WORKSHOP TO DEVELOP AN ACTION PLAN FOR WIDER APPLICATION OF OPERATIONAL RESEARCH AND ADVANCED ANALYTICS IN UK HEALTH CARE

Briefing Report

Thursday October 6th

9.30am – 4.00pm

The Health Foundation

90 Long Acre, London, WC2E 9RA

Contents

Outline schedule for the workshop – 6th Oct 2016

(Venue: The Health Foundation, 90 Long Acre, Covent Garden, London WC2E 9RA)

From 9.30	Arrival, registration, coffee
10.00	Introduction and scene-setting
11.00	Facilitated break-out groups: identifying key issues and areas to be addressed
12.00	Plenary: Integrating the group work
12.45	Lunch
13.30	Plenary: identifying actions/interventions
14.00	Facilitated break-out groups: homing in on specific actions
15.00	Tea
15.15	Plenary: integrating the group work and identifying next steps
15.45	Wrap-up and close
16.00-17.00	Informal continued conversation (with wine) for those able to stay

Aim of workshop

The background to this workshop will be familiar to most participants: despite a plethora of collaborative initiatives and a rich history of local success stories, Operational Research (OR) modelling and advanced analytic methods more generally are still not routinely embedded in all NHS organisations. The academic literature is full of OR models applied to healthcare problems, but the take-of such models by the NHS is fragmented and even highly successful models are rarely applied in other settings once a particular project has ended.

The key questions underpinning the workshop are: what can we do about this, and why should we succeed this time?

This workshop is co-organised by four organizations with an interest in answering these questions: MASHnet, the UK Network for Modelling and Simulation in Healthcare; NHS England, who have fairly recently established an Operational Research and Evaluation Unit; The Health Foundation, who are generously hosting this workshop, and the UK Operational Research Society. It has also sought to engage with AphA (the Association of Professional Healthcare Analysts) to develop the important links between operational researchers and analysts within the NHS.

The event has attracted an impressive and diverse set of participants from a wide range of organizations (listed in pages 10-11 below). We will assume everyone has read this briefing document before the workshop.

Current landscape

There are two short introductory booklets which explain modelling and simulation in lay terms and review the evidence for its value in healthcare. The first of these 'Change by Design' can be found here and was produced in 2014 by the Health Services Research Network in collaboration with MASHnet. The second can be assessed here and was one of the outputs from the *Festival of Evidence* conference organized by the Cumberland Initiative in October 2015. This conference fortuitously coincided with the publication of NHS England's Five Year Forward View, and it was noted with delight that p34 contained the statement "*Working with NIHR and the Department of Health we will expand NHS operational research, RCT capability and other methods to promote more rigorous ways of answering high impact questions in health services redesign*".

Many workshop participants are already successfully using OR and advanced analytics and have achieved considerable benefits. It would be invidious to single out named individuals, so the following just provides a brief overview of the main organizations involved to give a flavour of this work.

In England, the 13 NIHR-funded CLAHRCs (Collaborations for Leadership in Applied Health Research and Care) have provided some excellent examples. The CLAHRCs were established to support the translation of research evidence into practice in the NHS, for the benefit of local patients. Following the example of PenCHORD (the Peninsula Centre for Healthcare OR and Development), which has been in existence since 2008 as part of the pilot Peninsula CLAHRC in the south-west of England, several other CLAHRCs funded in the second round (2013-18) have established OR groups to work with local providers. A small number of the NHS England Academic Health Science Networks have also established OR groups, for example the Wessex AHSN's Centre for Implementation Science.

This type of initiative is not limited to England. In Wales, the Aneurin Bevan University Health Board has established a collaborative relationship with the University of Cardiff and as part of its Continuous Improvement Unit (ABCi) has funded four post-docs and half a lectureship to undertake joint research. These researchers spend half their time at the university and the other half in ABUHB, working directly on practical problems.

