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Economics of
Social and Health Care
Research Unit

University of
Kent



THE LONDON SCHOOL
OF ECONOMICS AND
POLITICAL SCIENCE ■

PSSRU

Personal Social Services Research Unit

Body Mass, Physical Activity and Future Care Needs

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September 1, 2014

- Obesity in the UK is on the rise: quarter of the population obese by 2013
- P(Obese) highest at 45-64, P(Overweight | Obese) highest at 65-74

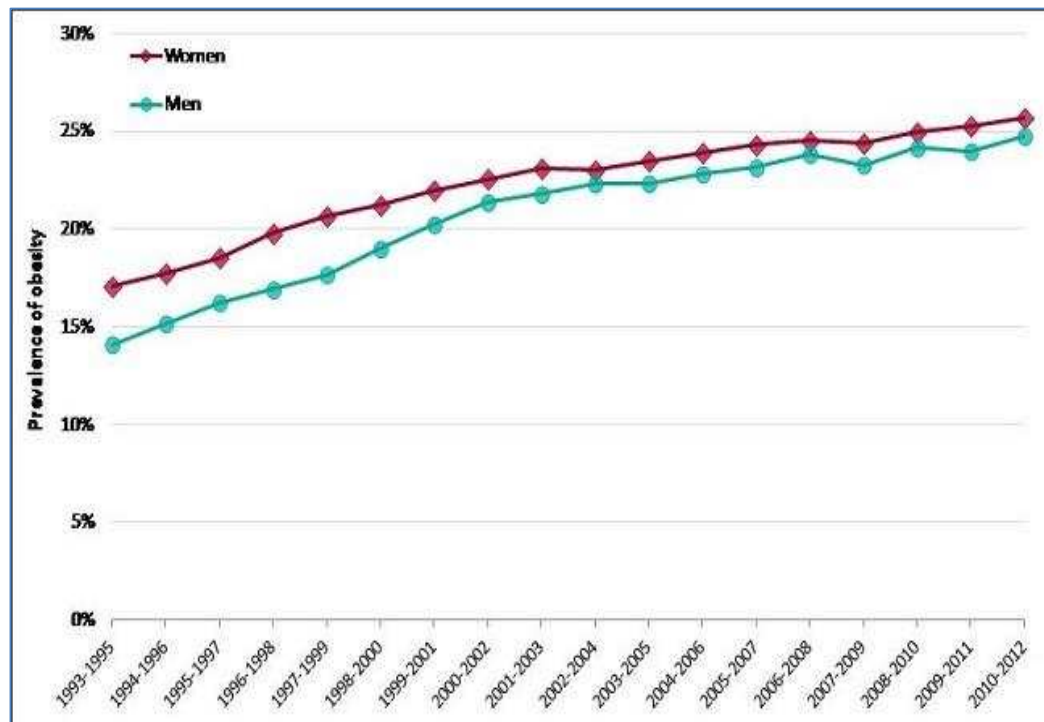


Figure 1: Prevalence of Obesity Among Adults 16+
Source: Health Survey for England 1993-2012 (3-year average)

Obesity – health bomb

- Obesity contributes to the development of long-term conditions:
 - mental health problems
 - liver disease
 - type 2 diabetes
 - cardiovascular disease
 - muscular skeletal disease
- The resulting NHS costs attributable to overweight and obesity are projected to reach £10 billion by 2050, with wider costs to society estimated to reach £50 billion per year (Foresight 2007)

Obesity – care bomb?

- Long-term health conditions
- Severe obesity may lead to severe physical difficulties inhibiting ADLs:
 - Housing adaptations
 - Specialist care for house bound people
 - Provision of appropriate transport and facilities
- SES-obesity gradient, ethnic differences in obesity – increasing inequality in health and social care

Research Question

- What is the impact of obesity on the use of various modes of care in the future, in addition to its impact through long-term health conditions?
- Does physical activity play a role in the future care use?

