



High Antibiotic Use in Young Children

Dervla Kelly

**Co-authors: Catherine Hayes,
Alan Kelly, Tom O'Dowd**



Overview of Presentation

- **Introduction to antibiotic use in children**
- **Objectives of research**
- **Methods**
- **Findings to date**



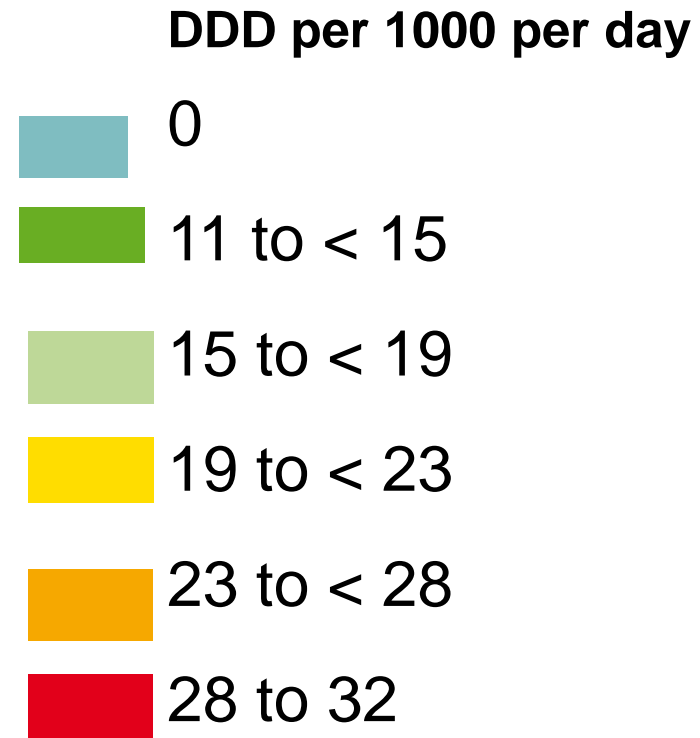
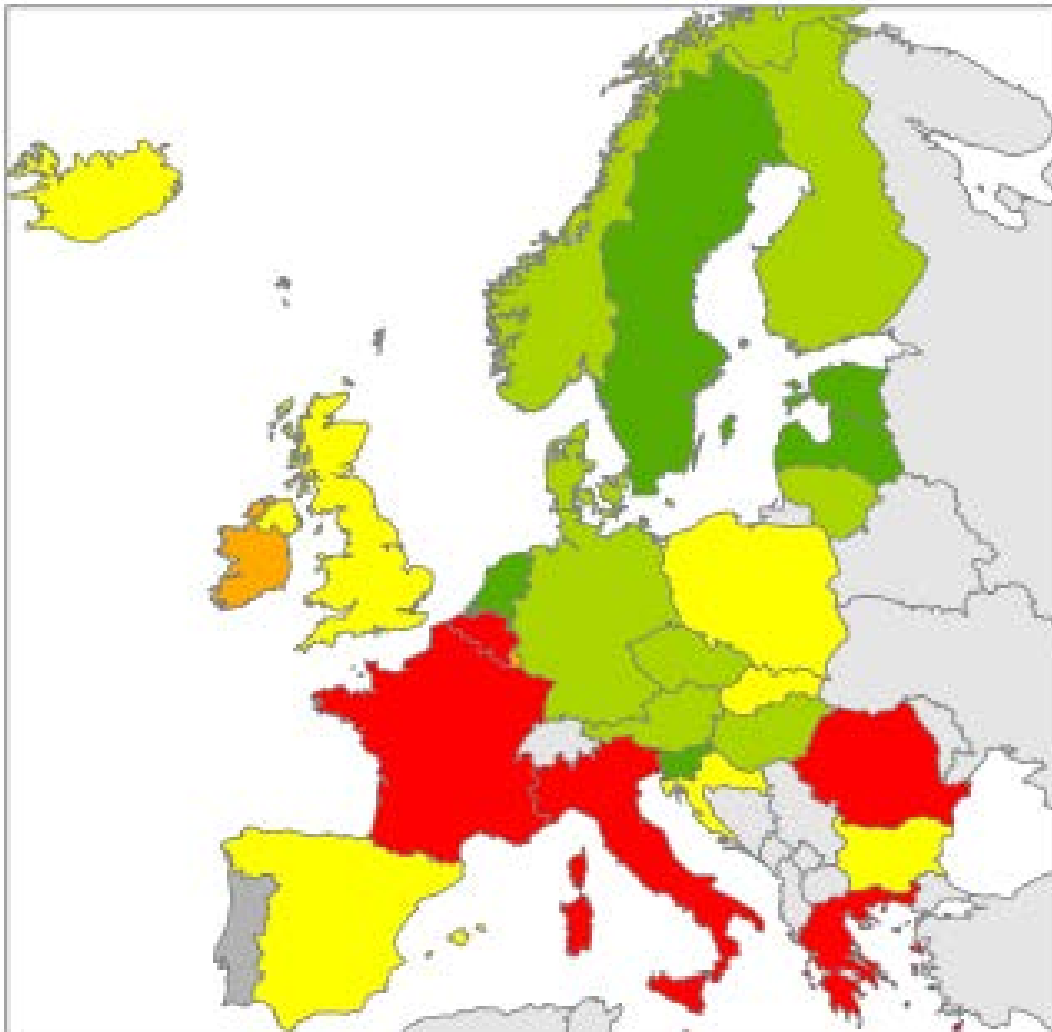
Background

