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Abstract

This technical paper addresses improvements to the policy analysis stage of the Centre for Workforce Intelligence's (CfWI) robust workforce planning framework, in particular on selecting polices for analysis and structuring the analysis. We plan to test these approaches on the Horizon 2035 – the purpose of which is to consider different workforce futures for health, social care and public health 20 years from now.

Policy analysis is the thread that runs through the CfWI's robust workforce planning framework. The purpose is to determine which of a set of alternative policies will best meet a specific set of goals. This requires determining which policy is the most effective, according to the measures used, against a set of plausible but challenging future scenarios. Some workforce policies may perform well across all these futures; we would then say that they are *robust* against future uncertainty. However, other policies may not perform as a well. Specific scenarios may be challenging and the outcome may not be good. Decision-makers will then need to judge which policy to choose in situations where several policies perform adequately, but no single policy is outstanding.

This paper includes the following:

- an updated review of the literature with particular focus on the importance of evidence in policy making and approaches to policy analysis
- selecting policies for analysis, including the conceptual steps to take
- structuring the analysis and the principles for a CfWI policy analysis tool

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Key points

1. The CfWI has reviewed the literature on the use of evidence in policy making and approaches to policy analysis.

2. This review has suggested an approach to the selection of policies for analysis.

3. Our thinking on how the analysis can be structured and presented has been formalised in a set of principles for the construction of a policy analysis tool.

4. The next stage is to develop this tool and test it in the Horizon 2035 project. We will report the findings in a future technical paper.

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1. Introduction

This technical paper addresses improvements to the policy analysis stage of the Centre for Workforce Intelligence's (CfWI) Robust Workforce Planning Framework (RWPF), in particular on selecting polices for analysis and structuring the analysis. We plan to test these approaches on the Horizon 2035 programme of work – the purpose of which is to consider different workforce futures for health, social care and public health 20 years from now.

Policy analysis is the thread that runs through the CfWI's robust workforce planning framework. The purpose is to determine which of a set of alternative policies will best meet a specific set of goals. This requires determining which policy is the most effective, according to the measures used, against a set of plausible but challenging future scenarios. Some workforce policies may perform well across all these futures; we would then say that they are *robust* against future uncertainty. However, other policies may not perform as a well. Specific scenarios may be challenging and the outcome may not be good. Decision-makers will then need to judge as to which policy to choose in situations where several policies perform adequately, but no single policy is outstanding.

This section describes how policy analysis is used by the CfWI in the RWPF, the use of evidence in policy making, and the impact it has on workforce planning.

1.1 Background to policy making

In *Technical Paper 9* (CfWI 2014b), we provided an introduction to policy analysis and some of the common ways of approaching a policy analysis exercise, before giving some specific context on workforce planning in the health and social care sectors. The paper then went on to describe some of the key typologies developed by analysts to understand policy systems, before summarising the major policy levers which may be used to influence these systems. It concluded with a discussion of the measurements used to evaluate intervention success, along with a review of the practical and political complexities synonymous with agenda-setting.

Policy making and policy implementation may be viewed as two distinct phases in public policy analysis (Wheat, 2010), both of which take place in environments where evidence (and the role of evidence) must be considered against multiple criteria. As noted by Sanderson, 'the process of formulating and delivering policy takes place in a political context and is subject to many legitimate influences from a range of stakeholders and interests' (Sanderson, 2009). Whilst evidence has always been an important part of the policy making process in the UK, this was explicitly recognised in 1999 in a white paper entitled *Modernising Government* (Cabinet Office, 1999a), subsequently developed in *Professional Policy Making for the Twenty First Century* (Cabinet Office, 1999b) and operationalised in *Adding it up: Improving modelling and analysis in central government* (Cabinet Office, 2000). Media criticism of policy relating to issues such as Bovine Spongiform Encephalopathy (BSE, more commonly known as mad cow disease) and climate change has driven decision-makers to increasingly seek unimpeachable evidence ahead of making important decisions in the past decade (Schulz, 2006).

