NIHR | Applied Research Collaboration South West Peninsula

HSMA 4 Information for Applicants

Thank you for applying for the fourth round of the Health Service Modelling Associates Programme. Please read the following information carefully before commencing your application.

The HSMA Programme is a hybrid training and mentoring programme funded by the NIHR Applied Research Collaboration South West Peninsula (PenARC) (https://www.arc-swp.nihr.ac.uk/). Whilst primarily targeted at staff currently working in analytical roles, it is open to all staff working in health, social care, policing and other related organisations (such as Public Health and third sector organisations) who have sufficient analytical and IT skills to be able to undertake the programme. The programme demands a significant commitment – at least one day a week for a period of 12 months (with some weeks in the training phase requiring more than a day a week), in addition to attending 8 virtual Learning Set Meetings and a final presentation event at the end of the programme. Therefore, all applicants must have the full backing of their organisation, and we ask you as part of the application process to name a senior staff member (someone with responsibility for your workload who is supportive of your application), to ensure your time to undertake the programme is protected. If successful in moving onto Phase 2 of the programme (see below), this person will adopt the role of your *Workplace Supervisor* – a senior member of your organisation who can help to facilitate the project, champion your work and ensure that your skills become part to the routine analytical function of your organisation.

The commitment outlined above represents the *minimum* level of engagement, and HSMAs will be strongly encouraged to undertake additional exercises and engage in additional learning between training sessions, likely in their own time, to ensure that they are able to cover all the areas they need. Applicants should also be aware that an assessment towards the end of Phase 1 will be set to ensure that HSMAs taking projects forward to Phase 2 of the programme are sufficiently comfortable with the technical methods necessary for their proposed project work. However, applicants should also be assured that the assessment will be as "light touch" as possible.

The aims of the programme are:

1. to embed Operational Research and Data Science methods within health, social care and policing organisations, to improve the level of evidence-based decision making
2. to develop the skills of staff working in analytical roles in health, social care and policing organisations
3. to create embedded ambassadors of Operational Research and Data Science methods
4. to develop and foster collaboration between health, social care and policing organisations

The HSMA programme is split into two phases. In the first phase (October - December), HSMAs are provided with extensive and intensive training in a wide range of modelling, simulation and data science methods. For HSMA 4, 100 places have been made available for Phase 1, which includes 10 places for our Trainee Mentor Scheme, in which experienced Operational Research and Data Science academics or practitioners, or HSMA alumni, are trained to support a Phase 2 project as a mentor. Please note that the HSMA programme is not currently available for anyone based outside of England, or those not

working in the health, social care or policing sectors (or associated organisations). If you are in doubt about your eligibility, please contact the HSMA Programme Lead Dr Daniel Chalk (d.chalk@exeter.ac.uk).

Phase 1 training areas include : Discrete Event Simulation for modelling queuing problems, Geographic Modelling, System Dynamics and Network Analysis for modelling whole systems, Agent Based Simulation for modelling behavioural dynamics, Machine Learning, Natural Language Processing techniques to automatically extract information from free text, and Forecasting methods. In addition, HSMAs are taught how to program, primarily using the Python programming language, but with some training in the use of R. HSMAs are not required to have any prior programming experience, as they will be taught programming from the basic principles upwards, although previous experience in other languages may help applicants to understand whether they have an aptitude for programming, which is an important part of the HSMA programme.

Training sessions will be delivered online, and will mostly be delivered as live lectures delivered on Zoom, with time carved out during each training day for HSMAs to work on individual and group exercises. Some pre-recorded content will also be made available as additional material to support the training programme.

Training sessions will be split into “Core” and “Option” sessions. Core sessions teach skills in Python and R programming, and introduce the broad range of Operational Research and Data Science approaches taught on the course. **All HSMAs must attend all Core sessions.** Option sessions delve deeper into each of the approaches taught, to allow HSMAs to dive deeper into the areas of most interest and/or relevance to them. We strongly encourage all HSMAs to attend all Option sessions, but **as a minimum, we require that they attend 30 hours of the 60 hours of Option sessions available**. HSMAs should be aware that certain Option sessions require not only attendance at all Core sessions, but at other Option sessions. These dependencies are made clear against each session.

The current timetable for HSMA 4 Training is provided in the Key Dates file of your application pack, a link to which is provided on the application form. Please note that there may be minor changes to specific sessions, which could switch content subject to any yet to be announced university timetabling commitments of the trainers, but the **dates themselves will not change.** If you are accepted onto the programme, you must attend all required sessions, which includes:

FOR PHASE 1
- All Core Training sessions
- A minimum of 30 hours of Option Training sessions
- The HSMA 4 Phase 2 Pitches and Panels session

FOR PHASE 2
- One day a week working on your project (managed by the HSMAs themselves – no explicit ‘sessions’ to attend)
- All 8 Learning Set Meetings (for those managing a project in Phase 2)
- The final presentation event in September 2022 (for those managing a project in Phase 2)

Towards the end of Phase 1, HSMAs will be asked to deliver a pitch for a project proposal to take forward into Phase 2 of the programme. The pitch will outline the project that they

would manage in Phase 2 if successful, why the project is important for the organisation/ system, the potential impact of the project and how they propose to undertake it (including what methods they would use, and what data is available to support their project). Pitches will be judged by members of the PenCHORD team and patient representatives, using a number of criteria, which will be published in advance. In particular, for HSMA 4, HSMAs will be encouraged to propose collaborative projects that work together with other HSMAs and which address common issues being faced nationally and/or issues that span the health, social care and policing sectors.