BMI and long term care: literature

- Few studies take BMI explicitly into account as a determinant of care needs
- All evidence comes from US studies only
- Mixed evidence
 - Both obese and under-weight adults are at greater relative risk of nursing home admissions (Zizza et al. 2002)
 - Midlife obesity predicted nursing home admission in later life compared with normal BMI (Elkins et al. 2006)
 - No evidence on effect of BMI on informal care (Resnik et al. 2005)
- Cox proportional hazard models, logit

Data

- English Longitudinal Study of Ageing 2002-2011
- 65+ sample: overall (N=8100) and those not using care initially (N=5721), men vs. women
- BMI from Nurse data (wave 0, wave 2, wave 4)
- Care status data (wave 3, wave 5)

Methodology

- Multinomial Logit for various care needs controlling for non-response and death:
 - Comparison of the impact on 2-year transitions to the longer run impact of variables of interest at the baseline
 - Exploring the importance of obesity in determining future care use after controlling for available related health conditions and limitations (ADLs, iADLs, HBP, diabetes, cancer, lung disease, heart disease, stroke, psychic problems, arthritis)
 - Exploration of the role of the physical activity
- Outcomes: future care needs (informal care, privately purchased care, social care, nursing/care home)
- Controls: demographic and socio-economic characteristics

Nonparametric evidence – 1

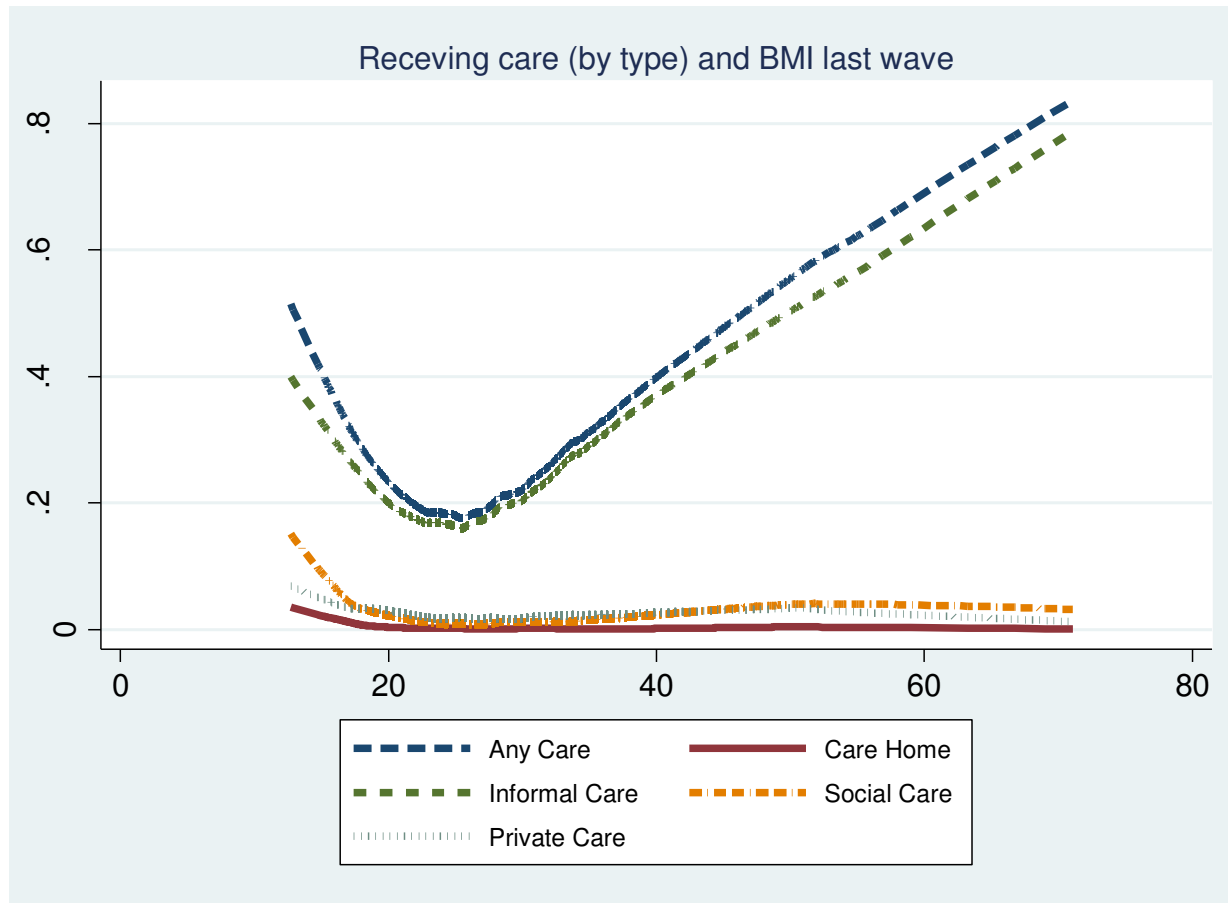


Figure 1 : BMI and Care Needs in 2 years.

Nonparametric evidence – 2

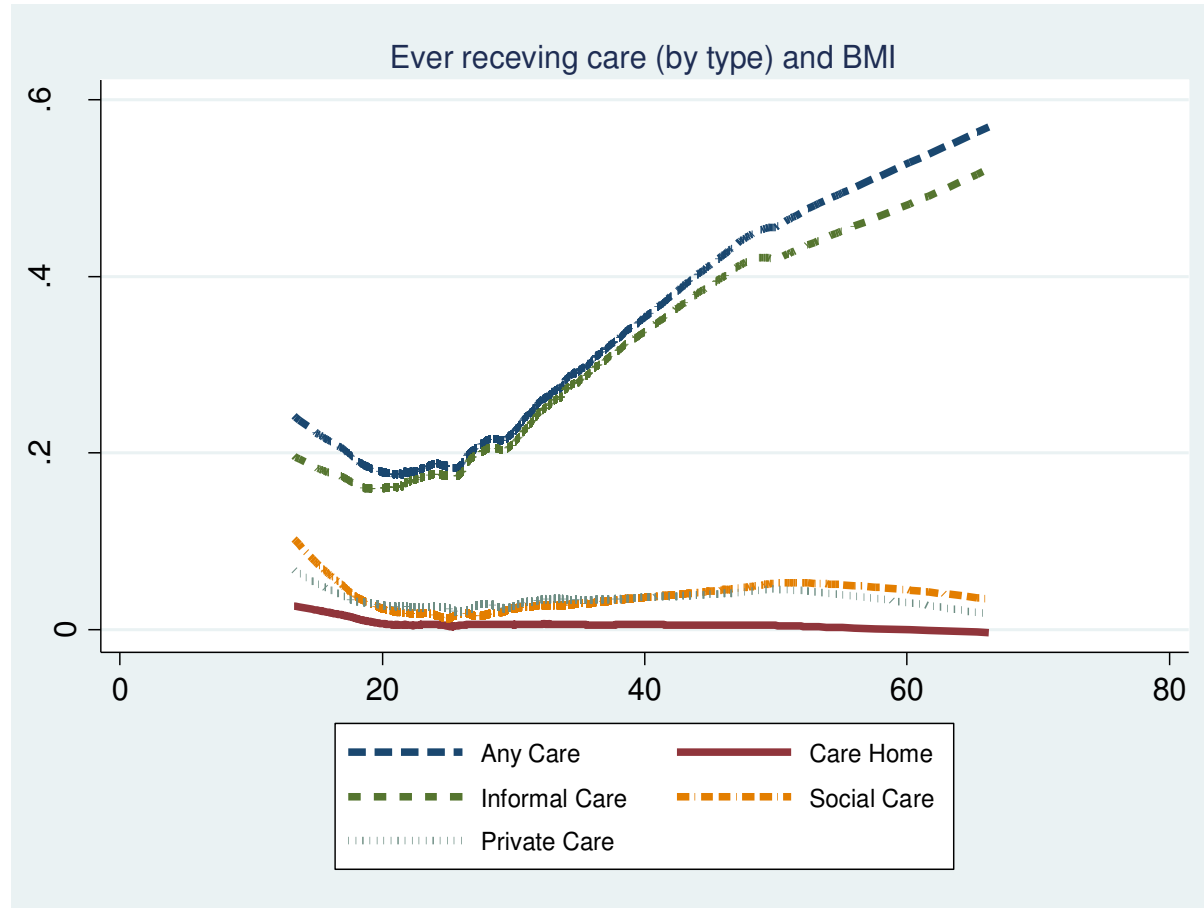


Figure 2 : BMI at Baseline and Care Needs Ever.