At a national level, UK-wide, the broad aims of both the Cumberland Initiative and MASHnet are to bring together the three communities of academia, the NHS, and the commercial sector, in order to drive forward the wider implementation of OR modelling in healthcare. The commercial sector has been purposely excluded from today's workshop but we do know that a great deal of modelling is being undertaken by business consultancies, from individual consultants through to the "Big Four".

Academic groupings

In addition to the research led grouping mentioned above, there are several universities which have established focused Centres for healthcare-related OR. University College London's Clinical OR Unit (CORU) has almost certainly been around the longest. CORU was founded in 1983 and was originally funded by the Department of Health: although now officially part of UCL, it is still predominantly grant-funded. The University of Westminster's Health and Social Care Modelling Group specialises in the use of (big) data and analytics in healthcare, and the University of Bath has recently established the Bath Centre for Healthcare Improvement and Innovation (CHI^2). There are several other similar centres across the UK, and they all collaborate closely with their local NHS providers through joint research, MSc and PhD student projects, and consultancy (see Change By Design booklet -here- for a map of currently active groups in the UK).

Non-academic groupings

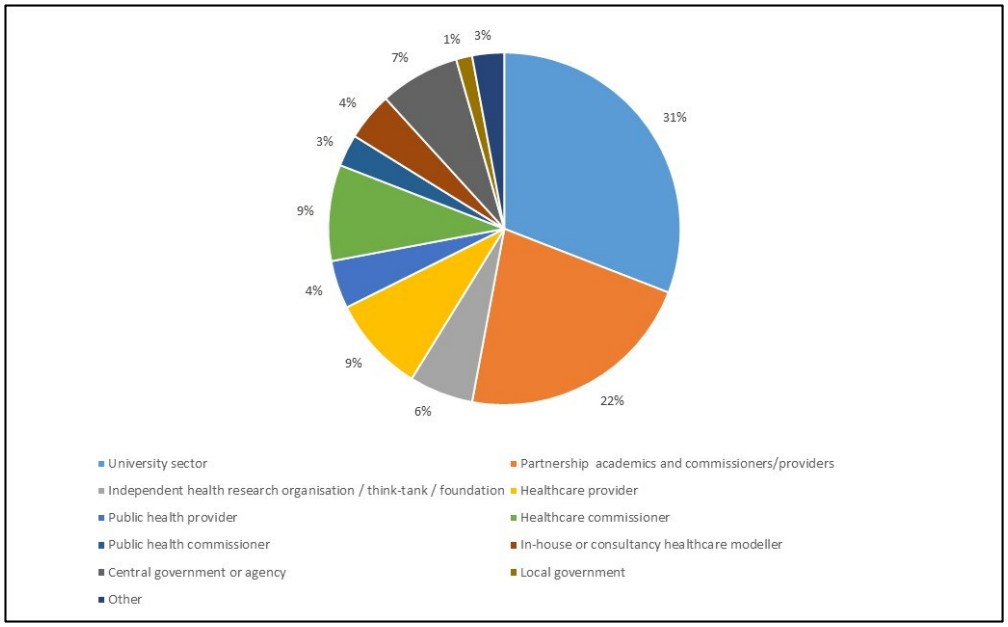
The Department of Health and NHS England have a strong complement of OR modellers (currently around 50) many of whom are within the Government OR Service. They are mainly based in London and Leeds and undertake a range of projects on policy and operational issues. The NHS and Department of Health have funded a number of national organizations over the years which have included and supported OR modelling, e.g. the former NHS Institute for Innovation and Improvement (now NHS Improving Quality).

At CCG level, some Commissioning Support Units might provide modelling expertise, but capacity and capability are variable. It is unclear how much modelling work is currently being commissioned by CCGs. We are endeavouring to find out. Across the country, there are of course many health service analysts working at different levels for a wide variety of purposes in the NHS, here once again capacity and capability are key issues as are recognition and status. These are issues which have specifically been highlighted by AphA.

Finally, it may be some small comfort to know that the problem we are addressing at this workshop is not unique to the UK. Across Europe, members of ORAHS (the EURO Working Group on OR Applied to Health Services) report the same issues of implementation and within the US, the INFORMS Health Applications Society face similar challenges, despite a totally different healthcare system.

