Using the ALSPAC cohort study to investigate the effect of clustering of childhood problems on educational attainment

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Outline of presentation

- Fulfilling Lives: A Better Start initiative
  - Local area model

- ALSPAC analysis
  - Aims
  - Definitions
  - Results

- Points for discussion

'Fulfilling Lives: A Better Start'

- Big Lottery: £215m over 10 years -> 5 local areas

- Aim: to improve life chances of babies and young children in England

- Improve outcomes in
  - social and emotional development
  - communication and language development
  - nutrition

- Disadvantaged families
- Early intervention
- Variety of programmes and initiatives

Preventonomics: 'A Better Start' – how will it pay?

Develop models and frameworks to understand the potential down-stream public sector cost savings from intervening with parents and children aged 0-3

→ Calculate the costs of 'problems'
→ Estimate savings from intervention

ALSPAC analysis: to inform cost models

ALSPAC analysis

Aims to contribute to the models by investigating :

- relationship between perinatal factors and childhood problems

- relationship between childhood problems and later outcomes

- clustering of childhood problems age 5, 8, 11

- effect of clustering of problems on later outcomes

- persistence over time of childhood problems

- effect of persistence of problems on later outcomes

Definitions of childhood problems (1)

Communication difficulties

- Macarthur Infant Communication Questionnaire total communication score: bottom quartile

Low school readiness

- combined reading, writing, maths, language score at school entry: lowest quintile (Chittleborough et al 2014)

Behaviour problems

- parent–rated Rutter or SDQ conduct disorder sub score: highest quintile (Goodman, 1997)

Definitions of childhood problems (2)

Mental ill health

- Development and Well-Being Assessment (DAWBA): any depressive disorder; any anxiety disorder; combined

- Short Moods and Feelings Questionnaire (SMFQ) score : score of 12 or higher (e.g. Angold et al)

Obesity

- BMI derived from height and weight

- obesity = above the sex and age-specific 95th BMI centiles (Viner)

Outcomes

Educational attainment

- Not obtaining 5 or more GCSEs or equivalent grades A* - C including English and Maths

- Age 16

- Other outcomes for future analyses

Confounders

- Maternal education

- Paternal social class

- Child's ethnicity

- Housing tenure

Methods

Clustering

- Pairs of childhood problems at or as near to the same age as possible
- univariate logistic regression

Association between problem and outcome

- multivariate logistic regression
- problems age 5/age 8 and GCSE results age 16
- number of problems age 5/age 8 and GCSE results
- controlling for confounders

Sample size

Age 1	• 13,988
Age 7	• 15,458
Age 18	• 7,729

3,049 completed all questionnaires to date

5,777 completed 75% of questionnaires to date

Problems age 5 and not obtaining 5 or more GCSEs A*-C inc. English & Maths

	Odds ratio	CI
Communication difficulties	1.22 (ns)	0.80, 1.87
Low school readiness	**3.91***	2.31, 6.62
Behaviour problems	**2.34***	1.48, 3.71
Obese	1.28 (ns)	0.58, 2.82
Constant	0.48	
N	674	

Problems age 8 and not obtaining 5 or more GCSEs A*-C inc. English & Maths

	Odds ratio	CI
Low school readiness	**4.16***	3.12, 5.55
Behaviour problems	**1.71***	1.33, 2.20
Obese	1.13 (ns)	0.71, 1.82
Depressed or anxious	**2.22***	1.22, 4.02
Constant	0.68	
N	1813	

