

**Contextualising risk, reducing harm. How do quality
dashboards influence care delivery within hospital wards? A
realist evaluation**

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Undertaking a PhD is challenging, more so than I ever imagined.

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The very first requirement in a hospital is that it should do the sick no harm.

Florence Nightingale

Abstract

Background

In response to patient safety concerns, a number of NHS hospitals have developed and implemented quality dashboards. The aim of this research was to examine how quality dashboards influence care delivery within hospital wards.

Methods: A literature and scoping review were used to develop the initial theories to explain how quality dashboard influence care. These theories were refined using a realist interview technique with 11 stakeholders. Three case study sites were selected according to their dashboard performance and a mixed method approach was used to gather data to test the refined theories. In total 30 staff and 6 visitors were interviewed, 18 hours of non-participant observation of a patient safety board, safety huddles and handovers were undertaken and a review of 3 years outcome data were used to test the theories.

Findings: The evaluation found ward leaders play an important role in promoting staff engagement with quality dashboards and are responsible for developing strategies to improve performance. Staff were more likely to change practice if the information from the dashboard was seen as important, meaningful and given with a specific focus for change. While staff enjoyed receiving positive performance information, change was more likely in response to performance data that caused dissonance. During the periods of observation a total of 123 staff and 72 visitors were observed walking past a patient safety board displaying information from a QD. During this time 0 staff and 9 visitors were seen interacting with the board.

Conclusion: The three interrelated programme theories of Importance, Disruption and Avoidance could be used to explain why and how quality dashboards influence care delivery within hospital wards. The evidence suggests, best practice guidance to support ward managers to use QD information should be developed, information from QD should be incorporated into daily team discussions, auditors should engage with staff during the audit visit as outcomes are triggered by disruption rather than compliance, regular updates to the standards and metrics is needed and where possible QD data should be automatically generated to remove the risk of auditor bias. In conclusion, contextualising QD data has the potential to reduce harm.

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List of Abbreviations

CQUIN	Commissioning for Quality and Innovation
CMO	Context-Mechanism-Outcome
CMOC	Context-Mechanism-Outcome Configuration
CSU	Clinical Service Unit
FIT	Feedback Intervention Theory
FFT	Friends and Family Test
HCP	Healthcare Provider(s)
NPS	Net Promoter Score(s)
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
NQF	National Quality Framework
NPSA	National Patient Safety Agency
PROMs	Patient Reported Outcome Measures
PSB	Patient Safety Board
QD	Quality Dashboard(s)
RE	Realist Evaluation
SHMI	Standard Hospital Mortality Indicator
SMR	Standardised Mortality Rates
ST	Safety Thermometer
UK	United Kingdom
WHC-QD	Ward Health Check Quality Dashboard
WMAP	Ward Metrics Audit Programme

Chapter 1 Background

1.1 Introduction, the importance of context

While working as a Matron within a large NHS teaching hospital in the North of England, a member of staff knocked on my door to tell me that a scan request had gone missing and a patient's scan had been delayed. The staff member was upset, as he knew the result of the scan would determine if further cancer treatment was possible. We discussed how we could improve the system and agreed to monitor the number of scans requested and performed each week.

As he left, he asked *'I wonder if we attached a photograph of the patient to each of the request cards, less would go missing?'*

Although attaching a photograph to a request card would not be practical or possible, the point the staff member was highlighting was how do we raise awareness of the importance of medical tests and what they mean to patients. Scans and tests often represent a significant step in a patient's journey, in this particular case the scan was to decide if cancer treatment was possible, for others it represents being cancer free for another year or is the first step in explaining symptoms or diagnosing a condition. The supposition from this conversation was if request cards were individualised or contextualised, staff would see them as important, take greater care and lose less of them. While this was a hypothetical proposition, it did make me reflect upon the recent introduction of quality dashboards (QD) into NHS organisations, the reason for their introduction, and how they influence care delivery.

This chapter will therefore describe what quality dashboards are, and using key texts from public inquiries and healthcare reports, present a historical perspective of quality and safety in health care. Using evidence from government responses to healthcare scandals and corresponding reports, it will explain why improvements in the quality and safety of health care was needed and outline the steps recommended in those reports to achieve this (Appendix A). It will present the rationale for the development of quality dashboards and the role they are expected to play in making healthcare safer. It will conclude with a brief outline of this thesis structure.

1.2 What are quality dashboards

Dashboards are described as tools to drive change and make improvements (Strome, 2014). They consolidate and arrange the information needed to achieve one or more objectives so it can be monitored at a glance (Few, 2004). Okes (2013) describes dashboards as summary views of multiple metrics that allow a quick assessment of overall performance.

Quality dashboards within healthcare often displays a range of structure, process and outcome measures relating to safety, experience and effectiveness (Okes, 2013). Strome (2014) in his work on healthcare analytics, uses Few's (2004) definition to remind the reader to see dashboards as much more than a collection of charts, graphs and numbers but tools to communicate complex data to individuals, teams or organisations. The aim of dashboards is to provide information at an organisational, departmental, ward, and individual level to track progress against pre-determined objectives or goals and identify areas for improvement (RCN, 2012, Heslop and Lu, 2014). Initially within healthcare, objectives were often linked to cost reduction or financial performance, however in more recent times, dashboards have been developed to assess performance against quality and safety goals (Lloyd, 2017).

1.3 A historical view of quality in healthcare

In North America, the growing demand for healthcare data started in the 1980s when healthcare regulators and insurance companies wanted information that would allow them to assess which providers could offer the highest quality care for the lowest cost. These initial reports were known as report or score cards (Nelson, 1995) and were further developed by Kaplan and Norton (1992) to become balanced scorecards (Lloyd 2017). Although a new development in the 1980s and 1990s, throughout the history of healthcare, data gained from measuring the safety and quality of care have been used to inform and drive change.

In 1858, Nurse, Florence Nightingale published data showing soldiers injured in the Crimean war were dying from iatrogenic reasons and nosocomial infections rather than their battle injuries. Nightingale used this information to create a coxcomb (polar diagrams) to raise awareness and make the case for better sanitation and conditions in hospitals (Lloyd, 2017).

In North America, Dr Ernest Codman a surgeon from Boston, suggested hospitals develop an 'end result system' to allow the public to decide where they should have treatment. From 1911 to 1916, he reviewed the treatment of 337 patients and their outcomes once they left hospital. He recorded 123 errors caused by a lack of knowledge, skill, surgical judgement, and equipment. He published this information in an annual report for patients and the local community and urged other hospitals to do the same. The purpose of Codman's end result system was to recognise where errors had been made, learn from them and improve practice. He believed publishing the results would allow the fee paying public to judge the quality and outcomes of care and make informed choices about where to have treatment (Neuhauser, 2002). While not popular with his colleagues at the time, his ideas continue to pervade healthcare today (Lloyd, 2017).

Some years later the need to assess the quality of healthcare care was highlighted by Cohen (1964) and Robb (1967) when they published their concerns about the standard of care within elderly, mental health and paediatric hospitals in United Kingdom (UK). These reports gave examples of cruel, undignified, institutionalised practice and care within hospital building that were not fit for purpose. Robb's (1967) report highlighted hospital management teams who had lost sight of their primary purpose of providing safe and effective healthcare and had become involved in self-serving rituals. Recognising this dichotomy Robb (1967, 87) wrote '*Doctors and nurses have two contracts, one to their board which is written, and one to their patient which is unwritten, when conflict between the two arise, it is the unwritten contract that should be observed*'.

The report drew public and professional attention to the role of the nurse and the quality of nursing care. Staff shortages, low staff morale, poor organisation of care, and deficiencies in human relationship skills were identified as specific areas for improvement. In response, the Ministry of Health commissioned the Royal College of Nursing to undertake the "Proper Study of the Nurse" project (McFarlane, 1971). The study was tasked with developing techniques for measuring the quality of nursing care as none were available in the published literature at that time.

The project, acknowledged the infancy of nursing research, reviewed the available evidence and interviewed nurses about their roles and responsibilities. The study found that nurses reported that safe care was dependent upon the experience of the nurse and the number of nurses available, however no measures of quality

existed that could verify or prove the assumptions (McFarlane, 1971). McFarlane (1971) concluded that as nursing care takes place within a system, it was difficult to isolate antecedent factors and show a causal relationship. The study recognised that work was needed to develop research techniques for measuring the quality of nursing care with '*cybernetic models*' (an automated communication and control system) a consideration for future data capture. The study suggested hospitals should start to measure variables such as factual incidents, aspects of nursing care that had an impact upon patient welfare, and the ward environment. This information could be used to assess the performance of hospital wards and control the quality of care provided. The variables recommended by McFarlane (1971) were similar to those identified by Donabedian's (1966) structure-process-outcome conceptual framework for examining the quality of health care.

Avedis Donabedian, one of the world's leading authors on quality (Best and Neuhauser, 2004) found assessing the quality of health care to be remarkably difficult. He suggested "*quality healthcare could be anything anyone wishes it to be, but should reflect the values and goals that are current in the medical care system and the society of which it is a part*" (Donabedian, 1966 , 167).

As a solution he offered a framework based upon 'structure-process-outcome' which uses the attributes of the care setting (Structure), activities related to giving and receiving care (Process) and the effect of care on the person and wider population (Outcome) to assess the quality of healthcare. He recommended that an assessment of quality should be more than a measurement of medical outcomes, as "*what is the benefit of using patient survival as a criterion of success if the patient is left with a crippling condition*" (Donabedian, 1966 , 168).

Over the next 20 years healthcare providers (HCP) continued to collect large quantities of administrative data such as number of patients admitted, treated, length of stay in hospital, deaths following operations, and waiting time for tests. The information was generally used by insurance companies, regulators and managers to inform strategic decision making and submitted to government departments for planning and funding considerations. Very little of this information was used to assess the quality and safety of healthcare (Lloyd 2017).

1.4 Concerns regarding the quality and safety of healthcare in North America and the United Kingdom.

The quality and safety of healthcare was brought into sharp focus in 1992 when a British newspaper drew attention to the higher than expected mortality rates for children undergoing cardiac surgery in a UK National Health Service (NHS) hospital. Internal audit data identified death rates significantly higher than expected with no action taken by hospital management to investigate the root cause. A member of the medical team made his concerns known to the media and a national healthcare scandal was uncovered (Nashef, 2016). The Department of Health, the UK's government department responsible for health, commissioned a public inquiry to investigate surgical outcomes at cardiac unit between 1984 and 1995. The report identified 171 children who may have survived complex cardiac surgery if it had been performed at another hospital. The inquiry also found the hospital 'awash with data' from 1980s onwards, showing mortality rates significantly higher in Bristol than other centres in the UK. Unfortunately this information was not shared with patients, parents, or the public.

The inquiry made 198 recommendations, many of which were focused upon developing clinical standards and assessing the performance of individual surgeons and hospitals. The aim was for cardiac surgery in the UK to become more transparent by sharing individual surgeons outcome data with patients, parents and the public. The information was to be used to challenge paternalism and start to create a culture of candour and transparency for all aspects of healthcare within the UK (Department of Health, 2002, Nashef, 2016).

As the UK was reflecting upon the concerns identified at Bristol, the safety of healthcare in the United States of America was also identified as a concern when the Institute of Medicine (1999) published their landmark report '*to err is human: building a better health system*'. The report suggested several thousand patients died each year due to errors in their care and hundreds of thousands experienced non-fatal injuries. The significant human and financial burden of those errors demanded action was needed to improve the quality and safety of healthcare.

In response, the Institute of Medicine's Committee on Quality of Health Care, (2001) published 'Crossing the Quality Chasm' a comprehensive series of reports and recommendations to address the concerns outlined by the Institute of Medicine (1999). The committee proposed six domains for improvement

- Safe: avoiding injuries to patients from the care that is intended to help them.
- Effective: providing services based on scientific knowledge to all who could benefit and refraining from providing services to those not likely to benefit.
- Patient-centred: providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions.
- Timely: reducing waits and harmful delays for treatment.
- Efficient: avoiding waste, including waste of equipment, supplies, ideas, and energy.
- Equitable: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location, and socioeconomic status.

The report suggested if health care systems could make improvements in each of these domains, patients would experience care that was safer, more reliable and responsive. The committee recognised significant change would require substantial improvement in health care and health care systems. It urged clinical leaders, front line staff, and management teams to work together to identify the scope and significance of healthcare errors, and develop strategies and recommendations to advance and encourage improving the quality and safety of patient care.

The report identified one of most significant barriers to improving patient safety was a lack of awareness of the extent to which errors occur. It suggested this was because the vast majority of errors were not reported, as staff feared they would be punished or disciplined. The report placed significant emphasis on the role leaders would play in encouraging and supporting staff to report errors. The aim was to use this information to develop process and outcome measures to understand the degree to which performance is consistent with best practices, and the extent to which patients are being helped or harmed when receiving care (Institute of Medicine, 2001). As with the Bristol Heart Surgery inquiry, the Institute of Medicine (2001) asked for transparency from hospitals, to allow patients and families to make informed decisions when selecting a health plan. The report asked for guidelines and evidence to be developed and used to design quality measures which could continuously monitor the quality and safety of care. The information needed to be comparable between HCP and include performance information on safety, evidence based practice, and patient satisfaction.

Similar themes also emerged from a review of patient safety in the NHS published in 2000. The report 'An organisation with memory', estimated that 400 patients died or were seriously injured due to the incorrect use of medical devices each year in the NHS. The cost of adverse drug reactions, hospital acquired infections and pressure ulcers was also estimated to cost the NHS £1Billion per year (Department of Health, 2000). It found the culture within the NHS, did not encourage errors to be reported, or lessons learned to be widely shared. Often recommendations and learning from patient safety issues were not embedded into clinical practice and performance data were difficult for front line staff to access.

As with previous reports, the recommendations were once again focused upon creating a culture of honesty and transparency and developing systems to allow harm to be reported and performance to be compared (Vincent, 2013).

1.4.1 The Shipman Inquiry

Despite recommendations from the various inquiries and reports in previous years (Appendix A), the safety of healthcare in the UK was once again called into question in 2000 when a General Practitioner (GP) was found guilty of murdering 15 patients and may have been responsible for the deaths of over 200 patients over a twenty five year period.

Once again a public inquiry was commissioned and a comprehensive report and recommendations were published in 2004 (Smith, 2004). In 2007, the UK government published 'Learning from tragedy, keeping patients safe', its response to the Shipman Inquiry. As with previous inquiries, a theme within Dame Smith's report was the need for greater oversight and transparency within healthcare. (Smith, 2004, Department of Health, 2007). The Shipman Inquiry found very little systematic data was collected on the performance of health professionals in general practice. At that time the routine data collected by general practitioners were focused upon cost effective prescribing patterns rather than looking at the quality or safety of care. The inquiry also found no systematic arrangements for sharing information between healthcare organisations. The findings were similar to those identified in the Bristol Inquiry (Department of Health, 2002) which recommended hospitals began to measure and report surgeons outcome data and hospital mortality rates.

Hospital mortality rates had been available to the public via Dr Foster Intelligence since 2001. Dr Foster Intelligence, an organisation specialising in the analysis of

healthcare data, would publish an annual report comparing the performance of hospitals in England against a range of indicators, including Standardised Mortality Rates (SMR) (Vincent 2013). SMR or standard hospital mortality indicators (SHMI) is the ratio between the expected and actual number of patients who die in hospital (or within thirty days of discharge from hospital) (NHS Digital, 2018). While there was criticism of the methodology used by Dr Foster, there was recognition that although the SMHI was not a measure of quality of care, a higher or significantly lower number of deaths would require further investigation by the HCP and their regulator (Illingworth, 2014). Research carried out on behalf of the Shipman Inquiry suggested if mortality data on the number and pattern of patient's deaths had been analysed, some unusual features would have come to light and an investigation may have been started sooner. The Shipman inquiry concluded that routine monitoring of mortality rates should be extended beyond hospitals to include GP practices and the NHS needed to adopt a systematic approach to collecting and monitoring information on the performance of doctors and the safety of healthcare (Department of Health 2007).

1.4.2 The Mid Staffordshire Public Inquiry

Unfortunately concerns regarding the quality and safety of healthcare in the UK were once again brought to the attention of the public when mortality rates at the Mid Staffordshire NHS Hospital Trust were found to be higher than expected for patients admitted for emergency procedures in 2009 (Mid Staffordshire NHS Foundation Trust and Robert Francis QC, 2013). What followed was an investigation into the care at the hospital by the Healthcare Commission, a regulator at that time. This investigation found the organisation had poor governance arrangements, lacked data on quality and safety, and chose to discredited poor outcome data rather than understand its root cause.

Concerns regarding the standards of care at the hospital led to the government of the time commissioning a public inquiry. The Mid Staffordshire Public Inquiry, chaired by Robert Francis was published in 2013 and describes in detail the failings of an organisation which did not provide the most basic standards of care for hundreds of patients, subjecting them to appalling and unnecessary suffering. The report suggests patients and their relatives were failed by a system which ignored the warning signs and put corporate self-interest and cost control ahead of safe care (Mid Staffordshire NHS Foundation Trust and Robert Francis QC, 2013). The report highlighted a lack of compassion by nursing staff and a culture of senior

managers prioritising achieving financial targets over providing safe healthcare. The report gave 290 recommendations, with many of them focused upon improving the quality and safety of healthcare.

The UK Government response to the report was to commission the National Advisory Patient Group for Patient Safety (NAPGPS) led by Dr Berwick, a leading expert in patient safety. The aim of NAPGPS, was to review the quality of care and safety of patients in the NHS and develop a whole system approach to achieving harm free care throughout HCP in England. The aim of the group was to ensure patient safety was an ever present and constant concern for every NHS funded employee, ensuing risks to patient safety were recognised and always acted upon as soon as they were identified. To achieve this shift in culture a new approach to patient safety was set out in three key documents, A promise to learn- A commitment to act (National Advisory Group on the safety of patients in England, 2013), Safe staffing for nursing in adult inpatient wards in acute hospitals (NICE, 2014), Hard Truths: The Journey to Putting Patients First. (Department of Health and Social Care, 2014).

As with previous inquiries (Smith et al 2004, Department of Health 2002) the response was to commit to improving the quality and safety of healthcare through actions focused upon the themes of organisational culture, compassionate care, leadership, standards, information and openness, transparency and candour (Department of Health and Social Care, 2014). It suggests the quality of care should be measured and monitored via a single set of nationally agreed measures. This would allow the public, parliament and those who work within the NHS to have a single version of the truth about the quality and safety of health care. The National Advisory Patient Group for Patient Safety (2013) report recognised the importance of engaging front line staff in measuring and monitoring safety within their wards and departments, encouraging them to interrogate, scrutinise, and use the information to improve care. When front line staff engage with performance data on a day to day basis they can react to the early warning signals which lead to quality and safety concerns, acting as 'smoke detectors', identifying problems much earlier than mortality rates do (National Advisory Group on the safety of patients in England, 2013).

1.5 Summary

This chapter has provided a brief introduction to quality dashboards and a historical summary of concerns regarding the quality and safety of healthcare in the UK and USA (Appendix A). The evidence suggests, throughout history, patients have at times experienced care which has caused distress and harm. While the root cause of the published healthcare failings have differed, all have called for HCP to encourage staff to report errors and concerns to create a culture of transparency and candour. To achieve this, HCP were asked by their governments to begin to measure and monitor the quality of the care they provide and to make this information available to healthcare regulators, staff, patients, and the public. The reports suggest this would allow patients to make an informed choice of where to receive care and health care regulators to identify HCP, surgeons, and general practitioners who need support. Measuring the quality and safety of health care is complex, understanding what to measure and how this information can be used to create a quality dashboard will be explored in Chapter 2.

1.6 Thesis structure

As dashboards are tools which consolidate data to create a visual summary of performance, their development and use within health care has increased over time. The purpose of this research is to understand why quality dashboards have been developed and how they influence care delivery within hospital wards. To present this research the thesis will be organised into the chapters set out below, the steps taken to define, refine and test the programme theories is set out in Figure 1 .

Chapter 2: This chapter presents an overview of safety within healthcare and describes the Ward Healthcheck-Quality Dashboard and rationale for its development and implementation. Unintended consequences of performance data and quality dashboards are also presented. The chapter concludes by setting out the aims and objectives of this research study.

Chapter 3: This chapter presents the results of a scoping review designed to examine the evidence to explain how quality dashboards influence care delivery within hospital wards. As QD are mechanisms or tools for audit and feedback, this literature was also considered with reference to best practice frameworks and two formal theories identified from the literature.

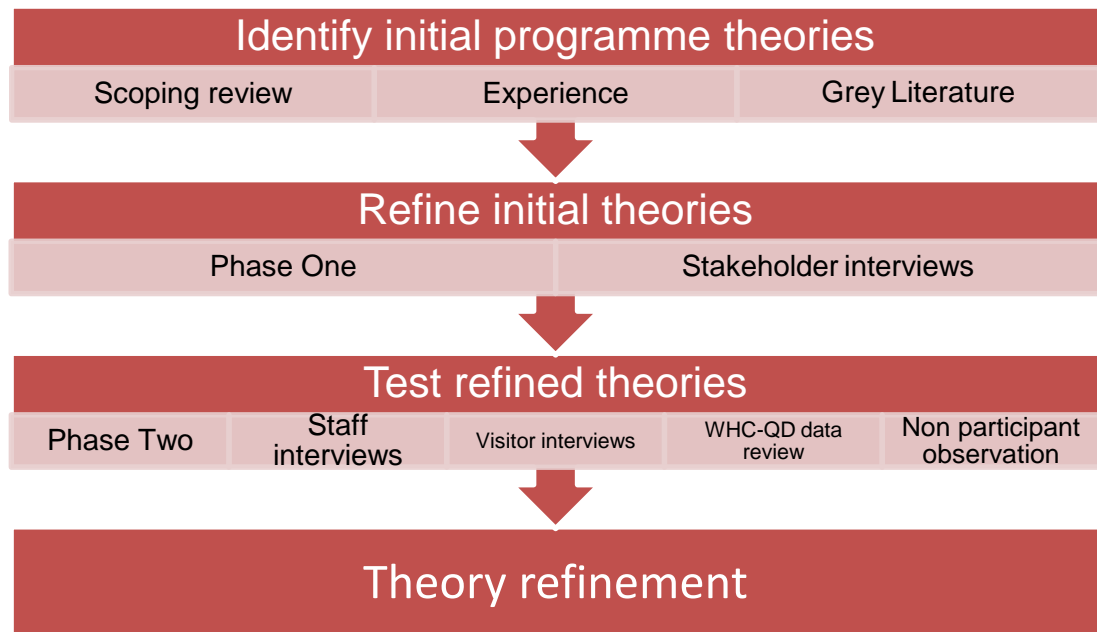
Chapter 4: This chapter introduces realism and realist evaluation and the rationale for the use of this approach to answer the research questions. The central principles of Context, Mechanism and Outcomes and the need to generate initial programme theories about how a programme is expected to work are explained. The chapter sets out the three phases of the study and the steps taken to recruit stakeholders and participants. Data collection and analysis techniques are outlined for Phase one and Phase two of the study. The rationale for using a mixed methodological approach to capture information from three case study sites is set out with reference to ethical approval and how the case study sites were selected. Case study site data, non-participant observation and participant and visitor interviews were used to capture data for analysis. Consideration is also given to how the researcher may influence the study.

Chapter 5: This chapter describes how evidence from a scoping review, board papers, audit and feedback literature, and unintended consequences concerns, were brought together to develop seven context, mechanism outcome configurations to describe the initial programme theories

Chapter 6: This chapter describes the process for refining the initial programme theories set out chapter 5 with key stakeholders. This process allows the initial theories to be refined before they are tested.

Chapter 7: This chapter presents the findings from the realist evaluation of the programme theories. The theories were tested in three case study sites using multiple research methods to test and refine the theories

Chapter 8: This chapter brings together the findings from all phases of the research to bring understanding to how quality dashboards influence care delivery within hospital wards. Unintended consequences are considered and the strengths and limitation of the study presented. The chapter concludes with recommendations for practice and considerations for future research.

Figure 1 The process of theory development

Chapter 2 The development of a quality dashboard

2.1 Introduction

This chapter provides an overview of the drivers for quality dashboards in the UK and a summary of health care information available to the public. Using a case study from a large hospital in the North of England, the steps taken to develop and implement a quality dashboard are presented. The intended consequences of the quality dashboard are discussed and potential unintended consequences are identified. The chapter will conclude with setting out the research aims and objectives of this study.

2.2 The drivers for quality dashboards in the UK

To address quality and safety concerns (Appendix A), the UK government published 'High Quality Care for All', a document setting out a shift in approach to health care policy. Previous targets and metrics were largely focused upon how quickly care was given, such as waiting times in emergency departments and time taken for patients to receive treatment. The government's aim was to broaden the metrics to also measure the quality of care provided (Hood, 2006, Department of Health, 2008).

As previously identified, assessing the quality of healthcare can be difficult (Donabedian's 1966). Lord Darzi, the principle author of High Quality Care for All, recognised this and defined quality in healthcare using three criteria:

- Patient safety; doing no harm to patients.
- Patient experience; care should be characterised by compassion, dignity and respect.
- Effectiveness of care; to be measured using survival rates, complication rates, measures of clinical improvement and patient-reported outcome measures.

As with previous reports, the collection and publication of information on the quality of care was a central theme. The report suggested quality improvement in healthcare was going to be achieved predominantly through the publication of comparable performance data. The suggestion was this would encourage clinicians to improve their practice and systems, and place new emphasis on professionals' innate desire to improve services (Department of Health, 2008).

To support the collection and publication of comparable data, a National Quality Framework (NQF) was created which set out the type of quality indicators for primary and secondary care providers to consider. The framework asked HCP to capture patient safety, patient experience and effectiveness of care data. Recognising the challenges associated with developing methodologies for collecting and collating information to allow meaningful comparison between HCP, the government commissioned 'Quality Observatories'. Quality Observatories were expected to enable and support benchmarking between hospitals, support the development of metrics to enable frontline staff to effectively monitor safety, identify opportunities for clinical staff to innovate and improve services, and provide quantitative evidence to support change and progress (Riley and Cheema, 2010).

2.2.1 Financial incentives and penalties

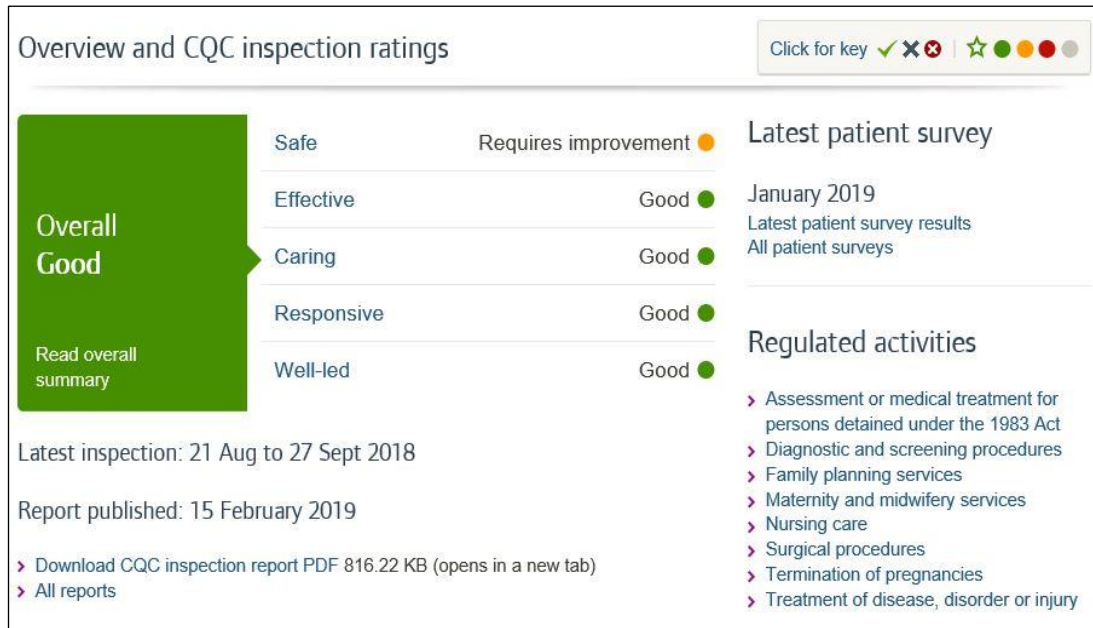
Financial incentives known as Commissioning for Quality and Innovation (CQUINS) were also introduced, to reward hospitals for improving their performance against pre-determined indicators. Healthcare regulators such as the Healthcare Commission which would later become the Care Quality Commission (CQC) were given powers to issue healthcare providers with financial penalties if they failed to reduce the number of patients with specific gastrointestinal or blood stream infections (Care Quality Commission, 2021) . HCP had to develop systems and processes to collect information on incidences, infections, and surgical complications to demonstrate their compliance with targets and allow them to receive financial incentives or avoid financial penalties.

2.3 Availability of information on the quality and safety of healthcare in the UK

As transparency was a fundamental principle of the NQF, HCP were required to submit data to approximately 80-100 national clinical audit databases.

Advancement in data warehousing and the introduction of electronic platforms to organise care within hospitals has also allowed vast quantities of electronic data to be generated and made available to the public. Patients can access hospital performance data via government and regulator websites (Figure 2) (Vincent, 2013).

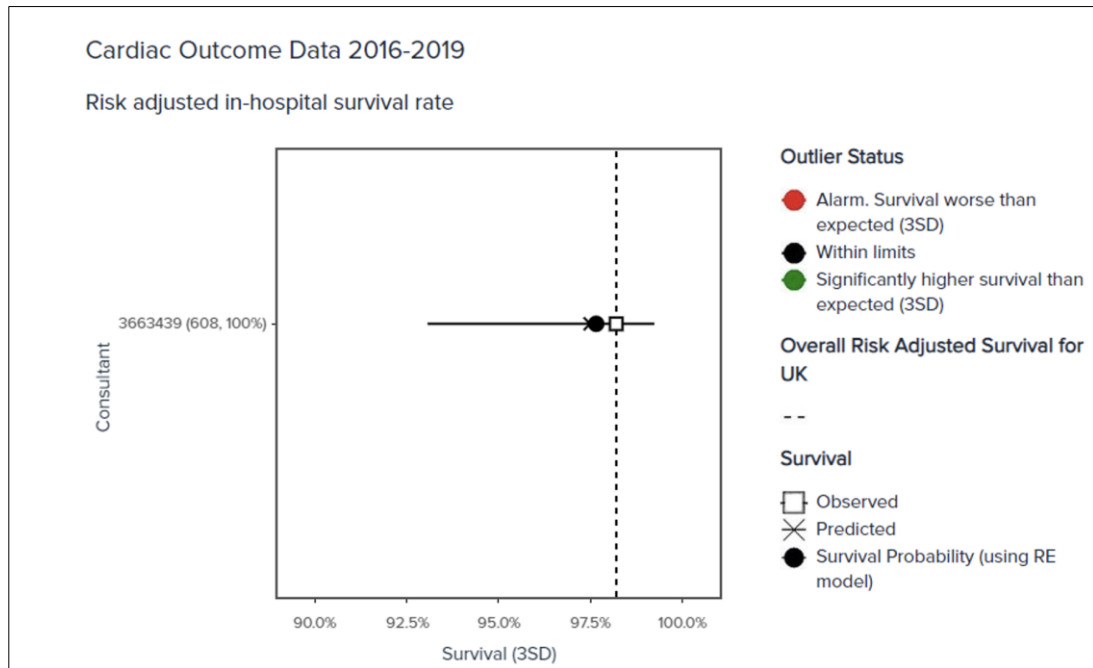
Figure 2 Example of information available from the CQC website



(Care Quality Commission, 2019)

As well as hospital performance data, it also became possible to access the performance data for individual cardiac surgeons (Figure 3) (Bridgewater et al., 2007, Keogh and Bridgewater, 2007, Bridgewater et al., 2013).

Figure 3 The outcome data for a cardiac surgeon in the North of England



(Society for Cardiothoracic Surgery in Great Britain and Ireland, 2019)

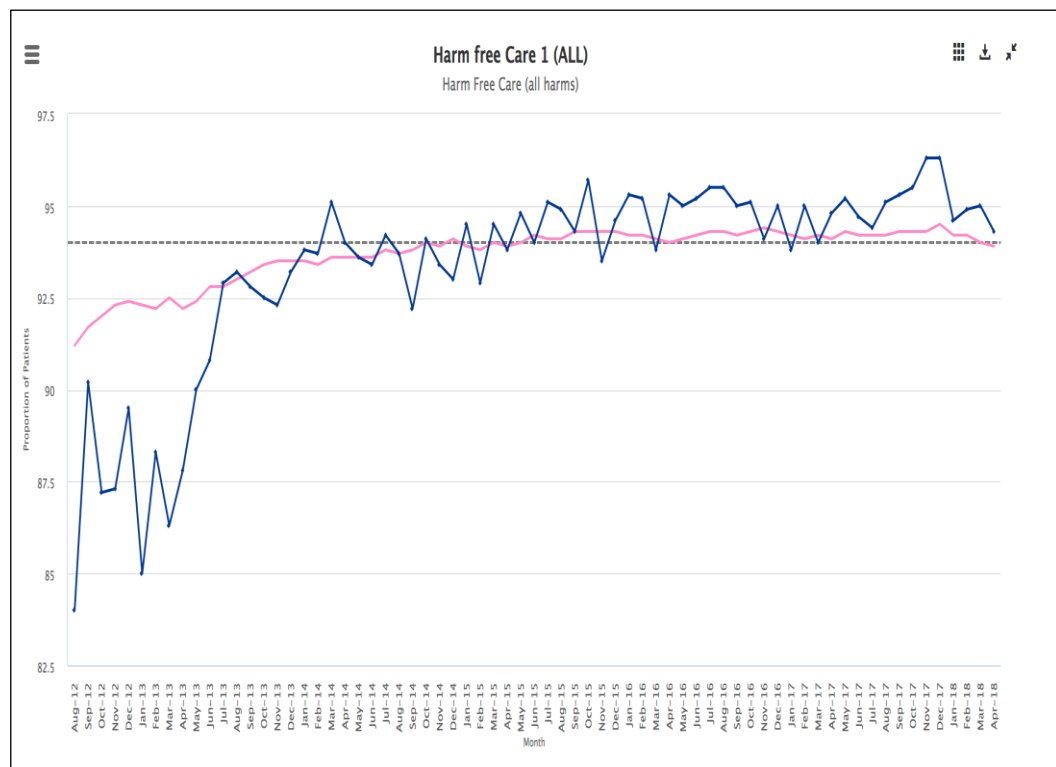
Building on the work of cardiac surgery the UK government also set out plans to publish similar data by consultant for ten more surgical specialities (Department of Health and Social Care, 2014).

2.3.1 Quality of nursing care

As the Francis report raised concerns about the standard of nursing care, in response the National Institute of Health and Care Excellence (2014) (NICE) published guidance on nurse staffing levels for adult in-patient wards in an acute hospital setting. While the guidance fell short of identifying specific nurse to patient minimal requirements it recommended hospitals were required to monitor 'safe nursing indicators' (Appendix C). Hospital Boards were also asked to be given a six monthly update on nurses staffing levels and hospital wards were required to display the planned vs actual number of nurses available each day (Mid Staffordshire NHS Foundation Trust and Robert Francis QC, 2013).

In addition to reporting safe nursing indicator data and nurse staffing levels, hospitals were required to submit information to a national database called the NHS safety Thermometer (ST), the use of the tool was incentivised via CQUIN payments. Hospital wards could track their performance against a range of measures based upon the potential harm patients' face when receiving care. Data were analysed and made available to the public and staff via a website, information could be seen by organisational or by ward (Figure 4) (Morris-Thompson et al., 2012, Power et al., 2012, Buckley et al., 2014, Power et al., 2014).

Figure 4 An extract from ST showing a ward's performance over time



(Power et al., 2012)

2.3.2 Patient feedback; patient reported outcome measures

A recommendation from the Francis report was to give patients an opportunity to provide feedback on their experience of receiving care (Department of Health and Social Care, 2014). Within the NHS, Patient Reported Outcome Measures (PROMs) data has been collected since 2009 from patients who have undergone hip and knee surgery, minor vascular procedures and hernia repairs. The aim was to calculate the health gains after surgical treatment using pre- and post-operative surveys. PROMs measure a patient's health status or health-related quality of life at a single point in time. The information is collected before and after a procedure and provides an indication of the outcomes or quality of care (NHS England, 2019). Although limited to a small number of procedures in the UK, PROMs have been used to assess the quality of care for a number of surgical procedures around the world. How the feedback from PROMs is used by HCP to influence care delivery is not clear (McGrail et al., 2011, Breckenridge et al., 2015, Greenhalgh et al., 2018, Turner et al., 2019).

Greenhalgh et al. (2018) sought to identify ideas or programme theories about how PROMs data improves patient care. The team undertook a realist synthesis of the

international evidence to examine how performance data leads to intended and unintended changes in HCP provider behaviour and this can be influenced by contextual factors.

Greenhalgh et al. (2018) found patients rarely used publicly reported information to inform their choice of HCP, instead they used previous personal experience or the opinions of friends and family. HCP were concerned about the consequences of being labelled as a poor performer and the impact this would have on their reputation. Financial incentives were found to lead to only short-term improvement in care and efforts to maintain performance dwindled when financial incentives stopped. The use of financial incentives and performance indicators with limited validity with clinicians had a greater propensity to gaming or data manipulation to ensure the target was achieved. HCP also had the potential to focus upon achieving the target (tunnel vision) at the expense of other competing needs. The credibility, timeliness and accuracy of data were also found have an impact on the believability of the information. As PROMs data do not provide information on the cause of poor care or why HCP became outliers, HCP also need to have the ability to interpret, and react to the information they receive. The study found not all HCP had experience of quality improvement or access to their own quality data to investigate the root cause of their issues. The paper recommends HCP should disseminate information to staff closest to the patient and allow them to provide insight into how improvements in patient care could be made.

The realist synthesis showed there was limited research evidence to support theories of how PROMs data stimulate quality improvement. It did however identify three programme theories (supporting patient choice, improving accountability, and performance comparison) and influencing contextual factors to guide how to maximise the impact PROMs data can have on improving patient care (Greenhalgh et al., 2018).

2.3.3 Patient feedback; friends and family test

As PROMs data are limited to only a few surgical procedures in the UK, NHS England launched the Friends and Family Test (FFT) in April 2013. The FFT is a tool to collect patient feedback on their experience of care. A number of questions are asked including the Net Promoter Score question 'How likely is it that you would recommend our service to a friend or colleague?' respondents indicate the likelihood on a 10-point rating scale. Net Promoter Scores (NPS), are a methodology often used outside of the healthcare setting to generate customer

loyalty metrics. Since its launch, FFT has generated more than 75 million pieces of feedback and receives approximately 1.3 million more every month. Feedback data are captured via on line surveys, hand written post cards left on wards or departments at the end of a patients care episode, or via a telephone survey. The aim of the FFT is to use feedback to identify what is working well and what can be improved. It provides a mechanism to highlight both good and poor patient experience (Maben et al., 2012, Sizmur et al., 2015, NHS England, 2019).

Sizmur et al. (2015) undertook a secondary analysis of FFT data to investigate the impact of demographic factors such patients' age and sex, and the mode of feedback. The study used data from 38,998 inpatients and 29,610 emergency department attendees at 429 wards or units in 32 hospitals. It found, women gave less positive ratings than men and telephone responses were found to be the most positive followed by post card responses. Online responses were significantly less positive than postcard and telephone responses. The study concluded suggesting FFT data are vulnerable to bias from demographic factors and can be influenced by the method of data capture. Unlike PROMs, comparisons between organisations should be avoided until a national approach to data capture was in place. The study suggested FFT scores may be useful at a local level but did not identify how data are used by HCP to improve care.

The FFT and PROMs programmes have captured vast quantities of patient feedback, at considerable cost (NHS Confederation, 2013, NHS England, 2019). Power (1997) predicted, as healthcare and education moved from central government control to increased autonomy for hospitals and schools, there would be an 'audit explosion'. Information from audits would become the primary focus for regulatory inspections and allow organisational and individual performance to become visible to a wider audience. Currently there has never been as much information on the quality and safety of care available for patients, staff, and the public to access. (The Health Foundation, 2013, Illingworth, 2014, Randell et al., 2016, Keen et al., 2018b). How this information influences care delivery within hospital wards remains unclear.

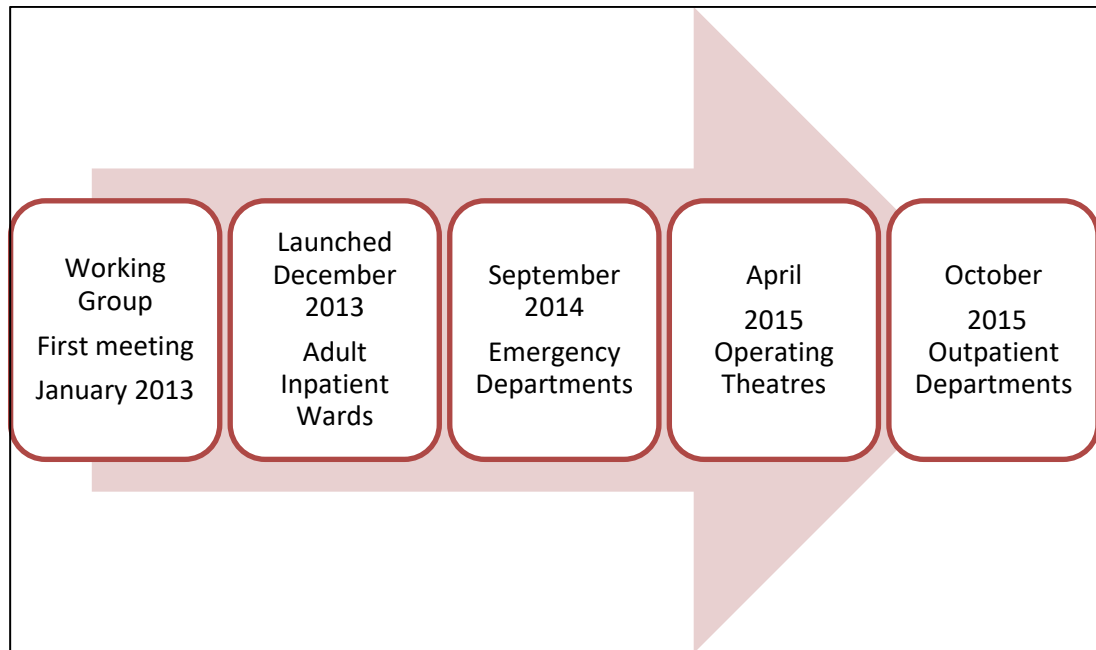
2.4 Development of a quality dashboard; a case study presenting the Ward Health Check Quality Dashboard (WHC-QD)

To highlight the impact of national initiatives on HCP, the development of a QD at the case study site will be presented as a case study. The aim is to highlight the challenges, development, and implementation of the programme and the intended consequences of its implementation. Information to support the text is taken from the researcher's personal experience of working as a senior nurse within the HCP at the time of its development, transcripts from phase one data, which will be presented later in the thesis, and from publicly available patient information leaflets and HCP board papers.

As shown earlier in this chapter, HCP in the UK, were required to submit information to a number of national databases, (ST, FFT, PROMs, surgeons outcome data) and have information available for regulators, patients, and the public. Despite this wealth of information, very few had access to routine data that could be used to identify specific aspects of care that needed improvement or wards in need of support (Greenhalgh et al., 2018, Keen et al., 2018b). This specific issue was highlighted in 2012 when the CQC undertook an unplanned inspection of a large NHS Teaching Hospital and the case study site for this research. During the inspection, several patients raised concerns about nurse staffing levels and the quality of the care they received.

Recognising the need for more robust assurance processes, the organisation's response to the CQC visit was to undertake a review of nurse staffing levels and set up a working group to develop a dashboard (QD) to monitor the quality and safety of patient care. A cross-section of nurses joined analysts and informatics experts to develop the Ward Health Check (WHC-QD). The aim was to create a dashboard that could report on structure, process and outcome measures of care, to act as a smoke detector to identify wards in need of support and provide assurance to senior managers care within the organisation was safe (National Advisory Group on the safety of patients in England, 2013). The WHC-QD was launched at the case study site in December 2013 (Figure 5).

Figure 5 Timeline of WHC-QD development and implementation



2.4.1 What should the WHC-QD measure?

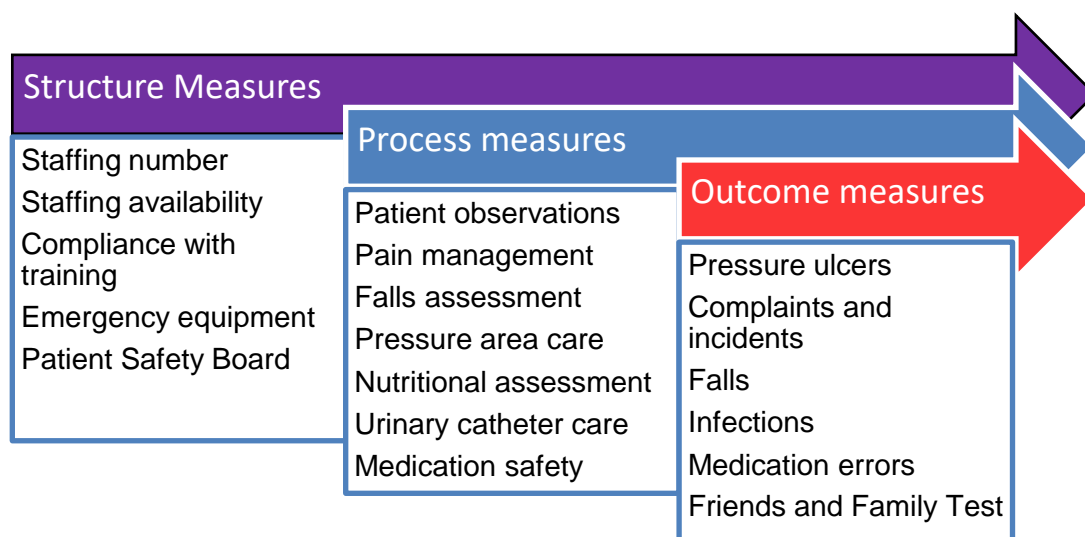
Power (1997) suggests audit for the purpose of certification, assurance or as a vehicle to drive change only works if processes can be made auditable. Making things auditable is a practical issue, rather than a scientific process. You have to audit against an agreed standard, if the standard is incorrect or contested, then the information from the audit is less useful (Power, 1997).

As previously highlighted, assessing the quality of healthcare can be difficult, HCP have evolved into complex organisations, managing complex issues caused by the dynamic environment in which healthcare exist. The need to respond to population demands, introduction of new treatments and technologies, and reassure regulators, professional groups, governments, funders, and patients the care provided is safe, appropriate and cost effective places considerable demands on HCP (Donabedian, 1966, Strome, 2014).

To measure and monitor care across a number of hospitals with different specialist wards and departments was complex. The metrics chosen by the case-study site for the WHC-QD were a selection of structure, process and outcome measures that incorporated several of the metrics required for submission to national audits.

Structure metrics reflected the attributes of the ward such as staffing levels, process metrics captured the interaction between the HCP and patient in the course of providing care, and the outcome metrics reflect individual quantifiable end points or events. As an example, the structure metric reports the number of staff working on the ward per shift, the process metric reports compliance with completion of a falls risk assessment tool designed to identify patients at risk of falls, and the outcome metric reports the numbers of patients who had fallen. Looking at all three metrics allows a better understanding of the quality of care provided by the ward. A summary of the metrics are shown in Figure 6.

Figure 6 Specific metrics inputted into the WHC-Q



The metrics chosen by the case-study site, were similar to the key findings from a task and finish group set up to bring together evidence and theory to define key indicators of high quality nursing (Maben et al., 2012).

This report was commissioned by the chief nurse of England to support the development of metrics to measure the quality of nursing care. The aim was to have all HCP using the same metrics to assess quality of care. The report found outcome measures such as healthcare associated infections, pressure ulcers, falls, drug administration error, and patient complaints were key metrics. Workforce data such as staffing levels, sickness rates, and staff experience were also considered important contextual or structural measures. The report found there was variation in dashboard maturity between HCP in the UK and limited bench marking opportunities between hospitals or wards.

The evidence from the USA and Canada suggested it was possible to link up hundreds of hospitals to share information on nurse staffing levels, number of falls, pressure ulcers, medication errors, and patient satisfaction data. This information was used to monitor the status of hospitals, identify risks or areas for improvement, and track progress on initiatives or interventions. Evidence from international QD also suggested it was possible to risk adjust patient level data to allow meaningful comparison between healthcare systems and specific specialities (Maben et al., 2012). The report suggested the development of QD in the UK would need significant investment in the informatics infrastructure to capture data across HCP. It would also need to develop standards and definitions of care to support the development of metrics to allow comparison and benchmarking of HCP performance (Maben et al., 2012).

Recognising the recommendations from the Maben et al. (2012) report, the case study site aimed to capture much of the structure and outcome metrics through existing electronic platforms within the organisation (incidents, infection, workforce, friends and family test). Assessing the process metrics needed an audit programme to capture the care given to patients in each of the wards. A summary of the expected standard of care was created from existing policies and procedures, agreed by the chief nurse and shared with ward managers. A monthly audit visit by an independent senior nurse (someone who would normally work in another area of the hospital) was agreed and the information was uploaded to an electronic database. The monthly audit visit was known as the 'Ward Metrics Audit Programme' (WMAP) and would require the auditor to review the care records of 5 patients and assess key safety features within a ward. The audit reviewed logbooks to assess compliance with daily checks of the emergency resuscitation equipment and the safe storage of medication. Training on how to undertake the audit was given and periodic quality control checks for the purpose of validation were undertaken by a corporate nursing team.

2.4.2 Output from the WHC-QD

Once the standards of care, metrics and data collection methods were agreed, it was important to decide how information from WHC-QD would be used within the organisation.