- **Up to 80% of antibiotics prescribed in primary care**
- **In children majority of antibiotics are treating respiratory illnesses**
- **Threat of antibiotic resistance real**
- **More and more interest on human microbiome and the relationship between bacteria in our gut and health ¹**
- **Antibiotics alters gut bacteria composition**

1. Clemente JC, Pehrsson EC, Blaser MJ, et al. The microbiome of uncontacted Amerindians. *Science Advances*. 2015;1(3):e1500183-e1500183.



Antibiotic use (EASC-NET 2013)





Aims

- 1. To describe level of antibiotic use in Ireland among infant cohort of GUI**
- 2. To examine the relationship between high antibiotic use and social factors**



Study Population

- **Infant cohort of GUI**
- **Sampled from the Child Benefit Register; Infants born in Ireland between December 2007 and May 2008**
- **My analysis n = 8186 preschoolers**
- **11134 9-month-olds; Re-interviewed at 3 (n = 9793) & 5 years (n = 9001)**
- **Data was reweighted to be statistically representative**

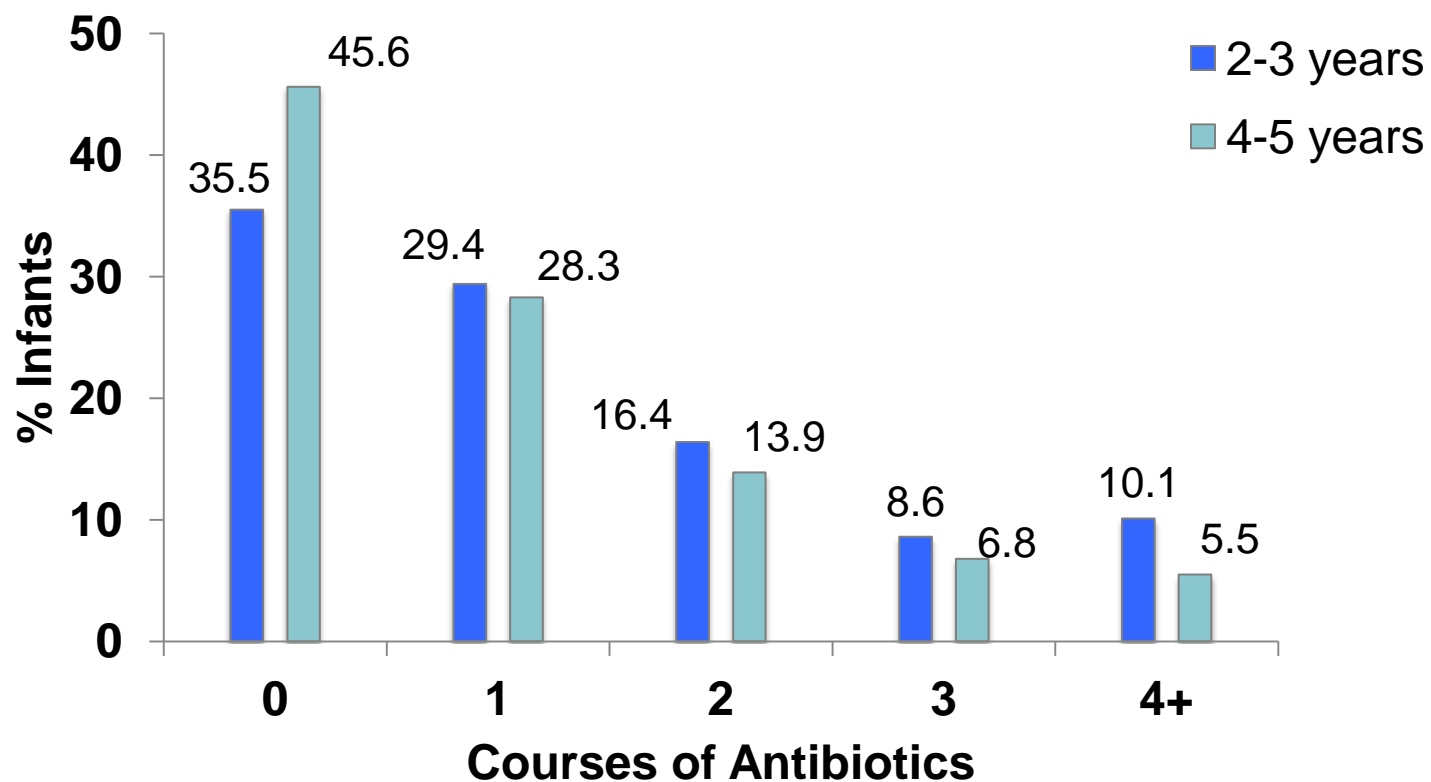


Survey Questions

- **Has <child> received a course of antibiotics in the past 12 months?**
- **In total, how many courses of antibiotics has <child> received in the past 12 months?**
- **Since <baby> was born, how many times have you seen, or talked on the telephone with any of the following about <baby's> physical health? (exclude at time of birth)**
 - GP, Pediatrician, Public health nurse or practice nurse, Another medical doctor, Accident and Emergency or Outpatient
- **Has <baby> ever been admitted to a hospital ward because of an illness or health problem?**
- **How many nights has <baby> spent in hospital?**