Whilst the concept of 'evidence-based policy making' is associated with the particular development of 'Third Way theory (Little, 2012)', the role of evidence in policy making and implementation is now an issue that reaches far beyond this left-wing position. Recent inquiries, for example, have looked at the role of evidence, and the use of horizon scanning, in UK policy making (House of Commons,

2006). The model outlined in *Professional Policy Making for the Twenty First Century* (Cabinet Office, 1999b) is made up of nine key characteristics of policy making which are still useful for providing guidance to decision makers today:

1. Forward looking
2. Outward looking
3. Innovative
4. Creative
5. Evidence based
6. Inclusive
7. Joined up
8. Systematic evaluation and review
9. Learn lessons

Source: Sanderson, 2009

At a global scale, the World Health Organisation (WHO) has championed evidence based policy making for several years. EVIPNet (the Evidence Informed Policy Network) was initiated by the WHO and the ministries of health in 25 countries in 2005. This network encourages the robust use of evidence, specifically to promote sustainable partnerships at global, national and regional levels. They provide the following definition of evidence based policy making:

'Evidence-informed health policy-making is an approach to policy decisions that aims to ensure that decision making is well-informed by the best available research evidence. It is characterised by the systematic and transparent access to, and appraisal of, evidence as an input into the policy-making process.' (Oxman et al, 2007).

1.2 Impact on workforce planning

In the health and social care workforce policy arena, the objectives of workforce planning have shifted in many countries over the last forty years from concepts which were originally aimed towards producing the right number of people, with the right skills, at the right time. Nowadays these lean more towards the inclusion of further dimensions such as having a workforce with the right values or with the right productivity (Fellows and Edwards, 2014). Recent arguments have also been made for an increased focus on operational process and staff skills and capabilities, rather than the number of boots on the ground (Bohmer and Imison, 2013).

As an organisation which analyses the supply and demand of workforces and provides intelligence on the basis of modelling, it is necessary for the CfWI to be cognisant of the limits of this type of evidence in and for policy making. Even in an idealised situation where data and projections were theoretically perfect, change is unlikely to be successful if it is dictated or decreed (Dussault et al, 2010). In response to this added dimension, when modelling complex systems and then altering model parameters to estimate policy effects, it has been argued that policy implementation feedback processes should be understood to enhance the use of system dynamics in policy design (Wheat, 2010).

However, without a policy implementation model, it is necessary to focus on the utility of a model for policy analysis. This is in order to alter model effects to simulate policy actions, although there are limits on this type of enquiry being set. Overall, models are useful as tools to enhance policy design through having effective road maps for different potential futures (as in Mahamoud et al, 2013).

Acknowledging the complex causality inherent in policy and system change and the potential range of methods required to investigate these dynamics, Gilson argues that the rigour of any studies should be based on their appropriateness for the disciplinary or research strategy (Gilson, 2012). With that in mind, understanding the different type of analysis available has been vital for the CfWI's development of an approach to policy analysis for health and social care workforce planning.

1.3 Policy analysis and the CfWI's robust workforce planning framework

The CfWI produces quality workforce planning intelligence for the health, public health, and social care sectors in England by using the RWPF. This is a four stage approach to research involving horizon scanning, scenario generation, workforce modelling and policy analysis. For more information on the RWPF, see Technical Paper 10 in this series (CfWI, 2014a). It is important to note that the framework is iterative. Although it always starts with defining the focal question or key issue of concern, determining the most desirable and robust policy make take several iterations around the framework, and may even require the problem to be redefined in the light of knowledge gained.

Policy analysis is the fourth stage in the RWPF. This is the process of determining which workforce planning decisions are the most robust in the face of an uncertain future. In August 2014, the CfWI's research and development team published *Technical Paper 9* (CfWI, 2014b) which outlined our initial thinking around policy analysis, before outlining our intentions to develop this further in an update to the Department of Health. This involved three key areas of focus:

1. **Joint scoping of initial policy lever options with commissioners** - Working with commissioners to define the range of plausible policy responses to be modelled in the analysis will allow for more flexible, bespoke workforce system models to be created.

2. **Improved consideration of uncertainty** – Elicit the range of uncertainty surrounding future scenario outcomes from subject matter experts using the SHeffield ELitation Framework (SHELF) method (O'Hagan, 2014). This will allow outcome probability to be factored into our final analysis, improving the value and quality of evidence presented to decision makers.

3. **Performance monitoring** – Determining the signals that indicate a favourable or unfavourable future may be unfolding. Scanning for signs of change so that mitigating actions can be taken if needed.

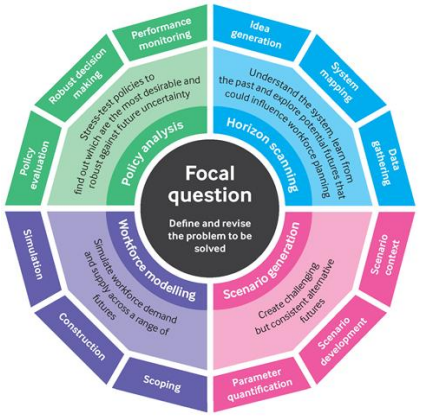


Figure 1 - CfWI robust workforce planning framework, (CfWI, 2014a).

1.4 Structure of this document

This document builds upon the initial knowledge shared in *Technical Paper 9* and presents our recent research and development activity focused on points one and three above. It should be noted here that point two is covered separately in *Technical Paper 11* (CfWI, 2015).

- **Section 1** is an introduction to policy making and policy analysis, and the role of policy analysis in the CfWI's robust workforce planning framework.

- **Section 2** is a review of different approaches to policy analysis, including the three main methodologies of descriptive analysis, comparative analysis and causal analysis. Observations are

made on the implications for the CfWI's policy analysis process. In particular it is noted that very little detailed guidance exists in the literature, and that a range of indicators are required to fully assess the success of a policy.

- **Section 3** is selecting policies for analysis, including the conceptual steps taken. The policies selected should be realistic, affordable and consistent. However, there is always a difficulty between ensuring a sufficient spread of options, and a policymaker's tendency to avoid difficult or 'edgy' options, even if these are likely to be more effective.

- **Section 4** is structuring the analysis and presenting information to decision-makers. The principles underpinning the CfWI policy analysis tool are described. This tool will be developed and piloted as part of the Horizon 2025 project.

- **Section 5** contains next steps.

2. Approaches to policy analysis

It is often noted in policy analysis literature that not enough attention is paid to the methodologies and theories applied by practitioners in the field, however, it is arguable that this is a result of a lack of readily available research-design guidance. In this section of the review, we outline a broad taxonomy of policy analysis methodologies, which are recognised across the wider literature, in an attempt to improve the clarity of the boundaries between research types. The long term aim of this is to assist analysts in the shaping of future exercises.

There are three clearly succinct methodologies to consider but it is equally important to note two factors for planning any policy analysis study:

1. The extent to which the policy in question is being considered within the system as a whole, i.e. a system which 'exists and evolves to serve societal needs'—with 'components' that '... can be utilised as policy instruments to alter the outcomes' (Hsiao 2003, from Atun 2012, iv4).
2. Whether the study is an experiment or simply an observation of everyday circumstances (Mills, 2012). In parallel to the move towards systems thinking, it has also been argued widely for the increased value of experimental studies, with Sanderson presenting evidence for a model in which "vigorously trying out possible solution to recurrent problems" (Campbell and Russo, 1999, in Sanderson, 2009, p708) becomes the norm.

Whilst historically much analysis has been scoped in isolation of wider system factors, the past ten to fifteen years has seen a general paradigm shift towards whole system thinking, with the CfWI's Horizon 2035 (CfWI, 2014d) project providing an excellent example. This has been enabled in part by the increased analytical capacity granted by advancing computer technology and the ability to quickly process vast quantities of data (Lempert et al, 2003).

It should also be noted that the shift towards whole systems thinking has been largely limited to studies in high income countries, with low and medium income countries being more limited in their understanding of the policy change process as noted by Gilson and Raphaely (2008). This serves to emphasise the point that international and domestic policy analysis, as well as how policy makers respond, require different approaches and tools. The need for a wide range of policy tools, as well as the need for increasing co-operation, is highlighted by the Organisation for Economic Co-operation and Development (OECD) when examining policy challenges for the future at these different resolutions and the global drivers (OECD, 2014)

Mills et al also note the caveat that whilst randomised sampling is considered the gold standard in medical research, health systems often do not allow this by nature, resulting in the perception that these studies are less rigorous (Mills et al, 2008). This difficulty is reflected upon by Sanderson (2009) who later argues for studies to use varying levels of experimentation depending upon the systemic context, for example using controlled pilots in conjunction with rigorous monitoring and evaluation in a politically sensitive health system.

The following section considers three broad policy analysis methodology groups with the aim of further defining the boundaries between research types.

2.1 Descriptive analysis

Descriptive analysis commonly uses a range of data sources to establish the current state of a society or market. The general aim of most descriptive analysis is to identify trends or issues within a system, or to focus on an already known feature of the system (McPake et al, 2014). This approach is most commonly employed in complex labour markets where supply and demand imbalances are most easily identified by sudden changes in full time employee equivalent (FTE) or market wage rate. It is through descriptive analysis that many further research questions or hypotheses are developed (McPake et al, 2014). Descriptive analysis typically tends to use a loose framework of probing questions to structure its enquiry, as presented in the box (right).

Suggested topics for discussion in descriptive workforce analysis. Adapted from McPake et al, 2014, p61.

- Supply and demand factors
- Interactions between supply and demand
- Society/market structure
- Society/market trends
- System metrics/indicators
- Geographical distribution
- Cross society/market variance

Adapted from McPake et al, 2014.

Whilst it is possible to use this methodology to carry out research concerning the whole of a system (providing the time and resource are available for this labour intensive process), it is rarely possible to consider more than one policy response or system simultaneously. This restricts the value of using just descriptive analysis to assist with informed policy decisions when faced with deep uncertainty, such as those that are inherent in health and social care workforce planning. Despite this, descriptive analysis does add value to the wider policy analysis process, often by providing a starting point for further research as demonstrated by Ricketts and Fraher (2013) in their call for care workforce reconfiguration in the US, which was informed by an in depth analysis of the current labour market.

2.2 Comparative analysis

The literature in recent years has shown an increasing popularity in studies where an intervention or strategy's success is compared between settings. Theoretically this analysis allows researchers to infer which types of policy work best in response to which issues, or which policies may be suitable for certain systems. Comparisons may be made between naturally occurring experimental situations such as the regularly published 'Health at a Glance' series from the OECD (OECD, 2013), or in controlled experimental situations such as the recent evaluation of several pilot integrated care models implemented across England (RAND Europe and Ernst & Young, 2012). Several proven conceptual frameworks for comparative analysis can be found in the prominent *'Theories of the Policy Process'* series (Sabatier and Weible, 2014).

Whilst this approach does provide some insight in to the conditions required for a policy to provoke a beneficial system response, the sheer range of variance between system characteristics often makes identification of those that are relevant, or irrelevant, difficult. One further limitation of this approach is that the quantitative comparison of system indicators is often made difficult by varying study area sizes, resolutions, or metrics (Mills, 2012). For instance, comparing the success of similar workforce policies implemented in England and the USA may be made difficult by differing definitions of job satisfaction in national workforce surveys. Despite these challenges, generalisation of policy/system types can allow for valuable qualitative research of this type to be carried out, for instance the recent comparison of health policy success across 43 European countries carried out by

Mackenbach and McKee (2013). Studies such as these are valuable in that they allow for greater certainty when identifying causal relationships (Walt et al, 2008), as is explained further below.

2.3 Causal analysis

Broadly speaking, causal analysis is concerned with identifying the reasons why things in a system are happening. In policy analysis terms, this means that the aim of such analysis is to understand the causal relationships between policies and system factors such as the workforce or the economy (McPake et al, 2014). Causal relationships are often identified by iteratively asking the question 'why did this change occur?' when something unusual happens in a system. If this process leads to a relationship with a policy intervention that can be told as an instinctively plausible story, this relationship may then be tested experimentally or by seeking comparison with other instances where similar policies have been implemented (Stone, 1989). Cognitive mapping, developed by Ackermann et al (1992), provides an alternative way of approaching causality that has been successfully deployed by operational researchers in a range of situations.

Having established that relationships exist between policies and their effects, analysts can go on to map the linkages between these system components. It is these linked factor maps upon which much of the CfWI's system dynamics modelling is based. For more detail on this process, see *Technical Paper 8* in this series (CfWI, 2014c). Perhaps the best recognised diagram showing causal relationships in the UK health and social care sector is that developed by Dahlgren and Whitehead (1991) to show the linkages between various determinants of population health.

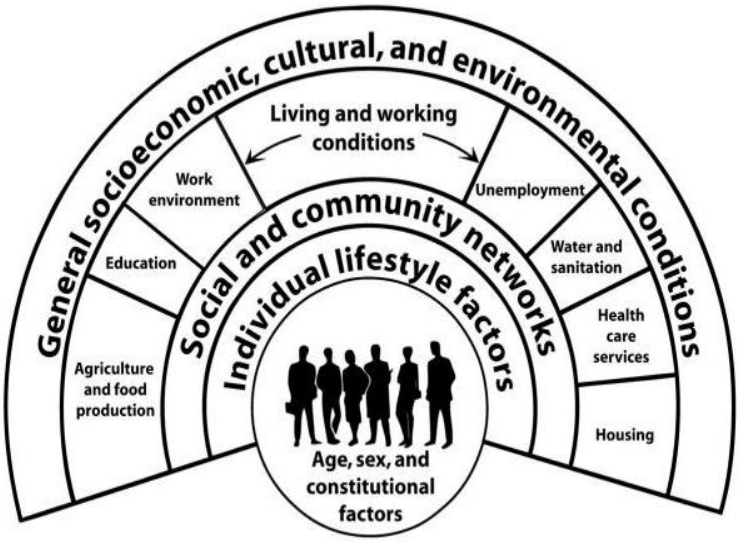


Figure 2: Social model of health. Dahlgren and Whitehead (1991)

Cost benefit analysis is perhaps the most commonly found example of causal analysis, where assumed relationships between factors are used to calculate the effectiveness of an intervention relative to the cost of implementing it (HM Treasury, 2011). This type of analysis often provides valuable evidence to decision makers when attempting to choose from a number of investment opportunities, with Hutton and Rehfuess (2006) providing best practice guidelines for conducting such analysis in the health and social care policy arena.

2.4 Wider observations and the CfWI

Whilst conducting the research for this section, two key observations were made which have helped to shape the CfWI's policy analysis process:

1. Despite the recognition that policy analysis provides important evidence to inform decision makers in uncertain conditions, **very little detailed guidance exists in the literature on how**

to practically conduct this research in the context of health and social care workforce planning. The CfWI aims to inform policy analysis practitioners by developing cutting edge methodologies and sharing them publically through this technical paper series.

2. There is a common recognition that **a range of indicators are required to fully assess the success of a policy**. In its policy analysis, the CfWI continues to use a variety of system outputs to measure policy effectiveness. Whilst this does include economic indicators such as supply and demand, wider factors such as political sensitivity and patient outcomes are increasingly being considered in our analysis. More information on measuring policy success can be found in *Technical Paper 9* in this series (CfWI, 2014b).

3. Selecting policies for analysis

The first stage of the CfWI's two-part policy analysis process is to decide which policies it will focus its analysis upon. As testing and analysis is a time-consuming and labour intensive activity, it is important that the policies chosen are realistic, affordable, and consistent with wider policy strategies.

Historically, policy option development at the CfWI has been using a variety of methods, with options coming from a range of sources including commissioner requests, external stakeholder workshops, and CfWI analysis. The process outlined in this paper, based on ideas developed by the RAND Corporation (RAND) (Davis, 2014), will improve the structure and transparency of this subjective process and ensure that the full range of policy options is considered.

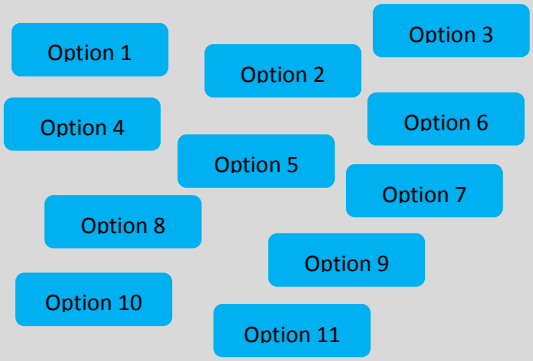
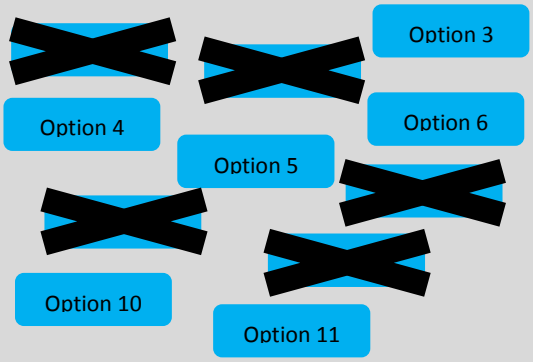
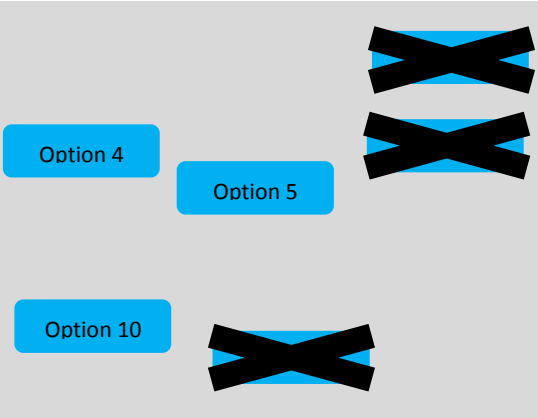
3.1 Practical application

Whilst the concept of the 'efficient frontier' between cost and effectiveness is recommended as a tool to assist with the options development process by RAND, the deep uncertainty inherent in health and social care policy would render the use of this concept by the CfWI too subjective to add any true value. For this reason, the decisions made in the options development process are made by engaging with expert stakeholders and decision-makers at each stage.

In practice, each stage may differ in its execution based upon the requirements of the research in question, for example stage one for smaller more focused projects may simply involve a meeting between CfWI analysts and commissioners, whereas for large projects such as Horizon 2035, this stage may require a workshop involving stakeholders from across the health and social care spectrum. In each instance, a clear options development methodology will be included in the final project report.

3.2 Options development process

The following process outlines the conceptual steps taken by the CfWI when developing policy options for analysis:

Stage 1	Create a vast menu of policy options, going beyond conventional wisdom and prejudice as to what might be considered. Possible sources could be historical policies, thoughts captured from previous stakeholder engagement, wider literature/research, or simply maverick ideas. E.g. You are presented with a wine list whilst dining at a restaurant.	
Stage 2	Filter out the vast bulk of options because they are clearly inconsistent with wider existing strategies, too expensive, or unrealistic in the given timeframe. E.g. You filter out all white and rose wines as you have chosen to eat beef for your main course. You also filter out all wines that cost more than £40 per bottle.	
Stage 3	From the remaining options, identify the final subset of policies to undergo detailed analysis as those which are of most interest to decision makers. E.g. Based on personal preference you decide that you would like to taste the malbec, pinot noir and merlot from the remaining red wines before making your final decision.	

Of course, wine and meal matching is very much one of personal preference, and does not have to follow conventional wisdom. White wine may be very acceptable for some beef dishes, taking into account parameters such as event, location and climate! There should always be a degree of challenge as the best options may not always be apparent.

4. Structuring our analysis

The second stage of the CfWI's policy analysis process involves structuring and presenting our analysis in a way that provides the most robust evidence possible to decision makers. In this context, a robust policy is one that is effective for a range plausible future scenarios as it is able to evolve over time in response to the changing policy context (Lempert et al, 2006).

4.1 The RAND Portfolio Analysis Tool

As the effects of health and social care policy change are wide ranging and highly uncertain, it is important that a variety of outcome measures are used to assess the effectiveness of an intervention. Research carried out by RAND has found that presenting decision-makers with a vast range of modelled metrics can however create a greater sense of uncertainty than that which existed prior to analysis. In response to this, a Portfolio Analysis Tool (PAT) which aggregates the range of model outputs or measures of effectiveness (MOEs) has been developed (Davis and Dreyer, 2009).

Initially the PAT presents decision-makers with a high level scorecard of MOEs versus policy strategy. Each MOE is measured on a scale of 0 to 1 and can be represented as a colour on a scale to ease interpretation of the diagram. MOEs can also be combined for each policy strategy to give an overall effectiveness score between 0 and 1.

At this high level it is unlikely that the way each MOE has been calculated will be clear, therefore the PAT allows users to drill down to the next level of detail for each MOE. Here it is possible to see the disaggregated factors providing the effectiveness value of between 0 and 1. For more complex models this process can be repeated several times. For more information on the RAND PAT, see Davis and Dreyer (2009).

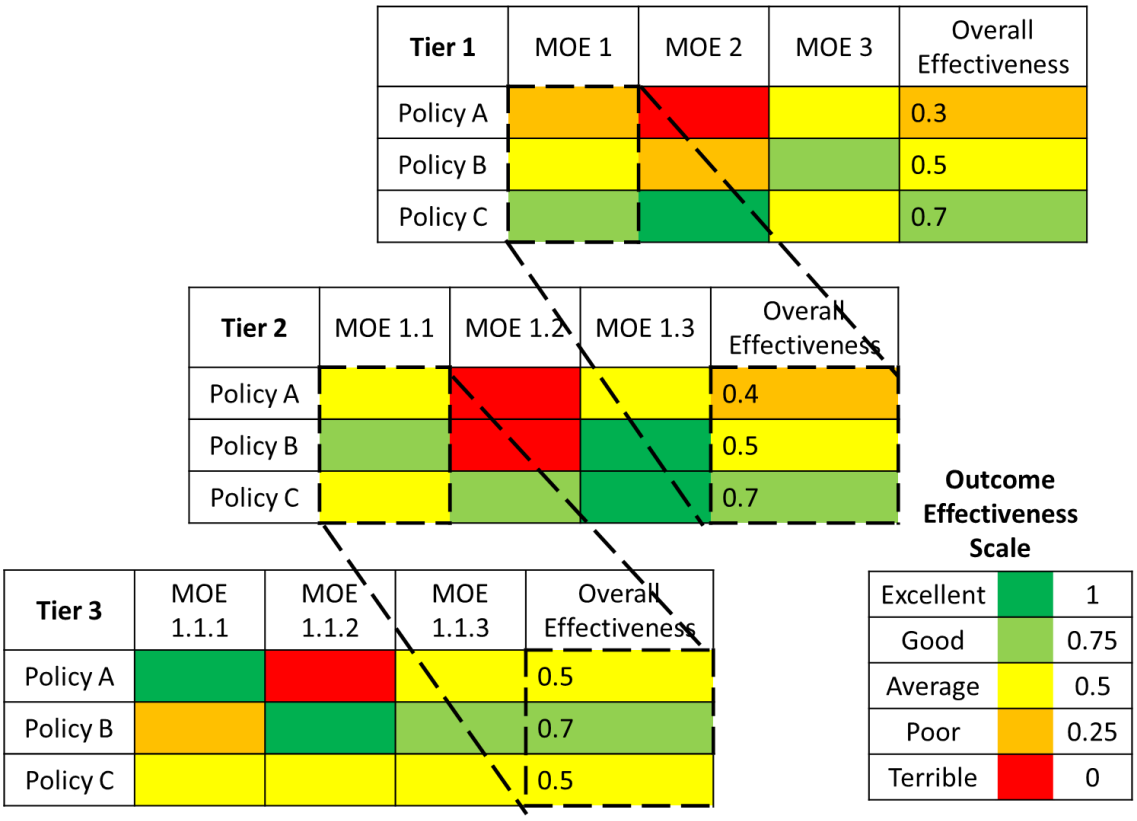


Figure 3: Schematic diagram of a three-tiered scorecard system. Based on Davis and Dreyer (2009).

4.2 Principles of the CfWI Policy Analysis Tool

In the next round of CfWI research and development activity we will develop a tiered policy analysis tool based on the ideas of the RAND PAT. This tool will complement our approach to robust decision making and will be piloted in our analysis as part of the Horizon 2035 project. It will be underpinned by the following principles:

1. Any policy analysis project will have a set of clear objectives such as matching supply to demand, not making big changes in intake or minimising costs. These objectives will form the high level measurable outcomes and may be weighted in importance.
2. MOEs should reflect the full range of stakeholder perspectives, i.e. from decision maker through to recipient of change.
3. All MOEs are subject to uncertainty and this must be reflected in results when presented to stakeholders.
4. Results cannot all be presented simultaneously. Selective aggregation will be one approach used to circumnavigate this problem.
5. All chosen policy options must be presented in the same way reflecting the true variance in outcomes and uncertainty across interventions.
6. High level outputs must allow drilling down to reveal detail at a higher resolution, perhaps through the use of an interactive presentation tool.
7. Policy effects under plausible future scenarios must be represented in the analysis. For more on the CfWI's approach to scenario development, see *Technical Paper 7* (CfWI, 2014e).

5. Next steps

The next steps are to develop the policy analysis tool as described in the previous section and following the principles listed. The nature of the tool is yet to be decided, but a key driver is the need to present the outputs of the Horizon 2035 project. This project is looking at the whole health, public health and social care workforce, and modelling skills and competences, as well as workforce numbers. We will report the findings in a future technical paper.

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