The WHC-QD offered an opportunity to fundamentally change the visibility of the information and transparency of performance within the HCP. Historically within the

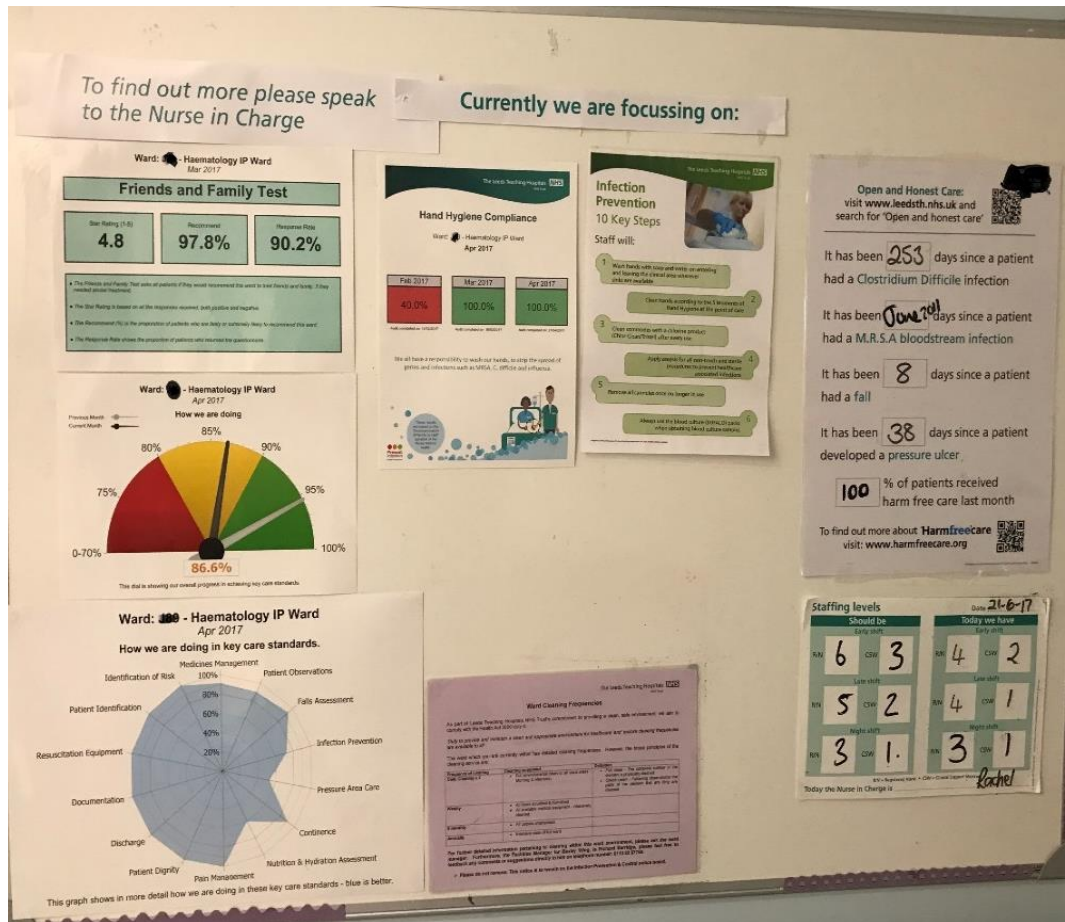
case study site only staff working in the macro and meso levels of the organisation (Table 1) would review performance information.

Table 1 Organisational structure in healthcare

Levels of an Organisation	
Macro	Regulator, Commissioner, Hospital Board, Chief Nurse/Medical Officer/Executive, Directors of Nursing/ Directors of Quality
Meso	Head of Nursing, General Manager, Clinical Directors, Matron, Allied Health Professional Lead, Clinic Lead, Manager.
Micro	Ward manager, Ward Clerk, Staff Nurse, Clinical Support Worker, Student Nurse, Patient, Relative, Allied Health Professional, Medical staff.

The WHC-QD was designed to allow all staff access to the same performance information as the chief nurse. At the microsystem level of the HCP, once a month data from the WHC-QD was used to create performance information that could be graphically displayed for staff patients and visitors to see on an information display board called the Patient Safety Board (PSB) (Figure 7).

Figure 7 Photograph of a PSB on a Case Study Site Ward



(Reproduced with permission from the case study site, IRAS Reference Number: 196077)

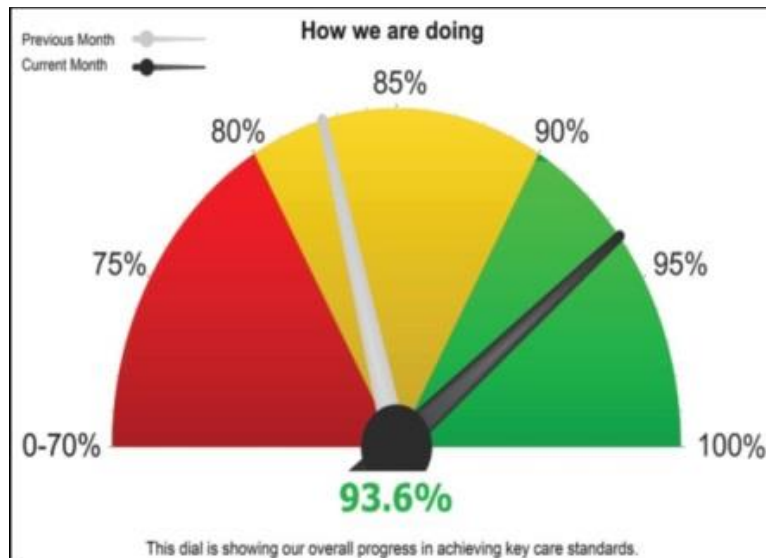
Performance data were graphically represented as dials and a speedometer and displayed on the PSB (Figure 8 and Figure 9). In figure 8, it is possible to see that venous thromboembolisation performance is below a red line set at 80% and therefore would be an area to consider for improvement. Figure 9 displays an overall assessment or composite score of performance and the previous month's position. Composite scores are multiple metrics rolled into a single figure, they reduce the amount of information needed to allow a judgement to be made and offer a snapshot of performance. Care must be taken with composite scores as variation in an important metrics could be masked with over performance in other areas. Consideration should be given to weighting key metrics, and further interrogation of data to understand variation in performance (Okes, 2013).

Figure 8 Example of performance data displayed on PSB



(Images taken from a patient information leaflet explaining the WCH-QD. Reproduced with permission from the case study site, IRAS Reference Number: 196077)

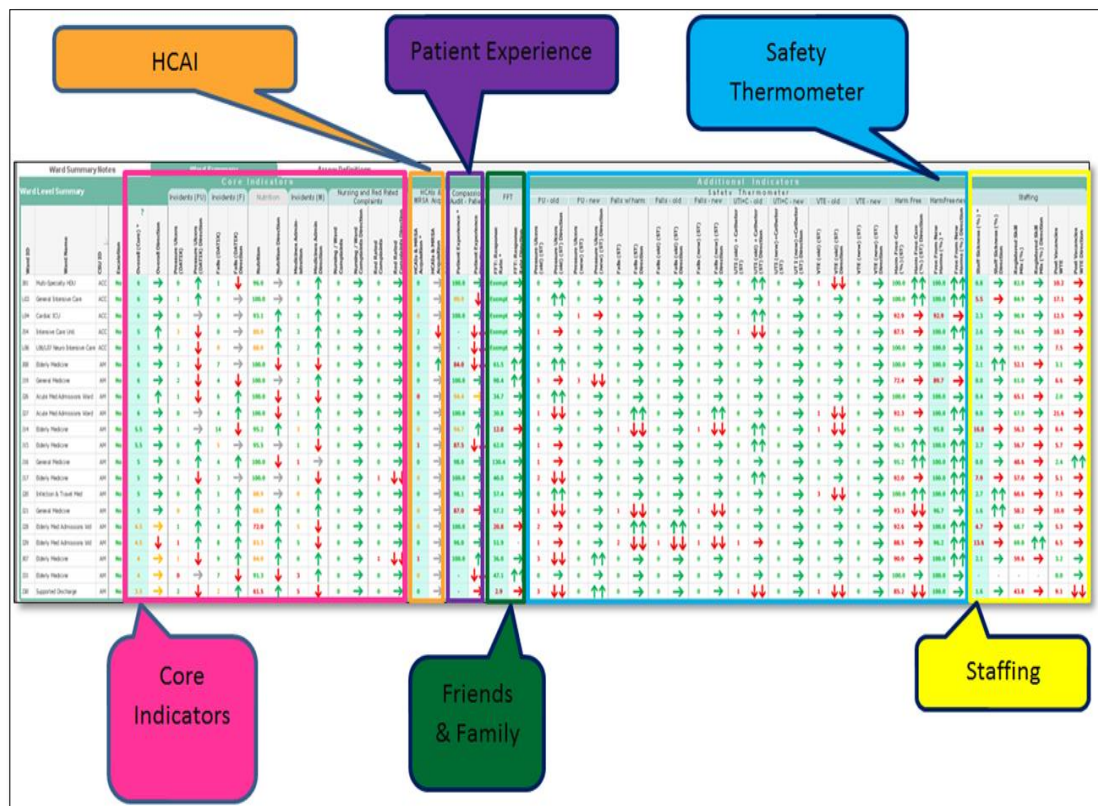
Figure 9 Example of performance data displayed on PSB from WHC-QD



(Images taken from a patient information leaflet explaining the WCH-QD. Reproduced with permission from the case study site, IRAS Reference Number: 196077)

In addition to the information displayed on the PSB, a comprehensive data set was available via networked hospital computers. The functionality of the WHC-QD allowed ward-to-ward comparison, and specific metrics could be interrogated. This information was often used by staff working at the micro and meso level of the organisation (Table 1) and used to generate reports, provide a focus for discussion between management teams such as matrons and ward managers and display a summary of performance on a wide range of measures and initiatives, such as FFT, ST, staffing levels and number of infection by ward (Figure 10).

Figure 10 Types of metrics displayed by WHC-QD



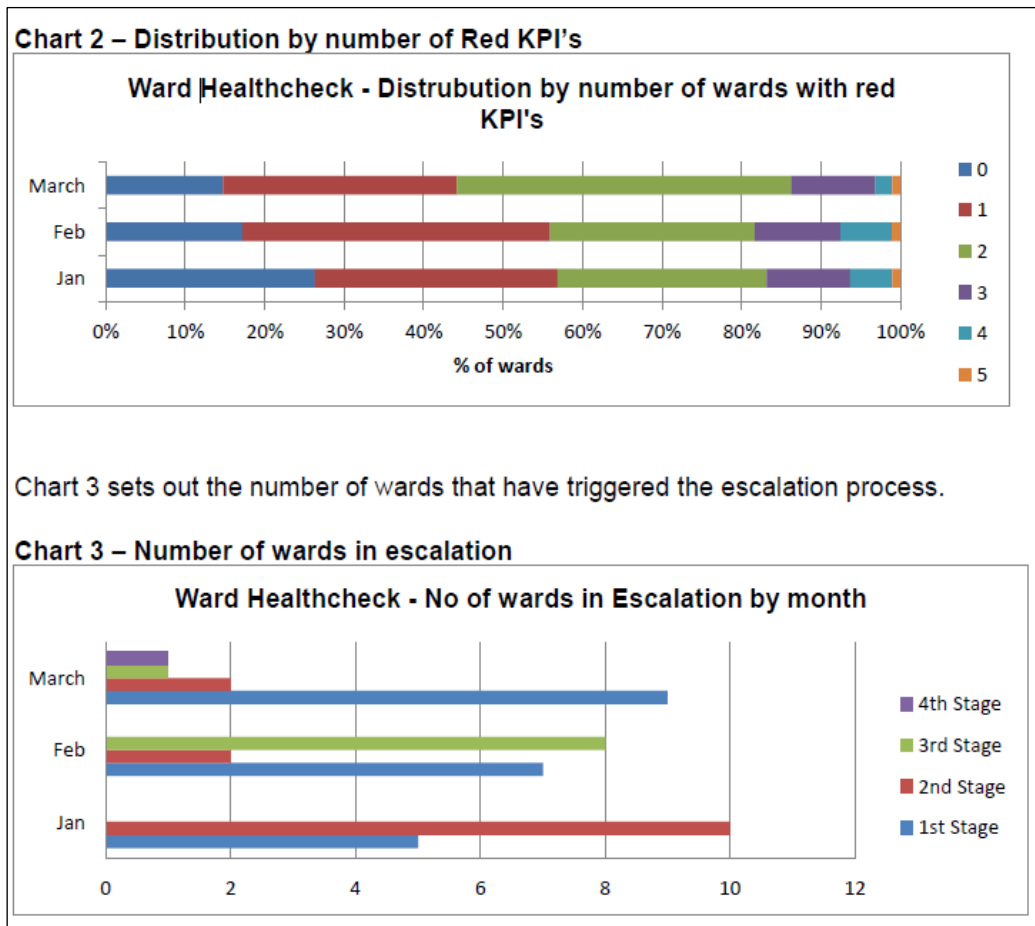
(Images taken from a patient information leaflet explaining the WCH-QD. Reproduced with permission from the case study site, IRAS Reference Number: 196077)

Information from the WHC-QD was also presented at management and governance meetings within the HCP and used to assess the performance of wards. An escalation policy was developed which used six core metrics to identify when a ward needed additional management support. When performance against these metrics fell below a certain threshold, this would trigger an escalation process that involved a review by senior managers.

The WHC-QD was also used to highlight when a ward was successful in making improvements or consistently achieved their targets. When wards had improved their position or achieved a consistent level of performance for a period of longer than 12 weeks, they received recognition for their achievements. Recognition of success would take the form of reducing frequency of WMAP visits, a sign that an area could be trusted to maintain standards of care. Ward managers would receive certificates of achievements from nurse directors with recognition of their success shared via social media and internal hospital newsletters.

Information from the WHC-QD was also used to generate information for patients and the public via a six monthly Board report presented at public board meetings and available via the hospital website (Figure 11).

Figure 11 Extract WHC-QD found in HCP publicly available board paper



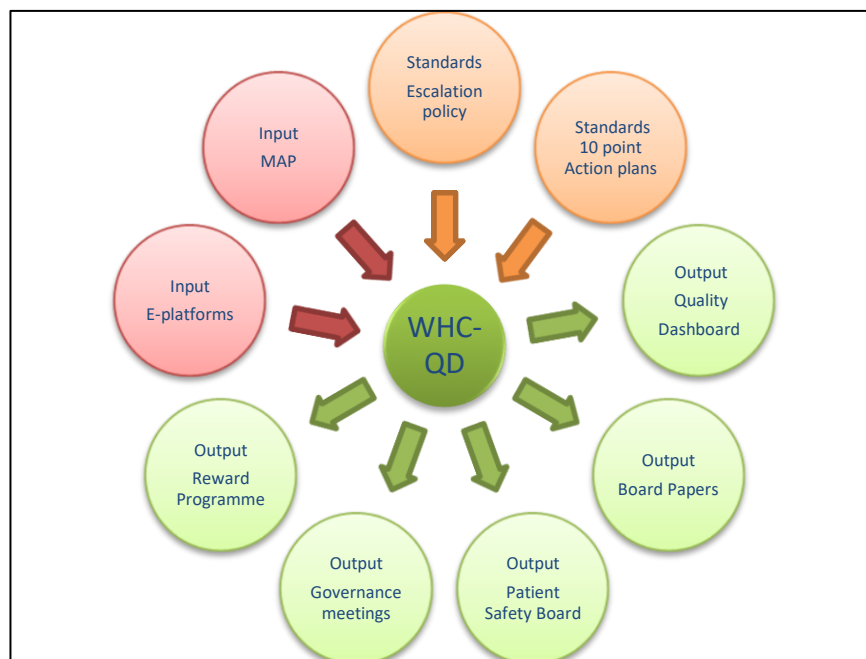
(Images taken from a board paper display data from WHC-QD. Reproduced with permission from the case study site, IRAS Reference Number: 196077)

The publication of performance information in board reports is in line with findings from Keen et al. (2018a) who investigated the progress acute NHS hospitals had made in developing technological infrastructures to enable them to monitor the quality and safety of care within their organisation. The team reviewed publicly available board reports for 152 HCP in the UK and found all had data on waiting times, ST, FFT, complaints and incidents within the paper. Although board level dashboards were an integral part of HCP management information systems, it found ward managers and those at the micro level of the organisation were often receiving limited information regarding performance.

A field study was undertaken in four HCP and found although the development of real time ward management systems was limited, HCP were publishing more data on their performance than ever before. The study found the quality and safety of care was reported to have improved in the 4 case study sites and technological infrastructures developed to capture and share data had contributed to this improvement (Keen et al., 2018a, Keen et al., 2018b).

The WHC-QD developed by the HCP was an electronic platform that allowed data to be captured, and shared with staff all levels of the organisation (Figure 12). As Keen et al. (2018a) identified QD can contribute to improvements in safety and quality, although how this is achieved is not clear.

Figure 12 Summary of the inputs and outputs of the WHC-QD



2.5 Unintended consequences of quality dashboards

Although QD have the potential to improve the quality and safety of care within HCP, consideration must be given to the time and cost of their development (Keen et al., 2018a). QD have the potential to improve the quality and safety of care within HCP, consideration must be given to the time and cost of their development. Power (1997) reminds the reader that information is never free and is often expensive in ways that rarely occur to those who demand it. The cost of data collection and analysis is estimated at £500 million per year in the UK's NHS, with over one thousand clinical datasets, mortality statistics and information on productivity, responsiveness, and quality of care (NHS Confederation, 2013, NHS Digital, 2018).

Once it has been decided what and how to measure quality and safety in healthcare, what to do with the information must also be carefully considered. It is recognised that measurement and public reporting carries risks and is far from problem free. Paradoxically, instruments to enhance visibility and transparency are themselves interpretations and are therefore at risk of misrepresentation and manipulation (Lilford et al., 2004, Hood, 2006, Raleigh, 2010).

While the intention of QD development is based upon making improvements and providing reassurance, many authors have warned of the unintended consequences that rise inadvertently from health performance measurement (Power, 1997, Lilford et al., 2004, Mannion and Braithwaite, 2012, Dahler-Larsen, 2014, Beer, 2016, Greenhalgh et al., 2018, Muller, 2018).

Mannion and Braithwaite (2012) published 'a taxonomy of dysfunctional consequences' of performance measurement in healthcare (Appendix V). They identified 20 lessons to consider under the broad headings of poor measurement; misplaced incentives and sanctions; breach of trust, and the politicisation of performance systems. The main concerns are centred on measurement fixation, tunnel vision and the manipulation of data or gaming that has the potential to invalidate the veracity of a QD.

Measurement fixation is the emphasis on meeting a target rather than considering the true intent of why the target was introduced. Mannion and Braithwaite (2012) and Muller (2018) cite examples from UK emergency departments who introduced steps which would achieve the 4 hour emergency admission standard but added very little benefit for the patient. Tunnel vision is when an individual or organisation

becomes focused upon achieving particular targets, at the expense of other important issues that may be unmeasured or unmeasurable.

The motivation for gaming by individuals or organisations are driven by the incentives created by making performance information visible (Lilford et al., 2004, Beer, 2016). Outcome based performance data that risks organisation or individual reputational damage or leads to financial rewards or avoids financial penalties have been shown to lead to dysfunctional behaviour such as gaming and data misrepresentation. Misrepresentation is the deliberate manipulation of data, and ranges from creative accounting to fraud. Gaming is the alteration of data to obtain an advantage or avoid a penalty. While there was not always evidence put forward that could identify deliberate attempts to manipulate performance metrics, the use of financial rewards in healthcare to achieve targets has the potential to raise suspicion and cast doubt upon the credibility of the performance data (Hood, 2006, Greenhalgh et al., 2018, Muller, 2018).

The credibility of QD data was seen as important as change was more likely when staff understood what was being measured and were working towards a professional goal. Muller (2018) uses the example of the Cleveland Clinic who reduced the incidence of sepsis from central line infections within their organisation using quality measurement. Muller (2018) suggests the improvement was likely due to the peer pressure created by the metrics and the team working together to solve a complex problem. Lilford et al. (2004) suggests the key to improvement is knowledge and to drive out fear from performance metrics as reward and punishment strategies often lead to distortion of the data or the process. Successful audit and feedback only takes place in a culture that does not attribute blame (Power, 1997).

It is therefore recognised the measurement and public reporting of performance data has been shown to include risks, it is therefore recommended that QD metrics should be reviewed to keep negative consequences to a minimum, and incorporate mechanisms to counter unintended consequences (Raleigh, 2010, Mannion and Braithwaite, 2012).

2.6 How does the WH-QD influence care delivery within hospital wards?

The WHC-QD was implemented within 74 inpatient wards in December 2013 and extended into over 100 wards and departments by 2018. The programme was updated, with new metrics added often in response to NHS England priorities, new standards of care or patient safety alerts, for example, the WMAP was updated to ensure wall air outlets were not used within wards, due to an incident that identified a potential risk when one was mistaken for an oxygen outlet.

Prior to the introduction of the WHC-QD, although vast quantities of information about the quality and safety of healthcare was available, this information was generally accessed by managers, commissioners and regulators with limited evidence to suggest it was shared with nursing staff working within hospital wards or accessed by patients prior to their admission to hospital (Dixon-Woods et al., 2013, Lloyd, 2017, Keen et al., 2018a)

The aim of the WHC-QD was to develop a programme that could measure standards of care, patient outcomes and patient's experience of care and make this information accessible to staff and patients (Case study site board paper 2013). Lord Darzi, (Department of Health, 2008) suggested this would provide a lever for change, as transparency about performance will facilitate meaningful conversations about how staff working in the NHS can continuously improve the quality of care they deliver. However QD can only be effective if the knowledge gained from the information they present influence actions, decisions, and behaviours. Dashboards themselves have no inherent value if people do not engage or respond to them (Okes, 2013).

2.7 Research objectives

While hospital wards may have similar policies, procedures, and staffing structures they are not homogenous units delivering homogenised care to patients. Each ward is a complex micro system with complex interplay between staff members, hierarchies, and teams working together to provide individualised care for patients with a range of social, physical, psychological and spiritual care needs. The impact of new initiatives or interventions when introduced into hospital wards can therefore vary. As Realist Evaluation (RE) is a methodological approach which aims to advance understanding of why complex interventions work, how, for whom and in what context and to what extent, as well as to explain the many situations in which

an intervention or programme fails to achieve its anticipated outcomes it seemed an appropriate approach to understand how and why QD influence care delivery within hospital wards and if they make healthcare safer.

The aim of this research is therefore to use RE to understand how and why quality dashboards influence care delivery within hospital wards.

The specific objectives of the study are to

1. Critically review the evidence for QD within hospital wards.
2. Explore with those responsible for the development and management of the WHC-QD their perceptions of the intended consequences and possible unintended consequence of its deployment within wards.
3. Use a range of approaches to explore the impact of QD within hospital wards including staff interviews.
4. Explain how and why QD influences care delivery within hospital wards and to understand the influence of contextual factors.

2.8 Chapter summary

This chapter has set out the need for HCP within the UK to develop strategies to capture data on the quality and safety of healthcare and the incentives given to make this information available to governments, regulators, staff, and patients. Advancements in data warehousing and an increased use of electronic platforms to organise care has made capturing healthcare data increasingly possible. A vast array of electronic information about the safety of hospitals and surgical procedures is now available and is presented. In response to local and national concerns regarding standards of care, the development of a QD was presented as a case study to highlight the challenges and considerations needed to capture data on structure, process and outcome measures of care within a HCP and explains how this information was used.

The intention of the WHC-QD is to improve the quality and safety of care within the organisation, however consideration must be given to the unintended consequences of its development and the impact this may have on its ability to influence change. Although patients are expected to receive the same standard of care while in hospital, the complex interplay between staff members and hierarchies suggest the impact of the WHC-QD was likely to vary from ward to ward, understanding the heterogeneity of wards would allow insight into why complex

interventions work, in some circumstances and are less successful in others. With this in mind, the aims and objectives of the study are presented and Chapter 3 will explore the evidence to explain how and why quality dashboards influence care delivery within hospital wards.

Chapter 3 Scoping review

3.1 Introduction

As RE requires initial theories to explain how QD influence care delivery within hospital wards a review of the literature will be undertaken. This chapter will discuss the concept of dashboards and their application within healthcare and present the results of a scoping review. As the WHC-QD is also a system of audit and feedback, this literature will also be critically reviewed to identify theories that may explain how QD influence behaviour.

3.2 What are dashboards?

Dashboards provide a graphical display of aggregated data to enable rapid assessment of performance against a range of pre-determined metrics. They are used to communicate complex data to individuals, teams or organisations and their development draws on theories from information systems, accounting and cognitive psychology (Few, 2004, Okes, 2013, Velcu-Laitinen and Yigitbasioglu, 2012).

A quality dashboard within healthcare often displays a range of structure, process and outcome measures about safety, experience and effectiveness (Okes 2013). Strome (2014) in his work on healthcare analytics, uses Few's definition to remind the reader to see dashboards as much more than a collection of charts, graphs and numbers but tools to achieve objectives.

As a concept, dashboards were often used within the financial and sales sectors of organisations as visual and functional performance management tools, developed from their intrinsic purpose of monitoring performance to allow more analytical functions such as drill down capabilities, flexible visual presentation styles. Within the healthcare literature, dashboards generally fall into two categories, clinical dashboards and quality dashboards. Although these terms are often used interchangeably, quality dashboards refer to a tool that visually displays outcomes and process measures or metrics that enable managers and staff at an organisational, departmental or ward level to identify areas for improvement (RCN, 2012, Heslop and Lu, 2014). This is in contrast to clinical dashboards that provide individual clinicians with relevant and timely information to inform clinical decisions with the aim of improving individual patient care (Dowding et al., 2015).

The genesis of modern healthcare dashboards can be traced to the development of hospital reports or scorecards in the 1980s (Nelson, 1995), Kaplan and Norton (1992) work on balanced scorecards in the USA in the 1990s and the drive to improve cardiac surgical outcomes by Nugent (1994). Drivers for the development of quality healthcare dashboards in more recent times have come from a number of authors (Institute of Medicine, 2001, The Health Foundation, 2011, Makary and Daniel, 2016, Shojania and Dixon-Woods, 2017, Lloyd, 2017). As information technology within hospitals has evolved, electronic platforms such as staff rosters, e-observations, and medication administration are being used to organise, monitor and deliver care within wards and departments. These systems capture vast sums of data that are being used to develop quality dashboards. The research literature has largely been focused upon clinical dashboards and there are limited numbers of empirical studies that explore how quality dashboards are being used in practice and the circumstances that enhance or inhibit their impact (Dowding et al., 2015). For that reason, a scoping review rather than a systematic review has been undertaken (RCN, 2012, Ramsay et al., 2014, Dowding et al., 2015).

When Dowding et al., published a review of the literature in 2015, 547 articles were identified, 68 were conference abstracts' suggesting that research is being undertaken, 11 articles were included in the synthesis, one was rated as high quality and only one was identified as a quality dashboard. The conclusion of Dowding et al., (2015) review suggests dashboards appear to be associated with a positive effect on outcomes and care processes but limitations with the study designs should be considered. The review showed a limited numbers of empirical studies had been published that explored how quality dashboards are used in practice and the circumstances that enhance or inhibit their impact. The review also suggested future research should focus on how quality and clinical dashboards influence the behaviour and actions of staff and to consider the intended and unintended consequences of their introduction. As Dowding et al., (2015) review included clinical and quality dashboards, and the focus of this research is to understand how quality dashboards influence care delivery within hospitals wards a scoping review limited to QD and hospitals was undertaken.

3.3 Method

This scoping review follows the framework developed by Arksey and O'Malley (2005) which allows the researcher to include studies from a broader array of

methodological approaches including data from the grey literature (Anderson et al., 2008, Levac et al., 2010, Armstrong et al., 2011, Tricco et al., 2018). To understand how QD influence care delivery, a search strategy was guided by the broad research question of “do quality dashboards influence care delivery within hospital wards?” This review is reported according to the PRISMA extension for scoping reviews (PRISM-ScR) (Tricco et al. 2018).

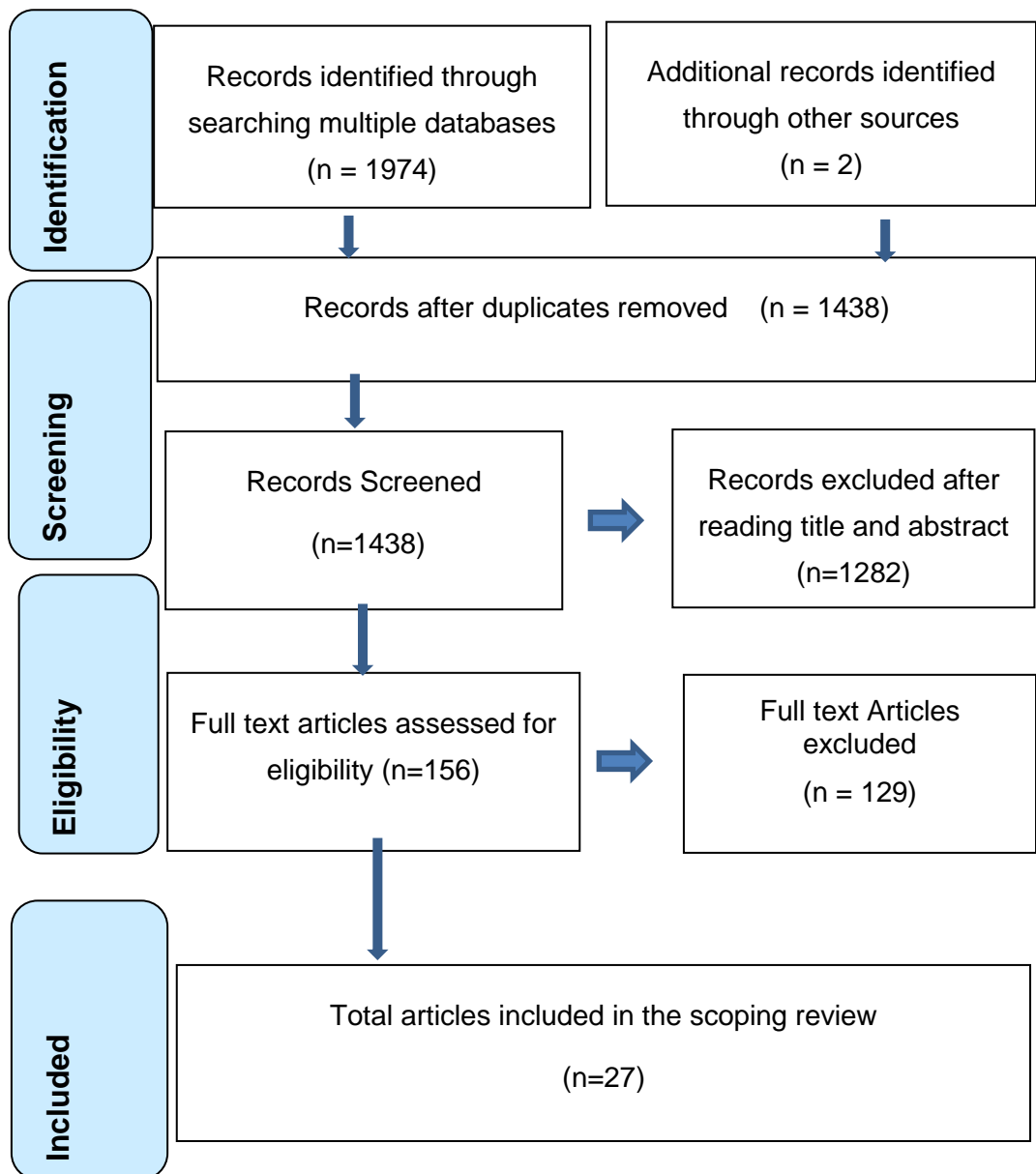
An initial search was carried out using eight electronic databases (Cochrane, Embase, Ovid Medline, Web of Science, Scopus, Proquest, PsycInfo and Health Management Information Consortium) as these are known to focus their search within the relevant areas of healthcare, management, and psychology. The search terms used (Table 2) were chosen as they describe the core concepts relating to the use of performance data and dashboards within healthcare. Although the focus of the review is quality dashboards, the term clinical dashboard was included in the search as an initial review of the literature identified the terms quality and clinical dashboards are often used interchangeably (RCN, 2012). No year restrictions were added to the search strategy.

Table 2 Initial search terms

Dashboards, Balanced scorecards, Analytics, Audit and feedback, Performance metrics, Clinical dashboards, Nursing metrics, Safety thermometer, Harm free care, Safety express, Quality dashboards

All citations were electronically imported into Endnote 7 (reference management software) and duplicate articles were removed. An initial search and the title and abstract of the remaining articles were reviewed for eligibility. Articles were selected if they referred to a QD or clinical dashboard within a hospital ward. Full text versions of the selected articles were downloaded and underwent a second stage review. The second stage review excluded studies describing or suggesting the type of metrics that could be used to design a healthcare dashboard and focused upon those used in practice. Once the papers were selected, information was tabulated according to the country and area of healthcare. The intended purpose of the QD was noted with any reported outcomes measures. The articles were reviewed for suggestions of how quality dashboards influenced care delivery within hospital wards. A quality assessment was undertaken using the Mixed Methods Appraisal Tool (Pluye et al., 2009, Souto et al., 2015).

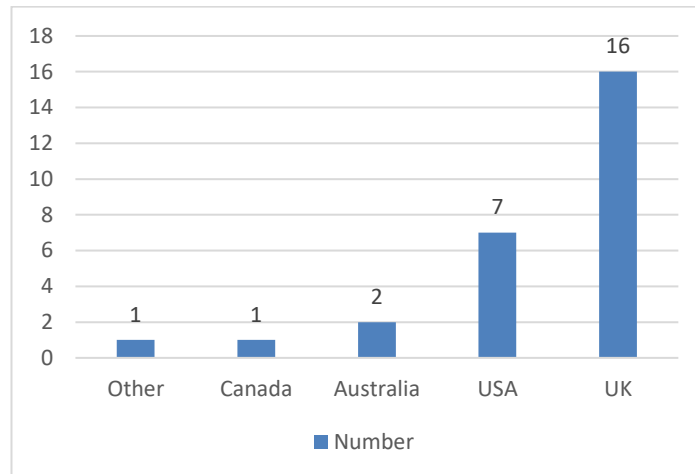
Figure 13 A PRISMA flowchart



3.4 Results

In total 27 articles were included for review and presented in Appendix B. All of the articles published from 2010 onwards and explore a range of the healthcare systems from around the world, although the majority are from the USA and the UK (Figure 14).

Figure 14 Breakdown of published articles by country



The selected articles have been categorised into four main groups:

1. Medication Safety. (MS) Number of articles = 5
2. Hospital Dashboards. (HD) Number of articles = 8
3. Speciality Specific Dashboards (SSD) Number of articles = 9
4. Initiative Evaluation. (IE) Number of articles = 5

A quality assessment tool; Mixed Methods Appraisal Tool (MMAT) was used to review 11 of the studies that used a mixed method approach (Pluye et al., 2009, Souto et al., 2015). The tool is used to appraise the methodological quality of the studies not the quality of the article. Three of the 11 articles met 100% of the MMAT criteria ((Benning et al., 2011, Dixon-Woods et al., 2013, Ramsay et al., 2014) in that the research design and results addressed the research question with appropriate limitations identified. The remaining 8 articles, three achieved a 75% quality score (Coleman et al., 2013, Redwood et al., 2013 Christiansen et al., 2014), four achieved a 50% (Daley et al., 2013, Clark et al., 2014, Jeffs et al., 2014, Phull and Hall., 2015) and one achieved 25% (Smith et al., 2014).

3.4.1 Medication Safety

Five articles within the review focused upon dashboards designed to improve standards of medication prescribing and reduce omitted doses of medicines (Coleman, 2013, Dixon-Woods et al., 2014, Dixon-Woods et al., 2013, Ramsay et al., 2014, Rostami et al., 2016). Only two studies demonstrated an improvement in performance over time with both using dashboards as part of a wider initiative to drive change (Coleman, 2013, Dixon-Woods et al., 2014). Dixon-Woods et al. (2014) undertook an ethnographic study within a large hospital in the UK to explore work undertaken to improve medication administration performance. The hospital used information from electronic prescribing and decision support tools to generate a dashboard that displayed 34 indicators that provided a summary of a ward's performance against the hospital's average. Clinical staff could access the dashboard at any time by logging into a hospital computer with feedback on performance also given via email and in performance and management meetings. The dashboard made practice, behaviour and performance visible and led to the introduction of initiatives to reduce the number of missed medication doses for patients. The number of omissions of prescribed medications was monitored over an eighteen-month period, reducing from 12% to 5%.

Those interviewed for the study suggested that improvements are caused by highlighting individual's performance through email and the introduction of monthly root-cause analysis meetings. The root-cause analysis meetings were chaired by senior managers within the organisation and were used as an opportunity to emphasise the organisation's commitment to improving patient care. Crucial to the success of the meeting was assurance that the data were credible, contemporary and accurate so the team could focus on what had gone wrong rather than whether it had gone wrong. Dixon-Woods et al. (2014) study demonstrated improvements in performance against predetermined metrics could be achieved, with dashboards playing a role in highlighting areas for improvement and providing focus for root cause analysis meetings.

In a similar study Coleman (2013) demonstrated improvements in reducing the number of omitted medications in a large hospital over a four year period following the introduction of an electronic prescribing system, a dashboard showing visual metrics on overdue doses and the introduction of root cause analysis meetings to investigate missed medication doses. The study used a retrospective time series analysis of weekly dose administration to identify improvements in reducing

omissions over a four-year period. The results revealed that the introduction of a dashboard with feedback via weekly emails to senior management, with escalation to executive level if an unacceptable threshold was reached did achieve an immediate 0.60 percentage point reduction in delayed antibiotic administration and 0.41 percentage point reduction in delays to non-antibiotic medication. As with the Dixon-Woods et al. (2013) study, Coleman (2013) also identified that the greatest improvements in practice were seen when dashboard information was used to implement a targeted intervention such as a root cause analysis meeting. Coleman et al.'s (2013) study found the introduction of the dashboard and root cause analysis meetings resulted in a reduction of missed medications doses by 1112 per week across the organisation and therefore had the greatest impact on reducing the numbers of omitted medications. Coleman et al.'s (2013) study suggests that data from electronic prescribing systems can be used to help reduce overdue drug dose rates when used in a proactive way. If there is board level involvement with a specific quality improvement goals, quality dashboards can lead to improved organisational performance.

In a smaller scale study, Ramsay et al. (2014) developed medication safety metrics based upon compliance with drug prescription and administration standards. Compliance with the standards were audited across three wards in Hospital A and three wards in Hospital B over a seven-week period. In Hospital A, feedback on performance was given weekly to the ward manager and discussed at each nursing shift handover. In Hospital B, feedback was given via established staff meetings. The audit and feedback cycle continued over a seven week period with the data analysed using a difference in difference, quasi-experimental technique designed to measure the effect of the introduction of an intervention. Interviews were also undertaken with staff working in the sites to discuss their experiences of providing and receiving dashboard feedback. The study found that patients were exposed to medication safety risks in all six wards with no significant improvements identified following seven weeks of dashboard feedback. Interviews with staff identified that competing priorities, resource issues and a lack of engagement from the ward management team may have limited the effect of the feedback.

3.4.2 Hospital Dashboards

Eight papers within this review describe the introduction of quality dashboards within hospitals (Brown et al., 2010, Davis et al., 2010, Clark et al., 2013, Jeffs et al., 2014a, Russell et al., 2014, Ratwani and Fong, 2015, Weiner et al., 2015).

Brown et al. (2010), Russell et al. (2014), Jeffs et al. (2014a), Ratwani and Fong (2015) describe the development and implementation of quality dashboards within North America and the UK. While limited outcome data is reported, motivation for dashboard development, specific aspects of their design, and the intended consequences of their introduction and impact on patient safety is evident. Brown et al. (2010) describe how quality indicators and nurse sensitive indicators were monitored in 196 hospitals in the USA over a seven-year period. Aggregated data demonstrated a 5% reduction in the number of patients who developed pressure ulcers or who had a fall while in hospital. While a 5% reduction over a seven-year period seems somewhat limited, when the data are broken down by organisation, the impact of the quality dashboard varied significantly between hospitals. Brown et al. (2010) suggest the improvements were due to linking performance to payments and making the data available to staff and patients, although it is not clear from the paper how staff and patients receive the dashboard information. The article suggests the publication of data allowed hospitals to benchmark performance and patients to choose the healthcare provider with the best outcomes. However, systematic reviews undertaken by Fung et al. (2008), Henderson and Henderson (2010), Ketelaar et al. (2011), Henderson and Henderson (2015) found limited evidence to establish the relationship between the publication of performance data and improvement in patient safety.

Russell et al. (2014) discuss the introduction of a nursing dashboard into 70 wards across three hospitals in Scotland. While the focus of the article is on design and implementation, feedback from ward managers and senior nurses highlight the usefulness of the dashboard and its impact on improving practice. It suggested dashboards assist clinical teams to interpret quality improvement information and provide structure to management meetings, thus helping ward teams to target areas of care which need to improve and encouraging staff to take ownership, resulting in action.

Jeffs et al. (2014) found similar themes when interviewing staff following the introduction of a nurse led audit and feedback dashboard in a large teaching hospital in Canada. Dashboards were implemented in 22 hospital wards with the information displayed on smart boards in staffrooms, on ward computers, and on hard copies on notice boards. Jeffs et al. (2014) undertook 56 interviews with staff nurses and ward managers. Key themes from the study were that the dashboard allowed nurses to see the impact of their care on the patients' outcomes and

experience, providing a visual update of how their ward was performing. The dashboard provided reassurance that their effort was making a difference in improving patient care and gave them a sense of pride in the work they were doing. Some participants described how important it was to see their ward's performance over time as it allowed patterns to emerge. The information formed a focal point for discussion and identified areas of practice to improve. The staff used the dashboards as aide memoirs, reminding them of where improvements were needed. Overall, the nursing staff interviewed in this study found quality dashboards to be a useful tool for keeping track of process, outcome and experiential indicators, but recognised nurses needed capacity to interpret and use data in a meaningful way to make improvements or change practice.

Clark et al. (2014) describe the development and implementation of electronic patient journey dashboards designed to track a patient's journey while in hospital. Following an initial pilot, dashboards were installed in a number of medical, surgical and maternity units across fourteen hospitals in Queensland, Australia. The study used a mixed methods approach to evaluate the impact of the dashboard. The results found in the study sites there was improved compliance with documenting estimated date of discharge data, improved communication between teams and a reduction in length of stay by an average of 1.86 days across the study sites. The article suggests the reduction in length of stay was due to improvement in the flow of information, discharge planning, referral alerts and handovers between clinical teams.

Patel et al. (2018) undertook a cluster randomised controlled trial comparing giving standard audit and feedback information with an intensive approach. A group of 40 doctors were involved in the study over a four-month period. The aim of the study was to identify factors that would promote the use of dashboard data to facilitate behaviour change and identify any potential barriers. The intensive feedback group were given access to an online data dashboard and a weekly face-to-face review of their performance data. The findings from the study revealed those who received intensive feedback significantly increase their performance against composite metrics designed to assess performance of discharge planning, record keeping and compliance with best practice standards. The difference was found to be statistically significant ($P < 0.0001$) between the two groups during the intensive feedback period but was not sustained once the intervention ceased. The paper identifies limitations within the study that are linked to several participants crossing

from the intensive to the usual feedback group during the study due to clinical commitments. This study does however suggest that dashboard data alone is not sufficient to drive improvements; rather, performance improves when dashboard data are combined with face to face feedback (Patel et al., 2018).

3.4.3 Speciality Specific Dashboards

Changes in aspects of practice within hospital wards as a result of the introduction of a dashboard have also been demonstrated in studies by Daley et al. (2013), Smith et al (2014), Weiner et al (2015), and Field et al. (2018). Daley et al. (2013) evaluated the introduction of a quality dashboard in an older person's mental health unit. The study used a questionnaire to explore staff perceptions of the dashboard three months after its introduction. The response rate for the questionnaire was 60% with 21 included for analysis. Although limited by the number of participants, those who did take part in the study identified that a dashboard improved communication within the unit and increased staff awareness of information. There was also improved compliance with completion of documentation with, for example, completion of patient fall risk assessments increasing from 0% to 82% within a six-month period. However, some staff had concerns regarding their ability to access the data, its accuracy, and its perceived focus on management priorities.

Smith et al. (2014) evaluated the introduction of a quality dashboard alongside an integrated care pathway and improvement plan for patients undergoing orthopaedic surgery within 12 hospitals in Canada. The study reviewed the results of 10,000 orthopaedic procedures performed across the hospitals in the 12-month period following the introduction of the dashboard. The initiative reduced the length of stay following a procedure by 16 hours per case, creating capacity for a 17% increase in cases and reducing waiting times from 43 to 39 weeks. The dashboard was found to be a useful tool for setting goals, measuring results and providing regular feedback to teams.

Weiner et al. (2015) also reported improvements in compliance with pre-determined standards following the introduction of a quality dashboard in a hospital in the USA. The paper describes the introduction of a dashboard designed to measure a patients length of stay in hospital following hip surgery and turnaround time for radiology requests. Although the length of a time a patient stays in hospital can be affected by many factors, the paper suggests over a 24-month period, the introduction of a QD led to a one-hour reduction in length of stay following hip surgery and improved turnaround time for radiology requests from 0.7 hours to 0.2

hours. Although no evidence is provided, the paper describes a cultural change within the organisation following the introduction of the dashboard, with staff discussing performance and the dashboard metrics. As the metrics reflected the organisations priorities and values, frontline and managerial staff engaged with the metrics with some experiencing peer pressure to improve the performance of their ward or department.

Field et al (2018) describe the development and implementation of quality dashboards into two children's wards within one hospital in the USA. The dashboard was designed to be displayed on a large electronic visibility board and ward desktop computers. Real time information, drawn from the patient's electronic health record was visually designed to be used by nursing staff during patient safety huddles. Safety huddles are meetings or gatherings used to exchange key patient information. The article reports that since the dashboard was implemented, compliance with nursing documentation standards improved from below 95% to 98% and there was improvement in performing spirometry tests. No specific reasons for the improvements are given (Field et al., 2018).

Phull and Hall (2015) designed and implemented a quality dashboard within two mental health wards in the UK. The impact of the dashboards was evaluated through questionnaire data from 25 staff members and 8 patients. Participants found the dashboard to be an efficient way of collecting and summarising data that created a degree of focus and structure to clinical practice, highlighting areas for improvement and promoting local engagement and ownership of challenges. Patients viewed the information as helpful and it increased their confidence in the service and the ward. Although limited by sample size and the method of exploring the patient's experience, the paper provides useful insight into the patient's perspective and is the only study in the review which attempts this.

Crofts et al. (2014) evaluated the introduction of a quality dashboard in a Zimbabwean maternity hospital. The dashboard presented maternity audit data monthly using a red, amber, green format. A review of 28 months of data was used to improve staff training and enforce compliance with existing procedural requirements. This change resulted in an 8% reduction in the number of babies admitted to specialist care beds and alerted hospital managers to peaks in infant mortality leading to the development of action plans and additional training.

Anand et al. (2015) describe the design and implementation of a quality dashboard for paediatric cardiac surgery in North America, emphasising the importance of

engaging with patient groups to support their development. This paper suggests that the implementation of dashboards increases staff awareness and interest in quality improvement and reduces the spread of misinformation through anecdotal reporting and unmonitored information streams in the public domain. While no evidence is offered to support these claims, it does offer an interesting area for future research.

Other studies which have described the successful introduction of quality dashboards into their departments have been published by Khemani et al. (2010), Guha et al. (2013) and Pemberton et al. (2014). While Khemani et al. (2010) provide the briefest of summaries they do suggest that the introduction of a quality dashboard led to an increase in managerial engagement with clinical issues. Guha et al. (2013), Pemberton et al. (2014) also report similar results when describing the introduction of an acute gynaecological dashboard and a dental clinical effectiveness dashboard.

3.4.4 Initiative evaluation

Five of the papers evaluated three patient safety initiatives in the UK that included quality dashboards as one component of the initiative: the Patient Safety Thermometer (ST), Safer Patient Initiative, and Open and Honest Care (Benning et al., 2011, Morris-Thompson et al., 2012, Power et al., 2012, Buckley et al., 2014, Christiansen et al., 2014, Power et al., 2014).

3.4.4.1 The Patient Safety Thermometer

The Safety Thermometer (ST) requires data to be submitted on a monthly basis from hospital wards in England and generates information on the number of patients who have fallen, developed pressure ulcers, acquired urinary catheter associated infections or experienced a venous thromboembolism while in hospital. From an initial pilot of 23 hospitals, the programme was developed to include metrics for community, maternity and mental health providers and was available for all NHS healthcare providers to participate (Morris-Thompson et al., 2012, Power et al., 2012, Buckley et al., 2014, Power et al., 2014). Healthcare organisations were given financial incentives by NHS England to use the ST from 2013 onward. The initiative required wards and healthcare providers to monitor their performance against a range of measures based upon the potential harm patient's face when receiving healthcare. The data were analysed and made available to the public via a website and for organisations to share with their staff.

The papers identified in this review describe the results of initial pilots (Morris-Thompson et al., 2012, Power et al., 2012), its implementation within a hospital (Buckley et al., 2014) and an evaluation of the ST contribution to improving patient safety (Power et al., 2014). Morris-Thompson et al. (2012) reviewed data from over 10,000 patients over a nine-month period across three study sites. As each site approached the implementation of the initiative differently, with some study sites including executive walkabouts, face-to-face teaching sessions, and documentation changes, it was not clear from the evidence which aspect of the initiative resulted in the greatest improvement in reducing harm. All three study sites did however at the end of the initiative show a reduction in the number of falls, pressure ulcers and urinary catheter acquired infections, although no statistical modelling was applied. Buckley et al. (2014) suggest the success of the ST was due to its ability to raise awareness of the importance of patient safety which encourages staff to focus attention on particular aspects of patient care.

3.4.4.2 Safer Patient Initiative

Benning et al. (2011) undertook a large scale evaluation of the Health Foundation's Safer Patient Initiative (SPI). Four hospitals were identified in the UK with the aim of improving safety through targeting high risk clinical issues, the promotion of safety as an organisational priority, increasing the effectiveness of senior leadership in relation to safety and instilling knowledge and principles of safe practice among staff. The initiative emphasised the importance of measurement to improve safety and used quality dashboards to generate graphs and charts to allow staff to visualise changes on selected measures over time. Using a controlled before and after design and information from 18 control hospitals, the evaluation of the initiative was complex and comprehensive, providing considerable additional insight into the challenges of evaluating large scale quality improvement initiatives. The study concluded that the SPI resulted in an improvement in only one type of clinical process (observation measurement) and raised awareness of organisational priorities but had no additional effect on targeted issues or measures of organisational strengthening (Benning et al., 2011).

3.4.4.3 Open and Honest Care: Driving improvements initiative

Christiansen et al. (2014) formally evaluated the Open and Honest Care: Driving Improvements initiative, which is a commitment for hospitals in the UK to publish monthly information on a range of metrics. The study invited staff within 21

healthcare organisations to give their opinion on how the programme was implemented, how the information was shared with staff and the public, and how the initiative was used to drive improvements in patient safety. Questionnaires were sent to 1368 employees with 383 responding, giving a response rate of 28%. Thirteen telephone interviews were also undertaken with senior nurses. The report identified, all healthcare organisations included in the study had information available on their hospital website, just over half displayed the information within their hospital wards and only one fifth of the respondents said that the public had asked them about the information. The report also identified that while 82% of staff agreed that transparency was important there was some uncertainty with respect to whether the programme offered useful information to the public or how it would be used.

3.4.5 Availability of information

Only three of these studies displayed quality dashboard information within hospital wards and departments for patients and relatives to view (Christiansen et al., 2014, Anand et al., 2015, Phull and Hall, 2015). While there was some uncertainty by professionals about how this information would be received, all three studies reported that relatives and patients found it reassuring that departments were being transparent. Other dashboards in this review did make information available to the public via hospital and NHS England websites but it is unclear how staff or patients use this information (Power et al., 2012, Buckley et al., 2014, Christiansen et al., 2014, Power et al., 2014, Anand et al., 2015, Phull and Hall, 2015).

3.4.6 Organisational priorities and raising awareness

Several studies have reported that staff use the information from quality dashboards to frame the discussion in management and audit meetings, with the information raising awareness of organisational and patient safety priorities or initiatives (Pemberton et al., 2014, Ramsay et al., 2014, Russell et al., 2014, Phull and Hall, 2015). In areas where quality dashboards identify underperformance or resourcing challenges, information was used to prioritise and develop business cases for additional resources, and target teaching programmes. These outcomes led to the perception that managers became more engaged with patient safety initiatives and a sense of greater transparency in decision making (Brown et al., 2010, Davis et al., 2010, Khemani et al., 2010, Clark et al., 2013, Clark et al., 2014, McLaughlin et al., 2014, Wajong, 2015, Weiner et al., 2015).

