Trends in overweight and obesity levels in Geneva: time for optimism?

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Aim

To assess trends in overweight and obesity levels using objectively measured data.

Methods

Data collected between 2005 and 2011 by the Bus Santé study on representative samples of the Geneva population.

Conclusion

Overweight and obesity levels appear to have levelled in Geneva, with a possible decrease in overweight in men.

Still, the decrease in overweight appears to be partly compensated by an increase in obesity,

These favourable findings should be confirmed in other locations.

Results

Table 1: *Trends in anthropometric data, by study year*

	2005	2006	2007	2008	2009	2010	2011	p-value
Sample size	210	254	257	457	1023	1010	930	
BMI (Kg/m2)	24.90 ± 4.26	25.14 ± 3.84	24.97 ± 4.34	24.87 ± 4.08	24.97 ± 4.05	25.46 ± 4.48	25.38 ± 4.30	0.02
BMI groups (%)								
Normal	55.7	52.0	56.4	57.1	53.7	51.3	52.7	
Overweight	34.3	37.8	33.9	30.9	35.5	34.0	33.6	0.14
Obese	10.0	10.2	9.7	12.0	10.9	14.8	13.8	
Waist (cm)	88.0 ± 14.2	89.0 ± 13.4	87.1 ± 12.9	84.9 ± 13.0	88.6 ± 42.9	88.6 ± 19.7	88.0 ± 19.2	0.58
Abd obesity (%)	24.5	28.1	21.6	18.2	23.1	27.6	22.3	0.003
WHR	0.87 ± 0.10	0.80 ± 0.10	0.87 ± 0.09	0.86 ± 0.10	0.88 ± 0.28	0.88 ± 0.17	0.90 ± 0.18	0.005
High WHR (%)	47.1	48.6	43.5	42.1	43.8	49.3	59.4	<0.001

Results are expressed as percentage or as mean ± Standard deviation. BMI, body mass index; Abd obesit,y abdominal obesity; WHR; waist/hip ratio. Statistical analysis by chi-square or linear regression using calendar year as an independent variable.

Table 2: *Trends in anthropometric data, by study year, stratified by gender*

	2005	2006	2007	2008	2009	2010	2011	p-value
Men (N)								
BMI (Kg/m^2)	26.05 ± 3.87	26.13 ± 2.60	25.60 ± 3.91	25.84 ± 3.62	26.06 ± 3.65	26.14 ± 3.90	26.12 ± 3.67	0.39
BMI groups (%)								
Normal	40.2	38.2	45.4	45.8	40.8	43.7	42.9	
Overweight	48.5	49.6	46.9	41.0	46.0	40.2	42.4	0.37
Obese	11.3	12.2	7.7	13.2	13.2	16.1	14.7	
Waist (cm)	95.6 ± 13.1	95.3 ± 12.1	92.1 ± 11.2	91.2 ± 10.9	93.5 ± 11.7	94.8 ± 23.6	93.3 ± 10.6	0.83
Abd obesity (%)	25.5	26.7	16.4	15.6	20.7	23.0	19.2	0.09
WHR	0.94 ± 0.07	0.94 ± 0.07	0.92 ± 0.07	0.93 ± 0.09	0.93 ± 0.08	0.95 ± 0.21	0.95 ± 0.08	0.08
High WHR (%)	72.3	68.7	59.4	62.4	65.1	67.3	75.7	0.001
Women (N)								
BMI (Kg/m^2)	23.91 ± 4.35	24.09 ± 3.82	24.32 ± 4.66	23.92 ± 4.28	23.99 ± 4.14	24.80 ± 4.89	24.66 ± 4.71	0.008
BMI groups (%)								
Normal	69.0	66.7	67.7	68.3	65.2	58.7	62.1	
Overweight	22.1	25.2	20.5	20.9	26.0	27.9	25.1	0.15
Obese	8.9	8.1	11.8	10.9	8.7	13.5	12.8	
Waist (cm)	81.4 ± 11.7	82.3 ± 11.3	82.0 ± 12.6	78.5 ± 11.8	84.2 ± 57.8	82.6 ± 12.2	82.9 ± 23.6	0.44
Abd obesity (%)	23.6	29.5	26.8	20.9	25.3	32.1	25.3	0.05
WHR	0.80 ± 0.07	0.81 ± 0.07	0.81 ± 0.07	0.80 ± 0.07	0.82 ± 0.37	0.82 ± 0.08	0.85 ± 0.23	0.02
High WHR (%)	25.5	27.1	27.6	21.4	24.8	31.7	43.8	<0.001

Results are expressed as percentage or as mean ± Standard deviation. BMI, body mass index; Abd obesit,y abdominal obesity; WHR; waist/hip ratio. Statistical analysis by chi-square or linear regression using calendar year as an independent variable.

