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Growing Up in Ireland
National Longitudinal Study of Children

The impact of local food environment on the quality of children's diet

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Introduction

- Dietary quality is a well established contributor to health conditions such as CVD and cancer and SES inequalities in health
- Research internationally has found pronounced social inequalities in dietary quality and food intake
- SES inequalities in diet and nutrition are complex
- Emphasis in health promotion on individual behaviours and characteristics, not structural factors and context
- BUT, is dietary quality influenced by environment and context?

Food Poverty

- **“the inability to access a nutritionally adequate diet and the related impacts on health, culture and social participation” (Friel and Conlon 2004)**
- **Direct result of economic resources**
- **Indirectly via environment if poorer SES areas also have poorer access to foodstuffs**
- **Concerns about “Food Deserts”**
- **In US and Canada research shows differences in number and type of shops, availability of different foods and cost of foods BUT ALSO, impact on diet across SES and race**
- **Not found in Europe and Australia**

Food Retail in Ireland

- There is surprisingly little published evidence about the development of retail trends in Ireland and socio-economic status
- Loss of smaller local specialist shops has been highlighted (Poole and Parker 1990; Furey et al 2001)
- Some evidence of poorly served residential areas around cities
- Irish market divided into:
  - Vertically integrated retailers (multiple & foreign discount)
  - Affiliated retailers (group and symbol)
  - Independent retailers
- Vertically integrated have largest share (Dunnes and Tesco have 50% of market)
- Group/Symbol more expensive and less fresh food, more high fat/sugar foods
- SES patterns of use: low income use group/symbol

Analysis Strategy

- Descriptive analysis of distance to food stores and DASH score
- To estimate impact of distance net of individual and HH characteristics we use OLS
- Effect could be driven however by area characteristics and composition and degree of rurality
- Use fixed effects multi-level model to estimate impact of distance and density within each sampling cluster

$$\hat{y} = (yij - \bar{y}j) = \alpha + \beta(\chi ij - \bar{\chi}j) + \varepsilon ij$$