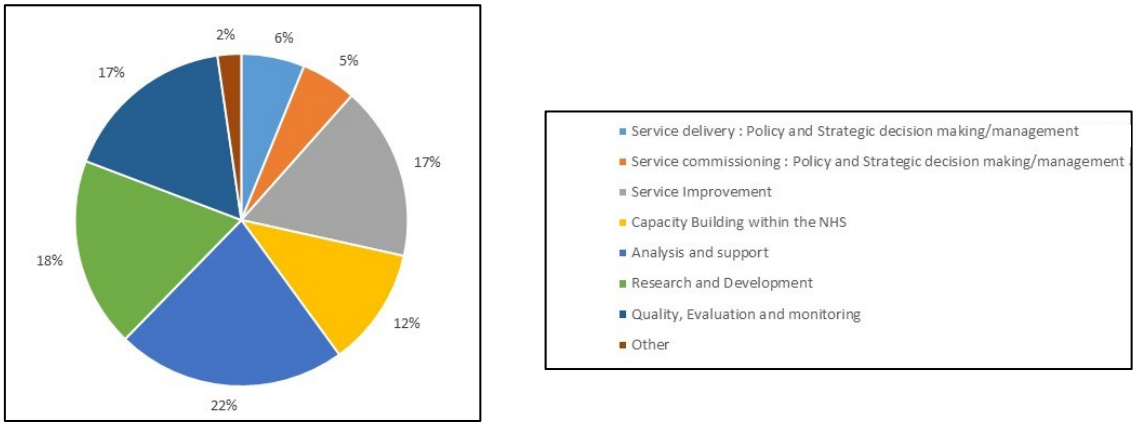
Preparing the Ground: Questionnaire summary

46 people responded to the pre-workshop questionnaire. Not all respondents were able to attend the workshop and conversely, some workshop participants did not complete the questionnaire. Questions 1 to 7 were all descriptive and related to who people are, who they work for and what they do.



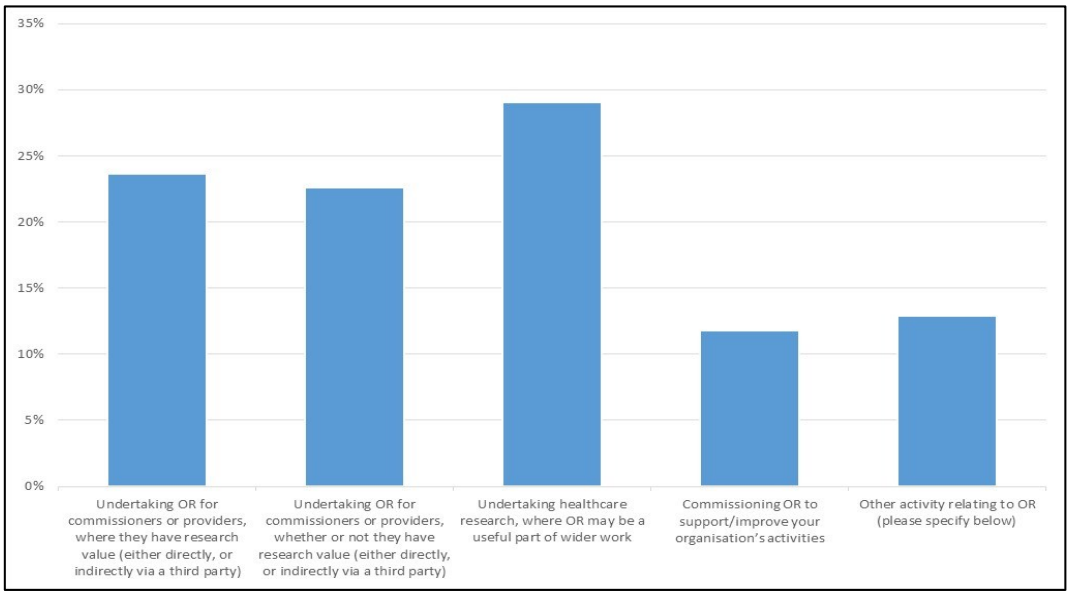
Question 1. Main employer organization

Note that over half were academic or in some partnership between academia and providers or commissioners.



