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Cross-generational Trajectories in Weight Gain in Ireland

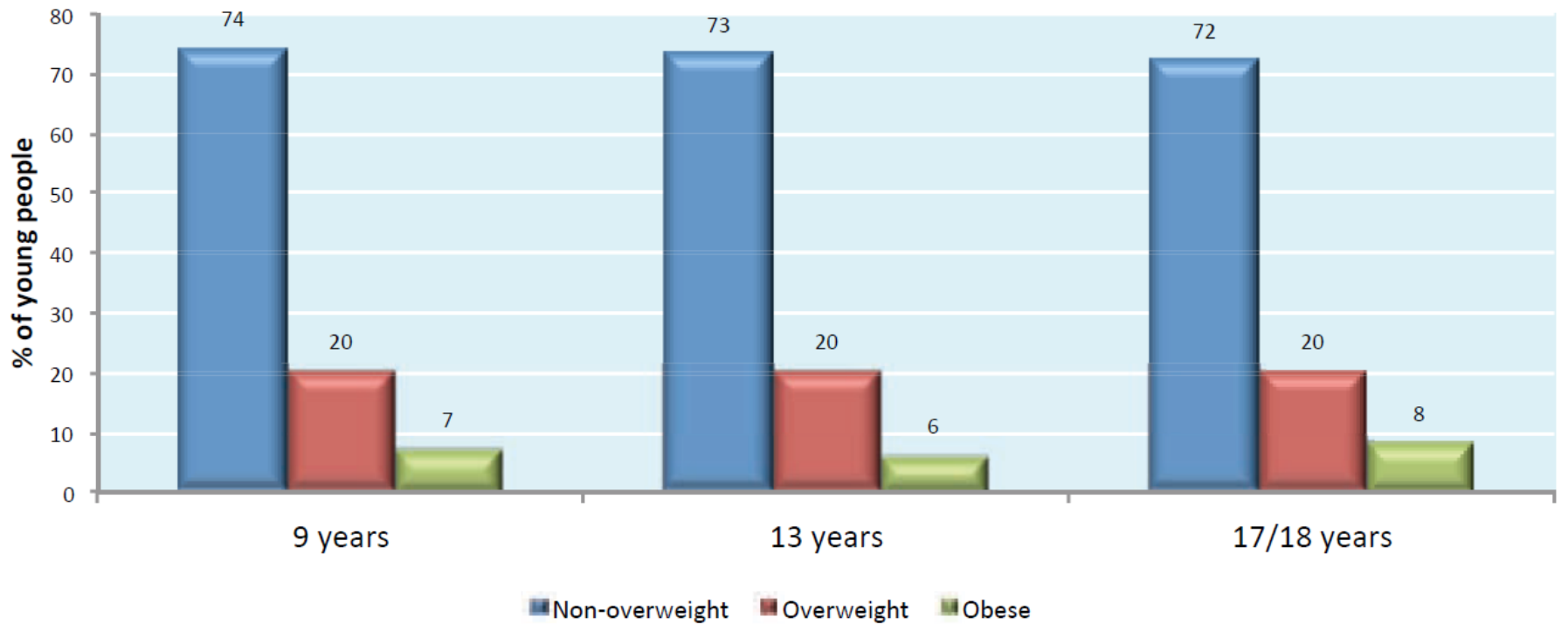
Mark McGovern

Queen's University Belfast
Centre of Excellence for Public Health (Northern Ireland)



An Roinn Leanaí
agus Gnóthaí Óige
Department of Children
and Youth Affairs

Weight Status among GUI Child Cohort





Background

- Weight status impacts not just on the health/wellbeing of individuals, but also has wider implications
- Including health service externalities
- Economic impact is one example
- Estimates of societal costs generally large (e.g. Tremmel et al., 2013)



Economic costs of obesity in Ireland

- Safefood report “What are the estimated costs of childhood overweight and obesity on the island of Ireland?” – Perry et al (2017)
- Total lifetime cost of €4.6 billion
- Around 20% due to direct costs, other 80% due to indirect costs associated with morbidity and mortality
- Key issue is persistence of weight status