The GUI Study- Sample Design

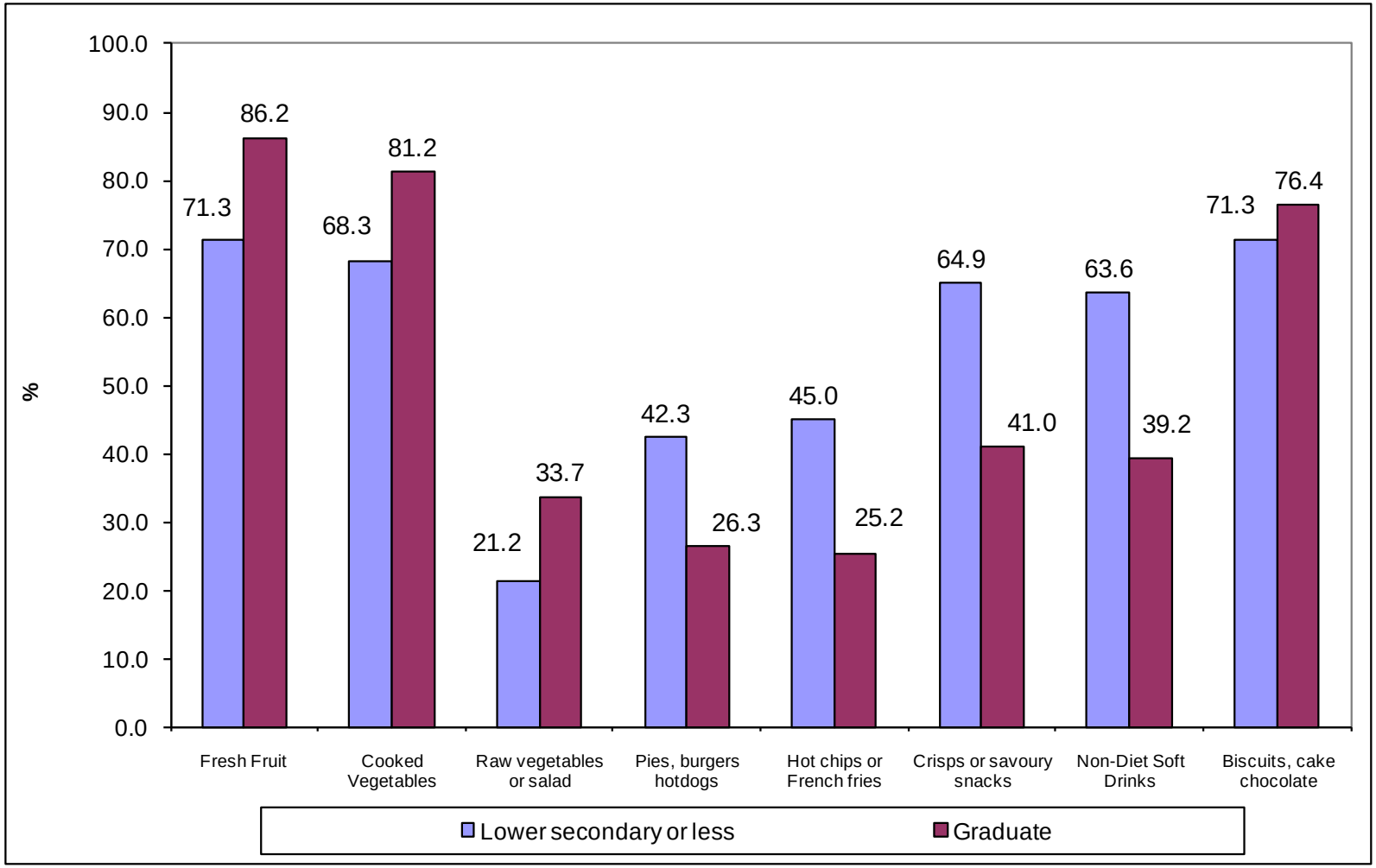
- 8,568 nine-year old children participating in the Growing Up in Ireland Project
- Selected through the school system using a Probability Proportionate to Size (PPS) sampling method with schools serving as the primary sampling units (PSU's)
- 910 schools from the national total of 3,200 primary schools were selected for inclusion
- 82% response rate at the school level and 57% at the household level (i.e. eligible child selected within the school)
- The data was weighted to be nationally representative
- 20 Item Summary Index of dietary Quality
- Data on position and type of retail from Competition Authority
- Network distance measures using ARCView 9.3.1 in metres