Question 2. Employer organization's main role and responsibilities

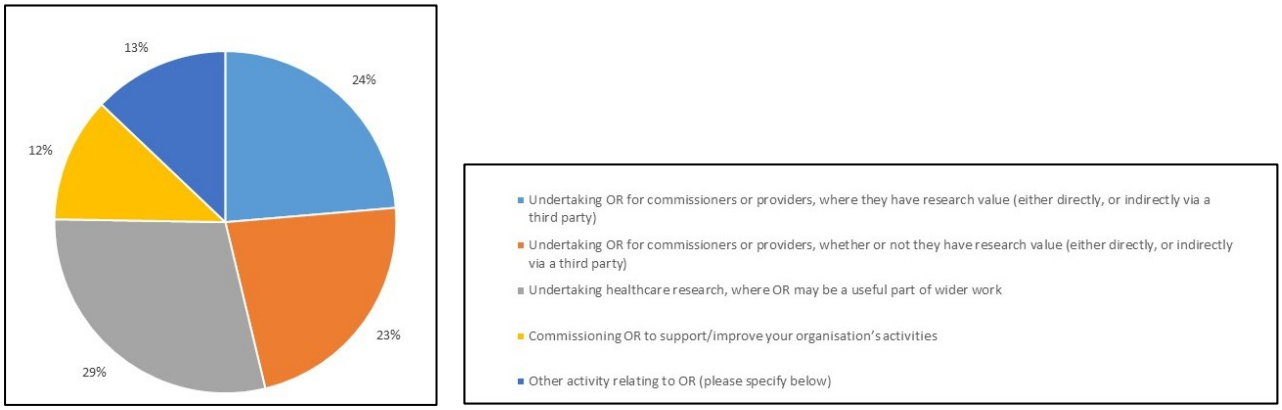
Other: Internal NHS training and development; Arms Length Body



Question 3. Professional role with respect to healthcare

Other: Management of analytical and evaluation support; Policy and strategic decision making as part of system design and management; Clinician

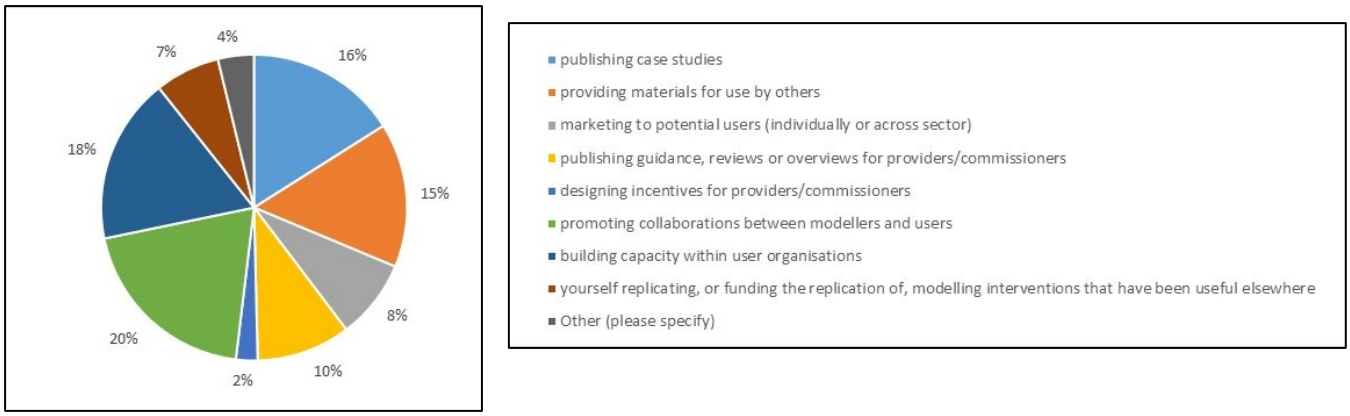
More people were undertaking research than any other activity, reflecting the preponderance of academics.