3.4.7 Unintended consequences

Only three papers in this review identified the possibility of any unintended consequences of introducing a quality dashboard and the impact upon staff working under the panoptican gaze of performance measurement (Dixon-Woods et al., 2013, Dixon-Woods et al., 2014, Crofts et al., 2014). Dixon-Woods et al. (2013) identified that activities not related to the dashboard were not prioritised and staff sought to 'game the system' to avoid managerial scrutiny. Because the performance data only reflected certain aspects of care and contextual data was missing, nurses felt that they had limited capacity and opportunity to change or make improvements. There was also a sense amongst nursing staff that, when poor performance was identified, responsibility was disproportionately placed with them.

Redwood et al. (2013) also identified similar themes during their evaluation of a quality dashboard designed to provide feedback to junior doctors about medication prescribing practice. The junior doctors expressed some anxiety about the surveillance and auditing of their practice and how this information could be used to performance manage or discipline them. Similarly, in Crofts et al. (2014) evaluation of the introduction of a maternity dashboard staff feared they would be to blame if a poor outcome was highlighted via the dashboard.

3.5 Limitations and summary

The review was limited by the type and quality of studies included, in that several of the studies reported the introduction of a hospital wide dashboard, but provided limited contextual information regarding its introduction or the views of those responsible for care delivery within hospital wards. As quality dashboards are often introduced as part of hospital wide initiatives, their specific impact on the complex social structures within hospital wards is not fully understood. Few of the studies included in the review attempt to report the patient's perspective of quality dashboards and their influence on their perception of care.

The purpose of this review was to explore the evidence for quality dashboards within healthcare and provide insight into how they influence care delivery within hospital wards. Overall, the evidence suggests that QD influence care delivery by raising awareness of performance which leads to a prioritisation of resources and

effort. To drive change information has to be timely, accurate, and believable with consideration given to the unintended consequences of using dashboards linked to performance. This review suggests the act of measurement and presenting information is not sufficient to drive improvements on their own.

3.6 How quality dashboards drive improvement

The scoping review has shown making improvements in the safety of healthcare is more complex than providing information from QD to healthcare professional and expecting behaviour to change (Scott and Phelps, 2009, Vincent, 2013). While there may be an abundance of data, to be useful it needs to be processed and turned into information which triggers actions (Strome 2014). Consideration must also be given to contextual factors which influence how and why people engage with information. Staff working within healthcare have access to more data than ever before, it may however be a case of '*water, water everywhere, nor any drop to drink*' (Coleridge, 1798), in that staff are surrounded by something they are unable to benefit from (Mannion et al., 2015, Keen et al., 2018b).

The Health Foundation (2013) suggest the intention of making information more widely available should be made explicit as it is unclear if QD have been developed to inform patient choice, embarrass staff into making improvements, to be used as a tool to drive competition or a combination of all three (The Health Foundation 2013). The Department of Health and Social Care (2014) wanted to use information to encourage patients to engage with HCP, give feedback on their experience of care, and restore public confidence in the quality and safety of healthcare. Collecting and analysing data would also allow areas for improvement to be identified, resources and support prioritised, performance to be tracked, and allow the performance of HCP to be compared (Department of Health and Social Care, 2014).

The aim was to build on the success seen within cardiac surgery and the improvements in patient outcomes reported by Bridgewater et al (2007, 2013) following on from the work of Nugent (1994) in North America. Bridgewater et al, study reviewed the data from 25,730 patients undergoing cardiac surgery in the UK and could demonstrate a decrease in the 30-day risk adjusted mortality following the publication of outcome data by surgeon and hospital. Although previous papers had highlighted gaming and risk aversion behaviours from cardiac surgeons in North America which may have disadvantaged patients (Lilford et al., 2004),

Bridgewater et al. (2007, 2013) study showed, high risk patients were still getting access to surgery, and more patients were surviving the operation, but offers very little explanation as to how or why this improvement was achieved. Nashef (2016) reflecting upon this success suggests it was most likely due to standardisation in protocols, engagement with performance information, and the 'Hawthorne effect'. The Hawthorne effect is in reference to a workplace behaviour study undertaken at the Electricity Company's Hawthorne plant in the 1930's. The study was concerned with the effect of workplace changes on productivity. It was initially thought increased productivity was due to changes to rest periods and lighting within the plant but the study suggested the increase was due to improved personal relationships between workers and management as a result of being involved in an experiment (Wickström and Bendix, 2000). While many have dismissed the findings from the original experiment, it remains a common phrase to describe the effect of observation on behaviour.

Publishing information about the performance of a HCP or surgeon to inform patients choice is not always possible in the NHS, however there was an assumption that patients would choose to be referred to hospitals with the best outcomes. This would encourage other hospitals to improve their performance so they could compete for referrals (Berwick et al., 2003, Keogh and Bridgewater, 2007). Henderson and Henderson (2010) undertook a systematic review examining the effect of providing surgeon's performance data to patients prior to their planned surgery. The review found no evidence to suggest that providing mortality outcome or performance data directly to patients influences the decisions they make when choosing a surgeon or healthcare provider. This may be because the true level of patient empowerment has been over-estimated as patients choice of HCP has been found to be influenced by socioeconomic factors such as the cost of travel to use other hospitals, previous experiences, a recommendation from friends and family, an ability to pay for treatment and the complexities of the doctor patient relationship (Henderson and Henderson, 2015, Greenhalgh et al., 2018).

Ketelaar et al. (2011) undertook systematic reviews to determine the effectiveness of the public release of performance data in changing the behaviour of patients, professionals and organisations. The review could find no consistent evidence to suggest making information about the performance of the HCP available to the public changed the behaviour of patients or healthcare professionals or improved care. These findings are similar to those of Shekelle et al. (2016) who used a

literature search based upon Berwick et al. (2003) conceptual model to explain how public reporting of data could improve the effectiveness of care and patient safety. This review identified 33 articles which suggested that the public release of performance data often stimulated quality improvement activity within HCP and this may have been driven by concerns about a negative public image. The review found a lack of evidence to suggest the public reporting of performance data improves the safety of healthcare.

3.6.1 Audit and feedback

As audit and feedback is an established strategy within healthcare to improve quality and safety and QD provide an audit and feedback function, it was important to critically review the audit and feedback literature to understand how it can influence behaviour. Audit and feedback in the context of healthcare provides a summary of performance over a specified period of time to healthcare professionals to allow them to assess and adjust their performance (Flottorp et al., 2010).

Flottorp et al. (2010) reviewed the evidence for using audit and feedback as part of a strategy for improving the quality and safety of healthcare in European health care systems and reported on several systematic reviews which assessed its effectiveness. The review found evidence to suggest that audit and effective feedback improves compliance with standards but the effects were limited. The greatest impact on outcomes was found when practice was furthest away from the desired standard. The report identified the opinion of local leaders may be more effective than audit and feedback, and found no empirical evidence to suggest an internal audit or an audit imposed from a regulator or senior manager made a difference to outcomes. The report did however suggest that theories on how to improve the effectiveness of audit and feedback should be considered and identified Feedback Intervention Theory (FIT) and Control Theory as two possible lenses through which to view why and how audit and feedback influences behaviour.

Feedback intervention Theory was also identified by Hysong et al. (2009) as a framework to guide the design of feedback interventions following a meta-analysis of 19 articles from 519 selected from an audit and feedback systematic review previously undertaken by Jamtvedt et al. (2006). Hysong et al. (2009) found that the effectiveness of audit and feedback was improved when feedback was given with suggestions for improvement, in writing and frequently. This study was notable for being one of the first demonstrations of the application of theory to evidence

synthesis. Gardner et al. (2010) did however identify a number of methodological shortcomings highlighting the results reveal little about the effectiveness of supplementing feedback with additional behaviour change techniques, despite feedback being used in conjunction with other techniques in many of the studies. Gardner et al. (2010) also questioned the lack of guidance for the systematic identification of appropriate theories upon which to base theory-based evidence synthesis.

Ivers et al. (2012) published a systematic review of the effects of audit and feedback on professional practice and healthcare outcomes. Randomised controlled trials of audit and feedback that reported objectively measured healthcare professional practice or patient outcomes were included in the review. The results from 140 studies were reviewed, concluding that only 25% of studies had a positive effect on quality of care. They did however identify that, feedback was more effective when baseline performance was low, the source of feedback was from a supervisor or colleague, feedback was provided more than once, and given in verbal and written formats which included explicit targets and action plans.

Ivers et al. (2014) recognising that there had been little progress with respect to identifying the key ingredients for a successful audit and feedback intervention or understanding their mechanisms of action, arranged for a consensus meeting to bring together key academics in the field of audit and feedback. The aim of the meeting was to establish a best practice framework. Twenty four experts from eight countries attended a two day meeting to discuss findings from systematic reviews, theory informed intervention design, and the methodological options for investigating the effectiveness of audit and feedback in healthcare. The published paper from the meeting recognised an increase in audit and feedback interventions within healthcare and offered best practice guidance for designing audit and feedback interventions to maximise their effectiveness (Table 3). The paper also suggests research strategies to be considered to explore the impact of the recommendations and implementation considerations (Ivers et al., 2014).

Table 3 Best practice for audit and feedback

Best Practice Suggestions for Audit and Feedback Interventions	
Audit Components	Data are valid and based on recent performance
	Data are about individual or team behaviours
	Audit cycles are repeated with new data presented
Feedback components	Presentation is multi-modal including text, talking and graphics
	Delivery comes from a trusted source
	Feedback includes data for comparison with relevant others
Nature of behaviour change	Targeted behaviour is likely to be amenable to feedback
	Recipients are capable and responsible for improvement
Target Goals	The target performance is provided
Action plan	Goals set for the target behaviour are aligned with personal and organisational priorities
	Goals are specific, measurable, achievable, relevant time-bound
	A clear action plan is provided when discrepancies are evident

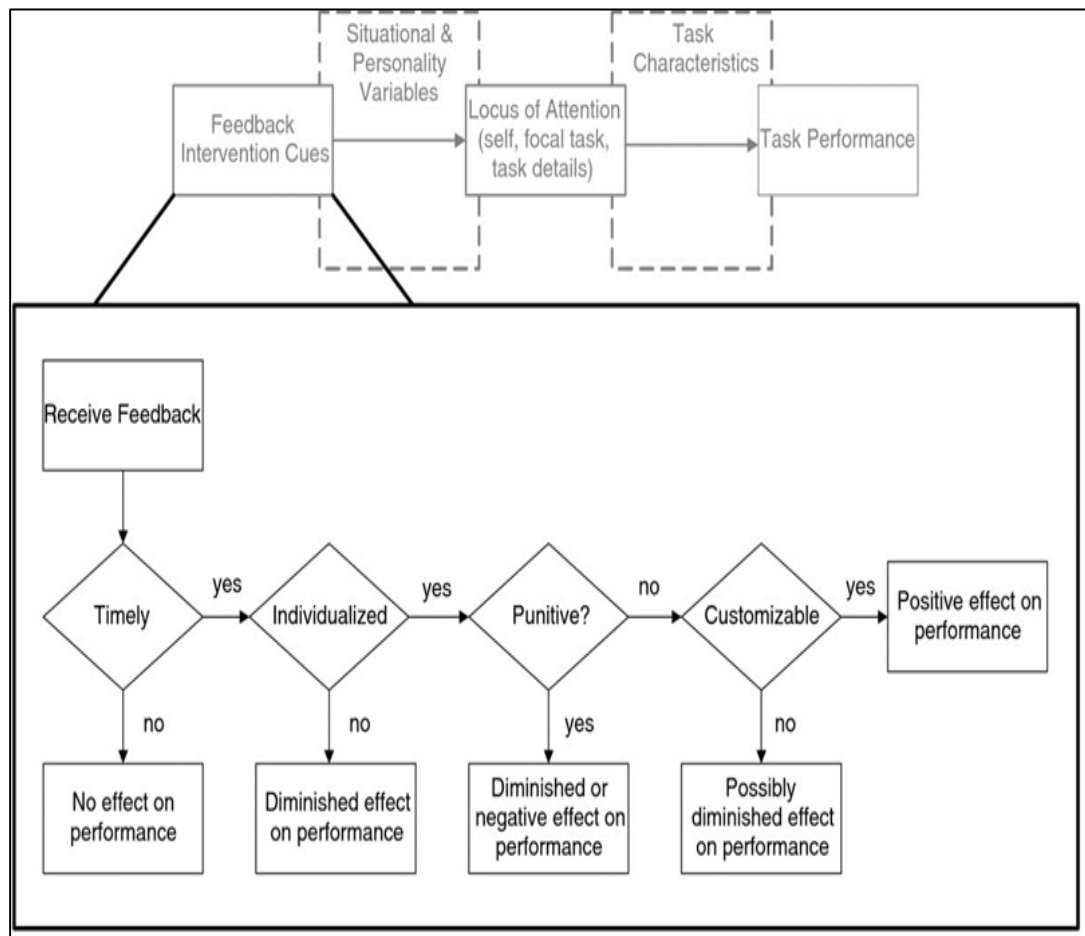
3.6.2 Audit and feedback theory

The success of audit and feedback is dependent upon the volition of individuals responsible for providing care (Flottorp et al., 2010, Ivers et al., 2014, Colquhoun et al., 2017, Ivers and Barrett, 2018). Colquhoun et al., (2017) suggest the gaps in understanding are due to a lack of theory to investigate the causal pathways which lead to behaviour change because of audit and feedback. They argue that applying theoretical perspectives may help to understand mechanisms that lead to change. If this is understood the evidence could be used to design more efficacious interventions or explain why some interventions fail and others succeed (Flottorp et al., 2010, Michie et al., 2013, Colquhoun et al., 2017).

One of the challenges has been deciding which theory or theories should be considered. Colquhoun et al. (2017) reviewed the studies identified in Ivers et al. (2012) systematic review to explore the extent theory was reported to have been used in the study design. The review found that only 20 out of the 140 studies reported using theory in any aspect of the design and in total 18 different theories were identified with the Bandura's Social Cognitive Theory and Rogers Diffusion of Innovations theory the most widely used. The review falls short of recommending which theory to use when considering audit and feedback designs but does point to Hysong et al. (2006) Actionable Feedback as a model to use when considering how to feedback audit information.

3.6.3 Actionable feedback

Hysong et al. (2006) presented their model of Actionable Feedback following research into adherence with clinical practice guidelines and effectiveness of audit and feedback within six medical centres in North America (Figure 15). They undertook a cross sectional purposeful sample and interviewed one hundred and two employees working in a HCP outpatient setting. The study found the effectiveness of feedback was dependent upon how the information is given to individuals. High performing HCP provided timely, individualised, non-punitive feedback to staff, with low performing HCP using an unstructured generic approach to feedback. Their research showed that simply reporting performance data rarely leads to behaviour change and therefore gave several recommendations for how feedback should be given. The characteristics shown to influence the effectiveness of feedback were set out in a proposed model for actionable feedback which could be used to guide the design of feedback interventions (Hysong et al., 2006, Hysong et al., 2012, Hysong et al., 2017).

Figure 15 Model of Actionable Feedback

Hysong et al. (2006) found their model was consistent with propositions set out in Feedback Intervention Theory which was developed by Kluger and DeNisi (1996).

3.6.4 Feedback Intervention Theory

Feedback Intervention Theory (FIT) was developed by Kluger and DeNisi (1996) in response to the variation in results published in numerous studies aimed at assessing the effect of feedback on performance (Balcazar et al., 1985, Latham and Locke, 1991). FIT was based upon a meta-analysis of papers which reported the effect of feedback interventions. Although 3000 papers satisfied the search criteria only 131 were included in the review. They define a feedback intervention as '*actions taken by an external agent to provide information regarding some aspect of one's task performance*' (Kluger and DeNisi, 1996). The definition was originally developed to explore the effect an external source such as a teacher, expert, or manager could expect to obtain from using a feedback intervention.

Kluger and DeNisi (1996) used existing theory (control theory, goal setting theory, action theory, learned helplessness theory and action identification theory) to develop FIT. The five principles underpinning the theory are

1. An individual's behaviour is regulated by comparison of feedback to goals or standards
2. Goals and standards are organised hierarchically
3. Attention is limited therefore only feedback standard gaps that receive attention actively effect behaviour.
4. Attention is normally directed to a moderate level of hierarchy
5. Feedback interventions change the locus of attention therefore affect behaviour

FIT suggests that people regulate their behaviour by comparing it to goals, standards or benchmarks to which they are committed. If a discrepancy is identified between the standard and their behaviour, they will try and resolve it by adjusting their effort in a particular direction. The degree of increased effort a person makes to reduce a deficit can be influenced by feedback.

3.6.4.1 Feedback Comparison Standard

Feedback-standard comparison is found in several theories including goal setting theory and control theory (Carver and Scheier, 1981, Latham and Locke, 1991) Although there are theoretical differences between the two theories, goal theory suggested if a discrepancy in performance is identified people are motivated to reduce it, and goal setting theory suggests people are motivated to achieve a goal rather than reduce a discrepancy, FIT suggests people have behavioural options in response to a feedback- standard discrepancy. They can change behaviour to influence future feedback by changing the standard (which is not always possible), reject or dismiss the feedback or the importance of the standard to avoid the cognitive dissonance caused by the deficit, or address the feedback deficit by attempting to achieve the standard. Kluger and DeNisi (1996) were aware the evidence to support their theory has limitations in the context of multiple competing standards and fails to identify the feelings involved in receiving performance feedback information. They recognised feedback can produce feelings of pleasantness and this in itself can influence behaviour, therefore a model that suggests behaviour is affected only by a negative feedback loop without

consideration for affective reactions is too simplistic and requires further research (Kluger and DeNisi, 1996, Hysong et al., 2012).

3.6.4.2 Hierarchy

Kluger and DeNisi (1996) second principle, hierarchy, was based upon identification theory and hierarchy theory and refers to meaning attached to the feedback.

Feedback loops are cause and effect processes which are organised hierarchically. At the top of the hierarchy are goals of self and those at the bottom contain physical action goals or tasks. When feedback is aimed at goals of self, this can cause anxiety and therefore lead to behaviour change. As tasks lower in the hierarchy have the potential to draw attention to self, they also influence behaviour as the person wants to avoid managerial scrutiny which may negatively impact goals higher in the hierarchy. As self is subjective, this may also explain why people at different levels of an organisation experience the same feedback in very different ways.

Kluger and DeNisi (1996) recognised people often have competing priorities and multiple discrepancies may occur at different points of the hierarchy. Only deficits that receive attention and are acted upon will result in change. This reinforces the point that it is not enough just to provide information and expect change to occur. FIT works by providing new information that redirects a person's locus of attention either towards or away from a task. When attention is directed towards a task, change is more likely to occur to address the standard deficit gap.

The ability for feedback to influence where attention is focused is dependent upon characteristics of how feedback is given. The frequency of feedback, feedback given in writing and graphically had a positive impact on performance. Using comparative performance data, public displaying information and verbal information alone were not shown to have augmented effect on performance of an individual (Kluger and DeNisi, 1996, Hysong et al., 2006, Hysong et al., 2012).

3.7 Discussion

From this review, the evidence would suggest that the introduction of quality dashboards influences care delivery within hospital wards by making information about practice, behaviour and performance visible and accessible. The greatest improvement in care delivery were noted when performance data were discussed in

person with individual staff members or became visible to senior managers via root cause analysis or performance meetings.

Using dashboards to raise awareness of the challenges within wards reassured staff that senior managers would support and were engaged in efforts to improve the quality of care. The engagement of senior management signalled collective responsibility for improvement and gave permission for all staff members to make suggestions for improvement (Coleman, 2013, Dixon-Woods et al., 2013). The implementation of dashboards led to an increase in awareness and interest in quality improvement and had the potential to reduce the spread of misinformation and anecdotal reporting.

On a practical level, nurses used quality dashboards as aide memoires to remind them of their wards priorities and areas for improvement. The dashboards also provided reassurance that the changes they made to improve patient outcomes actually made a difference (Jefferis et al. 2014). Dashboards were also found to raise awareness of organisational priorities with the data use to bring focus to safety briefings, meetings and handovers between clinical teams. Once quality dashboards and their metrics become part of the culture of a ward staff often experience peer pressure to make improvements and maintain performance (Jefferis et al., 2014).

To drive change information has to be timely, accurate, and believable with consideration given to the unintended consequences of using dashboards linked to performance (Daley et al., 2013, Dixon-Woods et al., 2013, Jefferis et al., 2014). This is especially important when achievement or compliance with metrics are used to determine who should be given rewards or highlights poor performance that could lead to reputational damage for an individual or ward. Identifying poor performance can lead to ward stigmatisation and associated anxiety for staff working in those areas. This can lead to the diversion of resources from genuine quality improvement initiatives to superficial steps to address a particular metric and has been associated with behaviours such as gaming or measure fixation (Petersen et al., 2006, Griffiths, 2008, Van Dishoeck et al., 2009, Okes, 2013). Where staff engage in measure fixation or gaming, although wards metrics may improve there will be no real change in practice or care provided (Illingworth, 2014).

While the majority of papers focus on addressing deficits in performance, several highlight the importance of using quality dashboards to recognise success. Dashboards have the ability to provide reassurance about the care provided and

can track improvements in performance over time (Power et al., 2012, Dixon-Woods et al., 2013, Christiansen et al., 2014, Jeffs et al., 2014, Weiner et al., 2015). Power et al. (2012) and Dixon Woods et al. (2013) suggest performance information appeals to individuals who want to make changes within their wards. The motivation for this change is often to improve patient care or to avoid managerial scrutiny. Ramsey et al. (2013) and Jeffs et al. (2014) however recognised that improving safety is more complex than providing information and expecting behaviour change to occur. Jeffs et al (2014) highlighted the importance of ward leaders in promoting staff engagement with quality dashboards, and identified a lack of leadership can diminish their impact. Staff need to be given the capacity and training to interpret and use data in a meaningful way and be given the opportunity by ward leaders to make changes in practice (Jeffs et al., 2014).

Although there is limited evidence to suggest providing performance data to patients, the public and professionals changed behaviour or improve care (Ketelaar et al., 2011, Shekelle et al., 2016), evidence from the audit and feedback literature is more favourable. Audit and effective feedback has been shown to improve compliance with standards, with the greatest improvement often seen when a significant deficiency in performance is identified. How feedback was given and by whom was also shown to influence the impact of feedback on quality of care (Flottorp et al., 2010, Ivers et al., 2012, Ivers et al., 2014) Colquhoun et al., (2017), suggested using a theoretical perspective or model such as Actionable Feedback to identify the causal pathways which lead to behaviour change (Hysong et al., 2006). Actionable Feedback suggests the effectiveness of feedback is dependent upon how information is given to individuals. Information that was timely, individualised, and non-punitive was found to have the greatest impact upon an individual's behaviour. Simply providing performance data was found to rarely lead to change (Hysong et al., 2006, Hysong et al., 2012, Hysong et al., 2017).

The Actionable Feedback model was based upon FIT developed by Kluger and DeNisi (1996) to bring understanding to the effect of feedback on performance. FIT suggests people regulate their behaviour through comparison, if a discrepancy is identified between a standard they are committed too and their behaviour, they will try and resolve it by adjusting their effort in a particular direction. The degree of increased effort a person makes to reduce a deficit can be influenced by feedback. When feedback is aimed at goals of self, this can cause anxiety and therefore lead to behaviour change. As self is subjective, this could explain variation in the impact

of audit and feedback within an organisation. FIT also acknowledges that people often have competing priorities so only deficits that receive attention will result in change. This reinforces the notion that simply providing information and expecting change to occur is likely to be ineffective. FIT works by providing new information to redirect a person's locus of attention either towards or away from a task. When attention is directed towards at task, change is more likely. The ability for feedback to influence where attention is focused is dependent upon how feedback is given. The frequency of feedback, feedback given in writing and graphically had a positive impact on performance. Using comparative performance data, public displaying information and verbal information alone were not shown to have an augmented effect on the performance of an individual or improve the quality of care.

3.8 Chapter summary

While much has been published about why QDs should be developed, what they should measure, what should be displayed and where, there was very little information on how QD influence change within hospital wards. A scoping review was therefore undertaken to gather evidence to support development of the programme theories (Appendix B).

The evidence from the scoping review suggests, information from QD can be used to highlight when performance against pre-determined metrics are not achieved. Individuals can ignore the information, engage with it and direct attention or resource towards improving performance, or seek help and advice. As QD need targets and standards to allow performance to be measured, making this information explicit may be as important as measurement itself. Once performance is measured it becomes possible to compare individuals or ward performance with others, this may trigger competition within individuals or challenge an individual's perception of their ward, creating cognitive dissonance which acts as a driver for change.

As QD are mechanisms or tools for audit and feedback, this literature was also considered. As several systematic reviews have reported wide variation on the effectiveness of audit and feedback on improving performance a best practice framework was published. The framework presents recommendations for audit and feedback research and suggests its impact can be maximised if information is timely, accurate, and believable with consideration given to the unintended consequences of using feedback linked to performance. The framework reminds

the reader that people need to engage with feedback if improvement is to happen, measurement and presenting information is not sufficient to drive improvements on their own. It was also suggested audit and feedback variation may be due to a lack of theory to explain how audit and feedback influences behaviour, especially in healthcare. Two formal theories identified in the literature that were developed to explain audit and feedback was Kluger and DeNisi's (1996) FIT and Hysong (2006) model for actionable feedback. Both offer propositions of how audit and feedback influence the volition of individuals and will therefore be considered when constructing the programme theories in the subsequent chapters.

It was clear the WHC-QD is a complex programme, implemented into a complex environment. To understand how and why quality dashboards influence care delivery within hospital wards, a research approach that uses multiple methods to capture complexity will be required. The following chapter will therefore introduce realist evaluation and the methods used to explore the research aims and objectives.

Chapter 4: Methodology and Methods

4.1 Introduction

This chapter will introduce realism and realist evaluation and explain the rationale for using this methodology to explore the aims and objectives of the research. The epistemological and theoretical principles of realism will be critiqued and an overview of the central tenets of realist evaluation provided. The specific research aims of the study will be presented and the three phases of the research set out. The methods used to refine and test the theories developed in phase 1 will be explained and the influence of the researcher on the study and any ethical considerations will be discussed.

4.2 Research methodology

As the current literature fails to fully explain how quality dashboards might influence staff behaviour and improve the quality and safety of healthcare a methodological approach that is capable of exploring complex interventions is needed so it can be used to bring new understanding to this area of research. Research methodology has been described as the strategy or plan of action which sets out the approach used to address the research questions and can be characterised through their ontological and epistemological perspectives (Kuhn, 1970, Crotty, 1998). Epistemology refers to how we know and learn about reality and ontology is concerned with the nature of reality and what there is to know about the world. (Ritchie et al., 2014).

As programmes to improve the quality and safety of care are dependent upon and lie within the complex social and institutional contexts of healthcare, capturing this reality can be complex and challenging (Davidoff et al., 2015). Pawson (2006 35) describes social programmes as “*complex systems thrust amidst complex systems*”. The ontological approach therefore taken to explore these topics is realism and the research methodology used to address the research questions is Realist Evaluation (RE). Realist evaluation is a methodology that has been applied to investigate several healthcare programmes (Rycroft-Malone et al., 2010, Marchal et al., 2012b, Jagosh et al., 2015, Ford et al., 2016). Its flexibility of application is considered a methodological strength and therefore an appropriate approach to explore how quality dashboards influence care delivery within hospital wards.

4.3 Realism and realist evaluation

Realism and RE is a branch of philosophy that sits between positivism and constructivism. A positivist view of the world is governed by natural laws and seeks to explain human behaviour in terms of cause and effect, in that they expect individuals to react to events or their environment. This can be observed and used to predict future behaviour. A constructivist view is concerned with the meaning and interpretation given to experiences by individuals, therefore knowledge is socially and individually constructed (The RAMESES II Project, 2017e). A Realist approach uses positivism and constructivism in its search for knowledge of causal mechanisms. Mechanisms refer to the structures, powers and relations that explain how things work beneath a surface's appearance. Realism views causation as generative rather than the successional view often used when conducting experiments under controlled conditions (The RAMESES II Project, 2017f). As it is not possible to control conditions in a complex social world a pragmatic approach is needed to find mechanisms which are not directly observable and have to be identified through their effects (McEvoy and Richards, 2003).

Realism recognises a social programme or intervention does not generate the outcome, they work by offering resources designed to influence a person's reasoning or actions. Interventions and their outcomes are subject to contextual influence and as a result may remain latent until they are activated by a change in circumstance (Gilmore et al., 2019). Causal explanation is therefore a matter of producing the theories of what the mechanisms are, looking for evidence to support or refute the theories, and considering the contextual factors that may influence reasoning (McEvoy and Richards, 2003, Pawson, 2006, Bhaskar, 2008, Westhorp, 2014, The RAMESES II Project, 2017c).

4.3.1 Realist evaluation.

RE is a methodological approach which has been used to evaluate a wide range of interventions in areas such as social policy, psychology, law, and contemporary health service research (Pawson and Tilley, 1997, McEvoy and Richards, 2003, Pawson, 2006, Bhaskar, 2008, Rycroft-Malone et al., 2010, Westhorp, 2014, Jagosh et al., 2015, Lacouture et al., 2015, Ford et al., 2016, The RAMESES II Project, 2017c)

RE comes under the realism umbrella and was developed by Pawson and Tilley in the 1990s in response to a lack of methodological choice for programme evaluation

which at that time was dominated by outcome driven research imported from clinical trials (Pawson, 2013). Knowing that X leads to Y, is not enough, RE looks to uncover how X lead to Y. Pawson and Tilley's aim was to develop an approach which focused on research designs which could extract, test and refine theory (Pawson, 2013). The aim of RE is to advance understanding of why complex interventions work, how, for whom, in what context, and to explain the many situations in which an intervention or programme fails to achieve its anticipated benefit (Wong et al., 2017). This is often summarised as; what works for whom, in what circumstances and how (Pawson and Tilley, 1997)

RE begins with asking the researcher to identify initial theories which explain how and why an intervention or programme is expected to achieve its outcomes and the conditions which may influence this (Emmel et al., 2018). Constructing programme theories involves reviewing the literature, interviewing stakeholders involved in the development of the programme and considering how programmes are expected to work. RE aims to bring these theories to the surface to allow them to be confirmed, refuted or refined (The RAMESES II Project, 2017c). Developing theory in realist evaluation should consider what resources and opportunities a programme offers to an individual, group or organisation and the circumstances or contextual factors that influence the volition of those involved (Pawson and Tilly, 1997, Emmel et al., 2018).

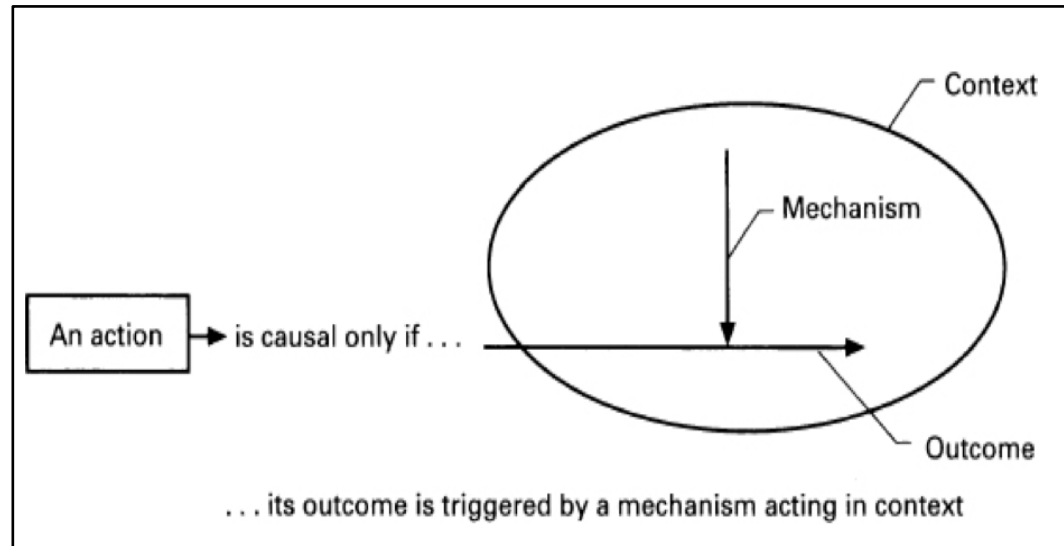
Constructing programme theories using RE is retroduction, as it is seeking to identify the hidden causal forces that lie behind identified patterns or outcomes (The RAMESES II Project, 2017b). Retroduction uses inductive and deductive logic to identify the causal powers of a programme and the influence of the circumstances in which it is applied. Inductive reasoning generates conclusions from multiple observations and deductive reasoning starts with theory and tests propositions. Data collection methods in realist evaluation are considered by their potential to contribute to theory testing and refinement (Pawson and Tilley, 1997).

4.4 Context, Mechanism, Outcomes

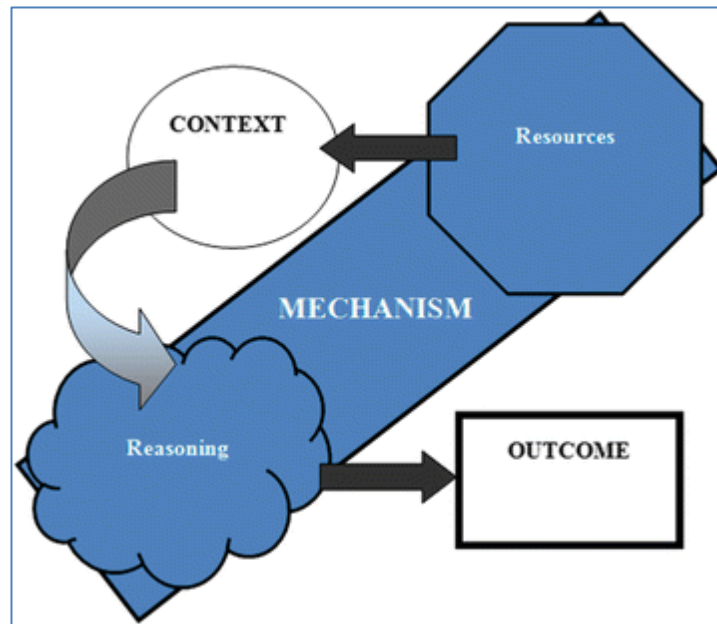
Pawson and Tilley (1997) offer a conceptual framework known as the Context-Mechanism-Outcome configuration or CMOC's (Figure 16) to highlight the relationship between the concepts (Astbury and Leeuw, 2010). The formulation of Context, Mechanism and Outcome configurations are the hypotheses or

propositions about how a programme is expected to work and is the starting point for undertaking realist evaluation.

Figure 16 Context Mechanism Outcome Configuration



The CMO configurations are the fundamental building blocks of realist explanation as they are used to facilitate the refinement and generation of middle range theory (Pawson and Tilley, 1997, Emmel et al., 2018). Middle range theories are described as theories that sit between programme theories and grand theories. Grand theories are formulated at a level of abstraction which makes them generalizable in many differing circumstances (Davidoff et al., 2015). The CMO heuristic is often used during data analysis to identify the generative causal processes underlying the outcomes. Constructing the CMO and programme theories can be extremely time consuming and complex. Pawson and Manzano-Santaella (2012) found that researchers often find themselves conflating mechanism and contexts. Jagosh et al. (2015) suggest many researchers struggle with recurring conceptual and methodological issues as the boundaries between context and mechanisms are not always clear. Dalkin et al. (2015) also found it difficult to distinguish between contexts and mechanisms when presenting programme theories on integrated care pathways and therefore proposed an alternative conceptual arrangement of the CMO configuration (Figure 17).

Figure 17 Alternative CMO configuration

4.4.1 Mechanisms

The concept of mechanisms can mean many different things depending upon the field of knowledge in which it is used. Mahoney, (2003) identified 24 definitions of mechanism from within the literature with them often appearing as unexplained causal forces or variables within input-output formula. Although mechanisms are used to understand causation between two events (X and Y) to truly understand causation you need to understand the underlying generative mechanism (M), the influence of context (C) and its relation to the outcomes (O) (Pawson and Tilley, 2007). Dalkin et al. (2015) model further disaggregates the mechanisms into resources and reasoning with context placed in between. Dalkin et al. (2015) suggest that the separation of resource and reasoning encourages researchers to consider both concepts individually rather than concentrating on one over another and makes it easier to differentiate between context and mechanisms.

Astbury and Leeuw (2010) explains that mechanisms are usually hidden and sensitive to variations in context. To highlight this Pawson and Tilley (1997) use the example of trying to understand the workings of a clock by only examining the movement of the hands or its face. In the case of the WHC-QD, if we only used the outcome measures to understand the impact of its introduction it does little to explain the variation between wards, how it improves care, and what enables or disables its potential impact. Although the use of mechanistic analogy is an over

simplification of human behaviour it does remind researchers to look beyond outcomes and to think about how the programme influences volition or reasoning. Mechanisms are therefore a combination of resources offered by the programme under investigation and a person or stakeholder's reasoning and response (or not) to those resources (Pawson and Tilley, 1997).

4.4.2 Context

The second important feature of mechanisms is they are sensitive to variations in context. Astbury and Leeuw (2010) suggest mechanisms always have potential but are dependent upon the context at that particular time. They highlight mechanisms should not be seen as universal and therefore can only ever be used to generate mid-range theories that sit between universal laws and description (Pawson et al., 2010). Mechanisms are influenced by context, which has a causal effect upon outcomes. As programmes are introduced into pre-existing social contexts, it is not possible to have a simple cause and effect relationship, every programme implemented will be influenced by contextual constraints and contextual enablers, which can occur at an individual and organisational level (The RAMESES II Project, 2017a). Context refers to the physical and cultural drivers which influence the choices made by a person in response to the programme. The influence of context explains why the wards with the same policies, bed numbers and staffing levels respond differently to the WHC-QD. This point is made to highlight the complexity of context which must be considered in regard to its relationship with the mechanisms as of part of the CMO configuration rather than a separate entity (The RAMESES II Project, 2017a). People always have a choice about whether to participate or engage with a programme and their willingness to do so will be influenced by pre-existing values, beliefs, and experiences (Pawson, 2006).

Pawson and Tilley (1997) do not expect a programme to have the ability to change the culture or social order of an area. As context influences the success and failures of programmes, if a programme is implemented into a setting that is considered hostile, the programme's mechanisms are unlikely to be activated and therefore change is unlikely to occur. Pawson (2013) believes the success of a programme is dependent upon context and they form an integral part of the programme. Contexts are however infinitely complicated and dependent upon time, individuals, interpersonal relations, institutional settings and infrastructure or the wider, social, economic and cultural setting of the programme. Undertaking realist evaluation requires the researcher to understand how context shapes the mechanism and

influences the outcome of the programme. Pawson and Tilley describe the influence of context on a mechanism by using a gunpowder analogy. An outcome may only trigger if the conditions are favourable in that a flame applied to gun powder will only result in an explosion if the powder is dry (Pawson and Tilley, 1997). Dalkin et al. (2015) recognised that when programmes involve stakeholders, volition or reasoning comes into play, this makes the firing metaphor problematic. Programmes work by enabling or changing a persons' reasoning and therefore should rarely be considered binary. The impact of an individual's reasoning on a mechanism should be considered as part of a continuum, similar to a light created by a dimmer switch, the intensity of the light would change in response to an ever evolving context. As an example, while negative WHQ-QD performance on month one may not elicit a response or a change in practice, if performance in month two is still negative, change is more likely.

4.4.3 Outcomes

The third characteristic of mechanisms is they are causal and can generate outcomes or outcome patterns. Realist evaluation often uses quantitative data to understand outcome patterns. Astbury and Leeuw (2010) suggest that when looking for the impact of mechanism on outcomes, we have to go beyond surface events and consider the intended and unintended consequences of the programme. As programmes have the potential to fire multiple mechanisms resulting in multiple outcomes realist evaluators are asked to look for outcome patterns or Context, Mechanism Outcome configurations (Pawson and Tilley 1997).

4.4.4 Realist evaluation to explore the WHC-QD

Research underpinned by realist philosophy recognises that our understanding of the real world is filtered through our senses, culture, and experiences (Westhorp, 2014). The outcomes observed are generated (generative causality) by causal processes and forces or mechanisms that we cannot see, and are influenced by the context in which they occur (Bhaskar, 2008, Pawson, 2013). Realist evaluation is an approach which is used to bring new understanding to social programmes, initiatives and interventions which are designed to solve problems or make improvements, rather than explore existing social phenomena. As programmes are often implemented into complex social structures, it is recognised that outcome patterns will vary dependent upon the context.

The purpose of realist evaluation is not to limit focus to successful programme outcome patterns but to explain what works, for whom, in what circumstances (The RAMESES II Project, 2017b). The aim of this research is to understand how and why quality dashboards influence care delivery within hospital wards.

As has been shown in previous chapters, quality dashboards have been designed and deployed to improve the quality and safety of health care. In response to national drivers and safety concerns a large HCP developed a quality dashboard (WHC-QD). The aim of the WHC-QD was to develop a programme that could measure standards of care, patient outcomes and patient's experience of care, and make this information accessible to staff and patients. To achieve this the WHC-QD was required to capture data on structure, process and outcome metrics. This information would be used to provide data to the myriad of national audit databases, produce composite scores to be displayed for patients and staff to view each month, and create a QD that could be accessed by all staff working within the HCP. As part of the audit process, a senior nurse would visit the ward each month to audit patient records and safety checks. Information from the QD would also be used to generate a focus for discussion in management meetings and generate data for governance and board reports. The WHC-QD was implemented into 100 wards across the HCP at considerable cost in terms of financial commitment, time required to undertake the WMAP, cost of printing infographics displays for every ward, and ongoing data warehousing commitments. As the aim of the programme was to improve the quality and safety of patient care, the cost vs benefit consideration was justified if improvements were made.

As previously highlighted hospital wards are not homogenous units but teams of professionals working together to provide care to patients. As highlighted in Chapter 3, simply providing information and expecting change to occur is unlikely to be effective, understanding why and how the WHC-QD programme improves the quality and safety of healthcare and the circumstances that explain why the programme might fail to achieve its anticipated outcomes will bring new knowledge to dashboard development and deployment.

As realist evaluation allows a range of methods to be used to address complex research questions in healthcare and looks to explore beyond outcome measures, it is therefore an appropriate methodology to address the aims and objectives of this study (Rycroft-Malone et al., 2010, Marchal et al., 2012b, Jagosh et al., 2015, Ford et al., 2016).

4.5 Research methods

The aims of this study is to use RE to understand how and why quality dashboards influence care delivery within hospital wards. To achieve this the following objectives will need to be considered

- Critically review the evidence for QD within hospital wards.
- Explore with those responsible for the development and management of the WHC-QD their perceptions of the intended consequences and possible unintended consequence of its deployment within wards.
- Use a range of approaches to explore the impact of QD within hospitals wards including staff interviews.
- Explain how and why QD influences care delivery within hospital wards and to understand the influence of contextual factors.

As every attempt to conduct a realist evaluation is beset with the impossibility of covering every angle, and identifying every issue (Pawson 2013), RE allows multiple approaches to answer the research question. Some research questions are so complex they require quantitative and qualitative answers. A mixed method approach involves combining or integrating both quantitative and qualitative research in one study. While there has been some academic discourse raising concerns about how this integration should take place to prevent one method seen as more dominant than the other, combining research methods is common place within the literature (Appendix B) (Mason, 2006, Ritchie et al., 2014, Flick, 2014). Richie et al. (2014) suggests viewing quantitative and qualitative methods as equal but separate and used to answer different questions of the research topic.

It is also possible to mix methods to support triangulation, with each perspective testing and adding to or validating each other. To understand the impact of the WHC-QD, outcome data will be required to understand if there has been an improvement in outcome measures such as infections, falls or pressure ulcers. There has been academic debate regarding the value of triangulation as each methodological approach captures their own data and therefore it is unlikely it will align. Richie et al. (2014) suggests mixing methods can bring understanding or multiple perspectives of the phenomenon under investigation.

4.5.1. Theory development

RE begins with asking the researcher to identify potential programme theories which explain how and why an intervention or programme is expected to achieve its outcomes. When a programme is developed the original idea behind its inception should be considered (Emmel et al., 2018). Constructing the initial programme theories involves reviewing the literature and bringing these theories to the surface to allow them to be confirmed, refuted or refined (The RAMESES II Project, 2017c). Consideration must also be given to the resources a programme offers and circumstances that may influence the volition of those involved (Pawson and Tilley, 1997, Emmel et al., 2018). Using evidence presented in Chapters 2 and 3 (Appendix A and B) and the researchers experience of working as a senior nurse within the case study site, the initial programme theories are presented as eight Context-Mechanism -Outcome configurations in Chapter 5.

4.5.2 Phase 1: Theory refinement

Using the literature presented in the scoping review (Appendix A and B), publicly available board papers from the case study site, and the professional experience of the researcher, seven initial programme theories were considered. To refine the candidate theories, RE asks that the propositions are considered by those who can provide a real world perspective (Manzano, 2016). The aim was to explore the theories with those who had been responsible for the development of the WHC-QD or who were stakeholders in the programme.

4.5.2.1 Stakeholders Recruitment

Realist evaluation uses the views of stakeholders or those involved with the design, implementation or with responsibility for the programme as a key source of information to elicit programme theory and provide data on how a programme works (Pawson and Tilley, 1997). Stakeholders have different information and understanding about how a programme is supposed to work and therefore RE should be designed to capture stakeholder views and opinions (Wong et al., 2017). The views of stakeholders, while important, need to be considered in the context of their investment in the programme and how this shapes their views. Often stakeholders are not the ones on the receiving end or affected by the programme (Pawson and Tilley, 1997). Pawson and Tilley (1997) therefore asks realist evaluators to be aware of, and alert to, stakeholder bias towards a programme and to treat them as fallible experts whose understanding needs to be formalised and

tested. For the purpose of this research, stakeholders are staff who work within the macro and meso (Table 1) levels of the HCP and were involved with the design, development, implementation, and management of the WHC-QD.

When considering who to recruit, Manzano (2016) recommends interview participants should be selected from a broad range of stakeholders who have knowledge of the programme under investigation. Selecting stakeholders, middle managers or those involved in the design of the programme allows information about the programme's intention and tacit knowledge of how programmes are expected to work to be captured. Sampling for realist interviews are theory based, that is respondents are selected because they are in a position to cast light on the hypotheses or aspects of the programme (The RAMESES II Project, 2017d). Ensuring participants have particular characteristics such as insight into and understanding of the area under investigation is known as purposive or judgement sampling (Ritchie et al., 2014, Bryman, 2016).

No recruitment target was set for Phase one of this research, as the sample size for recruitment varies with each realist evaluation (Table 4). It is difficult to establish the definitive number of interviews required as it is determined by the need to investigate patterns of behaviour, unintended consequences and differing perspectives rather than reach a balanced view or consensus.

Table 4 Sample size in published RE studies

Randell et al. (2017) interviewed 44 participants in their study into robotic surgery.
Jagosh et al. (2015) interviewed 24 participants exploring participatory healthcare research in a community healthcare setting.
Cheyne et al. (2013) interviewed 12 participants in her study into the impact of a government programme to support normal childbirth.
Harris et al. (2017) interviewed 120 participants in their study on intentional rounding.

Although no target was set for the number of participants, 11 stakeholders were interviewed in this phase of the study. Staff roles such as ' directors of nursing, Head of Nursing for Professional Standards, and Lead Nurse for Informatics were specifically targeted for recruitment as they were instrumental in the design and implementation of the WHC-QD. Staff groups such as Matrons, Heads of Nursing

were also targeted due to their knowledge of the day-to-day operationalisation of the WHC-QD, patient safety board (PSB) and ward metric audit (WMAP).

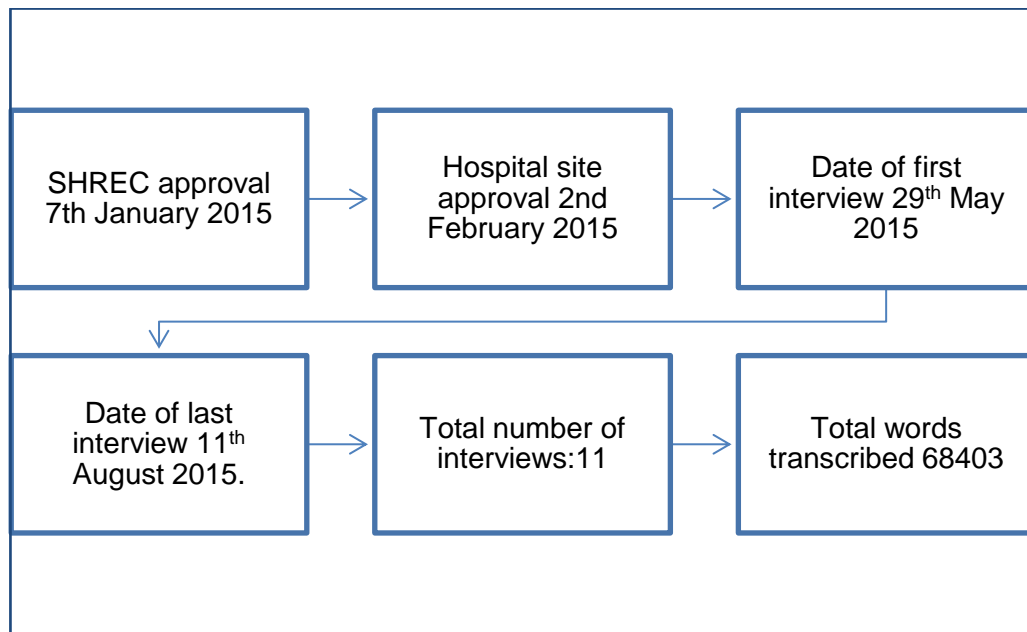
4.5.2.2 Ethical considerations

As the focus of Phase 1 did not involve patients as participants, NHS Research ethics was not required. Ethical approval was provided by the University of Leeds, School of Healthcare Research Committee (SHREC Approval Number RP/499). Permission to gain access and interview staff within the case study site was obtained from the health care provider's Research and Innovation (R&I) department (R&I Approval number HP15/053). A Participant Information Sheet (PIS) and Consent Form were developed and given to the participants (Appendix G,H,I).

As the researcher was a senior nurse within the case study site and may have the potential to influence the willingness of potential participants to agree to take part or change the nature of the discussion during the interview, it was decided that the recruitment strategy would not include participants who were directly or indirectly line managed by the researcher. Consideration was also given to the professional nature of the participants and what should happen in the event that information disclosed during the interviews was considered to be criminally or professionally incriminating (Ritchie et al., 2014). Information within the PIS made it clear that if the participant disclosed information which was considered by the researcher to be illegal or posed a risk to patient safety, the interview would be stopped and the concerns would be brought to the attention of the researcher's academic supervisor and if appropriate the Head of Nursing for Research and Innovation at the case study site.

4.5.2.3 Participant recruitment

To recruit stakeholders, an invitation letter and email (Appendix I) was sent to staff working in the key roles identified earlier in the chapter. The researcher also attended a monthly staff update meeting attended by Heads of Nursing, Matrons, and senior nurses to give an outline of the research and distribute PIS. In total 11 participants agreed to be interviewed and their information used in this research (Figure 18).