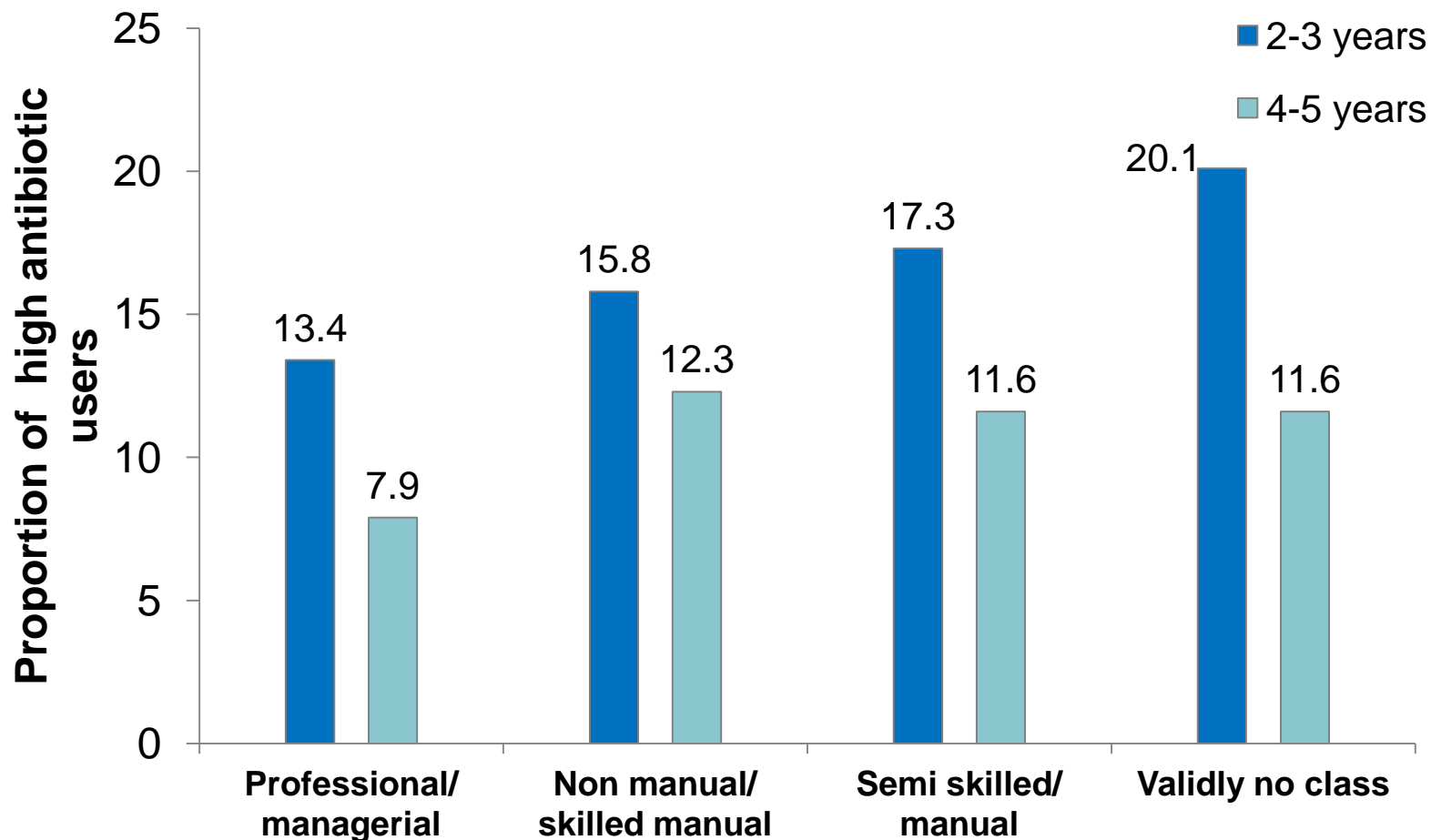


Prevalence of antibiotic use



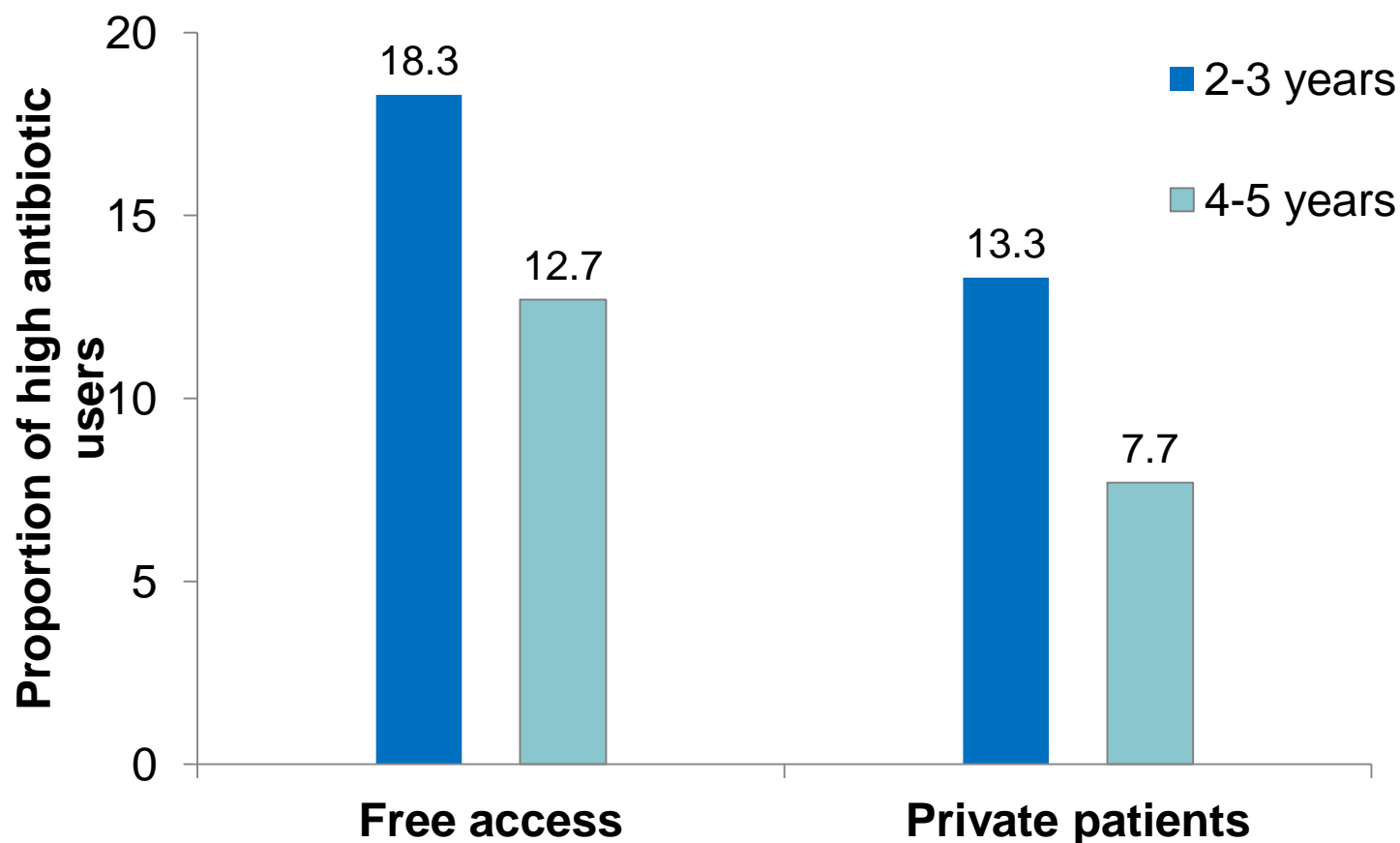


Social Class & High Antibiotic Use