Indicator of Dietary Quality

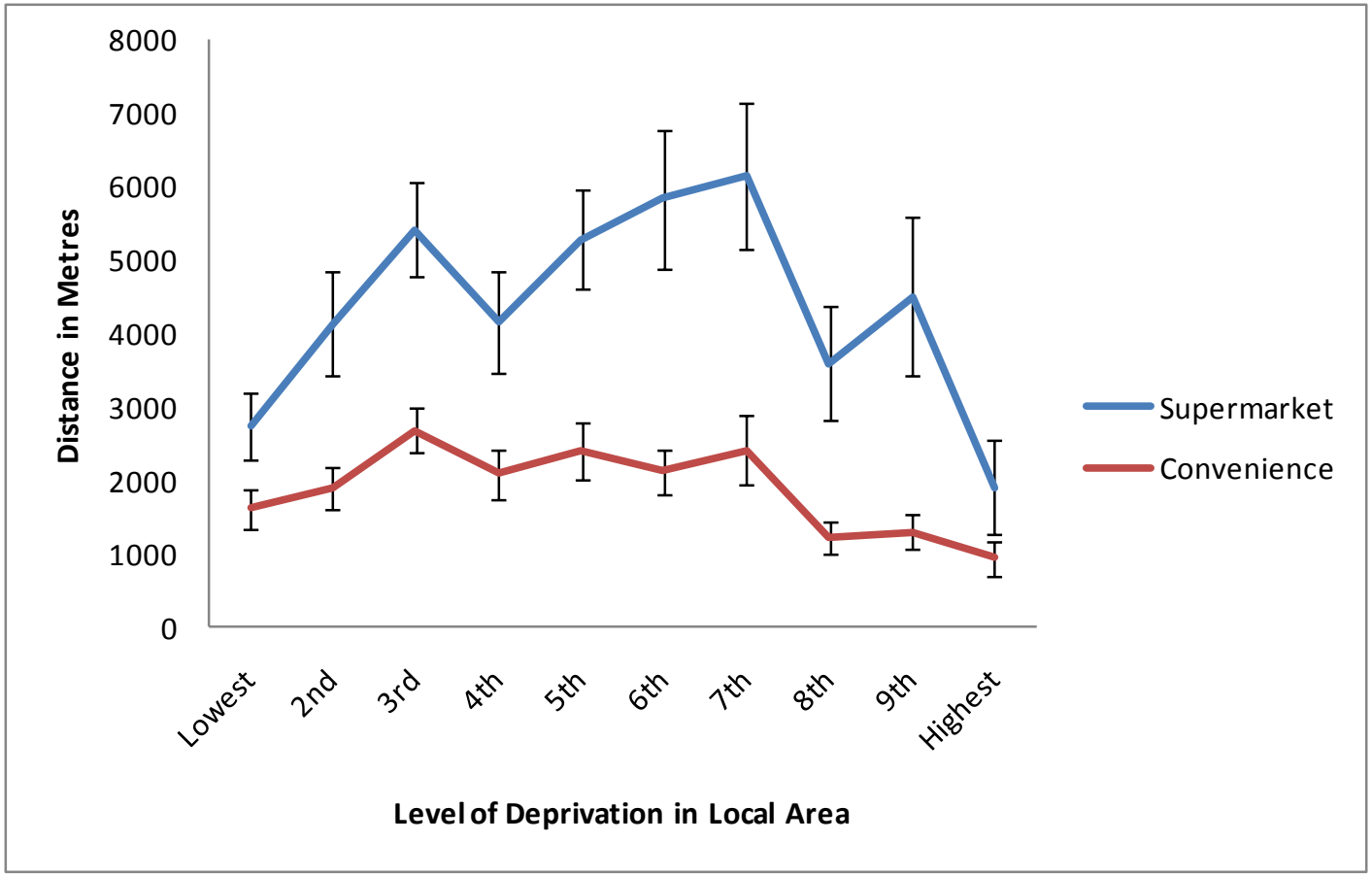
Fresh fruit	Potatoes/ Pasta/ Rice
Fruit juice	Cereals
Meat / Chicken / Fish	Biscuits, doughnuts, cake, pie or chocolate
Eggs	Cheese/yoghurt/ fromage frais
Cooked vegetables	Low fat Cheese/ low fat yoghurt
Raw vegetables or salad	Water (tap water / still water/ sparkling water)
Meat pie, hamburger, hot dog, sausage or sausage roll	Soft drinks / minerals / cordial / squash (not diet)
Hot chips or French fries	Soft drinks / minerals / cordial / squash (diet)
Crisps or savoury snacks	Full cream milk or full cream milk products
Bread	Skimmed milk or skimmed milk products

- Log net household income (modified OECD equivalence)
- Maternal Education (low 2nd, high 2nd, post 2nd, third level)
- Population density (open countryside, village <1500, small town <10k, large down 10k+, city, Dublin)
- Maternal age (<30, 30-39, 40-49, 50+)
- Distance and density in models of DASH is logged
- HH CSO Class (6 groups)
- Haase Deprivation Index