Question 4. Which of the following activities do you engage with in your professional role?

Other: Creating informatics infrastructure that has the creation of data for analysis as a core benefit; OR, modelling and advanced analytics programmes for my organisation; Cost-effectiveness modelling; Health Economic Evaluation; Various national and regional projects intended to improve clinical delivery and outcome; Capacity building in the NHS; Analysis to drive the improvement of care through publication; Service representation through diagrams; Economic modelling (Decision analysis); Simple analytics relevant to real problems; Co-creating research projects.

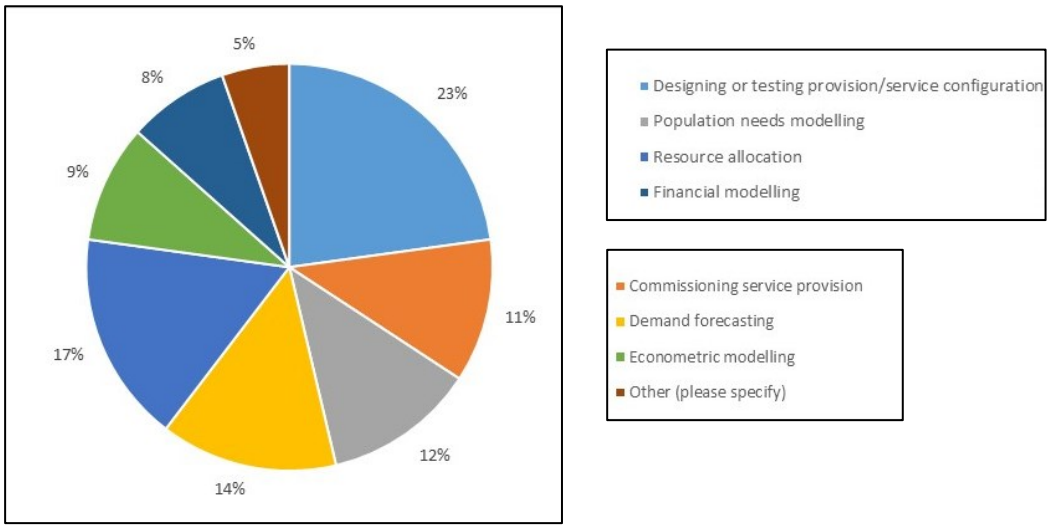
Note that respondents could select more than one activity and were not asked to state what % of their time they spent on each. Clearly, there is a much wider range of OR-related activity going on than captured in our survey, since at 13% "Other" was larger than for any other question.



Question 5. What methods have you used to promote modelling and OR?

Other: building into externally commissioned projects; including OR as a key part of quality improvement programmes; Short courses / Training packages; promoting use of statistical process control methods for QI; Setting up & supervising MSc projects.

