

Online Supplementary Material

Accumulated exposure to rural areas of residence over the life course is associated with overweight and obesity in adults

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APPENDIX S1

CDAH cohort description

Of the 8,498 children who participated in the Australian Schools Health and Fitness Survey, a total of 6,840 participants were traced of which 5,170 agreed to participate in the CDAH study. The first follow up (CDAH-1) occurred during 2004-2006, when the participants were aged 26-36 years. Of the 3,999 participants who participated in CDAH-1 during this time, 1,589 participants completed questionnaires only, whilst a further 2,410 participants also attended one of 34 study clinics for physical measurements that were held in major cities and regional centres around Australia. The second follow-up (CDAH-2) took place during 2009-2011, when the participants were aged 31-41 years. At CDAH-2 participants either completed a written postal (n=1,786) or phone (n=1,263) questionnaire. The current analyses include participants who had data on BMI and covariates at CDAH-2, baseline BMI, and information on area of residence at baseline, CDAH-1 and CDAH-2 (n=1,775).

Table S1: Model Specification for Given Life Course Models

Life course model type	Life course model specification
Saturated model	$\alpha + b_1S_1 + b_2S_2 + b_3S_3 + \theta_{12}S_1S_2 + \theta_{13}S_1S_3 + \theta_{23}S_2S_3 + \theta_{123}S_1S_2S_3$
No effect	α
Sensitive period model	$\alpha + b_1S_1 + b_2S_2 + b_3S_3$
Accumulation model	$\alpha + \beta_1(S_1 + S_2 + S_3)$
Geographic mobility model	Saturated model with constraints ($b_2=b_1+b_3$) ($\theta_{12}= \theta_{23}=-b_2$) ($\theta_{13}= \theta_{123}=0$)

Table S2: Characteristics of the Sample in 2009-11 (CDAH-2) by Urban-Rural Area of Residence Trajectories, Childhood Determinants of Adult Health Study, Australia

Socio-demographic characteristics	Area of residence trajectories across three time periods ^a							
	0,0,0	0,0,1	0,1,0	0,1,1	1,0,0	1,0,1	1,1,0	1,1,1
Age (years), M (SD)	37.7 (2.1)	37.4 (2.0)	37.6 (2.1)	37.4 (2.0)	37.5 (2.1)	37.6 (2.2)	37.4 (1.9)	37.6 (2.1)
<i>P Value</i>				0.491				
Sex, % (n)								
Male	46.5 (403)	58.8 (20)	41.1 (23)	38.1 (45)	42.3 (123)	41.5 (17)	60.5 (26)	41.4 (135)
Female	53.5 (463)	41.2 (14)	58.9 (33)	61.9 (73)	57.7 (168)	58.5 (24)	39.5 (17)	58.6 (191)
<i>P Value</i>				0.075				
Highest level of education, % (n)								
University	45.2 (391)	44.1 (15)	33.9 (19)	29.7 (35)	52.2 (152)	46.3 (19)	34.9 (15)	28.8 (94)
Dip/voc/year12	33.0 (286)	38.2 (13)	35.7 (20)	46.6 (55)	27.2 (79)	29.3 (12)	34.9 (15)	35.6 (116)
<Year 12	21.8 (189)	17.7 (6)	30.4 (17)	23.7 (28)	20.6 (60)	24.4 (10)	30.2 (13)	35.6 (116)
<i>P Value</i>				<0.001				
Marital status, % (n)								
Single	14.8 (128)	11.8 (4)	3.6 (2)	10.2 (12)	12.4 (36)	9.8 (4)	23.3 (10)	7.8 (25)
Married/living as married	80.1 (694)	79.4 (27)	89.3 (50)	83.9 (99)	82.1 (239)	80.5 (33)	74.4 (32)	87.4 (285)
Separated/divorced	5.1 (44)	8.8 (3)	7.1 (4)	5.9 (7)	5.5 (16)	9.8 (4)	2.3 (1)	4.9 (16)
<i>P Value</i>				0.046				
Number of children, % (n)								
None	26.8 (232)	23.5 (8)	8.9 (5)	17.8 (21)	26.8 (78)	17.1 (7)	25.6 (11)	13.2 (43)
One	14.5 (126)	17.6 (6)	17.9 (10)	17.8 (21)	16.8 (49)	14.6 (6)	16.3 (7)	11.3 (37)
Two	37.8 (327)	52.9 (18)	39.3 (22)	39.0 (46)	36.4 (106)	51.2 (21)	37.2 (16)	41.4 (135)
≥Three	20.9 (181)	5.9 (2)	33.9 (19)	25.4 (30)	19.9 (58)	17.1 (7)	20.9 (9)	34.1 (111)
<i>P Value</i>				<0.001				

M: mean; SD: standard deviation; DIP: diploma; VOC: vocational education

^aUrban area of residence denoted by 0 and rural area of residence denoted by 1

All bolded values are statistically significant at the 0.05 level

Table S3: Beta Coefficients (95% CI) for BMI at CDAH-2 and Relative Risks (95% CI) for Weight Status at CDAH-2 for the Best Fitting Life Course Models^a, After Inverse Probability Weighting was Applied, Childhood Determinants of Adult Health Study, Australia (1985 – 2009/2011)

Selected life course model	BMI (n=1775) (kg/m ²) β (95%CI)	Weight Status (n=1775) ^b	
		Overweight RR (95% CI)	Obese RR (95% CI)
Sensitive period model			
Baseline 1985 (age 9-15 years)			
Urban	Reference	Reference	Reference
Rural	0.39 (-0.16, 0.96)	0.91 (0.79, 1.04)	1.13 (0.92, 1.39)
CDAH-1 2004-6 (age 26-36 years)			
Urban	Reference	Reference	Reference
Rural	0.95 (0.05, 1.84)	0.98 (0.80, 1.17)	1.31 (1.03, 1.64)
CDAH-2 2009-11 (age 31-41 years)			
Urban	Reference	Reference	Reference
Rural	-0.26 (-1.13, 0.61)	1.04 (0.85, 1.26)	1.10 (0.83, 1.46)
Accumulation model			
No. times rural ^c	0.36 (0.14, 0.59)	1.05 (0.94, 1.18)	1.16 (1.03, 1.32)

CI: confidence interval; BMI: body mass index; RR: relative risk; CDAH: childhood determinants of adult health
All bolded values are statistically significant at the 0.05 level
^a Adjusted for baseline BMI and the following CDAH-2 covariates: sex, age, number of children, own highest level of education and area-level disadvantage
^b Normal weight is the reference group
^c Reference group is those who stayed urban at each time point