This paper

- Given persistence in childhood weight status, key question is whether there are any factors which predict difference in trajectories in early life
- This paper examines the extent of covariation in child and parent weight
- GUI infant cohort
- Descriptive and preliminary



Previous literature on Ireland

- Keane et al (2014) – high and stable rates of obesity among children in Ireland
- Gender and SES gradients in overweight/obesity are substantial (Madden, 2016; Walsh and Cullinan, 2015)
- Childhood overweight/obesity predicts GP and hospital inpatient stays at age 13 (Doherty et al, 2017)
- Relationship between parental classification of child weight status, own weight status, and education (Cullinan and Cawley, 2017; Queally et al, 2018)



Measurement

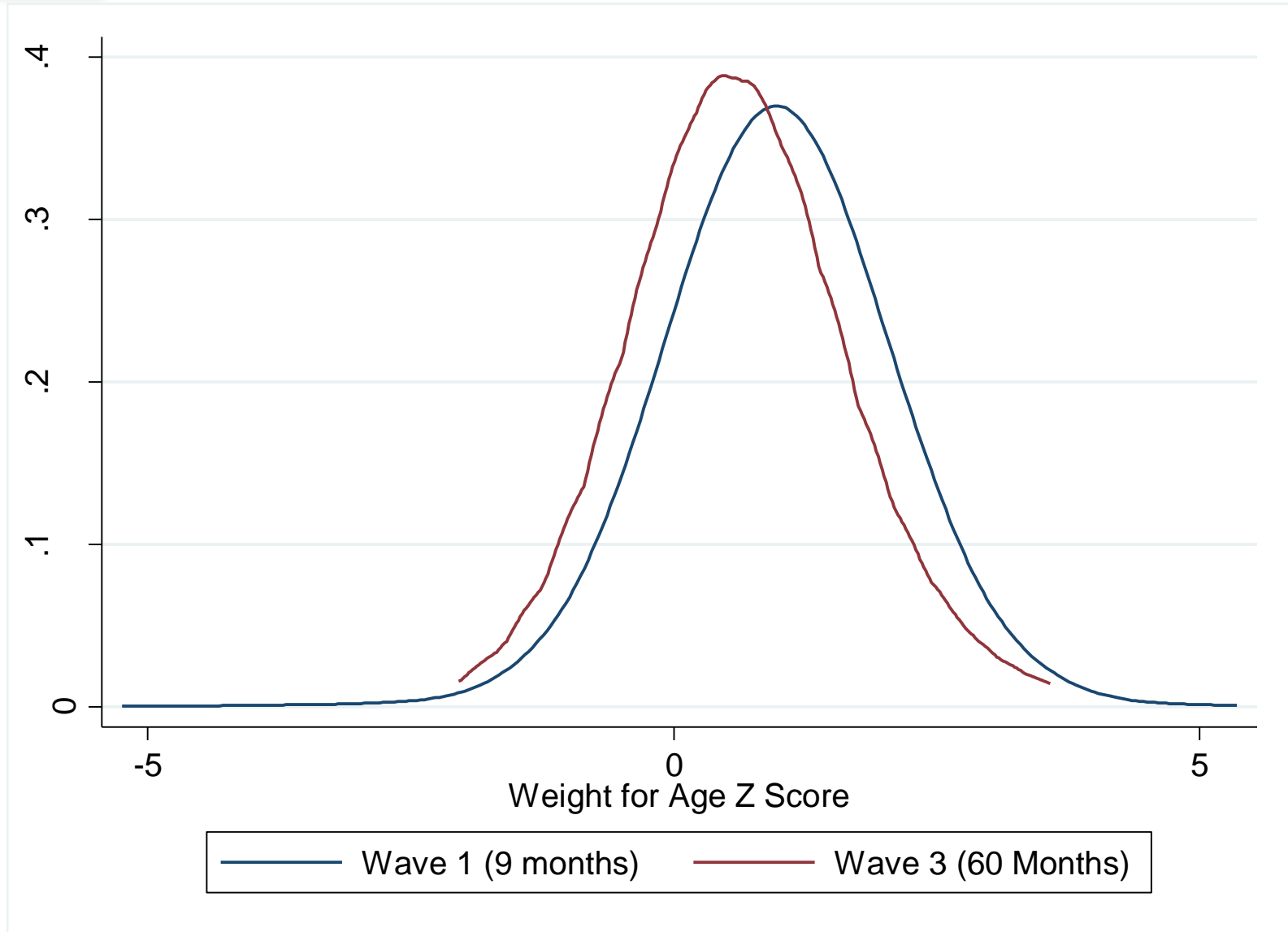
- Even with “objective” data, measurement of weight status is controversial even among adults, especially with regards to hard cut-offs (e.g. O’Neill, 2015)
- For children, measurement should additionally take account of standard age and gender-specific growth trajectories
- Puberty is particularly problematic
- Number of different approaches, mainly based on growth curve analysis (e.g. for the UK - Cole, 1995)



