

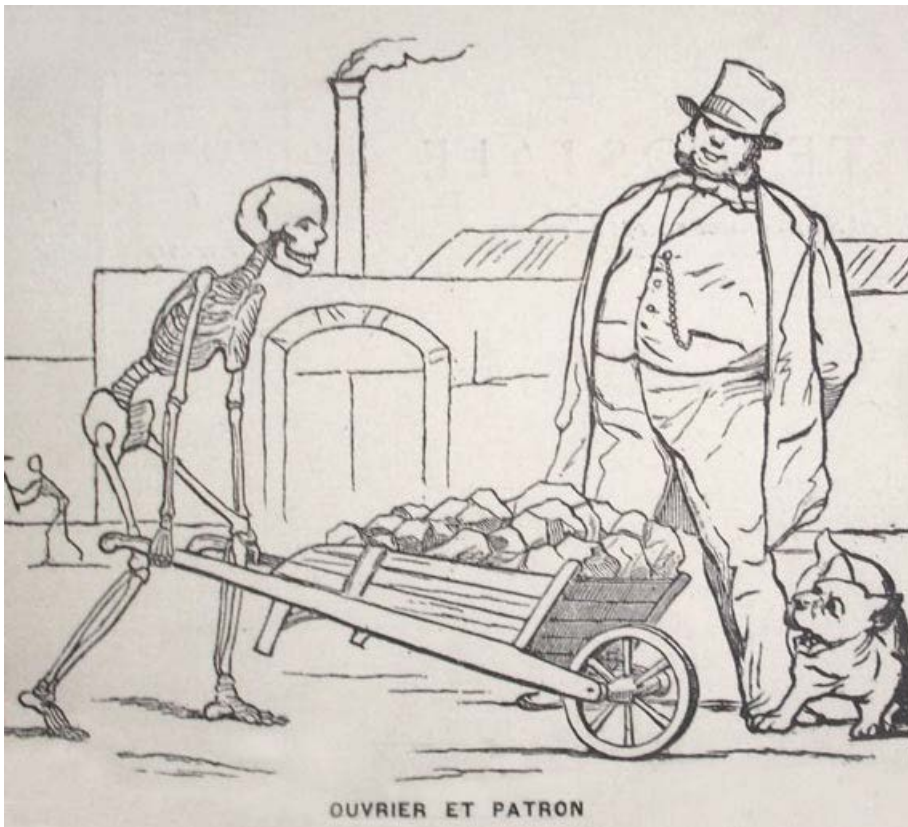
Pedro Marques-Vidal
Department of Internal Medicine
Centre Hospitalier Universitaire Vaudois

Economically deprived but bodily opulent: socio- economic differences in obesity levels



The lean and the obese

1903



OUVRIER ET PATRON

Which socio-economic factors?

Nationality, marital status, education, work type, income, wealth, neighbourhood...

