

**Job Description Notice of Change**

Public Health Scotland (PHS) is a new organisation, formally established on the 1 April 2020 that brings together the experience and knowledge of NHS Health Scotland and two parts of National Services Scotland - Health Protection Scotland (HPS) and the Information Services Division (ISD). Staff were migrated to become PHS employees from this date on existing job descriptions.

As a result of the recent merger and establishment of PHS, job description(s) associated with the current vacancy still reflect the National Services Scotland brand and structure. Candidates are advised that all job description(s) shall be updated over the coming months to reflect PHS branding and organisational structure as part of the establishment of the new organisation.

# JOB DESCRIPTION

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| **1. JOB DETAILS** | | | | | | |
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| Job Title | | | **Bioinformatician** | | | |
| Immediate Senior Officer/ Line Manager | | | Service Manager for Public Health Microbiology | | | |
| Department | | | Health Protection Scotland (HPS) | | | |
| SBU | | | Public Health and Intelligence | | | |
| Location | | |  | | | |
| CAJE Reference | | | NPPHIS339 | | | |
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| **2. JOB PURPOSE** | | | | | | |
| The post holder will be responsible for the delivery of bioinformatics in HPS and the Scottish Microbiology Reference Laboratories. They will maintain, enhance and develop reliable and efficient infrastructure for bioinformatics tools and processes to ensure the highest quality public health microbiology service.  The post holder will ensure that HPS and the Scottish Microbiology Reference Laboratories comply with legal and professional requirements for safe transmission and storage of large amounts of data. Also ensuring implementation of standard operating procedures (SOPs) and systems documentation.  The post holder will provide highly specialised advice and training for bioinformatics to colleagues within HPS, the Scottish Microbiology Reference Laboratories and the wider public health microbiology community. | | | | | | |
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| **3. DIMENSIONS** | | | | | | |
| The Scottish reference laboratories receive isolates and specimens from Microbiology laboratories and offer a comprehensive specialist service focusing on a defined portfolio of services to the Scottish users. Due to a global change in technology, these laboratories are currently undergoing a service transformation to replace older phenotypic and genotypic methodologies with a single genomic methodology (next generation sequencing). The Reference Laboratories work in partnership with Health Protection Scotland which is the biggest national user of the organism specific genomic data generated by the Reference Laboratories as the data forms an essential part of the intelligence needed to investigate and control outbreaks and incidents.  The post holder is a bioinformatician who has day to day responsibility for the development and delivery of bioinformatics underpinning service transformation to Whole Genome Sequencing (WGS) based typing services within the Scottish Microbiology Reference Laboratories in NHS GG&C and NHS Lothian (including analytical protocols, processing and storage solutions). For implementing a bioinformatics infrastructure and user tools hosted by HPS that enable scientific, data and clinical staff groups to integrate the genomic data in their epidemiological and health protection practice. The post holder will function as a key person in the national implementation of next generation sequencing technology in reference laboratory and health protection/public health microbiology services in the coming years, and will have a link function between HPS and the Scottish Reference Laboratories and associated IT departments and collaborative partners. | | | | | | |
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| **4. ORGANISATION CHART**  **Public Health Microbiology Team**  SHPN  Programme Manager  Programme Support Officer  HPS Associate Director  PH Microbiology Service Manager  Bioinformatician  HPS Clinical Director  Clinical Lead  PH Microbiology /  Consultant Microbiologist  Senior Scientist  Consultant Virologist  WGS Advisor  Ref Labs Directors | | | | | | |
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| **5. ROLE OF THE DEPARTMENT** | | | | | | |
| HPS plan and deliver effective and specialist national services which co-ordinate, strengthen and support activities aimed at protecting all the people of Scotland from infectious and environmental hazards. This is done by providing advice, support and information to health professionals, national and local government, the general public and a number of other bodies that play a part in protecting health. The Public Health Microbiology Team coordinates and oversees strategic direction for the delivery of the Public Health Microbiology functions for HPS and also on behalf of the SHPN.  HPS relies on intelligence and specialist clinical microbiology and virology advice generated by the Reference Laboratories for public health purposes to deliver their national Public Health function, including epidemic preparedness, surveillance of communicable and preventable diseases and health protection functions.  