Figure 18 Recruitment flowchart

4.5.2.4 The realist interview

Realist interviews are described as theory driven, or structured in a way which uses theory to guide the interview process (Manzano, 2016). The aim of the interviews was to refine theories in relation to participants experiences and role within the organisation (The RAMESES II Project, 2017d). This approach to interviewing differs from other research interviews as it is used to seek information about how a programme works rather than exploring the participant's views and experiences of the programme under investigation (Manzano, 2016). The realist interview requires the researcher to present theories to the participant, rather than trying to capture unbiased participant views or perspectives. This style of interview was described by Pawson and Tilley (1997) as the teacher-learner cycle. Within this model the roles of teacher and learner are not static and become interchangeable throughout the interview. Typically the interview begins with the researcher describing the programme theories to the participant and the participant gives their real worldview of the theory. Data collected from the interviews can be used to make inferences about the theories as the participant may reject them, provide insights to allow them to be refined or introduce new areas to explore. The theory-testing purpose of evaluation is an iterative process that shape and evolve in line with participants responses throughout the series of interviews (Manzano 2016, The RAMESES II project, 2017d).

The initial programme theories and CMO configurations set out in Chapter 5 were used to develop a topic guide to highlight the key issues to be explored with the research participants (Appendix F). A topic guide should act as an aide memoire to help the researcher to achieve a degree of consistency when collecting data but providing sufficient flexibility to pursue the detail that is salient to each individual participant (Richie, et al 2014). The aim was to achieve a conversational style of interview and to use the teacher-learner cycle as a framework to present the initial programme theories to the participants and to use their responses to refine the theories and look for evidence of new areas to explore (The RAMESES II Project, 2017d). The topic guide starts with general questions about the participant's role and their views of why the WHC-QD was developed and how it influences quality improvement. An iterative process was used to bring the theories to life with the participants so they could be refined and developed.

4.5.2.5 Data collection

For participants who agreed to take part, interviews were arranged at a time and location of their choosing. All interviews took place in offices within the case study site. Verbal and written consent was taken at the time of interview and agreement to use a password protected digital recorder was taken. The participants were made aware their information would be anonymised and could be removed from the study if the researcher was contacted by email or telephone within 14 days of their interview. After this time the audio recording was sent for transcription and anonymised for inclusion in the study. Information given during the interview was stored securely and in line with an agreed data management plan. The audio recordings were transferred to a secure University network within one hour of completion and removed from the digital recorder to reduce the risk of data being lost or stolen.

4.5.2.6 Data Analysis

The researcher transcribed the first four audio recordings, however when compared with the audio recording, evidence of subconscious auto correction was noted, as repeated phrases and dialect had been removed. All of the audio recordings were therefore sent to a professional transcription service to ensure consistency.

4.5.2.7 Framework Analysis

To allow the abstraction of theories or generate meaning from the vast sums of data generated from qualitative interviews, a methodological approach or discipline was

required to manage the data (Ritchie et al., 2014). An approach used in other realist evaluation studies within healthcare and used widely in qualitative healthcare research has been the framework approach, also known as the framework method or framework analysis (Smith and Firth, 2011, Cheyne et al., 2013, Gale et al., 2013, Ritchie et al., 2014, Alvarado et al., 2017). The framework method is not associated with a particular methodology or theoretical approach but is a tool to manage information. It does however use similar processes such as data immersion, and comparison between themes that are used in other qualitative analysis methods (Gale et al., 2013). Interviews in RE are used to seek information about how a programme works, rather than exploring the participant's experience of programmes to the point of thematic saturation (Manzano, 2016). The approach allows for theme and case based analysis, rather than building themes up from individual participant views. It also provides a step-by-step approach to guide the analysis of data which can be helpful to the novice researcher. The steps for analysis are, familiarisation; identifying a thematic framework; Indexing; charting; mapping and interpretation (Smith and Firth, 2011, Gale et al., 2013, Ritchie et al., 2014).

4.5.2.7.1 Familiarisation

As part of developing an analytical framework, Ritchie et al (2014) asks the researcher to familiarise themselves with the data. This is the process of becoming immersed in the information through reading the interview transcripts and re-reading them to highlight themes identified in the initial programme theories or identify possible context, mechanism and outcome not identified from the literature. As the process for RE is iterative, familiarisation took place after each interview, identifying areas of interest for possible discussion during subsequent interviews (Siriwardena, 2009) . Familiarisation in this study included listening to the audio recordings, reading a printed copy of the transcribed interview, and re-reading to highlight salient points with hand written comments made on the transcripts (Gale et al., 2013). Due to participant availability, the scheduling of interviews meant that the transcripts were not always reviewed prior to the next interview. Where time did allow the notes were added to the topic guide, in addition to using them to form the basis of the analytical framework.

4.5.2.7.2 Developing an analytical framework

After familiarisation, the aim is to organise data in a meaningful and manageable way (Parkinson et al., 2015). The research aims and objectives, initial programme theories and CMO configurations, which are set out in Chapter 5, were used to construct an initial set of codes. Underlying themes were used to allow grouping of ideas under each heading. As a novice researcher, support was given by the academic supervision team to develop the initial codes for the analytical framework. To support learning for the researcher, two identical transcripts were chosen at random and sent un-coded to two academic supervisors. Independently they were asked to reviewed the data and identify codes for the analytical framework. The codes identified by the academic supervisors were compared to the researcher's codes (Appendix U). While there was general concordance, *recognition of success and belief in feedback* were added as specific codes within the framework. A summary of the codes is presented in Table 5.

Table 5 Initial codes for the analytical framework

Resources	Contexts
Consistent QD Data	Organisation legitimises QD
Focus for improvement	Awareness of performance
Contextualise/educate	Ward manager role
Performance over time	Need to improve accepted
Opportunity for change	Knowledge of standards
	Information is meaningful
Reasoning	Outcome
QD is seen as important	Awareness of performance
Avoidance	Engagement with QD
Disrupts view of ward/self	Opportunity for change
Assurance / reassurance	Seek help
Recognition change/help is needed	Adopt or change practice
Recognition of Success	Culture change QD routinely discussed
Belief in feedback	Increase effort

4.5.2.7.3 Indexing the data

Using these codes, an analytical framework was developed initially in Excel and imported to NVivo (Version 10) which is qualitative data analysis software which can be used as an effective way of storing and organising data so it is accessible for analysis. Each transcript was once again reviewed and passages of text were assigned a code from the analytical framework, this process is known as indexing (Richie et al., 2014). Indexing was used to organise the transcripts into framework categories and involved systematically applying the framework to each interview transcript (Figure 19).

Figure 19 Framework codes

Resources	Resource Code	Contexts	Context Code
Consistent QD Data	Accuracy	Organisation legitimises QD	Legitimation
Focus for improvement	Focus	Awareness of performance	Awareness of performance C
Contextualise/educate	Meaning/story	Ward manager role	Ward Manager
Performance over time	Performance	Need to improve accepted	Acceptance
Opportunity for change	Opportunity for change	Knowledge of standards	Knowledge
		Information is meaningful	Meaningful information
Reasoning	Reasoning Code	Outcome	Outcome Code
QD is seen as important	Importance	Awareness of performance	Awareness of performance O
Avoidance	Performance Management	Engagement with QD	Engagement
Disrupts view of ward/self	Disruption	Opportunity for change	Opportunity O3
Assurance / reassurance	Assurance	Seek help	Seek help
Recognition change/help is needed	Recognition of Help	Adopt or change practice	Chance practice
Recognition of Success	Recognising success	Culture change QD routinely discussed	Culture change
Belief in feedback	Belief in feedback	Increase effort	Increased effort

4.5.2.7.4 Charting

Once the transcripts were coded, it became possible to organise the data into a more manageable format to allow data analysis, this phase is known as charting (Gale et al., 2013). The data was imported back to Excel as the researcher found this more useful in providing a visual summary of the data. The transcripts were combined and added to Excel with each sentence or groups of sentences added to

a row. In total over two thousand rows were created. Filters were added according to, participant, participant job role, questions from the topic guides and codes from the analytical framework (Figure 20).

Figure 20 Charting example

351	And do you think Dashboard is the right mechanism to do that?	focus		C	
352	we need to improve on.	focus		C	
353	But again as we've discussed in the past regarding metrics, you know, the metrics can be subjective dependent on the assessor of that ward.	focus	belief in feedback	C	Participant C
484	Okay, very good. So when we do these research studies we look at kind of what's in the literature, and the literature suggests that dashboards give staff an opportunity to see how their ward is performing. And then that allows them to kind of target things to make the ward better, or reviews staff to improve their practice. What are your thoughts on that?	focus		D	
485	I think within our Trust there's a huge problem with that because not everyone can access the dashboard.	focus	Access	D	
486	So you have to apply for access because the Trust... because QlikView has a licence. Anyone can get access but you have to	focus	Access	D	
487	So they wouldn't say no to a staff nurse or a support worker, but you've got to fill out the form to ask for it.	focus		D	
488	Because only 100 people can look at it at one time, that's the licence that we have.	focus		D	
489	So what about the dashboard at the entrance to the wards?	focus		D	Question
490	So the... but the information then, so the key information, including the dial and how they're doing overall on the spidergram is displayed each month on the ward board.	focus		D	
491	I think that information is really good, and I think that helps them look at how they've done.	focus		D	
492	So when I speak to the staff about that, if I go on to support a ward that maybe aren't doing as well, they can tell you when they haven't had a good month.	focus	Awareness of performance	D	
493	They can say, well actually we had lots of agency workers that month or, you know, we had lots of people who were falling and it was really difficult, or really sick people.	focus		D	Participant D
494	Because I think the one thing that drops quite quickly when somebody... when a ward is struggling is the documentation, you know, I can see that across the board.	focus		D	
495	And particularly if we have a lot of agency workers, the standard of the documentation definitely is influenced.	focus		D	
496	So then the ward... but I think some of that is about ward expectations and what they ask an agency worker to do and some of that follow up, and actually this is what we do each day, and just not, you know, finishing handover and saying off you go, there's your eight patients, but having a quick 5 or 10 minute briefing conversation to say, do these things.	focus		D	
497	Because they can tell you that quite quickly. I think that depending on the ward leaders will depend on how much the staff know	focus	Ward manager	D	
498	Some ward leaders hand them over, so as they get their new board they will have a theme of the week and a theme of the month, and the ten key steps that goes on the ward board they will change them appropriately.	focus	meaning/story	D	Analytical Code
499	I think other wards just display them and not a lot of interest is paid to them. So I think it does vary on how the ward is using that to the leader of the ward, even perhaps to the matron sometimes and how much they use that information.	focus	Ward manager	D	
750	That to me is what it's for, it should be to say, right this is starting to look like there's something going on here, what's going on, and where do we use that to support. So for example on one of my wards, that's exactly what we did do.	focus		E	Analytical Code
751	So it started to drop off, the figures started to drop off, got matron involved, talking to the ward sister, talking to the staff on the ward about how it felt, what were they struggling with; did they think that they were, you know, why were they struggling to give	focus	Outcome engagement	E	
752	Lots and lots of useful information came out which didn't put them into a punitive process, it put them into a supportive process so that we could get in the support team.	focus		E	Participant E

4.5.2.7.5 Mapping and interpretation

Once the data was coded, indexed and charted, it was used to move beyond data management and towards understanding and interpretation (Gale et al., 2013). The process of coding, indexing and charting allowed data to support the CMO configurations to be identified and new patterns or programme theories to be uncovered. The information allowed comparison on a case-by-case basis, by role or by themes. The CMO configurations were also used as a reference point to look for contexts, mechanisms, and outcomes within and across data which was used to refine or develop new CMO configurations.

4.5.3 Reflexivity

Reflexivity refers to the need for researchers to be reflective about the impact of their methods, values and biases, how these may change with time and how they influence the research process and analysis (Bryman, 2016). While the aim is for researchers to strive to remain neutral, it is recognised that this can never be achieved as all qualitative research is in some way influenced by the researcher. It is therefore important that researchers themselves reflect upon their bias and this is made explicit within the study (Ritchie et al., 2014).

Bryman (2016) definition has resonance when considering the researcher's views on the WHC-QD at the time of starting this project and how this has changed throughout the thesis. At the time of conducting phase one interviews, the researcher did consider the WHC-QD to be a performance management tool or a modern day panopticon, using dashboards and the idea of central monitoring to control behaviour (Foucault, 2003). The researcher had also been present at several management meetings where the performance of an initiative was presented via a red, amber, green chart and the focus of the discussion always started with staff trying to discredit the data rather than making plans to make improvements. At that time there was no obvious link between the introduction of dashboards and tangible improvements in the quality of care patients would receive, in fact the programme actually demanded time from already busy nursing staff rather than providing a solution.

When conducting the interviews, the researcher was aware that several of the participants had invested considerable time and effort in the development of the WHC-QD and their view was likely to differ from the researcher. They were also cognisant that several of those interviewed worked in a senior role within the organisation and confidentiality could be inadvertently breached when research participants are from small interconnected populations (Ritchie et al.,

2014). The researcher was therefore careful when sharing other participants views of the WHC-QD and did so anonymously and without revealing the role of the participant as this could breach their confidence.

4.6 Methods Phase 2: Theory testing

As programme theories rarely exercise direct control over the social conditions they are expected to improve, programmes must work by influencing those on the receiving end of the programme (Rossi et al., 2004). Change, improvement or success is therefore dependent upon the volition of individuals, who are not passive recipients but active agents (Pawson, 2006). A programme offers individuals a choice, or an opportunity to change their mind, work harder, change practice, look for information or continue as normal. Phase 2 of this study explores how the WHC-QD influences the volition of individuals and how this changes practice within hospital wards by testing the refined programme theories and CMO configurations from the Phase 1 participant interviews.

Data collection methods in realist evaluation are considered by their potential to contribute to theory testing and refinement (Pawson and Tilley, 1997). Pawson (2013) argues there is no absolute methodological rulebook that researchers must follow; he suggests methodological approaches should be adapted to meet the peculiarities and complexity of the phenomenon under investigation.

To explore the complexities of the impact of the WHC-QD and how it influences care delivery within the complex social structure of a hospital ward, a case study approach was used. Case study design allows multiple data collection methods to be used to capture in-depth and contextual information which can be compared and used to highlight contextual influences on outcomes (Yin, 2009). Although a criticism of case study design has been the generalisation of findings beyond the case study sites, realist evaluation is not looking to build theory from observation or participant interviews, it uses retrodution to find evidence from case study sites to support or refute programme theories or propositions (Marchal et al., 2012a, The RAMESES II Project, 2017e).

As interviews only provide the researcher with “fragments” of insight, other methods must be considered when testing the theories (Rossi et al., 2004, Emmel, 2013, Pawson, 2013, Emmel et al., 2018). RE uses a mixed methods design as qualitative and quantitative data is needed to understand outcome patterns (Gilmore et al., 2019). Mixed methods research focuses on using quantitative and qualitative data to explain phenomena. As identified earlier in this chapter

mixed methods research can be used to illustrate or provide context to quantitative data and vice versa. Creswell (2010) describes a mixed methods study as involving the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given equal priority, and involve the integration of the data at one or more stages in the process of research. The information gained from using a mixed methods approach can offer a powerful resource to illuminate policy or practice (Ritchie et al., 2014). While philosophical assumptions about how to reach the truth in research will remain, a mixed methods approach was used in phase two of this study to integrate all the data to support or refute the programme theories (Wong et al., 2017).

4.6.1 Data collection methods

To test the programme theories and answer the research question, data collection methods were selected according to how they could be used to increase the robustness of theory testing (Wong et al., 2017). As programmes work by influencing the behaviour of individuals, it was important to explore the views of those at the receiving end of the programme. Data collection methods were selected to provide evidence or themes to explain intended or unintended outcomes (Table 6).

Table 6 Rationale for methods used in Phase 2

Data collection Method	Rational
Participant Interviews	
Staff	To understand how staff use the resource provided by the WHC-QD, how actions are influenced by context and what leads to behaviour change or outcomes
Visitors to case study site	To understand what visitors perception of the information displayed upon the PSB
Non Participant Observation	
Visitors to the case study site	To see if staff, patients or relatives interact with the PSB and if they there presence influences engagement or the perception of the importance of the WHC-QD information
Staff handovers/updates	To understand if WHC-QD information is discussed when planning patient care

Review of WHC-QD Data and Ward documentation (including electronic)	
WHC-QD data	To understand current and historical ward performance, identify areas for improvement used to inform staff interviews
Patient Safety Board Data	To understand what information is publicly displayed within the ward area and how staff receive information about their performance.
Staff communication information	To understand how WHC-QD data is used by staff in practice and how key information is communicated within wards

4.6.2 Ethical approval and considerations

As Phase 2 required data collection from within hospital wards, interviews with visitors to ward areas and the observation of clinical discussions, NHS ethical approval was required. Following completion of the necessary safeguards and assurances Phase 2 of this study was sponsored by the University of Leeds, with NHS ethical approval given by the East of England- Cambridge East, NHS REC number 17/EE/0006 on the 13th January 2017. The case study site gave permission in February 2017 for the study to be conducted within their hospitals, reference number NU17/91059. The letter of approval is available in Appendix J.

Once again, as the researcher was a senior nurse, any case study sites linked to their role was excluded from selection. As with the Phase 1 study, a participant information sheet and information on the consent form made it clear that if any information was disclosed which was considered by the researcher to be illegal or posed a risk to patient safety, the interview would be stopped and the concerns would be brought to the attention of the researcher's academic supervisor and if appropriate the Head of Nursing for Research and Innovation at the case study site. Thankfully no concerns were identified during any of the interviews.

4.6.3 Case study site selection

To gather evidence from a range of staff with differing experiences of using the WHC-QD, evidence from three case study sites were used to test the programme theories. Each case study site would be selected according to their WHC-QD performance.

Case study site A: A ward which had been 'green' according to WHC-QD metric data for 2 months or longer in the last 12 months. The rationale for this was to explore if consistent 'good'

performance was recognised, if it was seen as important and if recognising success was a factor in maintaining performance.

Case study site B: A ward that had been red/amber for 2 months or longer within the last 12 months. The rationale for this was to see if the negative performance data translated into actions within the department to address the performance deficit.

Case study site C: A ward where the metrics had changed from green to red within the last 12 months, to see if the negative performance data or a change in status triggered a response or change in behaviour.

Using these criteria, potential case study sites were selected by the Head of Nursing for Professional Standards who had oversight of all wards performance data within the HCP. The Head of nursing, Matron and Ward manager for the potential case study sites were contacted via email and letter to ask for permission to undertake the research within their ward areas. Maternity, paediatric, and wards with restricted access due to security and infection reasons were excluded due to reduced visitor access and additional security measures in place. Three case study sites were identified and the necessary permissions obtained.

4.6.4 Description of the case study sites

All three case study sites were hospital wards within the HCP

- Case study site A, was a ward with 24 beds specialising in caring for patients with medical conditions.
- Case study site B was a ward with 20 beds, specialising in caring for patients with extremely complex medical conditions and a tertiary referral centre providing highly specialist care.
- Case study site C was the largest ward with 32 beds providing support to patients recovering from complex cancer surgery.

The PSB were located in similar locations within the case study sites and all three wards had been receiving WHC-QD data for over 18 months. The wards were located on one hospital site, and were managed by different Matrons and Heads of Nursing.

The staffing levels and organisational structure within each case study site were similar in that each ward had one ward manager known as senior sister or charge nurse and three sisters or deputy ward managers. Although ward managers also get referred to as sister, for the purpose of clarity, a senior sister will be referred to as ward manager, and the deputy ward

managers/sisters referred to as sisters. The number of staff nurses and clinical support workers varied between 13-18 per ward with each area supported by one or two ward clerks.

4.6.5 Review of the case study site WHC-QD data

To inform and guide the participant interviews and the non-participant observation of ward handovers and updates, WHC-QD data from April 2016 to December 2018 for each of the case study site was provided by the HCP.

While pre-existing documentary data by its nature is ordered and structured around key topics or subject matters, consideration must be given to its purpose, intention, and target audience for the data as this must be considered in any analysis (Flick, 2014, Ritchie et al., 2014). For this phase of the study WHC-QD data was exported into an excel format and used to develop a descriptive profile of the case study sites. Areas for improvement were highlighted and descriptive notes made of trends and progress made against each metric commented upon. The data used were copies of the type of information available to all staff working in the case study site. As it was suggested in the phase 1 interviews, it was unlikely staff accessed the WHC-QD via a computer, so photographs of the PSB were taken from each of the case study sites for the purpose of using the information to inform the staff interviews. The information was redacted to maintain site location confidentiality.

Realist analysis is not a staged approach, it is an on-going iterative process, with information needed before data collection to allow insights to be pursued with participants (The RAMESES II Project, 2017e, The RAMESES II Project, 2017d). The purpose of reviewing data prior to staff interviews was to inform the discussion and test if the participants had an awareness of how their ward was performing and if their view matched performance. The data was also used to ascertain to what extent participants had an awareness of current priorities for improvement and how this influenced practice or care delivery. The information from the WHC-QD also informed the non-participant observation of ward handovers and updates to see if areas for improvement were discussed during key communication opportunities (handover) within the ward.

4.6.6 Non-participant observations

Observation is a central method used in qualitative research and realist evaluations (Rycroft-Malone et al., 2010, Harris et al., 2017, Randell et al., 2017, Ritchie et al., 2018). The involvement of a researcher during a period of observation varies from complete participant, where the researcher attempts to become a member of the group; to complete observer where the researcher seeks objectivity (Ritchie et al., 2014). The aim was for the researcher to

observe as a participant, which involved engaging in the case study sites but only for short period of time, being open about the purpose of the study, observing the participants and visibly making notes during the period of observation (Ritchie et al., 2014). The purpose of undertaking this element of the research was to use the information to test programme theories, rather than gathering descriptive information of the case study sites. The aim was to gain data on visitor interaction with the PSB and to observe nursing handover and safety huddles to see if information from the WHC-QD was discussed when planning patient care. Handover is the process of passing the responsibility of care from one team to another (Smeulers et al., 2014). Responsibility deals with the transfer of accountability for the quality, safety and care of the patient from one healthcare professional to another. This process typically happens two or three times per 24 hour period in hospital wards (Smeulers et al., 2014).

The primary function of handovers is to ensure continuity of patient care via a process which involves using verbal, written and electronic information about the care patients have received or need. The patient's medical history, care needs and areas of potential risk such as drug allergies, risk of falls, risk from infection or concerns over skin integrity are highlighted to the individual or team taking over responsibility for the patient's care (Messam and Pettifer, 2009). Although the location of handovers can vary between office setting, nurses station or the patient's bedside, the approach used within the case study sites utilised an office setting for handovers (Messam and Pettifer, 2009).

Safety huddles are short often multidisciplinary briefing focused on the patients most at risk. Effective huddles involve agreed actions and are informed with visual feedback of data. They are believed to improve safety through an opportunity for teams to agree focus and priorities for the shift and to raise awareness of safety concerns (Cracknell, 2017). The location of the safety huddles took place at the nurses' station which is an open space in the middle of the hospital ward.

The data collection method used for observing handovers and huddles involved the researcher being present during the process and making field notes via a data collection form (Appendix 0). The use of field notes is a common method during observation and prevents confidential patient information being inadvertently captured by audio or video recording devices (Ritchie et al., 2014). The researcher used handwritten notes to capture data while observing handover. Staff were made aware of the presence of the researcher by an introduction by the nurse in charge and a participant information sheet was available for staff to review. Participants were made aware that they could review the field notes made by the researcher during the period of

observation and information could be removed if required to protect patient or staff confidentiality.

The non-participant observation approach used to gain data on visitor interaction with the PSB involved the researcher observing visitors to the ward area. The periods of observation were limited to 1 hour and took place during ward visiting hours to maximise visitor numbers to the case study sites. Data was collected via field notes with the number of visitors recorded, their designation (if known) and if they were seen to interact or view the information on the PSB. A poster was displayed at the entrance to the case study site at the beginning of the period of observation to alert visitors to the presence of the researcher and the study (Appendix K). A participant information sheet was available if required (Appendix Q). No visitors or patients approached the researcher during the period of observation to ask about the study.

4.7 Participant recruitment

In phase 1, stakeholders or those involved with the design, implementation or responsible for the programme were targeted for recruitment to the study. The participant recruitment strategy for phase 2 was designed to target those on the receiving end of the programme (Pawson, 2013). As change is dependent upon the volition of individuals, understanding how a programme influences decisions and choices made by individuals allows programme theories to be tested. A key source of data in realist evaluation are participants who can provide information about how mechanisms are influenced by context to produce outcomes, any sample should therefore be sufficiently diverse to provide evidence across different contexts (Pawson and Tilley, 1997, Wong et al., 2017). The aim was to recruit a number of participants who worked within the micro level (Table 1) of the organisation.

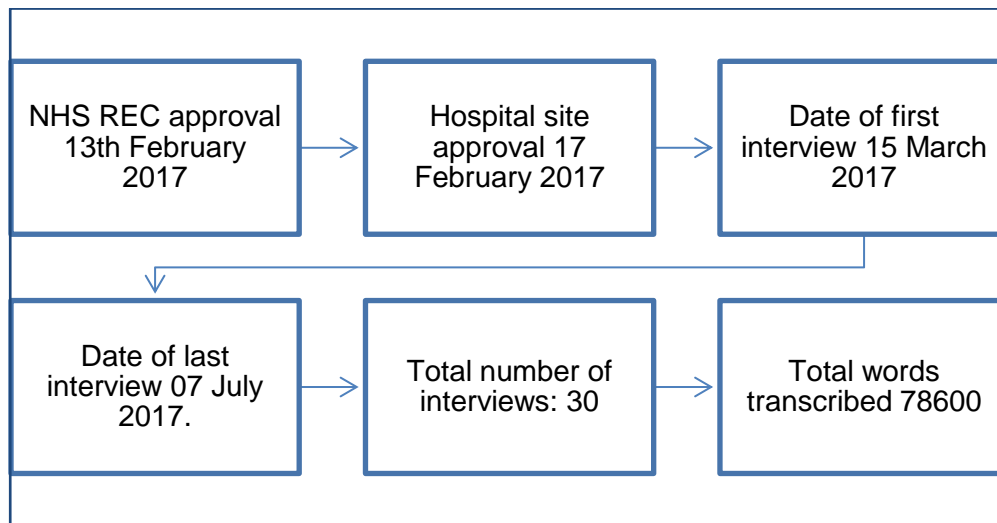
Within every hospital ward there is a hierarchy of pay grades, responsibilities and roles. A typical hospital ward in the NHS is staffed by registered nurses, clinical support workers and ward clerks. The precise numbers of staff vary between HCP and wards but a typical structure would be

- 1 ward manager
- 2 or 3 sisters/deputy ward managers
- 0.5 nurse per bed,
- 0.25 clinical support workers per bed.
- 2 ward clerks

This establishment would be used to provide care to patients over a 24 hour period (National Institute of Health and Care Excellence, 2014). The sampling strategy for the staff interviews was developed to include all grades of staff responsible for providing care, including clinical support workers and ward clerks. Since the unit of analysis in RE is not the person but the events and processes around them, every participant has the potential to uncover a collection of micro events that can be used to explore the theories. Emmel (2013) reminds the reader that it is not how many people we talk to, but who, why and how. Although no recruitment target was set for phase 2, consideration was given to purposively recruiting staff working in different roles within each of case study sites rather than focus on numbers of participants. The purpose of the interviews was to build knowledge of variation of what happens in the ward setting and to ensure all staff roles were included for interview. Data from the interviews were used to test how different participants were influenced by the programme.

To build explanation, Manzano (2016) recommends an iterative process of data collection involving the re-interviewing of participants as new theories emerge, no participants were re-interviewed as part of this study. Once data was entered for analysis, it was anonymised. New theories or areas to explore were however put to participants as the study progressed rather than return to the particular individuals for clarification or further testing. While it was not possible to re-approach participants, as new evidence emerged during the interviews, the topic guides were revised to explore the potential mechanism with the next participant, therefore ensuring a progressive iterative approach to data collection and analysis.

To recruit participants an invitation letter and email (Appendix Q) was sent to ward managers and participant information was given to staff during the periods of non-participant observation. In total 30 participants agreed to be interviewed across the 3 case study sites and their information used in this research (Figure 21).

Figure 21 Phase 2 participant recruitment flowchart

4.7.1 Visitor Recruitment

As one of programme theories was focused upon the influence of publicly displaying performance data via the PSB, the research was designed to interview visitors to case study sites. Participants were asked to take part in the study if they were seen to be interacting or looking at the PSB. The interviews would be undertaken during the planned periods of non-participant observation. The aim was to use the information to explore to what extent PSB information was used by visitors. It became apparent however during the periods of observation, that as very few people were seen to be observing the PSB, recruitment into this part of the study would be low. In total only six visitors were interviewed for this aspect of the study.

4.7.2 The realist interview

As previously discussed, as realist interviews use theory to guide the process, a new a topic guide was developed based upon the revised theories (Appendix S). This was used as an aide-memoire to help guide the interview and draw out the participant's view of the programme theories. A teacher-learner cycle was used to describe the programme theories to the participants and their response captured with an audio recording device with field notes written on the topic guide (Pawson and Tilley, 1997, Manzano, 2016, The RAMESES II Project, 2017d).

The time between participant interviews in most cases did not allow data to be transcribed, analysed and available to inform the next participant interview, therefore field notes taken during the interview were used to refine or highlight particular areas to focus question for the next participant where appropriate.

4.7.3 Data collection

The researcher made themselves available within the case study sites and the participant interviews took place within an office on the ward. A participant information sheet was available and written consent was taken at the time of the interviews (Appendix P, Q, and R). Interviews were audio recorded and stored securely according to a data management plan. The participants were aware their information could be removed from the study within 14 days of the interview.

The visitor interviews took place, next to the PSB within the hospital ward corridor, so the PSB could be referred to during the interview. No visitor information was collected during the consent process, but the participant information sheet set out how to contact the researcher if they wanted their data to be removed from the study. No participants or visitor contacted the researcher after the interview to have their data removed. All audio recordings were sent to a professional transcription service to ensure consistency. As no participants withdrew their consent for their information to be included in the research, 30 staff and 6 visitor interviews were available for analysis (Table 7).

Table 7 Participants roles

Role	Case study site A	Case study site B	Case study site C
Ward manager	1	1	1
Sister	2	1	3
Staff nurse	5	4	3
Clinical support worker	1	1	3
Ward clerk	2	2	0
Visitor	2	0	4

4.7.4 Framework Analysis

To allow the abstraction and generate meaning from the vast sums of data from the participant interviews, framework analysis was once again used to manage data. The process is outlined earlier in this chapter (Gale et al., 2013, Ritchie et al., 2014). A thematic framework was developed using the CMO configurations and theories refined in phase one.

4.7.5 Familiarisation

The researcher familiarised themselves with the data by reading the transcripts and re-reading them to highlight themes and areas of interest. The data was also read by job roles to see if any common themes within staff groups. Familiarisation for this phase of the study involved reading a printed copy of the transcribed interview, and re-reading to highlight salient points with hand written comments made on the transcripts (Gale et al., 2013).

4.7.6 Developing an analytical framework

After familiarisation, the aim was to organise data in a meaningful and manageable way (Gale et al., 2013). Themes were drawn from the refined programme theory, WHC-QD data and the salient points highlighted during familiarisation. A summary of the codes are available in Table 8.

Table 8 Phase 2 analytical framework

Resources	Contexts
Consistent QD Data	Organisation legitimises QD
Focus for improvement	Awareness of performance
Contextualise/educate	Leadership
Performance over time	Knowledge of standards
Opportunity for change	Meaningful information
	Credible auditor
Reasoning	Outcome
QD is seen as important	Awareness of performance
Avoidance	Engagement with QD
Disrupts view of ward/self	Opportunity for change
Assurance / reassurance	Seek help
Competition	Adopt or change practice
	Culture change
	QD routinely discussed
	Increased effort

4.7.7 Indexing the data

Data from the transcripts were exported into Excel, to allow an analytical framework to be developed. Columns were added to allow the data to be filtered according to participant, role, case study site, interview question and response. Each transcript was once again reviewed and passages of text were assigned a code from the analytical framework, this process is known as indexing (Ritchie et al., 2014). Indexing was used to organise the transcripts into framework categories and involved systematically applying the framework to each interview transcript.

4.7.8 Charting

Once the transcripts were coded, the data was organised to allow analysis, this phase is known as charting (Ward et al., 2013). The transcripts were combined and added to EXCEL with each sentence or groups of sentences added to a row. In total over two thousand seven hundred rows were created.

4.8 Reflexivity

Recognition of researcher biases is a key principle when undertaking research and reflexivity is how qualitative researchers strive for reliability and validity (Seale, 2011). As previously outlined in phase one interviews remaining neutral, can never be achieved as all qualitative research is in some way influenced by the researcher (Ritchie et al., 2014). The researchers previous bias was outlined earlier in this chapter, but there was recognition that time and considerable reading had taken place since the phase one interviews and therefore my enthusiasm for the WHC-QD and its potential was a consideration. I was also mindful that all three case study sites were busy wards with staffing vacancies and I was nervous that spending several hours observing, handovers, visitors to the ward, rather than supporting the nurses to deliver care to the patients would be seen as an luxury that could be ill afforded in such a time precious environment. It was noted that the length of the interview with the staff members were shorter than the phase 1 interviews. This may have been a consequence of theory consolidation rather than gleaning (Manzano, 2016) or may have been due to an awareness that staff were extremely busy and were giving up time to participate in the interviews. Upon reflection, follow up participant interviews could have been included in the research design to reduce the time pressure on the first interview and allow a second opportunity to present the programme theories to the participants.

4.9 Chapter summary

This chapter introduced realism and realist evaluation and the rationale for the use of this approach to answer the research questions. The central principles of Context, Mechanism and Outcomes and the need to generate initial programme theories about how a programme is expected to work are explained. An alternative to the CMO heuristic is presented to remind the researcher to separate resources and reasoning to aid the identification of contexts from mechanisms.

The research aims and objectives were reintroduced and three phases were identified to support programme theory development, refinement and testing. The process begins with theory development, which involves using the evidence set out in previous chapters and the researcher's experience of healthcare to develop candidate theories about how QD influence care delivery within hospital wards.

Theory refinement or phase one, sets out the steps taken to recruit stakeholders to participate in the study. Ethical considerations are presented and framework analysis is introduced. As RE

interviewing requires theories to be presented to the participant, the teacher-learner cycle is explained. Data collection and analysis techniques are outlined for Phase one and Phase two of the study. The rationale for using a mixed methodological approach to capture information from three case study sites is set out with reference to ethical approval and how the case study sites were selected. Case study site data, non-participant observation and participant and visitor interviews were used to capture data for analysis. Consideration is given to how the researcher may influence the study. As the first step in RE is to develop initial theories about how QD influence care, the next chapter, using evidence from Chapter 2 and 3 will present the initial programme theories and CMO configurations.

Chapter 5: Developing the initial programme theories

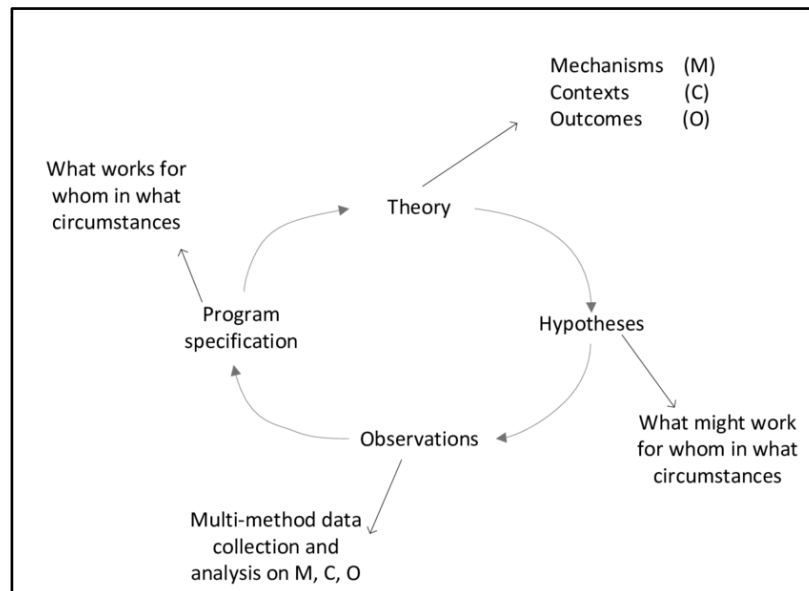
5.1 Introduction

Pawson (2006) describes programmes as theories incarnate, and believes every programme or intervention has a theoretical underpinning. Realist evaluation aims to bring these theories to the surface, to explain what works for whom, in what circumstances and how (The RAMESES II Project, 2017b). The first phase of RE is to develop initial theories or propositions which explain how and why a programme is expected to achieve its outcomes and the conditions that allow or prevent this from happening. This chapter will initially set out considerations regarding theory development using RE, and will identify the range of sources used to develop the initial CMO configurations and programme theories to explain how quality dashboards influence care delivery within hospital wards.

5.2 Constructing the programme theories

RE begins with identifying initial programme theories which hypothesize how, why and for whom a programme may work (Figure 22). The realist evaluation cycle highlights that RE process and the research journey needed to understand how mechanisms, respond to contexts to produce outcomes.

Figure 22 The realist evaluation cycle



(Pawson and Tilley, 1997)

The first phase of RE is to develop initial theories or propositions which explain how and why a programme is expected to achieve its outcomes and the conditions that allow or prevent this from happening. Where possible the theories should be developed using literature, document reviews, and interviews with programme architects or implementers (Gilmore et al., 2019). The RAMESES II Project (2017b) group also suggest multiple sources should be used to develop the theories (Table 9).

Table 9 Information used to develop the initial programme theories

Potential sources available to develop RE theories	Sources used to develop RE (Appendix A-D)
Published journal	Scoping review, Published systematic reviews
Published reports	Quality and Safety Reports (Appendix A)
Grey literature	Descriptive articles, Patient information leaflets
Expert and consensus papers	Audit and Feedback Framework Metric development Government reports
Existing or linked theories	Actionable Feedback Feedback intervention theory
Documentation used to develop and support the programme	Published Board papers with reference to the WHC-QD and the purpose of its development
Interviews with people involved in the development of the programme	Stakeholder interviews, (Chapter 6)
Experience of the researcher	Experience as a nurse working within the case study site, knowledge of the WHC-QD and its use in management meetings

(The RAMESES II Project, 2017b)

The programme theories in realist evaluation should reflect the realist view of causation, and should not be limited to evaluating if a programme achieves its outcomes. The theories should consider what resources and opportunities the programme offers to an individual, group or organisation and the circumstances or contextual factors that influence the volition of those involved (Pawson and Tilly 1997, Emmel et al., 2018).

With reference to this thesis and research project, the first step was to consider why the HCP decided to develop the WHC-QD and consider how the programme would be used to change practice. Using publicly available board papers from the HCP the following was identified

[The WHC-QD brings together] *“a range of measures that provide a strategic overview and focus on the fundamentals of care, together with patient outcomes and feedback on their experience of care by ward. It was developed to provide rich data to help ward & CSU (a collection of wards) teams focus their attention on actions that will improve patient outcomes and experience. The information is used to identify wards that have positive patient outcomes and identifies wards which need to focus on developments to improve performance and patient outcomes”* (Case study site Trust Board Paper 2014).

The use of board papers as evidence to develop the initial theories clearly shows the intended consequences of implementing the WHC-QD, it also specifies how the WHC-QD was expected to be used and by whom. The statement provides rich information regarding the intention of the programme (The RAMESES II Project, 2017b). Board papers have also been used in other studies to assess the maturity of HCP digital response to improving the quality and safety of healthcare (Keen et al., 2018a).

If the statement from the board paper is considered in the context of realist evaluation, it provides important insight, to explain how and why a programme is expected to achieve its outcomes but offers limited insight into the conditions that allow or prevent this from happening.

From the board statement the WHC-QD was developed to provide a strategic overview of care and improve patient outcomes and experience.

It was expected to achieve this by

- Providing feedback to all levels of staff within the organisation (strategic, ward, management) (Table 1)
- Providing rich data with focused actions
- Identifying wards with positive feedback and performance data
- Identifying wards who need to focus on developments to improve performance

This resource was expected to be used by management and ward teams to focus their attention on making improvements. Although consideration is not given to the unintended consequences of the introduction of WHC-QD or contextual factors which may limit its potential, it did provide a starting point for developing the initial programme theories.

Unfortunately as outlined in Chapter 3, the literature is littered with evidence to suggest programmes designed to improve performance, actually have limited impact making healthcare safer (Kluger and DeNisi 1996, Flottrop 2010, Iver's et al., 2014). The first step to understanding how QD influence care delivery within hospital wards was to understand the link between measurement and improvement (Berwick et al., 2003). Where the introduction of programmes have led to improvements in the safety or quality of care, the evidence suggests it is multifactorial and dependent upon what information is given, how the information it is given and by whom. To support the develop of initial theories a synthesis of evidence from HCP board papers, the scoping review and the researchers experience of working with the WHC-QD was used to identify salient points from the literature outlined in Chapter 3.

To organise the information three key questions were considered, a summary of this is available in Appendix C and D.

- What are the unintended consequences of QD?
- What are the key features of QD feedback needed to improve performance or change practice?
- How does information from QD influence practice?

The key themes for successful feedback from QD, suggested that information needs to be trustworthy, timely, meaningful, useful, and discussed. It was also important for staff to engage with, and understand QD information and be given an opportunity to use it to change and improve care (Appendix C).

It is suggested from the literature, QD provide focus and can act as an aide memoire to remind staff of the areas for improvement. QD also raise awareness of performance against pre-determine standards, this creates an opportunity to be recognised for success, avoid managerial scrutiny or ask for help (Appendix B).

Unintended consequences of QD are discussed in greater detail in Section 2.5, (Appendix V) however there is a concern that as QD identify poor performance, this can lead to ward stigmatisation and associated anxiety for staff working within those areas. QD may also lead to resources diverted from genuine quality improvement initiatives to superficial steps to address a particular metric. Behaviours such as gaming or measure fixation are more likely when the consequence of poor performance is linked to financial incentives or the avoidance of personal reputational damage, measure fixation and gaming may lead to improvements in metrics but

patients will receive no real benefit (Lilford et al., 2004, Mannion and Braithwaite, 2012, Illingworth, 2014).

To develop initial theories or propositions to explain how QD influence care within hospitals wards the evidence was used to identify, Context, Mechanisms, and Outcomes and how these could be brought together as CMO configurations.

5.3 Initial programme theories

Using Dalkin et al. (2015) model, mechanisms are disaggregated into resources and reasoning to avoid conflating contexts and mechanisms The evidence summarised in Appendix B,C and D, was used to develop initial theories to suggest what resources are offered by QD (Table 10).

Table 10 Initial resource mechanisms offered by the programme

Mechanism Title	Mechanism (Resource)
Consistent QD data	For QD to influence behaviour, the data needs to be considered trustworthy, accessible, accurate, and given in a timely manner. Consideration should be given to the content and how data are displayed, with more than one medium recommended
Focus for improvement Contextualise Education	Change was more likely when QD information or feedback highlighted specific areas for improvement, given with an educational component and specifically discussed with individuals or teams
Performance over time	As one of the benefits of collecting performance data is the ability to track performance over time, this allows progress to be assessed, improvement to be recognised and allows audit cycles and goal driven targets to be used. It also reassured managers and staff that changes made to improve patient outcomes actually made a difference.
Opportunity for change	Within a structure or hierarchy of a hospital ward governed by process and procedures, change can be difficult to enact and is dependent upon a person's roles and responsibilities. QD makes performance visible and therefore provides an opportunity for staff members to make suggestions or changes in practice to improve care

5.3.1 Initial contextual considerations

As providing information does not inevitably lead to improvement in performance, consideration was given to the pre-existing social contexts which influence how the resources offered by the QD programme are viewed and used. The initial contexts are presented in Table 11.

Table 11 Initial contexts considered

Context Title	Context
Organisation legitimises QD	When QD was used by senior managers to engage in quality improvement initiatives and the information was used in governance, root cause analysis meeting, it reassured staff that there was a collective responsibility to improve care. This was also emphasised when QD metrics are aligned to organisational priorities
Awareness of performance	An awareness of performance was seen as a fundamental step in making improvement, if staff are not aware of how they or their ward is performing, it is unlikely any increase in effort or change in practice will be actioned. For change to occur there has to be recognition change or help is needed
Ward manager role	Ward managers play a vital role in promoting engagement with QD programmes and giving staff an opportunity to make changes in practice, change is more likely if information comes from a trusted source. The opinion of local leaders has been found to be more effective than audit and feedback and a lack of leadership found to diminish the impact of QD
Need to improve accepted	As with any system developed to provide performance information, if improvement is needed those receiving the information have to accept the message. Acceptance may happen over time or with repeated performance information, change is unlikely if staff are resistant or reject the need to improve
Knowledge of standards Information is meaningful	Change is unlikely if staff are unaware of the targets or standards which they are being measured against. The information has to be meaningful for the individual and provides them with information to inform actions, decisions or behaviours. Change is more likely when data are about individual or team behaviours and based upon recent performance and within an audit cycle

5.3.2 Initial mechanisms

As outlined earlier, mechanisms are the participant's response to the resources offered by the programme. Mechanisms suggest why participants decide (or not) to change behaviour or participate in a course of action. As hospital wards are extremely busy places, staff are faced with multiple competing priorities. Staff work within a system governed by routines, customs and practice developed to provide structure to how care is delivered (Jagosh et al., 2015).

The initial mechanisms are presented in Table 12.

Table 12 Initial reasoning mechanisms

Mechanism Title	Mechanisms (Reasoning)
QD is seen as important	For information from QD to lead to change, it has to be considered to be important. Importance may be dependent upon which layer of the organisation you work and the rationale for why it is important
Avoidance Disrupts view of ward/self	As QD also brings poor performance to the attention of all levels of the organisation, staff are motivated to make improvements to avoid managerial scrutiny and publicly displaying negative performance information which can worry patients and disrupt their own world view of their own or team performance
Reassurance Assurance	For those working in the Macro, and Meso levels of an organisation, QD information provides assurance care is delivered in line with agreed standards. For those working at a micro level, QD information highlights success and can provide reassurance the team is performing well

5.3.3 Initial outcomes

With the right resources and in the right context staff will respond to the QD and this will lead to improvement in the quality and safety of care within hospital wards. The affect may however not be immediate, while an awareness of performance may not lead to improvements in care; it may start a ripple effect, what starts as an initial outcome becomes a resource and context over time (Jagosh et al., 2015). The outcomes presented reflect sustained improvement in patient safety and care (Table 13). It has been shown that QD can lead to short term improvement, which ends when the initiative or incentive is removed.

Table 13 Initial outcomes

Outcomes Title	Outcomes
Awareness of performance Engagement with QD Opportunity for change Seeks help	Once teams are aware of performance and engage with QD information, this may lead them to look for opportunities for change or seek help to improve performance depending upon the specific areas for improvement
Adopt or change practice Increase effort	Some tasks may need a simple increase in effort to improve performance, others require a change in practice or a new approach to be taken
Culture change WHC-QD routinely discussed	For sustained improvement be made QD can lead to change in culture where opportunity to change practice becomes routine, peer pressure to maintain standards is evident and QD information is routinely discussed in day to day practice

5.4 Initial Context Mechanism Outcome configurations

As Context-Mechanism-Outcome configurations are central to analysis, theory building and refinement, the resource, context, reasoning, and outcome theories were brought together as context, mechanism, outcome configurations (CMOC's) (Wong et al., 2016, Gilmore et al., 2019) (Table 14).

Table 14 Initial CMO configurations

Initial Programme theory	Context-Mechanism (Resource/Reasoning)-Outcome Configuration
Importance 1	Information generated by the QD needs to be considered important
	When information from QD is generated consistently and systematically (Resource) and legitimised through management engagement (Context), its key message will be seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness of the wards performance (Outcome)
Importance 2	Information generated by the QD needs to convey a story
	When QD information is contextualised or given with an educational component (Resource), and there is a need to improve performance (Context) the message is seen as important (Reasoning) and the information used to adopt or change practice and increase effort to reduce deficit (Outcome)
Disruption 1	Disruption may lead to change.
	When a ward has previously performed well (Context) and QD information reports negative information (Resource), this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.
Disruption 2	Consistent disruption will lead to change
	When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid scrutiny (Reasoning) and disrupting how the ward is viewed by patients and managers (Reasoning), a change in practice will be initiated or the ward manager will seek help (Outcome)

Initial Programme theory	Context-Mechanism (Resource/Reasoning)-Outcome Configuration
Focus /Aide memoir	<p>Informative feedback will lead to improvement</p> <p>If a ward has a performance deficit identified (Context) and a specific focus for improvement is given (Resource) if the metric is considered important (Reasoning) and there is recognition (Reasoning) change is needed, staff will engage with the information and increase effort to improve performance (Outcome)</p>
Reassurance	<p>Awareness of QD over time can positively influence ward culture</p> <p>When information from the QD (Resource) tracks performance over time, and staff are aware of their wards performance (Context) they become reassured (Reasoning) the care on their ward is safe. If QD information is used to recognise success, and staff engage with the information, this can lead to a change in culture as QD information becomes embedded in practice, discussed daily and used to plan care (Outcome)</p>
Avoidance	<p>QD offers an opportunity for change</p> <p>When QD information (Resource) tracks performance over time (Resource) and identifies a need to improve standards (Context), (Ward) managers who wish to avoid managerial scrutiny or publicly displaying negative performance information (Reasoning) ask staff to increase effort (Outcome), seek help (Outcome) and create opportunities for staff to suggest changes in practice (Outcome) to improve performance</p>

5.5 Discussion

The initial programme theories, of importance, disruption, focus, reassurance and avoidance, are based upon evidence that suggests how and why quality dashboards influence care delivery within hospital wards and presented earlier in this thesis. This information was used to identify potential mechanism and theories to be refined and tested later in the study. The initial theories presented in this chapter are based upon several key findings from the literature, which suggest how QD improve care within hospital wards.

5.5.1 The initial theory of importance

Information generated by the QD needs to be considered important.

CMO Configuration 1: When information from QD is generated consistently and systematically (Resource) and legitimised through management engagement (Context) its key message will be seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness of the wards performance (Outcome).

As QD have been shown to generate information about performance (Maben et al., 2012, Strome, 2014). The quality of the information and how it is used have been identified as key mechanisms for change (Table 10 and Table 12). To drive change, information from QD needs to be timely, accurate, and believable. Believability is enhanced when the information comes from a trusted source and is based upon recent performance. Engagement with information was more likely when ward leaders considered it important. In one study (Flottorp et al., 2010) the opinion of local leaders was found to be more effective than audit and feedback (Flottorp et al., 2010, Coleman, 2013, Dixon-Woods et al., 2013, Jeffs et al., 2014a, Ivers et al., 2014).

The initial theory of importance:

Information generated by QD needs to convey a story

CMO Configuration 2: When QD information is contextualised or given with an educational component (Resource), and there is a need to improve performance (Context) the message is seen as important (Reasoning) and the information used to adopt or change practice and increase effort to reduce deficit (Outcome).

The greatest improvement in quality and safety were seen when performance data were discussed in person with individual staff members (Dixon-Woods et al., 2014). Contextualising or providing information that illuminates an area for improvement is one of the key features of QD and one of the intended consequences for the development of the WHC-QD. Feedback given with an educational component, used text or graphics or discussion was found to be more effective than information alone. Evidence from Actionable Feedback theory also suggests the effectiveness of feedback is dependent upon how information is given to individuals. Information that was found to be timely, individualised, and non-punitive was found to have the greatest impact upon an individual's behaviour. Simply providing performance data was found to rarely lead to change (Hysong et al., 2006, Hysong et al., 2012, Ivers et al., 2012, Hysong et al., 2017).

5.5.2 The initial theory of disruption

QD information can cause disruption which leads to change.

CMO Configuration 3: When a ward has previously performed well (Context) and QD information reports negative information (Resource), this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.