Sample Description – 1

	Whole
	sample
No of observations	8100
In care home	0.01
Any mode of care	0.27
Informal care	0.24
Formal care	0.03
Privately paid care	0.04

Sample Description – 2

	Whole
	sample
Underweight	0.01
Overweight	0.43
Obese	0.28
Female	0.55
No Educ Qualif	0.42
Non-white	0.02

Sample Description – 3

	Whole
	sample
R Age	74.10
Married	0.54
Number of Children	2.22
Living Alone	0.26
R Working	0.04
Home owned	0.75

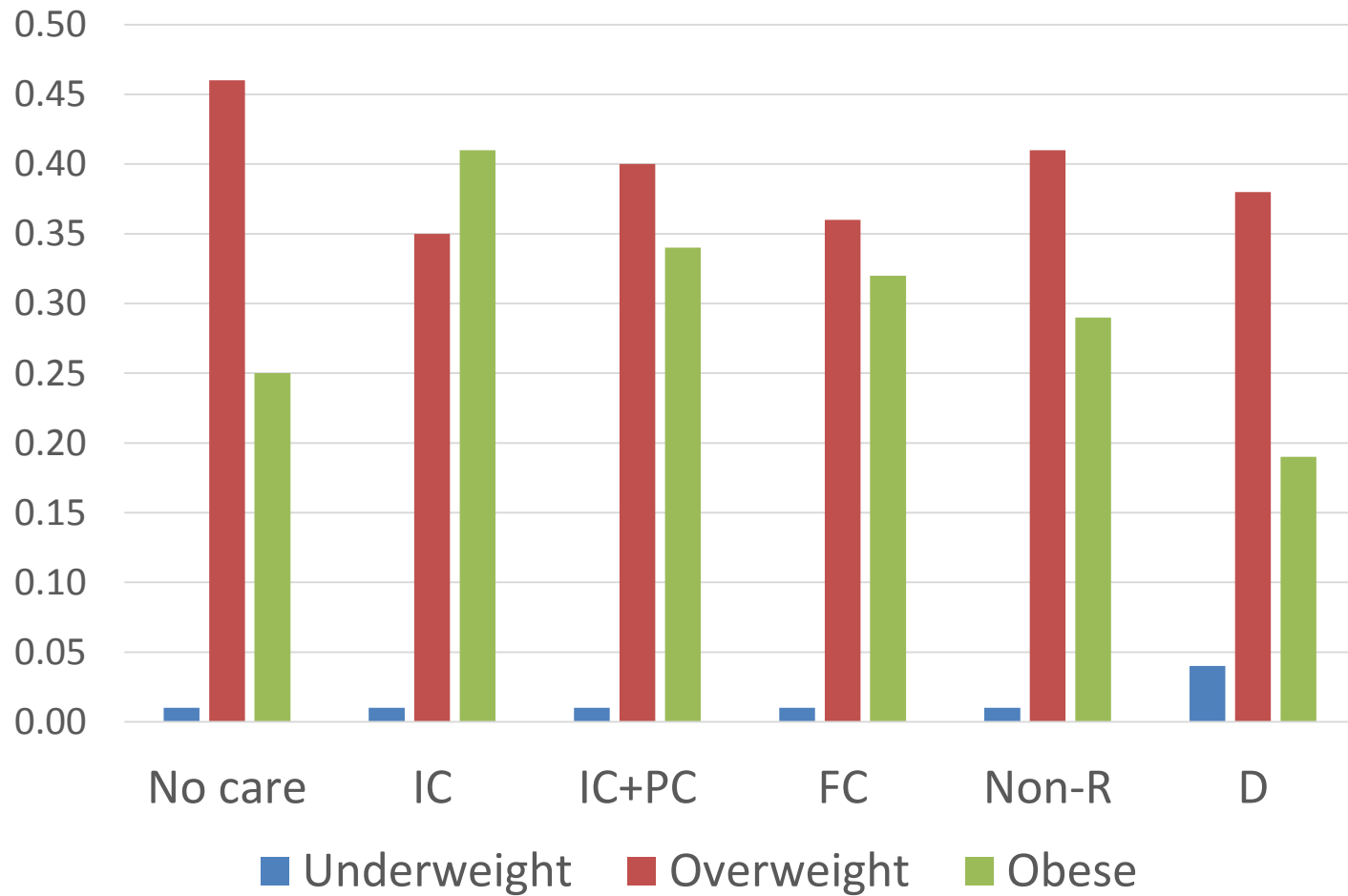


Figure 3: Weight Status by Care Use.