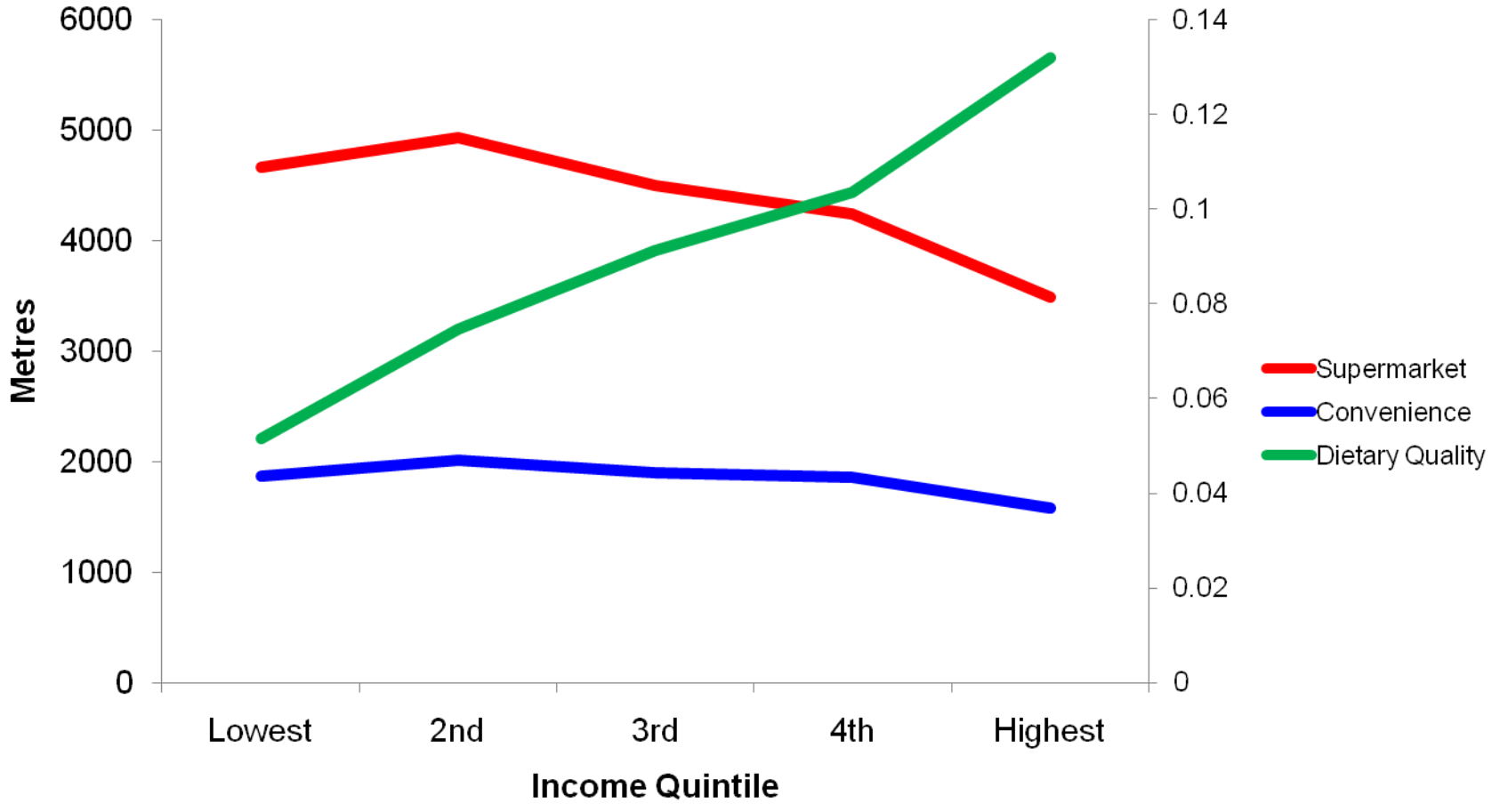
Dietary Components



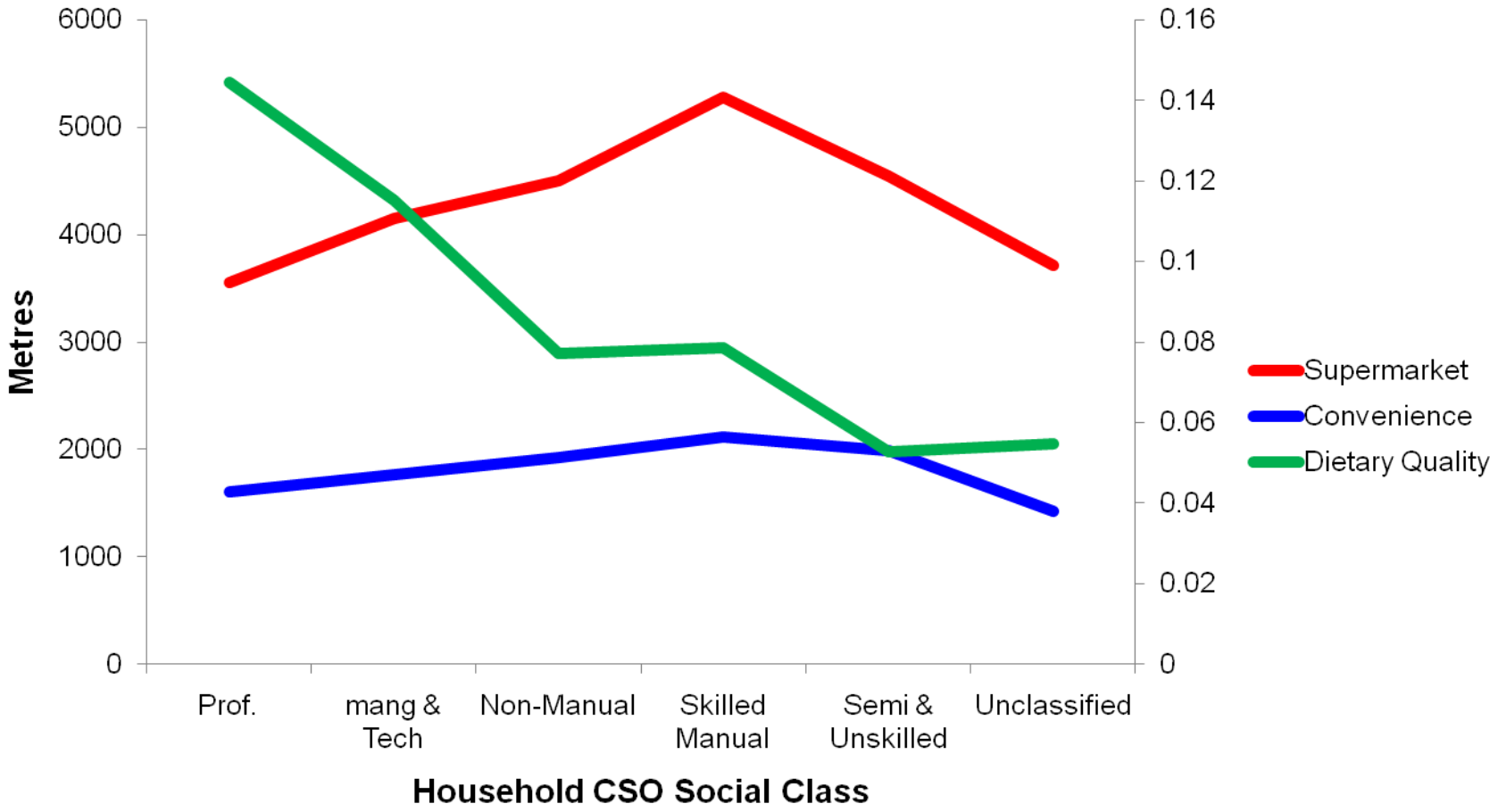
Mean Distance to Food Outlet by Type and Area Deprivation Decile