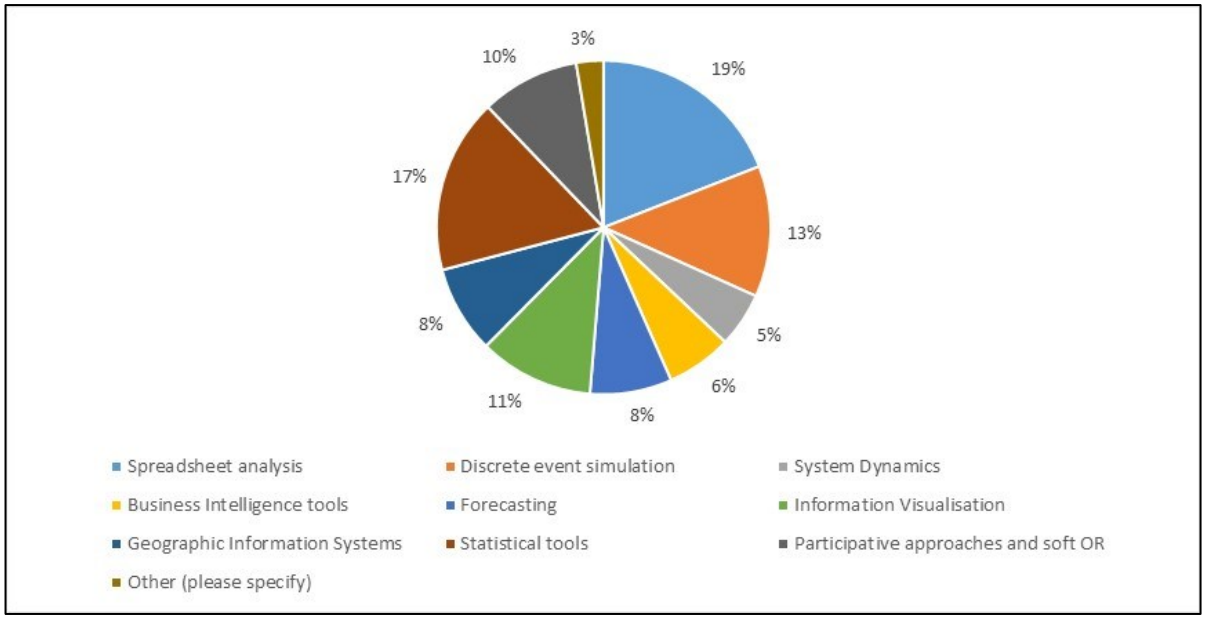
Note that respondents could select more than one method and were not asked to state how often they used each one. Again, given the preponderance of academics it is perhaps not surprising that so few people were involved in replicating the work of others.



Question 6. For what purpose have you used OR modelling?

Other: Health Economics; Cost-Effectiveness Modelling; Outcomes of healthcare; Thought Leadership; predicting and improving changes to the quality of care; Quality improvement projects and also for influencing; Risk stratification; Economic evaluation/appraisal.

Note that respondents could select more than one purpose and were not asked to state how often they had used OR for each one. With the exception of "Designing or testing service configuration", the fairly even spread across the other areas is interesting and shows that OR is being quite widely used for many purposes.



Question 7. What OR/analytics techniques or software tools have you used?

Other: Optimisation, Scheduling; Markov modelling; SPC, control charts; Stochastic modelling/ Queue modelling; Not myself but in collaboration with OR academics.

Note that respondents could select more than one technique and were not asked to state how frequently they used each one. The popularity and relative ranking of spreadsheet analysis, statistical tools and DES will not come as a surprise to most people.

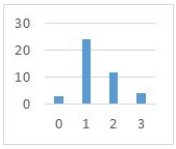
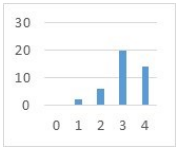
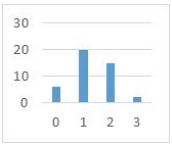
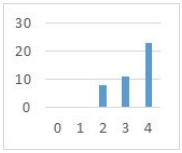
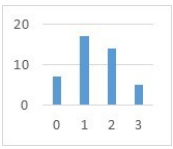
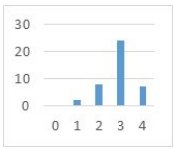
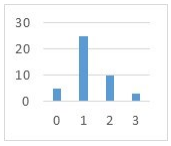
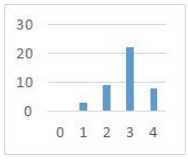
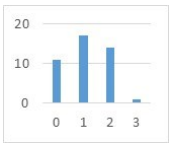
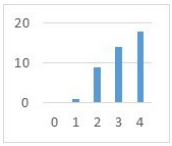
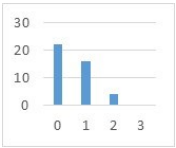
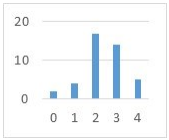
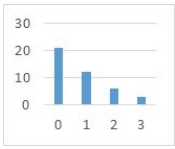
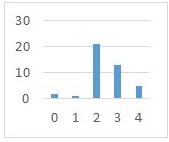
Questions 8 and 9 referred to the 2010 MASHnet conference, which identified seven interventions as the most important for improving the use of modelling and analytics in the NHS.