The Scottish Microbiology Reference Laboratories provide National Reference facilities for the people of Scotland from laboratories mainly located in NHS GG&C and NHS Lothian.  The Scottish Reference Laboratories fall under the auspices of National Services Scotland (NSS), HPS along with the National Services Division (NSD) have a statutory role in commissioning on behalf of the Scottish Government.  The laboratories work closely with HPS to deliver key Public Health functions for national surveillance of infection within Scotland and to support the investigation and management of outbreaks and incidents. There is also close working with NHS Scotland Genetics and PHE colleagues and other agencies within the UK to support UK-wide activities, and within relevant networks and partners within the EU and beyond to support the international Public Health Microbiology collaborative infrastructure. | | | | | | |
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| **6. KEY RESULT AREAS** | | | | | | |
| 1. Responsible for developing and maintaining protocols for the primary and secondary analysis of next generation sequencing (NGS) data for detailed and accurate sub-typing of Microbiology isolates and rapid and accurate outbreak identification. The post holder will work with the scientific staff to transform large volumes of statistical and genomic data into annotated results for clinical reporting in HPS. 2. Adhere strictly to the departmental policies and Standard Operating Procedures and follow Health and Safety regulations, as outlined in HPS and the laboratories protocols and policies. The post holder will also write and maintain Standard Operating Procedures relating to procedures involving bioinformatics, ensuring that they comply with standards for accreditation. 3. The post holder must organise, prioritise and perform their own work in HPS and the laboratories. They must be responsible for the time management of multiple tasks and to respond to the changing requirements of HPS and the laboratories by taking on additional tasks and responsibilities as required in relation to bioinformatics. 4. To demonstrate and apply a thorough understanding of the scientific principles involved in the delivery of a public health microbiology service including health protection/public health and reference laboratory services. 5. Support the HPS Public Health Microbiology team by providing technical expertise. The post holder will provide specialised advice to colleagues within HPS and the reference laboratories in matters relating to bioinformatics. 6. To deliver bioinformatics protocols in the reference laboratories (involving critical appraisal and validation of computational algorithms) and quality assure analytical data extracted in relation to results and reports, which include statistical analysis. 7. To participate in internal and external quality control procedures and assessments, as directed by the service manager. The post holder will also help determine and establish internal quality control parameters and quality indicators for bioinformatics analysis and protocol. 8. To monitor the quality of the data produced by next generation sequencing, microarrays and other technologies to ensure that it meets the standards required for reference laboratory and health protection services, according to laboratory protocols and national professional standards. 9. Have expertise in epidemiological user software and associated platforms in order to be able to appraise alternative solutions, develop high level service models and detailed product specifications and contribute to business cases for the user end at HPS (and other NHS users). 10. To plan, develop, validate and implement major bioinformatics tools, protocols and processes for efficient analysis, annotation and interpretation of large amounts data generated from next generation sequencing, microarray and other technologies as required. 11. To create intuitive macros, routines and other software tools to allow user-friendly manipulation and annotation of data by laboratory staff and users. 12. Working with laboratory management and IT colleagues in HPS/NHS GGC and Lothian to monitor and evaluate new developments in bioinformatics to ensure that the laboratories use the most appropriate tools and methods available to deliver a high quality diagnostic service. 13. To support the development and maintenance of effective databases for storage of scientific and clinical information and to help establish links with the LIMS, working with IT colleagues in HPS/NHS GGC and Lothian. 14. Working with IT colleagues in HPS/NHS GGC and Lothian to develop and maintain effective methods for robust storage and transmission of large amounts data generated by different processes, ensuring that the appropriate regulatory and legal standards are met. 15. Contribute to the development of strategy and implementation plans especially by providing technical expertise (e.g. by explaining limitations and opportunities of alternative solutions).  Managerial  1. To participate in the laboratories internal audit programmes as directed by the Ref Labs Directors and present the results of audit work to colleagues at internal and national meetings. 