0.90; 1.38)</td>
<td>1.15 (0.89; 1.48)</td>
</tr>
<tr>
<td>Skilled manual</td>
<td>1.01 (0.79; 1.29)</td>
<td>1.07 (0.80; 1.42)</td>
</tr>
<tr>
<td>Semi-skilled manual</td>
<td>0.94 (0.70; 1.27)</td>
<td>0.81 (0.56; 1.17)</td>
</tr>
<tr>
<td>Unskilled</td>
<td>1.36 (0.77; 2.38)</td>
<td>1.42 (0.76; 2.65)</td>
</tr>
<tr>
<td>Never worked</td>
<td>1.21 (0.81; 1.80)</td>
<td>1.18 (0.74; 1.90)</td>
</tr>
<tr>
<td>The crisis had a significant effect on the family</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>A very significant effect</td>
<td><strong>1.22</strong> (1.02; 1.46)</td>
<td><strong>1.27</strong> (1.03; 1.58)</td>
</tr>
<tr>
<td>A slight effect</td>
<td>1.06 (0.90; 1.25)</td>
<td>1.10 (0.90; 1.33)</td>
</tr>
<tr>
<td>No effect at all</td>
<td>1.08 (0.81; 1.44)</td>
<td>1.05 (0.74; 1.50)</td>
</tr>
</tbody>
</table>

Table 4: Excerpt from the regression models 1 & 2. a p ≤ 0.05
Conclusion

- Increases of both OWOB and obesity similar in families of different social classes
- Children with obesity, at 9 months of age, maintained their weight status regardless of social class and perceived recession effect
- No inequalities in the incidence of obesity between social classes
- The ‘very significant’ perceived effect of the economic crisis on the family was strongly associated with a 27% increased risk of developing childhood obesity from the age of 9 months to 3 years
Conclusion

**Obesity at 9 months**

No difference seen at 3 years

Perceived ‘**very significant**’ recession effect vs. ‘**significant**’ recession effect

27% increased risk of obesity at 3 years

**No obesity at 9 months**

*Figure 3*: Association of obesity at 3 years of age with perceived recession effects on the family, adjusting for obesity risk factors
Implications for research

Further investigation needed:

• Other age groups
• Other countries
• Potential causes to the association of childhood obesity and recession, e.g. more data may be needed on children’s lifestyles (eating, physical activity, …)
Implications for policy makers

1. The (subjective) perception of recession by families of young children appears to be a useful indicator of economic loss and health deterioration in their households.

2. Healthy eating should be supported among families of young children affected by an economic recession, independent of their social class, in order to avoid that children move up into the highest weight category.
Acknowledgments

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Thanks for your attention!

Questions?

Source: UPMC My health matters

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References