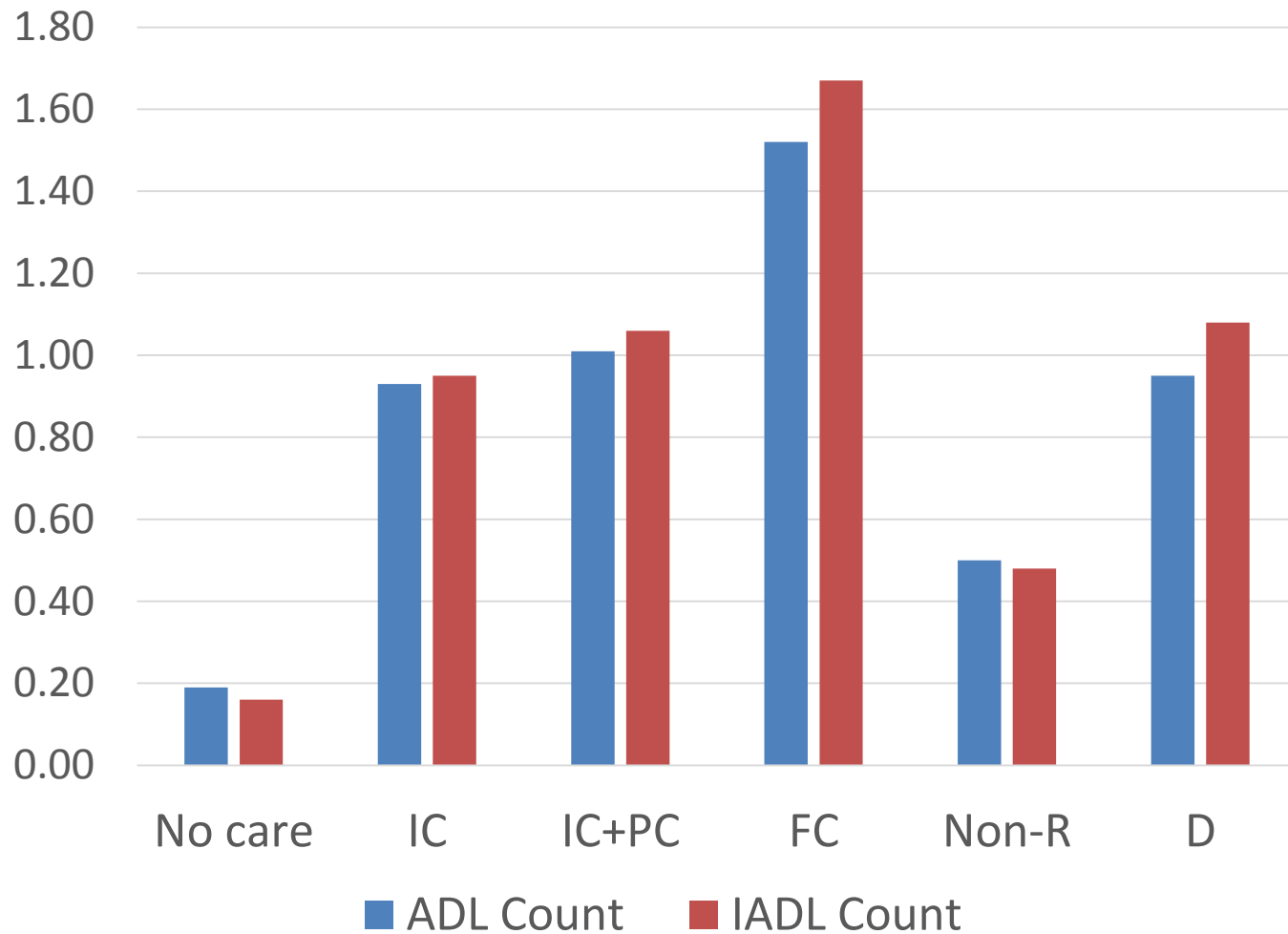


Figure 4: Functional Limitations Count by Care Use.