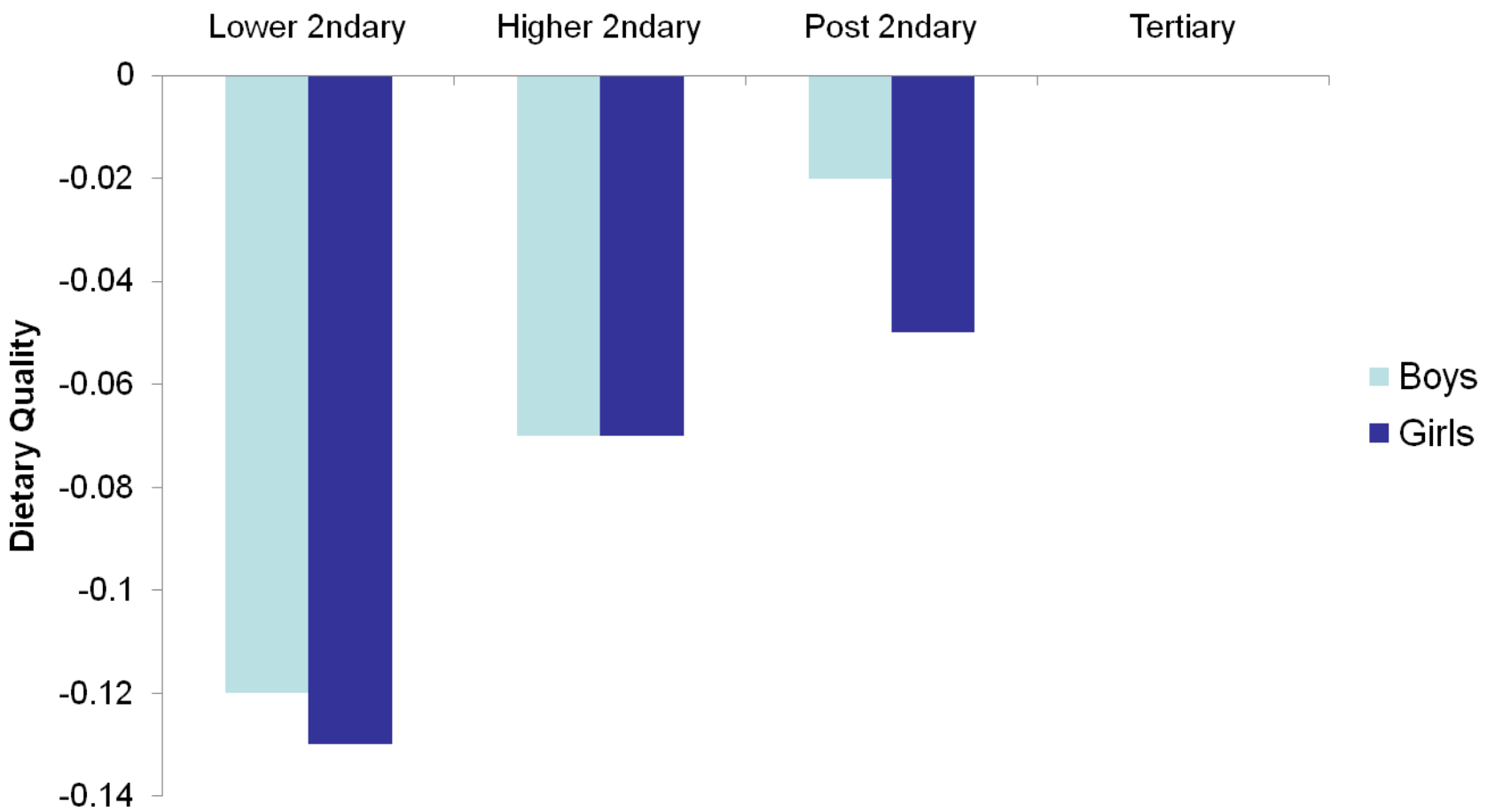
Mean Distance by Outlet Type and Income Quintile



Mean Distance by Outlet Type and HH Social Class



Fixed Effect Estimate by Maternal Education



Distance Effects in Fixed Effects Model

- Supermarket (log)distance coefficient is 0.012
- Elasticity of 0.12 or 12%
- Effect for convenience stores slightly less
- BUT, effects only for girls
- No relationship of distance for boys

Conclusions

- Income and education independently influence dietary quality
- BUT, food poverty is also influenced by physical food availability net of individual and household characteristics
- Greater distance to a food outlets leads to worse dietary quality
- Poor households in poor areas are doubly disadvantaged
- Dietary quality reduces by 1% for every 10% increase in distance
- However, not clear why the effect only occurs for girls – examining methodological issues
- Possible association may be result of demand factors although fixed effects would militate this
- Why are effects so strong in Ireland?