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Use of OR by government to inform health policy in England: Examples and reflections

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ABSTRACT

Operational Research (OR) analysts work alongside other specialists in providing policy analysis for the Department of Health in England. This paper outlines the roles played by OR analysis, taking three different areas of policy for illustration, with examples drawn from projects related to health service operation, health protection and health promotion. In addition to the provision of technical modelling skills, the contributions that OR analysts make to the processes of problem formulation and evidence synthesis are discussed. The paper concludes with some general reflections on what makes for successful OR in this context and on the challenges and opportunities faced by OR in informing health policy over the coming years.

1. Introduction

The Department of Health (DH) has overall responsibility for the operation of the National Health Service (NHS) and for public (population) health across England. It is also responsible for setting policy on the provision of social care, though these services are delivered by local government authorities. These responsibilities are specific to England, rather than being UK-wide, though many issues – particularly in public health – span national borders and require cooperation with the devolved administrations in Scotland, Wales and Northern Ireland. Many, indeed, have wider international dimensions. In this paper we give an account of the role played by Operational Research (OR) in informing policy within DH.

Major reforms of the health and social care system will change the role of DH itself markedly over the coming few years. This will in turn have implications for the organisation and delivery of analysis, as well as the type of analytical work done. Though the specifics are not yet known, we return to this topic briefly at the end of this paper.

There are about 40 OR staff in the Department, split roughly equally between London and Leeds (in the north of England), and working in multi-disciplinary teams alongside economists, statisticians, and a smaller number of social researchers. They tackle a very wide range of topics, in an equally wide variety of ways. The following sections will illustrate the former, but it must also be stressed that in all these areas, technical modelling – application of what readers might recognise as "OR methods" – forms only part of the overall process of using analysis. Typically when a particular policy question arises, some relevant evidence will exist already (but may not be fully-understood), while the available policy options may need clarification. In practice, a good deal of analytical work therefore involves problem structuring, option generation and critical review of existing evidence.

OR modelling fits within this overall process. As will be seen, the modelling itself may sometimes make use of relatively-advanced analytical methods, but in many cases, the key skill lies in being able to make sense of issues in ways that allow the insightful application of relatively simple models.

In the following sections, we briefly discuss examples drawn from three broad areas, one concerning the operation of the NHS, and two involving different aspects of public health, namely health promotion, and health protection. The final section offers some general observations.

2. OR to inform policy on Primary Medical Care

In the English NHS, General Practitioners (GPs) provide primary medical care services, undertaking over 300 million consultations per year [1]. They provide services to patients on their "practice list" (and temporary residents) who are ill or believe themselves to be ill for the duration of that condition, including referrals (e.g. for secondary, hospital-based treatment); they help care for the terminally ill, assist in the management of chronic disease and provide relevant health promotion advice. For DH, organisation of primary care represents a major area of work, and this work is supported by the Primary Medical Care Analytical Team.

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2.1. Modelling the impact of changes to the GP contract

GP practices are independent contractors providing a service defined by the General Medical Services contract [2]. There are regular negotiations at a national level around the contract, frequently involving one or both of:

- *The Minimum Practice Income Guarantee* (MPIG), a minimum payment to practices that is not linked either to patient list sizes or the quality of care. Though agreed historically, this leads to a perceived inequity in funding [3]. However, these payments can represent a sizeable proportion of practice income, so sudden withdrawal of this component of the contract would risk financially destabilising many practices.
- *The Quality and Outcomes Framework* (QOF). Accounting for over £1.1bn of the Department's expenditure, this rewards practices for their achievement in 134 quality indicators spread over four domains. Payments are calculated on the achievement in relation to thresholds, and adjusted according to practice list-size, the reported prevalence of the condition and the value of the indicator. Understanding the impact of potential changes to these calculations has been facilitated using a large-scale spreadsheet model.

To support DH in these negotiations, the analytical team has worked with policy colleagues, NHS-Employers (who negotiate on behalf of the Department) and the British Medical Association. As each party can put forward ideas and proposals, the team needs to quickly understand and model these to clarify the impacts and advise on implications. Delivered to tight timescales, analysis has contributed both to agreed changes to the QOF formula and to negotiated reductions in MPIG from an initial £325m to roughly £110m, with practices in receipt declining from over 90% to 61% [4].