Antibiotic Use and Medical Card



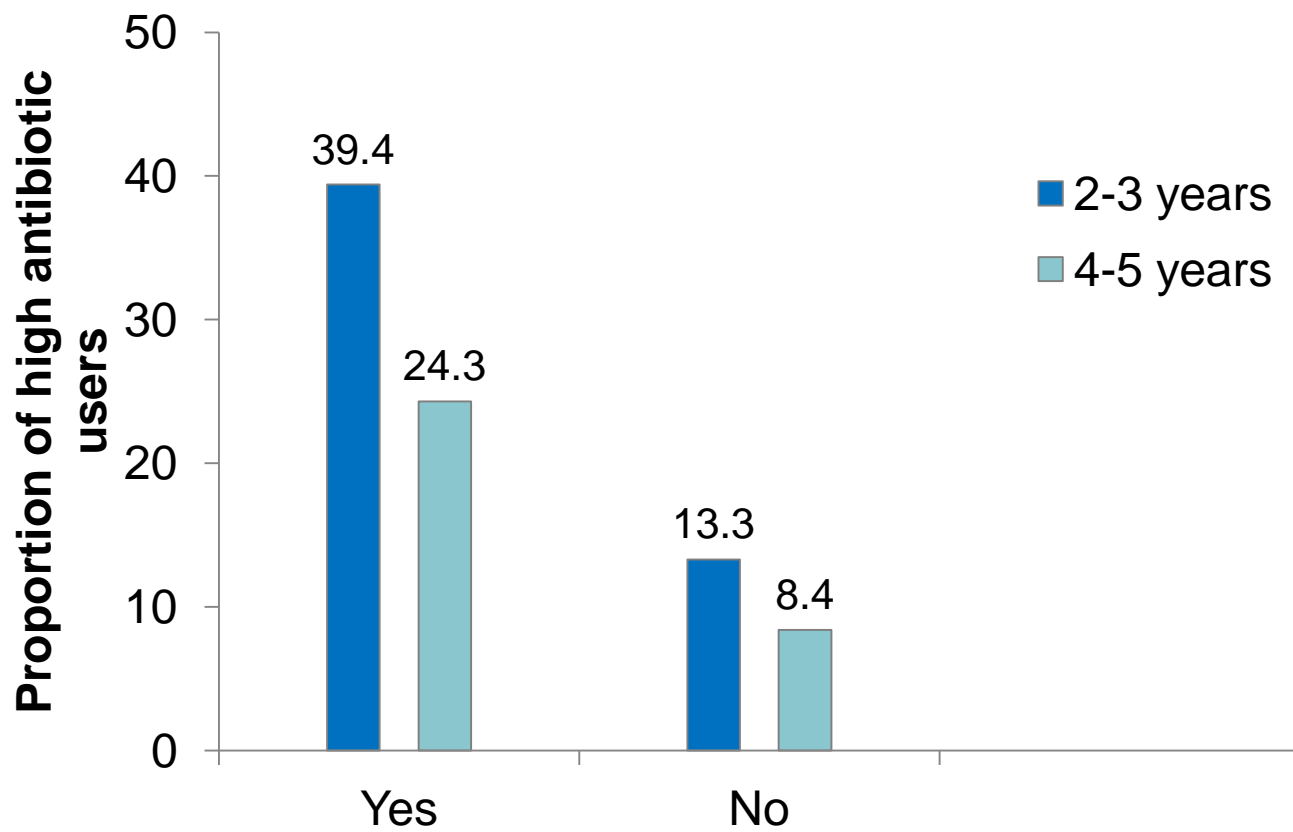


Antibiotic Use and Asthma

	n	%
9 months: Total Cohort	11134	
Diagnosed with asthma	450	4
3 years: Total Cohort	9793	
Diagnosed with asthma	533	5.4
5 years: Total Cohort	9001	
Diagnosed with asthma	861	7.6

