Urbanization and obesity: a case study of Soweto, South Africa
Investigating the relationship between inequality and adiposity

Rebecca Love [1,2]
Esther Van Sluijs [1], Jean Adams [1], Shane Norris [2], Richard Munthali [2], Lisa Micklesfield [2,3]
[1] MRC Epidemiology Unit, University of Cambridge, Cambridge, United Kingdom
[2] MRC/Wits Developmental Pathways for Health Research Unit, University of Witwatersrand, Johannesburg, South Africa
[3] University of Cape Town Department of Sports Science, Cape Town, South Africa

Summary and conclusions

Aims of the analyses:

1) Investigate the influence of early life inequality on adiposity trajectory latent growth class membership

2) Examine if the relationship between socioeconomic position and obesity within the Birth to Twenty (BT20) Cohort changes as Soweto undergoes a urban and economic transition

Results revealed that:

- The escalating obesity crisis in South Africa is primarily centralized in the female population

- A higher early life socioeconomic status (as indicated by individual, family and household factors) is associated with increased risk of overweight and obesity

- However, as the cohort ages within a local context experiencing economic development and urbanization, the variables demonstrate a clear step wise change whereby lower socioeconomic position is associated with increasing rates of overweight and obesity

Conclusions
These analyses outline for the first time within a South African context the shifting burden of obesity and associated chronic diseases from wealthy to poor populations

The Birth to Twenty Cohort

- Following Nelson Mandela's release from prison in 1990, 3273 children born in the metropolitan area of Johannesburg-Soweto were enrolled into a birth cohort that would follow them and their families for the next 20 years
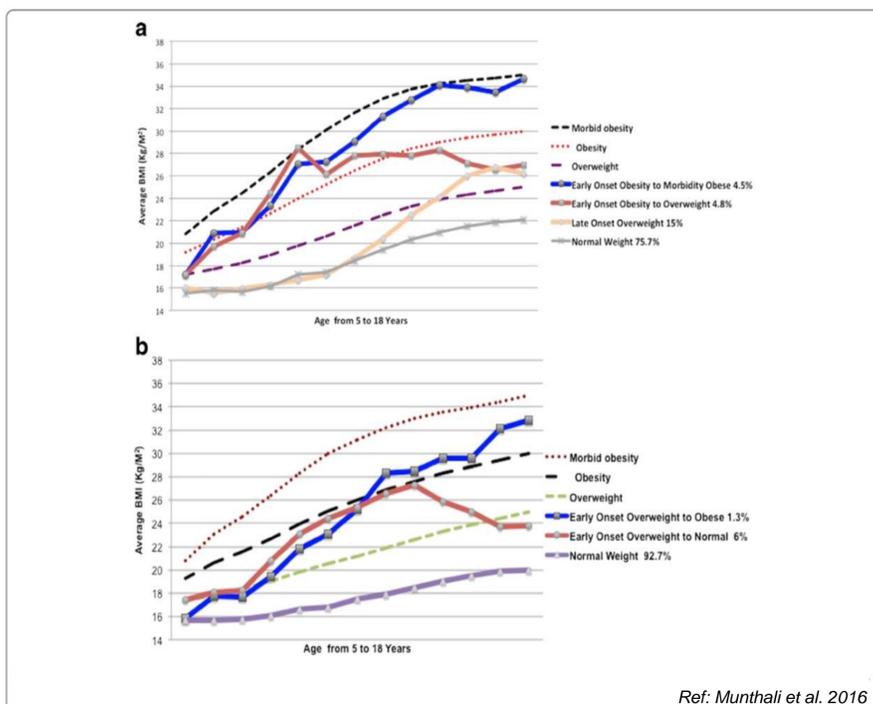
- The Birth to Twenty Cohort is Africa's largest and longest running study of the growth, health, well-being and educational progress of urban children, and one of the few large-scale longitudinal studies in the world
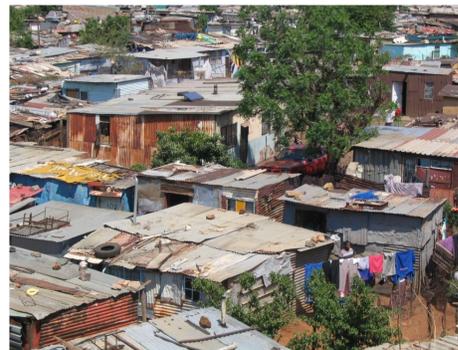
Johannesburg's Soweto Township

Results

Body Mass Index (BMI) Trajectories in Girls (a) and Boys (b) across the Birth to Twenty Cohort, ages 5-18 years

Ref: Munthali et al. 2016

a) <u>BMI Trajectories in girls.</u> BMI latent classes plotted together with Extended International Obesity Task Force (IOTF) Cut-Offs for BMI in girls

b) <u>BMI Trajectories in boys.</u> BMI latent classes plotted together with Extended International Obesity Task Force (IOTF) Cut-Offs for BMI in boys

Multinomial logistic regression models of the relationship between girl's BMI latent growth classes and early life inequality indicators

BMI latent growth classes		Crowding (people/household rooms)
Ref: Normal weight	RRR	p-value
Late onset overweight	1.09	0.11
Early onset obesity to overweight	0.69	**0.02***
Early onset obesity to morbidly obese	0.74	**0.03***
		Maternal education (years)
Ref: Normal weight	RRR	p-value
Late onset overweight	0.93	**0.04***
Early onset obesity to overweight	1.14	0.08
Early onset obesity to morbidly obese	1.03	0.59
		Sum of all household physical assets
Ref: Normal weight	RRR	p-value
Late onset overweight	0.89	0.08
Early onset obesity to overweight	1.32	**0.02***
Early onset obesity to morbidly obese	0.99	0.99

Sample-total: 947

Linear regression models investigating the association between socioeconomic position and girl's BMI at 2, 8, 13 and 16 years

	Co-efficient	p-value	Co-efficient	p-value
Year 2				
	BMI		BMI z-score	
All physical assets (weighted)	-0.148	0.042	-0.089	0.084
All assets (weighted)	-0.145	**0.008***	-0.102	**0.009***
Year 8				
	BMI		BMI z-score	
All physical assets (weighted)	0.170	**0.029***	0.082	**0.026***
All assets (weighted)	0.121	0.051	0.057	0.054
Year 13				
	BMI		BMI z-score	
All physical assets (weighted)	0.312	**0.012***	0.083	**0.024***
All assets (weighted)	0.343	**0.001***	0.096	**0.002***
Year 16				
	BMI		BMI z-score	
All physical assets (weighted)	-0.174	0.202	-0.060	0.085
All assets (weighted)	-0.064	0.529	-0.031	0.228

Sample-total: 1682