



QResearch News Update Winter 2024

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We hope that you are enjoying our newsletters. We think that they are a great opportunity to feature some of the wide-ranging projects that have been enabled by access to QResearch data.

To feature your research news here, please email Claire Meadows at

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QResearch study reveals stark ethnic and social inequalities in lung cancer diagnosis

The most comprehensive study ever conducted of lung cancer diagnosis in England has revealed significant disparities between ethnic groups and striking evidence that people living in the most deprived areas were diagnosed with lung cancer at twice the rate of those in affluent areas.

Lung cancer is a leading cause of death world-wide, responsible for over 1.8 million deaths each year. The UK also faces a significant burden, with lung cancer accounting for more than 35,000 deaths each year.

The study, published in The Lancet Regional Health – Europe, which is the largest of its kind analysed health records of over 17.5 million people and more than 84,000 lung cancer cases, found that Bangladeshi men had the highest rates of lung cancer, while people from the most deprived areas developed the disease at twice the rate of those from affluent areas.

Among those who developed lung cancer, people from deprived areas had a 35% higher risk of being diagnosed with more aggressive forms of the disease.

Researchers from Oxford's Nuffield Department of Primary Care Health Sciences found clear evidence that different ethnic groups show distinct patterns of lung cancer types, with important implications for screening and early detection.

Professor Julia Hippisley-Cox, senior author of the study, said: "This research provides the strongest evidence yet of how your ethnic background and social circumstances affect both your risk of developing lung cancer and the type of cancer you may develop. These findings are particularly timely as the NHS rolls out its targeted lung cancer screening programme."

Read the full paper here <https://doi.org/10.1016/j.lanepe.2024.101124>



QResearch Study looks at how the COVID-19 pandemic affected cancer patients in England who had hospital appointments cancelled

A new paper based upon the use of QResearch data has shown how cancer patients who had hospital appointments were affected by COVID-19.

The paper finds that, while the research team (including Professor Catia Nicodemo—pictured) did not find a statistically significant increase in mortality risk for the pandemic cohort after accounting for other factors, the consequences of these care disruptions should not be underestimated. Delays in diagnosis and treatment can allow cancers to progress, potentially reducing the chances of successful treatment outcomes. The emotional toll of cancelled appointments, including increased anxiety and loss of control, can also severely impact patient well-being. However, our findings highlight some important nuances. Cancellations that occurred later in the disease course appeared less disruptive, suggesting early diagnosis and treatment may be most vulnerable to pandemic-induced delays. Additionally, appointments cancelled by medical providers rather than patient self-cancellations were associated with significantly higher survival rates. This implies that clinicians were able to effectively prioritise patients most in need of urgent care during the crisis. The research team commented

‘We are encouraged that the results we present suggest the disruptions caused by COVID did not lead to negative outcomes for those with cancer. Further research should examine long-term impacts on outcomes and strategies to minimize treatment delays during healthcare crises.’

Read the full paper here <https://doi.org/10.1016/j.socscimed.2024.116998>



White women most likely to get HRT prescriptions in England, new QResearch study finds

The findings of a ten-year QResearch study into ethnicity in prescribing have been reported in [The Guardian](#) in the United Kingdom.

The study found that Menopausal women of Chinese and black African backgrounds are about 80% less likely to receive hormone replacement therapy than white women, according to a large-scale study. HRT is one of the most common treatments for menopausal symptoms such as hot flushes, mood swings, poor sleep and vaginal dryness. It can also help maintain muscle strength and prevent osteoporosis.

But a 10-year study of nearly 2 million women in England has found worrying inequalities in women's access to HRT. Academics at the University of Oxford examined HRT prescriptions issued in England to 1,978,348 women aged 40 to 60 over a 10-year period. Findings presented by [Dr Jennifer Hirst](#) (pictured) at the World Congress on Menopause in Melbourne on Monday revealed that between 2013 and 2023, almost six times as many white women were prescribed HRT than black women, and more than twice as many women in affluent areas were offered HRT than those living in socially deprived areas. While previous studies have identified unequal access to HRT, the academics believe this is the first study to quantify the likelihood of receiving it, having adjusted for age, deprivation and ethnicity.



