

Cost Evaluation of Interventions in the New Care Models Programme

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Operational Research and Evaluation Unit, NHS England

For queries please contact:

**Operational Research and Evaluation Unit | NHS England | Skipton House, 80 London Road
London, E1 6LH**

england.oret@nhs.net

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Executive Summary

Across many local areas the New Care Models Programme has represented a significant transformation in how care is delivered. With the new models of care there has been a great deal of interest in outcomes and how the changes might impact patients. However, in order to learn effectively from new ways of working it is crucial to try to understand how resources are being deployed to produce the outcomes.

To address this, the Operational Research and Evaluation Unit at NHS England conducted a study to explore the changes in resources use and costs resulting from the implementation of interventions within the New Care Models (NCM) programme. We report the costing methods in detail in order to encourage this way of presenting cost evaluation within the programme. The study also explores the challenges that need to be overcome to arrive at robust estimates of costs. The key element of this approach is an attempt to compare NCM interventions with scenarios prior to the implementation of these interventions.

The report presents two case studies:

- Multi-disciplinary teams (MDTs) in the Dudley vanguard, and
- The Safe Haven mental health café in the North East Hampshire & Farnham (NEHF) vanguard.

Multidisciplinary Teams were introduced in Dudley in April 2014 with the aim of supporting frail elderly patients to prevent non-elective admissions, and reduce unnecessary outpatient appointments. A risk stratification tool was used to identify those patients most at risk of an emergency hospital admission.

The Safe Haven café in Aldershot is an intervention in the NEHF vanguard, launched in April 2014. It is an out-of-hours mental health service, run in the evenings and weekends, and allows people to drop-in without an appointment. The aim of the service is to help people at the point of a mental health crisis, as well as providing ongoing support to maintain their mental health. It is hoped that the drop-in nature of the service will provide an attractive alternative to attending A&E as well as helping to reduce admissions to psychiatric beds by enabling faster access to prevention and treatment for those with mental illness.

Both interventions have been evaluated locally producing some evidence that the approaches have positive benefits for patients and the efficiency of local services. In the case of the Dudley MDTs, there is evidence that they have contributed to a reduced average length of stay for non-elective Ambulatory Care Sensitive admissions (though not that they reduced the rate of such admissions). There is some evidence that the Safe Haven café has benefits in terms of reducing psychiatric admissions and A&E attendances.

The cost evaluation suggested that the additional financial cost of delivering MDTs was estimated to be £2.7 million since 2014. However, this estimate did not include the set up costs of MDTs or potential lost benefits from existing staff working differently. The cost per MDT meeting ranged from £818 to £2279. There was considerable uncertainty in these estimates however; the main cost driver appeared to be staff costs.

The additional cost of the Safe Haven was estimated to be around £275k in the current financial year, although there is uncertainty around this estimate. This is higher than estimated by the NCM vanguard, largely due to an overspend on agency staff, additional third sector management costs, and building overheads.

The findings from both of these analyses could provide an indication of the additional costs required to generate the benefits for similar interventions in other NHS areas.

A number of general methodological challenges to cost evaluation of NCM interventions were identified. These included the involvement of multiple organisations, difficulty in identifying the boundary of an intervention, and difficulty in identifying the counterfactual (what would have happened if the intervention did not exist). However these challenges identified were not so substantial as to prevent evaluation teams from presenting more detailed analyses of costs and descriptions of changes in resource use. Therefore, **the approach followed here could provide a guide for other vanguards, their evaluators, and integrated care systems aiming to evaluate integrated care programmes.**

1 Background

In April 2016 guidance was issued to NCM vanguards on the key questions that local evaluations of the new care models should address¹. One component of this guidance was to understand:

“The change in resource use, activity and cost for specific interventions that encompass new care models locally”.

To date, a range of qualitative and quantitative data has emerged from local evaluations as a result of the guidance and funding provided. However, there has been a clear gap in the evidence relating to how resources are used differently as a result of the NCM programme.

Where local evaluations have provided information on resources or cost, it has predominantly been high level costs, with a focus on financial cost data. However, without a breakdown of high level costs, three key problems arise. First, without details of how costs are attributed to resources it can be difficult to understand what the key resources are that are driving costs in an intervention. Second, it also makes it harder for other parts of the NHS to know which resources and in what quantities are required to replicate a given intervention. Finally, from an economic perspective it is important to understand both financial and non-financial costs of implementing interventions. For example, in some interventions there may be no changes in financial costs, but there could still be substantial changes in how existing resources are used differently (e.g. changes in how staff spend their time). Therefore, non-financial costs can be important for understanding what activities have been given up in order to implement the intervention of interest. This provides a more comprehensive picture of the overall costs and benefits of the intervention.

Given the evidence gap on resource use, it was agreed that the internal NCM evaluation team should undertake two detailed case studies of contrasting interventions. The aim was to consider whether there were common approaches that could be used to make further progress in understanding resource use and economic costs, and to develop transparent methods for doing this that could be adopted more widely within the evaluation programme.

It should be noted that on its own, cost evaluation has fairly limited value. Therefore, the evaluation of resource use of NCM interventions could be presented alongside evidence of impact on outcomes. Together, this would provide insights into the overall value for money of a specific NCM work stream. This is useful for two reasons. The NCM interventions operate in a climate of increasing healthcare demand and financial pressure on the NHS, so ensuring resources are used effectively is key. Further, the NCM evaluation insights will be used to inform the roll out of many similar work streams in integrated care systems. So, an evidence base of ‘value for money’ could inform future implementation in this area.

¹ *Evaluation Strategy of New Care Models Vanguards, 2016*

2 Aims of the project

This project had four specific objectives:

- 1) To start to fill the gap in our understanding of changes in activity, resource use and cost across the NCM programme by conducting a deep dive of two new care model interventions or work streams.
- 2) To understand and describe the challenges the vanguards have faced in gathering this data which may explain why local evaluation reports have lacked detail of resource use and costs thus far.
- 3) To provide some insight into how to address the challenges the vanguards have faced in gathering this evidence
- 4) To create a 'how to guide' which could support vanguards to conduct their own cost evaluation at a local level with more robust and transparent methods.

This briefing details progress made towards the first three aims, which will feed into and inform the 'how to guide'.

3 Methodology

Overview

This report focuses on resources used to deliver two interventions: (1) Multidisciplinary teams (MDTs) in Dudley² and, 2) the Safe Haven in North East Hampshire and Farnham. In this section of this report we describe the decision problem, explain the criteria used to select which interventions to evaluate, and outline the perspective and time horizon of our study. We then outline some key concepts in cost evaluation such as non-financial costs and the counterfactual. Finally, we outline how we sought to identify, measure, and value the resources used. This methodology thus relates to objective 1 in the previous section.

This project aims to provide information on resource use at the intervention (as opposed to whole-vanguard) level. This is for two reasons. First, clearly defining a comparator / counterfactual (what would have happened if the intervention did not exist) is likely to be easier at the intervention level rather than at the vanguard level. This makes detailed resource evaluation less complex. Second, an intervention level approach makes it easier for other local areas to learn from the vanguards and implement it in their area, rather than having to replicate the entire new care model.

It should also be noted that much of the methodology below is drawn from two key sources (Mogyorosz, Smith, 2005; Drummond et al, 2015).

3.1 The Decision Problem

Before attempting to collect any information on resources, it is important to be explicit about the decision problem. That is, what decisions do we expect the information on resource use to inform? Clarifying this at the outset can avoid unnecessary work obtaining information that has no bearing on the decision problem, or can identify where additional work and effort will be required to successfully inform the decision problem. In this project, the decision problem has two parts:

Decision problem:

(1) Identify, measure, and value the resources used in implementing the two interventions in sufficient detail to allow other areas of the NHS to replicate the interventions if they decide to.

*(2) Identify, measure, and value the **change** in resources used in implementing the two interventions in sufficient detail to inform decisions regarding their cost-effectiveness.*

The above can be seen as a two-step process where (1) can be a standalone piece of work for implementation analysis. In order to complete stage (2), it is necessary to understand an intervention and all the resources involved in detail which is why stage (1) can be seen as a prerequisite. The information from (1) can then be compared to a counterfactual scenario(s) and any resources common to intervention and counterfactual can be excluded. This is because for stage (2) we are concerned with *the change* in resource use. If we were only concerned with (1), we would not need to attempt to identify counterfactual resource use. By contrast, (2) requires us to identify, measure, and value the resources used in the intervention that is actually implemented, *as well as*

² It should be noted that MDTs are not strictly an intervention but rather a way of working. They are referred to as interventions in this report for the purpose of distinguishing between MDTs and their counterfactuals clearly.

estimating the resources used in a counterfactual scenario. This change in resource use gets to the heart of economic evaluation, which is ultimately concerned with informing decisions about the best use of limited resources.

3.2 Selection of interventions

The first task we were faced with was identifying which interventions would be most amenable to detailed cost evaluation and that would provide the most insight for decision makers across the NHS. The following five criteria were used to decide which interventions to focus on:

- 1) Potential access to data and for fieldwork: The extent of the vanguard's engagement with the central team and, in turn, the possible access to detailed data on interventions was considered to be the most important criteria. This is because the success of the project was contingent on being able to access additional data from the vanguard that was not already available to the OR&E team.
- 2) Availability of robust outcomes data: Data on the effectiveness of interventions, when combined with data from a cost evaluation, can allow for future cost effectiveness analysis to take place.
- 3) Maturity of the interventions in question: Interventions which are relatively new may not have sufficient data available or have been fully implemented.
- 4) Of wider interest to decision / policy makers: The cost evaluation of the intervention should be of sufficient interest to policy makers and contribute to a solution in a particularly prominent policy area e.g. mental health. The intervention should also be of sufficiently large-scale (e.g. in terms of numbers of patients affected) to be of interest to policy makers.
- 5) Other evaluation: our evaluation needs to have added value. If a local cost evaluation is planned for the future, there may be little value in doing an extra one now. By contrast, any future robust evaluation of outcomes could complement a detailed cost evaluation, improving any future cost-effectiveness analysis.

In hindsight, given our experience with the study, we would have added a sixth criterion:

- 6) The ease with which counterfactual scenarios can be robustly identified: Identifying a counterfactual is essential for estimating the change in resource use.

These factors should be considered before replicating the method elsewhere. These criteria were selected to ensure that vanguards that took part were supportive of, and amenable to, the analysis. Applying the above criteria lead to the selection of two interventions to focus on:

(1) multidisciplinary teams in Dudley (2) the Safe Haven in North East Hampshire and Farnham. The next two subsections briefly outline the extent to which the first five criteria were met in these two interventions.

3.2.1 Multidisciplinary Teams in Dudley

Conversations with analysts in the NCM programme at NHS England, as well as with account managers of vanguards, suggested that Dudley would be appropriate. It offered good access to data and to individuals familiar with the programme. With regard to the availability of outcome data, the

local evaluation, undertaken by the local commissioning support unit, had produced a robust interrupted time series analysis of key outcome metrics such as patients' length of stay in hospital.

The Dudley MDT model was implemented in early 2014 across 45 GP practices and thus was considered a mature intervention by the time of this evaluation (late 2017/early 2018). MDT working is also a central component of the new care models which are being developed by many vanguards and thus are an important area for policy consideration. Finally, there were no plans by local evaluators to consider resource evaluation of the MDT intervention which meant this analysis would not replicate existing work.

3.2.2 *The Safe Haven in North East Hampshire and Farnham*

Similarly to the MDTs, the North East Hampshire and Farnham vanguard has so far been highly engaged with the central NHSE team, and were expected to provide access to data and staff. There were some outcomes data available, for example relating to psychiatric admissions. The Safe Haven was originally implemented in early 2014, and is thus considered reasonably mature. Given the increasing focus on mental health, it was perceived to be of particular interest for policy-makers, especially as there has been limited evaluation of other mental health interventions across the vanguards. Finally, there were no local plans to do a more detailed evaluation of the resource use of the Safe Haven by local evaluators.

3.3 *Perspective*

The perspective of a study refers to the scope of the cost evaluation and in turn which costs (and benefits) are accounted for. The wider the perspective, the more costs there are that are accounted for. The widest perspective would take into account all costs across the whole of society. For example, it would include the costs to the NHS, other public services, patients and their carers, the voluntary sector, and the private sector. As well as detailing the costs associated with the intervention in question, the costs associated with the counterfactual scenario(s) would need to be estimated in order to estimate the *change* in costs associated with the intervention.

Although taking a wide, societal perspective is considered theoretically ideal by economists, in practice it is likely to be near-impossible to undertake in this case. It is also very likely unnecessary. This is for several reasons. First, if an intervention is considered very unlikely to lead to a *change* in costs, or any change is likely to be very small, there is little reason to investigate such costs. For example, suppose implementing the Safe Haven in Aldershot has an impact on the private sector in Sunderland (compared to not implementing the Safe Haven). This impact is likely to be impossible to measure, is likely to be very limited, and any direction of impact (i.e. whether costs are higher or lower compared to the counterfactual) is far from clear. Thus, it is perfectly reasonable to assume the change in costs in this case is zero and ignore it. Second, even when a change *is* expected, and is potentially substantial, it may still be outside the remit of the relevant decision-makers. For example, an intervention that substantially reduces the burden of disease for working-age people may be expected to lead to a boost in wealth and productivity. However, this impact may not be relevant to NHS decision-makers who are not tasked with maximising economic growth.

As such, a narrower perspective may be taken. This may include costs and benefits to the NHS, patients and caregivers, and 3rd sector organisations that are particularly involved with health and social care. Or an even narrower perspective may be taken, focused only on NHS costs and benefits.

The perspective taken should be made explicit to allow any assumptions to be challenged, and to identify any limitations with an analysis. In this study we focused on NHS costs rather than societal costs. However, it was agreed that resource use outside of the NHS would be considered if it was thought to be critical to the success/ failure of the intervention and therefore could plausibly impact successful spread of the intervention elsewhere. Specifically, NHS costs refer to those associated with the two vanguards that had implemented the two interventions of interest. Such costs may include staff time and pay, costs of medicines and diagnostic tests, costs associated with buildings (utility bills, rent), equipment, and other overheads.

3.4 Time horizon

The time horizon refers to the time period over which the change in costs and benefits is investigated. It can be retrospective or can include forecasts of future changes. The time horizon matters for two reasons.

1. Suppose an intervention has been established and has been stable for a relatively long period of time. It may be possible to more confidently estimate the costs and benefits compared to a newer intervention where there are still important changes being made to how the intervention is implemented.
2. As the time horizon increases, the importance of the rate of discounting also increases. Discounting captures the notion that costs and benefits that occur in the future should be valued less than costs and benefits that occur today. This is because resources that are already available today can be invested (rather than being used immediately), potentially providing greater returns in the future. It also incorporates uncertainty about future events: costs and benefits that are *expected* to arise in the future may not *actually* occur, thus future costs and benefits should be valued less than costs and benefits that occur immediately. Over the short-term (e.g. a few years), discounting is unlikely to matter and may unnecessarily complicate the analysis. However, in the longer-term, discounting can substantially change the relative cost-effectiveness of interventions: intervention A may be more cost-effective without discounting, but intervention B more cost-effective when discounting is applied. For in-depth discussion of discounting in healthcare, see Claxton et al (2011)

The time horizon chosen in this study was from when the interventions were first implemented until present (2017/18). Both interventions were formally implemented starting around April 2014. While it may seem intuitive to consider the time horizon from the start of the NCM programme funding release until the present, many of the interventions began to be implemented prior to the start of the NCM programme (indeed, this was why many of these sites were selected to be vanguards). Therefore in order to capture the value of interventions, it is important to consider the changes from the start of implementation. Given the short time horizon, and to simplify the analysis, we did not apply any discounting.

3.5 Financial vs. Opportunity Cost

A key concept in economic evaluation is the distinction between financial costs and opportunity costs. The financial costs represent prices you might have to pay for resources. However, economic costs are considered to be any foregone benefits of using resources. The opportunity cost of something is the benefit you would get from the next best alternative use of something.

Suppose you were gifted a bottle of wine, the value of which is £50. The local wine shop has offered to buy it from you for £50. If you decide to drink this bottle of wine, you do not have any financial costs to pay. However, there is an opportunity cost. In the case of your wine, the next best alternative to drinking could be selling it to your local wine shop and getting paid £50. In drinking the wine, you are giving up the chance to sell the wine to shop and thus losing out on £50. This lost benefit is framed as the opportunity cost.

In the same way, there are opportunity costs to a health system when resources are used in a particular intervention. For example, before a new intervention is introduced, a GP might have spent 10am-11am seeing patients in their surgery (and assume this is the best use of the GPs time before the new intervention). However, as a result of the new intervention, this GP will now have to attend calls in the community. The opportunity cost of this hour of community calls is the lost benefit of the GP seeing patients. It may be that community calls are useful for patients but in order to analyse 'value for money' it is important to highlight what is given up as a result of using resources differently.

Further, some costs may not have any accounting value such as informal care or charity work but they might be vital to the operation of a service. As such, they should be taken into account (assuming such costs are relevant to the perspective of the study; see section 3.3 above).

3.6 Counterfactual

A key element of economic evaluation is to make a comparison between two or more scenarios. Therefore, to conduct cost evaluation from an economic perspective, it is crucial to clearly define a counterfactual scenario. This means estimating what would have happened if the intervention in question had not been implemented. By comparing what could have happened with what actually happened, we can estimate the *difference* (change) in resource use (economic costs), as well as the difference in associated activity and outcomes (economic benefits). This allows for an estimate of how much it costs to obtain any additional benefits for a given intervention. In turn, this allows for a comparison of alternative interventions, and can inform decision-makers about which interventions are most cost-effective and should be prioritised.

When choosing a counterfactual, the intervention should be compared to the best available alternative. However, in cases where it is not clear what the best alternative is, it is appropriate to estimate more than one counterfactual scenario. For example, a counterfactual to Intervention A may be to have No Intervention, intervention B, or intervention C. If it is not known which option out of the three is the best alternative to A, then they should all be compared to A.

The most robust method for estimating the costs and benefits of a counterfactual scenario is through the use of a randomised controlled trial (RCT). Here, the control group is intended to represent what would have happened to the intervention group had the intervention not been

implemented. However, RCTs are often highly impractical and expensive to run, and may not represent what would actually happen outside the environment of the controlled trial. There are other more complex statistical approaches to robust evaluation of costs, though they are beyond the scope of this report.³

In practice, the simplest approach is often a before-and-after analysis. This was the approach taken in this study with both the MDTs and the Safe Haven. Here, the counterfactual scenario is what happened before the intervention was introduced. It is assumed that any changes in costs and benefits that arise after the intervention is introduced should therefore be attributed to the new intervention. Before-and-after analysis is not considered particularly robust, since the health care environment can change rapidly. Thus, compared to other approaches to estimating the counterfactual, changes can easily be incorrectly attributed to the intervention of interest.

However, before-and-after analysis is often the most practical approach, because obtaining data on what happened before an intervention was introduced is usually simpler than other more complex statistical methods. This may also be a more useful approach when there is no access to patient level data, which is a key reason for using it in this study. Due to considerable potential for bias, it is important to be aware of the problems of over interpreting cost and activity data from these analyses, and this should always be acknowledged when presenting this type of evidence.

3.7 Identification, Measurement and Valuation

Once the above parameters of a cost evaluation have been determined, there are three basic steps to take. These are:

- Identification of the inputs into an intervention and its counterfactuals;
- Measurement of the quantities of these inputs;
- Valuation of these quantities of inputs.

Intuitively, the identification of inputs can be viewed as listing the ingredients of an intervention and the possible counterfactuals. Measurement relates to understanding the proportion or quantities of each ingredient required for the intervention and counterfactual. Valuation is concerned with placing a monetary value on the types and quantities of ingredients.

3.7.1 Identification

In order to identify inputs, it is crucial to first understand the intervention and counterfactual in detail. Once this is done, the resources to deliver the services can be identified more effectively.

Detailed description of the intervention and counterfactual

Some key elements to consider about the intervention and counterfactual:

- Is there a significant stage of implementation of the service, prior to it being (fully) established? If so, what did this involve?
- What are the key steps in the process of delivering this service? (e.g. preparation for MDT, MDT meeting, post MDT actions)

³ Studies in the academic literature have used a matching approach or difference in difference approach combined with matching.

- A detailed description of each step (e.g. who is involved, what type of activity are they involved in, what is required to deliver that step etc.)
- What is the scope of the service?
- What is the target population? (e.g. age, case mix, severity of illness)
- What are the types of facilities the service is delivered in?
- What is the context of the service? (e.g. geographical, institutional arrangements, local population etc.)
- What is the financial structure or funding arrangements of the service?
- Are there any unique characteristics of the service?

Identification of the resources in the intervention and counterfactual

Once the services are understood well, all relevant resources should be identified if possible, regardless of their expected impact on total costs and their measurability. Costs might include labour expenses, costs of disposables, costs of equipment etc. The companion guide to this document will provide a more detailed list. As mentioned above, it is important at this stage to identify all resources regardless of whether they are expected to have a financial or non-financial cost.

3.7.2 Measurement and Valuation

Top-Down and Bottom-Up

In order to identify, measure, and value the resources used, there are two broad approaches: top-down ('macro' costing) and bottom-up ('micro' costing). Both approaches were used in this study.

The top-down approach entails the use of pre-existing estimates of the value of healthcare resources, such as PSSRU unit costs. They are not disaggregated into the quantities and costs of the components of the resource in question. This type of approximation based approach is faster and often more practical. However, it assumes that costs behave in the same way across the system which might not be accurate e.g. regional variation of labour costs.

By contrast, the bottom-up approach seeks to (i) identify and describe each component as accurately as possible, (ii) measure/quantify the number of each component, and (iii) value each individual component. Finally, the values of each component are summed to estimate the overall value of the resources used to provide the intervention. This approach might deliver more reliable and accurate results. However, this can be very time consuming and it might not be possible to measure certain resources in detail e.g. how staff spend their time.

Valuation

Depending on the approach used, valuation might involve using some standardised costs such as the PSSRU unit costs. Alternatively, for the bottom up approach, other complex methods can be used to value the resources. These methods are beyond the scope of this document.

Value of Information vs cost of acquiring information

In practice, there is a trade-off between obtaining accurate detailed information on costs and the costs of securing that information. As a result, the top down and bottom up approaches are often combined in practice. For example, in order to obtain estimates of the value of the resources going

into MDTs meetings in Dudley, both top-down and bottom-up approaches were used. The bottom-up approach sought to *identify* and *measure* the amount of time each member of staff spent working in, and preparing for, the MDTs. However, in order to *value* this time, a top-down approach was used: PSSRU unit costs were attributed to the time of each staff member. These pre-existing unit costs are unlikely to perfectly indicate the true value of the time of each staff member in Dudley MDTs, as they are only average NHS costs. The true value of staff time in Dudley may be above or below the average. However, attempting to value the time of each individual staff member in Dudley MDTs would be an extremely resource-intensive piece of work. Thus, while the bottom-up approach provides greater insight (and probably greater accuracy), the top-down approach allows for more convenient and faster analysis.

3.7.3 Sources of information

In using these approaches we have drawn on a range of sources to identify, measure, and value resource use. We have drawn from local evaluation reports, interviews with local evaluators, interviews with vanguard staff and providers of community services in both vanguards, as well as the aforementioned PSSRU unit costs.

The method for sourcing information will depend on the service being evaluated and the local context. However, a useful starting point is existing reports or material on the intervention. Interviewing managers and staff involved in delivery of the service is crucial to understanding its operation. If working in an unfamiliar context, it is useful to get a broad overview of the local health economy from individuals who can in depth local knowledge such as local evaluators and key stakeholders in the local health system. The specific methodology we used differed slightly for each intervention evaluated and details are included in the sections below.

3.8 What this report does not include

This project has focused on the evaluation of resource use and cost of the delivery of two interventions. Analysis of their impact on healthcare utilisation is beyond the scope of this project. This is for two reasons. First, given the project timeframe, it would be challenging to gain access to healthcare utilisation data in the vanguard sites. Second, the focus on the *delivery* of the intervention (as opposed to *impact*) means this report could provide useful information for local areas who want to learn about the resource commitment required to deliver these models of care.

It should also be noted that we only considered the additional resources needed to *provide* a service, not the subsequent changes in resource use that arise elsewhere *because* of the service. For example we did not consider the change in resource use that may arise due to any change in hospital or GP activity resulting from patient engagement with a change in service delivery. These subsequent changes in resource use would be needed to understand the full cost and impact of an intervention as part of a full economic evaluation.

The next two sections describe the two interventions and outline preliminary findings.

4. MDTs in Dudley

Overview

This section outlines the steps taken for the cost evaluation of the Dudley MDT model. We describe the decision problem, provide a summary of what is already known, and outline the perspective and time horizon used. We then describe possible counterfactual scenarios. Finally, we outline how we sought to identify, measure, and value the resources used in this intervention and discuss our findings.

4.1 Decision Problem

(1) Identify, measure, and value the resources used in implementing the Dudley MDT model in sufficient detail to allow other areas of the NHS to replicate the intervention if they decide to.

*(2) Identify, measure, and value the **change** in resources used in implementing the Dudley MDT model in sufficient detail to inform decisions regarding its cost-effectiveness.*

4.2 What is already known

Dudley has an estimated population of around 317,000 which is projected to increase to around 338,000 by 2038. The population is slightly older than the West Midlands and national average, has a comparatively low average income (with some areas among the 10 per cent most deprived nationally), and contains a higher than average proportion of people with a disability. More than 10% of residents are not White British⁴.

The Dudley vanguard has conducted a consultation with its senior staff (primarily Chief Executives and Directors) as well as members of the public, revealing a range of problems with the pre-MCP organisation of health and social care within the area. These included (i) a fragmented, disjointed system, (ii) too much emphasis on hospital services rather than preventative, community, and primary care services, (iii) difficulties in getting GP appointments, and (iv) financial unsustainability and the presence of perverse incentives facing providers.⁵

An important feature to note about Dudley is that it is covered by a single CCG, local authority, mental health trust, set of social and voluntary services, and community nursing services. This could be particularly advantageous for the implementation of an MDT model which includes staff from the above organisations.

A local evaluation report on MDTs was written by the vanguard's local evaluators (a consultancy firm called ICF and the Strategy Unit at Midlands and Lancashire commissioning support unit)⁶. The report states that the multidisciplinary teams (MDTs) were initially introduced in Dudley in April 2014, with the aim of supporting frail elderly patients, preventing non-elective admissions, and reducing unnecessary outpatient appointments. The MDTs were implemented in five GP practices as initial test bed sites before being rolled out to all 46 practices across Dudley's five localities. The implementation phase included considerable involvement from Dudley CCG, heads of involved services and GPs.

⁴ Public Consultation and Equalities Impact Assessment

⁵ Bringing the Evidence Together, Dudley, (Operational Research & Evaluation Unit, NHSE, Nov 2017)

⁶ Evaluation of Dudley MDTs Final report (ICF and Strategy Unit at Midlands and Lancashire CSU, May 2017)

Each MDT involves a team of health and social care professionals. Using a risk stratification tool, they work together to identify and intervene in the top 2% of patients at risk of non-elective admissions who do not yet have a care plan in place.

Staff who regularly attend MDT meetings include: General Practitioners, mental health nurses, case managers (Virtual Ward), practice-based pharmacists, Integrated Plus workers⁷, district nurse leaders, social workers, and practice-based administrators. Additionally, 10 Care Navigators⁸ spend a portion of their time helping to facilitate MDT working.

There is some variation in the operation of the MDT model across GP practices. The meetings are held weekly or monthly depending on the practice. The number of patients reviewed at each meeting can range from 11-101 across practices. On average 78% of the patient population of MDTs are 64+ years of age.

The MDTs are designed to bring together practice based health professionals with non-practice based health professionals to facilitate interdisciplinary discussion of patients. The meetings not only include clinical discussions such as mobility issues of patients but also non-clinical discussions such as difficult family relationships. Regular care plans are created and updated for patients who require them. The Dudley MDT model primarily aims to reduce unplanned emergency admissions and improve patient experience.

Qualitative work in the local evaluation report suggests the MDTs are functioning in line with best practice, and there have been improved experiences for professionals and patients. For example, in interviews MDT staff stated they felt MDTs were a more efficient use of their time compared to prior methods of staff communication concerning patients. Patients emphasised the importance of not having to repeat their clinical history to multiple healthcare professionals. This was a result of MDTs facilitating information sharing across healthcare professionals.

Quantitative work in the local evaluation report was focused on testing whether the MDTs had impacted on the utilisation of hospital care by the patients who had been referred to the MDTs. This includes key indicators such as whether there was a reduction in non-elective admissions. The analysis also looked at whether these patients' length of stay in hospital had changed; the provision of MDTs sought to improve hospital clinicians' confidence that patients could be discharged into the community more quickly. There was a focus on patients with Ambulatory Care Sensitive conditions (ACSCs), which are considered to be more amenable to optimising treatment outside of hospital.

The impact analysis used an interrupted time series approach and indicates that MDTs may not have had a positive impact in reducing non-elective Ambulatory Care Sensitive (ACS) admissions for patients aged over 65. This is consistent with findings from elsewhere. An impact study undertaken by the Operational Research and Evaluation Unit at NHS England⁹ looks at evidence from the wider

⁷ Integrated Plus is a service that facilitates communication between primary care health professionals and community service providers. They also interact with patients to supplement clinical information that GPs have with lifestyle information about individuals.

⁸ The care navigators act as a link between the MDTs, primary care services and hospital services. They provide support to the individuals at highest risk of unplanned care both in terms of preventing admissions as well as supporting discharge.

⁹ Multidisciplinary team working – lessons from the vanguards and beyond (Operational Research and Evaluation Unit, NHS England, 2018)

literature, as well as the New Care Models vanguards, and notes the lack of evidence that MDT working can reduce non-elective admissions. Instead, MDT working may be most beneficial for motivating and empowering the workforce, and reducing the boundaries between different disciplines (physical and mental health, and community, primary, and social care).

The analysis in the local evaluation report did find supportive evidence that MDTs in Dudley may have led to a decrease in the average length of stay of such admissions, with an estimated saving of 9,600 bed days between April 2014 and August 2016, though it is not possible to clearly attribute this outcome to MDTs alone.

The local evaluation did provide some information on resources required to deliver the new MDTs. We sought to extend this knowledge base and conduct evaluation from an economics perspective. Interviews with Dudley's local evaluators suggested a couple of reasons for why they had not already conducted a cost evaluation from an economic perspective. First, at the time of the MDT local evaluation there was no clear decision within Dudley vanguard that depended on the findings of a cost evaluation. Given this, undertaking such a cost evaluation was not a priority for local evaluators. Second, it was not clear to local evaluators what type of information NHS England might want included in a cost evaluation.

4.3 Perspective

When considering the perspective for evaluating the Dudley MDT model, we identified the key stakeholders involved in delivering the service. Due to the fact that the service spanned across multiple organisations, we chose to include some description of resource use by key partners in the vanguard, including those outside the NHS. The local evaluation report on MDTs and the Dudley CCG website suggested that the key partners involved in the MDTs were the following:

- Dudley CCG
- Dudley Metropolitan Borough Council
- Dudley Group NHS Foundation Trust
- Dudley and Walsall Mental Health Partnership Trust
- Dudley Council for Voluntary Service

4.4 Time Horizon

The Dudley MDT programme began in April 2014. The time horizon considered was from the start of the programme until the financial year 17/18. It should be noted that the MDTs had been implemented and were operational prior to the NCM funding being released to vanguards. The NCM funding did provide a contribution to the MDT programme. However, the aim of the study was a cost evaluation of the MDT programme as a whole rather than to account for the NCM funding.

4.5 Identification, Measurement and Valuation of intervention and counterfactual

A good starting point for identification is to map the processes/steps in an intervention from start to finish. However, this proved a challenge for the MDTs. This is because an MDT is a step in a broader set of healthcare interventions in the MCP. As a result, placing a boundary on the MDT is somewhat arbitrary. For example, it could be suggested that only the MDT meeting is considered. However, the meeting alone, without the preparatory actions or subsequent referrals, does not necessarily impact the patient. Ideally, a cost evaluation of the Dudley MDTs should include all inputs from beyond the

MDT meetings as well. For example, at the MDT meeting it may be decided that a patient should be prescribed a new drug. If this prescription does not occur, then the decision of the MDT is pointless. If it does occur, then the additional costs of this prescription should be attributed to the MDT, *particularly if a change in health outcomes due to the drug is also attributed to the MDT*. However, estimating the costs that arise as a consequence of the MDT would require access to extensive additional data which we did not have access to, and which would have been highly resource-intensive to interpret properly due to the wide range of consequential activity that could be attributed to MDTs.

A second issue was the considerable variation around how MDTs operated across Dudley, in terms of i) type of staff ii) number of staff iii) methods of patient selection (e.g. risk stratification tool) iv) methods of patient discharge vi) number of patients discussed v) length of meetings etc. While there is a broad definition of the Dudley MDT model, this variation means that in practice MDTs do not represent homogenous models of care. As a result, there was not one intervention to evaluate but multiple.

Finally, there was also considerable variation in the practice-level MDT counterfactual scenarios. The counterfactual was defined as being 'how patients were discussed/referred etc. prior to the Dudley MDT programme'. An example of the variation in counterfactual scenarios is that some GP practices already had some form of MDT prior to the Dudley MDT programme, while others did not. Even within one GP practice, there were a range of counterfactuals. For example, sometimes non-practice based staff visited GPs in person, on some occasions they made a phone call, while on other occasions they corresponded via e-mail. Staff interviews suggest that larger practices had better access to social workers due to the large population size. Smaller practices shared a social worker leading to more ad hoc communication between the practices and social workers.

There were also variations in contact with other disciplines:

- **District nursing:** Generally, district nurses would meet GPs at MDT meetings in some practices where MDT meetings existed prior to the formal Dudley MDT programme. Other district nurses might visit GPs during lunch times, call GPs, or request GP call backs.
- **Mental health:** In about half of the surgeries, where there was space, mental health nurses would hold weekly clinics. However, while this was not an MDT-related activity it suggests for some practices there was greater opportunity for mental health staff and GPs to communicate.
- **Social care services:** Prior to MDTs, smaller practices did not have social workers attached. Staff interviews suggest there was a lack of input from social workers for practice patients. This was especially so in smaller practices where social workers were not attached.
- **Voluntary services:** Prior to the MDTs, there was virtually no communication about patients between practice-based staff and voluntary services. This is significant because the vanguard has over 1000 different voluntary and community service programmes available.

However, it should be noted that the very purpose of an MDT meeting is to try to streamline various ad hoc counterfactual scenarios, in the hope of improving communication between staff. This variation in counterfactual scenarios is therefore not surprising from an organisational perspective but does make cost evaluation challenging.

The number of different factors to consider, and the implementation of MDTs across 46 different GP practices, meant it was not possible to study the Dudley MDT model comprehensively in the timeframe available for this evaluation. As a result, the strategy we took was to identify key resource use at the level of the whole vanguard. However, in addition, we looked at three different GP practices as case studies. For each of these practices we mapped a typical MDT meeting, listed the key resources used in these meetings, and provided a cost estimate using PSSRU unit costs.

4.5.1 Vanguard Level

For the vanguard-level approach, the first step was to attempt to describe the start-up resources required to initially implement the Dudley MDT model and as well as to describe the additional costs of running it. Next, we sought to build up a picture of a counterfactual. This has largely been done qualitatively, through interviewing the local evaluators, staff at Dudley CCG, and extracting information from the description of the MDT model from the ICF MDT Evaluation report.

Answers to the following questions were sought for identifying resources used in the implementation of MDTs:

- What are the posts, numbers and hours worked, and travel time of staff involved in MDT implementation?
- Did these staff receive any training? What was the cost?
- Were there any IT costs for the MDT implementation?
- Were there any expenses in terms of office space for MDT implementation?

Answers to the following questions were sought for identifying resources used for running MDT meetings:

- What are the posts, numbers and hours worked, and travel time of staff involved in MDT meetings?
- Did these staff receive any training? What was the cost?
- Were there any IT costs for the MDT meetings?
- Were there any expenses in terms of office space for MDT meetings?

To find additional costs, the following questions were asked:

- What were additional labour financial costs as a result of implementing and running MDTs in Dudley?
- What were additional non-financial labour costs as a result of implementing and running MDTs in Dudley?
- What were additional non-labour costs as a result of implementing and running MDTs in Dudley?

While we are primarily interested in the marginal costs of the Dudley MDT model, the evidence suggests that the majority of inputs into the Dudley MDT model resulted from existing vanguard or local resources being allocated differently. Therefore, while most of the resource use does not represent an additional financial cost, it could represent an economic/opportunity cost to the vanguard in terms of other benefits foregone.

4.5.2 *Practice level*

The aim here was to describe the MDT meeting pathway and a counterfactual scenario for each of the three case study GP practices. The three practices were chosen to demonstrate variability across practices, and extract some useful lessons for future analysis, as it was not possible to study all MDTs across all 46 GP practices. Information on practice level MDTs was obtained from the ICF MDT evaluation report and interviews with the Head of Business Intelligence and Director of Organisational Development at Dudley CCG. Time estimates were obtained from local evaluators who had observed MDTs.

Based on the description of the MDT pathway, inputs into each practice level MDT were recorded and PSSRU reference costs were used to value these inputs and obtain a total cost per meeting. From the perspective of an economic evaluation, the additional cost of each MDT meeting alone is not necessarily useful. In particular, this is because it is challenging to meaningfully attribute any outcomes to the MDT meeting alone. However, we included the cost per meeting to demonstrate the variation in resource use across practices.

Staff costs were the only costs used to calculate the additional cost of the meeting. This is because interviews suggested that practices incurred no additional costs other than staff costs. While the local evaluation report suggested there was a requirement for computers linked to EMIS, laptops or tablets for non-practice based staff, and meeting room space, interviews suggested these were not additional costs. Further, the MDT local evaluation report and interviews with the local evaluators and CCG staff suggest that most MDT meetings have been taking place during lunch time. This means staff may not have been working during this time prior to the introduction of MDTs. CCG staff suggest that attending MDTs requires staff to be more flexible during the lunch period than might have otherwise been. We assumed staff costs were additional economic time costs. However, further interviews with practice staff would provide more clarity on whether staff would have been working during the time of the MDT.

Another assumption made is that the counterfactual scenario to an MDT meeting is no MDT meeting. This is a simplifying assumption given the current uncertainty around the counterfactual scenario for each practice's MDT. Therefore, the true cost of the MDT meeting in each case is likely to differ because there is some variation around counterfactual scenarios across practices.

The findings (next section) are based on the following sources:

- Interview with local evaluator of Dudley CCG from the Strategy Unit at Midlands and Lancashire CSU
- Interview with local evaluator of Dudley CCG from ICF
- Interview with Director of Organisational Development & HR, Dudley CCG
- Interview with Head of Business Intelligence, Dudley CCG
- Evaluation Report on MDTs in Dudley, by ICF
- Evaluation of Value Proposition Projects in Dudley by ICF
- Dudley's Financial Template submitted to New Care Models Finance Team
- Integrated Plus Social and Economic Impact Evaluation Report, by Dudley CCG
- Dudley CCG website
- Dudley CCG YouTube Channel

- Dudley CCG Annual Report 2015/16

4.6 Findings – Vanguard Level

4.6.1 Counterfactual

The local evaluation report and staff interviews suggest that the majority of GP practices had no MDT prior to the Dudley MDT programme. Where practices did have a pre-existing MDT, they were much smaller than what came afterwards and were run mainly by practice GPs and district nurses. In practices where MDTs were not in operation there was variation in methods of communication between staff who were based in practices and staff who were not. As mentioned above, in many cases there was ad hoc communication via e-mail or telephone. In other cases where non-practice based staff had an existing relationship with practice based staff, communication was more regular. Interviews with staff involved in MDTs could provide more clarity on how the patients discussed in the Dudley MDT model were previously discussed by staff, and what staff or other resources were involved. Further research could provide more information on staff posts, numbers and time spent in counterfactual scenarios.

4.6.2 MDT Implementation and Running

Implementation of the Dudley MDT model has been CCG led, with the Director of Organisational Development heading up the development of the programme. Information provided from Dudley's local evaluators and Director of Organisational Development also suggested that significant start-up resources were required for the implementation of the MDTs across 46 practices. This entailed a commitment of 2 days a week from the CCG board member with support from three other senior CCG staff over a period of 9 months. The activities included persuading practices to get involved and offering support to practices, such as helping them develop regular care plans for over 75s.

A local evaluation report on Dudley MDTs states that a vanguard level MDT implementation group was also set up. This group held regular meetings that were attended by senior managers from a range of core services needed for MDTs, such as social care. Initially, the MDT meetings were trialled at five practices, where further locality implementation staff meetings were held to address operational issues during early stages of the programme. This was attended by a GP and leads of core MDT services such as social care. In order to deal with troubleshooting issues, the MDT implementation team and the five locality implementation teams have continued to operate beyond the initial implementation, though their meetings and activity is now less frequent.

Scoping interviews with local evaluators and staff at Dudley CCG suggest that the additional financial costs for the delivery of MDT programme are costs for the integrated plus workers, care navigators who take part in MDT meetings and assist in MDT facilitation, and additional hours for practice based pharmacists.

We have also reviewed a local evaluation report on the Dudley vanguard value proposition projects, written by Midlands and Lancashire CSU. This is a separate piece of work to the MDT-focused local evaluation mentioned above. It focuses on the local projects which were funded by the NHS England transformation funding provided to all vanguards (although Dudley provided some local match funding to supplement this). It states that the total financial cost for the Integrated Plus programme

in 17/18 is £587,291 and this includes staff of one manager, one administrator, five link officers and five link support workers. Of this total amount £220,041 came from transformation funding and the remainder was from other CCG fund sources.

A Dudley CCG evaluation report on the economic impact of integrated plus states that the total cost for this programme in 16/17 was £523,666, which includes the same staff resource as 17/18. It is not yet clear why the figures are different for 16/17 and 17/18 given the same staff resources were used. This report also stated the annual cost for the Integrated Plus programme in 14/15 and 15/16 was £387,950 and £367,250 respectively. These figures are smaller than the subsequent years as the 5 link support workers were added to the team in 16/17.

The local evaluation report on value proposition projects also states that the annual financial cost for the care navigator programme for 17/18 is £249,000 and includes 10 care navigators. This programme began at the end of 2016 when care navigators underwent an induction until 2017. There are likely to be costs for this induction period which could be explored in future work.

The above report states that in 2017/18 there was a total financial cost of £556,000 to increase 36 practice based pharmacist's working hours to an additional 375 hours per week. As of July 2017, the team had expanded to 300 hours per week. It was also reported that the pharmacist leadership team make substantial in-kind contributions, working beyond their contracted time.

The MDT local evaluation report suggests that there are additional costs to Dudley CCG for implementing an extended MDT model in one of its 46 practices. The extended MDT is when an advanced nurse practitioner, mental health nurse and a social worker are all based in a specific GP practice devoted to MDT working. The financial template for the vanguard submitted to the NCM Finance team in NHS England suggests the additional cost of three staff is £60,000 per practice for 2017/18.

Other resources such as staff time, meeting room space and IT infrastructure are predominantly existing CCG resources which have been reallocated to the MDT programme. However, Dudley practices do use some type of risk stratification tool as a way of identifying patients to discuss at MDTs and needs to be considered. It is not yet clear how the costs of this tool might be allocated because MDTs are not the only work stream that uses the tool. For Dudley vanguard, a portion of the risk stratification tool's running and maintenance costs could be allocated to the MDT costs. However, in areas without an existing risk stratification tool, the full investment costs might have to be considered since the tool is a key first step to the Dudley MDT model. Without it, the time to prepare for MDTs and review patients would be longer and hence costs to deliver the model would be higher. Future work could explore a robust method to allocate costs of the risk stratification tool.

Interviews with MDT local evaluators and Dudley CCG staff suggest that mental health, social care and district nursing staff in Dudley MDTs are existing staff who were asked to volunteer their time for MDT working thus no additional financial costs were incurred. The Director of Organisational Development at Dudley CCG suggests that for some of the staff, lunch times would have been spent in activities such as trying to make contact with GPs. Future interviews with staff members could establish whether MDT working has meant these staff work any extra hours in *addition* to their previous workload or whether they have substituted previous activities with MDT work.

Tables 1 and 2 summarise the above information.

Table 1. Dudley MDT Model Costs (Implementation)

Resource	Input detail	Total Cost	Additional or Opportunity Cost
MDT Implementation			
<p>Staff (Core Implementation Team)</p> <ul style="list-style-type: none"> • Director of Organisational Development, Dudley CCG • Commissioning Manager for Community services, Dudley CCG • Commissioning Manager for Social Services, Dudley CCG • Commissioning Manager for Primary care, Dudley CCG 	<ul style="list-style-type: none"> • Since April 2014 • 2 days a week time spent over 9 months • This includes 30 mins weekly meetings • This includes MDT set-up and development at practice level using a rag rated system. 	No additional financial cost	Staff would have been working on other activities previously. This suggests MDT work was replacing previous activities. However, further research could clarify whether any staff members had to work additional hours to accommodate MDT implementation.
<p>Staff (Borough wide implementation team)</p> <ul style="list-style-type: none"> • Team of 10 • Including the Core team • Head of adult social service , Dudley • Head of District Nursing • Health of mental health service • Lead for practice based pharmacists • Lead for voluntary services 	<ul style="list-style-type: none"> • April 2014 till present • 9 monthly meetings x 1 hr 	No additional financial cost	Staff would have been working on other activities previously. This suggests MDT work was replacing previous activities. However, further research could clarify whether any staff members had to work additional hours to accommodate MDT implementation.
<p>Staff (5 Locality teams)</p> <ul style="list-style-type: none"> • Leads of all MDT disciplines at each locality such as lead GP, locality lead for social care, lead for district nursing etc. 	<ul style="list-style-type: none"> • April 2014-2017: 1 monthly meetings x 2hrs, for each of the 5 localities of Dudley • 2017 – Present: 1 bimonthly meeting x 2 hrs, for 5 localities 	No additional financial cost	Staff would have been working on other activities previously. This suggests MDT work was replacing previous activities. However, further research could clarify whether any staff members had to work additional hours to accommodate MDT implementation.

Table 2. Dudley MDT Model Costs (Financial)

Resource	Input detail	Total Cost	Additional or Opportunity Cost
MDT Financial Costs			
Staff (Integrated Plus Programme) <ul style="list-style-type: none"> one manager one administrator five link officers five link support workers. 	<ul style="list-style-type: none"> During 14/15 and 15/16 staff resources were one manager, one administrator and five link officers During 16/17 and 17/18 five link support workers added 	14/15: £387,950 15/16: £367,250 16/17: £523,666 17/18: £587,291 Total: £1,866,157	These all represent additional costs for the MDT programme.
Staff (Care Navigators) <ul style="list-style-type: none"> team of 10 	<ul style="list-style-type: none"> Introduced in 17/18 Aid the facilitation of MDTs 	17/18: £249,000	These all represent additional costs for the MDT programme. However, care navigators do not solely work on MDTs
Staff (Practice based pharmacists) <ul style="list-style-type: none"> Existing 36 pharmacists funded to work extra hours 	<ul style="list-style-type: none"> Funded to work additional 375 hours per week As of July 2017, 300 additional hours per week worked Pharmacy team leadership provided in kind contributions 	17/18: £556,000	These all represent additional costs for the MDT programme hours
Staff (Extended MDT Model –Lion’s Health) <ul style="list-style-type: none"> Advanced Nurse Practitioner Mental Health Nurse Social worker 	<ul style="list-style-type: none"> Extra practice based staff for one practice which has implemented the Extended MDT model This involves funding extra practice based staff at a practice 	17/18: £60,000	
Total Additional Financial Costs			£2,731,157

Table 2 shows that the additional financial resources required to deliver MDTs since 2014 is estimated to be £2,731,157. However, there are a few key issues with the above figures. First, from the data it is not clear whether the financial staff costs are salary figures or whether they include other costs such as pensions, national insurance and administration costs associated with staff. It may be that the actual economic cost of the staff is higher if the non-salary costs have been excluded from the above figures. Secondly, while Table 1 provides some measure of staff time for MDT implementation, we have not placed a value on this without information on various staff salaries. Thirdly, our research suggests that the majority of the costs for the Dudley MDT model stem from staff costs. However, these are not always financial costs but the result of staff working differently, resulting in an opportunity cost. It is challenging to measure and value opportunity costs

and as such our work has not provided a detailed account of this. Finally, it should be noted that the care navigators do not spend all their time working in MDTs thus their contribution to the additional costs are likely to be lower.

As a result of the above, overall, it is likely that the true economic costs of the Dudley MDT model are *understated* by our analysis.

4.7 Findings – Practice Level

The first step to investigating MDTs at the level of a GP practice was to outline an MDT Pathway and a Pathway for possible counterfactuals. This can be found in Appendix A.

Under the simplifying assumption that the counterfactual to a practice-level MDT is no MDT, Table 3 shows an estimated cost-per-meeting for three practices. With more time, a more detailed picture of the true counterfactual scenario at each practice prior to the Dudley MDT programme could be obtained from staff interviews. This would allow more accurate costs to be obtained. A detailed exposition of these figures can be found in Appendix B.

Table 3. Practice level MDTs - Cost per meeting

Case Study	Inputs	Cost per meeting (£) approx.	Counterfactual
Lion's Health – large practice with weekly MDT meetings which cover on average 23 patients	13 staff members 90 min MDT meeting 30 min MDT (medicines review with GP & nursing team only) 30 min prep time/staff member 30 travel time/non-practice based staff	1777	<ul style="list-style-type: none"> • This practice has been conducting MDTs for over 10 years. • Evidence suggests that the actual counterfactual prior to the Dudley MDT programme is a mini MDT in various phases. • Initially, GPs conducted an MDT with virtual ward nurses. At a later phase, the meetings included district nurses. The final stage was the extended Dudley MDT model.
Wychbury Medical Practice – large practice with monthly MDT meetings which cover on average 101 patients	12 staff members 180min MDT meeting 30 min prep time/staff member 30 travel time/non-practice based staff	2279	<ul style="list-style-type: none"> • Evidence suggests that the counterfactual prior to the Dudley MDT programme is no MDT but informal staff discussion about patients.
Eve Hill Practice – small practice with monthly MDT meetings which cover 11-23 patients on average.	6 staff members 60 min MDT meeting 30 min prep time/staff member 30 travel time/non-practice based staff	818	<ul style="list-style-type: none"> • Evidence suggests that the actual counterfactual prior to the Dudley MDT programme is no MDT but informal staff discussion about patients.

4.7.1 Efficiency Issues at Practice MDTs

The work so far has highlighted some key issues around efficiency of MDT operation which may be worthy of further exploration. These issues might impact both the resource use and outcomes for MDTs.

Staff absence: interviews with local evaluators suggest that staff absences can increase time taken to discuss some cases. For example, in one practice absence of the Macmillan nurse led to a partial discussion about a patient. After the MDT meeting the absent staff member was contacted directly to discuss the patient again. In another case, the mental health nurse was never able to attend MDT meetings due to the time clashing with another clinic. Therefore, any discussion with her had to be done outside the MDT. If staff absences do increase time spent per case for certain cases then this in turn increases the cost per patient.

The local evaluation report on MDTs suggests staff absences might be driven by the fact that MDTs in some practices are not scheduled at consistent times during the week or at the same venue. During an interview, a local evaluator also stated that some staff members served up to 11 MDTs which made it difficult to attend all meetings. This local evaluation report also highlighted how commitment to multiple MDTs has led staff in some MDTs to arrive late or leave early.

Staff absences suggest that if key staff members are not available in meetings then members of the meeting have to resort back to ad hoc communication for some patient. This could be explored in future work.

Meeting space: Local evaluators and Dudley CCG staff stated suggest that most MDT meetings take place at lunch time, and often the meeting space is the GP practice's staff room. This can result in disruptions to effective discussion of patients in the meeting. For example, staff in one practice were interrupted by practice staff not involved in the MDT. The non-MDT staff regularly started conversations with MDT members during the meeting. This left less time to discuss MDT patients. It might be that without this interruption more patients could be covered during the time and the cost per patient could fall.

The local evaluation report on MDTs also suggested a consistent issue with meeting rooms lacking enough seating space for all MDT members, leaving some to stand. This could further disrupt efficiency and staff morale at meetings.

Practice patients who do not live in the area: Interviews with local evaluators suggested that problems were posed by patients who were registered in a practice but lived outside the local authority/social service/mental health trust area which covered Dudley. This is because the patients who had previously lived in the local area had moved away but stayed registered to their old practice. Patients were discussed at MDTs but staff were unable to make direct referrals to social services in their area. It is unclear whether this increases the time taken to discuss certain cases. This could be explored in future work.

4.8 Assumptions and Limitations

The findings have a number of limitations.

- The overall costs valuation only provides details on financial costs of MDTs and some description of opportunity costs. This is likely to be an underestimate of the true economic costs. This is because the majority of staff involved in MDTs are doing this MDT work instead of other activity. This suggests there may be high opportunity costs to the rest of the system in terms of the benefits staff could have delivered if not involved in the MDT. For example, a social worker not in a MDT meeting could have been seeing a patient. On an aggregate level, it might be that these opportunity costs impact the Dudley health system as a whole.
- While opportunity costs are difficult to quantify precisely, the best option available would be to try to obtain some contextual information about non-financial costs through staff interviews. This has been done for the MDT implementation team resources. An interview with the Director of Organisational Development at Dudley CCG suggests that social care, district nursing, mental health and voluntary service staff were very keen to be involved in MDT working. This might suggest they perceived the benefits of MDT working to outweigh the lost benefits. Further interviews with staff involved in MDT meetings could provide a clearer picture on this.
- There is considerable variation around how MDTs are organised at a practice level in Dudley. This suggests that even at an intervention level, we are not considering one homogenous model of care. Due to constraints, the study was only able to examine three practices in detail, which were previously evaluated by Dudley's local evaluators. Therefore, our work cannot provide a comprehensive resource evaluation of the Dudley MDT model.
- It is difficult to establish a precise counterfactual to MDTs prior to the Dudley MDT model. This is because the patients currently discussed in the MDT programme were previously dealt with in a variety of ways such as telephone conversations or e-mails between healthcare professionals. Therefore, because we cannot establish in detail what used to happen prior to the MDT programme, our cost estimates are likely to be inaccurate. As stated above, this is perhaps unsurprising given the nature of the MDT model is to try streamline various ad-hoc modes of communication and referral. However, it highlights the fact that what might be necessary for delivering care can be at odds with undertaking robust evaluation.
- Much of the description of the intervention and counterfactual scenario was obtained from retrospective descriptions by staff in the CCG and practices. This is a less robust method since considerable time has passed since the start of the MDT programme and so memories can be susceptible to inaccuracies and biases. As a result, the cost and resource figures should be used with caution.
- The data on staff and time resources required to deliver MDT meetings are drawn from local evaluators' observations from a sample of three MDT meetings per practice. This is a small sample size of observations and may not be representative of how MDTs normally operate in the practice.
- The financial costs highlighted may be predominantly based on staff salary and exclude costs such as pension or national insurance. As a result, the financial cost for the resources stated is

likely to be an underestimate. Coupling this with the opportunity cost of MDT working, it is likely that our research has underestimated the economic cost of MDTs.

- The analysis has largely ignored intangible costs of the Dudley MDT model. For example, there might be psychological costs to staff of a transformational model of care.
- The analysis has not considered costs relating to Direct Enhanced Services (DES) payments for GP practices. These are given to practices for setting up active case-management, defined as (i) identifying their most at-risk patients (e.g. through the use of a risk stratification tool or other methods), (ii) setting up MDT meetings and (iii) allocation of a case manager for each high-risk patient identified. For 2016/17 these payments were up to £2.87 per registered patient. These payments were given to all practices that signed up to the DES, and were given to practices by NHS England under GP commissioning arrangements to incentivise setting up MDTs.

4.9 Possible future work in Dudley

Interviews could be conducted with the mental health lead for MDTs, the social care lead for MDTs and the district nursing lead for MDTs. This would help obtain a more detailed picture of resource use for MDTs at the vanguard level. It would also provide more contextual and qualitative information on the opportunity cost to the mental health, social care and district nursing systems in Dudley as a result of the MDTs.

Interviews could also be conducted with practice level staff to obtain more robust estimates of time spent on MDT meetings and preparation for them. Interviews could also be conducted with practice level staff to obtain information on the impact of staff absences and lack of access to patient data on MDT productivity.

5. The Safe Haven in NEHF

Decision Problem

(1) Identify, measure, and value the resources used in implementing the Safe Haven in sufficient detail to allow other areas of the NHS to replicate the intervention if they decide to.

*(2) Identify, measure, and value the **change** in resources used in implementing the Safe Haven in sufficient detail to inform decisions regarding its cost-effectiveness.*

In order to address the decision problem, we first describe what we already know about the intervention. We then set out the perspective of the analysis, the counterfactual used, and the time horizon. The next steps entail the identification, measurement, and valuation of the resources. Finally, the assumptions, limitations, and possible next steps are considered.

5.1 What We Already Know: Overview of the Safe Haven

North East Hants and Farnham (NEHF) is a vanguard located on the Surrey and Hampshire border, with a GP-registered population of around 225,000. The life expectancy and health and wellbeing of the NEHF population are higher than the England average, though with some pockets of deprivation. Key priorities for the vanguard are addressing health inequalities and planning for the ageing population. As of September 2017, the vanguard's change in rate of emergency admissions since the 2014/15 base year is 1.4%. This is comparable to the average for the PACS cohort of vanguards (1.2%), and is well below the 4.9% growth seen in non-NCM areas (source: NEHF BTET).

The Safe Haven café in Aldershot is an intervention in the NEHF vanguard, launched in April 2014 (before vanguard status and funding was awarded). It is an out-of-hours mental health service, run in the evenings (6pm-11pm) and weekends (12:30pm-11pm) by Surrey and Borders Partnership (SABP) NHS Foundation Trust, as well as two third-sector organisations: Andover Mind and Catalyst (formerly known as SADAS). The service is run from The Wellbeing Centre, a building in the centre of Aldershot, and allows people to drop-in without an appointment. Prior to 2017/18, the third-sector organisation mcch was involved in running the Safe Haven and Wellbeing Centre. However, Andover Mind took over their role in the current financial year.

Three mental health professionals staff the service; one clinician from SABP, plus a support worker from each of the third-sector organisations. The aim of the service is to help people at the point of a mental health crisis, as well as providing ongoing support to maintain their mental health. By setting itself up as a drop-in service, the aim is that it will provide an attractive alternative to attending A&E at Frimley Health NHS Foundation Trust. The service also aims to reduce admissions to psychiatric beds by enabling faster access to prevention and treatment for those with mental illness.

The independent local evaluation report by the Wessex Academic Health Science Network (WAHSN) provides some evidence regarding the impact of the Safe Haven on A&E attendances and psychiatric admissions, as well as evidence from the police (mental health related deployments and detentions). The evidence is suggestive of some impact in terms of reducing NHS hospital activity. For example, at the CCG level, there has been a downward trend in psychiatric admissions, though this trend is apparent before the Safe Haven was established, and no comparison with other CCGs is provided. Furthermore, a cohort of Safe Haven users has also seen a reduction when comparing their use

before attending the Safe Haven with after, though in the absence of a control group at least some of this reduction may be due to regression to the mean¹⁰.

5.2 Perspective

In this study we focused on NHS costs rather than wider societal costs, but it was agreed that resource use outside of the NHS would be considered if it was thought to be critical to the success of the intervention and therefore could plausibly impact successful spread of the intervention elsewhere. This is particularly relevant for the Safe Haven given the central role played by the 3rd sector organisations.

5.3 Counterfactual

We were interested in the change in costs that have arisen in providing the Safe Haven service compared to a counterfactual. Unlike the MDTs in Dudley, which involved slowly-evolving changes in staff time and organisation, the change in costs for the Safe Haven should be fairly straightforward to identify. In part, this is because there is a clear start-date for the intervention (April 2014). Furthermore, conversations with one of the authors of the WAHSN report and the senior mental health commissioning manager at NEHF CCG established that there was no out-of-hours mental health service prior to April 2014. Therefore the counterfactual is assumed to be a continuation of no out-of-hours mental health service. This means the counterfactual costs are zero, and means that the change in costs is equal to the full costs of running the service since then. If there had been a pre-existing service, the change in costs would be the difference in cost between the Safe Haven and the pre-existing service:

Change in costs for Safe Haven = Full costs of running the Safe Haven – Counterfactual costs

5.4 Time Horizon

Where possible, we wanted to identify whether costs have changed from year to year. For example, in year 1 there may have been start-up costs, while in subsequent years there may be costs that were initially unforeseen. This was a key reason for focusing the analysis on a relatively mature intervention. As with the MDTs in Dudley, it should be noted that the Safe Haven had been implemented and was operational prior to the NCM funding being released to vanguards. However, the aim of the study was a cost evaluation of the Safe Haven as a whole rather than to account for the NCM funding.

5.5 Identification of Resources

Mapping out the possible patient pathway was the first step taken in order to identify sources of data where changes in resource use (compared to the counterfactual) could arise. Based on the

¹⁰ Regression to the mean occurs when values that are extreme/unusual in one period tend to be less extreme in a following period, regardless of any impact of an intervention. This can make it look like the intervention has had a substantial impact, when it is actually not relevant. This is common in healthcare, because people will often improve even without any medical treatment. For example, if you took 100 people, measured their blood pressure once, prescribed daily Mars bars to the ten with the highest blood pressure, then remeasured the blood pressure of these ten a few weeks later, you would likely find that on average their blood pressure had declined. This is because blood pressure measurements have high variance and can be influenced by lots of temporary factors on a given day, so high measurements are likely to be followed by lower measurements anyway, rather than because of any impact from the Mars bars. Similarly, the reduction in psychiatric admissions from Safe Haven users may have occurred, at least in part, even without the Safe Haven.

WAHSN evaluation report, figure 1 below outlines the key options and alternatives for a person in need of mental health support.

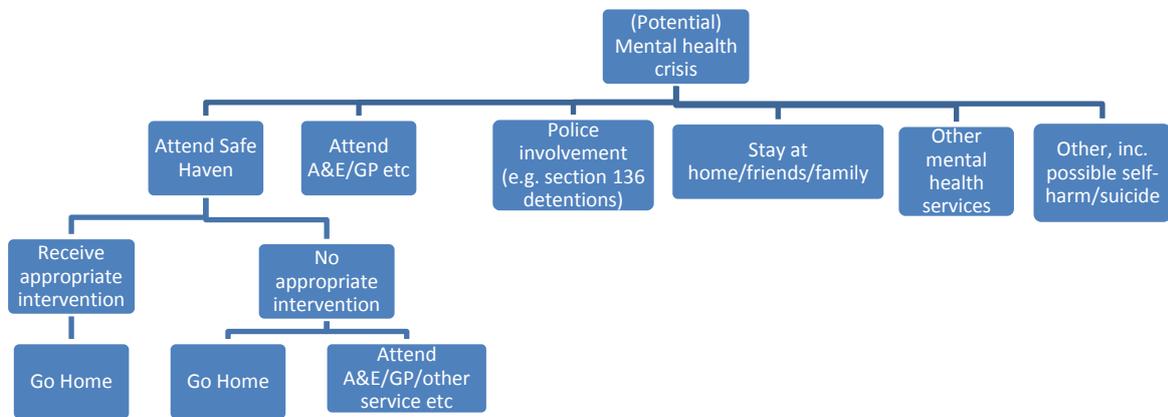


Figure 1: Key options for a person in need of mental health

This initial outline of patient options does not provide sufficient detail for mapping resource use. However, it does provide a challenge to the assumption that the Safe Haven will reduce A&E attendances and admissions. It may be that patients who would otherwise not have been users of the NHS (e.g. if they instead relied on friends/family for support or stayed at home) could instead turn to the Safe Haven and then plausibly be referred to their GP or A&E, thus *increasing* use of the NHS. However, from a patient mental health perspective, this increased use could still be a very positive outcome.

Figure 2 outlines the range of key activities undertaken once a patient attends the Safe Haven.

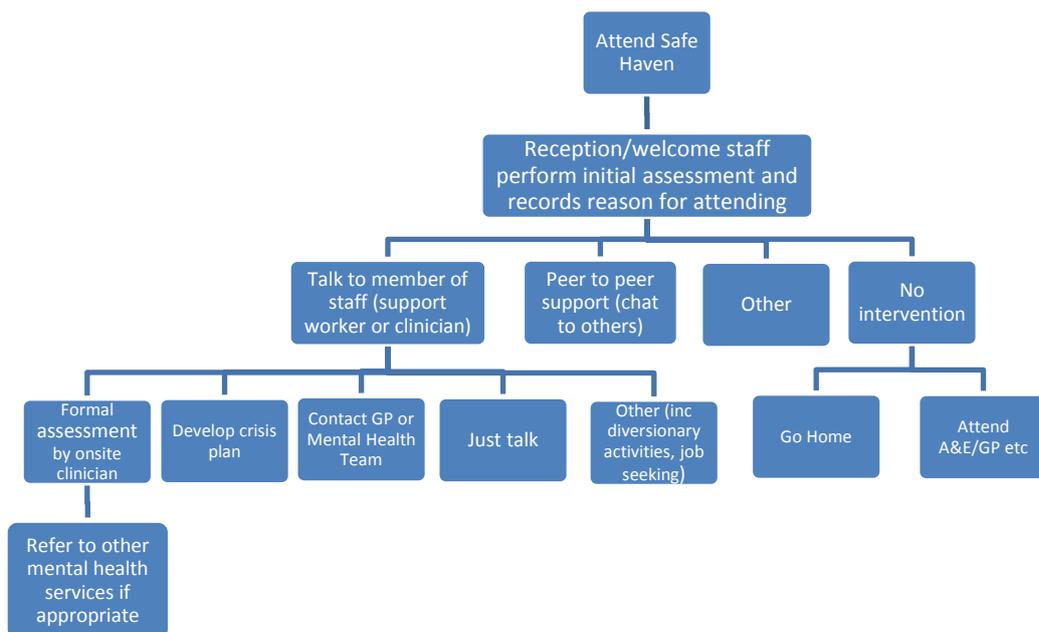


Figure 2: Patient pathway and key activities once patient attends the Safe Haven

Figure 2 implies that the main resource use is likely to be staff time and related costs (for both the SABP clinician and the third-sector support workers), which raised the following questions:

- How many staff are employed at the Safe Haven, and what is their pay and associated costs (national insurance, pension etc.)?
- How many hours do they work?
- What additional training do they require to work at the Safe Haven and what are the costs?
- Are any volunteers involved in providing the Safe Haven service, and if so for how many hours, and do they receive any compensation (travel, food)?
- What are the management costs associated with staffing the Safe Haven?
- Are there any other financial costs or resources?
- Have these costs changed over time?

Note that we are not therefore merely concerned with *financial* costs, but wider economic costs (e.g. staff/volunteer time).

The other key resource questions relate to the building (The Wellbeing Centre) where the Safe Haven is run from, for example:

- Are there capital costs or rent associated with buying/running the building?
- How about business rates, insurance, building maintenance, utility bills?
- Given that the Safe Haven is only open in the evenings and weekends, how should these costs be attributed to the Safe Haven? How is the building used the rest of the time?
- Are there any other financial costs or resources?
- Have these costs changed over time?

Answers to the above questions were sought from the following sources:

- Financial documents from SABP, Andover Mind, and Catalyst
- Interview with the Safe Haven manager
- Information provided by a financial analyst at SABP
- Information provided by the senior mental health commissioning manager at NEHF CCG
- Evaluation report by the Wessex Academic Health Science Network (WAHSN)
- Interview with an author of the WAHSN report
- Interviews and additional information from multiple staff members from Andover Mind and Catalyst

The financial documents received from SABP, Andover Mind, and Catalyst in particular provided significant details of the resources used. However, they did not answer the questions about training costs, use of volunteers, or details of the resources associated with the building. These were followed up in conversations and emails with staff from the three organisations. Furthermore, additional details were sought as to exactly what resources were included in categories that were rather vague (e.g. 'non pay'). The SABP document provided was from 2015/16, so we also checked whether particular resources may have changed in subsequent years. This was particularly important given that in previous years a different organisation (mcch) was involved in running the Safe Haven instead of Andover Mind. A significant anomaly was the 'café running costs', which neither Andover Mind nor Catalyst recognised for the current financial year. However, subsequent discussion with mcch indicated that they received funds to support the start-up costs of the project (including, furniture, decoration, and kitchen facilities), and then subsequently received the 'café running costs' referred to.

5.6 Measuring and Valuing Resources

The financial documents contained many details about the quantities of resources used, as well as their financial value. Rather than having to measure the quantities of resources used, the task primarily became one of verifying the details provided by cross-checking relevant information across the three organisations, in order to ensure consistency, flag up any anomalies, and identify any gaps (e.g. resources not included on the financial documents).

5.6.1 Valuing Resources

During the process of identifying and measuring resources, their financial value was often also obtained (e.g. on the financial documents and in discussions with Safe Haven staff). Thus, the process of valuing was largely a case of trying to verify the figures provided, identifying any inconsistencies (including across financial years), and filling any gaps.

The independent evaluation report by the WAHSN actually indicated total financial costs of £237k per annum, but no further details were provided. The limited information on costs of the service is one reason we chose to focus on the Safe Haven.

SABP provided some breakdown of these costs for 2015/16, with £95.5k being attributed to Trust Direct Costs (mostly staff pay), and £20.5k being attributed to Trust overheads. £121k was attributed to payments to the two third-sector organisations involved at the time. Of this £121k, £15k was attributed to Catalyst (who were known as SADAS at the time) for café running costs. However, it appears this was actually for mcch, who received £15k for the start-up costs of the project (including

furniture, decoration, and kitchen facilities) and then for subsequent running costs. No detail was provided by SABP as to how the rest of the £121k was used by the 3rd-sector organisations.

However, the £237k figure is likely to be an underestimate of the current costs. In the current financial year (2017/18), SABP have overpaid by £12k as of month 9, due to shifts being covered by agency staff who have a premium of 50% above substantive staff. If this continues for the full year, then SABP will have overpaid by £16k.

Furthermore, the third-sector organisations Catalyst and Andover Mind believe their costs exceed what they are currently being paid to provide the service. For example, Catalyst estimate their costs exceed their pay by £13.6k based on 2017/18 funding, mostly due to management costs (£10k).

Meanwhile, Andover Mind runs The Wellbeing Centre, the building where the Safe Haven runs in the evening and at weekends. This incurs rent, business rates, insurance, and utility bills. The Safe Haven is open for 46 hours out of a total of 86 hours per week, i.e. 53.5% of the time. If they passed on costs of running the building based on the time use, the NHS would incur additional costs of at least £11k (electricity and water bills are not known, but have been estimated at £1k each per year). Even without this, Andover Mind estimate their costs exceed their pay by £2.5k.

The above figures imply that £275k may be closer to the actual costs of running the Safe Haven for the 2017/18 financial year (see table 2; next page). The 2015/16 and 2016/17 financial years do not include the overpay on agency staff, but plausibly still entailed the difference between the costs and pay for the 3rd-sector organisations. This is supported by feedback from mcch, who indicated they received £44k per year, but calculated their running costs were £81,125.

It should be noted that NEHF CCG have recommissioned the Safe Haven service from SABP for a further five years, thus the sustainability of the service is not in question. NEHF CCG have indicated they will be making increased contributions to the running of The Wellbeing Centre, and there will also be additional funding from Surrey CCG from 2018/19.

Table 2 – Estimated costs of the Safe Haven, 2017/18

Estimated Safe Haven Costs, 2017/18				
Description	Quantity	Unit	Cost per unit, £*	Estimated Annual Cost, £ (2017/18)
Surrey and Borders Partnership direct costs				
<i>*note that the costs per unit for NHS pay are gross costs, so include pension and employer NI contributions</i>				
NHS nurse, band 6	1.25 WTE			
<i>Standard pay, 6pm to 8pm weekdays</i>	10	hours per week	22.31	11,601.20
<i>Time plus 30%, 8pm to 11pm weekdays</i>	15	hours per week	29.00	22,622.34
<i>Time plus 30%, 12pm to 11pm Saturdays</i>	11	hours per week	29.00	16,589.72
<i>Time plus 60%, 12pm to 11pm Sundays</i>	11	hours per week	35.70	20,418.11
Supervision, band 8c	0.01 WTE			
	1.5	hours per month	55.55	1,000.00
NHS Professionals Premium/absence cover	0.16 WTE			
	6	hours per week	29.31	9,144.72
Agency Staff Overpay				16,000.00
Non Pay				
<i>Mobile Phones</i>				500.00
<i>Travel expenses</i>				1,000.00
<i>Training course fees</i>				1,000.00
<i>RAS fees – for remote IT connection</i>				500.00
<i>IT & Other Office Equipment</i>				2,000.00
Trust Overheads/contribution				
<i>Safe Haven manager</i>				10,035.00
<i>Admin</i>				4,648.00
<i>Corporate Overheads</i>				5,967.00
Surrey and Borders Partnership direct costs total:			£	123,026.09
Catalyst				
Staff pay	46	hours per week	15.00	35,880.00
<i>National insurance</i>	12.8%			4,592.64
<i>Pensions</i>	3.2%			1,148.16
<i>Holiday cover</i>	2 weeks per person per annum			4,802.40
<i>Sickness</i>	3 weeks per annum total			2,401.20
<i>Bank holidays - extra pay</i>	7 days per annum			1,000.00
Non Pay				
<i>Training & supervision</i>	175 hours per person			4,802.40
<i>Staff travel & other costs</i>				1,500.00
<i>Staff advertising</i>				345.00
<i>Overhead 15% (Senior management, finance, HR, marketing)</i>				8,470.77
<i>Safe Haven management</i>				10,000.00
Catalyst costs total			£	74,942.57
Andover Mind				
Staff Pay	46	hours per week	12.53	29,904.00
<i>National Insurance</i>	13.80%			4,128.00
<i>Pensions</i>	1%			300.00
<i>Bank holidays</i>	72	hours per year	25.06	1,803.43
<i>Bank holidays pension</i>				18.86
<i>Bank holidays NI</i>				248.57
<i>Holiday cover</i>				3,973.71
<i>Sickness</i>				3,456.00
<i>Relief workers pay in lieu</i>				1,481.14
<i>Wellbeing Manager salary</i>	7.4	hours per week	13.78	5,302.56
<i>Wellbeing Manager NI</i>				432.00
<i>Wellbeing Manager Pension</i>				40.80
Non Pay				
<i>Premises</i>				624.00
<i>Support</i>				4,260.00
<i>Governance</i>				852.00
<i>Indirect Staff Costs</i>				4,500.00
<i>Recruitment</i>				1,714.29
Wellbeing Centre Costs				
<i>Cleaning</i>	1	hour per week	17.50	912.00
<i>Waste</i>				360.00
<i>Electricity</i>	53.50% of total Wellbeing Centre electricity (estimated)			1,000.00
<i>Water</i>	53.50% of total Wellbeing Centre water (estimated)			1,000.00
<i>Rent</i>	53.50% of total Wellbeing Centre rent			9,362.48
<i>Rates</i>	53.50% of total Wellbeing Centre rates			1,091.40
<i>Insurance</i>	53.50% of total Wellbeing Centre Insurance			693.81
Andover Mind costs total			£	77,459.05
Safe Haven costs total			£	275,427.71

5.7 Assumptions, limitations and next steps

There are two key limitations of the analysis. First, there is uncertainty about the accuracy of the true costs of the third-sector organisations. It is assumed that the third-sector organisations have provided genuine and accurate estimates of their running costs. However, there remains a possibility that they are overstating their true costs because they want to send a signal about how valuable their services are (i.e. implying that the NHS would be worse off if they did not continue to work with them).

Second, a key assumption made is the appropriateness of including the Wellbeing Centre costs and some of the 3rd sector management costs in the analysis. These costs have not (yet) fallen on the NHS, and thus fall outside the 'NHS perspective' indicated in the methodology (see section 3.3). However, in section 3.3 we also noted that "resource use outside of the NHS would be considered if it was thought to be critical to the success/failure of the intervention and therefore could plausibly impact successful spread of the intervention elsewhere". In this case, it is clear that the 3rd sector organisations play a key role in running the Safe Haven. These costs may be incurred by the NHS in NEHF if Andover Mind and Catalyst do not remain involved in running the service and the NHS faces higher costs with other providers, or if they remain involved and receive additional funds to cover these costs. Furthermore, if the Safe Haven model is replicated elsewhere the NHS cannot necessarily assume these costs will be absorbed by partner organisations.

It should be noted that in addition to the Aldershot Safe Haven, there are four other Safe Havens run by SABP, but outside the NEHF vanguard. Future work could involve detailing the resource use of these Safe Havens in order to obtain an estimate of whether any economies (or diseconomies) of scale arise. Catalyst are also involved in running two of these other Safe Haven; their £10k management costs for the Aldershot Safe Haven is based on attributing 1/3 of the costs to each of the three Safe Havens they are involved with. The £10,035 SABP have attributed to the Aldershot Safe Haven management also appears to be based on pro-rata attribution across the five Safe Havens.

6. Reflections on the method followed

6.1 Cost evaluation should be undertaken by local evaluation teams

The process of identifying which interventions to explore took considerable time. This time could be reduced if done at a local level where there is deep expertise about the work streams.

Local evaluation would also allow easier access to vanguard data and individuals involved in implementation and running of interventions. This report benefited from previous local evaluation reports that provided useful information about the work streams. Without these, it would have been much more challenging to do this work from a central NHSE perspective, even with occasional vanguard visits.

6.2 The robustness of the counterfactual should be one of the criteria considered when selecting an intervention to evaluate

Cost evaluation from an economic perspective is based on a comparison of one scenario with one or more counterfactual scenarios. Therefore, the value of undertaking the cost evaluation rests heavily on the choice of counterfactual and the accuracy of the counterfactual costs. To obtain meaningful information on the additional resources required to deliver a new programme of care, it is crucial to have as clear and accurate description of the counterfactual scenarios as possible. We recommend that this be considered among the selection criteria.

For example, there are different types of MDTs being implemented in Dudley, e.g. extended MDTs and standard MDTs. Ideally an economic evaluation will include all relevant alternative comparators, but this is not always possible. Thus, while we would like to compare the costs of implementing MDTs vs not implementing MDTs, if it is too challenging to identify resource use prior to the MDTs, then comparing the costs of extended MDTs vs standard MDTs may still be of some value. Other possibilities would be to compare costs with other geographical areas (e.g. other vanguards/CCGs), though this is likely to complicate the analysis due to the extra data collection and access required. There is also the risk of systematic bias if these other areas are used for comparing outcomes data.

6.3 There can be variability in how interventions are implemented

The fact that there was significant variability in how MDTs are implemented across GP practices also poses problems in terms of fairly comparing the different practices. This merits the inclusion of more qualitative work. It may be that different practices can be grouped together (e.g. large practices, small practices, those implementing extended MDTs), which may allow for different recommendations for the different groups.

6.4 Consider which decisions the evaluation will impact

It may be that a full robust economic evaluation is unnecessary for informing certain decisions; an iterative/rapid-cycle approach may be sufficient for improving local implementation (such as identifying local bottlenecks and inefficiencies). Of course, one of the goals of the New Care Models programmes is to provide evidence that can be generalizable across the country, so while *local* decision-making may not depend on a robust economic evaluation, a higher standard of evidence is preferred for informing wider/national decision-making.

6.5 New Care Models might call for more sophisticated evaluation techniques

The New Care Models place emphasis on delivering care that takes into account the specific local context. As a result, even within a single vanguard an intervention might have various forms depending on the locality it serves. While this could be hugely beneficial for patients, the complexity this adds means that standard cost evaluation techniques, which work well for randomised scenarios, might provide only limited insights when it comes to complex models of care. Other more sophisticated statistical modelling might be required for large scale robust evaluation.

7. General Challenges, Observations, and Advice in Cost Evaluation of the New Care Models

Evaluation of the MDTs in Dudley and the Safe Haven in NEHF has led to the identification of a number of challenges when seeking to detail costs of these interventions. These are discussed below, along with some advice and observations for vanguards/evaluators.

7.1 Involvement of multiple organisations in delivering an intervention

In the case of the MDTs, multiple commissioning bodies were involved and this meant that no stakeholder had full responsibility for calculating an overall cost for the MDTs. This situation was made more challenging by the fact that the majority of the resources used to deliver MDTs were existing resources which were allocated differently and thus it was difficult to understand fully health system opportunity costs which might arise from the MDT programme.

In the case of the Safe Haven, multiple providers were involved (i.e. SABP and the two third-sector organisations). Here, there is a risk of resource use being omitted or being inconsistent across the organisations. This might result from a lack of adequate stakeholder communication which means a common understanding on resource use is not reached. Evaluators should seek to triangulate findings by engaging with all relevant organisations rather than simply accepting evidence from a single NHS organisation.

7.2 Lack of understanding of financial costs vs economic costs

Whilst vanguards and evaluators are not expected to understand detailed theory regarding economic costs, there should be awareness that providing information from financial accounts often does not provide sufficient information regarding resource use. Detailing other resource use (such as changes in how staff spend their time) can be crucial for understanding whether an intervention is cost-effective and sustainable, as well as for informing spread of interventions from vanguard sites to the rest of the NHS.

For example, the MDT intervention in Dudley largely entailed changes in staff activity and time use, with additional financial costs being a relatively small factor. The activities staff have given up (or are doing less of) are some of the costs associated with MDTs.

Some services may rely on staff goodwill, for example working additional hours for no extra pay. This will not appear in financial accounts, but could be crucial for the success of the service whilst raising questions of sustainability. For example, in Dudley the practice based pharmacist leads provided significant in kind resources in the form of extra working hours. However, in other local contexts these additional hours could not be relied upon as a resource. Whilst doing in-depth time-use studies may be beyond the capacity of most vanguards, it should be possible to obtain a crude ballpark estimate of time-use without allocating significant resources to the analysis.

Broadly, understanding resource use should be seen as just as fundamental a question as understanding patient outcomes, since resources used for one intervention are resources that are not available to benefit patients elsewhere. As with an evaluation that focuses on patient outcomes, any assumptions in an evaluation should be made explicit. Furthermore, any resources that are known to be relevant but have not been measured or estimated (e.g. due to complexity, or lack of resources for undertaking evaluation) should at least be described.

Sometimes there has been a failure to provide even a simple breakdown of basic financial costs, as with the initial report on the Safe Haven. This should not be beyond the capacity of any vanguard.

7.3 Risk of impact on staff morale if measuring their time/activity

Safe Haven evaluators decided against doing detailed observations of staff activity in order to avoid the perception that the staff are being 'performance managed'; this can be a barrier for evaluators.

In some cases having a detailed breakdown of this activity will not add much value to the analysis. In the case of the Safe Haven, the change in staff costs associated with the intervention relate to the additional staff employed (since there were no pre-existing Safe Haven staff) rather than their time use.

By contrast, the change in staff costs associated with the MDTs largely entailed changes in activity of existing staff members. In this case, estimates of change in activity are essential. However, it may not be necessary to actively observe staff. Simply asking them about their time use may provide a reasonable estimate.

7.4 Difficulty in identifying the boundaries of an intervention

It is not always clear-cut as to *when* an intervention starts. The timeline of when an intervention starts can be very 'fuzzy'. This is clearly illustrated with the MDTs in Dudley, where some GP practices already had partially-formed MDTs at the start of the formal MDT vanguard programme: there are not distinct pre and post states. Furthermore, both the MDTs and the Safe Haven were established before Dudley and NEHF became vanguards.

In this case, the best that can be done is to be explicit about the time period for which resource use is described in detail, as well as any noting any possible changes in resource use that fall outside this time period.

Furthermore, drawing a line around *where* an intervention stops and starts can seem arbitrary. For example, should the cost of an MDT include the meeting, the preparations, and the subsequent actions of staff, such as changes in costs of treatment arising from decisions made in the MDT? Again, it is essential to be explicit about where the boundaries have been drawn for the purpose of evaluation.

Relatedly, it is not always clear what perspective should be taken: just that of the NHS, or a wider social perspective? For example, with the Safe Haven there are costs associated with running the building (The Wellbeing Centre) that currently fall on Andover Mind rather than the NHS. However, it seems appropriate to include these costs in the analysis, since (a) Andover Mind may decide they can no longer cover the costs (b) if the Safe Haven model were to be replicated elsewhere, it is likely that these running costs will need to be covered by the NHS.

7.5 Difficulty in identifying the counterfactual

Related to section 7.4 above, if the boundaries of an intervention are unclear, without distinct pre and post states, it can also be challenging to identifying the counterfactual, i.e. what would have otherwise happened without the intervention (which is needed in order to estimate the change in costs and outcomes).

7.6 No set template/guidelines

There was no existing guidance about exactly what information is relevant and should be included in a cost-analysis from the vanguards. We hope the examples in this report provide some help. As part of this work, a guide will be developed to provide further detail and clarity for others doing similar resource use and cost evaluations.

7.7 Cost Evaluation should be embedded at the start of health interventions

To allow for robust analysis of costs, a cost evaluation should be embedded in the rapid-cycle evaluation process. This would allow for more efficient and consistent collection of cost data, which is likely to be more accurate than estimates obtained retrospectively from staff interviews.

8. Conclusion and Implications for future cost evaluation

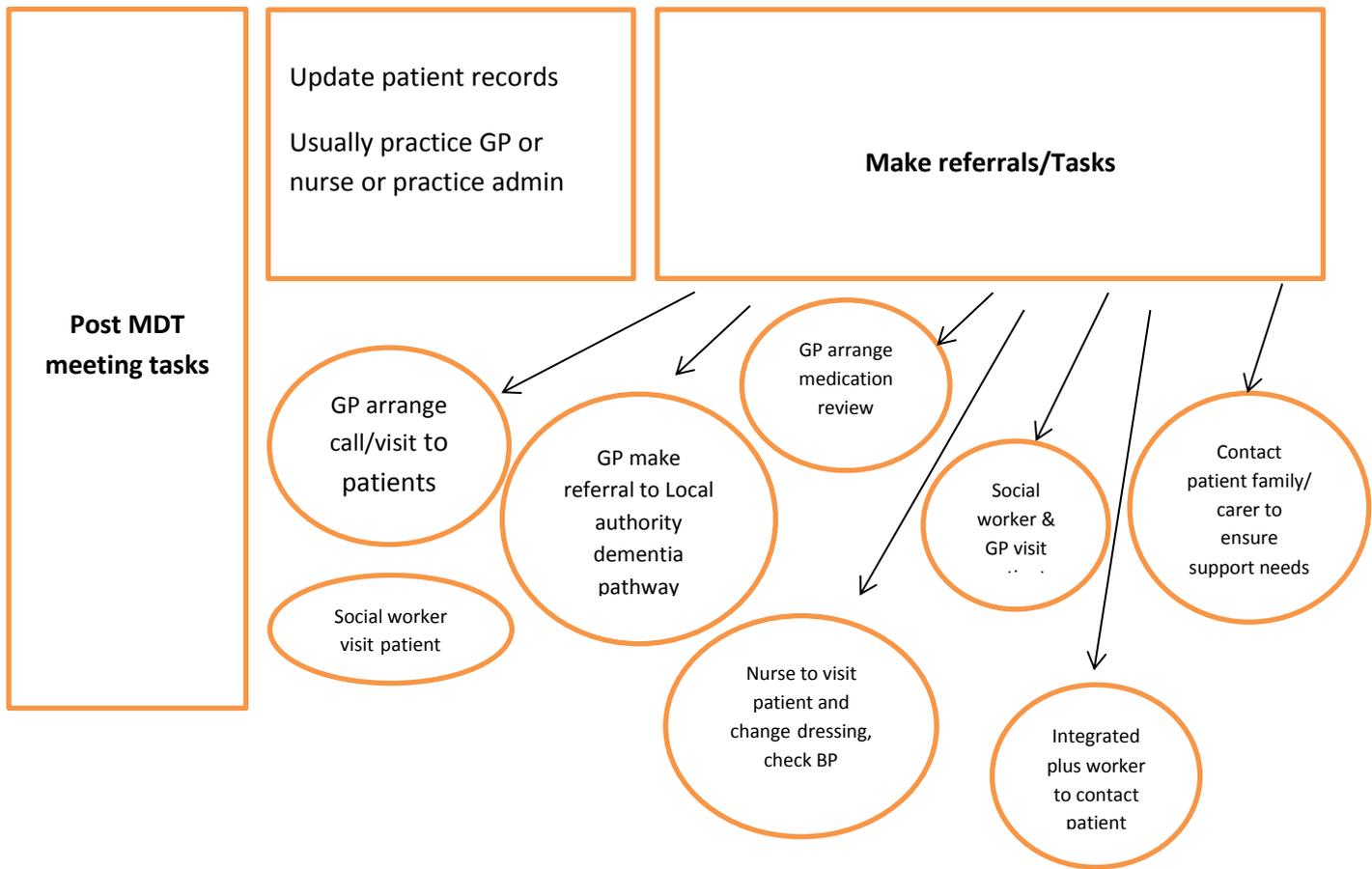
The above analysis demonstrates that there are clearly challenges to conducting cost evaluation of NCM interventions. We have shown that these challenges can differ across interventions and come in varying degrees. The most significant challenge we faced was in defining a counterfactual, which made estimating a change in costs difficult. In many cases this issue alone could be a barrier to preventing the vanguards from undertaking a rigorous economic evaluation given the resources they have available for evaluation.

However, while the challenges prove to be obstacles in conducting a comprehensive and robust cost evaluation, they are not so substantial that relatively detailed analyses and descriptions of costs cannot be provided. It should be emphasised that while the financial figures we have reported in earlier sections may be an underestimate of the true economic costs of interventions, a detailed identification and measurement of resources can be of value. It may require a trade-off to be made between in-depth evaluations of a few interventions versus shallow evaluation of many. Using the methodology of cost evaluation from an economics perspective, it is hoped that future local evaluations will provide a more detailed account of economic costs and resources. It is important, however, that local evaluators are supported with the correct guidance to conduct cost evaluations.

Appendix A – The MDT and MDT Counterfactual Pathway

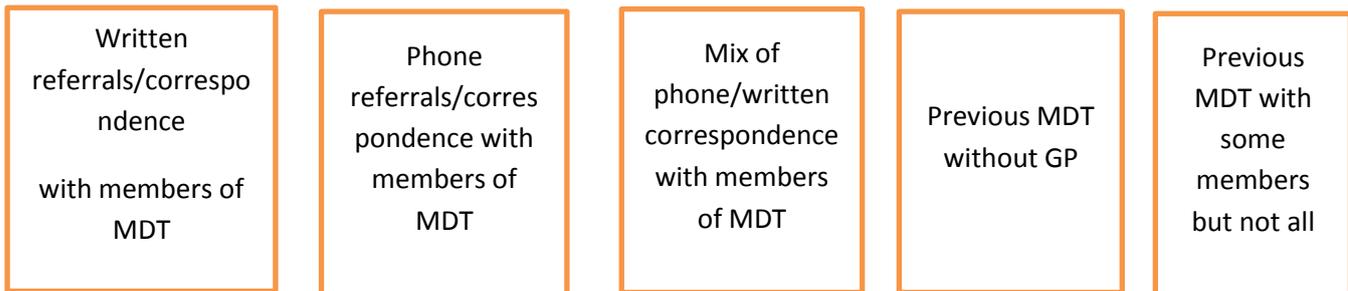
The MDT Pathway

Patient Identification	GP Practice Population		
	Risk Stratification The top 2% at risk of unplanned/emergency admissions		Review of own patients to discuss at MDT meeting by other MDT staff members
	Review of list for MDT inclusion by practice GP and nurse		
Patient Types	Frail & Elderly Patients with complex care needs - identified from risk stratification - comprises of majority of patients in MDT		Non elderly patients with complex care needs
			Patients with complex social care, community services needs e.g.
MDT Scheduling	Practice Administrator schedules meeting		
MDT Meeting	Requirements: <ul style="list-style-type: none"> - Need computer access to EMIS - Need access to mental health/social care records - Large enough room - Duration 60-180mins 		
	Attendees: <ul style="list-style-type: none"> - GPs from the practice; - Practice-based full-time social worker - Case manager; - Administrative staff member from the practice; - Practice-based advanced nurse practitioner - Practice-based mental health nurse - District nurses; - Integrated Plus worker; 		
	Implications of absence: what happens if attendee of MDT is needed but absent? <ul style="list-style-type: none"> - Review patients & make decision - Review patient in MDT then wait for next MDT (increases time per patient) - Review patient in MDT then written/phone communication with absentee (increases time per patient) - Review patient at next MDT where required attendee is there 		



The Counterfactual: What used to happen prior to the current model of Dudley MDT?

Counterfactual to Dudley MDT



Appendix B – Practice Level MDT Costs

An exposition of how MDT meeting costs are calculated in Table 1 is provided below.

Table 1: Case Studies MDT Meeting Details – Cost per patient

Case Study	Inputs	Cost per meeting (£) approx.
Lion’s Health – large practice with weekly MDT meetings which cover on average 23 patients	13 staff members 90 min MDT meeting 30 min MDT (medicines review with GP & nursing team only) 30 min prep time/staff member 30 travel time/non-practice based staff	1777 (see table 2 below for calculation)
Wychbury Medical Practice – large practice with monthly MDT meetings which cover on average 101 patients	12 staff members 180min MDT meeting 30 min prep time/staff member 30 travel time/non-practice based staff	2279 (see table 3)
Links Practice – small practice with monthly MDT meetings which cover 11-23 patients on average.	6 staff members 60 min MDT meeting 30 min prep time/staff member 30 travel time/non-practice based staff	818 (table 4)

MDT Cost Calculation

The cost per patient is calculated as follows:

Meeting Cost = Staff unit cost x time duration of meeting

Meeting Preparation Cost = Staff unit cost x duration of preparation time

Staff Travel Time Cost = Staff unit cost x duration of travel time

Total Cost = Meeting cost + Meeting Preparation Cost + Travel Time Cost

Total Cost per Patient = Total Cost / Average Number of Patients Discussed at Practice MDT

Sources for Inputs

ICF and Midlands and Lancashire MDT Evaluation Report – the information is based on 3 observations of MDT meetings at 3 practices by local evaluator ICF

Time estimates of MDT meeting preparation and travel time provided by Dudley’s local evaluator Dudley Value Proposition Projects Evaluation Report by Strategy Unit at Midlands and Lancashire CSU

Case 1: Lion's Health

Inputs:

Average patients reviewed per MDT meeting: 23

Time: 30 min medicines related MDT with GPs & nurses (excluding mental health nurse)

+ 90 min MDT meeting with all staff members

Preparation time: 30 mins / staff member

Non Practice Based staff travel time: 30 mins / staff member

Staff members who attend: 13 staff

Table 2. Inputs to Lion's Health Medical Practice MDT Meeting

Type of Cost	Unit Cost (£) (60mins) , PSSRU (2015,2016)	Duration (mins)	Cost per meeting (£)
Practice GP x 3	111	30 – medicines 90-meeting 30 - prep	277.50*3 832.50
Practice based full time social worker x 1	55	90- meeting 30 - prep	55*2 =110
Case manager x 1	44	90 - meeting 30 - prep 30- travel time	110
Practice based admin lead MDT (Band 5) x 1	32	90 - meeting 30 - prep	64
District nurse x 3	44	30 – medicines 90-meeting 30 – prep 30 - travel	44*3*3 =396
Advanced Nurse Practitioner (practice based) x1	52	30 – medicines 90-meeting 30 – prep	52*2.5 =130
Integrated Plus worker x 1	16.55	90 - meeting 30 – prep 30 - travel time	2.5*16.55 =41.38
Mental Health Nurse x 1	47	90 – meeting 30 – prep	47*2 =94
Total Cost Per meeting			1777
Average number of patients			23
Cost per patient			77

Case 2: Wychbury Medical Practice

Inputs:

Average patients per MDT meeting: 101 patients

Time: 180 mins

Preparation time: 30 mins / staff member

Non Practice Based staff travel time: 30 mins / staff member

Staff Members who attend: 12 staff

Table 3. Inputs to Wychbury Medical Practice MDT Meetings

Type of Cost	Unit Cost (£) (60mins), PSSRU (2015,2016)	Duration (mins)	Cost per meeting (£)
Practice GP x 2	111	180 – meeting 30 - prep	666 + 111 =777
Practice based full time social worker x 1	55	180 – meeting 30 - prep	165 + 27.50 =192.50
Case manager x 1	44	180 – meeting 30 – prep 30- travel	176
Practice based admin lead for MDT (Band 5) x 1	32	180 – meeting 30 - prep	96 +16 =112
District nurse x 2	44	180 – meeting 30 – prep 30 - travel	264 +44 +44 =352
Macmillan nurse x 1	28 (based on Macmillan report on costs)	180 – meeting 30 – prep 30 - travel	84 +28 =112
Long Term Conditions nurse x 1	44	180 – meeting 30 – prep 30 - travel	132 +44 =176
Community Nurse x 1	44	180 – meeting 30 – prep 30 - travel	132 +44 =176
Integrated Plus worker x 1	16.55 (based on ICF VP report)	180 – meeting 30 – prep 30 - travel	49.65 + 16.55 = 66.20
Mental Health Nurse x 1	35	180 – meeting 30 – prep 30 - travel	105 + 35 = 140
Total Cost per meeting			2279
Average Number of patients			101
Cost per patient			23

Case 3: Links Medical Practice

Inputs:

Average patients per MDT meeting: 11-23 patients

Meeting Time: 60 mins

Preparation time: 30 mins / staff member

Non Practice Based staff travel time: 30 mins / staff member

Staff Members who attend: 7 staff

Table 4. Inputs to Eve Hill Medical Practice MDT Meeting

Type of Cost	Unit Cost (£) (60mins)	Duration (mins)	Cost per meeting (£)
Practice GP x 3	111	60 – meeting 30 - prep	333*1.5= 499.50
social worker x 1	55	60 – meeting 30 - prep 30 - travel	110
Case manager x 1	44	60 – meeting 30 - prep 30 - travel	88
District nurse x 1	44	60 – meeting 30 - prep 30 – travel	88
Integrated Plus worker x 1	16.55 (based on ICF VP report)	60 – meeting 30 - prep 30 – travel	33.10
Total cost per meeting			818
Average number of patients			11-23
Cost per patient per meeting			36 - 74

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