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#### Factors Influencing Adolescent BMI in Urban China

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Selected Poster prepared for presentation at the Agricultural & Applied Economics Association's 2014 AAEA Annual Meeting, Minneapolis, MN, July 27-29, 2014.





- Body Mass Index(BMI) proxy for human body fat based on height and weight labels underweight, normal(healthy), overweight, and obese
- Chinese AdultEUnderweight>Normal(healthy)1Overweight2Obese>

BMI >18.5 18.5-23.9 24-27.9 ≥28

$$BMI = \frac{weight(kg)}{height^2(m^2)}$$

Source: Ministry of Health of the People's republic of China



#### Adolescents BMI

#### Adolescent BMI From data

Source	Underweight	Normal(Healthy)	Overweight	Obese
CDC	6.15%	75.38%	9.23%	9.23%
Ma et al. 2010	1.54%	70.77%	20.00%	7.69%
Ji 2005	1.54%	76.92%	13.85%	7.69%

•CDC growth chart (U.S. based)

•Ma et al. 2010 develops growth chart for Chinese children compares with CDC and WHO

• Ji (2005) Working Group on Obesity in China suggested as national reference for adolescents

#### SURVEY AND DATA



\*Edible oils in food preparation not included















 A general linear model tested the impact each variable has on an adolescent's BMI throughout a week in urban Nanjing, China

(1)  $BMI_i = \propto$ +  $\beta_1 fafhcalories_i + \beta_2 fahcalories_i + \beta_3 traf f_{mother_i} + \beta_4 educ_{mother_i} + \beta_5 gender_i + \beta_6 insur_i + \beta_7 incins_i + \beta_8 exam_i + \beta_9 west fast_i + \beta_{10} hhinc_i + \mu$ 

#### DESCRIPTION OF VARIABLES

Variable	Description
BMI	The body mass index recorded at beginning of week
fafhcalories	Total calories consumed away from home
fahcalories	Total calories consumed at home
traff_mother	Minutes spent in a one way commute to work
edu_mother	Ranges (1) primary to (6) advanced
gender	Male(1) Female (0)
insur	Indicates health insurance yes (1) no (0)
incins	Interaction term between hhinc and insur
exam	Number of health examinations over the last two
westfast	Visits to Western fast food outlets in a month
hhinc	Household income per month in thousands of RMB

## SUMMARY STATISTICS

Variable	Mean	Std. Dev	Min	Max	Observations
BMI	20.48	3.40	15.62	31.31	4424
fafhcalories	7.46	30.77	0	486.57	3705
fahcalories	20.42	71.44	0	1322.10	3705
traff_wife	16.73	19.56	0	80	4424
edu_wife	4.12	0.96	2	6	4424
gender	0.57	0.49	0	1	4424
insur	0.71	0.45	0	1	4424
incins	4.19	3.81	0	18.5	4424
exam	1.17	1.02	0	4	4345
westfast	1.08	1.23	0	5	4424
hhinc*	5.67	3.24	1.66	18.5	4424

\* in thousands of RMB

### ESTIMATION RESULTS

	BMI	Coeffcient	Std. Err	t	P >  t	
Number of observations 3639	fafhcalories	.0044643	.0017461	2.56	0.011	
	fahcalories	.0007211	.0007509	0.96	0.337	
Adjusted R-squared 0.1652	traff_wife	.0151225	.002753	5.49	0.000	
	edu_wife	6927600	.057651	-12.02	0.000	
	gender	.9828323	.1088411	9.03	0.000	
	insur	8801387	.2272158	-3.87	0.000	
	incins	.4491590	.0358334	12.53	0.000	
	exam	1351897	.0540902	-2.50	0.012	
	westfast	.1062765	.0449808	2.36	0.018	
	hhinc	0347812	.0305435	-1.14	0.255	
	Intercept	22.334	0.279695	79.85	0.000	

#### RESULTS

#### Nutritional Factors

- Data was converted for each kind of food consumed based on the China Food Composition Book from Institute of Nutrition and Food Safety China CDC, Beijing 2009
- FAFH calories was found to have a positive effect on the BMI of adolescents
- FAH calories was not found to be a significant factor in influencing BMI
- FAFH tends to contain higher calories per meal versus food consumed at home (Lin *et al.*, 1999)

#### RESULTS



#### Socioeconomic factors

- Increase BMI
  - Traffic time to work-Mother's will have less time to prepare a nutritional breakfast
  - Western fast food- tends to contain highly processed food that is high in fat



- Decrease BMI
  - Insurance-Households who buy insurance for adolescents are more health conscious and live healthier lives
  - Mothers education level important variable past studies mother's education appeared to have strong positive effects on health and nutrition (Behrman and Wolfe, 1987)

#### RESULTS

- In areas experiencing a nutritional transition, it was found that adolescents were reportedly more likely to be influenced by and obtain nutrition information from family members rather than friends or others (Doyle and Feldman, 1997)
- An increase in nutritional information for adolescents and mothers would be an effective way to assuring the BMI would be in a healthy range
- More nutritional education would be beneficial

#### CONCLUSION

- Eating is a central part of the Chinese culture
- The results offer insight on what factors may be attributed to the recent transition and concern over BMI in contemporary urban China
- Future studies should focus more on exactly what foods adolescents are consuming to find out more about this important demographic