Clustering of problems age 5

Clustering of problems age 8

Low school readiness

Obesity

Depressed or anxious

Behaviour problems
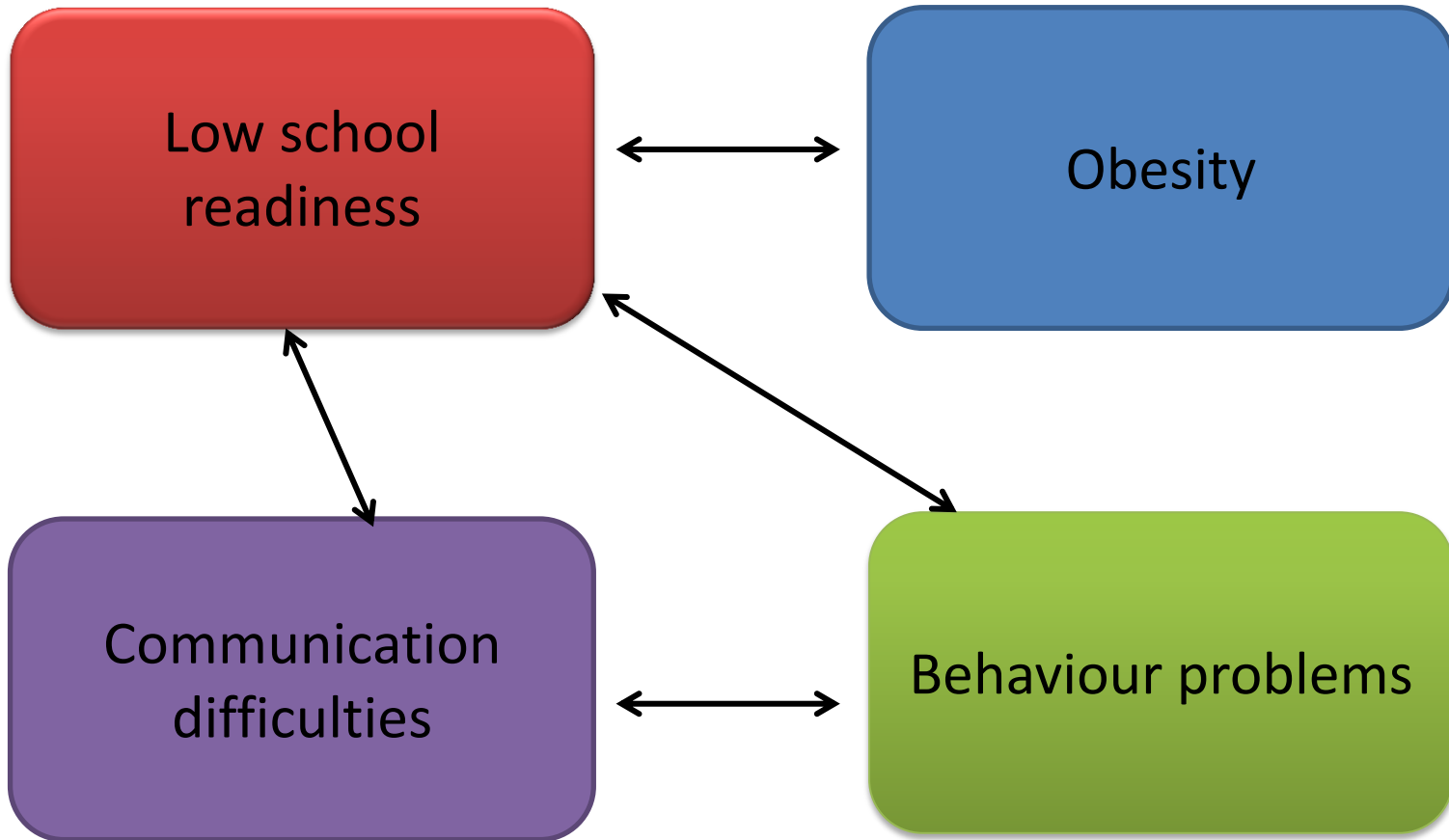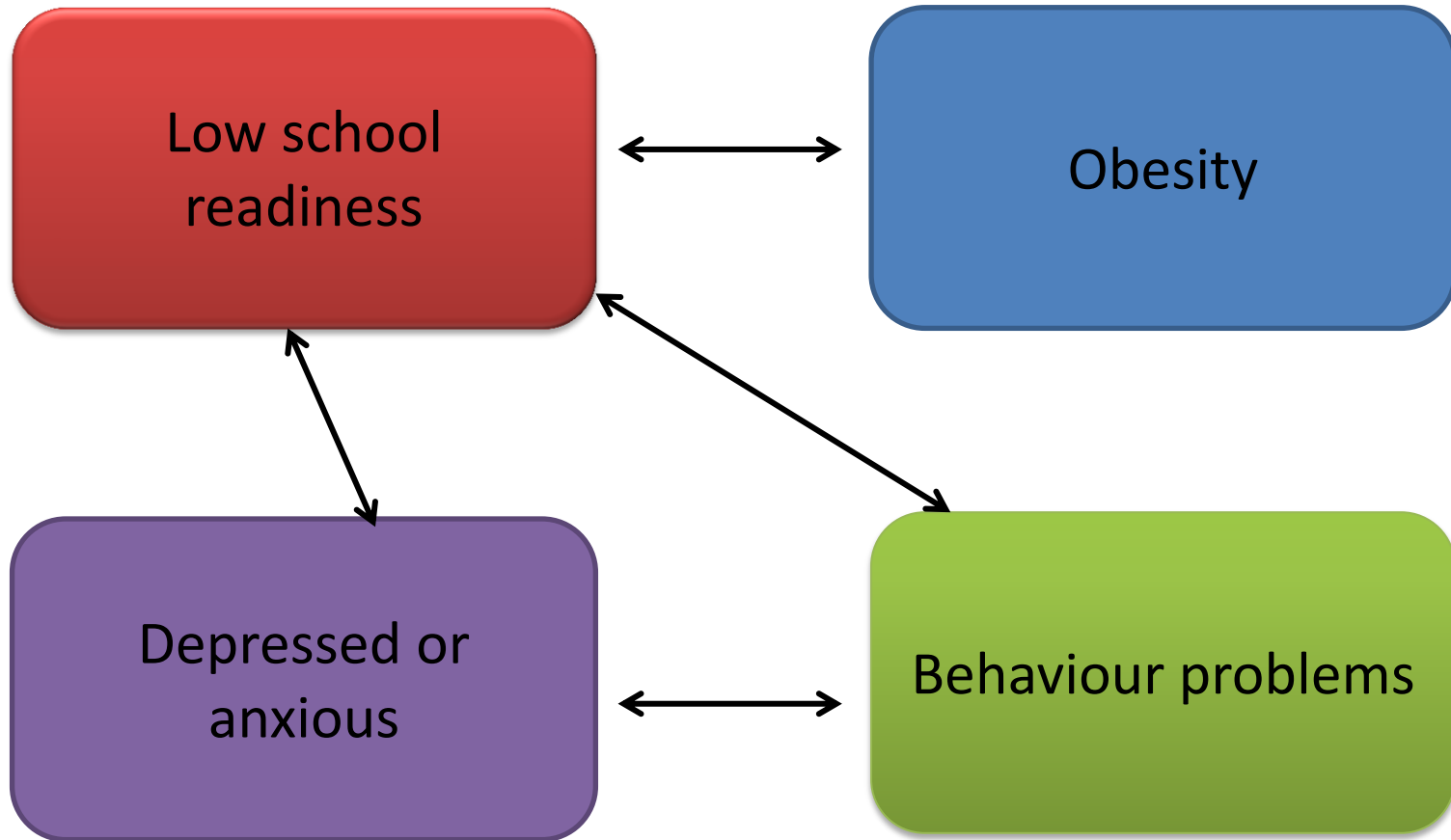
Number of problems age 5 and 8

Age 5		
Number of problems	Percent	Frequency
0	7.1	455
1	74.0	4720
2	17.2	1094
3	1.7	107
Total	100	6376
Age 8		
Number of problems	Percent	Frequency
0	23.9	1391
1	67.5	3932
2	8.0	465
3	0.6	34
Total	100	5822

Clustering of problems age 5 and not obtaining 5 or more GCSEs A*-C inc. English & Maths

		Odds ratio	CI
Number of problems	No problem	1.0	
	One problem	**3.16***	2.40, 4.42
	Two problems	**4.83***	3.56, 6.55
	Three problems	**8.84***	4.83, 16.17
Constant		0.42	
N	3974		

Clustering of problems age 8 and not obtaining 5 or more GCSEs A*-C inc. English & Maths

		Odds ratio	CI
Number of problems	No problem	1.0	
	One problem	**3.23***	2.74, 3.81
	Two problems	**6.51***	4.83, 8.77
	Three problems	**11.98***	3.96, 36.25
Constant		0.57	
N	3790		

Questions, problems, concerns

- Definitions of problems

- Better way of looking at clustering?

- Multicollinearity

- Lack of data for some problems -> reduced sample size

- Attrition

Thank you

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