FIT which suggests people regulate their behaviour through comparison, if a discrepancy is identified between a standard they have committed too and their behaviour they will try and resolve this by adjusting their effort in a particular direction. When wards have received positive metrics scores and then performance dips, this has the potential to cause disruption. FIT suggests new information, such as negative performance data can redirect a person's locus of attention either towards or away from a task. When attention is directed towards at task, change is more likely. FIT acknowledges that people often have competing priorities so only deficits that receive attention will result in change. When feedback is aimed at goals of self, this can cause anxiety and has greater potential to lead to behaviour change. As self is subjective, this could explain variation in the impact of audit and feedback within an organisation and why ward managers more than any other role are engaged with QD feedback (Kluger and DeNisi, 1996).

Initial theory of Disruption:

Consistent disruption caused by QD data will lead to change.

CMO Configuration 4: When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid scrutiny (Reasoning) and disrupting how the ward is viewed by patients and managers (Reasoning) a change in practice will be initiated or the ward manager will seek help (Outcome)

As staff working within hospital wards have many competing priorities it is possible performance data that shows a drop in performance does not initially result in change (National Institute of Health and Care Excellence, 2014). However if this deficit is tracked over time and remains an issue change will be initiated. This may be because the feedback message is harder to reject the longer it is in place. It is also possible that ongoing deficits in performance are more likely to receive managerial scrutiny and are interlinked with the theory of avoidance.

5.5.3 The initial theory of focus

Informative feedback will lead to improvement

CMO Configuration 5: If a ward has a performance deficit identified (Context) and a specific focus for improvement is given (Resource) if the metric is considered important (Reasoning) and there is recognition (Reasoning) change is needed staff will engage with the information and increase effort to improve performance (Outcome)

This theory describes the need for staff to understand what is being measured and the standards that underpin the metric. Audit and effective feedback have been shown to improve compliance with standards, with the greatest improvement often seen when a significant deficiency in performance is identified. Knowing what you are being measured against is an important factor in this. Improvement can be made if objectives are specific, measurable, achievable, relevant, time-bound, and a clear action plan is provided (Ivers et al., 2014). On a practical level, nurses used quality dashboards as daily aide memoires to remind them of their wards priorities and areas for improvement. For focus to be maintained reminders of the deficit need to be made explicit and often. Unlike CMO2 this information does not need to be brought to life by ward managers, its consistent presence suggests its importance.

5.5.4 The initial theory of reassurance

Awareness of QD over time can positively influence ward culture

CMO Configuration 6: When information from the QD (Resource) tracks performance over time, and staff are aware of their wards performance (Context) they become reassured (Reasoning) the care on their ward is safe. If QD information is used to recognise success, and staff engage with the information, this can lead to a change in culture as QD information becomes embedded in practice, discussed daily and used to plan care (Outcome).

While the majority of papers focus on addressing deficits in performance, several highlight the importance of using quality dashboards to recognise success (Dixon-Woods et al., 2013, Jeffs et al., 2014a, Ivers et al., 2014). Dashboards have the ability to provide reassurance about the care provided and can track improvements in performance over time. Staff can feel reassured that the efforts taken to improve care have been worthwhile when performance improves.

Although FIT fails to identify the feelings involved in receiving performance feedback information. They recognised feedback can produce feelings of pleasantness and this in itself can influence behaviour (Kluger and DeNisi, 1996).

Dashboards were also found to raise awareness of organisational priorities with the data use to bring focus to safety briefings, meetings and handovers between clinical teams. Once quality dashboards and their metrics become part of the culture of a ward staff often experience peer pressure to make improvements and maintain performance (Power et al., 2012, Dixon-Woods et al., 2013, Jeffs et al., 2014, Christiansen et al., 2014, Jeffs et al., 2014, Weiner et al., 2015).

5.5.5 The initial theory of avoidance:

QD offers an opportunity

CMO Configuration 7 When QD information (Resource) tracks performance over time (Resource) and identifies a need to improve standards (Context) (ward) managers who wish to avoid managerial scrutiny or publicly displaying negative performance information (Reasoning) ask staff to increase effort (Outcome), seek help (Outcome) and create

opportunities for staff to suggest changes in practice (Outcome) to improve performance.

Although there is limited evidence to suggest making performance information available to the public influence the behaviour of healthcare professionals, displaying performance data for patient and visitors to review needs to be explored.

Power et al. (2012) and Dixon Woods et al. (2013) have shown the greatest improvement in care delivery was noted when performance data were discussed in person with individual staff members or became visible to senior managers via root cause analysis or performance meetings. The motivation for this change may be linked to staff trying to avoid managerial scrutiny. This has been described by goal theory and suggests when a discrepancy in performance is identified people are motivated to reduce it. This differs from goal setting theory that suggests people are motivated to achieve a goal rather than reduce a discrepancy. The aim is to avoid the cognitive dissonance caused by the deficit, or address the feedback deficit by attempting to achieve the standard. (Carver and Scheier, 1981, Latham and Locke, 1991)

Using dashboards to raise awareness of the challenges within wards reassured staff that senior managers would support and were engaged in efforts to improve the quality of care. The engagement of senior management signalled collective responsibility for improvement and gave permission for all staff members to make suggestions for improvement. The implementation of dashboards can also lead to an increase in awareness and interest in quality improvement and had the potential to reduce the spread of misinformation and anecdotal reporting. Performance information may appeal to individuals who want to make changes within their wards. Staff will need to be given the capacity and training to interpret and use data in a meaningful way and be given the opportunity by ward leaders to make changes in practice (Coleman, 2013, Dixon-Woods et al., 2013, Jeffs et al., 2014b).

5.5.6 Unintended consequences

Although not specified in the programme theories, consideration was given to the unintended consequences of QD implementation and the circumstances that may result in their activation. Evidence suggests there are a range of unintended consequences or dysfunctional consequences of health performance measurement systems (Appendix V) and these are more likely to come into play when

achievement or compliance with metrics are used to determine who should be given rewards or highlights poor performance which could lead to reputational damage for an individual. Identifying poor performance can lead to ward stigmatisation and associated anxiety for staff working in those areas. This has been associated with behaviours such as gaming or measure fixation (Petersen et al., 2006, Griffiths, 2008, Van Dishoeck et al., 2009, Okes, 2013). Where staff engage in measure fixation or gaming, although wards metrics may improve there will be no real change in practice or benefit for staff or the patient (Illingworth, 2014).

5.6 Chapter summary

This chapter described how evidence from a scoping review, board papers, audit and feedback literature, and unintended consequences concerns, were brought together to develop the initial programme theories to explain how QD influence care delivery within hospital wards.

Mechanisms were separated into resource and reasoning to aid identification and potential contextual factors identified. A number of outcomes were presented and seven CMO configurations put forward as initial programme theories under the headings of, Importance, Disruption, Focus, Reassurance and Avoidance. These theories will be further refined in Chapter 6 when they are discussed with QD stakeholders.

Chapter 6: Phase one: Theory refinement

6.1 Introduction

This chapter sets out the steps taken to refine the initial programme theories set out in chapter 5. It reports on the stakeholder recruitment phase of the study and outlines the process used to refine and develop the programme theories. The methodology and methods used to undertake this phase of the research is set out in Chapter 4. This chapter will present the findings and explain how this information will be used to develop and refine the programme theory.

6.2 Stakeholder interviews

Realist evaluation considers stakeholders as a key source of information to elicit programme theory and bring insight, their tacit knowledge and understanding about how a programme is supposed to work. When considering who to recruit, Manzano (2016) recommends interviewing participants selected from a broad range of stakeholders with knowledge of the programme under investigation. As developing a WHC-QD is a significant strategic and financial undertaking, it was no surprise that the majority of stakeholders were staff working in the macro and meso level of the organisation and therefore the number of potential participants was limited (Keen et al., 2018b).

6.3 Findings

Using the recruitment strategy set out in Chapter 4, 11 participants were recruited to this phase of the study. The first interview performed on the 29th May 2015 and the last on 11th August 2015. Interviews lasted between 30 and 60 minutes.

Participants were recruited from a wide range of senior management roles within the organisation, including four that were identified as key to the development of the WHC-QD. An outline of the roles and responsibilities of the participants in relation to the WHC-QD and their role within the HCP is presented in Table 15. None of the participants asked for their data to be removed from the study.

Table 15 Phase 1 participants

Job Title	Role in WHC-QD	Participant
Chief Nurse	Executive sponsor of WHC-QD.	A
Nurse Director	Has hospital wide oversight and responsibility for WHC-QD data. Generates Board papers using WHC-QD summaries.	B
Nurse Director	Has hospital wide oversight and responsibility of WHC-QD data.	C
Head of Nursing	Had responsibility for leading the development and design of the WHC-QD including leading engagement events. Reports to the Director of Nursing Corporate.	D
Head of Nursing	Senior Manager, part of the management team of the clinical Service Unit (CSU), responsible several hundred nursing posts including several wards or departments. Reports to Director of Nursing Operations.	E
Head of Nursing	Senior Manager, part of the management team of the clinical Service Unit, responsible for several hundred nursing posts including several wards or departments. Receives WHC-QD reports for the clinical service unit and reports to Director of Nursing Operations.	F
Head of Nursing	Senior Manager, part of the management team of the clinical Service Unit, responsible for several hundred nursing posts including several wards or departments. Receives WHC-QD reports for the clinical service unit and reports to Director of Nursing Operations.	G
Lead Nurse Informatics	Senior nurse with responsibility for supporting Informatics projects within the Trust. Had responsibility for development of the WHC-QD. Reports to the Head of Nursing corporate.	H
Matron	Senior manager, responsible for overseeing standards of care, operational delivery of care. Oversees a number of hospital wards or departments. Receives WCH data for their ward/departments and reports to a Head of Nursing.	I
Senior Nurse	Senior nurse working within a team of staff with responsibility for delivering education and training to improve standards of care or trust wide initiatives. Reports to the Head of Nursing Corporate.	J
Clinical Educator	Senior nurse working with a Matron with responsibility for education and training across a number of wards or departments. Often has responsibility for specific initiatives. Reports to a Matron.	K

6.3.1 Intended outcomes of the WHC-QD.

As outlined in earlier chapters, the WHC-QD was a programme developed to provide a strategic overview and rich data to allow ward team to focus their attention on actions that will improve patient outcomes and experience and identify wards who provide safe care and those in need of support. As explained in Chapter 4, realism recognises a social programme or intervention does not generate the outcome, they work by offering resources designed to influence a person's reasoning. RE looks to explain causation, or what triggers something to happen or change to occur. This stage of the research begins by trying to understand why the WHC-QD was developed and the intention behind the programme.

Throughout the participant interviews, it became clear that the WHC-QD was developed principally as a tool to gather and collect data that could be used to provide assurance regarding the standard of care within the organisation.

Previous attempts to provide assurance regarding the quality and safety of care had been difficult with information held in various different healthcare systems. The participants shared their frustrations at previous attempts to generate reports about the performance of wards.

"I had about a day a week to go into the numerous different spreadsheets to obtain data, and then I'd have to cut and paste it in the format, paste it into another format, and then take bits of information, from all over the place really, and pull it together to allow it to tell me a story" (Participant H).

It was also difficult to acquire comparable data prior to the WHC-QD, so there was no benchmark with which to judge how a ward was performing.

"I had various bits of information, that were collated on different IT systems, but no generic overview of what the quality metrics were for nursing. There was nothing to say either celebrate success or where wards were in difficulty or need support, there was no comparison data" (Participant B).

Several participants also highlighted the difficulty with organising a comprehensive overview of quality and safety within a large multi-site healthcare organisation.

"when I asked the question how many falls were a consequence of the patient's comorbidities, or drug related, or what have you, no one could tell me. I wasn't confident that I could stand up in an annual public meeting and demonstrate to the public that I knew why patients were falling, getting

pressure ulcers; or losing weight when they were coming into hospital”
(Participant A).

The need for strategic oversight of the quality care was evident from the participants. As set out in Chapters 1 and 2, the move towards transparency and the need to supply regulators with vast sums of performance data was a mandatory requirement. Senior healthcare managers appeared worried about how a large HCP organisation could provide assurance the care within their organisation was considered to be safe, one participant recalled being asked by a healthcare care regulator how did she know care on her wards was safe and she was not confident she could provide them with a comprehensive answer.

“When the CQC came they went to a collection of wards and were not happy with the care, I was asked how assured are you in relation to the safety and quality of care within the wards that all under your remit in division. I remember thinking what evidence have I got? I hadn’t got any evidence” (Participant D)

There was also a sense that safety of healthcare in the NHS was under more scrutiny than ever before in light of the public concerns regard care (Appendix A).

“Since Francis was published, since the Daily Mail and the Stafford (Mid-Staffordshire Public Inquiry) and everything that goes with it, so the learning disabilities element, I think there is much more scrutiny on the wards than there has absolutely ever been” (Participant I) .

It was however clear from the participants that the WHC-QD was the start of the journey towards ward to board assurance and oversight (Machell et al., 2009)

“So if you're an individual ward sister you can use that data to help you get support via your matron and upwards, but if you're in a director position or chief nurse or whatever position, you can see the temperature of your wards” (Participant A).

The WHC-QD had fulfilled part of its commitment, as it was seen as programme that could provide a strategic overview and capture rich data. It also seemed reasonable to classify the WHC-QD as a quality dashboards as it was capable of consolidating and arranging information across a large organisation and allowing summary views of multiple metrics to allow a quick assessment of overall performance (Few, 2004). What was less clear was how the WHC-QD was expected to improve the quality of care or persuade those working with directly with patients to change behaviour when needed.

6.3.2 Importance 1

Information generated by the QD needs to be considered important

CMO Configuration 1: When information from QD is generated consistently and systematically (Resource) and legitimised through management engagement (Context) its key message will be seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness of the wards performance (Outcome).

Hospital wards are busy, complex social structures where staff face competing priorities on a daily basis. The theory of importance suggests information from the WHC-QD would only lead to change if it was seen as important. For it be seen as important, it needed to be generated consistently. The literature also suggests information from QD needed to be consistent and timely. Several participants confirmed the timeliness of the WHC-QD data was important, as delays in receiving information detracted from the information's value.

“You know, we've got some of the March's data still up and we're going into June. April's only came, you know, like a week ago and I think that's what they struggle with (ward managers) from an actual operational element the lag creates some challenges in itself” (Participant E).

Participants working operationally, had a clear view that as the information was retrospective, it did not contribute to their day-to-day routine.

“So it tells you how it was two months ago, but actually, as an operational manager, you know, I'm managing today and the future, so I have to get that from other sources” (Participant J).

The systematic generation of data seemed to be an area of particular interest; participants felt information that was automatically generated was more robust. There was a sense that information reported to external agencies or displayed publicly would be accurate and trustworthy, especially if it was used to prepare reports for regulators, commissioners and displayed on PSB's. The accuracy of the data was enhanced when information was pulled from electronic systems within the organisation.

“So I think we’ve got a higher degree of confidence in terms of where data is harvested automatically from within Trust systems, that it’s robust” (Participant B) .

The believability of WHC-QD was deemed important, as the researcher and several of the participants had been involved in several meetings where the focus of discussion was centred on what the information was telling us and trying to discredit the data rather than identify how to improve the care.

What we used to do if, you know, I went to an hours meeting, we spent 50 minutes debating whether the data was right or not, and then at the end of it we’d say, well are we going to do anything? Whereas now we go and we say, this is the data. If you think it is inconsistent, it’s consistently inconsistent. It gives us a much stronger footing to have much more honest and transparent discussions with them” (Participant E).

The accuracy of the data was considered more robust when automatically generated and less credible when an obvious error was present.

“When you see that (WHC-QD) coming through, so that’s when I then start to say, well it’s not right, how can it be? And when she sends... 107%, so yes, where I spot inaccuracy I immediate start to disregard that as a credible indicator” (Participant H).

During the interviews, several participants also identified that the validity of data could be negatively affected by the behaviour of the auditor during the ward metrics audit programme (WMAP).

6.3.2.1 Role of the Auditor

The participants suggested staff would devalue or discredit data in the context of negative performance results. The participants suggested if information can be discredited or devalued, it loses its importance and becomes less likely to change behaviour. The credibility of staff undertaking the WMAP and their behaviour during the audit visits was seen as an opportunity to discredit the data.

There was a perception that auditors from the corporate nursing team were more likely to find problems with the standards of care and give a negative performance score.

“So if a senior nurse from corporate land comes to do your audit they (Ward staff) feel that they will get a worse score than if a head of nursing from operational land comes to do your audit as you never achieve their standards (Participant K)

Interestingly a negative score given by an auditor from an operational role was thought to be more believable and more important as they considered them a peer.

“If the real nurse from operational world gave you a bad score I think they'd be inclined to believe it, and be disappointed” (Participant J).

The credibility of the WHC-QD data was also questioned when the robustness of the WMAP was in doubt.

“I had one of my wards, there was a lot of challenge that went back because the auditor came on, she did it in 20 minutes; if they don't believe in the auditor they will lose faith in the results if it's not positive. (Participant I)

Participant were also concerned when auditors visited the ward, completed the audit and left before giving any advice or feedback to staff.

“So their expectation is the auditor feeds back because what they were doing was leaving the ward and then they were amber or red and they were like, hang on a minute, if you're telling my care is not up to the standard that we expect, my expectations of you is that you feedback” (Participant C).

This was seen as a missed opportunity to influence change and reduced the credibility of the auditor and the WMAP results. Credibility was enhanced when the auditor engaged with staff during the audit, discussed the results and identified areas for improvement.

“We want the auditors to be, we want them to go and help that ward get better, not to go and put a policeman's hat on at the door, you know, metrics police, and walk in and be all hard and harsh, and it's about saying, you know, you've done a really good job of this, but we need to focus on this now” (Participant D).

The participants considered a credible auditor to be a senior member of staff, working in an operational role, and someone who could explain the audit standards and discuss their findings at the time of the visit.

6.3.2.2 Organisation legitimises QD

What was clear from the interviews was the importance of the WHC-QD in providing a focal point for discussion in meetings and performance reviews. As previously outlined, participants were unable to have an overview of performance prior to the WHC-QD. Several mentioned they could not imagine life without the WHC-QD now. It appeared its functionality had become part of the senior management landscape

“I hear heads of nursing and matrons describe how they use that information in one to one meetings with their ward sisters, I think there are parts of the organisation where it is used, it is embedded into day to day practice”
(Participant F).

Although participant F, suggested it was embedded in every day practice, several participants found it of limited value in supporting day-to-day operational issues. Where the WHC-QD could add day-to-day operational value was identifying wards in need of additional help and support.

“So for instance one of my wards was red, so it was about me, the lead clinician, business manager, doing weekly formal visit to say, how are you, what do you need, what do you need the help for.” (Participant G)

The organisation also used the WHC-QD to check compliance with patient safety alerts and patient safety risks. If a specific concern was raised, the WMAP would be adapted and a trust wide position of compliance could be generated.

I know some of the medicine questions completely changed in March and that was reflected from some of the lessons learnt and SUI (serious incidence) information to see if we have learnt our lessons (Participant H).

6.3.2.3 Public display of performance information

Publicly displaying performance information via the PSB was one of the key features of the WHC-QD. As information was displayed for visitors to the ward, there was an assumption it must be important. Participants were however unsure how the information was used by patients and visitors.

No one's every rung us to feedback anything, could you come and speak to a relative or can you come and explain this and I've never witnessed anything. Therefore, as a visitor to a ward, I am not sure how useful it is, but I still think it is probably one of the most useful ways to display that information (Participant B).

The PSB were located at the entrance in each ward and updated monthly with visual displays of performance data. Participant K was also unsure how information displayed on the PSB was used to influence practice.

"I think I am unconvinced of there being a direct relationship between staff thinking that, goodness, this information is visible to the public, and that linking through in terms of influencing practice" (Participant K).

Or if relatives engaged with the PSB

"So when I ask staff in clinical areas, I don't think staff believe that relatives spend a lot, or families spend a long time, looking at the boards, so the public display of information. I've had feedback that they are not often asked questions about the information that is displayed" (Participant F).

While it was suggested that publicly displaying performance data might enhance credibility, none of the participants could identify a situation where it had been referenced in a complaint or discussion with patients or relatives.

6.3.2.4 Revised theory

The interviews supported the idea information generated from the WHC-QD had to be timely, accurate and valid. Initially this was identified as a resource offered by the programme but could also be seen as a context, as consistent, believable data, enhanced the credibility and importance of the WHC-QD information and was more likely to trigger an outcome. The interviews revealed the perception that, in the context of negative performance information, staff would take an opportunity to discredit the importance or validity of WHC-QD data.

Automatically generated data was seen as more robust than the WMAP data due to the subjectivity of the auditor. Subjectivity gave staff an opportunity to question the validity of the WMAP data and diminish its importance. As the information from the WHC-QD was used in management and governance meetings and displayed in

each ward area, it was seen as important, and overtime the credibility of the information was accepted. Although it was unclear from the interviews how the information displayed on the PSB was used by patients and visitors, it was considered an important source of information for staff and used to remind them of the organisations priorities and recent performance. Based on these findings, CMOC1 was revised as follows

Information generated by the QD needs to be considered important

Revised CMOC1 Importance: When QD information is generated consistently (Resource+ **Context**) with **credible audit processes** (Context) and legitimised through management engagement (Context) it is seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness performance (Outcome).

6.3.3 Importance 2

Information from the WHC-QD was seen as important when it was contextualised or given with an educational component. To contextualise is to give meaning in a real context or situation, this adds value to the information and enhances its importance.

Information generated by QD needs to convey a story

CMO Configuration 2: When QD information is contextualised or given with an educational component (Resource), and there is a need to improve performance (Context) the message is seen as important (Reasoning) and the information used to adopt or change practice and increase effort to reduce deficit (Outcome).

The greatest improvement in quality and safety were seen when performance data were discussed in person with individual staff members (Dixon-Woods et al., 2014). Contextualising or providing information that illuminates an area for improvement is one of the key features of QD and one of the intended consequences for the development of the WHC-QD.

Feedback given with an educational component, using text or graphics or discussion was found to be more effective than information alone. Evidence from Actionable Feedback theory also suggests the effectiveness of feedback is dependent upon how information is given to individuals. Information that was found to be timely, individualised, and non-punitive was found to have the greatest impact upon an individual's behaviour (Hysong et al., 2006, Hysong et al., 2012, Ivers et al., 2012, Hysong et al., 2017).

The CMOC suggests contextualised information from the WHC-QD is considered more important and therefore more likely to lead to an outcome, in the context of a performance deficit. Participants supported this view

"I think when (the WHC data) it's real and about real people, it's more meaningful than if it's about a name or a number. You know, I don't know, human nature I guess to kind of if you personalise it and make it about a person then it means more and it bothers you more" (Participant K).

Contextualisation was also about raising awareness of why the standards were important and using examples to emphasise their importance.

"It's about awareness isn't it, it's about driving that understanding to say why that's important. You know, resus trolley [emergency equipment] check, might seem an insignificant thing, but you know, well what's one day missing a resus trolley check, but if you get them to understand that actually on that day there's a piece of kit missing and if it's not check what was going to happen to that patient, then they can see... it's the understanding isn't it that underpins what it is" (Participant H).

It was also important to understand any personal attachment given to the data, this participant and supported a nurse who had experienced a very traumatic resuscitation and felt very personal about this particular standard.

"I personally checked those resus trolleys [emergency equipment] to see when they were last checked, of those 56 only 5 of them had been checked in the last month, and some hadn't been checked for longer than two months and when I approached staff about that they, there seemed to be a lack a sense of importance. I just felt that was a big risk, and having gone through and learnt the trauma that you put nurses through that end up in Coroner's Court" (Participant A).

Several participants suggested it was the role of the ward manager to interpret the WHC-QD data and contextualise it or bring it to life for staff working within ward

“Most people can feel good at that because a year ago you had a patient fall every seven days, now a patient only falls every 30. Well that doesn’t take much to understand, you don’t need a picture, and you don’t need numbers, a simple statement” (Participant A).

Ward managers were also expected to use the information to develop action plans to improve care and present the information in a way which made it more meaningful for staff.

“I think other wards just display them and not a lot of interest is paid to them. So I think it does vary on how the ward is using that to the leader of the ward, even perhaps to the matron sometimes and how much they use that information” (Participant D).

Although no specific guidance or training on how to contextualise WHC-QD information was available, ward managers had developed their own strategies to present information to staff.

“Some ward leaders hand them over, so as they get their new board they will have a theme of the week and a theme of the month, and the ten key steps that goes on the ward board they will change them appropriately” (Participant D)

Evidence from participants suggests contextualising WHC-QD information adds to its importance and is often the responsibility of the ward manager. Although WHC-QD information is displayed on the PSB, there was no guidance to suggest how ward managers should communicate key messages to staff. Contextualisation was therefore dependent upon the ability and experience of ward managers. The CMO configuration was revised to include the role of the ward manager

Revised CMOC 2 Importance. When there is an need to improve performance (Context) and the WHC-QD information is **contextualised by a Ward manager (Context)** (Resource), the information will be seen as important (Reasoning) and used to adopt or change practice and increase effort to reduce deficit (Outcome).

6.3.4 Disruption

The programme theory of disruption was developed to include two CMO configurations

CMOC 3 Disruption: When a ward has previously performed well (Context) and QD information reports negative information (Resource) this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.

CMOC 4 Ongoing disruption: When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource Context) to avoid scrutiny (Reasoning) and disrupting how the ward is viewed by patients and managers (Reasoning) a change in practice will be initiated or the ward manager will seek help (Outcome).

While both CMOC's are based on disruption, they represent different reactions to disruptive performance data over time. Disruption is the interruption in the usual way a system or process works. Information from the WHC-QD can disrupt staff views or perceptions of how a ward is performing. Negative WHC-QD data has the potential to disrupt a person's view of how care is delivered or how their ward is performing.

“At one point it was literally just a RAG rated, you are bad. You are bad because this is red. I didn't think that was a good thing” (Participant F).

Participants felt disruptive performance information could lead to a change in practice or an increase in effort to reduce the deficit.

“We use the information to discuss I'm looking at doing this change or trying to implement this. So for example, it may reflect that your care is good and you've got greens and a 100% or whatever the mark is, and it might encourage you to then work harder to get a better, maintain or get a better score” (Participant E).

It was suggested that staff may choose to initially reject the WHC-QD data if it was the first time an issue with performance was identified.

“I think when the Health Check first came out, because they were red, the sisters were very upset and distressed because they said they felt their

wards were either good or that they had been given that message previously. So they didn't value it really, and they didn't value the metrics and measures initially when it first came out" (Participant B).

However, when the WHC-QD information repeatedly showed care was below the agreed standard, despite an initial increase in performance, staff may use WHC-QD data to seek help and support from managers to avoid the ongoing disruption caused by the negative WHC-QD information.

"Where you think you're struggling and you did in fact get a lower score, that's your key to say to your manager, I need help with, because we're not doing very well on. So if you're an individual ward sister you can use that data to help you get support via your matron and upwards. I think especially in light of Mid Staffs, it goes back to the how do you demonstrate to people other than your own rhetoric, when you are trying to explain that you need help, support, I think they're really useful" (Participant E).

Several participants used the WHC-QD as a programme to support staff and provide a focus for improvement rather than using it as a performance management tool.

"I do think that as a visual tool to help them to work towards process improvement is a good thing, but a dashboard in itself can't do that, it has to be part of a process of improvement where it's used as a tool to document and visualise where the pinch points are I guess, or where the problems might be" (Participant F).

The participants confirmed that disruption remains an important CMOC to explore in phase two of the study as it has the potential to motivate staff to change practice, behaviour and effort. It is also important to consider how the influence of negative performance information changes with time. While no change may initially be seen, the mechanism may not trigger until consistent negative performance information changes the context for staff working within the ward. The CMOC's for disruption remain unchanged.

6.3.5 Focus

The purpose of dashboards are to summarise complex data and provide summary views of multiple metrics to allow a quick assessment of overall performance. They bring focus to positive and negative performance, therefore the focus CMOC was based upon these principles.

CMOC 5 Focus /Aide memoire

CMOC 5: If a ward has a performance deficit identified (Context) and a specific focus for improvement is given (Resource) if the metric is considered important (Reasoning) and there is recognition (Reasoning) change is needed staff will engage with the information and increase effort to improve performance (Outcome).

Much of the evidence for QD is centred on their ability to bring attention to a problem or deficit and the subsequent plan of action or change that occurs. There was evidence to suggest the WHC-QD data was used to highlight areas for improvement that resulted in the development of specific actions plans within ward areas.

“We developed the ten-point plans, so that actually the really important aspects of that policy were clearly on a very visual chart, available to them that they could use and use and that’s supposed to be a visible thing on the board, and everyone’s supposed to have a copy, and this is what we’re working on this week ” (Participant A).

However, it was possible the aide memoires or action plans were a focus for senior managers, matron, and ward managers rather than staff working within the ward areas. Participants did confirm the WHC-QD was used to improve communication within the ward and raise awareness of the organisational priorities to reduce infection and harm from pressure ulcers, falls and medication errors.

“So the ward rounds are better, the safety briefings and the MDT, rather it just being about discharge it’s about high risk patients, it’s about pressure ulcers, it’s about falls, it’s about incidents that go with that [WHC-QD] they integrate it into their daily work, they don’t just see it as a performance management or a support” (Participant B).

Participant C also confirmed successful change was more likely when the information was embedded and discussed routinely in practice.

“They need to be all singing from the same hymn sheet, you know, they need to know what it is that we want from them, getting things into their practice, you know, rather than it just being a Monday, Wednesday, Friday thing, getting it into their routine and making it a daily practice for them to, you know, having an influence on their practice so that it's improving their practice” (Participant C).

Participant G was concerned focusing on specific WHC-QD metrics may divert attention from other issues within a ward or department.

“I do think it can sometimes make us focus in a specific direction at risk of other things”.

These unintended consequences are recognised risks of QD and have been shown to diverted attention from genuine quality improvement initiatives to improve a deficit in a particular metric.

6.3.5.1 Knowledge of standards

Using WHC-QD to focus efforts to improve care is only possible if staff know what they are being measured against and the changes needed to improve. The participants suggested staff would have knowledge of the results displayed upon the PSB but may not be aware of the measures or audit standards that create the dashboard.

“I think, in all honesty, if you said to me, am I confident that the Band 2 on a ward, if you went and said, tell me what your metrics are for nutrition, the five categories, they'd glaze over. I think there is still a hierarchy of need to understand the detail, and I would expect the ward sister to be that person who would be going onto the dashboard quite regularly”. (Participant H).

As change was more likely when staff understood what was being measured strategies to improve performance were developed which focused attention on a particular area of practice.

“So if there's something on the dashboard for that month where we've failed on, we will use that as a message of the week or whatever, and that message gets given and what we're going to do to action it at every handover period. We've tried on one of the units, we're trying to give out a message with every handover” (Participant F).

Other participants shared the audit standards with staff to remind them of where to focus their attention and action plans for improvement.

“So I think by making the standards clear by virtue of saying these are the questions that we are ticking yes and no for, crystallises your thinking, okay, can't do that anymore” (Participant J).

In light of the importance of having an awareness of the standards performance was measured against, the CMOC was refined to include knowledge of standards as a contextual factor that may increase the likelihood of change occurring.

CMOC 5-Focus: If a ward has a performance deficit identified (Context) **if staff are aware of the standards** (Context) and a focus for improvement is given (Resource 2) if the metric is considered important (Reasoning) staff will engage with the information and increase effort to improve performance (Outcome).

6.3.6 Reassurance

As identified earlier in this chapter, one of the reasons the WHC-QD was developed was to provide assurance to senior managers that the care within the HCP was safe. WHC-QD also have the potential to reassure staff, care within their ward is safe. While previous CMOC's have been based upon information from the WHC-QD identifying deficits in performance, this CMOC is based upon its ability to highlight success and improvements in performance.

CMOC 6: Reassurance

CMOC 6: When information from the QD (Resource) tracks performance over time, and staff are aware of their wards performance (Context) they become reassured (Reasoning) the care on their ward is safe. If QD information is used to recognise success, and staff engage with the information, this can lead to a change in culture as QD information becomes embedded in practice, discussed daily and used to plan care (Outcome).

An awareness of performance over time was identified as an important resource provided by the WHC-QD.

“I thought that dashboards, if we were measured in our performance then everybody should know about it, right down to the housekeeping staff really. I thought everybody would be made aware of it and then everybody would

have a chance to improve on their practice and things would get better from thereon in” (Participant C).

Being aware of performance and changes over a time allowed staff to see if their increase in effort or strategies for improvement made a difference to the metric. This was seen as an opportunity to use the WHC-QD information to recognise achievements and celebrate success.

“So I think it focuses the team of what's going well and actually... they celebrate success, so they celebrate what they've done well, but not only that, where they're not they'll integrate together and they will pull together as a unit rather than just a ward or the Band 7” (Participant B).

Some participants were concerned the information would be used as a performance management tool.

“For performance management, absolutely. And I think our culture would tell us that's what we use the dashboard for. You know, you were red or you're green, and if you're red, it's not good” (Participant H).

“You could use it supportively or you could use it as a stick to beat people” (Participant E).

As the WHC-QD allowed comparison of wards and was the first objective measurement by which to quantify success and reassure staff the care provided had met or was above the standards expected by the HCP. Reassurance and recognition of success were identified by participants as important factors in encouraging staff to increase or maintain performance.

“I think having seen it running in Salford where it is absolutely part of their culture and they're proud of being... they get a little badge and they get an award and all the rest of it, and the senior nurses become matrons. And that feels something really to be proud of. So when you see it working in another organisation you can think, well actually yeah that really drives... will really, really drive practice, because people want to be in one of those wards, people want to achieve to be something (Participant F).

Following the participant interviews, the CMOC was revised to recognise the importance of using the WHC-QD as a tool for highlighting both positive and negative performance.

Revised CMOC 6- Reassurance: When information from the WHC-QD (Resource) tracks performance over time (Resource) and recognises success or improvement, (Resource) staff can see if improvement strategies have worked and are reassured (Reasoning) care on their ward is safe. This is likely to lead to greater staff engagement with WHC-QD programme (Outcome).

6.3.7 Avoidance

As the WHC-QD has the ability to highlight positive and negative performance, the theory of avoidance was developed to understand how and why negative performance information leads to change.

CMOC 7: Avoidance: When QD information (Resource) tracks performance over time (Resource) and identifies a need to improve standards (Context) (ward) managers who wish to avoid managerial scrutiny or publicly displaying negative performance information (Reasoning) ask staff to increase effort (Outcome), seek help (Outcome) and create opportunities for staff to suggest changes in practice (Outcome) to improve performance.

Participants confirmed negative performance data was a driver for change, as

“Nobody wants to be in red, I mean, you know, nobody likes it when they're in red” (Participant F)

When asked if other members of the ward team feel responsible for the metric results, the participants suggested that when the WHC-QD results were seen as ‘good’ or ‘green’ then staff were collectively proud of their ward, but when it was red, individuals were less likely to feel personally responsible.

“I think if was good they'll be proud of it, if it was red it was nothing to do with them” (Participant E)

The concern was the WHC-QD performance was an indicator of the quality of care provided by the ward. The participant identified that poor metric scores often accompanied other safety or leadership concerns.

“The wards in escalation, there's an absolute triangulation of ward metrics versus pressures with leadership, with staffing, a sudden change, an incident

maybe, I have rarely been surprised of any area that's gone into escalation
(Participant A).

6.3.7.1 The role of the ward manager

The participants also suggested ward managers experience a sense of responsibility for the WHC-QD results as they feel they reflect their leadership or management abilities.

"I think there's something for ward sisters and charge nurses that is probably very personal about this" (Participant C).

The role of the ward manager was identified as a context and resource when WHC-QD data was contextualised. However as improvement requires staff engagement with plans to improve performance, participants overwhelmingly identified the role of the ward manager and their leadership abilities as key to effecting change.

"My experience is that it's been about the ward leadership and what those ward leaders are able to do" (Participant J).

It recognised that time to support the ward managers was an issue

"Resources is the biggest barrier to change. Leadership is the second biggest barrier to change" (Participant D).

In particular participants suggested it was how the ward manager engaged with staff to highlight the need for improvement.

"I think it's about getting all your members of staff on-board as a team, and I think that that obviously boils down to how successful that ward manager is and the junior sisters and the clinical educator I suppose. But I think you've got to have all the team on-board as well" (Participant E).

"I think that all comes from leadership. So I would say, if you've not got a leader in there that believes in it and is driving it, you won't get the rest of the staff on-board" (Participant F).

As the CMOC for avoidance identified the role of the ward manager as crucial in enabling or disabling change. Rather than the using the 'role of the ward manager' the participants suggested it was there leadership style and ability to engage staff with performance improvement strategies, therefore the CMOC was refined to reflect this.

Revised CMOC 7: Avoidance: Ward managers who wish to avoid (Reasoning) the managerial scrutiny that comes with repeated negative performance information, (Resource + Context) will show leadership (Context) and seek help and develop strategies (Outcome) to improve performance within their ward.

One participant believed once staff were engaged with the WHC-QD data it encouraged leadership from all staff members and was a focus to bring teams together to meet the standards. The information was also used to share ideas of how to improve processes to achieve the targets.

“So there's a leadership at the Band 5 level that wasn't there before. I think they work much better, the senior teams, and the ward team MDT because it's very much about you all have to get it right to get your Dashboard right” (Participant B).

Success was thought to be more likely when the ward managers understood the standards within the WHC-QD; they believed in the data and used the information to develop action plans and strategies for improvement.

“I think that all comes from leadership. So I would say, if you've not got a leader in there that believes in it and is driving it, you won't get the rest of the staff on-board. Because what the staff see is the dial, they don't see everything underneath that do they, so generally I suspect they will see the board, and depending on whatever the senior nurse feeds back to them, would depend on how much they've bought into it. But I think it is absolutely about the individual who is responsible for that area to, as a leader to feed that information back” (Participant F).

Participants identified competition as a factor in making improvements with participant E, citing the case of a ward manager who started with low metric scores, identified what needed to improve, and developed an action plan. Over time, the scores improved, driven by the competitive nature of the ward manager.

“So that ward leader, maybe she had a slightly competitive nature, so was driven by those targets to make her ward improve, but nevertheless it worked because she then got to that sustained position, because, you know, on the reduced assessments but didn't just hang her coat up and put her feet back up on the desk, as part of that process she was already driving further

improvements which weren't necessarily monitored on the dashboard" (Participant E).

Several other participants also identified competition as a possible mechanism that needed to be considered.

6.3.8 Competition

All of the participants interviewed identified competition as a mechanism for change. The suggestion was the nature of healthcare was competitive but prior to the WHC-QD there had not been an objective system to measure the performance of wards.

"I think there is that competitive nature of we work in...I heard a lecture recently about we're tribes, so in healthcare you have tribes, and I guess it's the same thing as that kind of sibling rivalry" (Participant G).

Once performance could be measured, it allowed wards to be ranked according to performance and league tables to be developed. This visibility of performance allowed competition to flourish which became a potential mechanism for change.

"It's really simple, [the WHC-QD] it's like the star system at primary school isn't it, it's really simple and you can't imagine that it works, but it does. People are... competitive people are just driven by just that, whatever it is, a piece of paper, it's just that... it's like playing a card game isn't it, it's the need to better, it overrides all rationality" (Participant E).

Competition seemed to be limited to associated or comparable wards within specialist areas such as the ward next door rather than across the whole organisation.

"From my position as a ward manager and not in my role now, I'm competitive, so I wanted to be the best. I had a healthy competition with my peer ward next door, and we had constant banter each day, oh what are you doing, and that definitely helped. If one ward scored more than the other, you know, the next month you had to do better" (Participant D).

It was also seen as an opportunity for ward managers to come together to share ideas for improvement.

"So we had at least one cup of coffee a month and a sit down and we'd go through what we did to make it better. And we shared that in our bigger meetings because we all shared that because we all got on really well as the ward sisters, So we would, after our sisters meetings we would talk about what we did, how we got it better, go and look at stuff" (Participant D).

To explore competition as a mechanism for change, a new CMO configuration was developed.

CMOC 8: Competition: As QD information has the ability to identify performance over time (Resource) the performance of wards can be ranked and viewed by senior managers within the organisation (Context). This will engage ward managers (Context) to compete (Reasoning) with other wards which will lead to improvements in performance (Outcome).

6.3.9 Unintended consequences

Although not specified in the programme theories, consideration was given to the unintended consequences of QD implementation and the circumstances that may result in their activation. Evidence suggests there are a range of unintended consequences or dysfunctional consequences of health performance measurement systems (Appendix V) and these are more likely to come into play when achievement or compliance with metrics are used to determine who should be given rewards or highlights poor performance which could lead to reputational damage for an individual. Identifying poor performance can lead to ward stigmatisation and associated anxiety for staff working in those areas. This has been associated with behaviours such as gaming or measure fixation (Petersen et al., 2006, Griffiths, 2008, Van Dishoeck et al., 2009, Okes, 2013). Where staff engage in measure fixation or gaming, although wards metrics may improve there will be no real change in practice or benefit for staff or the patient (Illingworth, 2014).

When asked about concerns regarding gaming, participants considered the use of senior nurse from outside the ward area or management team to reduce bias. However as outlined in earlier in the chapter concerns regarding the auditor was found to have an impact on the believability of the WHC-QD data

6.4. Refined programme theory and CMO configurations

The initial programme theories of importance, disruption, focus, reassurance, and avoidance were refined using the phase 1 participant interviews. The role of the auditor when undertaking the MAP was identified as a specific contextual factor as it was suggested by participants that their behaviour at the time of the audit had an impact on the believability and therefore the importance of the WHC-QD results. When the credibility of the auditor or the validity of the WMAP was questionable,

the message from the WHC-QD was likely to be rejected and change was therefore unlikely to occur.

The initial theories identified the role of the ward manager as a significant contextual factor in leading to improvement. This has been changed to 'leadership' to emphasise importance of behaviour that effects change rather than a designed job role or title. The issue of leadership is also linked to competition that has been added as a new CMO configuration to explore in Phase 2. Although the literature identified competition as a potential mechanism for change, this was often linked to a commercial model of increased patient choice or patient numbers (Shekelle et al, 2008, Ketelaar et al, 2011). The potential mechanism identified by the stakeholders was not linked to a desire to be the best, but better than peers or to simply to avoid being 'last' rather than a need to be 'first'. It is possible this was linked to the avoidance mechanism and was highlighted by participants as an area for further investigation. The revised programme theory summary are presented followed by updated CMO configurations to be tested in phase 2.

Theory: Importance

Revised CMOC1: Importance: When QD information is generated consistently (Resource + **Context**) with **credible audit processes** (Context) and legitimised through management engagement (Context) it is seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness performance (Outcome).

Revised CMOC2: Contextualisation: When there is an need to improve performance (Context 4) and the WHC-QD information is **contextualised by a Ward manager (Context + Resource)**, the information will be seen as important (Reasoning) and used to adopt or change practice and increase effort to reduce deficit (Outcome).

Theory: Disruption CMOC 3: Disruption: When a ward has previously performed well (Context) and QD information reports negative information (Resource), this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.

CMOC 4: Ongoing disruption: When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid scrutiny (Reasoning) and disrupting how the ward is

viewed by patients and managers (Reasoning) a change in practice will be initiated or the ward manager will seek help (Outcome)

Theory: Importance: Revised CMO 5:

Focus: If a ward has a performance deficit identified (Context) if staff are aware of the standards (Context) and a focus for improvement is given (Resource) if the metric is considered important (Reasoning) staff will engage with the information and increase effort to improve performance (Outcome).

Theory: Reassurance: Revised CMOC 6:

Reassurance: When information from the WHC-QD (Resource) tracks performance over time (Resource) and recognises success or improvement, (Resource) staff can see if improvement strategies have worked and are reassured (Reasoning) care on their ward is safe. This is likely to lead to greater staff engagement with WHC-QD programme (Outcome).

Theory: Avoidance: CMOC 7:

Avoidance: Ward managers who wish to avoid (Reasoning) the managerial scrutiny that comes with repeated negative performance information, (Resource +Context) will show leadership (Context) and seek help and develop strategies (Outcome) to improve performance within their ward

Theory: Competition: New CMOC 8:

Competition: As QD information has the ability to identify performance over time (Resource) the performance of wards can be ranked and viewed by senior managers within the organisation (Context). This will engage ward managers (Context) to compete (Reasoning) with other wards which will lead to improvements in performance (Outcome).

6.5 Chapter summary

This chapter has reported on the results of the stakeholder recruitment phase of the study. In total 11 participant were recruited from the case study site. The chapter described how the initial 7 programme theories set out in Chapter 5 were refined using evidence from participant interviews. New Contexts, Mechanisms and Outcomes were identified and the new theory of competition introduced. All eight theories considered for evaluation will be described in Chapter 7.

Chapter 7 Phase 2: Results and theory testing

7.1 Introduction

This chapter presents the findings from Phase 2, and outlines the steps taken to test, confirm and reject the refined programme theories. The data collected in phase two is diverse and includes quantitative and observational data, information from key informants who are directly affected by the programme under investigation and visitors to the case study sites (Wong et al., 2016). The data gathered throughout phase two will be used to interrogate the programme theories and CMO configurations and used to explain theory. The aim is to identify potential mechanisms and use evidence to support or refute the theories, while considering the contextual factors that may influence a person's volition (Westhorp, 2014, ODE, 2015, Wong et al., 2016, Porter et al., 2017).

7.1.1 Results: Observation of interactions with the PSB.

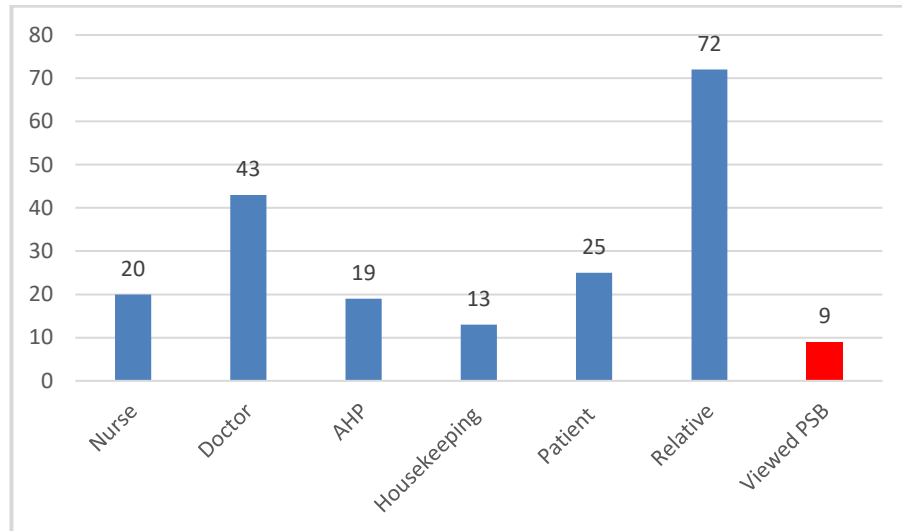
A total of 9 observations across the 3 case study sites took place. Their purpose was to observe visitor interaction with the PSB. Each observation was one hour in length and timed to coincide with hospital visiting hours, a summary of the observations are presented in Table 16. In total 195 visitors were recorded as entering the ward during the periods of observation. No staff were observed interacting with the PSB and only nine visitors. Three of the nine visitors were visiting relatives in the rooms next to the PSB (Figure 23).

Table 16 PSB observation

Case Study Site	Time	Nurse	Doctor	AHP	House keeping	Patient	Visitor	Views PSB
A	1	1	6	2	0	2	8	0
	2	3	3	0	2	3	7	1
	3	2	7	3	4	3	9	2
B	4	1	3	4	1	4	5	1
	5	3	3	3	0	3	7	0
	6	2	4	3	1	4	9	1
C	7	3	9	2	2	2	14	2
	8	3	3	1	2	3	7	0
	9	2	5	1	1	2	9	2
	Total	20	46	19	13	25	72	9

Of the nine visitors seen to be observing the PSB, six agreed to be interviewed for the study.

Figure 23 Visitors to case study sites



7.1.2 Visitor to the case study site interviews.

The researcher anticipated more people would be seen engaging with the PSB and a sample size of thirty was estimated. The fact that so few people were seen to be looking at the board, is in itself an important finding, In total only 6 of the 9 visitors agreed to participate, 4 from case study site C and 2 from case study site A. Five of the six participants expressed a view that displaying WHC-QD information was important.

“I think it's important. In my job in my career I was head of a university, the same sort of argument. We had people say to us, well your budget's 90 million tell us, is it value for money? So I'm very much in favour evaluation and monitoring so long as it doesn't become too excessive because that distorts from your behaviour. So I agree with what you're trying to do, and it's important that we as... well I suppose we're not customers, we're patients, we as patients have a good knowledge of what you're achieving and how well you're achieving and what you're seeking to achieve” (Visitor 5).

None of the six had the information explained to them, but three thought it was self-explanatory.

“Well that tells you how they're doing, obviously. That's the key standards of care, that's like you say, it's been seen they had this infection or that infection or a fall or sores, pressure sores. And I think... and that's the staffing levels, I mean I can understand all that, so yeah” (visitor 3).

They also expressed a view that transparency and the accuracy of the data was important.

“Well I'd still want to know because I think it's honest, that's honesty rather than somebody telling you a lot of lies saying, oh no that doesn't happen in this hospital” (Visitor 4).

When asked about the impact of displaying negative performance information, the visitors, confirmed that it may prompt them to ask staff about the data.

“Well I wouldn't be happy, put it that way, I wouldn't be over the moon, I'd have a word, yeah. I'd want to know why it isn't up to standard” (Visitor 3).

When asked if the PSB could be made better, two visitors suggested a simpler display in the form of star ratings and one suggested an electronic version with audio.

Although based upon six interviews, there was agreement that displaying performance information was an expectation and part of being open and transparent. Although visitors would be concerned about seeing negative performance information displayed, there was agreement the information should be displayed and it may prompt visitors to discuss their concerns with staff. Although the information was considered self-explanatory, staff had not explained the information to relatives, with visitor suggesting star ratings or an electronic display may have made the information easier to understand.

7.1.3 Results: Observation of the Ward Handovers and Safety Huddles

Handover and safety huddles were observed on 9 occasions. As handover and safety huddles take place at a pre-determined time, the researcher observed one morning and one evening handover and one safety huddles in each case study site. Each observation lasted approximately 30 minutes. The field notes taken were used to assess if any information or key messages from the WHC-QD was specifically mentioned within the handover.

As the primary function of handovers is to ensure continuity of patient care, it became evident that each handover followed a pattern, with those giving handover

highlighting salient points from a pre-printed sheet. The pre-printed sheets had headings used as aide-memoire to guide each patient report. Key topics such as resuscitation status, social care needs, medical history, risk of falls, pressure ulcer care and allergy status were discussed with a rhythmic sense of purpose as large volumes of information passed between staff members. Staff members were seen to write on pre-printed handover sheet, underlying key facts and creating little boxes that would at some point during the shift receive a tick to confirm a task had been completed.

The initial hand written notes of the researcher were awash with endless abbreviations, as the researcher was initially worried that key points would be missed. On reflection and review of the information captured during the handovers, it became apparent the information discussed was for passing on information about individual patients. Although information about key metrics within the WHC-QD was discussed, this was associated with specific patient needs rather than to highlight a ward performance issue, or to suggest changes in practice. Handovers were focused upon ensuring key aspects of patient care was communicated to the incoming staff members, with limited time for discussion or opportunity to discuss performance information. In case study site B, specific areas for improvement were discussed in each handover and staff were reminded to focus on a particular area for improvement. Certain tasks such as checking the status of the resuscitation trolley was also discussed. Case study site B had developed their own checklist to remind the nurse responsible for coordinating the shift to undertake specific tasks that were part of the ward metrics audit programme (Figure 24).