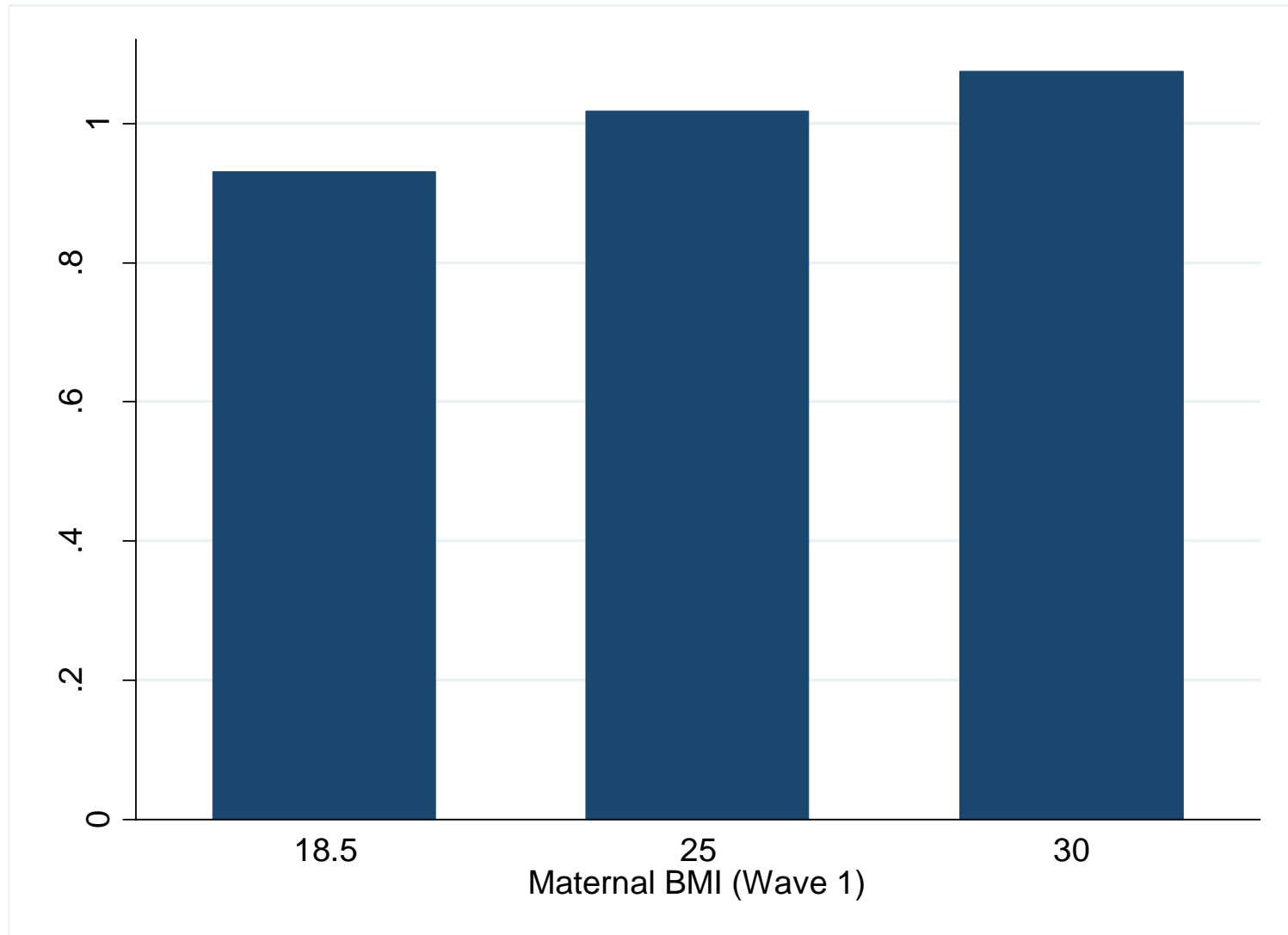
Measurement

- In this paper I use the WHO reference standards (WHO, 2006), but assessing sensitivity to alternatives is key
- Analysis mainly based on WHO derived weight for age Z score
- +1 SD taken as indicating overweight status
- Leads to classification of more overweight than International Obesity Task Force (IOTF) at younger ages
- Advantage is easier to compare across cohorts and account for birth weight (McGovern, 2018)

Distribution of Weight for Age Z Scores GUI Infant Cohort



Child Weight for Age (at 9 months)





Parental BMI Transitions W1 – W3

Mother's BMI Category in W3

		18.5-25	25-30	30+	Total
W1		%	%	%	%
BMI Category	18.5-25	73	24	3	100
	25-30	15	66	20	100
	30+	3	20	77	100

Father's BMI Category in W3

		18.5-25	25-30	30+	Total
W1		%	%	%	%
BMI Category	18.5-25	61	38	2	100
	25-30	9	77	15	100
	30+	2	18	81	100



Summary of Parental Weight Changes W1 – W3

Mother's Change in Weight Status	No.	%
Stayed NW	2470	38
NW to OW/OB	894	14
Stayed OW/OB	2743	43
OW/OB to NW	331	5
Total	6437	100

Father's Change in Weight Status	No.	%
Stayed NW	912	17
NW to OW/OB	588	11
Stayed OW/OB	3568	67
OW/OB to NW	252	5
Total	5321	100



Maternal and Child Weight Status Change

Boys

Mother's Change in Weight Status	Child changed to OW/OB Category in W3
Stayed NW	6%
NW to OW/OB	8%
Stayed OW/OB	11%
OW/OB to NW	5%
Average	8%

Girls

Mother's Change in Weight Status	Child changed to OW/OB Category in W3
Stayed NW	4%
NW to OW/OB	7%
Stayed OW/OB	10%
OW/OB to NW	5%
Average	7%



Paternal and Child Weight Status Change

Boys

Father's Change in Weight Status	Child changed to OW/OB Category in W3