Not all have been studied

Prevalence and trends, Switzerland

Swiss health surveys 1997, 2002, 2007

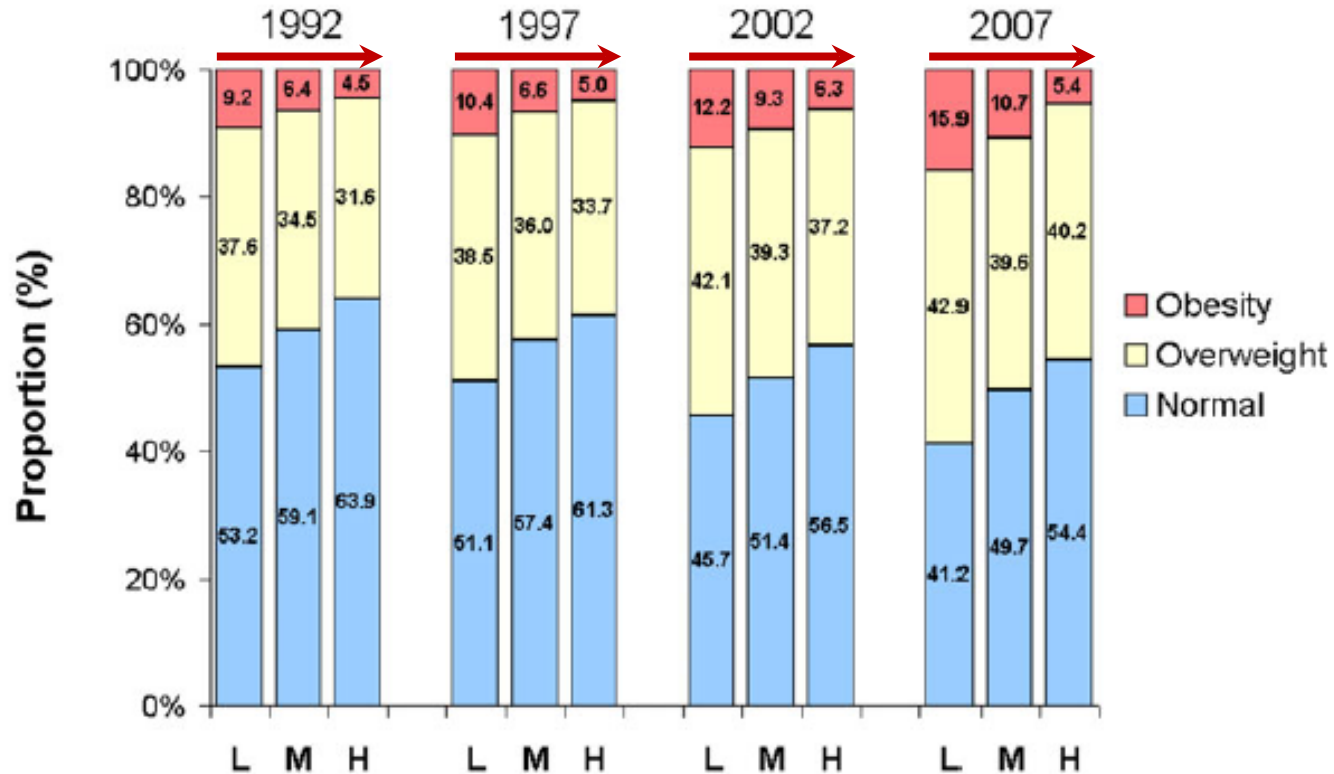
65,000 participants aged 18-102 years

Educational level (low, middle, high)

➤ Self-reported anthropometric data

Prevalence and trends, Switzerland

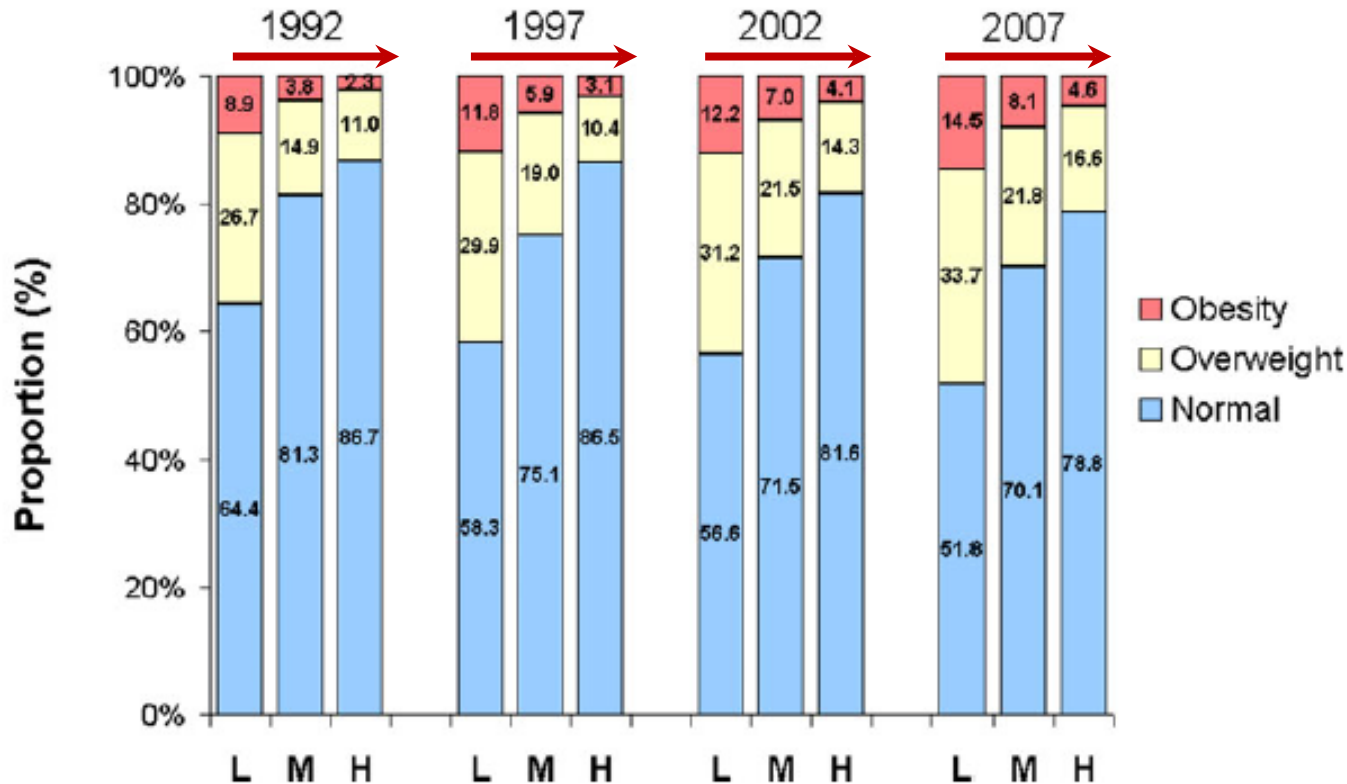
Men



Obesity gradient between educational levels
Gap increasing

Prevalence and trends, Switzerland

Women



Obesity gradient between educational levels
Gap also **increasing**

Prevalence and trends, Switzerland

	Men	Women
Study year		
1992-3	1 (ref.)	1 (ref.)
1997	1.07 [0.92-1.24]	1.44 [1.26-1.66]
2002	1.38 [1.22-1.56]	1.57 [1.39-1.78]
2007	1.51 [1.33-1.71]	1.79 [1.57-2.03]
Age group		
(18-44)	1 (ref.)	1 (ref.)
(45-64)	2.11 [1.91-2.34]	2.01 [1.81-2.23]
(65+)	1.83 [1.62-2.07]	2.19 [1.95-2.45]
Education		
Lower	1 (ref.)	1 (ref.)
Middle	0.72 [0.64-0.81]	0.59 [0.53-0.64]
High	0.43 [0.37-0.49]	0.35 [0.30-0.41]
P-value for trend	<0.001	<0.001
Nationality		
Swiss	1 (ref.)	1 (ref.)
Non-Swiss	1.01 [0.89-1.15]	1.16 [1.02-1.32]