Results – 1

MLOGIT: RRR	W/o controls	
Underweight	1.55	
	(0.42)	
Overweight	0.92	
	(0.07)	
Obese	1.79**	
	(0.14)	

Results – 2

MLOGIT: RRR	W/o controls	+(i)ADLs
Underweight	1.55	1.19
	(0.42)	(0.39)
Overweight	0.92	1.05
	(0.07)	(0.08)
Obese	1.79**	1.68**
	(0.14)	(0.15)

Results – 3

Extended Care Status

MLOGIT: RRR	IC	IC+PC	FC
Underweight	1.25	1.11	1.02
	(0.44)	(0.75)	(0.69)
Overweight	1.02	1.39+	1.02
	(0.09)	(0.26)	(0.19)
Obese	1.68**	1.87**	1.42+
	(0.16)	(0.37)	(0.29)

Results – 4

With no care at baseline

MLOGIT: RRR	IC	IC+PC	FC
Underweight	1.67	1.23	1.34
	(0.71)	(1.40)	(1.48)
Overweight	0.89	1.86*	0.95
	(0.11)	(0.54)	(0.35)
Obese	1.68**	2.24*	1.37
	(0.22)	(0.72)	(0.56)

Results – 5 + Health conds

MLOGIT: RRR	IC	IC+PC	FC
Underweight	1.30	1.16	1.04
	(0.46)	(0.81)	(0.70)
Overweight	0.99	1.29	1.00
	(0.09)	(0.24)	(0.19)
Obese	1.53**	1.55*	1.30
	(0.15)	(0.32)	(0.28)

Results – 6

+ Health conds + PA + HBeh

MLOGIT: RRR	IC	IC+PC	FC
Underweight	1.24	1.32	0.80
	(0.49)	(0.97)	(0.62)
Overweight	0.97	1.41+	0.97
	(0.09)	(0.29)	(0.21)
Obese	1.54**	1.64*	1.08
	(0.16)	(0.37)	(0.26)
Physical activity	0.63**	0.56**	0.34**
	(0.07)	(0.11)	(0.07)

Results – 7

+ Health conds + PA + Pre-diabetes

MLOGIT: RRR, Any care	(1)	(2)	(3)
Obese	1.52**	1.89**	1.91**
	(0.15)	(0.43)	(0.43)
Physical activity	0.58**	0.33**	0.33**
	(0.06)	(0.11)	(0.11)
Prediabetes			0.84
			(0.34)
N obs	5142	2492	2492

