

Job description

Job title:	Data Scientists/ statisticians
Grade:	X
Department:	Clinical Effectiveness Unit (CEU) – National Cancer Audit Collaborating Centre (NATCAN)
Responsible for:	n/a
Accountable to:	<i>Operations Director, National Cancer Audit Collaborating Centre, and Director of Clinical Effectiveness Unit</i>

Job summary

The roles provide a unique opportunity to work at a new national centre of excellence to help strengthen NHS cancer services and reduce variation in care. The roles are based at the National Cancer Audit Collaborating Centre (NATCAN) within the Clinical Effectiveness Unit (CEU), jointly run by the Royal College of Surgeons of England (RCS) and the London School of Hygiene and Tropical Medicine.

The post holders will be part of multidisciplinary teams, including senior cancer specialists, clinical fellows and project managers, who together deliver national cancer audits and carry out research. They will be developing 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 some of this work will be reported as peer-reviewed academic papers and PhD projects, supervised by senior colleagues within the National Cancer Audit Collaborating Centre.

A current statistician in the CEU says “These data scientist/ statistician roles provide a fantastic opportunity to carry out clinical research with ‘big data’. The new team members will learn a wide range of research skills and advanced analytical methods. There will be opportunities to answer really important questions about how to improve the quality of cancer care, and to develop the methods that we use for these national studies. 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 skills, present at conferences, and contribute to meaningful improvements for patients with cancer. I cannot recommend this position highly enough.”

The posts are available for remote working at any UK location, to be discussed upon appointment. However, there is an expectation that post holders attend the RCS regularly for in person meetings



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Specific duties and responsibilities

Several data scientist/ statistician 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. The posts will be shaped by work of the National Cancer Audit Collaborating Centre and the Clinical Effectiveness Unit as they evolve over time.

1. Statistical analyses for national cancer audits and research projects

In collaboration with other team members, 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
- Conducting analyses to support quality improvement initiatives

The post holder will be expected to work collaboratively within 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 management and provision of automated reporting across cancer audits

The delivery of six new 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
- 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



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3. Data access and Information Governance (IG)

- Supporting the Operations Director with data access requests
- Developing and maintaining 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

- Contribute to training material for technical and non-technical staff on data management 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 pursue a PhD in health informatics, statistics, data science or data management. Working in 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.

Further training in Information Governance and Data Protection will also be available.

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
Qualifications	<ul style="list-style-type: none"> Bachelor Level degree in medical statistics, data science, epidemiology, operational research or equivalent academic qualification 	<ul style="list-style-type: none"> Higher degree (MSc) in medical statistics, data science, epidemiology, operational research or equivalent academic qualification
Experience and skills	<ul style="list-style-type: none"> A good understanding of health-related research methods and study designs 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 Strong statistical analysis skills, including multivariable regression analyses. 	<ul style="list-style-type: none"> Knowledge of data protection and information security principles Experience of managing relational databases and using SQL Experience of writing applications to access healthcare datasets Experience of working within multidisciplinary teams Understanding of advanced statistical techniques such as missing data methods, risk model development, and multilevel modelling Data visualisation skills
Financial management and business planning		



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People and interpersonal skills	<ul style="list-style-type: none">• 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	
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The post holder will also need to demonstrate the following values:

Collaboration	<p>We embrace our collective responsibilities working collaboratively and as one college.</p> <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	<p>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.</p> <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	<p>We aspire to excellence and success. We share learning from our experiences, apply feedback into practice, and commit to continual improvement.</p> <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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National Cancer Audit Collaborating Centre (NATCAN)

NATCAN is part of the National Clinical Audit and Patient Outcomes Programme (NCAPOP). The centre is commissioned by the Healthcare Quality Improvement Partnership on behalf of NHS England and the Welsh Government. The Centre will deliver five new national cancer audits in breast cancer (primary and metastatic), ovarian, pancreatic, non-Hodgkin lymphoma and kidney cancer. It 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 will collaborate closely with professional groups, clinicians and patient charities to ensure that all relevant stakeholders inform the quality improvement goals of each audit. The Centre will have approximately 20 staff from a range of disciplines including statistics, data science, health services research, epidemiology, healthcare quality improvement and clinical audit management. It will be led by Dr Julie Nossiter, who will be the Centre's Operations Director, and Prof David Cromwell, Dr Kate Walker, and Prof Jan van der Meulen who are public health academics at London School of Hygiene and Tropical Medicine (LSHTM).

Cancer treatment is complex – there are multiple treatment options for different types of cancer. A patient's treatment plan needs to take into account their overall health, the stage of their cancer, and how they may respond to treatment. A key aim for each audit will be to ensure the information produced for cancer services recognises these differences and supports hospitals to focus on specific parts of the care pathway.

Clinical Effectiveness Unit

The Clinical Effectiveness Unit (CEU) is a collaboration between The Royal College of Surgeons of England and the Department of Health Services Research and Policy of the London School of Hygiene and Tropical Medicine (LSHTM) (<https://www.rcseng.ac.uk/surgeons/research/surgical-research/ceu>).

The work of the CEU involves carrying out national clinical audits, developing audit methodologies and producing evidence on clinical and cost effectiveness. The CEU currently delivers cancer audits in prostate, lung, bowel, oesophageal and stomach cancer, and recently completed an audit of breast cancer in older patients. 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.

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.



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Another important feature of the CEU's strategy is the emphasis it gives to joint clinical and methodological leadership.

The CEU has 20 staff members, of whom 6 are academic staff members of 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 David Cromwell, Professor of Health Services Research.



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