Thesis based on QResearch data looks at the development and evaluation of clinical prediction models for risk-stratified early detection, prevention and management of breast cancer

In his recently published thesis, Dr Ashley K Clift looked at how accurately estimating individual-level risks of breast cancer incidence and mortality could inform stratified approaches to screening, prevention, and management that help reduce deaths from breast cancer and are more cost-effective. Increasing interest in ‘machine learning’ techniques and the integration of phenotypic and genetic data present uncertainty around the best approaches to prognostication in these settings.

In his scoping review, evidence deficiencies were highlighted regarding risk-based breast screening, and parallels explored between this and risk-based breast cancer prevention and management. Using the QResearch primary care database and its linked datasets, clinical prediction models were developed using regression and machine learning methods to estimate individual women's 10-year risks of incident breast cancer, 10-year risks of developing and then dying from breast cancer, and 10-year risks of breast cancer mortality after diagnosis.

COVID-19 vaccines are safe and effective for people with blood cancer, study finds

A new study from researchers at the Nuffield Department of Primary Care Health Sciences provides reassuring evidence that COVID-19 vaccines are safe and effective for people with blood cancers, despite their vulnerable immune systems.

The study, funded by Blood Cancer UK, investigated the effectiveness of COVID-19 vaccines in preventing hospitalisations and death due to COVID-19 infection, as well as potential side effects, for people living with blood cancers. The researchers analysed data from QResearch, a multi-million-person health record database, to compare outcomes for people with blood cancer to those of the general population.

As we manage COVID-19 without social distancing and mask mandates, people with blood cancers, such as leukaemia, lymphoma and myeloma, are known to be at higher risk from severe outcomes from COVID-19 compared to the general population. Their compromised immune systems also lead to poorer antibody responses to vaccination. The study found that the vaccines were highly effective against death from COVID-19 for people with blood cancer, offering protection comparable to that in the general population. After two vaccine doses, those with blood cancer had 92% protection and after a booster dose they had 70% protection.

The study also analysed the risk of potential vaccine side effects in the 28 days after vaccination and found no evidence that people with blood cancer were at increased risk compared to the general population. Dr Rubina Ahmed, Director of Research, Policy and Services from Blood Cancer UK, said: "People with blood cancer are particularly vulnerable to severe illness from COVID-19. The lack of previous research has meant people with blood cancer have faced uncertainty about the levels of protection COVID-19 vaccines give".

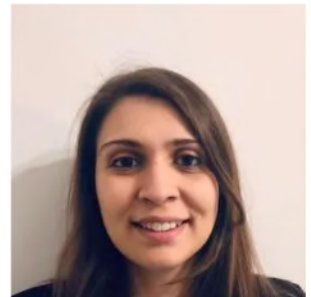
Read the full paper: '[Effectiveness and safety of COVID-19 vaccination in people with blood cancer](#)' in the European Journal of Cancer.

Identifying early symptoms associated with a diagnosis of childhood, adolescent and young adult cancers

Researchers from the Nuffield Department of Primary Care Health Sciences have conducted the largest ever study examining symptoms of cancer in children, teenagers and young adults (CTYA) presenting to GPs. The research, published in the [British Journal of Cancer](#), provides crucial new insights that could help improve early diagnosis of cancer in young people. Cancer is one of the leading causes of death in children, teenagers and young adults (0-24 years old) in the United Kingdom. Often there are delays in diagnosing these cancers which contributes to the poor outcomes.

Early recognition of cancers in this age group is hard because symptoms are often not specific to cancer and mimic other conditions that normally get better. In addition, cancer in patients under age 24 is rare, so clinicians may not consider an investigation immediately. One way to overcome this challenge is to better understand the early symptoms of cancer in young people, particularly in GP surgeries, where most people first seek help.