Question 8 asked respondents to indicate to what extent they are currently doing each one, on a scale of 0 to 3 where 0 = not at all; 1 = occasionally; 2 = routinely; 3 = core purpose of job role.

Question 9 asked respondents to indicate how important they thought each intervention remains today, on a scale of 0 to 4 where 0 = not important; 1 = limited importance; 2 = important; 3 = very important; 4 = essential.

The table on p9 shows the mean and the distribution of responses for each intervention.

Question 10 asked a series of text based responses to three specific questions. The list of responses is given in the fuller version of the questionnaire outputs which can be downloaded from the MASHnet website – here.

	Q8		Q9	
Promotion and 'proof of concept' demonstration: Raising the profile of modelling, simulation and advanced analytics within the NHS by demonstrating and promoting the benefits and potentials of its application.		1.4		3.1
Building capacity and capability within the NHS: Developing in-house professional skills and understanding of modelling, simulation and advanced analytics and its uses within NHS organisations etc. Provide relevant education and training to key staff.		1.3		3.36
Direct Intra and Inter-agency collaboration: Establishing on-going and professional links both within and between the different NHS organisations and communities engaged in health service modelling and advanced analytics.		1.4		2.88
Active Networking/Communication between groups: Fostering active links between key groups engaged in health modelling and advanced analytics (eg. Commercial, research, health) to encourage on-going exchange of information and experience.		1.26		2.83
Senior Management Engagement: Supporting initiatives to develop engagement from Chief Executives and other senior staff to ensure support for support from top level management.		1.12		3.17
Government Support and Incentives: Promoting centrally led policies and initiatives aimed at promoting the application of modelling, simulation and advanced analytics in the NHS. National measures to incentivise developments in the field.		0.57		2.38
Information, Resources and Technical support: Commissioning tools and information to support the development of health service models. Building standards and generic templates to support health service modelling and advanced analytics		0.79		2.43

It appears that not much has changed since 2010: capacity building within the NHS is still seen as the most important intervention, closely followed by senior management engagement and profile raising.

The combined responses to both questions indicate that while most respondents still considered all these interventions as important, very few people have them as their sole job purpose. However most people are actually doing these things, either occasionally or routinely, with "occasionally" being the modal response in all cases apart from *Information, Resources and Technical Support* and *Government Support & Incentives*.

