NIHR | Applied Research Collaboration South West Peninsula

# HSMA3 Briefing Document

Thank you for applying for the third round of the Health Service Modelling Associates Programme. Please read the following information carefully before commencing your application and refer back to it as necessary while completing the online form: https://bit.ly/HSMA3-apply.

From p.4 onwards you may also preview the questions asked in the online form. Both you and your prospective NHS Workplace supervisor will need to have input into the form, so you may wish to consider your answers and prepare them in advance to copy and paste, since you will not be able to save the form partway through. Please note that all free-text fields on the form are limited to 4000 characters or approximately 600 words.

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 the NHS within the geographic patch of PenARC 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, in addition to attending 8 virtual Learning Set Meetings. 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 who has 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 *NHS Workplace Supervisor* – a senior member of your organisation 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 sessions, likely in their own time, to ensure that they are able to cover all the areas they need. As places in Phase 2 of the programme are likely to be competitive, and the programme is being delivered virtually, applicants should also be aware that an assessment towards the end of Phase 1 will be set to ensure that HSMAs moving forward 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 NHS organisations, to improve the level of evidence-based decision making
2. to develop the skills of staff working in analytical roles
3. to create embedded ambassadors of Operational Research and Data Science methods
4. to develop and foster collaboration between NHS organisations

The HSMA programme is split into two phases. In the first phase (3 months), HSMAs are provided with extensive and intensive training in a wide range of modelling, simulation and data science methods. Up to 30 HSMAs will be admitted onto this phase of the

programme. 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 techniques such as Deep Reinforcement Learning to create Artificial Intelligence (AI)-based systems that can make decisions, 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.

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, 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 delivered online to other HSMAs, members of the PenCHORD team and patient representatives. Pitches will be judged on a number of criteria, including potential impact and practicability.

Five projects will be selected to take forward into Phase 2 of the programme. 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 member of the PenCHORD team 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 HSMA and their organisation. In addition, Project Managers are permitted (and encouraged) to assemble a project team from those HSMAs who are not taking a project forward into Phase 2. However, the mentor will only be able to provide support to the project manager, due to constraints on capacity.

In Phase 2 (9 months), 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 a virtual event attended by local and national health service staff and academics.

Due to the current global situation, the HSMA 3 course will be delivered entirely *online*. HSMAs will undertake training on set days via a combination of live lectures hosted on Zoom, pre-recorded lectures on YouTube, reading material and exercises using Jupyter Notebooks and Google CoLab (webpage content that includes both narrative text and blocks of runnable code) and Zoom-based group discussions. Learning Set Meetings, and all other events (such as the Open Day and final presentation event) will take place via Zoom. A dedicated channel on Slack (https://slack.com/intl/en-gb/) will be 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, and will be the primary means of communication on the programme. Therefore, it is recommended that HSMAs install the Slack and Zoom apps for their Operating Systems.

Applicants are encouraged to attend a Virtual Open Day session via Zoom on **1st September 2020 10:00 - 12:00.** At this event, applicants will have an opportunity to find out more detailed information about the programme, speak to HSMA alumni about their experiences on the programme, and speak in small groups to members of the PenCHORD team about their application and ask any questions they may have. Please click here to view the full itinerary. **If you would like to join the event, please either indicate this in the final section of the online application form or, if you wish to attend the Open Day before applying, complete the short questionnaire here: https://bit.ly/HSMA3_OpenDayReg to register your attendance and be sent the Zoom meeting details.** Due to a recently announced additional University closure day over the Bank Holiday weekend, registration for the Open Day will now close on **Wednesday 26th August** at 13:00.

Applicants are also encouraged to look at the online information about the previous HSMA programmes to get a better sense of how the programme works:

- Pilot (2016-17): https://health-modelling.org
- HSMA 2018: https://www.arc-swp.nihr.ac.uk/health-service-modelling-associates-programme

Should applicants have any further queries about the programme or the content of their application, please contact the HSMA Programme Lead, Dr Daniel Chalk (**d.chalk@exeter.ac.uk**).