[Dr Defne Saatchi](#) (pictured), working with Professor Julia Hippisley-Cox, Professor of Clinical Epidemiology & General Practice, at NDPCHS, analysed data from the QResearch database, examining records of 3,186 cancer cases and compared them to 50,576 young people without cancer. with uncommon cancers.



New heart disease calculator could save lives by identifying high-risk patients missed by current tools

Collaborative research, led from NDPCHS and published today in [Nature Medicine](#), has developed a new tool called QR4 that more accurately predicts an individual's 10-year risk of cardiovascular diseases, like heart disease and stroke, particularly identifying high-risk patients that current prediction tools miss. QR4 includes seven new risk factors applicable to all adults: chronic obstructive pulmonary disease (COPD), learning disabilities, Down syndrome and four cancer types (blood, lung, oral and brain), highlighting how other significant diseases impact on heart health.

QR4 also identified factors specific to women's health that were predictive of future heart disease risk, such as complications from high blood pressure during pregnancy, and postnatal depression.

"While traditional cardiovascular risk factors such as smoking and high cholesterol are well-recognised, our latest research identifies less obvious, yet crucial risk indicators," said Professor Julia Hippisley-Cox, lead author, Professor of Clinical Epidemiology and General Practice, at the University of Oxford's Nuffield Department of Primary Care Health Sciences.

About QResearch

QResearch is a large consolidated database derived from the anonymised health records of over 35 million patients.

The data currently come from approximately 1500 general practices using the EMIS clinical computer system.

The practices are spread throughout the UK and include data from patients who are currently registered with the practices as well as historical patients who may have died or left.

Historical records extend back to 1989, making it one of the largest and richest general practice databases in the world.

Founder Julia Hippisley-Cox is based at Nuffield Department of Primary Health Sciences, Medicine Sciences Division, University of Oxford.

www.qresearch.org

Celebrating the success of our 2024 In2STEM placement programme.

The QResearch team congratulates its 2024 In2STEM student for completing their summer placement, gaining vital experience and skills for their future careers. The In2 STEM programme is a vital initiative designed to equipping students from low-income and disadvantaged backgrounds with skills, knowledge, confidence, invaluable experience, valuable insights from industry and research professionals, skill-building opportunities and a pathway to a wide range of STEM careers.

This is chance to make informed choices, boost academic profile and prepare for a successful future in the world of science, technology, engineering and mathematics for students. We are delighted to have hosted such a talented and dedicated group of students. The activity was led by Dr Janice Hoang with a great involvement of other researchers including [Dr Nguyen Tran](#), [Wema Mtika](#), [Dr Ting Cai](#), [Dr Xiaoxiao Ling](#) and [Dr Deborah Allen](#) from different research teams in the Nuffield Department of Primary Care Health Sciences.

Dr Janice Hoang elected Junior Research Fellow of Kellogg College

Our congratulations go to [Dr Janice Hoang](#) (pictured) from the Primary Care Epidemiology Team/ the Nuffield Department of Primary Care Health Sciences has been elected to a Junior Research Fellowship (JRF) at Kellogg College in Oxford. Dr Janice Hoang is a researcher in primary care epidemiology and key area of her work is in cancer epidemiology.

The main duty of the Junior Research Fellow is to undertake research, however it is hoped that the JRF will also contribute to the general intellectual life of Kellogg College. Dr Hoang is looking forward to the opportunity to be involved with outreach, social and academic events, and other activities at the College and network with more academics across the University. She will also be acting as a College Advisor to a number of graduate students.



Study shows disparity in COVID-19 vaccines uptake for immunocompromised individuals,

A new study by researchers at NDPCHS has shown disparities in vaccine uptake in immunocompromised individuals across ethnic and socioeconomic groups, despite evidence that vaccines are safe and effective for patients with weakened immune systems.