Weight gain, Lausanne

CoLaus study, Lausanne

4469 participants aged 35 to 75 at baseline

Follow-up during ~5.5 years

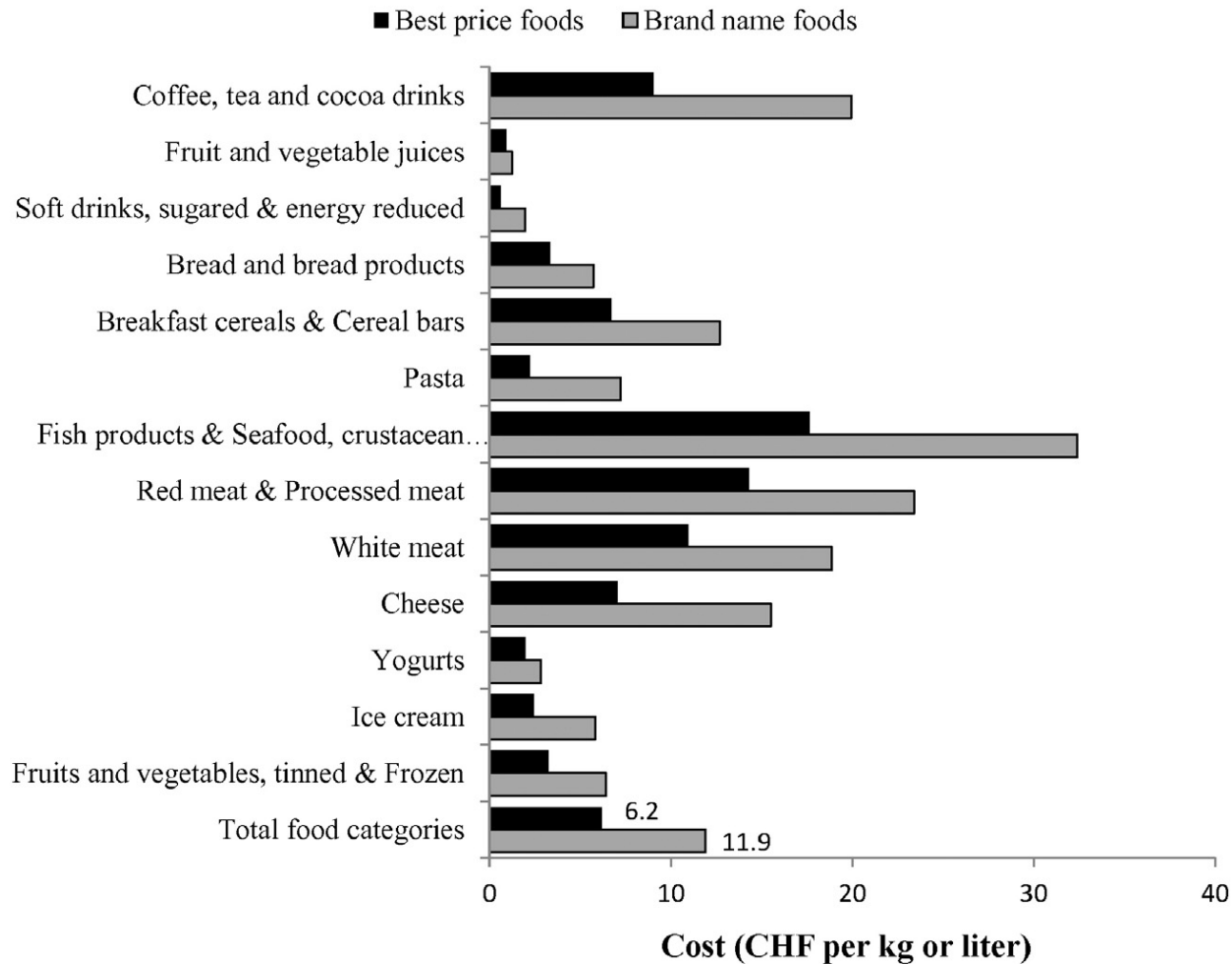
Nationality, marital status, education, AVS

