



Job description

Job title:	Macmillan/ National Cancer Audit Collaborating Centre (NATCAN) Data Scientist
Grade:	Grade X: LSHTM scale £39,984 to £51,872 per annum depending on qualifications and experience
Department:	Clinical Effectiveness Unit – National Cancer Audit Collaborating Centre
Accountable to:	Dr Julie Nossiter, Director of Operations, National Cancer Audit Collaborating Centre and ultimately, to the Director, Clinical Effectiveness Unit (Professor David Cromwell)

Job summary

This [Macmillan Cancer Support](#) funded post offers a unique opportunity to work at the [National Cancer Audit Collaborating Centre \(NATCAN\)](#) within the Clinical Effectiveness Unit (CEU) at the Royal College of Surgeons of England (RCSEng). NATCAN is a national centre of excellence dedicated to strengthening NHS cancer services and reducing variation in care and is the home of all 10 National Cancer Audits in England and Wales.

This post will support a Macmillan funded partnership with NATCAN to improve understanding of how to:

- Reduce health inequities within cancer treatment and care;
- Support those with cancer and other long-term conditions;
- Reduce unwarranted variation in cancer treatment and care.

The successful candidate will complete a PhD focused on one of the following thematic areas:

1. Hub and Spoke model – understanding variation in outcomes between hubs (tertiary centres) and spokes (general hospitals)
2. Treatment Attrition – understanding who drops out of treatment and why
3. Under-treatment and over/inappropriate treatment - understanding why some people receive less or no treatment, or treatment that differs from clinical guidance

NATCAN is based in the CEU, a collaboration between the RCSEng and the London School of Hygiene and Tropical Medicine (LSHTM). NATCAN is the largest centre evaluating cancer services in the UK, with 45 staff members, employed at the RCS or the LSHTM, from a wide range of backgrounds (medicine, statistics, epidemiology, data science, quality improvement, project management). You will also be part of a wider cohort of Macmillan Fellows working on projects to improve cancer care.



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Data Scientist

This is a key role in data science and reporting in NATCAN, working closely with senior cancer specialists, clinical fellows, methodologists, data managers, and other multidisciplinary team members. The post holder will develop advanced analysis and research skills. Having large detailed linked datasets provides opportunities to be involved in methodological development and in epidemiological studies assessing the quality of care and answering the most pressing questions about why some cancer patients receive different treatments and outcomes than others. The results of the work will be disseminated as peer-reviewed academic papers, and conference presentations as well as audit reports and their online dashboards. Work of the post holder will also include some of the following: supporting development to improve the efficiency of data analysis and reporting within the centre; working on the data flow into and within NATCAN; data validation; data science processes; automated reporting; state-of-the-art data visualisation and dashboards.

A current data scientist in NATCAN says: *“This role provides a fantastic opportunity to be part of multidisciplinary teams carrying out clinical audit and research with ‘big data’. For this to drive quality improvement and make a real difference to patients, we need more input from data scientists to handle the data coming into NATCAN efficiently and analyse and report on it effectively. My role has been extremely well-supported from academics and clinicians at the forefront of their fields and has provided me with invaluable opportunities to develop my data science skills, present at national and international conferences, and contribute to meaningful improvements for patients with cancer. I cannot recommend this position highly enough.”*

This post is located at the Royal College of Surgeons of England. There are opportunities to work remotely within the UK, to be discussed upon appointment. However, there is an expectation that post holders attend the RCSEng regularly for in person meetings.

Further details about Macmillan, the National Cancer Audit Collaborating Centre and the Clinical Effectiveness Unit are available at the bottom of the job description.

Specific duties and responsibilities

The duties and responsibilities of the role will depend in part on the experience, skills and interests of the post holder. The post holder will need to be flexible to how the needs of the partnership between Macmillan and NATCAN change over time.

1. **Statistical analyses for national cancer audits and research projects**

In collaboration with other team members across NATCAN, the post holder will design and carry out statistical analyses for the thematic research and related audit outputs using linked national cancer and administrative datasets. They will deal with methodological issues that arise, such as handling missing data, incomplete data linkage, or the censoring of individuals in time-to-event data, and the development of risk-adjustment approaches for making fair comparisons between organisations. Areas of statistical analysis work will be guided by the thematic areas of the Macmillan funded partnership with NATCAN and include, for example:



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- Reducing health inequities within cancer treatment and care;
- Supporting those with cancer and other long-term conditions;
- Reducing unwarranted variation in cancer treatment and care.

The post holder will be expected to work collaboratively across multidisciplinary teams and be able to communicate the methods and findings of analyses to a medical and lay audience. They will be expected to present their results in seminars and write up their findings for inclusion in project reports, academic journals and conference presentations.