The study, published in [BMC Medicine](#), analysed the anonymised real-world data of more than 12 million people in England, using the QResearch database. The researchers compared the effects of COVID-19 vaccination in immunocompromised individuals and the general population. This included more than 580,000 immunocompromised people who had conditions like cancer, had received organ transplants, or were taking immunosuppressive drugs. The authors analysed records from December 2020, when the UK began its vaccine programme, to April 2022, making this one of the largest studies to date evaluating COVID-19 vaccine uptake, effectiveness and safety specifically in immunocompromised groups.

'Our findings underscore the safety of vaccines and the importance of ongoing COVID-19 vaccination for immunocompromised individuals to maximize protection against severe outcomes,' said lead author [Dr Daniel Chen](#) (pictured) Research Fellow at NDPCHS.



Prevalence of metabolic dysfunction in cancer patients in England using large-scale linked population based data

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INTRODUCTION

- Metabolic dysfunction, while variably defined, has been linked to an increased risk of developing multiple obesity-related cancers, including of the breast, bowel, pancreas, liver, oesophagus and uterus.^{1,2}
- Electronic health records, collected on large populations in routine healthcare, can be leveraged for research into the onset, timing, trajectories and cumulative effect of various metabolic risk factors, such as insulin resistance, inflammation, dyslipidaemia and hypertension, including how these factors both contribute to the development of cancer and can be targeted in prevention.³
- This study design poster outlines our research into the relationship between metabolic dysfunction, obesity and cancer using linked electronic health records from five population-based sources in England.⁴⁻⁸

AIM

- To use large-scale linked population-based data to investigate metabolic dysfunction prevalence in obesity-related cancers in England, 2013-2023

OBJECTIVES

- 1) To describe history of metabolic dysfunction in cancer patients across tumour and treatment types;
- 2) To explore prevalence of metabolic risk factors in obese vs. leaner patients; and
- 3) To understand whether metabolic dysfunction has implications on cancer treatments and outcomes

METHODS

- Data are drawn from five population-based sources in England. Each capture unique elements of health and cancer care, which when linked together provide a more comprehensive view of the patient pathway (Figure 1):

- **QResearch**, recording primary care interactions from approximately 1,500 general practices⁴
- **Hospital Episode Statistics (HES)**, recording admissions to NHS hospitals⁵
- **Cancer Registry**, recording cancer registrations⁶
- **Systemic Anti-Cancer Therapy (SACT)**, recording SACT activity reported by NHS trusts⁷
- **Death Registry**, recording death registrations.⁸

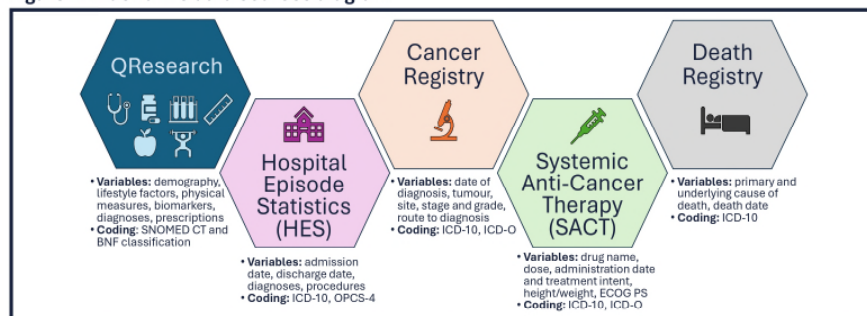
- The study population comprises adults, registered at a QResearch practice for a minimum of one year during 1 January 2013 and 31 December 2023 and with a first record of diagnosis of one of 13 cancer types in QResearch, HES or the Cancer Registry during this study period (Figure 2).

- Main exposure and outcome definitions are listed in Table 1.

- Prevalence and timing (duration of exposure) of metabolic risk factors in obese vs. leaner patients who develop cancer will be analysed, across tumour and treatment types, using descriptive statistics. Logistic regression and time-to-event models will assess associations between risk factors, cancer, cancer treatments and outcomes.