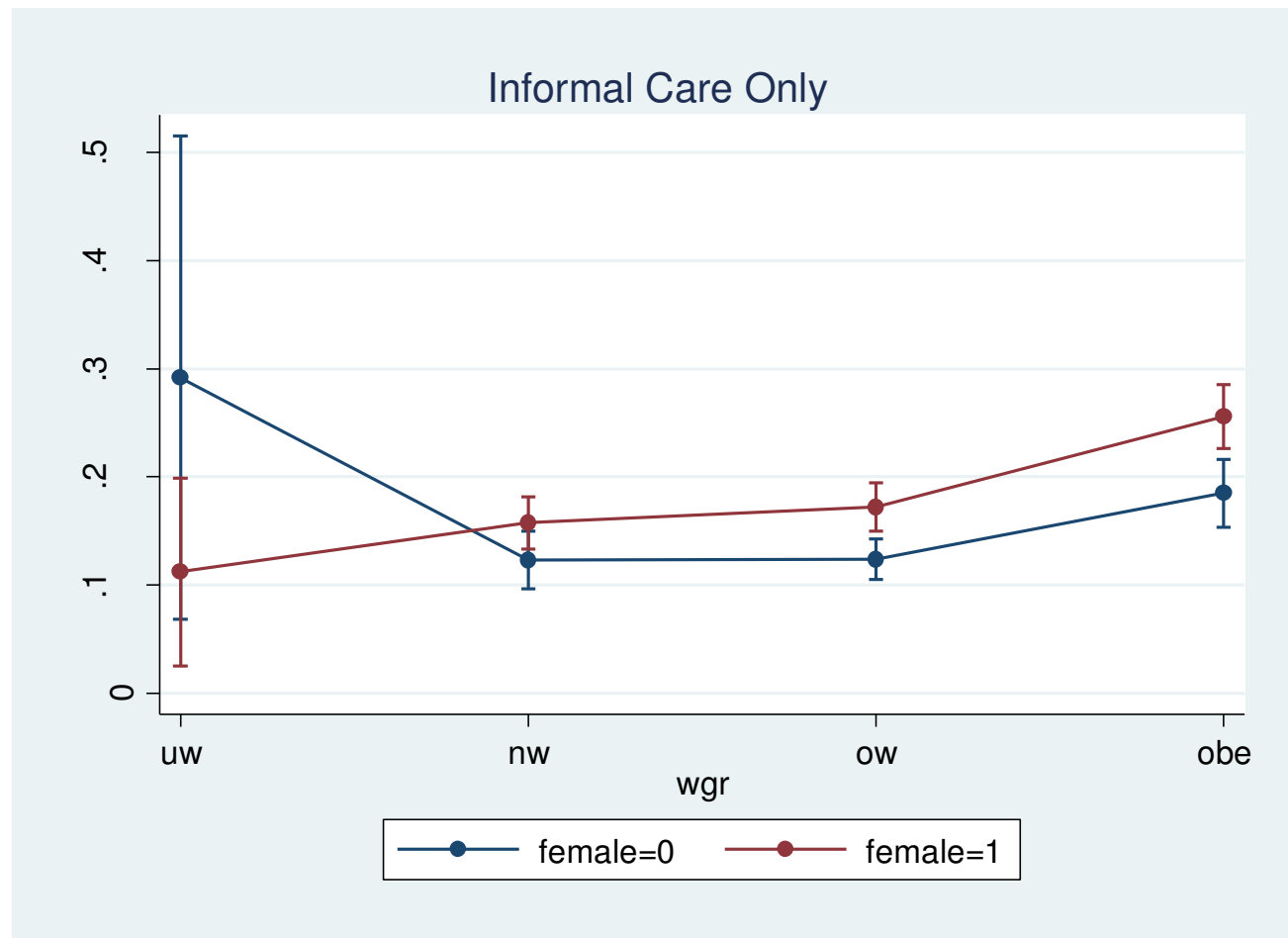
Results – 8

+ Health conds + PA + Abdominal Obesity

MLOGIT: RRR, Any care	(1)	(2)	(3)	(4)
Obese	1.52**	1.48**	1.32*	
	(0.15)	(0.20)	(0.18)	
Physical activity	0.58**	0.62**	0.62**	0.61**
	(0.06)	(0.10)	(0.10)	(0.10)
Abdominal obesity			1.44**	1.48**
			(0.17)	(0.17)
N obs	5142	5035	5035	5035