Between 7 and 17 projects will be selected to take forward into Phase 2 of the programme, depending on the number of students coming through the Trainee Mentor Scheme. The HSMAs who pitched the projects will become the Project Managers (and the primary point of contact for the project). Each project will be allocated a *mentor* – a modelling and Data Science expert (either a member of the PenCHORD team or someone who has been through the Trainee Mentor Scheme) who will provide advice, guidance and support throughout the project. However, it is important to stress that ownership of the project remains firmly with the HSMAs and their organisations. In addition, Project Managers are permitted (and encouraged) to further add to their project team from those HSMAs who are not taking a project forward into Phase 2, or who are not successful with their project pitch. However, the mentor will only be able to provide support to the project managers, due to constraints on capacity.

In Phase 2 (January - September), HSMAs will manage their projects through from inception to completion. Once a month, HSMAs will come together to attend a virtual 2 hour Learning Set Meeting. In these meetings, HSMAs will share their progress on their projects with the group, including successes and challenges, and share ideas with each other. HSMAs will also spend time with their mentor discussing specific issues and agreeing next steps. At the end of Phase 2, HSMAs will deliver a presentation of their project at an event attended by national health, social care and policing staff and academics.

All HSMAs admitted onto the programme must join a dedicated channel on Slack (https://slack.com/intl/en-gb/), that has been set up to allow HSMAs to communicate with other HSMAs, mentors, and other members of the PenCHORD team, and share code and other project work easily. Slack is the primary means of communication on the programme. Therefore, it is recommended that HSMAs install the Slack and Zoom apps for their Operating Systems if possible, rather than just using browser-based access to these services.

In order to undertake the programme, HSMAs are required to install a large amount of new software on their computers. Ideally, this should be installed on the work machines HSMAs will be using moving forward, and so they should liaise with their IT departments to ensure this is done in plenty of time. However, we also recommend that HSMAs install the software on their personal machines if possible, to allow for any delays to IT departments installing software on work machines, as the software will be required from the start of the training in Phase 1. The specific software that will need to be installed will be communicated to HSMAs in advance, but will include the following:

- Python and R Programming Languages (with a recommendation to use the Anaconda scientific package - https://docs.anaconda.com/anaconda/navigator/)
- pip (allowing the HSMA to install Python packages as required – this should be installed automatically as part of the Anaconda distribution above)

- QGIS Version 3 (https://qgis.org/en/site/)
- A free account to be created on https://insightmaker.com/ and a free Google account (if you do not already have one) to access Google CoLab (https://colab.research.google.com/).

Please note that HSMAs will not be able to undertake the training unless they have access to a computer with the necessary software installed. For the examples taught on the training programme, there is no explicit need for a high-spec computer. Those who pursue some of the advanced AI methods for their projects will benefit from having access to a high-spec PC with a CUDA-enabled NVIDIA GPU, although online services such as Google CoLab allow anyone to access GPUs in a more limited way if this isn't available locally.

To apply for the programme, you should complete the relevant online application form, depending on whether you are applying to be a student, or to be a mentor through the Trainee Mentor Scheme:

To apply to be a **student** on HSMA 4: **https://exeter.onlinesurveys.ac.uk/hsma-4-studentship-application**

To apply to be a **mentor** on HSMA 4 via the Trainee Mentor Scheme (this is only for existing Operational Research/Data Science academics and practitioners, or for HSMA alumni): **https://exeter.onlinesurveys.ac.uk/hsma-4-trainee-mentorship-application**

In addition to reading through this information thoroughly, please ensure you consult the Person Specification document – a link to which is provided on the application form – to make sure you are familiar with what we are looking for in a successful HSMA applicant, before commencing your application.

If you are applying to be a student on HSMA 4, it is very important that you speak to your line manager or another senior member of your organisation who has responsibility for your time before starting the application. This is because, as part of the application form, you will be asked to name such an individual as your *Workplace Supervisor*, who will support your application and, if your application is successful, your involvement in the programme as follows:

Your workplace supervisor will:

- ensure that your time is protected to undertake the programme
- ensure that your organisation's IT department install the software necessary to undertake the programme
- promote your work across the organisation
- help to ensure that the skills you develop are transferred within the organisation
- help to facilitate the progression and implementation of your project if undertaking a project in Phase 2 (including helping to set up meetings with key stakeholders, and ensuring the results of your project are used to inform decision making)

You are required to provide, the name, job title, organisation and email address of your nominated workplace supervisor, and a confirmation that they have read the information about the programme, and support your application. Please ensure you have this discussion with them in advance of completing and submitting your application. Applications close strictly at **23:59 on 28th July 2021**.

We are expecting demand for places to be highly competitive and to vastly outstrip supply. All applications will be judged on their merit, and we are particularly interested in a) why an applicant wants to apply for the HSMA programme, b) the raw passion and aptitude for the sorts of skills required for modelling and data science, and c) the support of the applicant's organisation, not just in terms of supporting them to undertake the programme, but also in terms of supporting the embedding of these new skills within the organisation. Applicants who are unsuccessful at gaining a place on HSMA 4 are encouraged to apply again for the next round of the programme. We are currently exploring potential funding opportunities to expand the number of places we can offer for HSMA 5.

Should applicants have any further queries about the programme, they are encouraged to contact the HSMA Programme Lead, Dr Daniel Chalk (d.chalk@exeter.ac.uk).