Strategic planning for the medical workforce in England

Centre for Workforce Intelligence and Decision Analysis Service Ltd

A System Dynamics based review was carried out on the medical workforce across England. The purpose of the review was to ensure an adequate and affordable future supply of good quality trained doctors for the next 25 years. The review found that there was a potential future oversupply of doctors in total and a potential imbalance between hospital doctors and GPs. As a result, the medical training inflows for these workforces have been adjusted accordingly.

Background

The Centre for Workforce Intelligence (CfWI) is a key contributor to the planning of future workforce requirements for health and care in England. The Department of Health, as well as Health Education England and Public Health England, engage the CfWI to inform national and local workforce planning and policy decisions. The CfWI is supported by Decision Analysis Services (DAS) who provide specialist System Dynamics consultancy.

The CfWI was commissioned by the Department of Health in 2012 to carry out a detailed review of doctors in England. The purpose of the review was to advise on future intakes to undergraduate medical training in order to ensure an adequate and affordable supply of good quality trained doctors. In 2013, the NHS in England employed 148,000 doctors, which includes hospital consultants, registrars and general practitioners. Supply of a single specialist doctor costs the UK Government approximately £250K to £550K in training and over £2 million in lifetime salary.

Approach

The project was carried out using the Robust Workforce Planning Framework, which was developed specifically for this project, and has been used for all subsequent workforce reviews carried out by the CfWI.

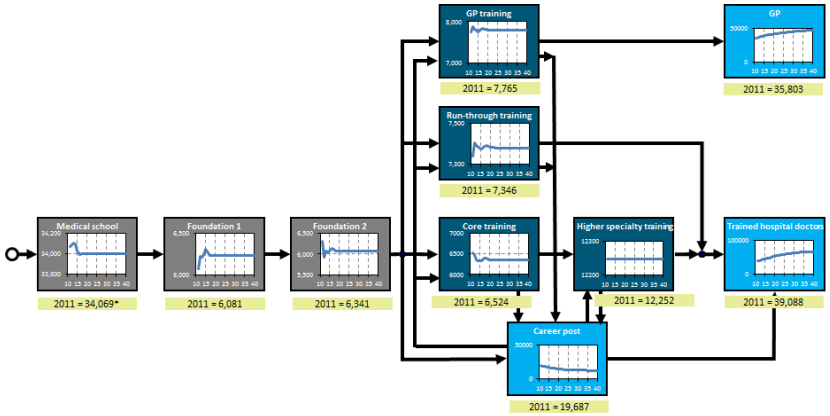
The framework consists of five linked stages and integrates horizon scanning with scenario generation, System Dynamics modelling and simulation. A major feature of the framework is the high degree of stakeholder involvement, which is critical to arrive at a shared view of future challenges, and in making robust policy decisions. Key stakeholder groups involved in this process included the Department of Health's Workforce Data and Analysis Team, the Health and Social Care Information Centre, the British Medical Association, the General Medical Council and specific Deaneries, University and Colleges Admissions Service, and NHS Pensions.

Four plausible, but challenging scenarios were created with the stakeholders in order to test the future supply and demand for doctors. Uncertain variables were determined using formal elicitation methods with the system stakeholders.

A System Dynamics model was then developed to enable rapid quantitative policy analysis within a risk-free environment. The model calculated the demand for, and supply of, doctors over a thirty-year period. The supply component of the model represented the workforce by age and gender to enable societal factors such as retirement changes and gender differences to be factored into the analysis. The training and career pathways were mapped out with stakeholders from the medical system using stock and flow diagrams. These were presented at a series of national road shows hosted by the CfWI, which enabled over 80 people to comment and amend them. The demand component considered the impact demographic and service changes would have on demand in primary and secondary settings.

Results

The System Dynamics model was used to calculate the supply and demand for doctors for each of the four scenarios generated with stakeholders.



The results of the simulation model were shared with stakeholders to ensure the model was producing realistic dynamics based on real-world behaviour.
The sensitivity of the model results to each of the input parameters was tested. In addition, the Monte Carlo analysis was carried out to determine the uncertainty of the model results.

The results of the modelling work suggested that there would be a future oversupply of doctors for each of the scenarios considered, and a misbalance between the availability of GPs and hospital trained doctors.

Impact

The review informed decisions taken by the Department of Health to adjust the numbers of doctors being trained in order to prevent a future under or over-supply, and to rebalance the numbers of GPs and trained hospital doctors. Decisions that were taken based on this work included a 2 per cent reduction in medical school intakes which was introduced in 2013, and a rolling cycle of reviews to be undertaken every three years.

The System Dynamics modelling approach meant that robust, evidence-based supply and demand models were developed for the medical workforce that could be used to test potential policies and their impact. It also meant that the model was 'transparent' and enabled capture and synthesis of the expertise of several hundred stakeholders from the healthcare system.

Further information

Since winning the award in 2013, the CfWI, supported by DAS, have produced System Dynamics models that have been used for over 20 workforces from across the health and care system. These have included pharmacists, specialist doctors, speech and language therapists and the social care workforces. They have also collaborated on the Horizon 2035 project, a whole system review of the health, care and public health workforces using a unique skill based approach. Further information on these projects is available at www.cfwi.org.uk.

The CfWI and DAS have also produced a best practice guide for developing workforce based System Dynamics models. In addition, DAS have produced a document providing their perspectives on System Dynamics modelling.

Authors

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