If you encounter any difficulties in accessing or completing the online application form, please contact **penchord@exeter.ac.uk**.

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## Preview of Application Form (apply online: https://bit.ly/HSMA3-apply)

Thank you for applying for the third round of the Health Service Modelling Associates Programme. Please ensure that you read the information available in the Briefing Document carefully before commencing your application, and refer back to it as necessary as you progress through the form. In the Briefing Document you may also preview the questions in the application form so that you can consider your answers and prepare them in advance if you wish.

Please note that your nominated NHS Workplace Supervisor will need to complete the "Organisational Support" section of the form. This will need to be done at the same time that you submit your application. We suggest that their answer to the Workplace Supervisor's Supporting Statement is prepared in advance and copied and pasted into the text box. You may feel that it is beneficial to do this with some of your own answers as well, as it is not possible to save the form and return to it later. (N.B. All free-text answers on the form have a maximum limit of 4000 characters/approximately 600 words.)

**Should applicants have any further queries about the programme or the content of their application, please contact the HSMA Programme Lead, Dr Daniel Chalk (d.chalk@exeter.ac.uk).**

**If you encounter any difficulties in accessing or completing the online application form, please contact penchord@exeter.ac.uk.**

## Section 1: Applicant Details *[Applicant to complete]*

**Name:**

**Email Address:**

**Job Title:**

**Organisation:**

**I confirm that both I and my nominated workplace supervisor have read the information contained in the Briefing Document:**

○ Please select to confirm

## Section 2: Person Specification *[Applicant to complete]*

HSMAs will undertake intensive training in a wide range of mathematical modelling, computer simulation and advanced data science methods, most of which will require the HSMA to develop computer programs in Python. Whilst no prior knowledge of any of these methods or programming is required, HSMAs will need to be comfortable learning and applying such methods, and a strong background in analytics and / or strong computer skills will be required. HSMAs progressing to Phase 2 will also need to manage a project through from design to delivery.

In particular, HSMAs should:

- be comfortable learning a wide range of new mathematical and computing approaches
- be creative in their approach to problem solving
- be comfortable managing a project
- be comfortable liaising with key stakeholders to design a project and obtain the necessary data to support the project
- be able to plan and manage their time efficiently
- have an enthusiasm for / interest in the kinds of approaches taught on the programme
- have strong self-learning skills to engage in the further learning necessary to develop their skills using online resources

**How would you describe your skills / experience in computer programming (if any)?** Please note that when we refer to programming, we do not include experience with "Query Languages" such as SQL. Please also be assured that previous programming experience is not essential for the programme, as HSMAs will be taught how to program, but it is useful for us to understand experience levels here so we can tailor our support accordingly *[Select option]:*

○ No previous experience using programming languages

○ Some limited previous programming experience / dabbling with legacy programming languages such as BASIC

○ A moderate amount of programming experience

○ I am an experienced programmer

**Have you got any experience in developing a computer / mathematical model?** *[Select option]:*

○ No
○ Yes

**If you answered "Yes" above, please provide details** *(Answer limited to 4000 characters):*

**Applicant's Supporting Statement**
Please explain why you want to apply for the HSMA Programme and describe, with examples, how you think you fit the description of a HSMA provided. You should highlight any previous experience you have relating to advanced analysis, computer programming and modelling, or any other work you've been involved with that you feel would be relevant. *(Answer limited to 4000 characters):*

**Section 3: Applicant Signature *[Applicant to complete]***

**Signed** (please type your name)**:**

**Date:**

**I consent to the use of my contact details to receive future general communications relating to the HSMA programme and the work of PenCHORD**
We will only use your contact details for occasional information relating to the HSMA and PenCHORD work programmes. We will not add your details to any other distribution lists unless you ask us to do so separately. We will not pass your details on to anyone outside NIHR Applied Research Collaboration South West Peninsula (PenARC). You may contact penchord@exeter.ac.uk at any time if you wish to be removed from the distribution list.