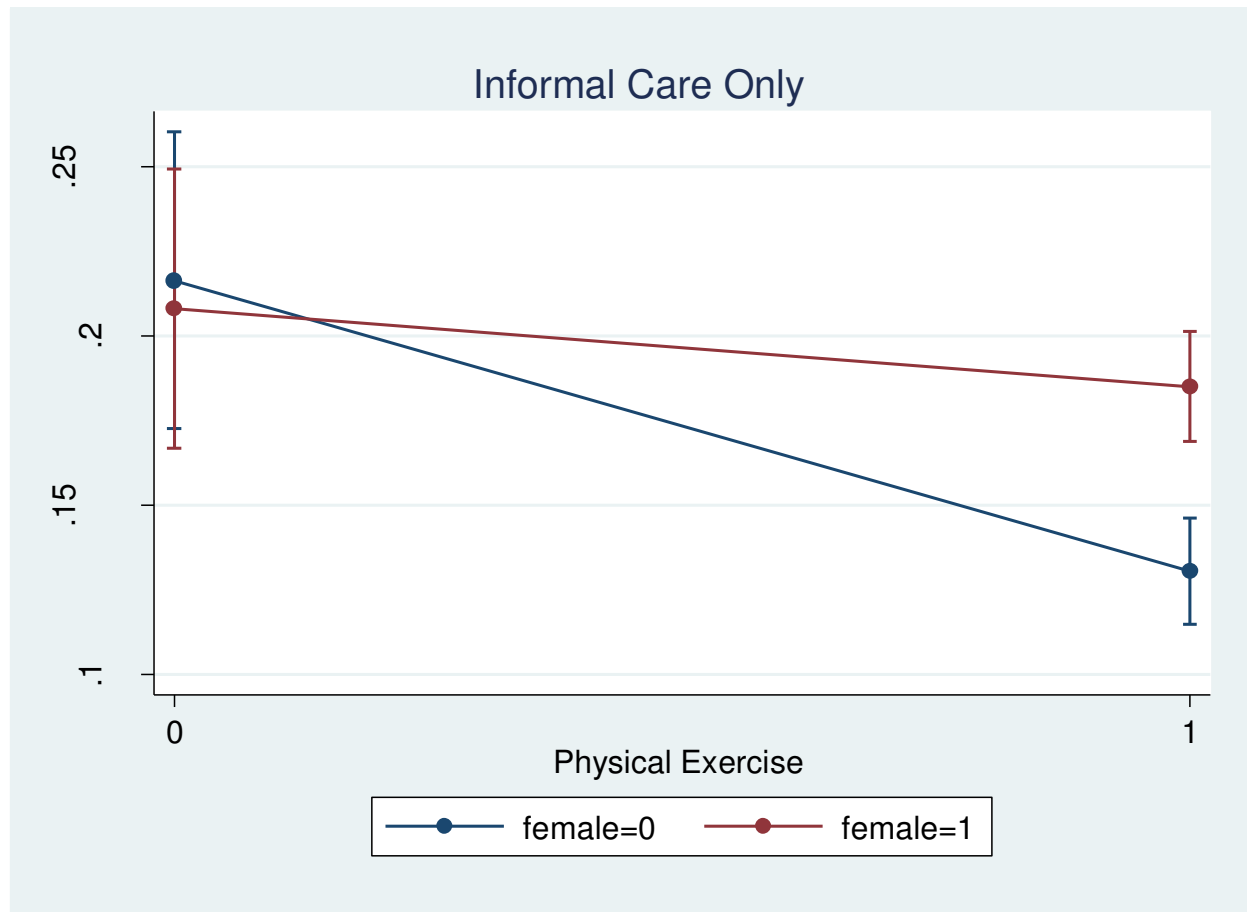
Results – 9

Obesity effect by gender



Results – 10

PA effect by gender



Results – 11

Longer term effect

LOGIT: OR	IC	NH	FC	PC
Underweight	1.12	.	.	.
	(0.61)	.	.	.
Overweight	1.29+	9.33*	2.55	1.73
	(0.18)	(9.52)	(1.48)	(0.76)
Obese	1.62**	14.93*	2.58	1.65
	(0.23)	(16.21)	(1.60)	(0.74)

Concerns

- Specification:
 - Categories
 - Control variables
 - Nursing home admission measure
- Measurement: BMI vs. WHR
- Endogeneity:
 - Time lag
 - Panel data methods (sample down to ~700)
 - IV (BMI of parents, BMI of spouse)

Summary

- Population ageing with growing obesity may create additional challenges for maintaining well-being of the elderly in terms of access to care – informal, formal and social care.
- Findings:
 - Obesity increases future use of care, mainly informal
 - Once existing health conditions are controlled for, there is no effect of obesity on formal care
 - Physical activity does act as a mitigating factor for future care needs
 - Impact of obesity on informal care is larger among females, but the protective effect of physical activity is smaller
 - Results from the analysis of the longer term effects are similar to the 2-year transitions.

Further research

- Mechanism of the obesity impact on future care use beyond the known disease-related pathways
- Care use versus care needs?

Thank you