2. Ensures that the HPS and the laboratories comply with requirements of data protection, liaising with the NHS Boards information governance and IT security managers as required. The postholder will also be required to be aware of and follow the current regional and national policies and legislature, along with UK best practice guidelines for the service and promote these to others. 3. Be responsible for maintaining, implementing and notifying all relevant laboratory staff of software and protocol updates, ensuring that all changes and procedures are documented properly informing the quality manager/service manager.   **Research and Development**   1. Develop and validate bioinformatics initiatives designed to improve the efficiency of existing services and present the results of bioinformatics service development to colleagues at internal meetings. To undertake and collaborate in relevant research and development on the application of bioinformatics for new diagnostic techniques. Maintain an awareness of the relevant scientific literature aimed at providing expert opinion within professional boundaries.   **Teaching and Training**   1. Regularly train and supervise relevant HPS and laboratory staff on bioinformatics applications and report any training issues to the Public Health Microbiology team. 2. To represent the team at relevant bioinformatic local, national and international meetings, as deemed appropriate by the Service Manager, and to disseminate information gathered at these meeting back to relevant colleagues. | | | | | | |
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| **7. ASSIGNMENT AND REVIEW OF WORK** | | | | | | |
| The post holder will report to the clinical lead for Public Health Microbiology, and operationally report to the HPS Service Manager for Public Health Microbiology, they will also work alongside laboratory quality managers.  The post holder will work autonomously and be responsible for delegating reviewing and organising their own work. The postholder may have to reprioritise this depending on the requirement for urgent bioinformatics analysis such as data analysis for an outbreak or an urgent diagnostic/confirmatory test result. They will be expected to use judgement around timescales, adjusting as appropriate. Where complex or unusual situations or incidents occur they will be expected to consider a range of options and recommend solutions to the consultant.  The post-holder is responsible for delivery of agreed objectives within guidelines provided, however they will frequently be required to determine how this is best achieved. The postholder will make decisions which require an understanding of NSS/HPS’s policies, procedures and methodologies. A portion of the work undertaken by the post-holder will be project-based i.e. designing bespoke bioinformatics protocols.  The postholder will make decisions regarding complicated and/or problematic analysis, troubleshooting and offering advice and guidance to other staff where appropriate, in consultation with head of laboratory.  The post holder will compile analytical clinical data reports to ensure that the information is clear, concise and unambiguous. The postholder will achieve this by using their expertise when making judgements, when identifying variants and making the decision whether these are real biological changes or artefacts of the methodology to avoid false positive results. | | | | | | |
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| **8. COMMUNICATIONS AND WORKING RELATIONSHIPS** | | | | | | |
| The post holder needs to be an excellent communicator, skilled in effective, concise and accurate briefing. The post holder will be expected to deliver presentations or contribute to, at a local, national and international level. This will be to the medical and scientific community concerned with WGS (in conference settings), this will be approximately 3-4 times per year.  Internal   * Communicate complex information regularly with colleagues within the IT Department. Such discussions will generally be technological or procedural in nature and will be aimed at ensuring HPS and the laboratories are provided with coherent and integrated solutions from the IT Departments. * Liaise with the training officer when training other members of staff. * Liaise with the Service manager (and laboratory quality managers) for issues relating to UKAS accreditation. * Liaise with senior management, on issues relating to service management. * Liaise with the Clinical Lead for PH Microbiology at HPS on other issues relating to clinical service delivery.   External   * Maintain close links with colleagues in other areas of NHS such as Laboratory Genetics and also other departments within the other directorates (e.g. Clinical Genetics, Biochemical Genetics, Pathology, Haematology, Microbiology, Virology, Biochemistry) to provide an integrated high quality service. * Communicate collaboratively with colleagues from HPS, the SHPN, other Scottish microbiology reference services, PHE and University departments (and other UK organisations) and commercial suppliers to maximise the speed of development and implementation of next generation sequencing technologies. | | | | | | |
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| **9. MOST CHALLENGING PART OF THE JOB** | | | | | | |