Figure 24 Ward checklist

Ward Metrics
Audit Results

E : CU check and evidence to two signatures, date	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	0.0%
F : Fridge locked	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	0.0%
G : Fridge temperature recorded daily	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	0.0%
H : Secured medicine trolleys	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Co-ordinator Checklist

This checklist must be completed on **every shift** to ensure the ward is safe

- Current staffing - is there enough staff to manage the patient teams. Is the next shift staffed adequately?
- Bed state? Any potential discharges? - get these planned early on to free beds.
- Is the resuscitation trolley checked?
- Are patient observations prescribed?
- Has patient care been handed over fully?
- Is the White board up to date?
- Safety Huddle at 09:00 - Focus on **FALLS/ PRESSURE CARE/ NUTRITION**
- Any **CHEMOTHERAPY** planned for the day?
- Are there any **TRANSPLANTS** planned?
- Have patients who require escalation of care been assessed and a plan made?
- Are medicines lockers are locked and surfaces clear of drugs post drug rounds?
- Fridges to be kept locked and temperatures checked daily
- Are breaks allocated fairly?
- Is there any same name patients - share with the team
- Any safety/ learning bulletins to share in the red folder?
- Ward BMT round meeting attended at either 08:30 or 09:30 times depending on which month shared with J88.
- Ward Round Times:
 - **Lymphoma:** 09-11 Monday, Thursday 11-1
 - **Myeloma:** Mon 10:30-1pm, Thurs 09:30-12:00
 - **BMT:** Mon 10:30-1pm, Thurs 09:30-12:00
 - **Myeloid/ RCC:** Mon AM, Thurs/Fri AM or PM
- Communicate - does everyone know what the patients plan is?
- Have a positive Huddle at the end of the shift!!!
Have a nice day 😊

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The three safety huddles observed were used as an opportunity to update team members and identify patients who were unwell or those at risk of falls or developing pressure ulcers. Within the safety huddle, staff were reminded of specific tasks that needed to be completed, and aspects of patient care that needed attention. The huddles were also an opportunity to include positive information about recent performance and reminders of changes in practice or new documentation.

7.1.4 Results: Review of WHC-QD data and ward documentation

To inform and guide the participant interviews and non-participant observations, access to WHC-QD data for each case study site was provided by the HCP. The data was exported from the WHC-QD into an Excel document, examples of the information is available in Figure 27. The case study sites performance over time is shown in

Figure 25 and Figure 26 with specific areas for improvement identified by the wards metric audit programme results also shown in Figure 27.

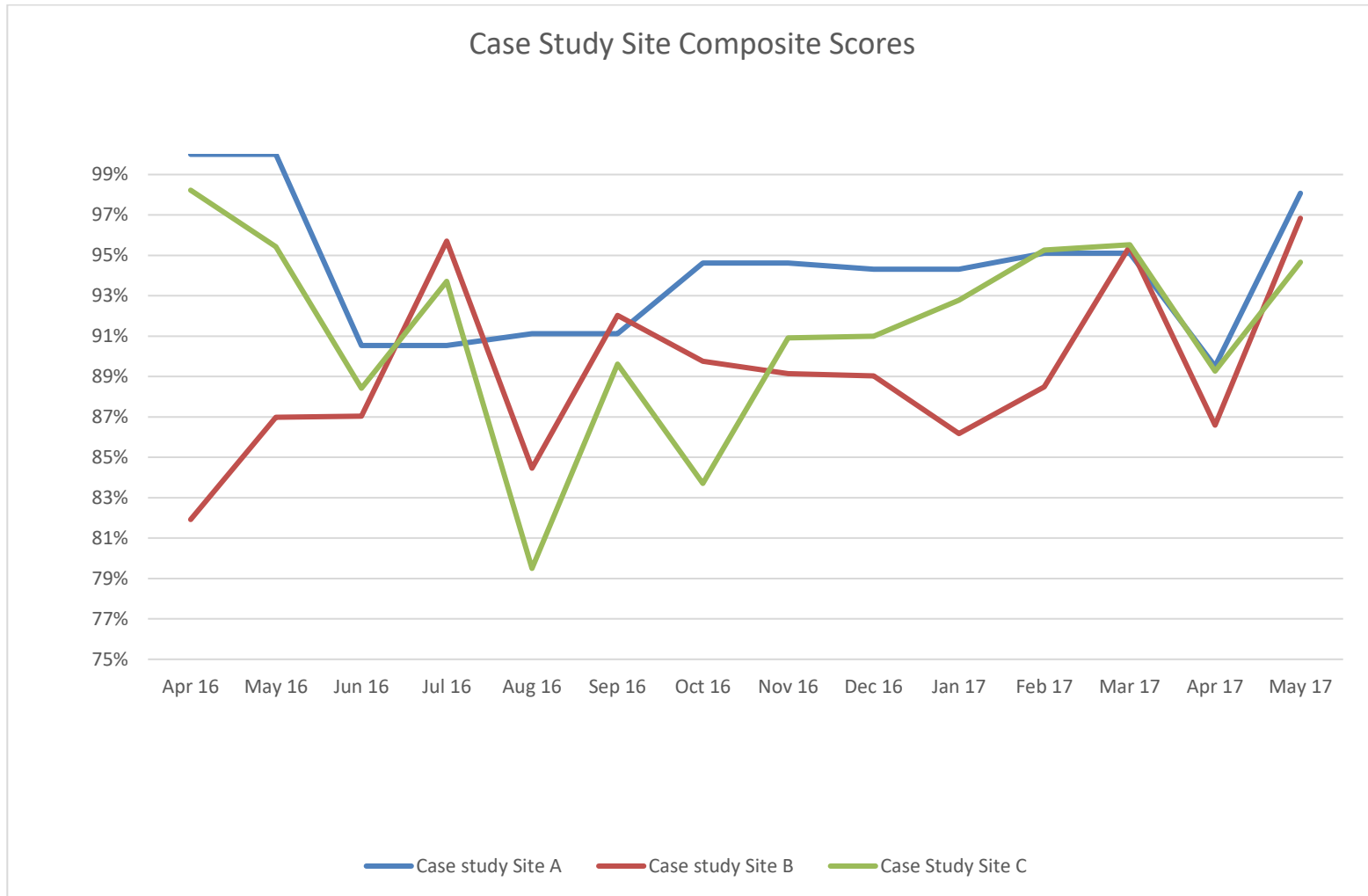
Case study Site A's WHC-QD data showed their performance to be rated as 'Green' with composite scores consistently above 90%. Case study site B, had several months where the score was less than 90%, and case study site C had two periods where their performance dipped below the expected standard, but had been consistently green in the months immediately prior to the staff interviews. Case study site B's performance was due to multiple issues identified from the metric audit data. These included, checking of fridge temperatures, undertaking controlled drug safety checks, ensuring patients have their observations and oxygen prescribed, and completing patient risk assessment documentation.

These findings were used to inform the participant interviews and provide an overall assessment of the case study sites performance over time. Participants were asked about specific areas for improvement highlighted by the WHC-QD data to establish if the performance data influenced practice. The information was also used to check the participants perception of their wards performance and understanding of what was being measured. All three case study sites did show an improvement in their composite scores since the introduction of the WHC-QD (Figures 25 and 26).

Figure 25 Case site scores

Metrics Results									
Case Study Site	July 2016	August 2016	September 2016	October 2016	November 2016	December 2016	January 2017	February 2017	March 2017
A	91%	91%	91%	95%	95%	94.3%	94.3%	95.1%	95.1%
B	96%	84%	92%	89%	89%	89.0%	86.2%	88.5%	95.5%
C	94%	80%	90%	84%	91%	91%	92.8%	95.3%	95.5%

Figure 26 Case study site performance over time



7.1.5 Results: Participant interviews

In total 30 staff members were recruited to participate in Phase 2 of this study between March 2017 and July 2017 (Table 17). The participants were staff recruited from a range of roles within each of the case study sites. The aim was to explore the programme theories and CMO configurations with different staff groups to understand how the WHC-QD influenced their behaviour or approach to organising patient care. None of the participants asked for their data to be removed from the study.

Table 17 Staff interviews in Phase 2

Role	Case Study Sites			Total
	A	B	C	
Senior Sister/Ward Manager	1	1	1	3
Sister	2	1	3	6
Staff Nurse	5	4	3	12
Clinical support worker	1	1	3	5
Ward Clerk	2	2	0	4
Total	11	9	10	30

7.2 Refined Programme Theory and CMO configurations

The WHC-QD was a tool for assurance, and a programme used to provide data to ward teams. The aim was for the information to be used to develop or trigger actions that would improve patient outcomes and experience. To improve patient outcomes and experience the WHC-QD has to influence the behaviour and actions of staff working within wards. The interaction between the resources offered by the WHC-QD and how staff responded to the programme mechanisms are central to realist evaluation. As mechanisms can be constrained or supported by context, realist evaluation also expects contextual factors to be identified and included in the CMO configurations.

7.3 Theory: Importance

The CMO configurations under the heading of importance were based upon evidence that suggests information from QD's are likely to be acted upon if the information is considered believable, generated consistently, and legitimised by the organisation or those in a position of authority. The credibility of data can be influenced negatively by inconsistency, lack of face validity, and its usefulness to staff in their day-to-day activities.

Theory: Importance: CMOC :Importance: When QD information is generated consistently (Resource + Context) with credible audit processes (Context) and legitimised through management engagement (Context) it is seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness performance (Outcome).

7.3.1 Consistent QD information.

The theory identified consistent information, as a resource and a contextual factor that influenced the credibility and importance of the WHC-QD information. Staff within all three case study sites, confirmed they received data from the WHC-QD via their ward manager and from the information displayed on the PSB. Only one staff member confirmed she had accessed the WHC-QD but this was for specific information needed for root cause analysis meetings. The other 26 participants confirmed they had not seen or were not aware of how to access the computer based WHC-QD.

“Not as much as [Ward Manager] does, she tends to get more involved with that than I do. I know where to find it, if I'm doing an RCA or something like that. The information displayed on the ward, I check that every day, because I make sure it's updated. That sounds really weird but yes, we tend to check that every day” (Site a, Sister 11).

All three managers confirmed they only accessed the WHC-QD on a monthly basis, usually around the time the WMAP had been completed.

“If I'm completely honest I will probably look at it when I know that they've done my metrics. And usually, probably I look at it once a month, when I've had my metrics done. If I've got more time in the office, it's all dependent on the time that I have in the office” (Site C, Ward Manager 4).

One ward manager used the WHC-QD to track their progress and used it to gather contextual information about their wards performance compared to other areas.

“Quite a lot really, because I think, well I personally tend to look at it in advance, to see where we are, where we are in the ratings, and if anybody’s in escalation, or how we’re doing. So quite often, I’m often checking on there to see what’s happening. Because I like to be in green all the time, and be up there” (Site A, Ward Manager 20).

The phase two interviews confirmed the wealth of information available within the WHC-QD was only every accessed by ward managers and those working within the macro and meso (Table 1) level of the organisation. Those working within the micro level of the organisation (ward) relied upon the information displayed upon the PSB and updates from their ward managers. When asked if staff were aware of management engagement with the WHC-QD results, there was a belief that the corporate nursing team would be monitoring results as well as matrons but the ward manager was responsible for reviewing the information and sharing it with their teams.

“I feel like probably corporate would look at it, the matrons would look at it. How in depth, I don’t know. I think they probably look at a lot of the ward health check, and look at whether you’re in escalation or not” (Site C, Ward manager 4).

Ticking of boxes could be considered as an unintended consequence of attempting to diminish the value of the WHC-QD.

“I think the ward managers are under lots of pressure, but ultimately if we’re not ticking all the boxes then they can’t force us to do it” (Site B, Staff Nurse 29).

When staff were asked if they believed the WHC-QD information, several confirmed they thought the information was accurate, but were unsure if it reflected the care on the ward.

Yeah I believe it. I believe that gaps are there. I think it’s very harshly marked. . So I believe the number as data, but I don’t think that they show what they’re designed to show. (Site B, Staff Nurse 29)

Other factors that influenced the importance of the WHC-QD information was when the credibility of the WMAP results were questioned by obvious breaches in standards of care which auditors missed.

“And I thought we don’t deserve 98%. Thank you for giving us 98%, but you know, you just think hmmm. But I think you get an idea when you’re talking to your patients” (Site C, Ward Manager 4).

Credibility of the auditor continued to appear as a theme throughout the interviews.

“But if you’re looking after six patients out of a whole ward, and not a single one’s got one in [audited care plan], but they’re still in the green, how does that work?” (Site A, Staff Nurse 15)

It was also reinforced when staff were aware of examples of incomplete or poor documentation in other wards that had positive QD results.

“Like when I see their documentations are probably 100%, and they come on here and half of it missing, I’m like something... they’re either lying or something is seriously, yeah” (Site C, CSW 3).

7.3.2 Credible audit process

The credibility of the auditor and the audit process was identified as an important context that affected the importance of the WHC-QD information. When asked how the behaviour of the auditor influenced the credibility of the WHC-QD data, staff were concerned about the time taken to do the audit.

“You hear of other people going to wards and doing it in 20 minutes, half an hour. Now to me, that is not a thorough evaluation of the documentation” (Site A, Ward Manager 20).

While others had a negative perception of the audit visit and considered auditors to be detached from the realities and challenges of working within a busy ward.

“They always tend to come on the busiest day at the busiest time when I think sometimes they expect things to have been done by maybe the time they arrive, but actually you know, they haven’t seen the full 13 hours day” (Site B, Staff nurse 27).

The majority of staff nurses and clinical support workers interviewed had never spoken to an auditor during the WMAP.

“No, I’ve never spoke to them, because they always like, take themselves off and not introduced themselves or said who they were, looking at the notes” (Site A, Staff Nurse 18).

The ward managers recognised the importance of engaging with the auditors during their WMAP visit.

“Because when they’d initially come on, when we were in a very, you know, negative place for a while, they’d come on and it was negative on the ward in general, and so nobody would talk to them. We weren’t doing well in the metrics, and everyone was just annoyed, and so they’d come on and you’d be like oh god, they’re going to find something that I’ve not done, and people would hide. And they wouldn’t talk to them” (Site C, Ward Manager 4).

There was also agreement that it was important for auditors to engage with staff during the audit and feedback any results or recommendations.

A good auditor is one that will feed things through, and if she’s struggling with something just sort of say, I don’t know about this It’s an absolute nightmare when they just come on, do the audit and then go, and don’t give you any feedback (Site A, Ward Manager 20).

One staff member suggested knowing there was an audit pending resulted in an increased effort to improve documentation.

“When it gets to that time when they come on, when you know sort of they’re due, we maybe up you game a little bit, they’ve not been to check us now and make sure everything’s in place and go through the paperwork and things like that” (Site, A Sister 11).

7.3.3 Box-ticking

When considering importance as a theory, several staff referred to the WHC-QD as a “box ticking” exercise or suggested the WHC-QD was a tool to improve documentation. Initially the researcher considered the perception of the WHC-QD as a ‘tick box exercise’ to be limited to Site B, which was the ward with the lowest metric scores. Referring to the WHC-QD as a tick box devalued its importance, and therefore the feedback message could be rejected. Further data analysis however identified participants from within all three case study sites referred to the WHC-QD in terms of “ticking boxes”.

“So if you’re scoring poorly on pain, that can be, it’s sometimes reflected just that it’s not ticked on your obs [observation] chart” (Site C, Sister 7).

This was also identified as a potential unintended consequence suggesting the organisation may be focused upon measure fixation

“I don’t know whether ticking a box necessarily means that someone’s had the right care, it means that someone’s ticked the box. And I don’t know whether the two always correlate” (Site A Staff nurse 15).

It was also considered a programme to improve paperwork rather than drive improvements in safety.

“It’s a way of measuring, it’s got to be done. It doesn’t always show a true reflection of what’s going on, because quite often the things that we get pulled up on are things like not having [ward number] written on a sticker, or not having the bed magnets on the end of the bed, which I personally, and I know this isn’t the corporate opinion. Something’s got to give. And the paperwork is what gives” (Site C, Staff nurse 2).

Staff had also been involved in audits and initiatives such as the ST and had questioned their purpose and value.

Where does it go? [The information] Frequently every month, on nights, you have to fill out this paper thing, which basically tells you bugger all, which then, the sisters have to put online, before 11 o’clock in the morning otherwise they get told off for having it not online by 11 o’clock in the morning. Where does it go, nobody knows what happens to it, who looks at it, what it proves, what’s it supposed to do, what’s its purpose? Why are we doing it? How does it help anybody? (Site A, Staff nurse 15).

It was also clear some staff were not aware of what was being measured and how the information was used. This was confirmed by the Ward Manager on Site B who had only recently been given access to the full WHC-QD.

“I’ve only recently got access to the electronic one, so I look at it now but I’m just starting to get used to how it works and getting the ward in and to like find it useful. So when I got access to it we were in escalation as a ward, which I didn’t realise until I got access to it. You can see very clearly why you’re in escalation and what you need to do to get out of escalation” (Site B, Ward Manager 30).

To revisit importance as a theory, the interviews with staff suggests the nurses, clinical support workers and ward clerks within all three case study sites received information from the WHC-QD via their ward manager and from the information displayed on the PSB. Staff were aware senior management such as Heads of Nursing, matrons and their ward managers, reviewed the information. There was an assumption the accuracy of the data was validated through the ward manager. Rather than question the reliability of the WHC-QD, staff were concerned the information did not always represent the care provided. Staff were more likely to question the reliability of the information or specifically the results of the WMAP when they reviewed documentation from other ward areas and found it to be lower than the standards expected and audited. Several staff gave examples of patients transferring from ward areas with positive metric results but found incomplete documentation that resulted in them questioning the audit process or the auditor.

All three ward managers felt staff should engage with auditors during the WMAP and emphasised the importance of receiving feedback during or on completion of the audit. Several staff and clinical support workers across all three case study sites had never seen or spoken to an auditor at the time of the WMAP.

Interestingly the importance of the WHC-QD seemed to be undermined or questioned by a suggestion that it was a “tick-box exercise” or a programme to improve documentation. Looking at the complexity of the WHC-QD and the performance information available, staff seemed to focus on aspects of the WMAP rather than the structure, process and outcome measures used to provide the WHC-QD composite summary. The theory of importance was therefore update to include lack of awareness of structure, process and outcome measures

Theory: Importance: CMOOC Importance
When QD information is generated consistently (Resource + Context) with credible audit processes (Context), legitimised through management engagement (Context) and staff have an awareness of the standards being measured (Context) the information will be seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness performance (Outcome).
Staff are likely to question the importance of the programme if there is a lack of awareness of what is being measured and why.

An awareness of what was measured and why, emphasised the important role contextualisation may have in how the WHC-QD data is used by managers to engage staff in making improvements.

7.3.4 Contextualisation

To contextualise or to consider something in context is to make information meaningful. As identified earlier, staff relied upon their ward managers to engage with the WHC-QD, check the credibility of the information and share it with their team. For the WHC-QD to influence care delivery, ward managers had to make the information meaningful for staff and important enough for it to lead to a change in practice or increase in effort. Several staff had expressed their doubts about the usefulness of the WHC-QD and considered it a programme for improving documentation or a 'box-ticking' exercise rather than improving the quality and safety of care. The CMOC identified the role of the ward manager as key to contextualising or making information meaningful and had identified it as a context and a resource when considering the mechanism of importance.

CMOC: Contextualisation: When there is a need to improve performance (Context) and the WHC-QD information is contextualised by a Ward manager (Context+ Resource), the information will be seen as important (Reasoning) and used to adopt or change practice and increase effort to reduce deficit (Outcome).

Throughout the interviews, it was clear the majority of staff in all three case study sites were not aware of how the overall metric score was generated or see relevance of measuring process and outcome measures. One way of contextualising WHC-QD information is to emphasise the link between process measure compliance and improvement in outcome measures. For example, improvements in completion of pressure ulcer risk documentation, (process measure) may reduce the number of patients who acquire a pressure ulcer while in hospital (outcome measure). As an example, staff were concerned about complying with the agreed standard of checking the emergency equipment every day.

“No, I don't feel the metric's always reflects the care because, sometimes you can be in red for things that don't involve care. Not directly, like you checking your crash trolley or how many times you've checked your CD checks and things like that I know it's an important part, but it's just, that bit I feel I a little bit unfair” (Site A Sister 11).

Several staff were also concerned about how relatives might perceive a negative result displayed on the PSB.

“You know like, if you’ve missed one crash signature, you fail for the whole month. Just think how does that look to relatives, when they’re walking past and it says you’ve gained 0% for resuscitation” (Site C, Ward manager 4).

In the interviews staff discussed the WHC-QD information in the context of achieving the standard, rather than explaining why the standard was important. Interestingly having interviewed the chief Nurse in phase 1 of this study, the 100% compliance threshold was set in response to their experience of supporting nursing staff who had to attend a coroner’s court to explain why the emergency equipment had failed to work during resuscitation of a patient. They had also undertaken her own snapshot audit of 56 wards and identified only 5 wards were compliant with the emergency equipment guidelines. It is unclear if knowing this information would have made a difference to how staff viewed the importance of achieving compliance with this standard, as their concerns were based upon undertaking more work in the time-pressured environment of a clinical ward.

“When they pull us up on something and it's like, yeah well this is a really minor thing, we've been really busy this morning, we haven't had time to just prescribe these obs” (Site B, Staff Nurse 27).

Again there was a suggestion that they missed ticking a box rather than what the metric actually represented.

“Yesterday was probably one of the worst shifts I've worked, we were all really busy, had quite a lot of poorly patients. And then like your paperwork kind of is your last priority and then if I miss a box then the whole ward gets marked down so it's stressful” (Site B, Staff Nurse 28).

Some staff did recognise the importance of completing risk assessments as they prompted staff to take action to improve patient safety.

“Well, the falls, because we’ve got the care plans, and the pressure ulcers, we’ve got care plans, so there’s more prompts to look into it. So you’re constantly having to evaluate their safety and stuff. So when you do your nursing assessment, it sometimes flags up that they are at risk, then you’ve got extra care plans then to do on a daily basis to make sure that everything’s been implemented. And it prompts you to get physio and to do all the other

bits and bats that you'd do for someone that was at risk" (Site A, Staff nurse 15).

When staff were asked if they were given information about outcomes measures such as pressure ulcers, medication errors, or patient falls, they referred to the metrics displayed on the PSB. Overall staff thought performance had improved since the introduction of the WHC-QD.

"Well if you notice that there is an issue with falls and you've got a target you know you can sort of address it as a ward, you know, identifying people that are a falls risk and then putting in place things to prevent falls. And if people are a bit more aware of the problem" (Site B, CSW 23).

There was however no evidence from the case study sites WHC-QD performance data or interviews to suggest the WHC-QD programme was associated with a reduction in patient harms such a falls, pressure ulcers or a link had been made through contextualisation to emphasise its importance.

Establishing causation within a large HCP is extremely complex. While outcome data from the ST (Figure 32) might suggest the number of falls in hospital has reduced since the introduction of the WHC, data must be considered in the context of changes in guidelines, risk assessments, and the introduction of specific initiatives to reduce harm from pressure ulcers, falls, and medication errors. It must be recognised that RE is an approach that is used to bring new understanding to social programmes, initiatives and interventions that are designed to solve problems or make improvements. As programmes are often implemented into complex social structures, it is recognised that outcome patterns will vary dependent upon the context. The purpose of realist evaluation is not to limit focus to successful programme outcome patterns but to explain what works, for whom, in what circumstances (The RAMESES II Project, 2017b). The aim of this research is to understand how and why quality dashboards influence care delivery within hospital wards and it not limited to the measuring outcome measures.

Considering the differences in bed numbers and patient admissions between case study sites, when outcome data was calculated over a 22-month period, there was little difference in the overall number of patients who developed pressure ulcers, experienced medication administration errors or fallen while in hospital. The friends and family test also showed little variation between sites (Figure 28). However, when the total number of pressure ulcers, falls and medication errors were

presented using a time matched sample for each site, a different perspective emerged (Figures 29, 30, 31). Case study site A was the only ward that had seen a year on year reduction in incidences. This emphasised the challenges ward managers faced when trying to use WHC-QD information to highlight areas for improvement, identify potential risks, or demonstrate the difference the WHC-QD has made to the quality and safety of healthcare. There was no evidence to support the assumption associating WHC-QD with a reduction in patient harm motivated staff to maintain or improve performance. Ward managers were found to be contextualising the WHC-QD information through their actions and reactions to the monthly summary of performance. When ward managers shared information about the WHC-QD results, thanked staff for positive performance scores, or implemented strategies and a focus for improvement in response to negative performance information the importance of the WHC-QD was reinforced.

Figure 28 Case study site outcome data

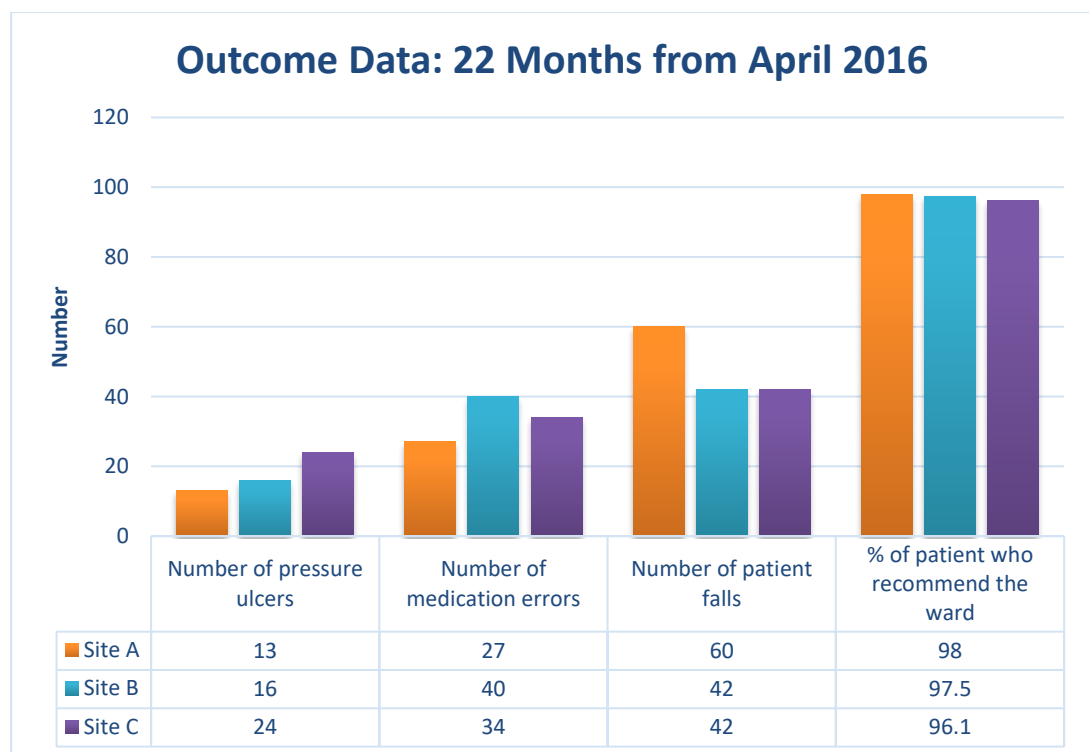


Figure 29 Study site A outcome data

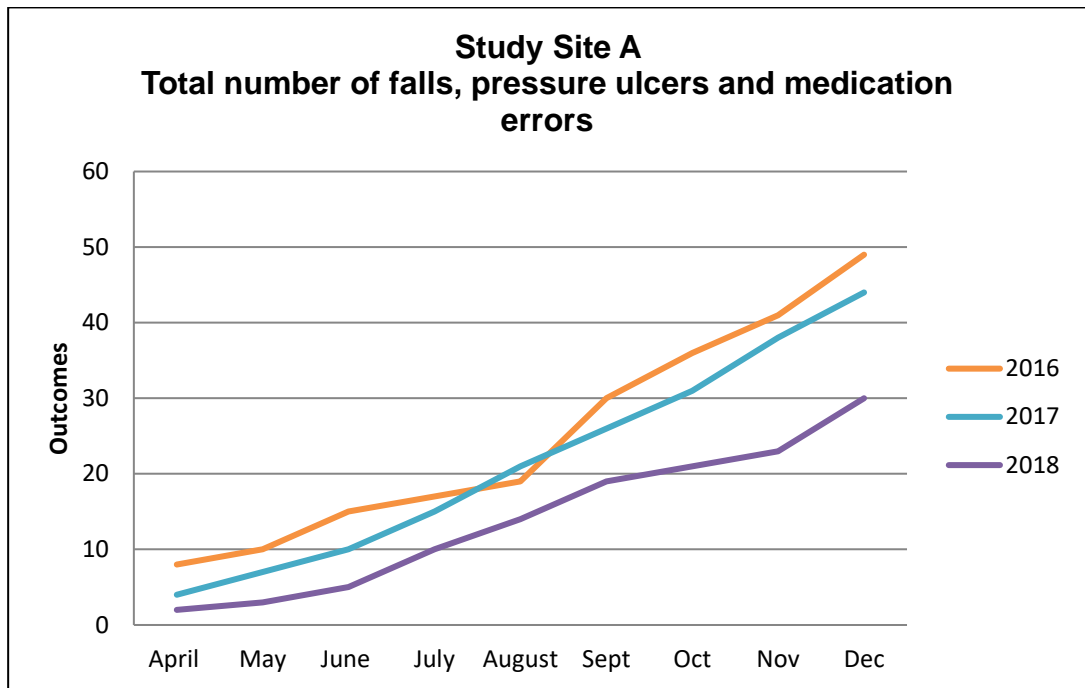


Figure 30 Study site B outcome data

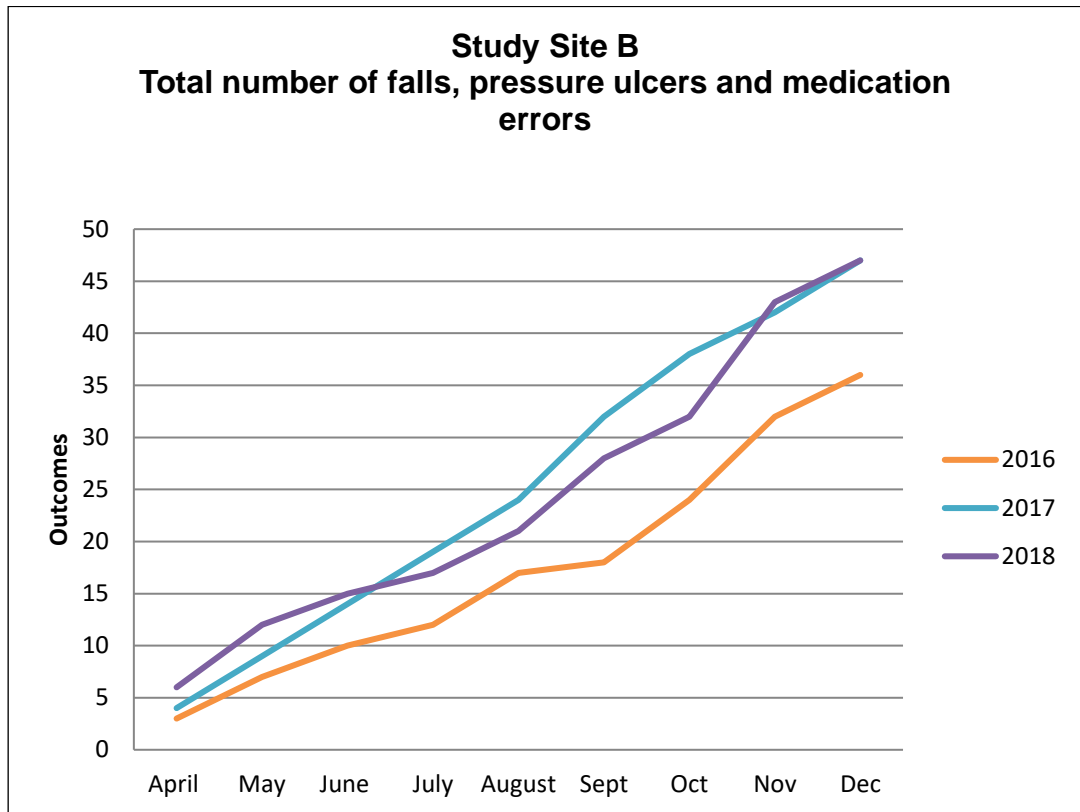


Figure 31 Study site C outcome data

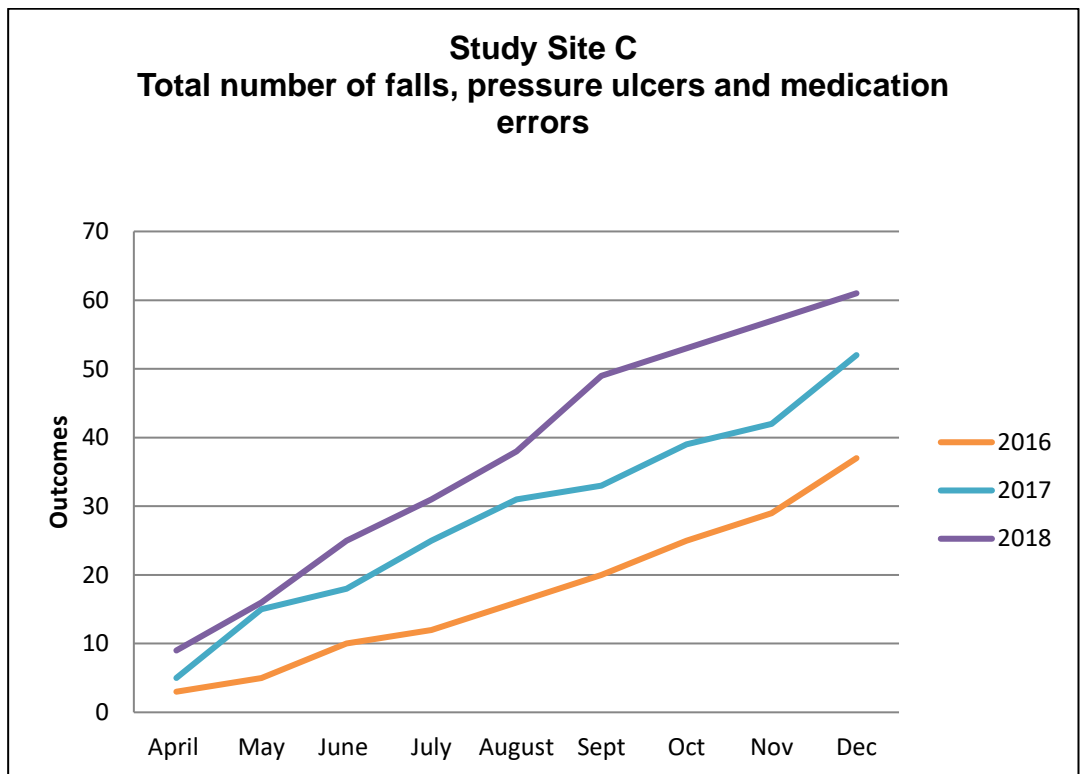
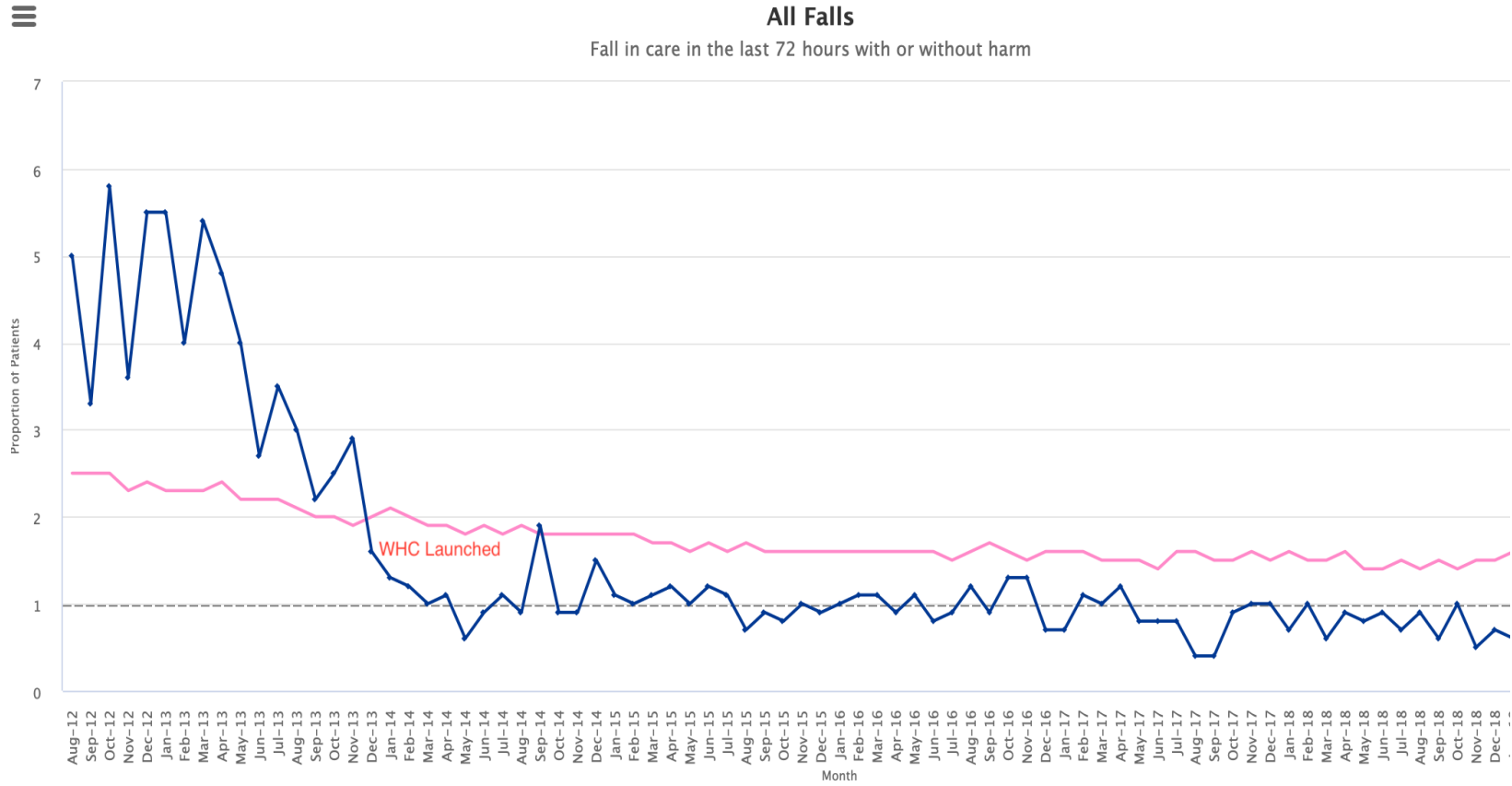


Figure 32 Proportion of patients who fall while in hospital



Ward managers' response to monthly performance information.

"Our [Ward Manager] tells us what's going on, everything that's gone on. Like I say, when we get the metric figures, she tells us straight away what we've got. If there's any problems on the ward, we get it on the huddle, every morning we have a huddle, and if anything's one on she tells us. It's all about communication, it's communication, communication, communication" (Site C Staff Nurse 10).

Other staff wanted to ensure performance was maintained out of professional respect for their ward manager.

"Oh, you can tell she's proud. You see on pay slips, team work makes the dream work, that type of thing. So she is happy that it's gone up" (Site C CSW 3).

The role of the ward manager and their leadership in response to the WHC-QD performance data was therefore identified as an importance context in the CMO configuration.

7.3.5 Leadership

As previously highlighted in Phase one the leadership of the ward manager and their response to the WHC-QD was found to be central to empowering, encouraging and leading change.

"I think people respond to that, and they respond to how their manager is working on the ward. So if they don't see their manager doing what they're asking them to do, they think well why should I bother. If they don't have confidence in the skills or the advice that the manager's giving them, then I think they, you know, they won't follow, they won't listen to what they're doing" (Site C, Ward Manager 4)

It was very clear from the staff interviews that improvement in each of the case study sites was attributed to the leadership of the ward manager.

Case study Site A

"We've got a brilliant manager, she came onto this ward as a Band 6 and was promoted up to a 7. She's very hands on, and that makes a massive difference because she's not prepared to ask people, or pull people up for stuff, that she doesn't know how to do herself. And I do think that makes a big difference" (Site C, Staff Nurse 2).

Case Study Site B

"She never like, names and shames. She wouldn't say like, you didn't fill this in in this care plan on this day. She'd just be like this is the areas that we're not doing so well in,

we need to be doing this. And I think it's a little nudge to say because half the time you're like, oh yeah, I don't do that" (Site A, Staff Nurse 18).

Case study site C

"So [Ward Manager] will give our latest metrics score, what we've done well on, what we need to improve on, and then when we were doing really badly. The [Ward manager] would physically go through every patient's paperwork and picking up the missing bits and saying, this person hasn't got this completed, this person hasn't had that done. Actually that got people filling in paperwork more than the strangers that show up" (Site B, Staff Nurse 22).

Staff also felt a sense of responsibility to maintain standards and 'not let the ward manager down'.

"we're a great as a team, we work as a team. And it's respect for [Ward Manager] as well, because she helps you, you know, she will, you know of you need anything. She's approachable, she's not like you know, oh she's the big boss, you know, she's approachable you can go to her. So you want to do well for her as well" (Site A, Staff Nurse 13).

In summary, some staff were unable to see the connection between the WHC-QD and improvements in patient safety. Using outcome data to demonstrate the impact of the WHC-QD on the quality and safety of care within the case study sites was difficult as although there was a reduction of the overall number of falls or pressure ulcers within the HCP as reported by the ST, the three case study sites showed limited change or improvement over a 22 month period. As it can be difficult to show WHC-QD was responsible for improving safety within the wards the outcome data from the case study sites were presented in a different formats to emphasis the challenges ward managers face when deciding how to use WHC-QD data. Only case study site A showed a reduction in incidences. As the ward managers confirmed that they had not received any formal training, guidance or advice about how to contextualise WHC-QD information, this was added as context, however as there was no evidence to support this notion, this is an area for future consideration. The interviews revealed that staff were more likely to respond to their ward manager's reaction to performance information rather than the information itself. When ward managers engaged with WHC-QD data and made it meaningful to staff through discussion and praise for positive performance, and a focus for improvement, this

reinforced the importance of the WHC-QD and was more likely to lead to outcomes. The CMO configuration was updated to emphasise the important role leaders' play in engaging and responding to performance information and how staff perceive this.

Theory: Importance CMO: Contextualisation
When there is a need to improve performance (Context) and ward managers, show leadership, engage with, and contextualise WHC-QD information and share this with staff (Context + Resource), the information will be seen as important (Reasoning) and used to adopt or change practice and increase effort to reduce deficit (Outcome).
Future consideration: Ward managers who undergo training on how to review, interpret and communicate salient points from the WHC-QD are more likely to develop communication strategies that lead to greater staff engagement with the WHC-QD information.

7.3.6 Focus

As discussed, a ward manager's response to negative performance information was often to highlight areas for improvement and provide a focus for change or an increase in effort. To aid the flow of the results, it was appropriate to discuss the focus CMO next. The focus theory was based upon evidence from the literature that suggests the main purpose of QD are to identify deficits in performance and areas for improvement against pre-determined standards.

CMO: Focus: If a ward has a performance deficit identified (Context) if staff are aware of the standards (Context) and a focus for improvement is given (Resource) if the metric is considered important (Reasoning) staff will engage with the information and increase effort to improve performance (Outcome).

The evidence suggests displaying QD information would act as an aide memoire reminding staff of aspects of patient care that needed to improve. Although staff interviewed were aware of information displayed on the PSB, there was no evidence to suggest this was used as an aide memoir. All of the discussion around improvement were initiated by the ward manager, often in response to accessing the WHC-QD or updated results on the PSB. This was highlighted by a ward manager who had only recently gained access to the WHC-QD and found the detail extremely useful in highlighting specific areas for improvement.

Within all three case study sites, ward managers had developed their own aide memoirs to remind staff to undertake certain tasks or improve performance in certain areas. Key messages and reminders were discussed in daily handovers and safety huddles. One ward had developed a checklist to remind staff to complete specific process measures (Figure 24) while another area used a staff notice board. One ward manager had developed a system of updating staff through attaching a written update to payslips that staff appreciated.

“Now we're using the handover from the dashboard, so that's maybe helping us fill the information out a bit more than we were before. Because we're printing that off every day and using it as our handover. It just prompts us to update it” (Site B Sister 24)

Safety huddles were used to move the WHC-QD into every use and information from the WHC-QD was displayed in staff rooms and communication folders.

“So at the end of handover whoever is in charge, either one of the sisters or whoever is in charge goes through a folder which has got notes and messages in. So will give our latest metrics score, what we've done well on, what we need to improve on, and then when we were doing really badly” (Case B Staff Nurse 29).

Using the summary from the WHC-QD rather than the PSB allowed a more detailed discussion on what needed to improve. As an example staff in case study site B, were aware they needed to improve compliance with prescribing patient observations (Figure 24). This approach did lead to improvements in performance for prescribing observations.

I suppose it's about recognising what we can improve in; so it helps us to identify the areas that we're maybe lacking in and can develop. There is something that we can bring to the team, like the safety huddle or whatever and say this is where we're slipping, this is what we need to do to be able to get there, and then knowing what we need to do and working towards that point. Like for instance like prescribing of obs, (bloods pressure, pulse, temperature) that was one thing that we was lacking on before” (Site B Sister 24).

All three wards used safety huddles as an opportunity to discuss patient safety, ward performance and specific areas for improvement.

“Our Band 7 [ward manager] passed it on in, what we do is we do a board round on a morning, it’s like a safety huddle. She does tell us anything that’s gone on, you know, that we need to know. Like metrics, she’ll tell us what the metrics are when we’ve got the metrics, the cleaning, she tells us what she’s put in place to get things improved”
(Site C Staff Nurse 10).

Observations of the safety huddles confirmed patient safety concerns were discussed, including key safety checks such as checking fridge temperatures and emergency equipment. All three case study sites had developed their own communication cascade to raise awareness of performance. These included verbal updates given in handovers and safety huddles and written information via notice boards and individual staff updates. Ward handovers and safety huddles were the key moments for WHC-QD data to be discussed. Although the focus of handovers was to communicate patient specific information rather than discuss the performance of the ward, case study site B which had several months with WHC-QD scores less than 90%, had developed a checklist or an aide memoire to remind staff of specific metrics to focus upon. Extracts from the WHC-QD was used in handover as a reminder and to raise awareness of what was being measured. There was evidence from observations of handovers, safety huddles, and staff interviews to show ward managers would use information from the WHC-QD to develop strategies to share information with their teams, highlight areas for improvement and remind staff to focus upon specific aspects of care and safety checks.

Theory: Importance CMO: Focus
<p>If a ward has a performance deficit identified (Context) if staff are aware of the standards (Context) and a focus for improvement is given (Resource) if the metric is considered important (Reasoning) staff will engage with the information and increase effort to improve performance (Outcome)?</p> <p style="text-align: center;">No change to this CMO</p>

7.4 Theory: Disruption

What motivated ward managers to develop strategies to improve performance and staff to respond to them was also due to how negative WHC-QD performance data has the potential to disrupt management, ward managers and staff perception of a ward, or reinforce pre-existing

negative views. This created cognitive dissonance as the new information challenged or reinforced their existing beliefs.

CMOC: Disruption: When a ward has previously performed well (Context) and QD information reports negative information (Resource), this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.

As outlined by Jagosh et al. (2015), resources can have a ripple effect. Ward managers did not always respond to unexpected negative performance information especially if they had concerns about the performance of the auditor or suspected aberrations in the data. If however subsequent performance information was still negative, this was more likely to trigger a response or action.

CMOC: Ongoing Disruption: When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid scrutiny (Reasoning) and disrupting how the ward is viewed by patients and managers (Reasoning) a change in practice will be initiated or the ward manager will seek help (Outcome).

One staff member when asked if they believed the WHC-QD information, they suggested only when the results were positive and dismissed it when the results were negative.

“When it's bad I don't think it reflects the care the patients are receiving” (Site B, Ward Manager 30).

Staff found negative WHC-QD performance information disruptive, causing frustration and anger for staff, who dismissed the data as unrepresentative.

“Oh no, no, it's just numbers for a ward, it's got nothing do with actually care. We had a metrics the other month and we dipped, but it was a horrendous... it was a horrendous week I think the whole week had been awful. I think we're a pretty strong ward, I think we are a good team and we were really cross about it, we were trying every way possible not to put that on that board [PSB]. But it's not a true reflection of the nursing care that you get at all” (Site B, Staff Nurse 22).

Some staff felt strong emotions in response to a negative score.

“I felt really frustrated because I think it make it look as though we weren't giving the same care, good care, and I knew how hard people were working. I just felt that it wasn't a true representation of how hard and how safe the patients were, because our metrics

weren't in the amber because we hadn't done this piece of documentation or that piece of documentation. It didn't reflect that the patients still got all the care they needed and all the drugs they needed. Their experience was still really good. So I found it really frustrating” (Site B, Ward Manager).

Other staff when aware of negative performance information referred to the friends and family test as a better indicator of care provided by the ward. The friends and family test data is based upon patient feedback about their experiences on the ward. Case site B at the time of the interviews was positive with 97.5% of patients recommending the care they provided (Figure 28).

Staff also found it disappointing when the focus was on the WHC-QD results but failed to recognise staffing shortages and the day-to-day challenges and pressure staff were working under

“I can kind of see why metrics are important but I don't always feel like they give a very true reflection of the day-to-day care provided on the ward. It feels very critical; it felt like we were being constantly told we weren't doing well enough, even though you're working with three less staff nurses than you should do and you have kept all of your patients safe and well and alive that day, to then be told we're in the red, you're not doing well enough, you all need to do better is quite difficult to hear” (Site B, Staff Nurse 29).

An awareness of negative WHC performance was also found to have an impact upon staff morale. Especially when the WHC-QD did not improve over time.

“By the time you get to third stage [escalation] we were a bit like, well they're not going to shut us down because where are they going to put the patients. Everybody got a bit like defeated, and instead of being like, let's try it was a bit like, well if we're crap, we're crap, let's just be crap “ (Site B, Staff Nurse 29).

The impact of negative performance information was challenging as staff within all three case study sites had referred to a sense of pride in the care patients received within their wards.

“Because it makes you want to... it gives you pride in your work and you want to be better, and do better. And you want... you don't want to let the rest of the ward down. I think it's because we just take pride in our work a bit more” (Site A, Staff Nurse 18)

When asked how important it was for the WHC-QD to show 'green' metrics, pride once again was identified as an important potential context to consider.

"People started to take a bit more pride when our metrics started to go up. They were asking you, what's our metrics this month, and so it was just, yeah, I think it was more team working. We just needed a bit of a fresh start, and it did kind of lift the mood, it started to lift a little bit, and people trying to help each other out a bit more" (Site C, Ward manager).

7.4.1 Pride

Although not originally identified as theory, during the thematic analysis several participants identified feeling proud of their ward and the patient care provided. Pride is *"a feeling of pleasure and satisfaction that a person experiences because a person or people connected has done or got something good"* (ODE, 2015). In the interviews pride was linked to teamwork and leadership and providing the best patient care.

"Yeah, very proud of, because as you know we're really short on nurses, and I feel like we all, me as a healthcare as well I feel like – what was I saying... I feel like we've really all come together and really got on with it as a team. And we have like a get on with it attitude and the main thing is the patients isn't it, so yeah. But I really enjoy it on here" (Site C, CSW 1).