2. Data science and provision of automated reporting across cancer audits

The delivery of ten cancer audits brings the opportunity for highly efficient working across audits. The post holder will be required to actively seek potential areas for cross-audit working in data preparation, analysis methods and reporting. Areas contributing to cross-audit working may include:

- Extracting, wrangling and curating large scale linked clinical datasets ready for analysis using SQL or statistical software (R, Python, Stata), and supporting related documentation
- Developing and applying reusable data pipelines and applying algorithms and code lists to derive required variables
- Contributing to developing automated reports, dashboards and data visualisations to support local quality improvement

3. Development and training

- Contributing to producing appropriate training material for technical and non-technical staff on data science and the application of statistical techniques in cancer research and audit
- Undergo further training in statistics, data science, research and audit methodology
- Keep abreast of and adapt to changes in the national cancer data landscape, and developments in presenting and disseminating statistical information (e.g. dashboards and control charts) to hospitals. Attend and contribute to Macmillan Fellowship Cohort events and engagement activities.

4. Other

- Maintaining the confidentiality of data at all times and to ensure that the requirements of the Data Protection Act are met throughout the work of the National Cancer Audit Collaborating Centre
- Ensuring that data analysis and reporting is carried out to the highest professional standards
- Supporting processes to ensure that data access, management and analysis activities take place within a robust data sharing and information governance framework that meets legal IG requirements
- Liaising with all professional bodies involved in the management of patients with cancer, and to represent NATCAN at regional and national meetings



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- Carrying out other occasional duties within the National Cancer Audit Collaborating Centre and the CEU, e.g. contributing to training workshops

Working in NATCAN/ the CEU will provide a wealth of potential topic areas, such as developing methods for monitoring healthcare performance, understanding variations in care and outcomes of cancer patients, improving data validation of linked datasets, and designing and evaluating quality improvement initiatives.

The post holder will also have the opportunity to pursue further training in statistical methods, project/programme management, quality improvement methodology or data science. Further training in Information Governance and Data Protection will also be available.

If you would like to find out more about the role please get in touch with Kate Walker, Senior Statistician, National Cancer Audit Collaborating Centre, CEU on kate.walker@lshtm.ac.uk

Applicants should submit a cover letter that concisely addresses each of the essential criteria, in addition to their CV.

The Royal College of Surgeons of England is an Equal Opportunities Employer.

All College employees are responsible for records held, created or used as part of their work for the College including patient/client, corporate and administrative records whether paper-based or electronic, which also includes emails. Records should be managed and stored appropriately and should in all cases comply with the requirements of the Data Protection Act 2018 and the General Data Protection Regulation. Employees should have read and understood the College's Data Protection Policy and Records Management Policy and should follow all agreed records management and data protection procedures, seeking advice where necessary.

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This job description will be subject to review in the light of changing circumstances and may include other duties and responsibilities as may be determined. It is not intended to be rigid or inflexible but should be regarded as providing guidelines within which the individual works.



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Person specification

	Essential	Desirable
Education/Qualifications	Bachelor Level degree in medical statistics, data science, epidemiology, operational research or equivalent academic qualification	Higher degree (MSc) in medical statistics, data science, epidemiology, operational research or equivalent academic qualification
Experience	Experience of undertaking analyses using large complex datasets in a statistical package Contributions to written output, preferably peer-reviewed Experience of applying information governance principles to health care data	Experience of analysing routine national datasets such as Hospital Episode Statistics or Cancer Registry data Experience of working within multidisciplinary teams
Knowledge/skills	A good understanding of health-related research methods and study designs Strong statistical analysis skills, including multivariable regression analyses. Proven ability to communicate statistical concepts and results to non-statisticians Good organisational skills, including an ability to prioritise work to meet deadlines and work on various tasks simultaneously	Knowledge of data protection and information security principles Understanding of advanced statistical techniques such as missing data methods, risk model development, and multilevel modelling Data visualisation skills



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<p>People and interpersonal skills</p>	<p>Excellent verbal and written communication skills, with the ability to adapt oral and written communication</p> <p>Ability to use initiative and work autonomously whilst within a team environment</p>	<p>Effective at building professional relationships and responsive to stakeholder needs</p>
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The post holder will also need to demonstrate the following values:

Collaboration	We embrace our collective responsibilities working collaboratively and as one college.
	<ul style="list-style-type: none">• We work together, using our collective expertise and experience to effect positive change• We are open, honest and transparent, straightforward in our language and actions, acting with sincerity and delivering on our commitments• We take our responsibilities to each other, to patient care and to the environment seriously and we act with this in mind across our work
Respect	We value every person we come into contact with at the College as an individual, respect their aspirations and commitments in life, and seek to understand and meet their physical and wellbeing needs.
	<ul style="list-style-type: none">• We treat everyone we meet with kindness and integrity and we seek to promote these behaviours in others• We actively seek a range of views and experiences across our work, and we listen to, and make everyone feel, a valued part of the team
Excellence	We aspire to excellence and success. We share learning from our experiences, apply feedback into practice, and commit to continual improvement.
	<ul style="list-style-type: none">• We work hard to be the best at what we do, recognising and celebrating effort and achievement, and reflecting on our work, so we can learn and improve• We value and invest in research, education and training to drive excellence and put improvements in surgical practice, dentistry and patient care at the heart of our work• We always seek to learn and discover more, valuing knowledge and scientific evidence, basing our decisions on insights, fact and experience

The Royal College of Surgeons of England is an Equal Opportunities Employer. We are open to all talent and we actively ensure that all qualified applicants will receive equal consideration for employment without regards to race/ethnicity, nationality, religion, pregnancy, marital status, sexual orientation, gender identity/expression, age and disability.



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Macmillan Cancer Support

[Macmillan Cancer Support](#) is one of the UK's leading cancer charities, dedicated to improving the lives of people affected by cancer. The charity's vision is to ensure that everyone with cancer receives the support they need to live as fully as possible. Macmillan provides support through its network of Macmillan professionals, information centres, online resources, and helplines and works in partnership with the NHS and other organisations to deliver person-centred care and advocate for improved cancer services. Macmillan funds research focussed on patient experience and unmet need, service improvement, inequalities, and the wider non-clinical impact of cancer.

Macmillan NATCAN fellows are funded by Macmillan Cancer Support, with support from The Thompson Family Charitable Trust through their lead gift to establish The Macmillan Cancer Care Institute.

National Cancer Audit Collaborating Centre

Evaluating and where necessary improving the treatment for cancer patients is a key priority for the NHS Cancer Programme, and the Quality Statement for Cancer Wales. The Healthcare Quality Improvement Partnership, on behalf of NHS England and the Welsh Government, has commissioned the development and establishment of a new centre of excellence for national cancer audits.

[NATCAN](#) is part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). NATCAN is home to all ten national cancer audits. This includes new audits in breast cancer (primary and metastatic), ovarian, pancreatic, non-Hodgkin lymphoma and kidney cancer, as well as long-standing audits in prostate, lung, oesophago-gastric and bowel cancer. These audits have helped to identify and address variations in cancer care across England and Wales and improve outcomes for patients. They have also promoted quality improvement initiatives within NHS cancer services and identified best practice.

NATCAN aims to:

1. Provide regular and timely evidence to cancer services of where patterns of care in England and Wales vary.
2. Support NHS services to identify the reasons for the variation in care in order to guide quality improvement initiatives.
3. Stimulate improvements in cancer detection, treatment and outcomes including survival.

NATCAN began on the 1 October 2022 in the CEU, a collaboration between the RCSEng and LSHTM. NATCAN collaborates closely with professional groups, clinicians and patient charities to ensure that all relevant stakeholders inform the quality improvement goals of each audit. NATCAN has approximately 45 staff from a range of disciplines including statistics, data science, health services research, epidemiology, healthcare quality improvement and clinical audit management. It is led by Dr Julie Nossiter, Director of



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Operations, NATCAN; Prof David Cromwell, Director of the CEU and Professor of Health Services Research, LSHTM; Prof Kate Walker, Professor of Medical Statistics, LSHTM; and Prof Jan van der Meulen, Professor of Clinical Epidemiology, LSHTM. NATCAN is currently recruiting for our next Clinical Director.

NATCAN is a key source of information that supports various quality assessment and improvement activities, both at a local level (by NHS trusts and boards, Cancer Alliances, Integrated care Systems) and at a national level (e.g., CQC inspection and regulatory work). The activities of NATCAN and the individual audits will drive quality improvement across the country aiming to help cancer services reach the highest standards possible.

Clinical Effectiveness Unit

The [CEU](#) is a collaboration between the RCSEng and the Department of Health Services Research & Policy of the LSHTM.

The work of the CEU involves carrying out national clinical audits, developing audit methodologies and producing evidence on clinical and cost effectiveness. An essential element of the CEU's strategy is that it considers audit projects as *epidemiological studies* of the quality of hospital care. Epidemiological methods are used to generate high quality evidence on the *processes* and *outcomes* of hospital care as well as on their *determinants*. Another important feature of the CEU's strategy is the emphasis it gives to joint clinical and methodological leadership.

The CEU has 50 staff members, of whom 12 are academic staff members of the LSHTM. The background of the staff demonstrates the multidisciplinary character of the Unit (medicine, health services research, medical statistics, epidemiology and public health). The Unit's Director is Professor David Cromwell.



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