If you do not consent to be added to the PenCHORD distribution list and your application is successful, we may of course still contact you for the specific purpose of delivering the programme. *[Select option]:*

○ Yes
○ No

**Section 4: Organisational Support [NHS Workplace Supervisor to complete]**

It is vital that HSMAs are fully supported by their organisations in terms of their engagement with the programme. This is not only to ensure that HSMAs are released from their usual work for the minimum periods described above, but also to ensure that the work of the HSMA, and the skills developed as part of the programme, will become integrated into the organisation moving forward.

To undertake the programme, HSMAs will also need access to a computer where a range of Free and Open Source Software can be installed. This includes, but is not necessarily limited to:

- 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)

- 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/)

We ask that a senior member of your organisation, who has responsibility for your time / workload, completes this section. This person will act as your NHS Workplace Supervisor should you be successful in entering the programme, and will help with the facilitation of your HSMA project if you are successful in progressing to Phase 2 of the programme.

**NHS Workplace Supervisor Name:**

**NHS Workplace Supervisor Job Title:**

**NHS Workplace Supervisor Email:**

**Workplace Supervisor's Supporting Statement**
Please use this space to explain why you are supporting this application, how you will support the applicant's engagement with the programme if their application is successful, and how your organisation plans to use and further the skills they develop in the programme. We would also be grateful if you could suggest any potential areas / early project ideas that you think could benefit from the skills taught in the programme. *(Answer limited to 4000 characters)*

**Section 5: Supervisor's Signature** ***[NHS Workplace Supervisor to complete]***
In signing this form, I confirm I have authority to ensure that the applicant's time is allocated to the programme in the manner specified above. I fully support their application, and, if successful, I will work with the HSMA to ensure that their work and newly developed skills are supported by the wider organisation. I will also ensure the HSMA's time is protected to enable them to undertake the programme, and that the necessary software is installed.

**Signed** (please type your name)**:**

**Date:**

**I consent to the use of my contact details to receive future general communications relating to the HSMA programme and the work of PenCHORD**
We will only use your contact details for occasional information relating to the HSMA and PenCHORD work programmes. We will not add your details to any other distribution lists unless you ask us to do so separately. We will not pass your details on to anyone outside NIHR Applied Research Collaboration South West Peninsula (PenARC). You may contact penchord@exeter.ac.uk at any time if you wish to be removed from the distribution list.

If you do not consent to be added to the PenCHORD distribution list and the applicant you are supporting is successful in gaining a place on the programme, we will still contact you with specific regard to their progress as required. *[Select option]:*

○ Yes
○ No

**Section 6: HSMA3 Virtual Open Day, 1st September 2020** ***[Applicant or Supervisor to complete]***

We encourage all applicants and their managers to attend a Virtual Open Day event on Tuesday 1st September 1000-1200, hosted on Zoom. The Open Day will provide an opportunity for applicants to hear more details about the programme, to hear from HSMA alumni about their experiences of the programme, and to speak directly with the programme organisers about their applications. Please see https://bit.ly/HSMA3OpenDayProg for the Open Day itinerary. Due to a recently announced additional University closure day over the Bank Holiday weekend, registration for the Open Day will now close on **Wednesday 26th August** at 13:00.

**Please indicate whether you are intending to participate in the HSMA 3 Virtual Open Day on 1st September, 10:00 - 12:00**

You can register to "attend" the Open Day separately here: https://bit.ly/HSMA3_OpenDayReg if you wish to find out more about the programme before applying, or are currently unsure whether or not you will be available. *[Select option]:*

○ Yes (applicant and supervisor)

○ Yes (applicant only)

○ Yes (supervisor only)

○ No

○ N/A (completing form after 1st September or applied separately)

**If you have any special requirements or circumstances that may affect your ability to join the Open Day via Zoom, please give details** *(Answer limited to 4000 characters)***:**