Royal College of Surgeons of England
ADVANCING SURGICAL CARE

Job description

Job title:	**Data Scientists x 3**
Grade:	Grade X: LSHTM scale £39,432 to £51,156 per annum depending on qualifications and experience
Department:	Clinical Effectiveness Unit – National Cancer Audit Collaborating Centre
Responsible for:	Working with team members to deliver national cancer audits of the 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

These posts offer 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 new national centre of excellence overseeing the 10 National Cancer Audits in England and Wales aiming to strengthen NHS cancer services by looking at treatments and patient outcomes across the NHS. The CEU is 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 40 staff members, employed at the RCS or the LSTHM, from a wide range of backgrounds (medicine, statistics, epidemiology, data science, quality improvement, project management).

Data Scientists

These are key roles in data science and reporting in NATCAN, working closely with senior cancer specialists, clinical fellows, methodologists, data managers, and other multidisciplinary members. The post holders 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 audit reports, dashboards, peer-reviewed academic papers, and conference presentations. The post holders will also support 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 "*These data scientist roles provide 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."

Specific duties and responsibilities

Three data scientist roles are available at different grades. The duties and responsibilities of each role will depend in part on the experience, skills and interests of the post holder. Post holders will need to be flexible to how the needs of the National Cancer Audit Collaborating Centre change over time.

1. Statistical analyses for national cancer audits and research projects

In collaboration with other team members across NATCAN, the post holders will design and carry out statistical analyses for national cancer audits and research projects 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 include, for example:

- Describing the cancer care and outcomes across different NHS organisations
- Examining how different patterns of care may influence patient outcomes
- Benchmarking and monitoring performance of healthcare providers over time
- Conducting analyses to support quality improvement initiatives

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 analyses 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-holders will be required to actively seek potential areas for cross-audit working in data preparation, analysis methods and reporting. Accurate documentation of data extraction, cleaning, validation and indicator production will be crucial. Areas contributing to the aspiration of efficient cross-audit working will 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
- Developing and performing systematic data quality checks across and within projects
- Producing automated reports, dashboards and data visualisations to support local quality improvement

3. Data access and Information Governance (IG)

- Supporting the Director of Operations with data access requests
- 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
- Liaise with RCS Data protection Officer (DPO) to ensure projects comply with RCS information governance policies and other statutory requirements

4. Development and training

- Contributing to training material for technical and non-technical staff on data science and the application of statistical techniques
- 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.

5. 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 collection, analysis and reporting is carried out to the highest professional standards
- Carrying out other occasional duties within the National Cancer Audit Collaborating Centre and the CEU, e.g. contributing to training workshops

The post-holders will have the opportunity to publish academic output in health informatics, statistics, or data science. 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-holders 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.

Further information about NATCAN & CEU is available at the bottom of the job description.

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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.

October 2024

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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 managing relational databases and using SQL 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

People and interpersonal skills	Excellent verbal and written communication skills, with the ability to adapt oral and written communication Ability to use initiative and work autonomously whilst within a team environment	Effective at building professional relationships and responsive to stakeholder needs

The post holder will also need to demonstrate the following values:

Collaboration	**We embrace our collective responsibilities working collaboratively and as one college.**
	• 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.**
	• 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.**
	• 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 age, disability, gender reassignment, marriage or civil partnership, pregnancy and maternity, race, religion or belief, sex or sexual orientation.

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. In addition, this includes to existing clinical audits in prostate, lung, gastro-oesophageal 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 40 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 Operations, NATCAN; Prof Ajay Aggarwal, Clinical Director, 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 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 e*pidemiological 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 45 staff members, of whom 6 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.