In response to disruption caused by the negative performance information staff working within case sites A and C (wards with the best WHC-QD performance) both identified teamwork as an important outcome, when areas for improvement were identified.

"We've always had quite a good sense of teamwork on here to be honest with you. And I don't know whether it's made any difference on other wards, but we've always worked quite well as a team on here. And that's something that's been quite nice. And when you do go to other wards, you notice that they really don't. So if you've got a proactive team and a proactive management team, then the whole ward and the whole productivity of the ward is better" (Site A, Staff Nurse 15).

Ward managers would engage with their teams and ask staff for help and support to make improvements.

“They weren't really doing the family and friends tests and then when I started I pushed them to do it and it's like, well not to like take credit but it has started going up because I just sort of prompt them (Site B, Ward Clerk).

Staff also worked collectively to improve care and were prepared to challenge colleagues to ensure standards of care were maintained.

Yeah, I think we do challenge each other. I think even the staff amongst themselves will challenge the others, they want to do well. And when we do well it encourages them to do better. And I think from that respect they are a team that want to get the best metrics and they want to be the best team” (Site B, Sister 24).

There was evidence to suggest negative WHC-QD did disrupt staff's perception of care provided and caused dissonance. Initially staff decided to reject the feedback message, or refer to other more positive metrics that challenged the WHC-QD data. Negative performance information also caused anger and frustration for some staff members as the WHC-QD information became a focal point rather than the addressing staffing level, patient numbers or the increase in patient acuity or complexity of care needs. Staff discussed the pride they had in their ward, and the disruption caused by negative performance information. While staff dismissed the importance of the WHC-QD, they did want their 'metrics to be green' and therefore did respond to negative performance information. The responses included working together as a team to make improvement and to challenge colleagues practice to ensure standards were maintained.

The CMO configuration was therefore updated to include pride as a contextual factor for consideration and to emphasise teamwork and challenge as an outcome in response to negative performance information and the disruption or challenge this causes the staff sense of pride in their ward.

CMOC: Disruption.
When a ward has previously performed well (Context) and staff are proud of their team and ward (Context) and WHC-QD information reports negative information (Resource) this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.
CMOC: Ongoing Disruption:
When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid disrupting how the

ward is viewed by patients and managers (Reasoning) a change in practice will be initiated, managers will seek help and staff **will work together as a team and challenge colleagues to improve performance** (Outcome).

7.5 Theory: Reassurance.

As the WHC-QD also had the potential to show when improvements had been made, recognise success and reassure managers, patients, visitors and staff care within the ward was safe or had achieved the pre-determined standard the mechanism of reassurance was developed.

Theory: Reassurance When information from the WHC-QD (Resource) tracks performance over time (Resource) and recognises success or improvement, (Resource) staff can see if improvement strategies have worked and are reassured (Reasoning) care on their ward is safe. This is likely to lead to greater staff engagement with WHC-QD programme (Outcome).

As has already been identified, staff express concerns that the WHC-QD did not always reflect the care given but were 'pleased' to have their metrics in 'green' and receive the recognition that came with consistent good performance.

"I think it's making people more aware. It's making people more empowered, if they see your falls are going up and up and up, and you get a certificate after so many, people do like that. They like to have a certificate and they like a photograph in the Trust Bulletin. And you think yay, we got to 30 days, and that's nice, to hear other people say about that (Site A, Ward Manager).

"Too many people have told us that we're really good, so we've got standards to keep up to" (Site A, Staff Nurse 17).

Staff were also pleased to see their work to improve performance reflected in the performance data.

"When we got out of escalation it proved what we're now doing is better, I think it just proves that we are capable of doing it, of being" (Site B, Staff Nurse 26).

In case study site A, then an amber metric score was updated to green in the following months audit, staff left positive messages on social media about the improvements (Table 18).

Table 18 Social media comments

Social media comments in response to returning to green metrics	
Well done you guys top effort. Right back where you belong in the green zone.	Well done team. Amazing, fantastic team effort. Fantastic work well done.

Unlike avoidance and disruption, there was no evidence to suggest reassurance was a mechanism which would lead to change. It was seen as an outcome of ward staff receiving consistent WCH performance data. Change occurred as a consequence of negative performance information, rather than wards seeking ongoing reassurance that the care provided was safe and effective. In view of this, reassurance was added as an outcome rather than a mechanism.

CMOC: Reassurance
When information from the WHC-QD (Resource) tracks performance over time (Resource) and recognises success or improvement, (Resource) staff can see if improvement strategies have worked and are reassured (Outcome) care on their ward is safe. This is likely to lead to greater staff engagement with WHC-QD programme (Outcome).

7.6 Theory: Avoidance

To aid with the flow of results chapter the theory of avoidance is presented. The theory of disruption was based upon a response to negative performance information; the theory of avoidance is based upon staff wanting to avoid negative performance information and its associated scrutiny.

Theory: Avoidance: CMOC: Ward managers who wish to avoid (Reasoning) the managerial scrutiny that comes with repeated negative performance information, (Resource + Context) will show leadership (Context) and seek help and develop strategies (Outcome) to improve performance within their ward

As the WHC-QD has the ability to make performance visible to patients via the PSB and senior management, the theory of avoidance was based on the assumption that outcomes will occur

because of staff wanting to avoid negative performance information and the potential consequences of triggering the escalation process. Ward managers were most concerned with avoiding negative performance information and escalation. The ward managers thought they should be able to manage their own ward and negative performance information may be seen as a judgement on their leadership ability.

“To me, that’s how it must feel if your metrics drop. And there’s nothing worse than people coming on to your ward and telling you how you should be running your ward, because that’s me, that’s my ward, and if I’m not doing it right then I will pick it back up “I don’t want people coming in and telling me how to pick it back up I’d be mortified, if it was my ward” (Site A, Ward Manager 20).

There was also a sense of judgement,

“I felt like that’s how I was judged, and that’s how we as a ward were judged. I found it, if I’m honest, I had a difficult time. As a manager, yes you lead, and you ask people to do something, but you can’t make them do it. You just hope that they will so that it makes your life easier” (Site C, Ward Manager 4).

With experience ward managers became more confident in responding to the performance information.

“So it’s important to me, but it doesn’t define me like it did maybe six months ago. I’m a bit more laid back about it now, in the sense of if I feel like the care that we’re giving is good, I think if it’s above a certain point, if it starts dropping and you get into like red, or low amber, I start thinking why are we like that, what are we not doing” (Case site C, Ward Manager 4).

For staff working in case site B their experience of the escalation process was considered negative rather than supportive and had an effect on team morale.

“It felt pretty rubbish to be honest because like when you’re here every day you see how hard the nurses work, you see that they’re putting everything into make patient care their number one thing. So when they’re put into escalation it sort of brings like an awful mood upon people, you know, when people bring it up and it’s like, oh we’re escalation” (Site B, Staff Nurse 26).

Some staff suggested when facing negative performance data the team would come together; identify areas for improvement and work harder to address the deficit.

“We’d get really disappointed and we’d look at why, we’d look at what areas we’ve slipped on and we’d just make sure that we improve in that area and we’re consistent with it throughout the... we wouldn’t just look at that particular area, but we would want to be back up to green, and we work hard as a team and we cascade information back to each other and say the reasons why we’re in amber, and just make sure that we all just work really hard to get it back up to where we were” (Site A, Sister 16).

From the interviews staff also suggested displaying performance information for patients and visitors was something staff wanted to avoid as this may worry patients and suggest care on the ward was unsafe. Ward managers were particularly concerned.

I remember thinking crikey, imagine if you’re red and relatives are coming. They’re not going to want to come into that ward. I’d be mortified if I was red outside the door” (Site A, Ward Manager 20).

Other staff members were also concerned that displaying negative metrics could worry patients or portray a negative perspective of the ward.

“Like we said before, it can be a bit humiliating when we’re really bad, you know when we’re in the ambers, and it showed what we were failing on. It kind of, it makes a bad light on you, to say, are they really crap at their jobs or not (Site C, CSW 3).

Staff did recognise that displaying information about their wards performance was part of encouraging an open and transparent culture within healthcare.

“I think it’s fine being audited, because I just think it’s the way of the world isn’t it and that’s what we’ve got to do. And I think the public and everybody wants to see that don’t they?” (Site A, Sister 16).

When asked if patients or visitors engaged with the information displayed on the PSB, the majority of staff across all three case study sites confirmed that they had seen patients and visitors looking at the PSB. However no staff members had been asked about the information displayed on the PSB. These findings supported the observational data presented earlier in the chapter.

“I have seen relatives looking, I have seen relatives when they’ve been waiting for certain things, they’ve actually stood and looked at them all. Not whatever they take in, maybe it’s something we should ask, do you think” (Site C, Staff Nurse 10).

One ward manager initially thought patients or relatives would be more challenging when they reviewed negative performance information but she had never been approached to discuss the data.

“I thought we'd be challenged a bit more by relatives and patients, there's only this many staff on shift today or, you've had a fall recently and was that my relative, and what have you” (Site B, Ward Manager 30).

In summary ward managers were concerned about receiving and displaying negative performance information via the PSB. Negative performance information could influence the reputation of ward manager, the ward and cause patients and relatives to worry. Those who had experienced the escalation process found the experience to have a negative impact upon morale. Managers and staff were therefore keen to avoid this so standards would be maintained or strategies developed by ward managers to improve performance. Although staff were concerned about displaying negative performance information, there was agreement that measuring and monitoring the safety of healthcare was now part of everyday practice and that it may lead to greater transparency and trust in the care provided even if the performance information was “red”. As identified earlier in the chapter through observation, although the PSB's were displayed in prominent locations within the case study sites, very few visitors stopped to review the information displayed or asked staff about the information. The driver for change was therefore intrinsic within staff than through challenges by relatives. As displaying negative performance information was a contextual factor that influenced the mechanism of avoidance, the CMOC was updated to reflect this.

CMOC: Avoidance
Ward managers who wish to avoid (Reasoning) displaying negative performance information (Context) and the managerial scrutiny that comes with repeated negative performance information, (Resource + Context) will show leadership (Context) and seek help and develop strategies (Outcome) to improve performance within their ward

7.7 Theory: Competition

Competition was identified by the stakeholders in phase one as an important driver for change. The theory was based upon the ability for the WHC-QD to organise results to allow wards to be

ranked and rated. An objective tool for recognising success also has the potential for comparison and league tables to develop. Competition would lead to improvement in performance and care as wards would compete with each other to achieve better results.

CMOC: Competition: As QD information has the ability to identify performance over time (Resource) the performance of wards can be ranked and viewed by senior managers within the organisation (Context). This will engage ward managers (Context) to compete (Reasoning) with other wards which will lead to improvements in performance (Outcome).

Several staff however did not see competition as a mechanism for change and there was no reference to competing with other wards or departments during the observation of the ward hand overs or safety huddles. One staff member was unsure if competition should be encouraged within healthcare.

That could make it more competitive, which I don't know if it's healthy in kind of the NHS, or I'd say on a ward to be like competing with each other. I don't know. Obviously competition can be healthy sometimes, but on here it's more working as a team and having that team kind of drive rather than individual drives. But I guess it might make some people not want to be red all the time and they might try harder" (Site B, Staff Nurse 28).

However some staff were interested in the performance of their nearest or "rival" ward, suggesting that competition with a peer or contextualised competition was important.

"Next door. I think they just maybe got slightly better than us last month" (Site B, Staff Nurse 22).

However the potential for competition to lead to change was limited due to the availability of performance data.

"Every ward's going to want to be better than their rival ward. Like [ward name] we're going to want to be better than them and stuff so. I don't actually know what their ratings are, I wouldn't know how to find out, apart from going onto the ward and looking" (Site A, CSW 14).

Interestingly several staff working in case study site A, did feel competition was important, but it was based upon wanting to be the "best" for their patients rather than being first, winning a prize or receiving recognition.

It was also recognised that it needed all staff to be involved if they were to be successful

“On this ward we’re quite competitive, so we want to be up there and be good at everything. And we work as a team, so if we just help each other to meet our targets really (Site A, Sister 11).

Others found the WHC-QD created competition within the ward itself between teams. This resulted in staff reminding colleagues of specific tasks to complete. It also allowed positive performance to be recognised which may have motivate staff to continue to improve or maintain the standards.

“I want to obviously do better but I never look at see what like [ward next doors] metrics are or whatever, you know. And some of the nurses like do want to do better than last month and they're always like, we're going to beat it, we're going to get better, we're going to be 100%, you know, so there is a bit of that camaraderie isn't there I guess and want to do better” (Site B, Ward Manager 30).

The mechanism of competition or the activity of striving to gain or win something by defeating or establishing superiority over others (ODE, 2015) was less about trying to establish superiority and more about creating uncertainty when the performance data are generated. This uncertainty was used for individual reflexivity that may drive changes in behaviour. The mechanism of competition is actually a resource, as the results allow wards to be ranked or judged. The actual mechanism of competition or judgement was based in the mechanisms of avoidance, and disruption as staff change behaviour to avoid being judged as a poorly performing ward, are reassured the care they provide is safe or have their perception of their performance disrupted by the results. Interestingly the ‘best performing’ ward of the three case study sites, were driven by a collective sense of responsibility and teamwork to maintain performance. It was an expectation that the ward would maintain their performance with staff experiencing a sense of disappointment or disruption when the WHC-QD identified areas for improvement and relief when performance improved

CMOC: Competition
As QD information has the ability to identify performance over time (Resource) the performance of wards can be ranked and viewed by senior managers within the organisation (Context). This will encourage ward managers to compete to avoid

(Mechanism) their wards performance being rated lower than neighbouring ward, this will lead to improvements in performance (Outcome).

7.8 Discussion

The phase 2 findings were used to test the programme theory and CMO configurations. Across all three case study sites, only the ward managers accessed the WHC-QD, all other staff members received their WHC-QD data from the information displayed on the PSB or via their ward manager. The information displayed upon the PSB was updated monthly and only displayed process outcomes from the WMAP and an overall composite performance score. The vast majority of data within the WHC-QD was left unseen by staff. Although there was no evidence to suggest the PSB itself was used as an aide memoir, one ward downloaded performance information from the WHC-QD to target specific areas for improvement and raise awareness of the standards the ward were being measured against. In addition a checklist was developed to remind staff to undertake specific tasks known to be included in the WMAP.

Although staff used the PSB for information, its design and location was developed to publicly display performance information for patients and visitors. All three ward managers were concerned about displaying negative performance information and how this may concern patients and their relatives. Other staff members recognised that displaying performance information, is part of encouraging an open and transparent culture within healthcare and while some expressed concerns, overall those who commented suggested it may reassure patients.

For WHC-QD data to drive change, the information has to be considered important and believable. Phase 1 participants expressed concerns about the credibility of auditors and how their behaviour can detract or influence the believability of the performance data. While several staff had never spoken to an auditor, ward managers and sisters made a point of engaging with the auditors during the audit visit and expected feedback to be given at the time of the inspection. Ward managers were frustrated when negative performance data was published without discussion. Staff did question the validity of the audit, when patients from well performing wards transferred to the case study site with incomplete documentation and missing information.

The main forum for raising awareness about performance was via ward handovers and safety huddles. These were the opportunities within the structure of a working day to specifically

discuss patient safety. The ward managers in all three case study sites each had developed their own way of disseminating information to their teams. Using outcome data to highlight the link between process and outcome measures was shown to be difficult and no guidance or standard approach was available from the HCP. The key factor in raising awareness of performance and enabling or prohibiting change was the behaviours of the ward manager. Many staff were inspired by the leadership skills of the ward manager and a sense of teamwork and commitment to their ward, with several staff highlighting pride as potential context.

One surprising finding from staff was their perception of the WHC as a system for checking documentation and a 'tick box assurance' process. Staff were concerned minor documentation failures during the WMAP would result in the ward failing to achieve compliance with the expected standards. This raised two issues, staff knowledge of standards and the importance of linking process measures and outcome measures. A review of the outcome data for the three case study sites could find no evidence to suggest outcomes such as number of pressure ulcers had reduced, although across all wards within the HCP there had been a reduction in incidences. Contextualising information is an important way of attaching meaning to a metric. An example from the Phase one interviews which highlighted the need for 100% compliance with checking emergency equipment. Contextualisation has the potential to raise awareness of the expected standards, why they are important, and challenge the tick box perception.

As WHC brings performance into the spotlight and staff expressed concerns about how the PSB information would be viewed by visitors and patients. In reality very few patients or relatives were seen to be looking at the PSB and few staff had been asked to explain the data displayed. Of those visitors who agreed to be interviewed, all suggested displaying open and honest performance data was an expectation and it provided reassurance wards were monitoring safety.

Avoidance as a mechanism also suggests change occurs as ward managers look to avoid potential reputational consequences of a ward being in 'escalation' and develop strategies to improve performance. When WHC-QD data disrupts a person's perception of the care they provide, this is a potential mechanism for change. There was evidence staff sought additional information to reaffirm and dismiss the WHC-QD data as non-representative however negative performance data, over time led to strategies to improve performance.

The mechanisms described as reassurance, on reflection became an outcome as the result of consistent performance data over time. Finally although competition was identified by the stakeholders as an important driver for change, staff within the case study sites did not see

competition as a mechanism and there was no reference of competing with other wards. While some staff may be motivated by competition, most staff agreed that it was more important to provide safe and effective care rather than try to out-perform a neighbouring ward.

In view of these findings the programme theory has been refined with reassurance, competition, teamwork, and challenging colleagues identified as an outcome. The greatest influence on staff was the leadership and commitment shown by ward managers and their ability to contextualise information and create a sense of pride and collective responsibility to provide safe care. The programme theory summary has been updated to reflect the changes to the CMO configurations. A summary of all 5 CMO configurations are outlined in the next section.

7.8.1 Summary of programme theories

Theory: Importance
Importance Information generated by the QD needs to be considered
When QD information is generated consistently (Resource + Context) with credible audit processes (Context), legitimised through management engagement (Context) and staff have an awareness of the standards being measured (Context) the information will be seen as important (Reasoning) and less likely to be rejected. This will lead to staff engagement with the programme (Outcome) and raise awareness performance (Outcome).
Staff are likely to question the importance of the programme if there is a lack of awareness of what is being measured and why.

Theory: Importance
Information generated by QD needs to convey a story
When there is an need to improve performance (Context) and ward managers, show leadership, engage with, and contextualise WHC-QD information and share this with staff (Context + Resource), the information will be seen as important (Reasoning) and used to adopt or change practice and increase effort to reduce deficit (Outcome).
Future consideration: Ward managers who undergo training on how to review, interpret and communicate salient points from the WHC-QD are more likely to develop communication strategies which lead to greater staff engagement with the WHC-QD information.

Theory Disruption

QD information can cause disruption which leads to change.

When a ward has previously performed well (Context) and staff are proud of their team and ward (Context) and WHC-QD information reports negative information (Resource) this disrupts (Reasoning) the positive perception of the individual/ward. Staff will choose to reject the message or increase effort (Outcome) to improve performance.

Theory Disruption

Consistent disruption caused by QD data will lead to change.

When an increase in effort (Outcome) fails to address the deficit when performance is tracked over time and staff are aware (Resource + Context) to avoid disrupting how the ward is viewed by patients and managers (Reasoning) a change in practice will be initiated, managers will seek help and staff will work together as a team and challenge colleagues to improve performance (Outcome).

Theory Avoidance

QD offers an opportunity

Ward managers who wish to avoid (Reasoning) displaying negative performance information (Context) and the managerial scrutiny that comes with repeated negative performance information, (Resource + Context) will show leadership (Context) and seek help and develop strategies (Outcome) to improve performance within their ward

7.9 Chapter summary

This chapter presents the findings from Phase 2 and the steps taken to confirm and reject the refined programme theories. Quantitative and observational data, information from participants directly affected by the programme under investigation and visitors to the case study sites were used to interrogate the programme theories and CMO configurations and used to explain theory. This RE attempted to explain causation, or what triggers something to happen or

change to occur. In view of these findings the programme theory was refined with reassurance, competition, teamwork, and challenging colleagues identified as an outcome. The greatest influence on staff was the leadership and commitment shown by ward managers and their ability to contextualise information and create a sense of pride and collective responsibility to provide safe care. The evidence from this research suggests three interrelated key theories of Importance, Disruption and Avoidance can be used to explain how and why QD influence care delivery within hospitals wards and the contextual factors that enable or inhibit their impact. This will be discussed in further detail in Chapter 8.

Chapter 8 Discussion

8.1 Introduction

As the structure of this thesis was guided by the Quality and Reporting Standards for Realist Evaluation, this chapter sets out the main findings in relation to the research question and aims and objectives of the study with reference to the programme theory (Wong et al., 2017). The chapter begins by presenting the original research question and a summary of the key findings. The three interrelated key theories of Importance, Disruption and Avoidance supported by the key CMO configurations are presented and consideration is given to the unintended consequences. A summary of the discussion sets out main areas of consideration of the research. Strengths and limitations of the study outlined and implications for practice will be presented. Consideration is given to future questions and the thesis presents a short conclusion for consideration.

8.2 The aims of the study

Throughout history, patients have experienced care that has caused distress and harm. While the root cause of the published healthcare failings have differed, all have called for HCP to create a culture of transparency and candour. Over the last decade, there has been considerable interest in the development of QD within healthcare. QD are created at considerable time and expense however, the benefit of deployment has the potential to outweigh any cost. The benefit will however only be realised if their potential can be unleashed and used to make healthcare safe. Assessing the quality and safety of care is complex, however we find ourselves surrounded by performance data, most of which is never used. As has been shown throughout this thesis, simply providing performance information has limited impact on quality and safety in healthcare (Dixon-Woods et al., 2013, Jeffs et al., 2014a, Ivers and Barrett, 2018, Keen et al., 2018a). Consideration must also be given to the potential unintended consequences associated with measuring healthcare practice. QD are complex programmes deployed into complex organisations, it is therefore unsurprising that their impact varies from ward to ward. This study brings new information to the field of QD development and deployment and may have the potential to allow QD data to be brought to life, contextualised and used to reduce harm and make health care safer.

The aim of this research was to understand how and why quality dashboards influence care delivery within hospital wards.

The specific objectives of the study were to

1. Critically review the evidence for QD within hospital wards.
2. Explore with those responsible for the development and management of the WHC-QD their perceptions of the intended consequences and possible unintended consequence of its deployment within wards.
3. Use a range of approaches to explore the impact of QD within hospitals wards including staff interviews.
4. Explain how and why QD influences care delivery within hospital wards and to understand the influence of contextual factors.

Objective one was addressed using a literature review of the history of patient safety within healthcare, quality dashboards, audit and feedback theory, and a scoping review of 27 papers focused upon the use of quality dashboards within hospital wards. The evidence for this was presented in Chapters 1, 2 and 3.

As RE is theory driven, evidence from the case study site, literature review, researcher, and scoping review were used to develop the initial programme theories and CMO configurations to explain how QD influence care delivery. Five initial programme theories; Importance, Disruption, Focus, Reassurance, and Avoidance supported by seven CMO configurations were developed.

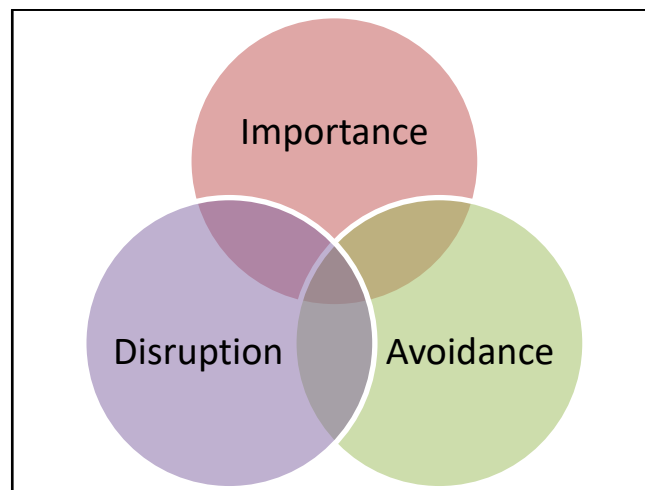
The programme theories were refined with staff responsible for the development of the WHC-QD. As the study site had introduced a QD known as the WHC-QD, phase one of the study interviewed stakeholders responsible for its development and implementation. The initial programme theories were presented to the participants to ascertain their views and insight into how quality dashboards influence care. The seven interrelated CMO configurations constructed were refined through analysis of the phase one interviews. Eight interrelated CMO configurations were taken forward for testing in phase two. Phase 2 used a mixed methods approach and a range of data collection methods to increase the robustness of theory testing, including outcome data, non-participant observational, HCP documentation, outcome data and visitor and staff interviews (Wong et al 2017). Three case study sites were selected according to WHC-QD performance scores to allow differing experiences to be explored. Evidence from phase two was used to test and further refine the CMO configurations that make up the programme theory.

8.3 How do quality dashboard influence care delivery within hospital wards?

As identified at the beginning of this research, while hospital wards may have the same policies, procedures, and staffing structures they are not homogenous units delivering homogenised care. Each ward is a complex micro system with complex interplay between staff members, hierarchies, and teams who work together to provide care. The impact of a new initiatives or interventions when introduced can therefore vary. The WHC-QD was a complex programme introduced into the complex social structure of a hospital ward. Using RE allowed a range of theories to be explored with staff within the case study sites to advance understanding of why complex interventions work, how, for whom and in what context and to what extent, and explain why the programme might fail to achieve its anticipated outcomes.

The evidence from this research suggests three interrelated key theories of Importance, Disruption and Avoidance supported by six key CMO configurations set out in Chapter 7 section 7.8.1 can be used to explain how and why QD influence care delivery within hospitals wards and the contextual factors that enable or inhibit their impact. Each theory will be discussed in turn.

Figure 33 Interrelated programme theories



8.3.1 Importance

The response to international and national concerns regarding the safety of healthcare and subsequent investigations, reports, and recommendations outlined in Chapter 1 was for governments, regulators and HCP to improve safety and become more transparent about outcomes. In response, a large HCP developed a QD to “*bring together a range of measures*

that provide a strategic overview and focus on the fundamentals of care, together with patient outcomes and feedback on their experience of care by ward. The QD would “*provide rich data to help ward & CSU (a collection of wards or Clinical Service Unit) teams focus their attention on actions that will improve patient outcomes and experience*” (Case study site Trust Board Paper 2014). The stakeholders interviewed in phase 1 suggested working without the WHC-QD was now unthinkable, as it had become indispensable.

Considering the concerns about safety, the significant investment in its development and implementation, and its purpose, the researcher assumed the WHC-QD would be seen as inherently important by ward staff and engagement in the programme would be guaranteed. The WHC-QD would identify areas for improvement, staff would respond accordingly and there would be a corresponding reduction in outcome measures such as falls, pressure ulcers and medication errors. As shown in Chapter 3, making improvements in healthcare is complex, simply reporting performance data rarely leads to behaviour change (Hysong et al., 2006). This study has shown programmes should not be assumed to have an inherent value, its value should be explored with the end users of the programme.

It was still surprising however for the researcher to hear participants describe the WHC-QD as a ‘tick box exercise’ or a tool for improving paperwork. The WHC-QD was only seen as important through the action and reaction of the ward manager. Feedback Intervention Theory (FIT) (Kluger and DeNisi, 1996) suggests people often have competing priorities and therefore have to prioritise what receives attention. Staff within all three case study sites confirmed the consistent time pressure within the hospital wards. FIT predicts only deficits that receive attention are acted upon and will result in change. Simply providing information is not enough for change to occur. FIT works by providing new information that redirects a person’s locus of attention either towards or away from a task. When attention is directed towards a task, a change is more likely to occur which addresses the standard-deficit gap. As the ward manager was responsible for receiving, reviewing, interpreting and sharing the WHC-QD information with staff, their ability to direct a person’s locus of attention towards the standard-deficit gap would determine if an outcome or action would occur. The importance of leaders and ward manager in promoting engagement with quality dashboards and audit and feedback was a key finding of this study.

This study found the reaction of the ward manager to a standard-deficit gap was determined by contextual factors (Contexts). Factors that influenced the believability of the data, such as the credibility of the auditor or aberrations in the data caused ward managers to consider if action

was needed. Beer (2016) suggests organisational metrics can be too powerful to be dismissed or undermined and staff find it difficult to challenge their accuracy and relevance. When staff do try to challenge data it can be seen as naïve, or excuse making. Action was also dependent upon the overall performance status of the ward. Actions or outcomes were more likely to be triggered when the standard-performance had previously been identified as an issue.

Knowledge of the standards was also identified as an important context, as ward managers were unable to develop a plan to address the standard-deficit gap if they are unclear what was measured. This was highlighted by the ward manager of case study site B, who knew the ward was in an escalation process but was unsure why or what metrics were the trigger, as she did not have access to the WHC-QD. Once access was gained, she was able to identify the metric and develop a specific action plan to address the deficit.

The CMO configurations of focus and contextualisation were developed to test how the importance of the WHC-QD information could be influenced through interpretation and contextualisation. Change or improvement can only be affected if sense can be made of the information. The metrification of information can strip the narrative from situations and diminish the impact of dashboards and the true meaning of their purpose can be lost (Espeland, 2015). As previously highlighted, many staff considered the WHC-QD as a tick box exercise, and were unsure if the information reflected the standard of care on the ward or improved safety. Senior managers were aware staff were unhappy with the burden associated with daily checks of emergency equipment but referred to the airline analogy to dismiss their concerns.

If the air hostess stood up at the front when she was doing her safety checks and says, the meals are fine, but we didn't have time to check the safety of the engine today, don't worry we've done it every other day for the last two weeks, but we've not done it today. How many people would feel absolutely safe?" (Participant H)

Staff were however unsure of the link between compliance with process measures and improvement in outcomes. While it was not possible to use the outcome data provided by the HCP to demonstrate improvements in patient safety, ward managers were using WHC-QD information to develop a focus for improvement via aide memoirs and reminders. Daily reminders and discussion via patient safety huddles and handovers enhanced the importance of the WHC-QD as its information became embedded within the culture and conversation of the ward. While several authors have commented on the importance of timely audit and feedback information, (Hysong et al., 2006, Ivers et al., 2012, Ivers et al., 2014), this study showed that

although the information was updated monthly, timely or daily discussion about the information had the potential to lead to improvement in outcomes.

The importance of leaders and ward manager in promoting engagement with quality dashboards and audit and feedback has already been highlighted (Flottorp et al., 2010, Jeffs et al., 2014a). The study found that staff relied upon their ward manager to determine the importance of the WHC-QD. If ward managers were concerned about performance then staff had a responsibility to work as a team to reduce those concerns. The likelihood of change occurring in response to ward manager concerns was increased in the context of a manager who showed clinical leadership and who was respected by their ward team.

Kluger and DeNisi (1996) suggest the reaction to performance information is determined by the meaning attached to the feedback. Feedback loops are cause and effect processes that are organised hierarchically. At the top of the hierarchy are goals of self and those at the bottom contain physical actions, goals or tasks. When feedback is aimed at goals of self, this can cause anxiety and lead to behaviour change. It was clear from the interviews that ward managers considered negative performance information to be a reflection of their management skill and ability rather than their ability to complete a fridge temperature checklist or prescribe observations. As self is subjective, this may also explain why people at different levels of an organisation experience the same feedback in very different ways. As negative performance information for ward managers are closer to goals of self than for other staff members within the ward, their levels of anxiety associated with negative performance was greater.

8.3.2 Disruption

One of the functions of the WHC-QD is its ability to measure and track performance. Measurement creates uncertainty and anxiety which can be used for individual reflexivity and used to drive change (Beer, 2016). The power of systems of measurement is often not directly related to what they track or capture but how the possible outcomes of being measured against something makes us feel, as with visibility comes scrutiny and judgement (Muller, 2018). The evidence from the participants identified the potential for the WHC-QD to cause dissonance when negative performance was reported. Cognitive dissonance was developed by Festinger (1957) and occurs when we perceive a discrepancy between our behaviour and our self-image. The theory predicts that dissonance occurs when a person's behaviour has a negative effect on self-esteem, or there is conflict between a person's belief in his or her own worth and something damages that belief. The dissonance can induce an unpleasant state of anxiety. As dissonance is an aversive state people are motivated to reduce the anxiety. A person can reduce the

dissonance by reducing the importance of one of the dissonant elements, or by adding consonant elements such as making an excuse to explain the discrepancy or change the dissonance by working harder or triggering a change (Martin et al., 2013, Passer and Smith, 2019).

As has already been established negative performance information and the possibility of triggering an escalation process had a negative impact on staff morale. Ward managers in particular thought they were being judged and their management abilities questioned. This caused disruption or dissonance that resulted in the WHC-QD information being dismissed, alternative information used to valid their self-worth such as the friends and family test or a plan to improve performance and reduce the standard-deficit gap developed. As many of the staff interviewed commented on the sense of pride working on their ward this was an importance contextual consideration. As negative performance information challenges the basis for feelings of pride, this in congruency created disruption or dissonance and influenced motivation for action.

Knowledge of standards was also identified as an important resource and contextual factor in improving the quality and safety of care. The interviews identified that other than the ward manager, staff working within the care study sites did not access the WHC-QD and were unsure what standards were being measured. In case study site B, when a specific standard-deficit gap was identified and discussed via ward handovers and safety huddle, knowledge of the particular standard increased. Once staff were aware of the standards, to not take the necessary action becomes a deliberate omission, rather than an unconscious omission or consequence of competing priorities. To deliberately omit to undertake the action, may cause dissonance, therefore the associated action is more likely to be taken.

8.3.3 Avoidance

As disruption is triggered in response to negative performance information, avoidance is based upon staff wanting to avoid receiving negative feedback and the associated scrutiny that invariable follows. Beer (2016) suggests the power of metrics and dashboards to facilitate change is based upon their ability to render things visible, in the division it creates between attention and non-attention, recognition and non-recognition, a causal force exists. The ability to affect change is dependent upon how visible those metrics are and to whom. FIT suggests people regulate their behaviour by comparing it to goals, standards or benchmarks to which they are committed. If a discrepancy is identified between the standard and their behaviour, they will try and resolve it by adjusting their effort in a particular direction. The degree of

increased effort a person makes to reduce a deficit can be influenced by the consequence of the deficit (Kluger and DeNisi, 1996).

Porter (2015) also suggests dashboards succeed by giving direction to the individuals, as they create a standard or a norm which an individual, department or organisation can be measured against. The desire to move toward the norm or achieve the standard is a persuasive form of power (Dixon-Woods et al. 2013, Muller 2018). Participants were concerned about the prospect of triggering an escalation process, however their biggest concern was displaying negative performance information publicly within their ward. While Porter (1995) believes making information visible to the public is a powerful incentive for improving performance, the evidence for this is unclear. Although staff recognised the need for greater transparency, Ketelaar et al. (2011) could find no evidence to suggest the public release of performance data changed patient behaviour or improved care. Although there was no evidence to suggest the public release of performance data had an impact on the behaviours of healthcare professionals, staff within the case study sites wanted to avoid publicly displaying negative performance information as it would give an negative view of the ward and this may worry patients and relatives. Interestingly the observational audit undertaken within the three case study sites showed that during that period of observation, only 4% of the total visitors to the ward interacted with the PSB. In the phase one data, none of the participants were aware of any conversation with patients or relatives regarding the information displayed on the PSB. All 6 visitors who were interviewed as part of this study did recommend keeping the PSB as it showed the HCP was committed to making improvements. Although staff were concerned about publicly displaying information this was more likely to be influenced by the anticipated dissonance created if patients or relatives were to use the information to complain about their care. This study could find no evidence to suggest information displayed on the PSB influenced care delivery, although it has highlighted further research is required to understand how patient safety information should be generated and displayed for patients and relatives.

As the WHC-QD measures performance and has the ability for comparison these principles allow competition to be enacted and judgements to be made (Beer, 2016). Competition was initially identified as a mechanism however it became apparent through the interviews that there was no evidence to support competition as a mechanism. An awareness of performance was identified however as an important context and outcome. Staff were reassured when actions taken to improve performance was evident on the PSB and sustained positive WHC-QD performance was recognised by senior managers within the HCP.

8.4 Unintended consequences

While the intention of QD development is based upon making improvements and providing reassurance, many authors have warned of the unintended consequences that rise inadvertently from health performance measurement (Power, 1997, Lilford et al., 2004, Mannion and Braithwaite, 2012, Dahler-Larsen, 2014, Beer, 2016, Greenhalgh et al., 2018, Muller, 2018). As metric based indicators or dashboards simplify the complexity of the social world their representativeness is often questioned (Espeland, 2015). Several staff members were concerned that the WHC-QD was not representative of the complex care provided with the ward. However even when metrics, are found to be misrepresentative, Beer (2016) suggests they still have the potential to influence behaviour if their use is adopted into social and cultural practice. The main concerns are centred on measurement fixation, tunnel vision and the manipulation of data or gaming, which has the potential to invalidate the veracity of a QD.

Measurement fixation is the emphasis on meeting a target rather than considering the true intent of why the target was introduced. The main concern from some staff members was the WHC-QD's inability to address fundamental day-to-day safety concerns such as staffing levels and the increasingly complex needs of patients with comorbidities and dependencies. The staff interviews did suggest there was an element of measure fixation which is more likely when the avoidance of reputational damage is associated with achieving compliance (Illingworth, 2014).

Within phase 2 several staff members referred to the WMAP as a box ticking exercise, suggesting there were elements of measure fixation. Measurement fixation is the emphasis on meeting a target rather than considering the true intent of why the target was introduced. Interesting most of the concern was focused upon daily emergency equipment checks. As the researcher was fortunate to hear the chief Nurses' rationale for its inclusion or 'true intent' the need for daily checks was obvious and needed. Contextualising metrics may therefore help with QD engagement.

The role of the auditor had the potential to have an unintended negative impact on engagement with the QD data. The participants suggested staff would devalue or discredit data in the context of negative performance results based upon the role and behaviour of the WMAP auditor. There was a perception that auditors from the corporate nursing team were more likely to find problems with the standards of care and give a negative performance score. Power (1997) also reminds the reader that those undertaking audit have a responsibility to find the balance between critiquing or comforting those under the spotlight. Although those undertaking

the WMAP were from another area of the hospital, moving towards the automatic generation of audit data may help remove auditor bias. Successful audit and feedback however only takes place in a culture that does not attribute blame (Power, 1997)

Although QD have the potential to improve the quality and safety of care consideration must be given to the time and cost of their development (Keen et al., 2018a). Power (1997) reminds the reader that information is never free and is often expensive in ways that rarely occur to those who demand it.

8.5 Discussion summary

Muller (2018) suggests we now live in an age of measurement and we should expect the demand for measured accountability and transparency to increase as trust decreases. It is recognised within the literature that patients can be exposed to additional risks through iatrogenic or systematic failures within healthcare. Healthcare has a long history of safety concerns and data has been used to highlight concerns (Appendix A) or hide them from view to disguise failure (Kennedy 2002). As technology has advanced the development of quality dashboards and their use in healthcare has been on the ascendency.

The use of quality dashboards has been one of the strategies used to reduce risks and improve the safety and quality of healthcare within the NHS. The monitoring and publication of performance data was expected to act as a catalyst to drive up quality by encouraging a change in culture and behaviour for organisations, departments and individuals directly responsible for care.

The scoping review provided limited evidence to suggest dashboards have been proven to drive up standards within an organisation or hospital ward, however there was evidence to suggest dashboards can encourage a change in culture and behaviour which can improve care outcomes if associated with compliance with a standard or procedure. Dashboards themselves have no inherent value if people do not engage or respond to them. It may be that individuals do not know how to interpret the information, or it is perceived to have little value as the information is believed to be inaccurate or has limited contextual value for an individual. The value of dashboards comes from the knowledge gained from reviewing the information and how that knowledge informs appropriate actions, decisions, and behaviours (Okes, 2013).

Programme theories were developed from reviewing the literature, interviewing stakeholders involved in the development of the programme and considering how programmes are expected

to work. The evidence suggests that ward leaders have an important role in promoting staff engagement with quality dashboards and how the information is used will determine their impact. The key findings from the study identify the three interrelated programme theories of Importance, Disruption and Avoidance to explain why and how quality dashboards influence care delivery within hospital wards.

8.6 Strengths and limitations of the study

The strength of this research was the opportunity to use realist evaluation to develop and test theories within three case study sites and explore the impact of the programme with a range of staff working within hospital wards. The study includes evidence from the chief nurse to ward clerks. Their insight and experiences were invaluable and may have been overlooked if an outcome based methodology had been used.

To develop the initial theories, the current evidence base for quality dashboards had to be fully explored and critically evaluated. The mixed method approach allowed rich data to be gathered and used to test, refine and reject the programme theories. The aim of the study was to understand how and why quality dashboards influence care delivery within hospital wards; this research provides the evidence to answer these questions.

As information technology advances and electronic platforms will be increasingly used to organise care, this will continue to be an area of ongoing development with future research opportunities. Currently there are no published realist evaluations that explore how quality dashboards influence care delivery within hospital wards.

Although the study was designed to capture information from patients and visitors to the case study sites, only 6 visitors were recruited. It was anticipated visitor engagement with the PSB would be higher. Although the lack of engagement was an interesting finding of the study, it is a limitation of its phase 2 design.

Due to the mixed method approach, managing large data sets was complex and initial attempts to show causation resulted in complex voluminous chapters. Supervisory support and iterative data analysis allowed the findings to be refined. As has already been discussed, the time between data collection, transcription and analysis of the staff interviews did not allow the topic guide to be iteratively developed following each interview. Consideration could have been given to a follow up focus group with staff within the case study sites to explore and confirm findings from their initial interview.

One of the limitations of the study was the influence the researcher may have had on participant recruitment and data collection. As highlighted, the aim is for researchers to strive to remain neutral, however as the researcher was a senior nurse within the case study site, it is recognised that this was difficult. Although steps were taken to reduce the influence of the researcher's role on participants by identifying case study sites with no managerial links and using the academic supervisor team to cross-reference analytical codes, participants were aware of the researcher's role within the organisation. What is not clear is how this may have influenced participant recruitment and participants candour during the interviews. It must also be recognised that the phase 1 interviews were conducted with senior managers within the organisation. The researcher's performance during those interviews may have been influenced by the status of the participant.

8.7 Implications for practice

Quality dashboards are expensive to design, develop and maintain and have the potential to capture large volumes of data, most of which was unseen by staff working within the case study sites. Although each of the ward managers had developed their own system for reviewing and disseminating WHC-QD data, there was no guidance or training on how to use the information to its best effect. This research therefore recommends best practice guidelines and an educational training package should be developed to support ward managers to use QD information.

Although WHC-QD was published monthly, when staff discussed the information in ward handover and safety huddles, this raised awareness of the standards expected. It is therefore recommended information from the WHC-QD be incorporated into daily team discussions.

As outcomes are triggered by disruption rather than compliance, updates to the standards and metrics in line with incidences or patient safety alerts is recommended. This will ensure ongoing engagement with the WHC-QD is required if standards are to be maintained.

As publicly displaying performance information was seen as a positive step towards transparency this study also recommends the development of a staff PSB and a patient PSB with consideration given to a patient focus group to develop the metrics to be displayed.

As the approach of the person undertaking the audit had the potential to influence the believability of the data, this study recommends auditors should take time to demystify the audit process with ward staff. This study therefore recommends auditors engage with staff when they arrive to do the audit, share audit standards and discuss any areas for improvement at the time of the visit. The visit should conclude with a summary discussion and recommendations for improvement if

required. A timely written summary of recommendations for improvement should also be provided. As the believability of the data is crucial to activating outcomes, consideration should also be given to moving towards automation of audit data, or a '*cybernetic model*' as recommended by McFarlane in 1971. Removing auditor bias and the opportunity for staff to dismiss the WHC-QD may lead to greater engagement with the programme. This could be an area for future research.

8.8 Recommendations for future research

As ward managers were instrumental in responding to the WHC-QD information and developing strategies for improvement, further research specifically with ward managers is recommended. If best practice guidance is developed and an educational programme for the interpretation of QD information is launched, formal evaluation of this programme should also be considered. As quality dashboards continue to evolve and electronic documentation, medication administration and observations allows more complex data capture, it may be possible to develop quality dashboards for every member of staff within a hospital ward. This has the potential to use dashboards to influence individual staff members and identify individual training and development needs and support based upon performance and is an exciting area for future dashboard development and research.

What was surprising was the lack of engagement with the information displayed on the PSB, as HCP are committed to increasing their transparency, consideration must be given to generating knowledge on how to develop QD for patients and the public and how the information can be shared.

8.9 Conclusion

This thesis has used realist evaluation to bring new understanding to how quality dashboards influence care delivery within hospital wards and has therefore achieved its aims and objectives. Staffing challenges, new treatments and complex patient care means safety in healthcare is and will continue to remain important for all concerned. The need for assurance and transparency has resulted in quality dashboards becoming part of healthcare providers' organisational culture. Making improvements in safety is complex, quality dashboards have no inherent value if people do not engage with or respond to them. As Berwick et al. (2003) reminds us "*in the pursuit of healthcare quality improvement, measurement is necessary but is no more sufficient than measuring a golf score makes for better golf, to make improvements in*

healthcare it is vital to understand the link between measurement and improvement". A refined programme theory based on the mechanisms of Importance, Disruption and Avoidance and the corresponding contextual considerations has brought new understanding to how quality dashboards influence care and the behaviour and actions of staff within hospital wards. Understanding the contexts, mechanism and outcome configurations brings understanding to the link between measurement and improvement and can be used to ensure quality dashboards reach their full potential and make healthcare safer.