Table 3: *Trends in anthropometric data, by study year, stratified by education*

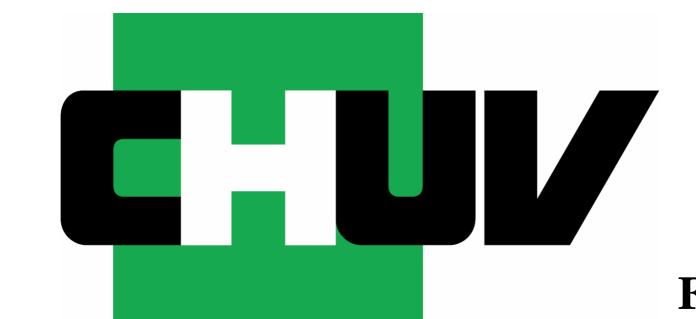|	2005	2006	2007	2008	2009	2010	2011	p-value
Non-university (N)								
BMI (Kg/m2)	25.63 ± 4.10	24.42 ± 4.02	25.74 ± 5.04	25.39 ± 4.30	25.47 ± 4.11	25.85 ± 4.53	25.89 ± 4.67	0.15
BMI groups (%)								
Normal	46.4	49.1	53.5	49.6	47.5	46.8	48.4	
Overweight	41.6	37.9	31.0	35.3	39.5	36.8	34.1	0.49
Obese	12.0	13.0	15.5	15.1	13.1	16.4	17.5	
Waist (cm)	90.8 ± 14.0	89.3 ± 13.7	88.7 ± 14.2	85.7 ± 13.1	91.4 ± 54.1	89.8 ± 23.3	89.5 ± 23.8	0.79
Abd obesity (%)	30.1	32.0	27.7	20.6	27.3	31.7	27.2	0.06
WHR	0.89 ± 0.10	0.88 ± 0.10	0.88 ± 0.10	0.87 ± 0.10	0.89 ± 0.35	0.89 ± 0.21	0.91 ± 0.23	0.16
High WHR (%)	58.5	50.3	48.2	45.9	51.2	55.0	61.0	0.001
University (N)								
BMI (Kg/m2)	23.81 ± 4.29	24.59 ± 3.40	24.01 ± 3.03	24.21 ± 3.68	24.23 ± 3.84	24.93 ± 4.37	24.78 ± 3.73	0.003
BMI groups (%)								
Normal	69.4	57.7	60.0	66.8	62.9	57.3	57.7	
Overweight	23.5	37.7	37.4	25.1	29.5	30.1	32.9	0.009
Obese	7.1	4.7	2.6	8.0	7.6	12.6	9.4	
Waist (cm)	83.7 ± 13.5	88.5 ± 12.8	85.2 ± 10.9	83.9 ± 12.8	84.3 ± 13.8	87.0 ± 13.1	86.3 ± 11.5	0.103
Abd obesity (%)	16.1	20.2	14.0	15.0	16.9	22.1	16.6	0.21
WHR	0.83 ± 0.09	0.87 ± 0.09	0.85 ± 0.08	0.85 ± 0.11	0.87 ± 0.09	0.87 ± 0.09	0.88 ± 0.09	<0.001
High WHR (%)	29.6	45.2	37.7	37.0	32.7	41.6	57.5	<0.001

Results are expressed as percentage or as mean ± Standard deviation. BMI, body mass index; Abd obesit,y abdominal obesity; WHR; waist/hip ratio. Statistical analysis by chi-square or linear regression using calendar year as an independent variable.

Table 4: *multivariate-adjusted anthropometric data, by study year*

	2005	2006	2007	2008	2009	2010	2011	P-value *
BMI (Kg/m^2)	24.93 ± 0.28	24.82 ± 0.37	24.95 ± 0.25	24.89 ± 0.19	24.96 ± 0.13	25.37 ± 0.13	25.37 ± 0.13	0.005
BMI groups								
Overweight	1 (ref.)	0.94 (0.56 - 1.59)	0.94 (0.62 - 1.42)	0.86 (0.59 - 1.25)	1.06 (0.75 - 1.48)	1.04 (0.74 - 1.46)	1.02 (0.73 - 1.44)	0.39
Obese	1 (ref.)	0.86 (0.38 - 1.96)	0.95 (0.50 - 1.81)	1.19 (0.68 - 2.08)	1.12 (0.67 - 1.88)	1.56 (0.94 - 2.61)	1.48 (0.88 - 2.48)	0.003
Waist (cm)	88.1 ± 1.8	87.1 ± 2.3	86.9 ± 1.6	84.7 ± 1.3	88.6 ± 0.8	88.2 ± 0.8	88.0 ± 0.8	0.33
Abd. obesity	1 (ref.)	1.07 (0.63 - 1.81)	0.84 (0.53 - 1.33)	0.68 (0.45 - 1.05)	0.92 (0.64 - 1.33)	1.15 (0.80 - 1.65)	0.90 (0.62 - 1.31)	0.43
WHR	0.87 ± 0.01	0.87 ± 0.02	0.86 ± 0.01	0.86 ± 0.01	0.88 ± 0.01	0.88 ± 0.01	0.90 ± 0.01	<0.005
High WHR	1 (ref.)	0.82 (0.48 - 1.40)	0.76 (0.50 - 1.18)	0.71 (0.48 - 1.05)	0.80 (0.56 - 1.14)	1.00 (0.71 - 1.43)	1.86 (1.30 - 2.67)	<0.001

Results are expressed as relative risk ratio (95% confidence interval) or as multivariate-adjusted mean ± standard error. Statistical analysis by multinomial logistic regression or multivariate analysis of variance. Adjusting for age, gender, education (2 groups), smoking (3 groups), nationality (Swiss and non-Swiss).

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