Weight gain assessed

- Absolute gain
- Gain ≥ 5 kg

	Weight gain (kg/year)			Gain ≥ 5 kg		
	Model 1	Model 2	Model 2	Model 1	Model 2	Model 2
Born in Switzerland						
No	0.32 \pm 0.02	0.32 \pm 0.02	-	1 (ref.)	1 (ref.)	-
Yes	0.30 \pm 0.02	0.30 \pm 0.02	-	0.97 (0.83 - 1.13)	1.04 (0.89 - 1.22)	-
p-value between groups	0.47	0.52	-	0.66	0.61	-
Nationality						
Swiss	0.30 \pm 0.02	-	0.30 \pm 0.02	1 (ref.)	1 (ref.)	1 (ref.)
French	0.34 \pm 0.05	-	0.33 \pm 0.05	0.96 (0.70 - 1.32)	-	0.98 (0.71 - 1.34)
Italian	0.45 \pm 0.06	-	0.45 \pm 0.06	1.41 (1.02 - 1.93)	-	1.36 (0.98 - 1.88)
Portuguese	0.13 \pm 0.06	-	0.12 \pm 0.06	0.65 (0.45 - 0.95)	-	0.60 (0.41 - 0.88)
Spanish	0.35 \pm 0.07	-	0.35 \pm 0.07	1.12 (0.75 - 1.66)	-	1.10 (0.74 - 1.65)
Other	0.32 \pm 0.03	-	0.31 \pm 0.03	1.07 (0.88 - 1.31)	-	1.01 (0.82 - 1.25)
p-value between groups	0.006	-	0.005	-	-	-
Receiving social help						
No	0.30 \pm 0.01	0.30 \pm 0.01	0.30 \pm 0.01	1 (ref.)	1 (ref.)	1 (ref.)
Yes	0.34 \pm 0.04	0.33 \pm 0.04	0.34 \pm 0.04	1.43 (1.16 - 1.77)	1.28 (1.03 - 1.58)	1.32 (1.07 - 1.64)
p-value between groups	0.32	0.49	0.40	0.001	0.03	0.02
Marital status						
Living alone	0.36 \pm 0.02	0.36 \pm 0.02	0.35 \pm 0.02	1 (ref.)	1 (ref.)	1 (ref.)
Living in couple	0.28 \pm 0.02	0.29 \pm 0.02	0.29 \pm 0.02	0.73 (0.62 - 0.86)	0.76 (0.65 - 0.90)	0.77 (0.66 - 0.91)
p-value between groups	0.007	<0.05	<0.05	<0.001	0.001	0.002
Educational level						
Primary	0.32 \pm 0.03	-	-	1 (ref.)	1 (ref.)	1 (ref.)
Apprenticeship	0.31 \pm 0.02	-	-	1.05 (0.84 - 1.30)	-	-
Secondary school	0.30 \pm 0.03	-	-	0.88 (0.70 - 1.11)	-	-
University	0.29 \pm 0.03	-	-	0.81 (0.63 - 1.03)	-	-
p-value between groups	0.95	-	-	0.02 ^d	-	-

Best price not worse than brand foods



Best price not worse than brand foods

Food categories	Energy (kcal/100 g or 100 mL)		Fat (g/100 g or 100 mL)	
	Median	IQR	Median	IQR
Pasta (warm dishes)				
BNF (n = 58)	230	[204–281]	6.0	[4.5–8]
BPF (n = 3)	212	[207–233]	4.5	[4–6]
P-value	0.473		0.283	
Fish products				
BNF (n = 147)	146	[95–181]	6.0	[2–10]
BPF (n = 6)	181	[180–191]	8.0	[7–9]
P-value	0.211		0.617	
Biscuits				
BNF (n = 204)	485	[435–519]	23.0	[15.5–29]
BPF (n = 15)	497	[457–515]	23.0	[18–27]
P-value	0.589		0.933	
Cakes and tarts				
BNF (n = 328)	381	[320–424]	16.0	[10–21]
BPF (n = 4)	411	[347–431]	16.5	[8–23]
P-value	0.563		0.988	
Creams and puddings				
BNF (n = 83)	157	[123–199]	6.0	[3.5–11.0]
BPF (n = 4)	113	[96–119]	1.3	[0.9–1.7]
P-value	0.012		0.001	