| Developing and implementing a bioinformatics protocol for routine diagnostic use where the technology is highly developmental and with limited knowledge or support available from colleagues with a similar role, in collaboration with laboratory management.  Undertaking research and development with a view to ensuring that HPS and the Reference Laboratories adopt those emerging technologies which represent real service benefits.  Working to very demanding Professional Standard Guidelines. These cover both the necessary quality of the work undertaken and also the acceptable turn-around times.  The acquisition and maintenance of knowledge with regards to laboratory procedures, and the interpretation and the reporting of results, which must be constantly refreshed as practice and guidelines change. | | | | | | |
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| **10. Systems** | | | | | | |
| The post holder will record and extract patient information, search for patient test information, generate patient data and reports using the bioinformatics protocols and analyse results using specialised, highly specialised or custom-written software packages and bioinformatics protocols.  The post holder will search for patient test information and simple audit to produce standard and non-standard reports as required by the head of laboratories.  The postholder will update and manage specific databases and produce electronic data e.g. Word, Access, Excel, PowerPoint.  Systems  Laboratories LIMS (Telepath) laboratories’ quality management system e-library Datix incident reporting  To produce electronic data e.g. Word, Access, Excel, PowerPoint. | | | | | | |
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| **11. WORKING ENVIRONMENT AND EFFORT** | | | | | | |
| **Physical Effort** | | | | | | |
| * Frequent requirement for sitting in a restricted position for extended periods whilst using computer workstation and specialist software to analyse data and results, or to write and authorise patient reports with little opportunity to exercise during this time. | | | | | | |
| Mental Effort | | | | | | |
| * There is a frequent requirement for prolonged, intense concentration when analysing and interpreting genetic diagnostic data and results. Often processing very large data sets. * Work pattern can be unpredictable due to demands of the service; therefore the post holder must be able to multi-task and deal with the unpredictable bioinformatics workloads and changing priorities. | | | | | | |
| **Emotional Effort** | | | | | | |
| * The handling of patient data and maintaining patient confidentiality whilst processing specimens / isolates which will undergo testing for example from a baby on a ventilator, can be emotionally distressing. | | | | | | |
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| **12. ENVIRONMENTAL / WORKING CONDITIONS & MACHINERY AND EQUIPMENT** | | | | | | |
| Photocopier for duplicating documentation.  Fax Machine for sending and receiving documents.  Scanners for document archiving.  Email  Telephone for communication both internally and externally.  Continuous use of display screen equipment (DSE) on a daily basis. | | | | | | |
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| **13. QUALIFICATIONS AND/OR EXPERIENCE SPECIFIED FOR THE POST** | | | | | | |
| * MSc or equivalent postgraduate qualification in bioinformatics with experience of Microbiology genetics OR MSc or equivalent postgraduate qualification in a Microbiology based discipline with a significant bioinformatics component. * Significant experience of developing and implementing bioinformatics tools and resources. * Experience of applying bioinformatics in a diagnostic laboratory is desirable. * Experience of scripting language (e.g. C++ or Java). * Bioinformatics analysis of next generation sequencing data. * Bioinformatics analysis of microarray data is desirable. * Thorough knowledge and understanding of next-generation sequencing approaches and statistical methodology used for the analysis of the large data sets generated. * Thorough knowledge of bioinformatics tools available for the analysis and interpretation of genetic and genomic data. * Specialist scientific and clinical knowledge in a diagnostics setting is desirable. * Good knowledge of UNIX, programming and scripting language. * Knowledge of information governance and data protection requirements. * Capable of prolonged concentration and attention to detail. * Ability to work as an effective team member in the delivery of a diagnostic service. * Careful and meticulous, adhering to written organisational and laboratory policies and procedures. * Enthusiastic and motivated. * Good verbal and written communication skills. * Ability to impart bioinformatics knowledge to less experienced colleagues. * Demonstrate and participate in continuous professional development. * Advanced IT skills including expertise in the manipulation of information/data and the ability to produce reports and statistical analysis. | | | | | | |
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| **14. JOB DESCRIPTION AGREEMENT** | | | | | | |
| A separate job description will need to be signed off by each postholder to whom the job description applies. | | | | | | |
| Postholder Signature: |  | | | Date: |  |  |
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| Postholder Print: |  | | |  |  |  |
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| Manager Signature: |  | | | Date: |  |  |
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