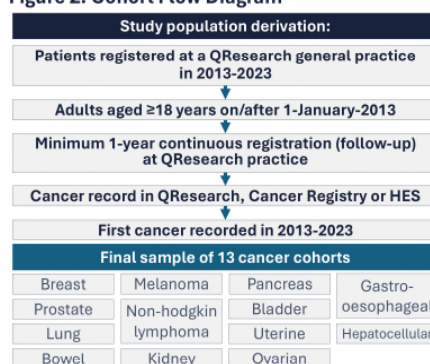
- All analyses are carried out in line with the approved study protocol (OX183), which was independently peer-reviewed and sanctioned by the QResearch Scientific Board.

Figure 1. Illustrative data sources diagram



Abbreviations: BNF – British National Formulary; ECOG PS – Eastern Cooperative Oncology Group Performance Status; ICD-10 – International Classification of Diseases 10th Revision; ICD-O – International Classification of Diseases for Oncology; OPCS-4 – Classification of Interventions and Procedures version 4; SNOMED CT – SNOMED Clinical Terms.

Figure 2. Cohort Flow Diagram



Abbreviations: HES – Hospital Episode Statistics.

Table 1. Main exposures and outcomes

	Study variable type	Data Source(s)	Format
		QResearch HES Cancer Reg. SACT Death Reg.	
Obesity			
Body mass index	Exposure	•	numerical
Waist circumference, waist/hip ratio	Exposure	•	numerical
Metabolic Factors			
Diabetes, hypertension, ischaemic heart disease, dyslipidaemia	Exposure	• •	SNOMED ICD-10
HbA1C, insulin, glucose, blood pressure, lipids, C-reactive protein	Exposure	•	numerical
Cancer Diagnosis	Outcome	• • •	SNOMED ICD-10 ICD-O
Systemic Anti-Cancer Therapy	Outcome/Exposure	•	drug names
Cancer-specific mortality	Outcome	•	ICD-10

Abbreviations: HES – Hospital Episode Statistics; ICD-10 / O – International Classification of Diseases 10th Revision / for Oncology; Reg. – Registry.

PRELIMINARY FINDINGS

- After implementing the cohort derivation steps (Figure 2), preliminary counts of the number of cancer patients available for analysis and person-years of follow-up across tumour types are summarised in Table 2.

- Breast and prostate cancers are the most common cancer types, followed by cancers of the lung and bowel. The distribution of cancer types among QResearch patients is shown to be similar to those reported at a national level.⁹

Table 2. Preliminary Cancer Patient Counts

	No. of Patients ¹	Person-years of follow-up (Total)
Breast	63,000	554,000
Prostate	61,000	531,000
Lung	55,000	322,000
Bowel	53,000	399,000
Malignant melanoma	21,000	184,000
Kidney	16,000	128,000
Pancreas	13,000	72,000
Bladder	24,000	190,000
Gastro-oesophageal	19,000	118,000
Ovarian	9,000	68,000
Hepatocellular	4,000	28,000

¹ with a first record of cancer diagnosis in QResearch, HES or the Cancer Registry in 2013-2023. Numbers are rounded down to the nearest 1000. Person-years calculated from QResearch data eligible to exit data. Data for uterine and non-hodgkin lymphoma not shown as unavailable at time of analysis.

IMPACT

- In this unique data linkage study, involving five population-based sources in England with more than 300,000 cancer patients with 2.5 million person-years of follow-up, there is an unparalleled opportunity to study the relationship between metabolic dysfunction, obesity and cancer development and outcomes.

- A contemporary population-based estimate of metabolic dysfunction timing and prevalence in cancer patients with and without obesity, may help guide risk stratification, reveal optimal windows for intervention, and inform ongoing public health campaigns aimed at preventing cancer

- Results may also lead to a more precise phenotypic definition of what metabolic dysfunction means in the context of cancer.

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