

Project Details	
Project Code	PHS27Br Corbin
Title	What is behind the upsurge of colorectal cancer incidence among young adults?
Research Theme	Population Health Sciences
Project Type	Dry lab
Summary	Colorectal (bowel) cancer (CRC) is the third most diagnosed cancer and the second leading cause of cancer death globally. Whilst overall CRC incidence rates are stable or even in decline in many high-income countries, recent data has shown steep increases in CRC incidence in younger persons (age <50 years). It has been hypothesised that temporal changes in modifiable risk factors are responsible for this trend. This project aims to uncover the driving factors behind the upsurge of colorectal cancer incidence among the young with a view to aid potential preventative and early detection strategies in this generation.
Description	Background: Colorectal (bowel) cancer (CRC) is the third most diagnosed cancer and the second leading cause of cancer death globally, responsible for more than 1.9 million new cases and more than 904 000 deaths in 2022 globally (https://pubmed.ncbi.nlm.nih.gov/38572751/). Whilst overall CRC incidence rates are stable or even in decline in many high-income countries, recent data has shown steep increases in CRC incidence in young people (age <50 years) (https://pmc.ncbi.nlm.nih.gov/articles/PMC7617144/). It has been hypothesised that temporal changes in modifiable risk factors (or 'exposures') such as diet, exercise and antibiotic use are responsible for this trend. However, there is limited evidence to support these hypotheses (https://pubmed.ncbi.nlm.nih.gov/31095950/) and a recent analysis of UK data found body mass index to be the only one of the behavioural risk factors studied that could explain the rising incidence of cancer in younger adults (https://pubmed.ncbi.nlm.nih.gov/42094023/). Key research question: What factors are driving the rise in CRC incidence among young adults? Methods: During this project you will deploy a range of epidemiological methods to address the following objectives. Objective1: Describe the risk factors for colorectal cancer Conduct a review of the existing literature to identify proposed risk factors for colorectal cancer. Consider the strength of evidence for each and categorise the risk factors into modifiable and non-modifiable factors. Objective 2: Identify existing longitudinal population studies to use in analyses One of the principal challenges in evaluating emerging generational shifts is access to relevant data (https://pubmed.ncbi.nlm.nih.gov/40848248/). To evaluate the temporal trends in CRC incidence and how this relates to possible changes in the distribution of risk factors identified in Objective 1 you will need to identify studies with comparable data on early life risk factors and CRC incidence in participants from different generations. This may include historical cohorts hosted by Bristol Medical School as well as

	external resources. Electronic Healthcare Record (EHR) data as well as cancer and death registry data will be available for many cohorts. Objective 3: Assess the contribution of each identified risk factor to CRC across generations You will deploy appropriate statistical models to evaluate the relative importance of the risk factors identified in Objective 1 on CRC across different generations. Consideration should be given to potential confounders. Methods may include logistic regression and cox proportional hazards. Where appropriate genetic epidemiology approaches may be used. Resources: This project will make use of a wide range of existing research resources. At a minimum, you will have access to the following studies: • UK Biobank (participants born between 1937 and 1970), https://www.ukbiobank.ac.uk/ • Avon Longitudinal Study of Parents and Children (ALSPAC) (participants from two generations, the first born between 1940 and 1970, and their offspring born in 1991 and 1992), https://www.bristol.ac.uk/alspac/ • The MRC Integrative Epidemiology Unit collection of legacy cohort studies (participants born between 1920 and 1980), https://www.bristol.ac.uk/integrative-epidemiology/research/programmes/legacy-cohorts/ • The UK Longitudinal Linkage Collaboration's collection of longitudinal population studies, https://ukllc.ac.uk/datasets Additional resources might include long-term studies managed by the Centre for Longitudinal Studies at University College London (https://cls.ucl.ac.uk/) as well as contemporary resources such as Our Future Health (https://ourfuturehealth.org.uk/). Appropriate resources will be selected based on the specific risk factors being investigated. This project can be tailored to individual interests in several ways. Subject to the availability of data, additional comparisons could be considered, for example, differences by sex and ancestry. The framework presented could additionally be applied to a range of research questions with a similar temporal component. In addition to the analytical component of the work, you will have the opportunity to contribute to the ongoing management of the longitudinal population studies hosted in Bristol. For example, the research governance structure supporting our legacy cohort studies includes a Steering Committee, a Data Access Committee and a Public Advisory Group. Active engagement with these groups will provide you with invaluable insight into the day-to-day running of studies from information security requirements to public engagement activities. The UK landscape for longitudinal cohort studies is rapidly changing. Supervisor involvement with contemporary LPS support structures including PRUK (https://pruk.ac.uk/), UK LLC (https://ukllc.ac.uk/) and HDR UK (https://www.hdruk.ac.uk/) will provide a wide range of networking opportunities to support both this project and your personal development. There may also be the opportunity for your work on this project to inform policy developments in this area.
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Can be completed part time?	Yes
Supervisory Team	
Lead Supervisor	
Name	Dr Laura Corbin
Affiliation	Bristol
College/Faculty	Faculty of Health and Life Sciences
Department/School	Bristol Medical School (Population Health)
Email Address	laura.corbin@bristol.ac.uk
Co-Supervisor 1	
Name	Professor Sarah Bailey
Affiliation	Exeter
College/Faculty	Faculty of Health and Life Sciences
Department/School	Exeter Medical School, Health and Community Sciences
Co-Supervisor 2	
Name	Professor Richard Martin
Affiliation	Bristol
College/Faculty	Faculty of Health and Life Sciences
Department/School	Bristol Medical School (Population Health)
Co-Supervisor 3	
Name	Dr Lucy Goudswaard
Affiliation	Bristol
College/Faculty	Faculty of Health and Life Sciences
Department/School	Bristol Medical School (Population Health)