Stayed NW	5%
NW to OW/OB	7%
Stayed OW/OB	8%
OW/OB to NW	2%
Average	7%

Girls

Father's Change in Weight Status	Child changed to OW/OB Category in W3
Stayed NW	4%
NW to OW/OB	7%
Stayed OW/OB	8%
OW/OB to NW	5%
Average	7%



Regression analysis

- We are interested in understanding whether changes in parental weight are associated with changes in child weight
- There are many ways to approach this, here we focus on a descriptive analysis
- Does change in parental BMI predict changes in childhood weight for age ($W1 - W3$) after other factors are accounted for?
- Standard panel approach, with FE accounting for additional fixed family characteristics
- Other controls: smoking, age, education, household size, income, employment



Regression Results

Variables	Weight for Age Z Score			
	RE Boys	RE Girls	FE Boys	FE Girls
Mother's BMI	0.0125*** (0.00316)	0.0166*** (0.00295)	-0.00590 (0.00672)	0.00190 (0.00612)
Father's BMI	0.0263*** (0.00402)	0.0248*** (0.00355)	0.0134 (0.00863)	0.00569 (0.00755)
Other Controls	Y	Y	Y	Y
Observations	5,913	5,650	5,913	5,650
Number of ID	3,559	3,445	3,559	3,445

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1



Next steps

- Compare with other measurement approaches for child weight status
- Reverse causality and lags
- Examine the role of other predictors of childhood weight change
- Incorporate W4 (although limited) and birth weight
- Potentially use child cohort



Limitations

- Very preliminary!
- Data are weighted, but attrition remains a concern
- Measurement of childhood weight status/gain is not straightforward
- Mean reversion



Thanks!

- Email: m.mcGovern@qub.ac.uk