The team has also explored the impact of other, more fundamental changes to the formula used to determine funding for GP practices. Any feasible change would involve a redistribution of resources, with some practices gaining and others losing. The team has worked with academics at Lancaster University to explore how changes could be phased-in over a number of years. The large number of potential options necessitates the use of heuristics to incorporate negotiators' possible preferences, while the need for rapid results to inform negotiation necessitates trade-offs between model run-time and the degree of confidence that the best solution has been found.

2.2. Working with NHS stakeholders: Primary Care Commissioning

The Primary Care Commissioning Application (PCCA) is an Excel based tool used to support Primary Care Trusts (PCTs) in commissioning Primary Medical Care. It is used to analyse and present data on clinical activities and outcomes for a range of reports, which allow PCTs and GP practices to assess how they compare to national and regional benchmarks and to their peers.

An initial version of this tool was developed by external contractors, but was found to have unacceptable faults in both data and functionality. The DH analytical team took over the updating and development of the application, along with embedding it into the NHS. In addition to a re-branding, this involved a thorough audit of the spreadsheets, and improvements to ensure ease of use for non-analysts. These changes were achieved by identifying and consulting with a group of users: their input was critical in rebuilding confidence in the application and created "champions" willing to endorse its use. The work has been presented across England and to varied audiences—from large events to raise awareness of the PCCA, to small groups for training and feedback. The team provides regular updates of the application with enhanced functionality and refreshed data. Each release is checked and validated both internally and by a small group of external users. To support the current restructuring of the NHS, additional flexibility has been built in to allow users to undertake reporting, benchmarking and analysis within user-defined groupings of practices.

PCTs are currently using the application to benchmark themselves and to identify areas of poor performance for targeted interventions. They also use it as the basis of their performance management process to help GP practices understand their strengths and weaknesses, and to identify where improvement can be made. Overall, it is considered within DH that use of the in-house team in delivering this work has proven to be a very cost-effective use of resources.

2.3. Policy development: GP practice boundaries

Since the inception of the NHS, patients have only been able to register with a GP practice if they live within its catchment area. Whilst the original rationale was to establish an area within which a GP can reasonably offer a home visit, many boundaries have become a legacy dating from when the practice was established. In an NHS focusing more and more on giving patients choice of healthcare providers, removing practice boundaries gives all patients a free choice of any GP practice.

To progress this policy, the Primary Medical Care team needed to develop the potential options, while ensuring that patients did not see any reduction in the level of services available. The analytical team was involved from the start, in helping to frame the problem and to generate ideas. This joint work identified multiple impacts across the NHS, and we used tools such as causal loop diagrams and mind mapping to help our policy colleagues understand them. For example, NHS resource allocation is based on populations resident in each area of the country: allowing patients to register with a practice away from where they live creates a potential imbalance, with resources no longer being allocated in the right areas.

An evidence base to support or discount the options developed was built up through work with academic researchers and NHS colleagues (and through patient surveys). This allowed the options to be pruned down to four, which were included in a full public consultation [5]. Subsequent changes in Government and proposed wider changes to the NHS have impacted on how this policy is taken forward. The team has facilitated a workshop involving NHS, DH policy staff and academia to understand how it could be implemented in the new NHS architecture. Working with one specific Primary Care Trust which has been encouraging patients to make informed choices about their GP practice, the data gathered have been used to analyse patterns of patient movement within a local area when choice of practice is actively encouraged. This evidence has been used to temper the results of patient surveys. (It is very easy for a patient to reply to a survey saying that they would use a new service should it be offered, but there is a high level of inertia when it comes to changing GP practice.) This information is then used to model the potential costs of new options being developed to match emerging organisational structures within the NHS. The team continues to support policy development both through cost benefit analysis, and by using wider problem-solving skills to promote "whole systems" thinking.

3. Analysis of public health issues

The Department of Health has responsibility for ensuring that the health of the population in England is monitored, and that appropriate steps are taken both nationally and locally to protect and improve public health.