



Dr Kaitlin Wade
BSc(Bristol), PhD(Bristol)

EBI Early Career Fellow

Area of research

The application of human genetics to the study of health and disease, with specific focus on causal inference and understanding the human gut microbiome as a causal risk factor for adverse health outcomes

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Summary

Biography

After obtaining a joint-honours BSc in Biology and Mathematics at the University of Bristol, I was able to combine and apply these two fields to epidemiological study designs within the Wellcome Trust Genetic, Molecular and Lifecourse Epidemiology 4-year PhD. Specifically, the topic of my PhD was aimed at assessing various causes and consequences of cardiovascular health variation across the lifecourse, with focus on risk factors including early life factors, aspects of diet and eating behaviour and adiposity. Throughout my PhD I was particularly interested in using methods to improve causal inference within observational epidemiological context, including the use of comprehensive longitudinal cohorts, randomized controlled trials and Mendelian randomization.

After completing my PhD, my first postdoctoral role involved developing MR-Base, a continuously updated online platform that collates and harmonises summary-level data from large-scale genome-wide association studies (GWAS) and automates two-sample Mendelian randomization analyses, including a range of new sensitivity analyses. My research since focused on the application of several causal inference methods (mainly Mendelian randomization and Recall-by-Genotype analyses) within large population-based cohorts to understand adiposity and dietary intake/eating behaviour as causal risk factors for disease and mortality within the BMI-to-Health group (PI: Professor Nicholas Timpson).

Now, as an Elizabeth Blackwell Institute Early Career Fellow based within the MRC Integrative Epidemiology Unit in the Bristol Medical School (Population Health Sciences), my work focuses on the application of these causal inference methods and genetic epidemiology to understand the causal role played by the human gut microbiome within health and disease. Specifically, within this Fellowship, my aims are to understand the link between dietary intake and the gut microbiome and, in turn, its impact on colorectal cancer, type 2 diabetes and inflammatory bowel diseases.

Teaching

Currently, I help teach on a variety of courses run specifically within the Bristol Medical School. These include:

- Basic Epidemiology
- Genetic Epidemiology
- Mendelian randomization

Along with a small group of PhD students and post-doctoral researchers, I organised a new Genetic and Epigenetic Epidemiology short course that we administered in Pelotas, Brazil in March 2015. After the success of this course, I lead the organisation of a similar course (*Causal Inference Methods and Epigenetic Epidemiology*) that I helped teach on in Mumbai, October 2017.

From its initiation in 2017, I am the co-organiser of one Unit (out of 5) of a new *Genomic Medicine* intercalated BSc, run for Medical Students at the University of Bristol, which will be run continuously over the coming years.

From February 2018, I am the co-director of the Mendelian randomization short-course run twice a year at the Bristol Medical School. I have also prepared and run workshops in Kyoto, Baltimore and Minneapolis on Mendelian randomization as part of conference and courses.

As well as teaching, I have supervised students for their 3-month miniprojects and am currently supervising a few students for projects within their main PhD thesis at the Bristol Medical School and MRC IEU .

Keywords

- Genetic epidemiology
- Causality
- Cardiovascular health
- BMI
- Adiposity
- Gut Microbiome
- Longitudinal analyses
- Mendelian randomization
- Recall-by-Genotype (RbG)

Skills

- Cardiovascular disease
- Obesity
- Metabolic disorders
- Inflammatory bowel disease
- Type 2 Diabetes
- Colorectal cancer

Methodologies

- Mendelian randomization
- Recall-by-Genotype (RbG)
- Epidemiology and statistics

Memberships

Organisations

[Bristol Medical School \(PHS\)](#)

Centres, collaborations and units

- [MRC Integrative Epidemiology Unit](#)

Recent publications

- Wade, KH, Carlslake, D, Tynelius, P, Smith, GD & Martin, RM, 2019, '[Variation of all-cause and cause-specific mortality with body mass index in one million Swedish parent-son pairs: An instrumental variable analysis](#)'. *PLoS Medicine*, vol 16.
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Molecular Psychiatry.

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- Langdon, R, Richmond, R, Hemani, G, Zheng, J, Wade, K, Carreras-Torres, R, Johansson, M, Brennan, P, Wootton, R, Munafo, M, Smith, GD, Relton, C, Vincent, E, Martin, R & Haycock, P, 2019, '[A phenome-wide Mendelian randomization study of pancreatic cancer using summary genetic data](#)'. *Cancer Epidemiology, Biomarkers and Prevention*.
- Bell, J, Carslake, D, O'Keeffe, L, Frysz, M, Howe, L, Hamer, M, Wade, K, Timpson, N & Smith, GD, 2018, '[Associations of body mass and fat indexes with cardiometabolic traits](#)'. *Journal of the American College of Cardiology*, vol 72., pp. 3142-3154
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