List of participants

SURNAME	FIRST NAME	ORGANIZATION	ROLE
Barber	Nick	The Health Foundation	Consultant for the Improvement Research Institute
Bardsley	Martin	The Health Foundation	Senior Fellow
Barraclough	Andrew	Nottingham Univ. Hospital	Head of Analysis and Improvement
Bird	Paul	Univ. of Birmingham Institute of Applied Health Research	Head of Programme Delivery
Blackwell	Richard	South West AHSN	Information Analysis Manager
Boulton	John	Aneurin Bevan Health Board	Director : Aneurin Bevan Continuous Improvement
Bowers	John	University of Stirling	Professor of Management Work & Organization
Brailsford	Sally	Southampton Business School, University of Southampton	Professor of Management Science and Head of Dept of Decision Analytics & Risk
Burhouse	Anna	West of England AHSN	Director of Quality
Caunt	Martin	NHS England	Sen. Analytical Lead (National Op.Res.), Project Dir. Improvement Analytics Unit
Chaussalet	Thierry	Westminster University	Prof. of Healthcare Modelling and Chair of OR Society SIG in Health & Social Care
Crowe	Sonya	Clinical OR Unit, University College London	HF Fellow & Senior Research Fellow
Deeny	Sarah	The Health Foundation	Assistant Director Data Analytics
Dickerson	Terry	Department of Engineering, University of Cambridge	Senior Researcher
Dougan	Sarah	Camden & Islington Public Health	Deputy Director Public Health (Camden)
Farr	Marc	East Kent Hospitals University NHS Foundation Trust	Director of Information
Fordyce	Andrew	Torbay Hospitals Trust	Clinician and Improvement Lead
Fothergill	Garry	Sheffield Teaching Hospitals NHS Foundation Trust	Lead Manager - Analytics for Improvement
Gillespie	Bill	Wessex AHSN	Chief Executive Officer
Harper	Paul	School of Mathematics, Cardiff University	Professor of OR and Head of OR group. Director of Health Modelling Centre Cymru (hmc²)
Hatton	Jim	Nottingham University Hospital Trust	Director of Information
Healey	Andy	Kings College London and NIHR CLAHRC South London	Senior Research Worker in Health Services & Population Research
Kaufman	Ruth	UK OR Society	President of OR Society
Kearns	Benjamin	ScHARR and NIHR CLAHRC Yorkshire & Humber	Research Fellow in Health Economics & Decision Sciences
Komashie	Alex	Department of Engineering, University of Cambridge	Research Associate
Lee-Wright	Richard	Kent, Surrey & Sussex AHSN	Head of Informatics
Lewis	Geraint	NHS England	Chief Data Officer
Lorrimer	Stephen	NHS England	Head of Analytical Services (Finance) & Head of OR
McCrone	Paul	Kings College London and NIHR CLAHRC South London	Professor of Health Economics
Mohammed	Mohammed	Faculty of Health Studies, Bradford University	Prof. in Healthcare, Quality & Effectiveness. Dep. Dir. Bradford Inst. of Health Research
Mohiuddin	Syed	University of Bristol and NIHR CLAHRC West	Research Fellow in Modelling and Simulation in Health Economic Evaluation
Monks	Tom	University of Southampton and NIHR CLAHRC Wessex	Head of Methodological Hub: Wessex CLAHRC
Pank	Will	Oxford AHSN	Best care programme manager

Peck	Simon	NHS England	Senior Analytical Lead
Pitt	Martin	CLAHRC SW Peninsula, University of Exeter	Director: Peninsula Collaboration for Health OR & Dev. (PenCHORD). Director of MASHnet
Powell	Caroline	SW Peninsula AHSN	Head of Intelligence
Riley	Neil	NHS England	Senior Analytical Lead (Local Operational Research)
Rourke	Emma	NHS Care Quality Commission	Head of Intelligence
Royston	Geoff	Independent	Health Analyst & Researcher (formerly Head of Strategic Analysis and OR - Dept of Health)
Shaw	Duncan	Manchester Bus. Sch. and NIHR CLAHRC Greater Manchester	Professor of Operations & Critical Systems
Steventon	Adam	The Health Foundation	Director Data Analytics, The Health Foundation
Sherlaw-Johnson	Chris	Nuffield Trust	Senior Analyst
Straight	Michael	East Kent Hospitals NHS Foundation Trust	Information Lead for Urgent Care
Stroner	Paul	NHSi and the Association of Public Health Analysts (AphA)	National Demand & Capacity Planning Prog. Lead. NHS Improvement & President of AphA
Tallack	Charles	NHS England	Hed of Operational Research and Evaluation Team
Umpleby	James	NHS England	Senior Analytical Manager
Utley	Martin	Clinical OR Unit, University College London	Professor of OR and Head of CORU
Vasilakis	Christos	Management School, Bath University	Senior Lecturer and Head of Centre for Healthcare Innovation & Improvement (CHI2)
Vile	Julie	Performance Analysis Manager	Delivery Unit, NHS Wales
White	Leroy	Warwick Business School, University of Warwick	Professor in Operational Research/Management Science
Woodcock	Tom	Imperial College London	Public Health and Information Intelligence Co-Lead
Worthington	Dave	Lancaster University Management School	Senior Lecturer in Operational Research
Wright	John	Bradford Institute for Health Research	Director of Research
Wyatt	Steve	NHS Midlands and Lancashire CSU	Head of Strategic Analytics