Children, Switzerland

Representative sample

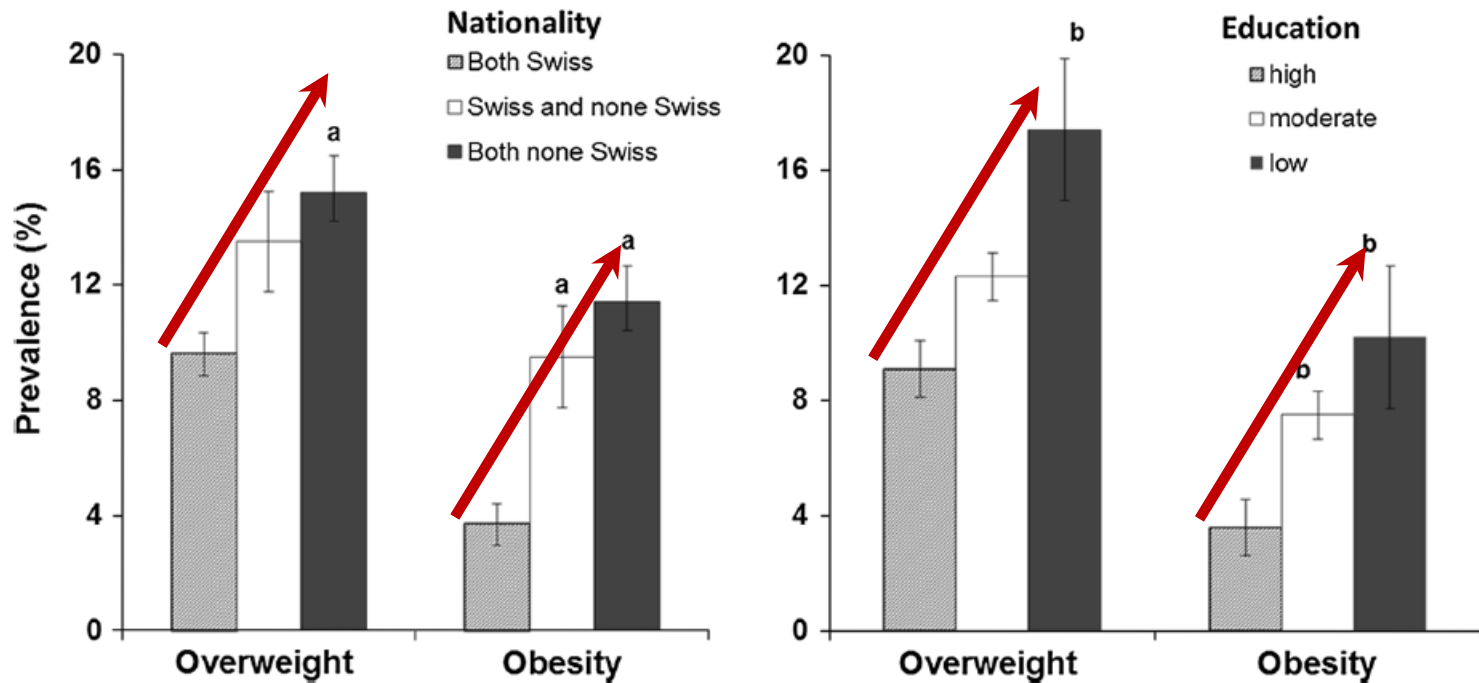
2724 children aged 6-12

Migration and educational level

- Overweight and obesity by CDC standards

Children, Switzerland

Migrant status and low education



Children, Switzerland

	Normal weight		Overweight		Obesity			
	%		%	OR (95 % CI)	<i>p</i>	%	OR (95 % CI)	<i>p</i>
<i>Parental nationality (n)</i>								
Both non-Swiss (317)	21.3		31.6	1.520 (0.958–2.413)	0.076	40.2	2.525 (1.444–4.415)	0.001
Swiss and non-Swiss (178)	12.0		15.8	1.534 (0.923–2.550)	0.099	24.7	3.519 (1.962–6.310)	<0.001
Both Swiss (834)	66.7		52.6	1.0		35.1	1.0	
<i>Parental education level (n)</i>								
Low (109)	7.3		11.5	0.903 (0.428–1.905)	0.788	12.2	1.019 (0.416–2.495)	0.968
Moderate (784)	57.3		59	1.059 (0.710–1.579)	0.778	67.3	1.529 (0.870–2.686)	0.140
High (453)	35.4		29.5	1.0		20.4	1.0	
<hr/>								
Girls	Normal weight		Overweight		Obesity			
	%		%	OR (95 % CI)	<i>p</i>	%	OR (95 % CI)	<i>p</i>
<i>Parental nationality (n)</i>								
Both non-Swiss (313)	21.4		31.6	1.494 (0.926–2.411)	0.100	45.8	3.457 (1.857–6.439)	<0.001
Swiss and non-Swiss (201)	14.9		17.8	1.431 (0.880–2.325)	0.148	16.7	1.693 (0.803–3.569)	0.167
Both Swiss (834)	63.7		50.7	1.0		37.5	1.0	
<i>Parental education level (n)</i>								
Low (127)	8.5		14.9	1.566 (0.783–3.131)	0.205	16.2	1.501 (0.565–3.988)	0.416
Moderate (767)	57.1		63.6	1.505 (0.979–2.313)	0.062	68.9	2.517 (1.233–5.139)	0.011
High (417)	34.4		21.4	1.0		14.9	1.0	