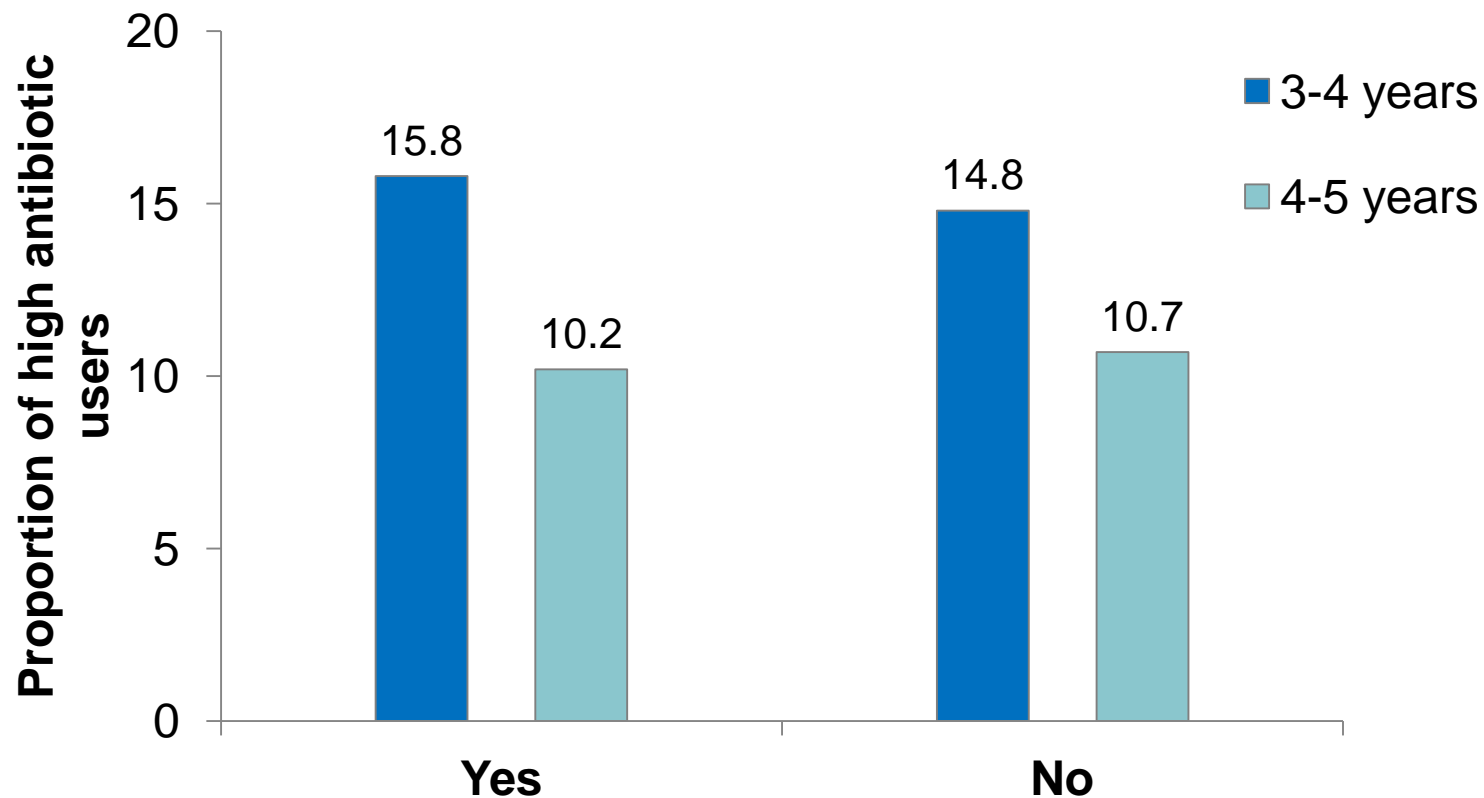


Antibiotic Use and Asthma





Antibiotic Use and Childcare





Factors associated with Antibiotic Use

		2-3 years OR (95% CI)	4-5 years OR (95% CI)
Gender	Male	1.00	1.00
	Female	1.05 (0.91-1.21)	1.28 (1.02-1.61)
Diagnosed with asthma	No	1.00	1.00
	Yes	4.03 (1.31-4.96)	3.64 (2.78-4.74)
Social class	Professional/ Managerial	1.00	1.00
	Skilled	1.13 (0.94-1.35)	1.47 (1.11-1.95)
	Manual	1.24 (0.97-1.62)	1.17 (0.77-1.75)
	No valid class	1.26 (0.94-1.61)	1.14 (0.73-1.72)
Medical card	No	1.00	1.00
	Yes	1.31 (1.10-1.21)	1.56 (1.20-2.05)
Childcare	No	1.00	1.00
	Yes	1.20 (1.03-1.39)	1.16 (0.90-1.48)

Also adjusted for maternal education, maternal age, child chronic illness



Summary of Findings

- **High antibiotic use in children mirrors similar observations in Europe**
- **GUI self report of antibiotic use may lead to recall bias**
- **Socioeconomic factors associated with antibiotic use: experience more illnesses or differing beliefs about medication**
- **Spending time in childcare outside the home: more opportunities to pick up infections or opportunity cost of having sick child is greater for parents**



Future directions

- **Effect of prior antibiotic use on weight at five years**
- **Plausible mechanism for this interaction: Recent observations suggest bacteria in gut is strongly influenced by early life including mode of birth, breastfeeding and close interactions with neonatal offspring. In theory, using antibiotics may disrupt gut bacteria and the knock effect of these changes on metabolism may affect weight**
- **Six studies published to date in western child cohorts showing a similar effect**



Acknowledgements

**Supervisors: Catherine Hayes, Alan Kelly,
Tom O'Dowd**

**Department of Public Health & Primary Care, Trinity
Centre, Tallaght Hospital, Dublin 24**



Trinity College Dublin
Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin