

Title: Is Patient Level Costing a Potential Tool to Add Technical Value
Within Healthcare Systems.

Executive Summary

This paper examines the concept of value and how patient level cost data could be used to improve value at a system level, in particular focussing on technical value.

Published literature examining the concept of value in healthcare was reviewed. In particular Porter's Value Equation (Porter, 2010) was evaluated in contrast to the Triple Value concept proposed by Muir Gray (2015).

Kaplan and Porter (2011) identified time driven activity-based costing as a potential tool to increase value, which in the NHS has taken the form of Patient Level Costing. This tool is particularly applicable to the 'technical value' stream of the Triple Value concept, although it was noted that it intertwines with personal value where improvements benefit both service efficiency and improve patient experience. Various case studies were examined that demonstrated technical value improvements within NHS organisations.

Having demonstrated the theoretical case for using patient level costing data to improve technical value, and found examples within organisations where this has been delivered, a survey of costing practitioners was conducted to establish the extent to which patient level cost data is currently being used both within organisations and across organisational boundaries. This exploratory study also examined barriers to adoption and use at a system level.

The results were surprising in that around 50% of respondents reported not using patient level cost data within their organisations for the purposes of value improvement through pathway redesign or reduction in unwarranted variation – two of the main theoretical benefits.

Given the lack of take-up within organisations it was then not surprising that the research revealed very little use of patient level data at a supra organisational level, with between 90%-100% of respondents not even having plans to combine data from any of ambulance, GP/primary care, social care or independent sectors.

The conclusion drawn is that without using patient level data at an organisational level, systems are not progressing work at a supra organisational level, and the potential benefits for value creation remain theoretical. As a result, system leaders need to champion the use of patient level data both within and without their own organisations to increase technical value for the NHS overall.

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Introduction

The production of patient level costing data has been a focus for costing teams in NHS organisations since the Costing Transformation Programme began in 2016 (NHS Improvement, 2016). The vision of having good quality costing data at a patient level that can inform decisions about service provision and therefore add value is one that has gained acceptance through a combination of being mandated by regulators and the publication of successful case studies.

Additionally, in the context of the relative rate of healthcare investment to increasing demand (Muir Gray, 2015) even before the current Covid-19 backlogs added to the requirement (BBC, 2020) the value imperative was significant. Further, the amount of funding available to the NHS is likely to be influenced by the general economic performance in the country which has been affected negatively by the pandemic, and which may be additionally affected by the UK exit from the EU: the better value drive remains pertinent.

With the publication of the NHS long-term plan (NHS, 2019) and its aim of increased system working and reduced organisational siloes, individual organisations have a requirement to look beyond their own boundaries and consider system partners. Given the apparent successes available from using patient level costing data within organisations, this study tests the current use of this data and explores the potential for using the same tool at a system level.

A survey of the relevant literature was undertaken, focussing on both Porter's value equation (Porter, 2010) and 'triple value' work espoused by Muir Gray (2015) to reach a definition of value that could be used in this report. Examples of the successes achieved through the use of patient level costing data within NHS organisations were examined, as were examples from outside the NHS.

Having established the extent of what is currently known about the use of patient level costing data to add value, a survey was designed to ascertain the extent to which systems were currently using or planning to use patient level cost data. Understanding what was seen as barriers to its use at this level was also delivered in this primary research.

This report examines the findings of the research in the context of the current literature and makes recommendations to system leaders.

Literature Review

The Concept of Value in Healthcare Settings

One of the touchstones of value within the literature is Porter's work (2010) that defines the concept of value in an equation: value is the patient outcomes achieved over the resource consumed in an entire cycle of care.

Both parts of the equation require discussion. One of the difficulties with Porter's definition is in defining where a cycle of care starts and ends, in particular in relation to long term conditions. Porter identifies that himself in the 2010 article, and notes the cost of measuring this is high especially where data systems are not integrated (Porter, 2010). Similar issues are encountered where prevention, public health and screening services for example have a short-term intervention that is not realised in value terms within the same time horizon (Smeltzer et al, 2017). This is an important concern given the amount of the NHS budget that is spend on ongoing conditions - 70% according to Campbell (2014).

The second difficulty arises in identifying the resource consumed by individual patients, especially where those resources are shared and capacity is not fully utilised. These issues are partially addressed by the use of time driven activity based costing techniques as suggested by Kaplan and Porter (2011). They argue that value is difficult to improve if only looking at one side of the equation; something echoed by Clarke (2012) who argues that cost management is an important part of the equation, not just outcomes.

There has also been criticism of Porter's equation from clinical perspectives highlighting its lack of a societal benefit dimension (Calabro 2017, DeCamp 2019, Talluri et al 2020). These authors while coming from the perspective of resource

distribution argue that viewing value solely from an individual perspective is limiting as wider benefits such as a return to economic activity or a reduction in societal burden through caring for less able individuals, should be considered. The wider the focus of the benefit lens though, the more difficult it is to quantify with any degree of accuracy.

The clinical response to Porter though is not all critical. There are a number of clinical areas that over time have aimed to increase recognition of their specialties' contribution using Porter's equation: Andrawis *et al* suggest a need to develop relevant metrics in Orthopaedics (2013), Sarwar *et al* suggest a similar need to demonstrate value added in Radiology (2015), and Cowart and Olson also argue for metrics to measure the value added by community pharmacists within a system (2019). It could be argued that these pleas may not be driven from positions of absolute altruism but from a professional promotion perspective as they are published in specialty specific journals, but the two positions are not necessarily mutually exclusive.

The definition of value expanded from Porter's original work to address two issues: that it was not designed for universal healthcare systems such as the NHS, and where there is a finite budget for services (Jani, Jungmann and Gray, 2018). The 'triple value' idea was implemented in the NHS using the RightCare initiative.

Triple Value sought to introduce the concept of allocative value (the extent to which healthcare resource is shared between populations of patients) alongside the personal value to the individual patient, and also the technical value which encompasses efficiency and cost control (Gray, Wells and Lagerberg, 2017). Gray argues that this concept of value is of primary importance in dealing with the issues of demand outstripping funding (Gray, 2015). Although Porter (2010) identified that value is a combination of quality, safety, patient factors as well as cost control, he doesn't address the allocative dimension beyond mentioning inequity and the potential to expand access (Porter, 2010).

The RightCare initiative uses benchmarking to look at both outcome and spend (NHS England, n.d.) at CCG level and it is consequently easy to equate outcomes with personal value for individual patient. However it assumes that expenditure by a CCG, which is based on a tariff, is equivalent to the cost incurred by organisations providing the service. This is unlikely to be true, as while there is a theoretical link between tariff and historical reference costs (NHS England & Improvement, 2019) there is large variability in reference costs around the tariff, to the extent in one Trust that 83% of their episodic costs varied more than 10% to the national tariff (Blunt and Bardsley, 2012). As such any local variation in technical value (as defined by actual cost incurred and its effectiveness) is negated by the very methodology used by the RightCare process. It cannot therefore be said to be addressing all three dimensions of the triple value concept.

There have also been concerns raised that in reality, outcomes are not necessarily improved by following the RightCare approach (Dropkin, 2018) although Dropkin's area of focus is quite restricted so the critique may have limited applicability to the scheme overall.

Although the triple value approach aims to cut across organisational boundaries (Gray, 2013) it too fails to adequately address the social benefit that was missing from Porter's value equation.

The final area within value to be examined is the concept of optimisation. Gray was well aware of this issue having quoted freely from Donabedian's research (Gray, 2007) on this issue. But the triple value concept still seems light on this aspect as it is only tangentially related to the personal value dimension. Optimisation is still an issue concerning healthcare leaders decades after Donabedian first published in the 1990s (World Economic Forum, 2017); indeed, some 1 in 10 hospital admissions in the NHS result in some form of harm to the patient (Ham et al, 2012).

Porter's and Gray's approaches are not mutually exclusive as the value equation is analogous to the technical value focusing on efficiency and cost reduction. Arguably, as patients would normally prefer their pathway to be efficient and not include unnecessary or duplicate steps or interventions, personal value to patients is also closely linked to the technical value stream. Although the triple value concept is more explicit about adding allocative value, Porter's definition still seems to be the one in most frequent use. The primary focus of this report and the research reported therein, focusses primarily on technical value aspects.

Patient Level Costing as a Tool to Add Value in the NHS

In 2015 NHS Improvement launched the Costing Transformation Programme (CTP) aiming to improve the quality of cost information in the NHS (NHS Improvement, 2016). This was expected to be achieved through Trusts producing cost information at individual patient level, to enable benchmarking and the reduction of unwarranted variation between comparable episodes of care, among other benefits outlined.

Various case studies have been published on the use of patient level cost data. These range from using it to compare the relative costs of treatment options across a whole episode of care (Noble et al, 2020) or to evidence the additional costs of treating patients who acquire surgical site infections (Jenks et al, 2014), through to informing allocative value discussions (HfMA, 2018). Others have been used to improve patient care and technical efficiency within provider organisations (HfMA, 2019a). Some have specifically tried to match patient outcomes with cost (HfMA, 2019b, HfMA 2017a, HfMA 2017b) to incorporate the effectiveness dimension.

It is noticeable from these case studies that the majority are limited in scope to a single provider organisation. Further, a number of toolkits were published by the HfMA between 2016 and 2018 (HfMA, 2016-2018) which are also all sector specific.

The system wide dimension is missing from the literature, which is perhaps unsurprising as the NHS financial architecture has until recently facilitated adversarial relationships between commissioners and providers, and also between providers.

There are few exceptions: the outline of a pilot case study (NHS Improvement, 2019) in the Nottinghamshire Integrated Care System is underway but findings have not yet been published. Similarly, work is ongoing in Derbyshire (Robertson and Mitchell, 2020) but this highlights the potential for system level use rather than any outcomes as yet.

Some conclusions could be drawn from provider specific case studies where these encompass entire patient pathways (HfMA, 2019b) as these would be analogous to a system. But there is no analysis yet published documenting the use of patient level cost data within an integrated care system to drive technical value.

One use that has started to be demonstrated at a system level (NHS England & Improvement, 2020) is in the contracting arena between organisations, but the link to value either as defined by Porter, or anything beyond discussions of resource allocation between organisations (Gray's allocative value) is unclear. Jabal and Lewis (2018) also failed to evidence value beyond a contracting and payment dimension when discussing this at a system level.

International Use of Patient Level Costing to Increase Value

Since Kaplan and Porter (2011) proposed the use of time driven activity based costing as a tool to understand the drivers behind costs within healthcare settings there have been a number of examples of use across the globe. Martina *et al* identify time driven activity based costing as a fundamental part of understanding value (Martina et al, 2018).

A recent literature review identified 25 examples, mostly published since 2013 (Keel et al, 2017) and showed that usage of time driven activity based costing is primarily within hospital settings (22 of the 25 studies reviewed), and none used patient level cost data across a system. Examples of studies published since 2016 also only evidence use on an individual organisation or procedure basis (for example Basto, 2019).

Where value at a systemic level has been considered (Hollander et al, 2009) the costing methodology used standardised costs for staffing rather than a fully absorbed cost based on actual expenditure in the way the NHS costing transformation programme envisages. This may be as a result of a lack of good costing data (Jackson, 2001), or possibly resulting from difficulties arising from a lack of regulatory or clear legal permission (Aschab et al, 2020).

The one example of system wide use of patient level cost data outside the NHS has come from the Bailiwick of Jersey as presented at the HfMA Value Conference in 2018 (Homer and Martyn, 2018) although there is no evidence of this work being published in any peer reviewed journal. The examples given included identification of the 'top 20' patients to enable targeted interventions for those and similar individuals to be implemented. While the data included in the Jersey costing system included acute, mental health and community provision, no GP data was included although it was acknowledged that to have primary care data would build a more comprehensive view of the overall system and potentially release further value.

Summary of Literature Review

The literature regarding the use of time driven activity based costing at a patient level demonstrates theoretical improvement in value, yet examples both within the NHS

and internationally have focussed primarily on usage within individual organisations. Little work has been published on the use of patient level costing as a tool to improve value at a system level; Jersey's healthcare system being the only example found of the use of systematically collected cost data at a patient level across multiple healthcare organisations.

Given the link between good patient level cost data and increased technical value, and the paucity of published case studies demonstrating the use of this data at a system level, there is a need for research to understand why this resource is not currently being utilised.

Research Aims and Objectives

The research aimed to understand the role patient level cost data plays in increasing technical value beyond individual organisational boundaries within the NHS. The review of published literature demonstrated little use of this data at a system level to date, or that where it is used, no examples have yet been published.

The specific research objectives were:

1. To review existing literature to establish links between the use of patient level cost data and improved value
2. To explore the current use of patient level cost data within NHS care systems at a supra-organisational level
3. To establish what costing practitioners expect the benefits to be from the use of patient level cost data at a system level
4. To make recommendations on what is needed to increase technical value using patient level cost data at a system level

Research Methodology

Setting

The literature review revealed a paucity of published examples of patient level cost data being used to advance technical value at a system level despite its apparent success within organisations.

Cross-sectional research was undertaken using a survey to costing practitioners during November 2020 to explore this. Google Forms was used to record answers to facilitate full access to survey data for analysis.

Questions were a mix of multiple choice and matrix rating style to assess levels and enable quantitative analysis. Additional depth was added through 'free-text' questions that gave respondents opportunities to expand on their answers.

The survey was open for a period of 14 days and was estimated to take around five minutes to complete the nine questions.

Sample selection

The survey questionnaire was sent out to all 288 client names contained on the Iqvia UserCost End User Forum¹. Iqvia is costing software supplier with a large market share, and whose client base is geographically disparate. The End User Forum is Iqvia's client costing teams' messaging system. Using this made it possible to target

¹ A blank questionnaire and example responses are included as appendices to this report

the questionnaire at costing practitioners, and should not be seen as an endorsement or recommendation of this company's software product.

Although this method of sample selection only captures the views of one supplier's customer base, all costing software has the same core function (to be compliant with the requirements of the National Cost Collection) so the research results can be applied throughout the NHS.

Demographic data collected provided assurance that responses covered sufficient geographical spread and that answers were not limited to a small number of healthcare systems.

Assessment of Reliability and Validity

To encourage participation the number of questions within survey was kept to a minimum. As participants voluntarily gave their time *gratis*, it was not felt appropriate to undertake a 'test-retest' reliability check as this may impinge on respondents' goodwill.

If this research were repeated it would be reasonable to expect some level of difference to occur as it is a snapshot of the views of the costing community at a point in time; circumstances are likely to change the responses as systems develop and look for tools to help them add value.

The response rate was 8%. While this may appear to be low, of greater importance is the number of systems represented; responses were received from 16 out of 44 ICS / STP areas (36%) meaning it would be reasonable to assume that findings from these areas would be applicable to other systems as the majority of healthcare

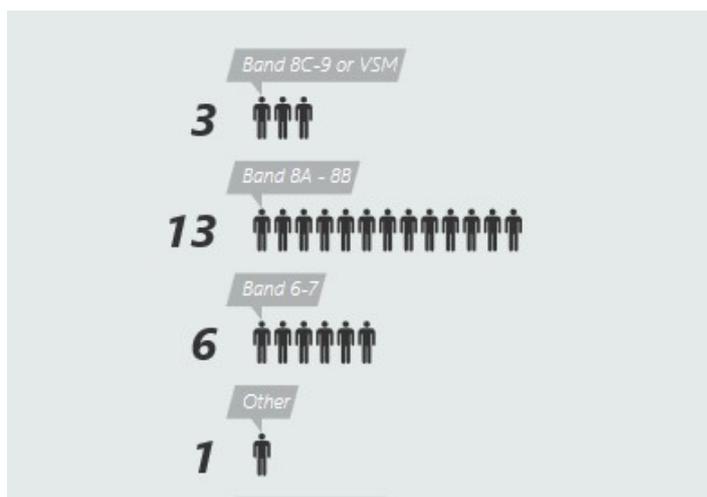
services provided are similar in scope across the country. Local variations in delivery models are unlikely to affect the principles and issues discussed.

It would also be reasonable to assume findings could be applied to Health Boards in the devolved nations as well for the same reason.

Limitations

Owing to the sampling method used, it is likely that all respondents are costing practitioners. There is a risk that some of these staff may not be fully aware of system work being undertaken (or planned) as strategic plans may not have been fully communicated. This is considered a small risk as requests to supply data are likely to be received by the costing teams if data is being combined for systems, and also many of the respondents (67%) declared their roles as Band 8A or above² (see Figure 1).

Figure 1 Profile of Respondents by Pay Band



² This is generally considered the break point in the NHS Agenda for Change pay-scales, with staff above this level being considered 'senior managers'.

The predominance of responses from the acute sector may be reflective of the relative maturity of patient level costing within this sector, and responses to the survey even when being asked about systems will be predominantly the view of the system from the acute sector perspective.

Ethics considerations

Respondent's consent to be part of the research was gained via the introduction message to the survey (see Appendix 1). Respondent's personal data was not collected meaning the data collection was made anonymously. However, as data was collected on the name of the system, the type of organisation worked for, and the salary grade brackets it might be theoretically possible for someone with knowledge of a particular system to infer who an individual respondent is or their employing organisation. As such steps have been taken to ensure results and analysis are presented in a way to avoid this.

No financial or other inducement was made to survey respondents.

Consent was gained from Iqvia to use their End User Forum as a survey distribution method. No payment was made for use of this channel. The author's employer does have a standard commercial contract with Iqvia for the supply of costing software.

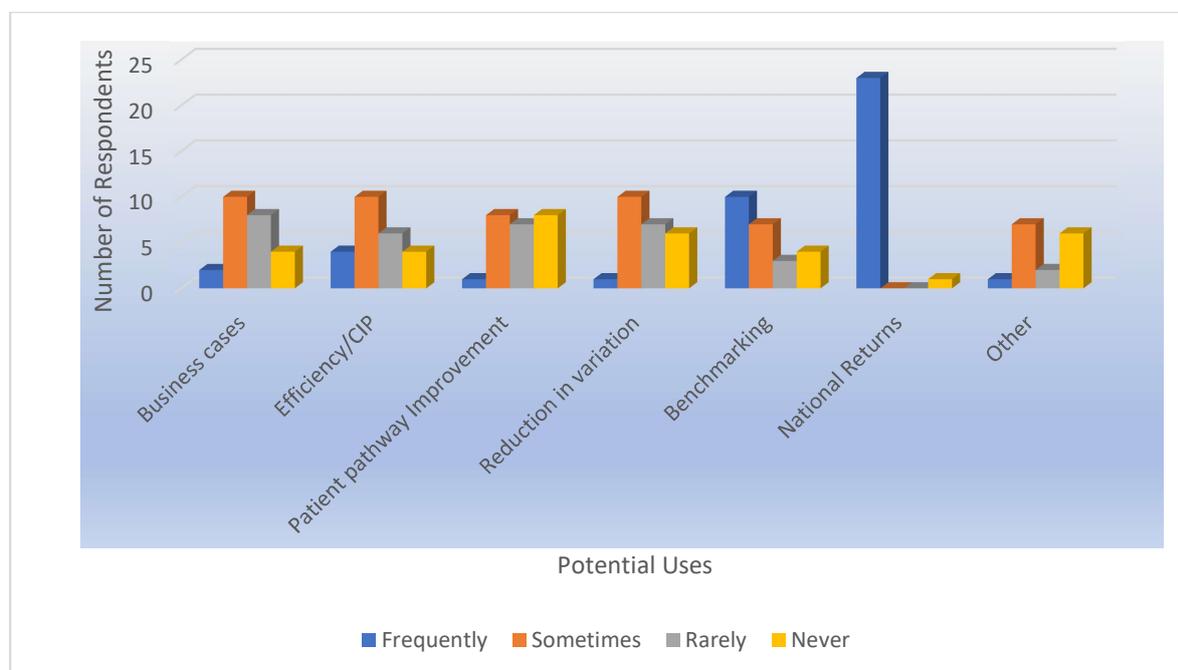
This research was undertaken as part of an MBA degree programme which was part funded by HfMA.

Research Findings

Practitioners were asked about their current use of patient level cost data within their own organisations to ascertain the spread the adoption of the benefits anticipated by the literature are, and whether the published case studies are exceptional or the norm. This was done by asking how frequently organisations used patient level cost data for the main purposes outlined in the case studies, plus one further category of 'national returns'.

Figure 2 shows overwhelmingly that completion of national returns is the most frequent use of patient level cost data with 96% of respondents citing frequent use. 42% stated frequent use for benchmarking purposes, with only 17% frequently using patient level cost data for efficiency and CIP programmes. All other uses were used by less than 10% of respondents on a frequent basis.

Figure 2 Frequency of Patient Level Cost Data Usage by Purpose



33% of respondents indicated that their patient level cost data was never used for patient pathway improvements, 25% indicated it was never used for reduction in unwarranted variation, and 17% indicated it was never used for either benchmarking, efficiency or business cases.

Analysis by sector revealed that mental health and community trusts had lower usage responses than acute trusts, with only one frequently using data at this level for any use (benchmarking) other than national returns. The number of non-acute trusts responding though was very low and statistical significance cannot be inferred from this.

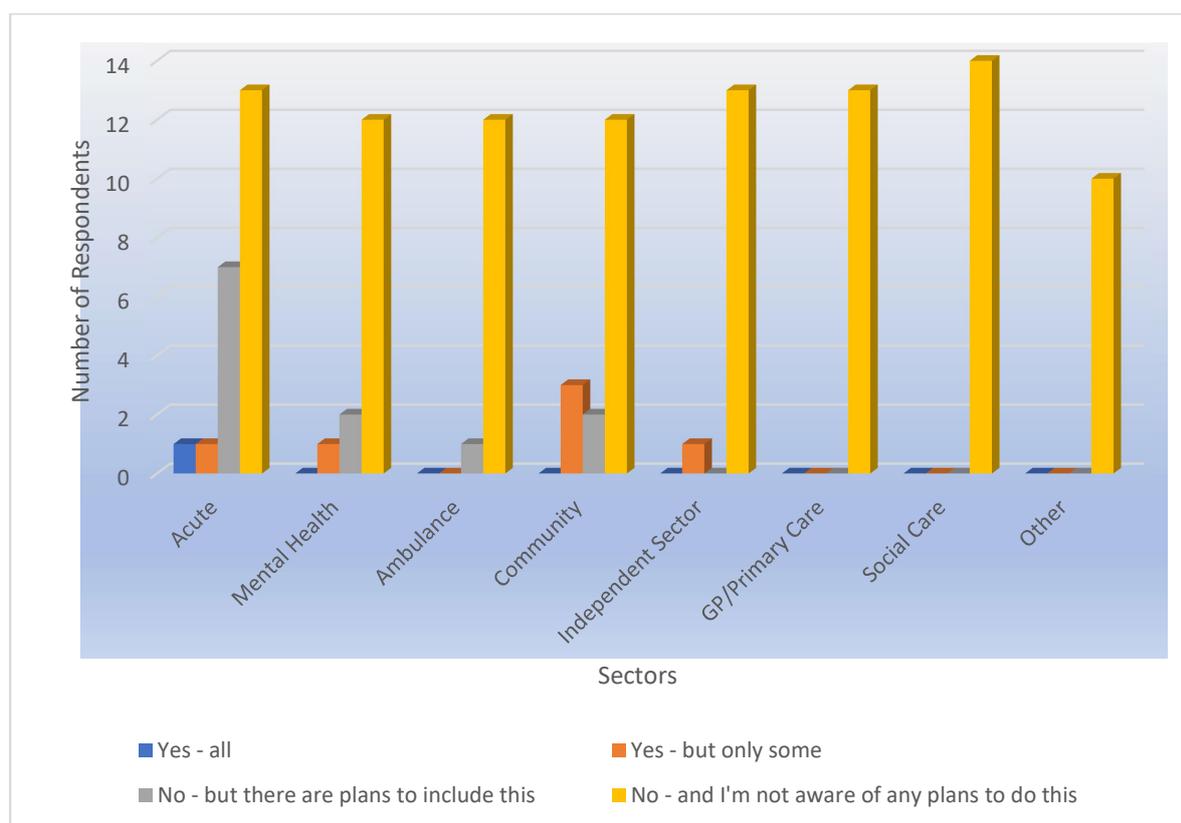
Respondents were then asked which sector's patient level data were being combined at a system level, to ascertain the scope of system wide data availability at the current time.

Figure 3 shows that no system is incorporating social care, GP/primary care and ambulance trust data at the present time. Overwhelmingly, respondents were not aware of any plans to combine patient level data at a supra-organisational level. The acute and community sectors indicated some level of combining or plans to combine data, and only one respondent indicated all the acute Trusts in their system combined patient level data.

Even in trusts that frequently use patient level cost data for efficiency, reduction in variation or patient pathway improvements, two thirds indicated there were no plans to combine data with other organisations.

Furthermore, there was no increase in the number of trusts planning to combine data between those in first wave integrated care systems (which could be expected to have more mature relationships) and those not.

Figure 3 Sectors Combining Patient Level Data



An opportunity was given to explore what respondents felt were the potential benefits of combining these sectors' data by means of a free text answer. The potential for this data is summarised by one respondent thus and incorporated themes of pathway improvements and efficiency gains through comparison that were also outlined in other free text responses:

"I think there is a great opportunity to learn from each other. By looking at where things are different between organisations and investigating and understanding why, we have the potential to identify best practise, raise standards, reduce costs, possibly streamline services through the ICS and better integrate the provision of care. It would also show the entire patient pathway cost (in an ideal world), which may eventually lead to a different view of prevention, early intervention, and possibly prediction of illness."
 (Anonymous, 2020)

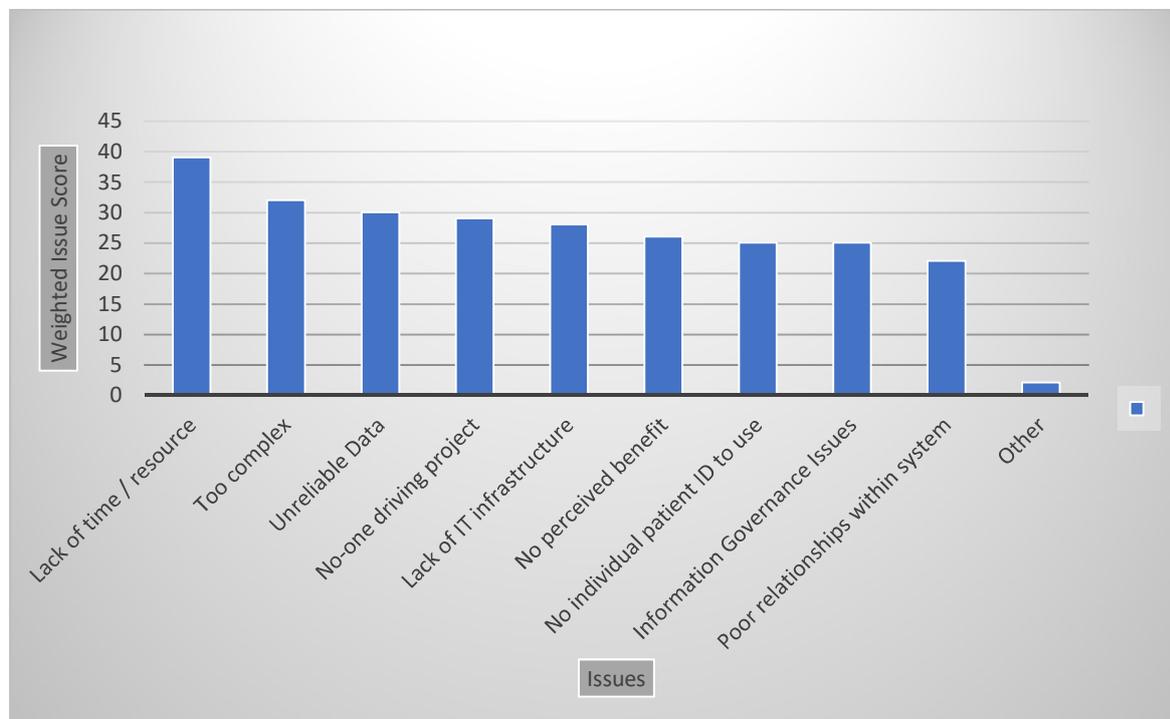
A further opportunity to discuss potential benefits elicited more responses and more detail, with improvements for both patients and organisations featuring in a number of responses, including a reduction in duplication and costs, improvements to waiting

times and direct targeted intervention from community teams for frequent service users.

Respondents were asked to rate how easily they thought a given number of potential barriers to the adoption of system wide patient level data could be overcome. These were then given a weighting ranging from zero (not a problem) to three (impossible to achieve), and Figure 4 shows the weighted results in ranked order.

It can be seen from Figure 4 that a lack of time and resource is viewed as the most significant barrier to adoption followed by concerns about the complexity of doing this and about the reliability of data. The least concerning issues for respondents were the information governance requirements and having adequate inter-organisational relationships within systems.

Figure 4 Issues (Weighted) Preventing Adoption of Patient Level Cost Data Analysis at a System Level



Free text answers enabling respondents to expand on the barriers largely restated the issues identified as options, however a few additional concerns were identified:

- the perceived focus of regulators on the acute sector,
- whether systems were yet mature enough to be able to use the data produced,
- over what time period data would be assessed and by whom,
- perceived increasing burden of requirements from regulators.

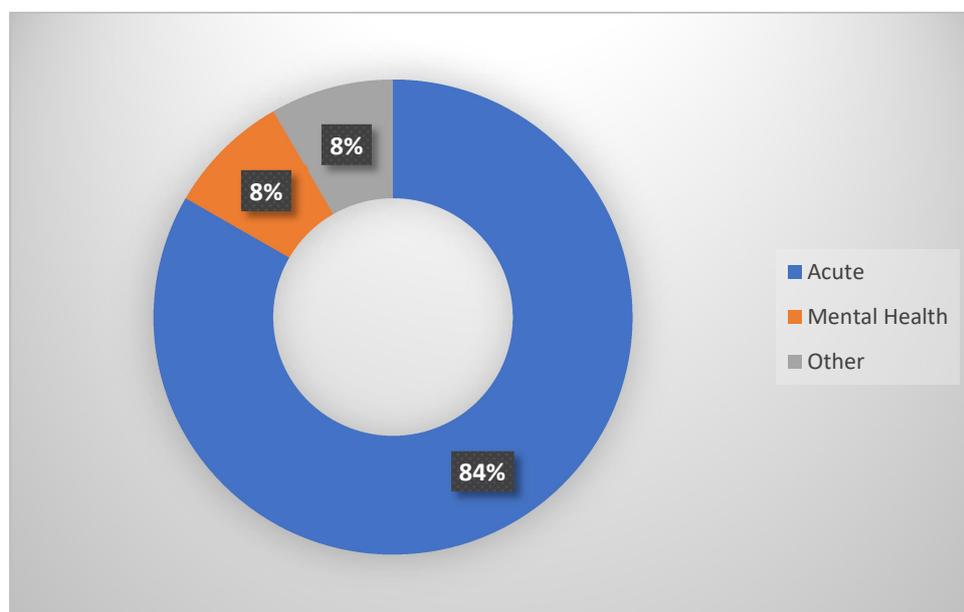
Detailed thematic analysis was limited owing to many respondents choosing not to complete this question, however of those that did, the most frequently identified barrier was related to vision and leadership. This is in contrast to the scores given by the whole sample.

The next section will discuss the implications of these findings for NHS systems in the search for increased value.

Discussion of Findings

Analysis of the healthcare sector represented by respondents indicated a strong predominance of responses from the acute sector (84%, see Figure 5). The results are therefore largely viewed through an acute lens. This may be a result of the maturity of patient level costing within the sector, which has had to make mandatory costing returns at a patient level for a number of years.

Figure 5 Sector of Respondents



Arguably, owing to this sector's predominance in responses, and the relative maturity of the sector it could be expected that the uses of patient level cost data within organisations would be relatively well established. It is surprising therefore that so few of the potential uses of this data to add technical value identified in the literature are being used frequently within organisations. Theoretical gains using time driven activity based costing were identified by Kaplan and Porter (2011); an expectation of this applicability to the NHS (NHS Improvement, 2016) and various case studies have been published (HfMA 2019b, 2018, 2017a, 2017b). Yet this research

indicates that adoption in terms of use (rather than solely to comply with regulatory requirements) is by no means universal. Around 50% of respondents never use the data for pathway improvements or to reduce unwarranted variation.

This lack of practical application of patient level cost data in organisations that have been collecting it for a number of years, and where source data is likely to be better (owing to the history of payment systems), has implications for the questions that followed in the survey. In light of this initial finding it is not surprising that a wider adoption of patient level cost data at a system level was not evident. Only one respondent combined all data within their system, and that for just one sector. Only seven respondents (29%) in total combined any data from other organisations.

The difference between the literature and this research can be explained by the argument that organisations and systems are at different stages of adoption, perhaps owing to the complexity of the undertaking, and perhaps owing to the lack of leadership to drive forward adoption (widespread adoption of patient level costing in acute provider Trusts was accelerated by national regulators requiring Trusts to adopt it). Interestingly, the most recent iteration of the national costing guidance (NHS England & Improvement, 2020b) introduced a new standard specifically to address the usage of patient level cost data. Similarly, the challenges (and therefore leadership required to overcome them in terms of cultural change) outlined in the HfMA paper on allocative value in systems (2019c) are applicable to technical value improvements as well and provide context to the responses seen in this research.

Of equal significance is the perception among costing practitioners that there are no plans to combine data outside their organisational boundaries. Between 90% and 100% of respondents had no plans to combine any of GP / Primary care, social care, Ambulance Trust, or Independent Sector data. This has significant implications for the potential to scale the organisational patient level cost data benefits to system level. Even though the respondents were predominantly from the acute sector, it is significant that the greatest number of plans to combine data were between acute

trusts (7/22). This will undoubtedly limit the scope of benefits as most patient pathways begin outside the acute sector. Thinking then about the complex pathways for ongoing conditions (which generate a significant proportion of NHS spending) which may have greatest potential for preventative or proactive intervention, these will also either end or continue outside the acute sector. As a tool to increase technical value (and indeed personal value for patients where there is an overlap) therefore this single-sector focus is problematic and needs to be addressed.

Some respondents did highlight within narrative answers that system wide data gives the potential for direct intervention where individual patients are accessing healthcare organisations multiple times within a system. This is something put in place in the Jersey system case study (Homer and Martyn, 2018) and addressed both technical and personal value streams. Others highlighted the potential to understand the role of prevention in increasing value. Both of these examples cannot be addressed solely at an organisational level and can only be assessed at a system level.

The barriers identified by respondents are interesting. Of the list of potential barriers provided to respondents, none were mutually exclusive, and indeed were potentially overlapping (for example the complexity of the issue may be driven by poor data quality, or the lack of leadership driving the project forward may result from a lack of perceived available benefit).

The greatest issue identified by respondents was the lack of time and resource with which to deliver system wide patient level cost data value. This could potentially be a result of the fact that respondents might be viewing this as potential additional tasks for themselves which they may feel unable to take on without additional resource. Alternatively it may be a recognition that there are no known additional resources within systems with which to undertake this work. NHS Improvement's view was that patient level costing projects within organisations would effectively be

self-funding through efficiencies gained (2016) and so additional resource was not provided for implementation. This argument could be applied at system level also.

The scoring indicated that poor working relationships within systems were viewed as one of the least likely potential barriers to implementation. While this is positive, narrative answers where they were given showed that mature system relationships were not universally acknowledged.

Also not seen as a major issue in terms of the scoring were information governance issues. This is surprising given the experience of the Derbyshire system³ (Mitchell and Robertson, 2020) which highlighted information governance as one of the major hurdles to overcome and advised systems to address this as early as possible. However, this may be indicative of respondents not having fully considered or understood the information governance issues, especially given the lack of expectation there was among respondents that data would be combined, compared to the post project experience of those that are in the process of trying to do this.

In this section the findings of the research have been discussed in light of expectations from the published literature, and the demographic profile of the respondents. The next section will draw conclusions for the project from the research.

³ Derbyshire was not represented by any of the respondents to the survey

Conclusion

The literature review identified that time driven activity based costing in the form of patient level costing has the potential to increase technical value at an organisational level. Kaplan and Porter (2011) proposed the use of this methodology, and it was taken up by the NHS as part of the Costing Transformation Programme with the expectation that patient level cost data will deliver increased technical efficiency through benchmarking and the reduction of unwarranted variation (NHS Improvement, 2016). Examples of where this has been achieved within organisations have been published which have demonstrated that link between theory and practical applicability (HfMA, 2019b, 2018, 2017a, 2017b).

The research set out to explore how much technical value generation work using patient level cost data is being done within systems, firstly by identifying the use within organisations, and going on to establish how much it is being used within systems. The research went further and explored what costing practitioners viewed as the potential barriers to implementing this at a system level where it is not already in place.

The answers were initially surprising in that despite the conclusions reached from the literature review, and despite the widespread adoption of patient level cost data to enable the completion of regulatory returns, only a small proportion of Trusts were using patient level cost data for value creation purposes on a regular basis. The subsequent answers were consistent with this initial finding – very little data is being combined at a supra-organisational level and as such little value generation activity is being undertaken. Of note for system leaders is the widespread perception that there are no plans for this to happen either.

The expected benefits of system level use of patient level cost data were largely in line with those articulated at an organisational level, with the expansion to encompass whole pathways rather than individual episodes of care. In other words, a more accurate representation of Porter's (2010) original definition of cost within his value equation of cost over the full cycle of care.

It is reasonable to conclude that without using patient level cost data at an organisational level, systems are not progressing work at a supra organisational level, and the potential benefits for value creation remain theoretical.

This section has drawn conclusions from the project by reviewing the research objectives against the findings. The next section will make recommendations on the actions needed to increase technical value by using patient level cost data at a system level, and options for further research.

Recommendations

Future action

This research has shown that there is not universal use of patient level cost data within organisations to deliver increased technical value despite (within the acute sector at least) the data already existing. It is recommended that as a start point individual organisations review the value that can be driven from within organisations while being mindful of the potential impact this could have on system partners. In particular the benefits should focus on cost rather than provider trust income generation which would not benefit the NHS overall.

System leaders are recommended to engage across organisational boundaries, and to dedicate sufficient resource to delivering tangible outcomes. This will require investment in both staffing and possibly IT infrastructure, and in the current mid/post Covid 19 climate it is recognised that this could be challenging. However, the medium term demand (exacerbated by the current Covid 19 issues) can be effectively addressed in part by value based interventions at a pathway level and systems need to be ready to leverage that value using available data tools such as patient level cost data.

Additionally, system leaders need to demonstrate leadership and commitment to system level data usage to address the perceived lack of direction identified in this research.

It is also recommended that where there are plans to combine data between organisations that the benefit, aims, uses and timescales are effectively communicated to costing practitioners who will be involved, both to engage staff but also so that the costing practitioner community can become advocates for the further

advanced use for the benefit of patients of the large quantity of data the NHS holds. The example of the Jersey system discussed earlier, that has targeted interventions for individual patients has demonstrated the practicability of this and could be used to engage healthcare professionals as well as costing staff.

Future research

It is recommended that this research is repeated in future to ascertain how the current state changes over time so that intervention and encouragement can be targeted to maximise value creation.

Finally, it is recommended that further case study examples are published when they have been implemented within systems, for example the Nottingham pilot that has already started (NHS Improvement, 2019), to demonstrate both the practical benefits to value that have been delivered, and how obstacles to implementation have been overcome. This will help other systems build the case for change in their own areas and share practical advice and learning within the NHS.

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Appendices

Appendix 1: Blank questionnaire

The following questions and message were sent to the research participants.

My name is [REDACTED] and I am currently studying for an MBA in Healthcare Finance with BPP University. As part of this I am undertaking some research into the current and potential future uses of PLICS – especially at an ICS level. I'm really keen to find out the views of costing practitioners so would be very grateful if you could spare the time to complete the questionnaire on the attached link. Your thoughts and input are greatly valued.

There are only 9 questions and it should only take about 5 minutes to complete. The survey will close on Friday 20th November.

Please note that your answers are completely anonymous, and there is no obligation to answer all (or any!) of the questions. By answering the questions you are confirming your agreement to take part in the research; that you understand any information provided will be treated in confidence; and that your identity will be protected in the publication of any findings.

<https://forms.gle/sf586wLHnMcNmsA4A>

If you have any concerns or questions regarding the research I can be contacted at [REDACTED]

Thank you for your time.

Questionnaire - Patient Level Cost Care Systems

Thank you for completing this questionnaire. Please be assured your answer completely anonymous.

It would be great if you could answer all the questions, but if there are any you or don't want to give an answer to, that's fine - just leave it out and move on.

Thank you again for your time.

Which ICS / STP area do you work in?

Choose 

What sector do you primarily work in?

- Acute
- Community
- Mental Health

Which of the following best describes your current role?

- Director
- Band 8C-9 or VSM
- Band 8A - 8B
- Band 6-7
- Prefer not to say
- Other: _____

Thinking about how your organisation currently uses patient level cc frequently is it used for the following purposes:

| | Frequently | Sometimes | Rarely |
|------------------------------------|-----------------------|-----------------------|-----------------------|
| Business Cases | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Efficiency / Cost Improvement | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Patient pathway improvement | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reduction in unwarranted variation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Thinking now about your ICS / STP: does your ICS /STP combine patient data from any of the following (tick all that apply)

| | Yes - all | Yes - but only some | No - but there are plans to include this | N |
|-------------------------|-----------------------|-----------------------|--|---|
| Acute providers (NHS) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | p |
| Mental Health providers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Ambulance Trusts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Community providers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Independent sector | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| GP / Primary Care | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Social Care | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |

Again thinking about your ICS / STP: what do you see as the barriers preventing patient level cost data from being used at a system level
Please rate how easy or difficult you think they are to overcome.

| | Not a problem | Easy to overcome | Difficult to overcome |
|--|-----------------------|-----------------------|-----------------------|
| Too complex to achieve | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Data is too unreliable | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| No unique patient identifier common across organisations | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information governance issues | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| No-one driving the project forward | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Poor relationships within the ICS / STP | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Lack of ICT infrastructure | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

N/A - data is
already being
used system
wide



Please use this space to expand on your thoughts on the barriers to patient level cost data at a system level.

Your answer

What do you think the main benefits would be if patient level cost data was available from all care organisations within your ICS / STP area?

Your answer

Submit

Appendix 2: Sample answers

Below is are two examples of the completed questionnaires.

Responses cannot be edited

Questionnaire - Patient Level Costing in Ca Systems

Thank you for completing this questionnaire. Please be assured your answers will be complete

It would be great if you could answer all the questions, but if there are any you are unsure of or
an answer to, that's fine - just leave it out and move on.

Thank you again for your time.

Answer redacted to prevent identification

What sector to you primarily work in?

Acute

Community

Mental Health

Social Care

Ambulance

Other:

Which of the following best describes your current role?

Director

Band 8C-9 or VSM

Band 8A - 8B

Band 6-7

Thinking about how your organisation currently uses patient level cost data, how frequently is it used for the following purposes:

| | Frequently | Sometimes | Rarely |
|------------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Business Cases | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Efficiency / Cost Improvement | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Patient pathway improvement | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Reduction in unwarranted variation | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Benchmarking | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| National returns (such as National | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Thinking now about your ICS / STP: does your ICS /STP combine patient level cost c
the following (tick all that apply)

| | Yes - all | Yes - but only some | No - but there are plans to include this |
|-------------------------|-----------------------|-----------------------|--|
| Acute providers (NHS) | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Mental Health providers | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Ambulance Trusts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Community providers | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Independent sector | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| GP / Primary Care | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please expand on your answer, thinking about what has benefit been gained or opp
by combining data from those organisations.

First the opportunities lost; no cohesive way of linking across either organisational or chronol
we cannot assess in what ways the acknowledged poorer physical health of patients with mer
conditions manifests itself, nor over what time periods. We do not recognise the full cost of sp
disease conditions; Renal patients are seen by one acute provider, but acute episodes are cou

The potential benefits are the flip side; what is the range of warranted variation and how does
this in a sustainable way. If the Acute sector loss is actually largely warranted against a paym

Again thinking about your ICS / STP: what do you see as the barriers to preventing data from being used at a system level (if any)? Please rate how easy or difficult y to overcome.

| | Not a problem | Easy to overcome | Difficult to overcome |
|--|-----------------------|----------------------------------|----------------------------------|
| Too complex to achieve | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Data is too unreliable | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| No unique patient identifier common across organisations | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Information governance issues | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| No-one driving the project forward | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Poor relationships within the ICS / STP | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Lack of ICT infrastructure | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Lack of time / resource to invest in this | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |

Please use this space to expand on your thoughts on the barriers to the use of patient data at a system level.

The major barriers are addressed in the main; how do we identify the patient (not the attendance), how do we identify the disease/condition in Outpatients and Primary care (not the attendance), how is it used safely, intelligently and useably? then who uses it? What are the pathway and outcome parameters we can achieve, and are they good, or just achievable. If clinical practice isn't consistent, why should it be? (Cemented hips over 75, anyone???)

What do you think the main benefits would be if patient level cost data were available to all organisations within your ICS / STP area?

Better (but not good) pathway and outcome data that can support valuable health initiatives and reduce costs.

Responses cannot be edited

Questionnaire - Patient Level Costing in Care Systems

Thank you for completing this questionnaire. Please be assured your answers will be completely confidential.

It would be great if you could answer all the questions, but if there are any you are unsure of or don't have an answer to, that's fine - just leave it out and move on.

Thank you again for your time.

Answer redacted to prevent identification.

What sector do you primarily work in?

- Acute
- Community
- Mental Health
- Social Care
- Ambulance
- Other:

Which of the following best describes your current role?

- Director
- Band 8C-9 or VSM
- Band 8A - 8B
- Band 6-7

Thinking about how your organisation currently uses patient level cost data, how frequently is it used for the following purposes:

| | Frequently | Sometimes | Rarely |
|------------------------------------|----------------------------------|----------------------------------|-----------------------|
| Business Cases | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Efficiency / Cost Improvement | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Patient pathway improvement | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Reduction in unwarranted variation | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Benchmarking | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| National returns (such as National | <input checked="" type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Thinking now about your ICS / STP: does your ICS /STP combine patient level cost c
the following (tick all that apply)

| | Yes - all | Yes - but only some | No - but there are plans to include this | a |
|-------------------------|-----------------------|-----------------------|--|---|
| Acute providers (NHS) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Mental Health providers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Ambulance Trusts | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Community providers | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| Independent sector | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |
| GP / Primary Care | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | |

Please expand on your answer, thinking about what has benefit been gained or opp
by combining data from those organisations.

Costing data is a rich resource that should provide useful pointers towards areas that may be
However local systems are not mature enough to start looking at this data - there are many m
they need to get to grips with first

Again thinking about your ICS / STP: what do you see as the barriers to preventing data from being used at a system level (if any)? Please rate how easy or difficult you think it is to overcome.

| | Not a problem | Easy to overcome | Difficult to overcome |
|--|-----------------------|----------------------------------|----------------------------------|
| Too complex to achieve | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Data is too unreliable | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| No unique patient identifier common across organisations | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Information governance issues | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| No-one driving the project forward | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Poor relationships within the ICS / STP | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Lack of ICT infrastructure | <input type="radio"/> | <input checked="" type="radio"/> | <input type="radio"/> |
| Lack of time / resource to invest in this | <input type="radio"/> | <input type="radio"/> | <input checked="" type="radio"/> |
| Other | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Please use this space to expand on your thoughts on the barriers to the use of patient data at a system level.

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What do you think the main benefits would be if patient level cost data were available to all organisations within your ICS / STP area?

It would drive ongoing quality improvements in the data

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Appendix 3: Contextualisation Statement

This contextualisation statement links the module learning outcomes to the project as follows:

| Learning Outcome | Delivery |
|---|---|
| <p>1. Demonstrate the knowledge of theory and the ability to apply it in the context of healthcare</p> | <p>This outcome was delivered via the Literature Review, where Porter's value equation (Porter, 2010) and the triple value concept (Gray, 2015) were discussed, including their usage in clinical settings. The link to the practical use of patient level cost data in organisations was demonstrated (citing case study examples) in this and the Discussion and Conclusion sections.</p> |
| <p>2. Exercise appropriate judgment in the planning, selecting and collecting of evidence to investigate the chosen issue via primary and/or secondary data</p> | <p>This outcome was delivered through planning to ascertain the current state of patient level cost data usage within the NHS. The method selected was to conduct primary research via a survey of costing practitioners using matrix style questions to ascertain the scale of individual responses, plus some multiple choice selections to enable statistical analysis. Depth was added by including free text questions for respondents to expand on their thoughts.</p> <p>Secondary data was analysed in the Literature Review.</p> |
| <p>3. Generate recommendations which will</p> | <p>This outcome was delivered through</p> |

| | |
|--|--|
| <p>contribute to business success, using analysis of value creation and capture</p> | <p>recommendations for system leaders to promote the system level use of patient level cost data to enable whole pathways to be understood across organisational boundaries, so that interventions maximise technical value.</p> <p>As a result of not receiving the expected answer regarding current use, the recommendation to publish further case studies demonstrating increased system level technical value will enable learning within the service, encourage adoption and thus add value to the NHS.</p> |
| <p>4. Communicate complex information succinctly, effectively and appropriately via different forms including presentation and analysis of quantitative/qualitative data</p> | <p>This outcome was delivered in the Research Findings section of the document with a variety of graphs and narrative explanation. Richer contextual information was provided through selected verbatim quotes from survey respondents to illustrate points. Narrative analysis was completed in the Discussion of Findings section.</p> |
| <p>5. Develop problem-solving competencies by applying key knowledge and concepts to an organisation's business challenges</p> | <p>Analysis of the current NHS operational environment using PESTLE analysis delivered this outcome, recognising the current capacity constraints arising from the Covid 19 situation and the need for the service to recover from it, and an acknowledgement of the increasing future demand on the service.</p> |

| | |
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| | <p>Additionally, the strategic move towards systems underpins the practicality of the recommendations.</p> <p>Understanding the current operational context has driven the imperative for technical value creation, and therefore influenced the recommendations for future action to include using existing value creation tools (patient level costing data) within organisations and systems.</p> |
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