Migrant status more important than low education

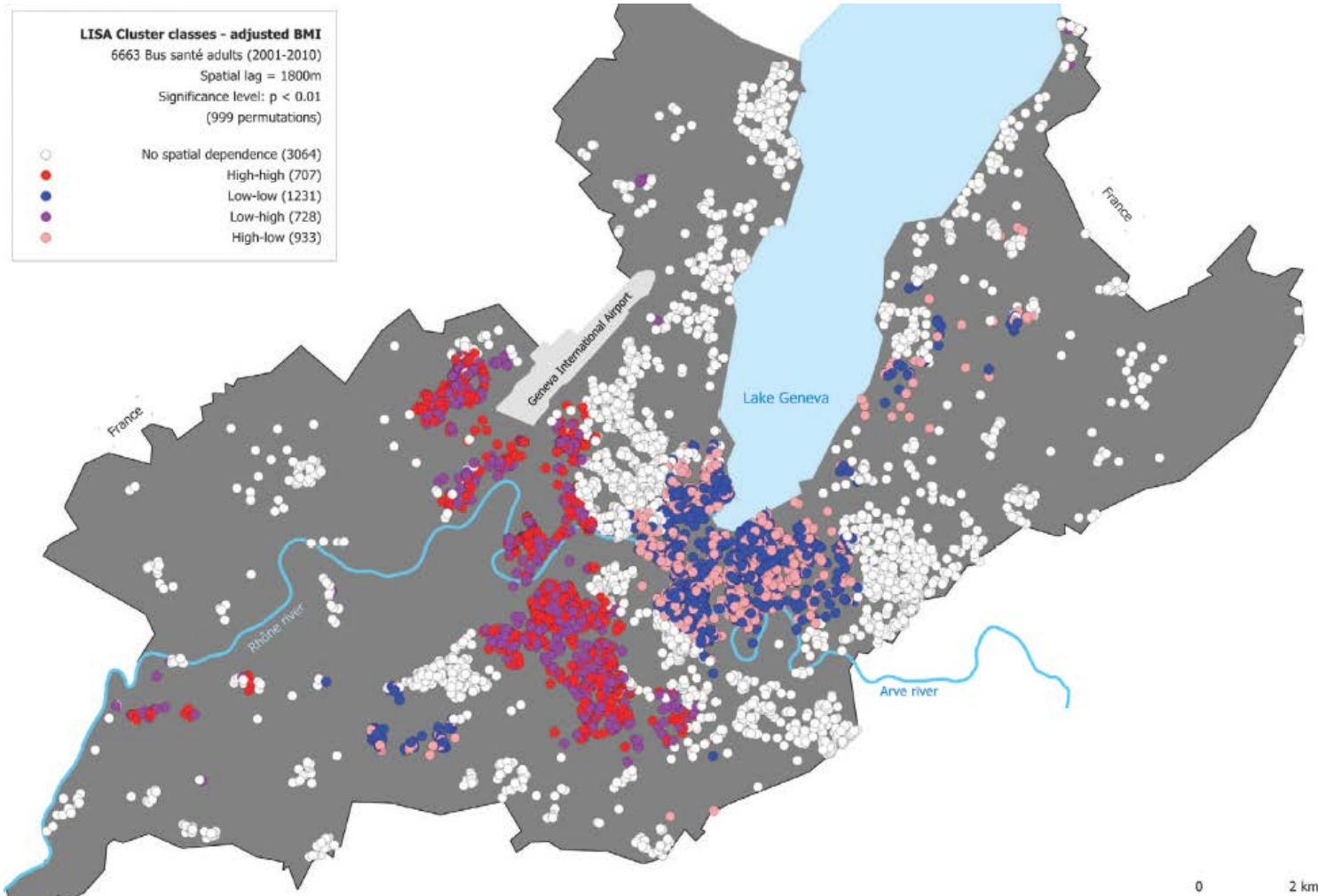
Spatial clustering

Analyses assessing the correlation of BMI or weight gain between an individual and other individuals living within a given distance.

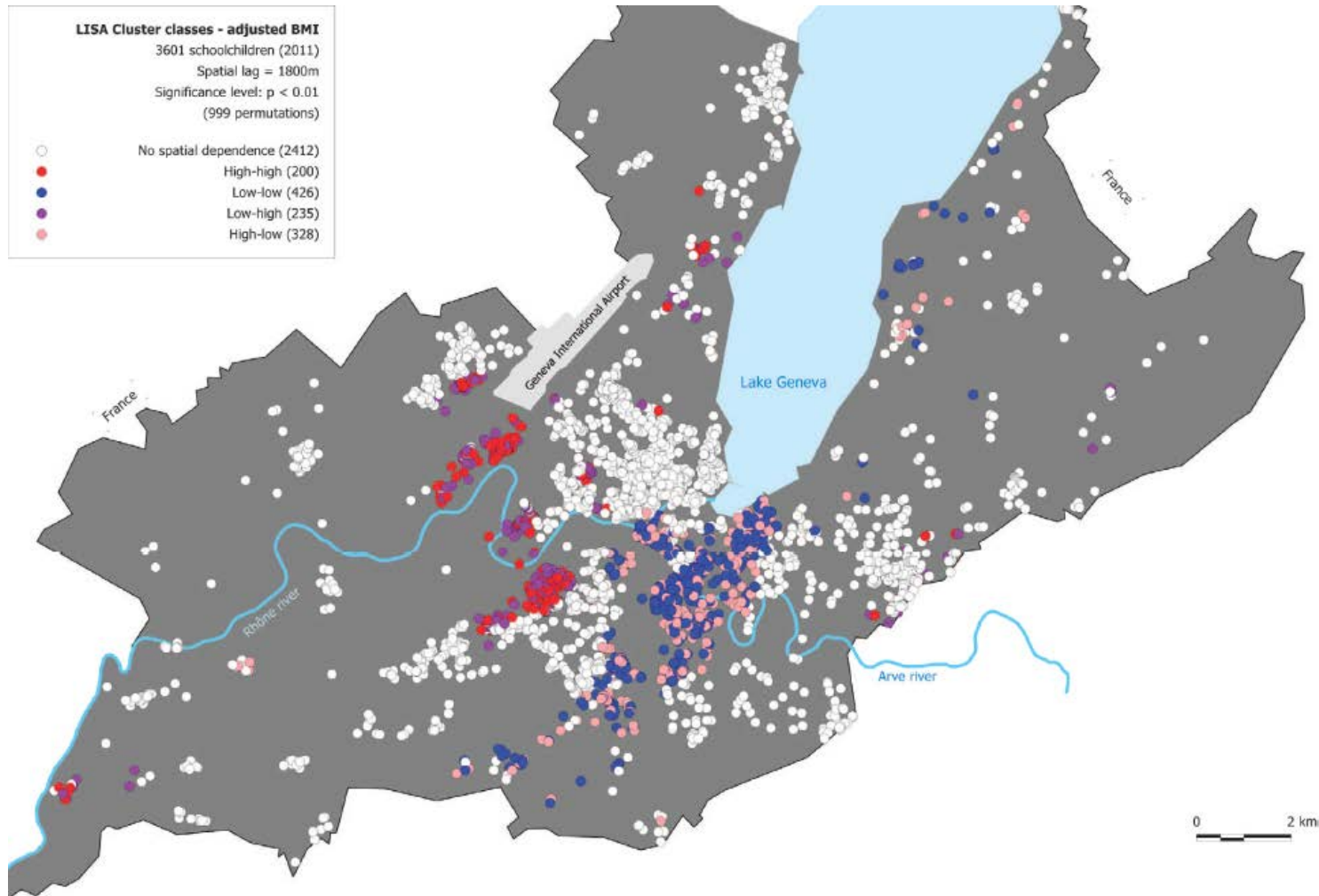
Adjustment for potential confounders, including other SES variables.

Bus Santé and CoLaus data analyzed.

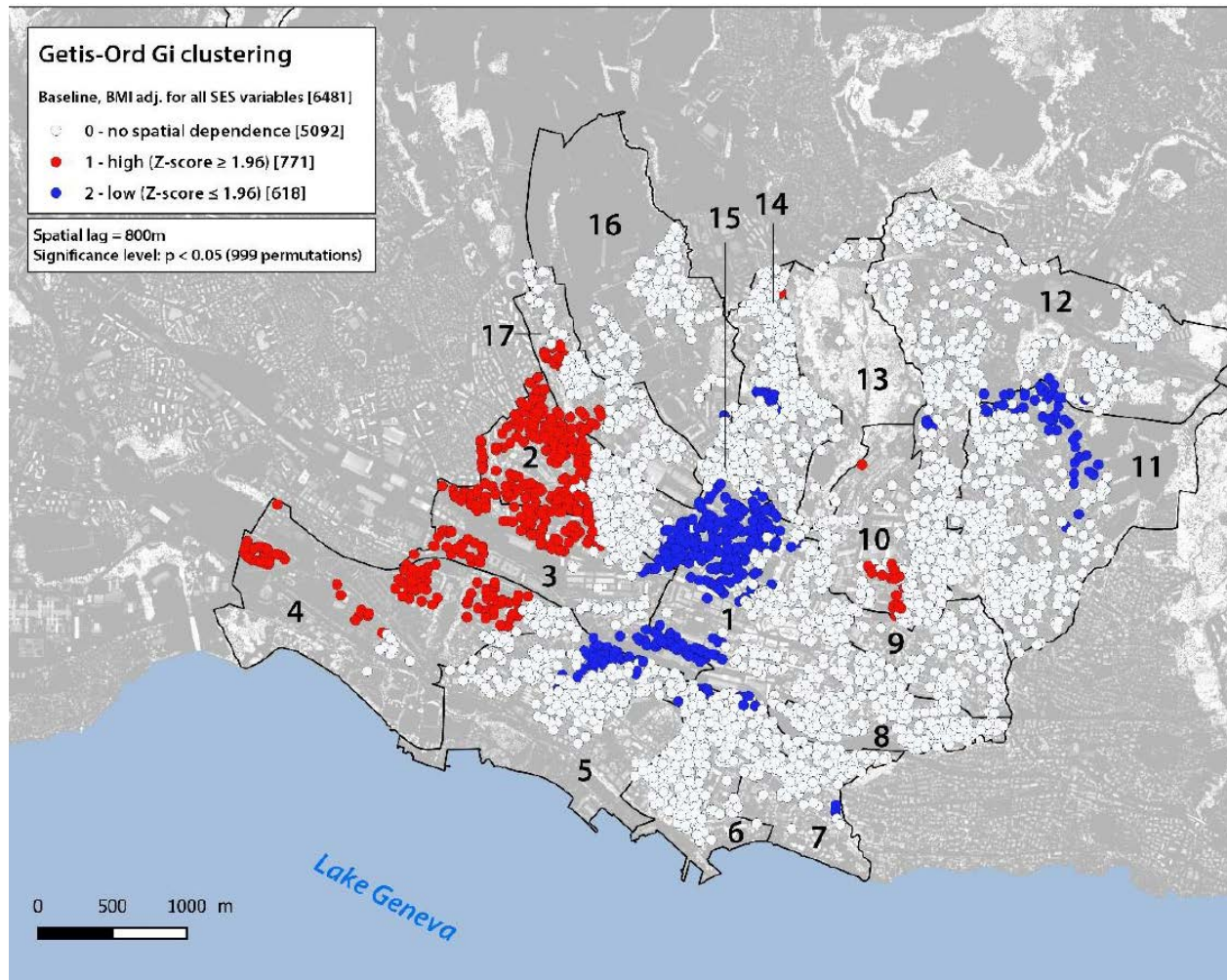
Geneva, adults



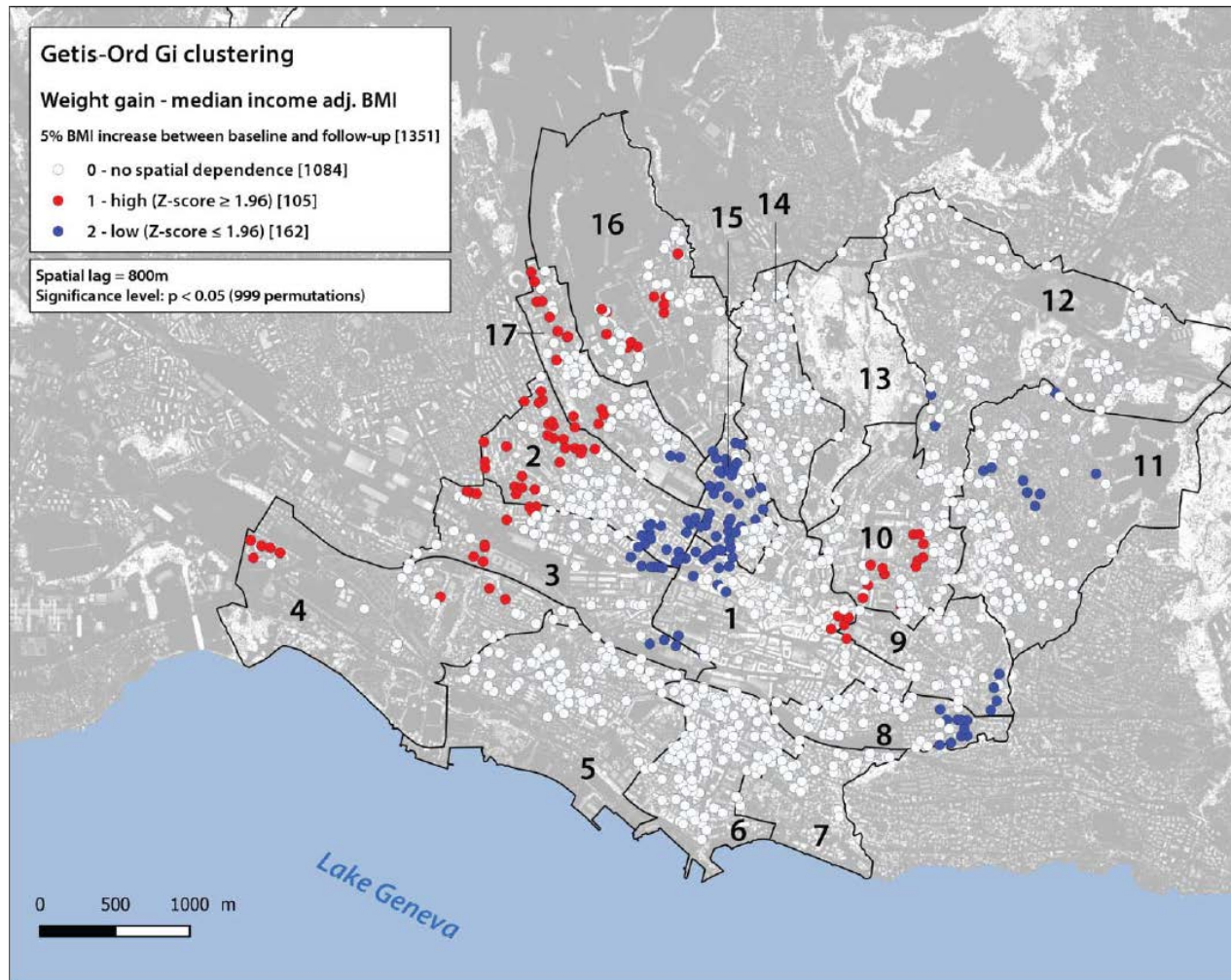
Geneva, children



Lausanne, income and SES-adjusted



Lausanne, weight gain



Conclusion

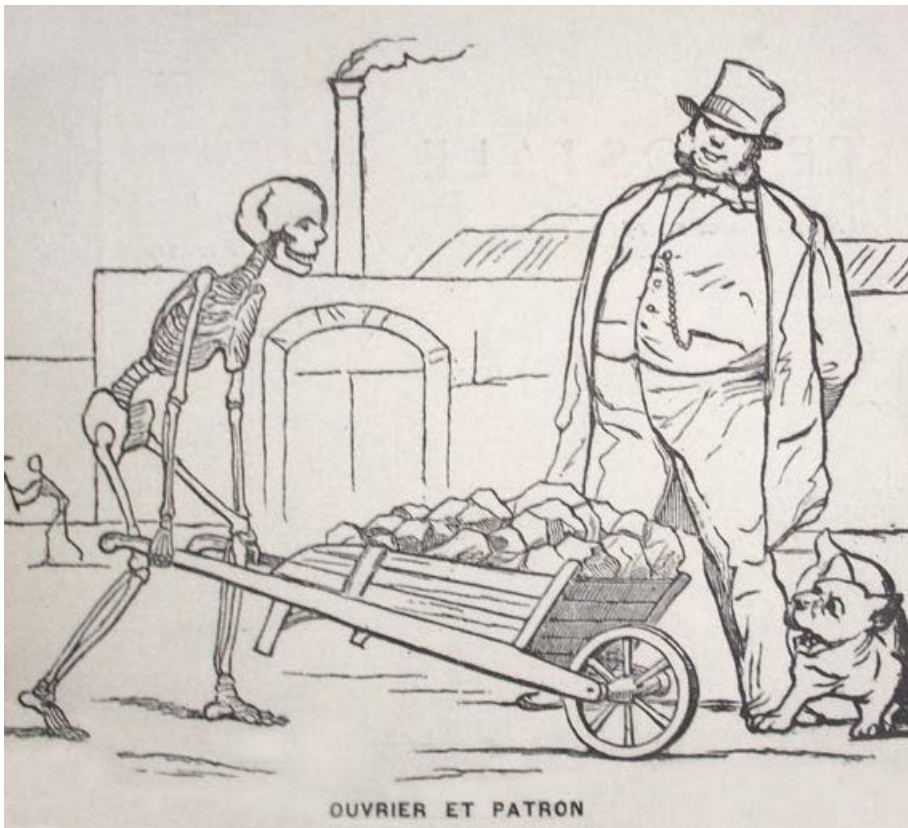
Low SES associates with higher BMI and a higher likelihood of weight gain.

The effect starts in childhood and continues further on.

The associations are far more complex than initially thought.

Evolution...

1903



2015



Thank you for your attention

Bus Santé

- Idris Guessous
- Jean-Michel Gaspoz
- Jean-Marc Theler

CoLaus

- Peter Vollenweider
- Gérard Waeber
- Silvia Stringhini
- Murielle Bochud

Filipa Guerra, Stéphane Joost
& Saman Khalatbari-Soltani