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Appendix A Summary of health care concerns, inquires and government reports

Time Period	Author	Title	Context	Recommendations	Reference
1858	Nightingale, F	Notes on Matters Affecting the Health, Efficiency, and Hospital Administration	Uses Coxcomb to highlight infection incident rates within a Crimean Hospital	Uses data to call for the improvement of sanitation and conditions in hospital	(Lloyd, 2017)
1914	Codman, E	End Result System	Boston, USA,	Publishes hospital annual reports with details of errors made and outcomes of treatments and surgery	(Neuhauser, 2002)
1964	Cohen, G	What's wrong with the Hospitals	Publishes critical report raising awareness of poor standards of care within children, elderly and mental health hospitals.	Report calls for standards of care to be developed and new structures to patients time in hospital.	(Cohen, 1964)
1967	Robb, B	Sans everything: A case to Answer.	Publishes critical report into the care patients received within mental health hospitals.	Urges hospitals to consider the needs of the patients rather than becoming self-serving. Encourages specialist medical training and recognises the role of Ward sisters in improving care	(Robb, 1967)
1970	McFarlane, J	The proper study of the Nurse.	A response to the national concerns regarding care in UK hospitals.	Identifies a need to develop standards of care. Recommends the audit of process and outcome measures to <i>control the quality of care within hospital wards</i>	(McFarlane, 1971)

Time Period	Author	Title	Context	Recommendations	Reference
2000	Institute of Medicine	To Err is Human	A report into the quality and safety of healthcare in America. Identifies the significant human and financial cost of healthcare errors in America	Call to improve the quality and safety of healthcare in America	(Institute of Medicine, 1999)
2001	Chief Medical Officer England	An Organisation with Memory	400 patient per year die or were seriously injured due to the incorrect use of medical devices or adverse reaction to drugs. The estimated cost of treating hospital acquired infections at over £1 billion per year.	To development a National Patient Safety Agency and a system for recording patient safety incidence relating to drugs, devices and hospital acquired infection	(Department of Health, 2001)
2001	Institute of Medicine	Crossing the Chasm	The response to the Institute of Medicines To Err is Human Report	Recommends the development of guidelines and quality measures which could be used to assess the performance of hospitals and the quality and safety of the care they provide.	(Institute of Medicine, 2001)
2002	Kennedy, I Public Inquiry	Learning from Bristol:	The Department of Health's response to the public inquiry into children's heart surgery at the Bristol Royal Infirmary 1984-1995	The reported concluded that 171 deaths may have been preventable. 198 recommendations were made which included, make outcome data available to patients and the public and make healthcare more transparent.	(Kennedy, 2001)

Time Period	Author	Title	Context	Recommendations	Reference
2004	Dame Janet Smith	The Shipman Inquiry (6 Reports in total)	The public inquiry into the murder of 250 patients by a general practitioner in England	Changes to Death Certification, recording deaths, Coronial practice, Police investigation in healthcare. Complaint investigations.	(Smith, 2004)
2006	Society of Cardiothoracic Surgeons of Great Britain and Ireland	Publication of cardiac surgery outcome information	30 day mortality rates for cardiac operations are made available a via website. The results are reported by hospital and individual surgeons	The public disclosure of surgical results is made available to make outcomes more transparent and to help drive improvements in quality.	(Bridgewater et al., 2007)
2007	Department of Health	Learning from tragedy, keeping patients safe.	The UK's governments response to the recommendations from the Shipman Inquiry.	Suggests the routine monitoring of mortality rates by GP practice. To develop expert patient panels to help improve the quality and safety of healthcare	(Department of Health, 2007)
2008	Lord Darzi	High Quality Care for All: NHS Next Stage Review Final Report	A comprehensive strategy to improve quality and safety within the NHS	The focus of the report is make healthcare safer. It asks that HCP systematically measure and publish information about the quality of care and asks patient's feedback of care to be captured. A National Quality Board to advise the department of health is to be established. Information about the safety of HCP is to be made available to the public.	(Department of Health, 2008)

Time Period	Author	Title	Context	Recommendations	Reference
2009	The Kings Fund	From ward to board	The report presents finding from a study into the role of nurse directors and their involvement in clinical engagement and improving the quality of patient care and experience	The report recommends organisations need the right information, robust governance and strong clinical leadership to improve safety. Hospital Boards should be aware of the patient experience in their organisation.	(Machell et al., 2009)
2012	Department of Health	Health and social care act	A definition of quality for the NHS is written into the legislation	The definition of quality includes three dimensions; Clinical Effectiveness, Safety and Patient Experience. High quality healthcare requires all three to be present.	(Department of Health, 2012)
2012	National Nursing Research Unit	High Quality Metrics for Nursing	A task and finish group to look at how to measure the quality of nursing care in the NHS	infrastructure is needed collection of patient level data. Nursing metrics be a combination of outcome measures, and effective compassionate care. Metrics such as staffing, skill mix and staff experience should be linked to patient experience.	(Maben et al., 2012)
2013	Robert Francis	Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry	Investigation into the quality of care in an NHS Hospital. The report details the suffering and harm patients faced while in hospital.	290 recommendations were made, with many aimed at the improving organisational culture through greater transparency, openness and candour.	(Mid Staffordshire NHS Foundation Trust and Robert Francis QC, 2013)

Time Period	Author	Title	Context	Recommendations	Reference
2013	House Of Commons Health Committee	After Francis: making a difference Third Report of Session 2013–14	A summary of the House of commons select committees review of the Mid Staffordshire public inquiries' recommendations.	To develop guidance on minimum staffing levels and to publish staffing levels on each ward daily through a twice yearly report. The aim is win public confidence.	(Department of Health, 2013)
2013	The Health Foundation	The measurement and monitoring of safety	A report which draws together information from academic sources for safety measurement in healthcare	The report reviews lessons from non-healthcare industries and recommends the development of metrics and measuring performance can make healthcare safer.	(Vincent, 2013)
2013	National Quality Board NHS England	Quality in the new health system maintaining and improving quality	A report from the National Quality Board.	A commitment to improve quality through measurement and identifies a need for robust, relevant and timely information. information on the quality of care should be made available to level of the system including patients.	(NHS England 2013)
2013	National Advisory Group on the Safety of Patients in England	A promise to learn- A commitment to act	A respond to the Mid Staffordshire Public Inquiry lead by Professor Don Berwick	Recommendations include the need for continual learning and improvement though measurement and transparency. Timely data on the quality and safety and healthcare is needed at all levels of an organisation.	(National Advisory Group on the safety of patients in England, 2013)

Time Period	Author	Title	Context	Recommendations	Reference
2013	National Medical Director NHS England	Review into the quality of care and treatment provided by 14 hospital trusts in England: overview report	The review was triggered in response to hospitals with persistently high mortality rates.	All Hospitals should develop an early warning system for identifying unwell patients. Data on quality should be made accessible to regulators, commissioner and public. Real time feedback from patients should be developed. Chief Inspector of Hospitals to develop a methodology to inspect hospitals. Directors of nursing should develop evidence based tools to determine appropriate staffing levels and Hospital Boards should be made aware of nurse staffing levels every 6 months.	(Keogh, 2013)
2014	National Institute for Health and Care Excellent (NICE)	Safe staffing for nursing in adult inpatient wards in acute hospitals	The government asked to develop evidence based guidelines on safe nurse staffing levels in response to the Mid Staffordshire public inquiry.	The report recommends although no single nurse patient ratio can apply, Safe nursing indicators should be measured and reported, which include the number of patient falls, pressure ulcers and medication errors. A commitment to publish staffing information, staff required vs actual staff available, use of agency staff and compliance with mandatory training.	(NICE 2014)

Time Period	Author	Title	Context	Recommendations	Reference
2014	Department of Health	Hard Truths: The Journey to Putting Patients First.	The formal government response to the Mid Staffordshire NHS public inquiry.	Appointment of Chief Inspectors of Hospitals, The development of a new hospital rating system, The publish the clinical outcomes by consultants in 10 specialities. To publish the results of friends and family test. To publish daily ward staffing levels and measures of patient safety.	(Department of Health and Social Care, 2014)
2014	NHS England	Five Year Forward View	Sets out how the NHS in England needs to change to meet the needs of its population.	The report recommends the development of transparent performance data to help healthcare professional see how they are performing compared to others and improve,	(NHS England, 2014)
2016	NHS England	Single Oversight Framework	The SOF sets out how NHS England oversees HCP	The framework is updated each year and identifies the metrics which will be used to assess the quality and safety of HCP.	(NHS England, 2015)
2016	Lord Carter of Coles/ Department of Health	Operational productivity and performance in English NHS acute hospitals:	A report commissioned to improve efficiency in hospitals in England by reducing variation	A single reporting framework across all trusts in England to measure and monitor quality of care and use of resources.	(Department of Health and Social Care, 2016)

Appendix B Scoping review literature

Reference	Health Care System	Sample	Category	Intervention	Improvement in outcomes	How care is influenced	MMAT Score
Anand et al. (2015)	USA	Paediatric Cardiac Surgery	SSD	Electronic dashboard with Public Display within Hospital	No Evidence	Public display increases bedside interest in quality improvement	N/A
Benning et al. (2011)	UK	4 Hospitals and 18 control hospitals	IE	A range of measures: dashboard data (run charts) which displayed care processes	Monitoring of vital signs and staff perception of organisational climate.	Management engagement with initiative.	Mixed Methods ****
Brown et al. (2010)	USA	196 Hospitals	HD	Overview of Nurse Sensitive Indicators	Across a range of measure	Use data to engage with senior management, Allows benchmarking	N/A
Buckley et al. (2014)	UK	N/A	IE	Overview of the ST	N/A	Provides feedback	N/A
Christiansen et al. (2014)	UK	18 Hospitals and 387 participants.	IE	An evaluation of the Open and Honest Care Initiative	N/A	Data with patient stories brings focus to areas for improvement.	Mixed Methods ***
Clark et al. (2014)	Australia	14 Hospitals	HD	Introduction of an electronic Patient Journey Board	Reduction of length of stay across all implementation sites.	Improved communication, Structured handovers Increased accountability.	N/A
Clark et al. (2013)	Australia	Early Assessment Medical Unit	HD	Dashboard introduction	Compliance with standards	Creates competitive spirit Provides real time information to inform decisions	Mixed Methods **

Reference	Health Care System	Sample	Category	Intervention	Improvement in outcomes	How care is influenced	MMAT Score
Coleman (2013)	UK	Large Teaching Hospital. Over 4 years.	MS	Electronic prescribing and administration system.	Improvement in reducing missed doses of medication	Dashboard information informed RCA meetings and senior engagement with Patient safety issues.	Mixed Methods ***
Crofts et al. (2014)	Zimbabwe	Maternity Hospital	SSD	Development of a Maternity Dashboard	Reduction in neonatal hospital admissions	Intervention identified areas for improvement and peaks in service demand	N/A
Daley et al. (2013)	UK	Older adult mental health unit. 24 staff interviews	SSD	Dashboard Introduction	Increased communication and information sharing, Data quality Timely access to information.	Data from dashboard was discussed at handover.	Mixed Methods **
Dixon-Woods et al. (2014)	UK	1 Hospital	MS	An ethnographic study used to explore how data from Electronic Prescribing is used	Techno vigilance allows feedback and management oversight.	Timeliness of data RCA meetings Engagement of management in safety	Mixed Methods ****
Field et al (2018)	USA	1 Hospital	SSD	Introduction of a patient quality dashboard	Dashboard displayed via desktop PC and electronic White boards.	Improved compliance with documentation standards, a clinical intervention (spirometry)	Evaluation
Guha et al. (2013)	UK	Acute Gynaecology service	SSD	Audit based Dashboard Introduction	None Reported	Used to inform business planning, service demand modelling and training needs	N/A

Reference	Health Care System	Sample	Category	Intervention	Improvement in outcomes	How care is influenced	MMAT Score
Jefferis et al. (2014a)	Canada	Interviews with 56 Hospital Ward Nurses	HD	Staff views on the implementation of a nursing dashboard	Implementation of a nursing performance dashboard	Useful to see improvement efforts Reminder of key objectives	Qualitative **
(Khemani et al., 2010)	UK	Otolaryngology	SSD	Electronic Dashboard Introduction	Non Reported	Informs future audit plans	N/A
Morris-Thompson et al. (2012)	UK	3 Hospitals	IE	Pilot of the Safety Express programme	Improvements against of range of nurse sensitive indicators	Public display Reminder of performance	N/A
Patel et al (2018)	USA	1 Hospital	HD	Introduction of a quality dashboard for doctors	Improvements in quality standards P value <0.0001	Improved compliance with a range of quality measure with intense feedback vs control group	Cluster RCT
Pemberton et al. (2014)	UK	1 Dental Hospital	SSD	Dashboard introduction	Safety compliance measurements	Focuses safety learning opportunities	N/A
Phull and Hall (2015)	UK	1 Adult Mental Health Unit Questionnaire 23 staff 8 patients	SSD	Dashboard Introduction Outputs displayed for public	Patients found information helpful.	Provides focus Structures team discussion and planning Promotes ownership and responsibilities.	Mixed Methods **
Power et al. (2014)	UK	161 Hospitals	IE	Instrument development Mixed Methods	700 healthcare providers using intervention.	Use of a PDSA cycle. Engagement with tool, give the results validity.	N/A

Reference	Health Care System	Sample	Category	Intervention	Improvement in outcomes	How care is influenced	MMAT Score
Ramsay et al. (2014)	UK	2 Hospitals	MS	Introduction of a ward level medication score card	No quantitative evidence of improvement	Identifies the contextual factors which limit engagement	Mixed Method ****
Ratwani and Fong (2015)	USA	10 Hospitals	HD	Development of an Electronic Dashboard	No Evidence	Reduced data analysis burden. Encourages data use to plan care.	N/A
Redwood et al. (2013)	UK	42 Junior Doctors	MS	Dashboard data was used to highlight prescribing and laboratory alerts	Weak evidence to suggest individualised feedback influences behaviour.	Concerns regarding performance management	Mixed Methods ***
Rostami et al. (2016)	UK	10 hospital wards and 200 community patients	MS	Pilot of a Medication Patient Safety Thermometer	Development of a patient safety tool to measure harm from medication errors	Use of data to perform a PDSA cycle.	N/A
Russell et al. (2014)	UK	70 Acute Adult inpatient Wards	HD	Development and introduction of a hospital Dashboard.	Not Reported	Provides focus for team discussions on quality and planning. Used in Line management discussions.	N/A
Smith et al. (2014)	USA	1 Unit	SSD	Introduction of a Balanced Scorecard	Improvements in reducing length of stay. Early patient mobilisation.	Timely updates Intrinsic motivation. Goal setting and feedback.	Case study
Weiner et al. (2015)	USA	1 Hospital	HD	Introduction of a dashboard	Reduced patient length of stay, Radiology turnaround times.	Increases accountability and transparency Dashboard data used for safety huddles.	N/A

Appendix C Summary of key features of a QD needed to influence practice

Key features of QD feedback needed to improved performance or make change in practice
Given with an educational component (Ivers et al. 2012)
Feedback is given more intensively, with consideration given to content, format, visual presentation, timing and how the feedback is presented and by whom (Ivers et al. 2012).
The information is considered to be accurate, accessible and timely (Hysong et al. 2006, Morgan et al. 2008)
The information is meaningful for the individual and provides them with information which informs actions, decisions or behaviours (Hysong et al. 2006, Oakes 2013).
Non punitive (Hysong et al. 2006)
Information comes from a trusted source (Ivers et al. 2014)
A target for performance is provided, with goals aligned with personal and organisational priorities (Ivers et al. 2014)
Goals have to be specific, measurable, achievable, relevant time-bound and a clear action plan is provided when discrepancies are evident (Ivers et al. 2014)
Delivery comes from a trusted source (Ivers et al. 2014)
Data are about individual or team behaviours and based upon recent performance and within an audit cycle (Ivers et al. 2014)
The feedback is considered to be non-punitive (Hysong et al. 2006)
Information should be presented using text, talking and graphics (Ivers et al. 2014)
The greatest improvement in care delivery were noted when performance data were discussed in person with individual staff members (Dixon-Woods 2014)
The opinion of local leaders may be more effective than audit and feedback (Flottrop et al. 2010)
Staff need to have the capacity and training to interpret and use data in a meaningful way and be given the opportunity by ward leaders to make changes in practice (Jefferies et al. 2014).
Ward leaders need to promote staff engagement with QD as a lack of leadership can diminish their impact (Jefferies et al. 2014).
Summary: Data should be trustworthy, timely, meaningful, useful, and discussed. Staff need to engage with, and understand QD information and be given an opportunity to use it to change and improve care.

How information from QD is used within HCP	Which level of the organisation
To provide a strategic overview of performance (Trust Board Paper 2014)	Macro/Meso/Micro
To identify wards that have positive patient outcomes and experience (Board Paper 2015)	Macro/Meso/Micro
To identify wards that need to improve performance (Trust Board Paper 2014)	Macro/Meso/Micro
To measure performance and recognise success (Christiansen et al., 2014, Dixon-Woods et al., 2013, Jeffs et al., 2014, Power et al., 2012, Weiner et al., 2015)	Macro/Meso/Micro
To provide assurance the care reaches the standard expected by the organisation (Trust Board Paper 2015).	Macro/Meso/Micro
To inform Board reports (Trust Board Paper 2014).	Macro/Meso
To provide assurance reports for regulators (Trust Board Paper 2014).	Macro
To highlight specific challenges within wards and identify specific areas for improvement (Jeffs et al. 2014)	Meso/Micro
To bring focus in safety briefings, team meetings and handover between clinical teams (Jeffs et al. 2014)	Micro
To ask for help from senior managers (Trust Board Paper 2014)	Micro
To inform root cause analysis, governance and performance meetings (Coleman et al. 2013)	Meso/Micro
To reduce the spread of misinformation and anecdotal reporting (Anand 2014)	Meso/Micro
To act as an aide memoire to remind staff of their wards priorities and areas for improvement (Jeffs et al. 2014)	Micro
Unintended consequences of QD	
Identifying poor performance can lead to ward stigmatisation and associated anxiety for staff whom work within those areas (Illingworth, 2014)	
Resources can be diverted from genuine quality improvement initiatives to superficial steps to address a particular metric (Lester et al. 2011, Illingworth, 2014).	
Behaviours such as gaming or measure fixation are more likely if a reward is associated with achieving compliance (Conrad & Ulsu 2011, and Okes, 2013)	
Where staff engage in measure fixation or gaming, although wards metrics may improve there will be no real change in practice or care provided (Lilford et al. 2006, Illingworth, 2014).	

Appendix D How does information from QD influence practice

How does information from QD influence practice
It acts as an aide memoire to remind staff of their wards priorities and areas for improvement (Jefferies 2015)
Making information more accessible allows areas for improvement to be easily identified and provides a focus for change (Dazi 2008).
Identifying areas for improvement allows resources or support to be prioritised, performance to be tracked, and assurance to be given to governments, regulators and Hospital Boards (Mannion, et al. 2009, Department of Health 2014).
It reassures managers and staff that changes made to improve patient outcomes actually made a difference (Jefferies et al. 2014).
Reassures staff working within the micro level of the organisation that senior manager's support and are engaged in efforts to improve the quality of care (Coleman et al. 2013, Dixon-Woods et al. 2013)
Indicates a commitment and collective responsibility from all levels of staff within the organisation to improve care (Coleman et al. 2013, Dixon-Woods et al. 2013)
If the QD metrics are aligned to organisational priorities, it suggests what is being measured is important (Lloyd 2017)
Gives permission and an opportunity for staff members to make suggestions or change practice to improve care (Coleman et al. 2013, Dixon-Woods et al. 2013).
Improves awareness and compliance with standards (Flottrop et al. 2010)
When specific areas for improvement are identified, staff are motivated to make a change in practice to improve patient care. (Coleman et al. 2013, Dixon-Woods et al. 2013)
When areas for improvement are identified, staff are motivated to make a change in practice to avoid managerial scrutiny (Power et al. 2012 Coleman et al. 2013, Dixon-Woods et al. 2013)
Staff want to avoid publicly displaying negative performance information, as it may worry patients and give a negative view of the ward. This will motivate staff to make improvements and reassure patients the care within their ward is safe. (The Health Foundation 2015)
Once quality dashboards and their metrics become part of the culture of a ward, staff often experience peer pressure to make improvements and maintain performance (Jefferies et al. 2014).
Staff need to have the capacity and training to interpret and use data in a meaningful way and be given the opportunity by ward leaders to make changes in practice (Jefferies et al. 2014).
Summary: Focus and Aide Memoire for change: Raises awareness of performance, standards and areas to improve. Importance of safety: Suggests a collective commitment to improve care and peer pressure to maintain standards Opportunity: To be recognised for success, avoid managerial scrutiny, make changes in practice, ask for help.

Appendix E NICE Safe Nurse Indicators

Safe Nurse Indicators

Patient reported outcome measures.

Focus: Nursing care, Pain management, communication

Safety outcome measures

Fall, Any fall a patient has

Pressure Ulcers, pressure ulcers developed or worsened after admission to hospital.

Medication administration errors. Any error in the preparation, administration or omission of medication.

Staff reported measures

Missed breaks, nursing overtime,

Ward nursing establishment measures,

Submission of Hard Truth's data. Planned, required and available nursing staff on each shift. Reliance upon temporary nursing staff.

Compliance with mandatory training

Nursing red flags

- Unplanned omission in providing patient medications.
- Delay of more than 30 minutes in providing pain relief.
- Patient vital signs not assessed or recorded as outlined in the care plan.
- Delay or omission of regular checks on patients to ensure that their fundamental care needs are met as outlined in the care plan. Carrying out these checks is often referred to as 'intentional rounding' and covers aspects of care such as:
 - Pain: asking patients to describe their level of pain level using the local pain assessment tool.
 - Personal needs: such as scheduling patient visits to the toilet or bathroom to avoid risk of falls and providing hydration.
 - Placement: making sure that the items a patient needs are within easy reach.
 - Positioning: making sure that the patient is comfortable and the risk of pressure ulcers is assessed and minimised.
- A shortfall of more than 8 hours or 25%
- Less than 2 registered nurses present on a ward during any shift.

(National Institute of Health and Care Excellence, 2014)

Appendix H Phase One Participant Information Sheet

Participant Information Sheet



Contextualising risk, reducing harm: How do quality dashboards influence care delivery within hospital wards? A realist evaluation

You are being invited to take part in a research study. Before you decide whether or not to take part, please take the time to carefully read the following information.

Background and purpose of this study

Many healthcare organisations are now using dashboards or tools which provide visual summaries of relevant metrics to monitor and improve quality and safety within the NHS. There is currently an absence of research which explains how and why dashboards are able to improve the delivery of health care within a hospital ward or department and how they influence the decisions taken by individual nurses.

By exploring these topics it may be possible to bring new knowledge and understanding, which may help inform the development of future dashboards within healthcare.

Who is doing the study?

This study is being undertaken by Mr Sean Willis as part of his PhD studies at the School of Healthcare, University of Leeds. The study is supervised by Dr Paul Marshall, Post Graduate Research Tutor and Dr Rebecca Randell, Senior Translational Research Fellow, both from the School of Healthcare, University of Leeds. Funding to undertake the study has been awarded from Leeds Teaching Hospitals Charitable Foundation.

Why have I been asked to participate?

You have been invited to participate in this study because you work within the Leeds Teaching Hospital and have been identified as a member of staff who has been involved in the design of a dashboard or has responsibility for a clinical area which uses dashboards or the Ward Health Check.

What will be involved if I take part in this study?

If you choose to participate, you will be invited to an interview, at a time and location of your choice within the Leeds Teaching Hospitals. The interview is expected to last no more than 1 hour and will be audio recorded.

What are the advantages of taking part in this study?

While there is no direct benefit to you for taking part in this study, your views will help us understand the influence of dashboards within hospital wards and departments.

Do I have to take part and can I withdraw from the study at any time?

Your views are extremely important but you do not have to take part in this study. If you respond saying you would like to be involved there is also the possibility that, should there be too many people interested in participating, your direct involvement will not be required. If you do take part you are free to withdraw at any time, before, during and up to two weeks after the interview has taken place. After this time your information will have been anonymised and included for analysis. If you decide to withdraw from the study you are not required to give a reason and all the data collected from you will be destroyed.

Participant Information Sheet

Will the information obtained in the study be confidential?

All information obtained from you before and during the interview will be treated in confidence. However if you were to disclose information which was considered to be illegal or a risk to patients the researcher is required to bring this to the attention of his supervisors and the Head of Nursing for Research and Innovation, Leeds Teaching Hospitals NHS Trust if appropriate.

The information collected during the interview will have all identifiable details removed and will be stored using a unique serial number. Your consent form will be kept in a secure location within the School of Healthcare and all electronic data will be transferred from the recording device to a secure, password protected university network site within one hour of completion of the interview. Access to the data will be restricted to Mr Sean Willis, Dr Paul Marshall and Dr Rebecca Randell and will be held securely until August 2019, after which time it will be disposed of securely.

What will happen to the results of the study?

Your responses and those of other participants will be analysed and used to develop a PhD thesis, scientific articles, conference presentations and a report for the Leeds Teaching Hospitals Charitable Foundation. When direct quotes are used to highlight themes the information will be anonymised.

Who has reviewed this study?

Ethical approval has been granted by the School of Healthcare, Research Ethics Committee; Project Reference Number: SHREC/RP/499, Date of approval [to be inserted]. Permission has also been given by Leeds Teaching Hospitals NHS Trust Research and Innovation department Reference Number HP15/053

If you agree to take part, would like more information or have any questions or concerns about the study please contact:

Mr Sean Willis Post Graduate Research Student.
School of Healthcare, Baines Wing, University of Leeds, LS2 9UT, Leeds, UK.
Tel: 07919 395 617 or email: sean.willis@nhs.net

Dr Paul Marshall, Post Graduate Research Tutor
Room LG 19, Lower Ground Floor, Baines Wing, University of Leeds, LS2 9JT
0113 3431178 or p.marshall@leeds.ac.uk

Thank you for taking the time to read this information

Appendix F Phase One Topic Guide

Topic Guide Version 1.1



UNIVERSITY OF LEEDS

Topic Guide

Contextualising risk, reducing harm, how do quality dashboards influence care delivery within hospital wards? A realist evaluation

Structure of the interview.

The participant interview will be semi-structured and will use the 'teacher learner cycle' as described by Pawson and Tilly (2005). The purpose of using the 'teacher learner cycle' is to allow a two way flow of information between the participant and interviewer. The interviewer describes ideas identified from within the literature to the participant who is invited to comment, expand and discuss the ideas based on their experience and expertise. This approach allows the clarification and refinement of theories and key ideas to emerge. For the purpose of this interview the topic guide is based upon ideas and suggestions from the literature about how dashboards influence healthcare within hospital wards and departments

Topic Guide:

General introduction

Firstly I would like to begin by thanking you for agreeing to take part in the study and I am happy to answer any questions you may have about any aspect of the research.

The purpose of this interview is to describe ideas which have been identified from the literature about how dashboards influence care delivery and I will ask you to reflect on whether this fits with your experience.

The interview is expected to last no longer than 1 hour and you are free to stop at any point. As you are aware the interview will be audio recorded and any information you provide will be kept confidential.

Are you happy to proceed?

Key Interview Questions

1) Can you describe your current role within the organisation, and your involvement with the design or introduction of a dashboard?

How was the dashboard described to you and did you think a dashboard was needed?

- If yes; why do you think it was needed?
- If no; why do you think it was not needed?

What did you think would happen once dashboards were introduced into the organisation?

2) From the literature it has been suggested that dashboards give staff an opportunity to see how their ward is performing so they can see where improvements need to be made. This encourages staff to review their practice and make changes that will improve patient care.

Was this something you hoped the dashboard would achieve? can you give any examples from practice ?

If yes,

What changes might occur in practice following the introduction of dashboards?

Why do you think changes or improvements in care are made?

What do you think was important in achieving this?

If no

What do you think needs to be in place for dashboards to make changes in practice and improve patient care?

What do you feel are the barriers?

Do you think changes are more likely in some areas than others? if so why is that?

3) It has also been suggested that dashboards support quality improvements by raising awareness of organisational priorities. This also has been found to influence the behaviour of staff who will focus their effort in a particular direction or area.

Were you aware of this when designing or introducing the dashboard?

If yes,

What do you think is the benefit of this?

How do you think this influences the behaviour of staff?

Why do you think this influences the behaviour of staff?

If no,

What else do you think needs to be in place for dashboards to influence care delivery?

What do you feel are the barriers?

4) Another suggestion is that the publication of performance data via dashboards promotes patients and relatives to question healthcare organisations about the care provide. This encourages healthcare organisations to make continuous improvements to their services.

Was this something you were aware of when you were designing or introducing the dashboard?

Do you think having dashboard information available on wards encourages patients or their relatives to question healthcare organisations?

If yes,

Can you describe how patients and relatives would question a healthcare organisation about the care they provide? How do you think this approach supports staff to make the changes required to improve patient care?

If no,

What do you think would be needed for this to happen?

5) The literature also suggests that for dashboards to be used to change behaviour and improve care, the information has to be considered by staff to be accurate, important and relevant.

Was this something you were aware of when you were designing the dashboard?

If yes,

Can you explain why this is considered to be important?

What do you think happens if the information is considered to be to be incorrect or inaccurate?

Do you think staff believe the information is directly related to their practice?

6) How do you think ward staff view dashboards and does this influence how the information is used?

How do you think healthcare managers view dashboards and how does this influence how the information is used?

At the beginning of the interview you described what you expected to happen when dashboards were introduced, what do you think has happened since the dashboards have been introduced?

Finally would you like to make any further comments, ideas or suggestions?

Thank you for participating |

Appendix G Phase One Consent Form

Version 2: 04/03/15



**Contextualising risk, reducing harm:
How do quality dashboards influence care delivery within hospital wards?
A realist evaluation**

Please consider each of the statements below and initial each box to signify your consent.

1	I confirm I have read and understood the Participant Information sheet (version 2: 04/03/15) for this study.	
2	I agree that I have had the opportunity to consider the information, ask questions and I have had these answered satisfactorily	
3	I understand that I am free to withdraw from the study at any time before, during and up to two weeks after the interview has taken place. I am aware that after this time my information will have been anonymised and included for analysis.	
4	I understand that if I withdraw from the study all the information obtained from me will not be included and will be deleted within 5 days of notification of withdrawal.	
5	I consent to the interview being audio recorded, notes taken and the data transcribed and securely stored and only accessed by those authorised by the University of Leeds until August 2019.	
6	I understand that the information I provide will be anonymised and may be included in published documents and reports.	
7	I agree to allow the Researcher's academic supervisors to access and review the data I provide for the purpose of ongoing academic support for the study.	
8	I agree to participate in this study	

Name of Participant	Signature	Date

Name of Researcher	Signature	Date

Additional Details	
Area of work:	
Position	
Time in Post	
	Copy of Consent form given Yes / No

Appendix I Phase One Invitation Letter



(date)

Dear [*name*]

**Contextualising risk, reducing harm:
How do quality dashboards influence care delivery within hospital wards? A realist evaluation**

As you are aware, over the last 12 months within the Leeds Teaching Hospitals NHS Trust we have seen the introduction of the Ward Health Check Dashboard to each of our ward areas. Within the published literature however there is limited information which explains how dashboards influence care delivery within hospital wards. I am therefore writing to invite you to participate in an interview, which is the first phase of a research study supported by the Leeds Teaching Hospitals Charitable Foundation to help understand the influence of dashboards within our wards and departments.

The School of Healthcare, Research Ethics Committee and Leeds Teaching Hospitals NHS Trust Research and Innovation department have given approval for this study Project Reference Numbers: SHREC/RP/499, HP15/053 Date of approval [to be inserted].

I would be grateful if you could take the time to read the attached (or enclosed) information sheet and sample consent form and If you are interested in the study and willing to take part please contact me via telephone on **07919395617** or email sean.willis@nhs.net by the [*insert date e.g. 14th April 2015*].

I look forward to hearing from you

Best wishes

Sean Willis
Post Graduate Research Student. School of Healthcare, University of Leeds.

Email sean.willis@nhs.net
Telephone: 07919395617
Enclosed: Information Sheet, Consent form.

Appendix J HRA Approval Phase Two



Health Research Authority

Mr Sean Willis
Senior Nurse
Leeds Teaching Hospitals NHS Trust
Liver Transplant Office 3rd Floor Bexley Wing
St James's Hospital
Leeds
LS9 7TF

Email: hra.approval@nhs.net

01 February 2017

Dear Mr Willis

Letter of **HRA Approval**

Study title:	Contextualising Risks Reducing Harm. How do Quality Dashboards Influence Care Delivery within Hospital Wards ? A Realist Evaluation.
IRAS project ID:	196077
REC reference:	17/EE/0006
Sponsor	University of Leeds

I am pleased to confirm that **HRA Approval** has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications noted in this letter.

Participation of NHS Organisations in England

The sponsor should now provide a copy of this letter to all participating NHS organisations in England.

Appendix B provides important information for sponsors and participating NHS organisations in England for arranging and confirming capacity and capability. Please read *Appendix B* carefully, in particular the following sections:

- *Participating NHS organisations in England* – this clarifies the types of participating organisations in the study and whether or not all organisations will be undertaking the same activities
- *Confirmation of capacity and capability* - this confirms whether or not each type of participating NHS organisation in England is expected to give formal confirmation of capacity and capability. Where formal confirmation is not expected, the section also provides details on the time limit given to participating organisations to opt out of the study, or request additional time, before their participation is assumed.
- *Allocation of responsibilities and rights are agreed and documented (4.1 of HRA assessment criteria)* - this provides detail on the form of agreement to be used in the study to confirm capacity and capability, where applicable.

Appendix K Poster for Non-Participant Observation

School of Healthcare
FACULTY OF MEDICINE AND HEALTH


UNIVERSITY OF LEEDS



Important Notice

A student from the University of Leeds is undertaking an
Observational Research Study on
this Ward today.

If you would like further information about the study please
ask to speak to the Nurse in Charge

Thank you

Ethical approval for this study has been granted by the NHS Health Research
Authority: East of England-Cambridge East

- NHS REC Number 17/EE/0006
- Project Reference Number: IRAS 196077
- Date of approval 13 January 2017

Permission has also been given by Leeds Teaching Hospitals NHS Trust
Research and Innovation Department

- Reference Number: NU17/91059 09/02/2017

09/02/17 Version 1.2

 **POSITIVE**

Appendix M Site Selection Letter

Head of Nursing for Professional Practice

(date)

Dear

Contextualising risk, reducing harm:

How do quality dashboards influence care delivery within hospital wards? A realist evaluation

As you are aware, over the last 18 months the Leeds Teaching Hospitals NHS Trust have introduced the Ward Health Check Dashboard and Ward Health Check Notice Board to every ward area. Within the published literature there is limited information which explains how dashboards influence care delivery within hospital wards which is why I am looking to identify three ward areas within the Leeds Teaching Hospitals NHS Trust to participant in phase two of a research study exploring the role of quality dashboards and how they influence care.

Ethical approval has been granted by the Health Research Authority, IRAS Reference Number: 196077, Date of approval [to be inserted]. Permission has also been given by Leeds Teaching Hospitals NHS Trust Research and Innovation department

The selection criteria for inclusion in the study is as follows:

Case Study Site A: A hospital ward which has been “green” for 2 months or longer within the last 12 months.

Case Study Site B: A hospital ward which has been “red” for 2 months or longer within the last 12 months.

Case Study Site C: A hospital ward which has been changed its position from green to red within the last 12 months.

The purpose of identifying case sites with different levels of performance data is to explore the extent in which competition is a driver for change and to understand healthcare professionals respond to positive or negative information about the care they provide.

Case study sites which would be excluded from the study would be

- Maternity Wards and Children’s wards
- Any ward restricted for security or infection prevention reasons

I would therefore be grateful if I could arrange a meeting with you or your team to identify three ward areas which may be suitable for the study. If you require any further information please contact me via telephone on **0xxxx** or email sean.willis@nhs.net.

I look forward to hearing from you

Best wishes



Sean Willis

Post Graduate Research Student. School of Healthcare, University of Leeds.

Email sean.willis@nhs.net

Enclosed:

Staff Participant Information Sheet v3

Visitor Participant Information Sheet v2

Appendix O Huddle Handover Observation Chart

Hand over / Safety Huddle Observation Chart Page 1, Dashboard observation Tool Page 2, Meeting Observation Tool Page 3.

Case Study Site: (circle) 1 2 3 Hand over / Safety Huddle observation 1 2 3 4 5 6 7 Sheet number: 1 2 3
Date of observation: Time started observation: Time Concluded

Observations/ Comments	Notes

Confirmation that no confidential patient or staff sensitive data has been included in this field note

Checked by Name Signature Position Date
Case Study Site: (circle) 1 2 3 Sheet number: (Circle) 1 2 3
Date of observation: Time started observation: Time Concluded

Document Reference Number HOOC v1.0 IRAS ID 196077 Version 3.0 14/12/16
Uploaded to Secure site: Yes No Date Time

Appendix P Staff Interview Consent Form

IRAS ID 196077

Version 3.2 10/01/17



Staff Interview Consent Form



Contextualising risk, reducing harm: How do quality dashboards influence care delivery within hospital wards? A realist evaluation

Please consider each of the statements below and tick each box to signify your consent.

1	I confirm I have read and understood the Participant Information sheet (version 3.2: 10/01/17) for this study.	
2	I agree that I have had the opportunity to consider the information, ask questions and I have had these answered satisfactorily	
3	I understand that I am free to withdraw from the study at any time before, during and up to two weeks after the interview has taken place. I am aware that after this time my information will have been anonymised and included for analysis.	
4	I understand that if I withdraw from the study all the information obtained from me will not be included and will be deleted within 5 days of notification of withdrawal.	
5	I consent to the interview being audio recorded, notes taken and the data transcribed and securely stored and only accessed by those authorised by the University of Leeds until August 2019.	
6	I understand that the information I provide will be anonymised and may be included in published documents and reports.	
7	I agree to allow the Researcher's academic supervisors to access and review the data I provide for the purpose of ongoing academic support for the study.	
8	I understand that this consent form will be securely stored within the University of Leeds and only accessed by those authorised by the University of Leeds until August 2019.	
9	I agree to participate in this study	

Name of Participant	Signature	Date
Name of Researcher	Signature	Date

Additional Details	
Area of work:	
Position	
Time in Post	

Consent Form Serial Number: _____

Consent still in place 2 weeks post interview Yes / No

Date checked

Appendix Q Participant Invitation Letter



Date:

Dear

**Contextualising risk, reducing harm:
How do quality dashboards influence care delivery within hospital wards? A realist evaluation**

As you are aware, over the last 12 months within the Leeds Teaching Hospitals NHS Trust we have seen the introduction of the Ward Health Check Dashboard to each of our ward areas. Within the published literature however there is limited information which explains how dashboards influence care delivery within hospital wards. I am therefore writing to invite you to participate in an interview, which is the second phase of a research study supported by the Leeds Teaching Hospitals Charitable Foundation to help understand the influence of dashboards within our wards and departments.

Ethical approval has been granted by the Health Research Authority, Research Ethics Committee: East of England-Cambridge East Reference 17/EE/0006, IRAS Reference Number: 196077, Date of approval: 13th January 2017. Permission has also been given by Leeds Teaching Hospitals NHS Trust Research and Innovation department Reference Number NU17/91059 Date of Approval 09/02/2017.

I would be grateful if you could take the time to read the attached (or enclosed) information sheet and sample consent form and if you are interested in the study and willing to take part please contact me via telephone my work telephone 07919395617 or email sean.willis@nhs.net by.....

I look forward to hearing from you

Best wishes

Sean Willis
Post Graduate Research Student. School of Healthcare, University of Leeds.

Email sean.willis@nhs.net
Work Telephone: 07919395617
Enclosed: Information Sheet, Consent form.

Appendix R Phase Two Participant Information Sheet

Staff Interview Participant Information Sheet



Contextualising risk, reducing harm: How do quality dashboards influence care delivery within hospital wards? A realist evaluation

You are being invited to take part in a research study. Before you decide whether or not to take part, please take the time to carefully read the following information.

What is a dashboard?

A dashboard is a visual display of important information which is arranged to provide a summary of performance against pre-determined measures. The dashboard we use in this hospital is called the Ward Health Check.

Background and purpose of this study

Many healthcare organisations are now using dashboards to monitor and improve quality and safety within the NHS. There is currently an absence of research which explains how and why dashboards are able to improve the delivery of health care within a hospital ward or department and how they influence the decisions taken by individual nurses.

By exploring these topics it may be possible to bring new knowledge and understanding, which may help inform the development of future dashboards within healthcare.

Who is doing the study?

This study is being undertaken by Mr Sean Willis as part of his PhD studies at the School of Healthcare, University of Leeds. The study is supervised by Dr Paul Marshall, Post Graduate Research Tutor and Dr Rebecca Randell, Lecturer, both from the School of Healthcare, University of Leeds. Funding to undertake the study has been awarded from Leeds Teaching Hospitals Charitable Foundation.

Why have I been asked to participate?

You have been invited to participate in this study because you are a Leeds Teaching Hospitals NHS Trust employee and work within a ward area where a dashboard or a Ward Health Check has been introduced.

What will be involved if I take part in this study?

If you choose to participate, you will be invited to an interview, at a time and location of your choice within the Leeds Teaching Hospitals. The interview is expected to last no more than 45 minutes and will be audio recorded. The audio recording will be transferred at the earliest opportunity to a password protected folder on the University of Leeds IT system and deleted from the digital audio recorder. The recording will be transcribed and stored with the audio recording within the secure folder. The information you provide will be anonymised and analysed using a computer software package called NVivo. Access to the information is restricted to Mr Sean Willis and it will be held securely until August 2019, after which time it will be deleted.

What are the advantages of taking part in this study?

While there is no direct benefit to you for taking part in this study, your views will help us understand the influence of dashboards within hospital wards and departments.

Staff Interview Participant Information Sheet**Do I have to take part and can I withdraw from the study at any time?**

No, you are not required to take part in this study and if you do take part you are free to withdraw at any time, before, during and up to two weeks after the interview has taken place. After this time your information will have been anonymised and included for analysis. If you decide to withdraw from the study you are not required to give a reason and all the data collected from you will be destroyed.

Will the information obtained in the study be confidential?

All the information you give before and during the interview will be treated in confidence. However if you were to disclose information which was considered to be illegal or a risk to patients the researcher is required to bring this to the attention of his supervisors and the Head of Nursing for Research and Innovation, Leeds Teaching Hospitals NHS Trust if appropriate.

The information collected during the interview will have all identifiable details removed and will be stored using a unique serial number. Your consent form will be kept in a secure location within the School of Healthcare and all electronic data will be transferred from the recording device to a secure, password protected university network site within two hours of completion of the interview. Any information you give will be treated confidentially and access to the data will be restricted to Mr Sean Willis and will be held securely until August 2019, after which time it will be disposed of.

What will happen to the results of the study?

Your responses and those of other participants will be analysed and used to develop a PhD thesis, scientific articles, conference presentations and a report for the Leeds Teaching Hospitals Charitable Foundation. When direct quotes are used to highlight themes the information will be anonymised.

Who has reviewed this study?

Ethical approval has been granted by the Health Research Authority, IRAS Reference Number: 196077, Research Ethics Committee; East of England-Cambridge East, Reference Number: 17/EE/0006, Date of approval: 13th January 2017. Permission has also been given by Leeds Teaching Hospitals NHS Trust Research and Innovation department Reference NU17/91059 Date of Approval 09/02/2017.

If you agree to take part, would like more information or have any questions or concerns about the study please contact:

Mr Sean Willis Post Graduate Research Student.
School of Healthcare, Baines Wing, University of Leeds, LS2 9UT, Leeds, UK.
Tel: 07919 395 617 or email: sean.willis@nhs.net

Dr Paul Marshall, Post Graduate Research Tutor
Room G17 Ground Floor, Baines Wing, University of Leeds, LS2 9JT
0113 3431178 or p.marshall@leeds.ac.uk

Thank you for taking the time to read this information

Appendix S Phase Two Topic Guide

Staff Interview Topic Guide Version 3.1 10/01/2017

IRAS ID 196077



Topic Guide

Contextualising risk, reducing harm, how do quality dashboards influence care delivery within hospital wards? A realist evaluation

Interview structure.

The participant interview will be semi-structured and will use the 'teacher learner cycle' as described by Pawson and Tilly (2005). The purpose of using the 'teacher learner cycle' is to allow a two way flow of information between the participant and interviewer. The interviewer describes ideas identified from within the literature to the participant who is invited to comment, expand and discuss the ideas based on their experience and expertise. This approach allows the clarification and refinement of theories and key ideas to emerge. For the purpose of this interview the topic guide is based upon ideas and suggestions from the literature about how dashboards influence healthcare within hospital wards and departments

Topic Guide:

General Introduction

Firstly I would like to begin by thanking you for agreeing to take part in the study and I am happy to answer any questions you may have about any aspect of the research.

The purpose of this interview is to describe ideas which have been identified from the literature and from interviews I did in phase one of this study about how dashboards influence care delivery and I will ask you to reflect on whether this fits with your experience.




The interview is expected to last no longer than 45 minutes and you are free to stop at any point. As you are aware the interview will be audio recorded and any information you provide will be kept confidential.

Are you happy to proceed?

NOTE TO FOR ETHICAL REVIEW:

The number of questions will become more focused following data from the observations and initial interviews.

Resources Programme Theory: KEY

Resource	Description	Example
Resource 1	Ward Healthcheck Notice Board (WHNB)	
Resource 2	4 or 8 Week Audit Visit	
Resource 3	Healthcheck Dashboard. (WHD) Trends, drill down results. Multiple measures.	
Resource 4	Policy for management of Healthcheck results.	
Resource 5	An Open and Honest Care Report published monthly and available publically via NHS England and Leeds Teaching Hospitals Web site.	

This table represents the resources offered by Programme Theory under investigation (Introduction of a quality dashboard into hospital wards)

Information from the phase one interview identified that the term dashboard can be used interchangeably (smartboard, e-observations, and metrics) therefore the table is included as a reference point and aide memoir to ensure consistency when discussing the different resource or mechanisms offered by the programme theory.

TOPIC GUIDE

WHNB = Ward Health-Check Notice Board

WHD= Ward Health-Check Dashboard

Note: Participants will be approached and asked to participate only if they are seen during a period of planned observation to be looking at the Ward Health Check Notice Board (WHNB)

Q	Case study interviews	Logic
Background and Response		
	Can you tell me how long you have worked in this area and tell me about your role. (Nurses, time since qualifying)	Introduction questions
	Can you remember when the WHNB and WHD was introduced what were your initial thoughts?	Check knowledge of motivation for dashboards.
	<p>This type of interview is to test theories from the literature and to discuss your thought and views.</p> <p>If we begin by looking at why dashboards were introduced.</p> <p>Its been suggested that the dashboards were introduced to assure the senior managers within the organization that the care within hospital wards is safe. What are your thoughts on this,</p> <p>Do they provide assurance about the care patients receive in your ward?</p> <p>How?</p> <p>(Reassurance is when someone tells you all's well; Assurance is when they tell you what's happening, show you the evidence, and you can judge for yourself if all's well)</p> <p>Do they provide assurance about the care YOU provide as a (doctor/nurses/manager/HK, CSW)</p> <p>The hope is introducing the dashboard into a ward will lead to improvements in care. What are your thoughts on this, Do you think this happens If so how ?</p>	<p>Knowledge of motivation for dashboards, performance management tool vs patients safety,</p> <p>Is the information perceived to be accurate? Important.</p> <p>Can actions of participant be seen to link with the dashboard data?</p> <p>Initial ideas about how dashboards improve care.</p>
	<p>The dashboard collect data from a number of sources then processes it and feeds it back to all levels within the organization.</p> <p>Theories from the audit and feedback literature suggests that for information or feedback to lead to change, it has to be</p> <ul style="list-style-type: none"> • Given in a timely manner, what are your thoughts on this. • It has to be individualized or about the performance of the person receiving the information. This can be difficult as the dashboard is about your ward, rather than you. However do you feel the dashboard reflects the care you provide? • Would individualized be useful and if so why 	<p>Testing of Hysong's Actionable Feedback and Feedback Intervention Theory.</p>

<p>The model also suggests that if the response is seen to be punitive, it is seen to be less effective at changing behavior. What are your views on this,</p> <ul style="list-style-type: none"> • If performance is poor, do we need to know? • Is poor dashboard data is discussed with you/the team? <p>How do you know how your ward is performing? How does it make you feel if you know the last results were poor/really good/no change?</p> <p>It is also suggested that the information has to be customizable or have meaning for the individual. (Example of finance data vs patient stories). Is this important, if so why. How do we make the information meaningful?</p> <p>Are any patient complaints shared with you, the team?</p>	<p>Is there an awareness of the data within the ward culture, huddles, and handovers.</p> <p>Is contextual data more useful?</p>
<p>It is suggested that when data is collected for the dashboard it provides an opportunity for someone to objectively look at the quality of the care.</p> <p>What are your thoughts on this</p> <p>Have you been involved in any audits that are used to generate the metrics?</p> <p>If you found documentation that was not an acceptable level what would you do,</p> <p>Would you challenge the individual, inform the ward manager.</p> <p>What would prevent you from bringing it to the attention of the staff member, ward manager? Who might you tell?</p> <p>It is also suggested that having a dashboard provides you with an opportunity to discuss its purpose with the senior manager who comes to do the audit.</p> <p>Have you taken any opportunity to be involved with the audit/discussion with the auditor?</p> <p>Do you know that is being measured and how the score is calculated?</p> <p>If you have met the auditor, it's been suggested the credibility or attitude of the auditor influences the believability of the data? What are your thoughts, have you experienced this.</p> <p>What is it about the behavior of the auditor that increases (decreases) the believability of the data</p>	<p>Mechanism Opportunity to review practice.</p> <p>Awareness of data/process</p> <p>Enabler Disabler,</p> <p>Culture of ward area re addressing good/poor practice.</p> <p>Mechanism Opportunity</p> <p>Believability of the data influenced by credibility of the auditor</p> <p>Contextualize the data, Makes the data more believable.</p>

Visitor Interview Participant Information Sheet



Contextualising risk, reducing harm: How do quality dashboards influence care delivery within hospital wards? A realist evaluation

You are being invited to take part in a research study. Before you decide whether or not to take part, please take the time to carefully read the following information.

What is a dashboard?

A dashboard is a visual display of important information which is arranged to provide a summary of performance against pre-determined measures. The dashboard we use in this hospital is called the Ward Health Check.

Background and purpose of this study

Many healthcare organisations are now using dashboards to monitor and improve quality and safety within the NHS. There is currently an absence of research which explains how and why dashboards are able to improve the delivery of health care within a hospital ward or department and how they influence the decisions taken by individual nurses.

By exploring these topics it may be possible to bring new knowledge and understanding, which may help inform the development of future dashboards within healthcare.

Who is doing the study?

This study is being undertaken by Mr Sean Willis as part of his PhD studies at the School of Healthcare, University of Leeds. The study is supervised by Dr Paul Marshall, Post Graduate Research Tutor and Dr Rebecca Randell, Lecturer, both from the School of Healthcare, University of Leeds. Funding to undertake the study has been awarded from Leeds Teaching Hospitals Charitable Foundation.

Why have I been asked to participate?

You have been invited to participate in this study because this ward has agreed to participate in an observational research study today.

What will be involved if I take part in this study?

If you choose to participate, you will be invited to take part in a short interview which will explore your view of the Ward Health Check Notice Board which is displayed on this ward. The interview is expected to last ten minutes and will be audio recorded. The audio recording will be transferred at the earliest opportunity to a password protected folder on the University of Leeds IT system and deleted from the digital audio recorder. The recording will be transcribed and stored with the audio recording within the secure folder. The information you provide will be anonymised and analysed using a computer software package called NVivo. Access to the information is restricted to Mr Sean Willis and it will be held securely until August 2019, after which time it will be deleted.

What are the advantages of taking part in this study?

While there is no direct benefit to you for taking part in this study, your views will help us understand the influence of dashboards within hospital wards and departments.

Appendix T Visitor Information Sheet

Visitor Interview Participant Information Sheet

Do I have to take part and can I withdraw from the study at any time?

No, you are not required to take part in this study and if you do take part you are free to withdraw at any time, before, during and up to two weeks after the interview has taken place. After this time your information will have been anonymised and included for analysis. If you decide to withdraw from the study you are not required to give a reason and all the data collected from you will be destroyed.

Will the information obtained in the study be confidential?

All information obtained from you before and during the interview will be treated in confidence. However if you were to disclose information which was considered to be illegal or a risk to patients the researcher is required to bring this to the attention of his supervisors and the Head of Nursing for Research and Innovation, Leeds Teaching Hospitals NHS Trust if appropriate.

The information collected during the interview will have all identifiable details removed and will be stored using a unique serial number. Your consent form will be kept in a secure location within the School of Healthcare and all electronic data will be transferred from the recording device to a secure, password protected university network site within one hour of completion of the interview. Any information you give will be treated confidentially and access to the data will be restricted to Mr Sean Willis, Dr Paul Marshall and Dr Rebecca Randell and will be held securely until August 2019, after which time it will be disposed of securely.

What will happen to the results of the study?

Your responses and those of other participants will be analysed and used to develop a PhD thesis, scientific articles, conference presentations and a report for the Leeds Teaching Hospitals Charitable Foundation. When direct quotes are used to highlight themes the information will be anonymised.

Who has reviewed this study?

Ethical approval has been granted by the Health Research Authority, IRAS Reference Number: 196077, Research Ethics Committee; East of England-Cambridge East, Reference Number: 17/EE/0006, Date of approval: 13th January 2017. Permission has also been given by Leeds Teaching Hospitals NHS Trust Research and Innovation department Reference Number NU17/91059, Date of Approval 09/02/2017.

If you agree to take part, would like more information or have any questions or concerns about the study please contact:

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0113 3431178 or p.marshall@leeds.ac.uk

Thank you for taking the time to read this information

Appendix U Supervisors Coding

As a novice researcher, support was asked from the academic supervision team to develop the initial codes for the analytical framework. To support learning for the researcher, two identical transcripts were chosen at random and sent uncoded to two academic supervisors. Independently they were asked to reviewed the data and identify codes for the analytical framework. The codes identified by the academic supervisors were compared to the researcher's codes. The following tables are the academic supervisors codes for identical transcripts.

150529 003		
38	Res	yeah, I think when the Health Check first came out, because they were red, the sisters were very upset and distressed because they said they felt their wards were either good or that they had been given that message previously.
39		
40		
41		Their governance was good in the fact that the complaints were low, they hadn't got many clinical incidents, the falls were low, their turnover of staff was low and the documentation on the documentation audit was really good.
42		
43		
44		But because it was superficial they didn't understand the complexity of the standards initially, so when they... they were extremely unhappy.
45		
46		They said, well... and also the data doesn't... it's not live, so they could find excuses for why the data was like that.
47		
48		Well it's like that because it wasn't published at that time, or, the patients have only just come in, so we haven't had chance to catch up.
49		
50		So they didn't value it really, and they didn't value the metrics and measures initially when it first came out.
51		
52	Int	So what did you hope would happen then when we were going to introduce these things in terms of the standards of care?
53		
54	Res	So I think for me what it was about was that the ward staff – so it's not just about the nurse in charge – the ward staff from Band 2 to Band 7 understood the standard of care that we as an organisation expect to make our patient safe. That's a global view.
55		
56		
57		
58		But also that standards... there was a generic standard on each ward of the minimum that we would expect.
59		
60		If it was additional to that, that was great, but there was that comparative data to be able to say, you're doing absolutely fantastic and celebrate the success of the ward, but not only that where a ward was struggling it's about looking at specific areas with the... because it had the ten steps behind it of the expertise, it was very much like, are we adhering to all these ten steps, and it was a supportive tool to get them up to the standard and not a performance management tool.
61		
62		
63		
64		
65		
66		And I think they see it now, but not when it first came on board, first came in.
67	Int	And obviously we've seen some wards improve and some stay the same and maybe some have identified problems. The wards that have identified problems, what's your understanding of the support that goes to that ward with the wards red for example?
68		
69		
70		

Interview 150811001

(new themes)

Sub-themes:

Celebrate success/reward good practice

Compare with others

Performance management and judgement

Purpose not clear

Criterion for measurement/validity of data

Credibility of auditors/validity

Lack of understanding of metrics (depth and impact)/ understand importance

Impact of style of presentation of data/design issues

Ward performance/evidence of performance (rather than professional judgement)

Organisational governance

Accessibility of data/presentation of data/ design issues

[metrics] Assimilated into daily working/discussion handover

Enhance governance and clarity of organisational objectives and priorities

Comparison – enhance/share good practice

Comparison – peer

Comparison – motivational

Celebrate success

Appendix V Taxonomy of dysfunctional consequences of Health Performance Measurement Systems

Poor measurement

1 Measurement fixation occurs when there is an emphasis on meeting the target rather than supporting the spirit of the measure. The potential for measurement fixation may be mitigated by involving front-line clinicians and professionals in the construction of measures to ensure that they are grounded in the realities of service delivery.

2 Tunnel vision has been defined as a focus on the dimensions of performance that are included in the measurement system, displacing other important but unmeasured aspects of performance.

3 Myopia involves an excessive concentration on immediate and short-term issues to the exclusion of important long-term considerations.

4 Ossification emerges for example when organisational paralysis results from an excessively rigid system of performance measurement.

5 Anachronism is a risk for all performance measurement systems. All data have built in obsolescence. In performance measurement, no matter how much investment there is in keeping systems up to date, there is a lag effect between data capture, processing, dissemination and use. This leads to the defence that the data do not help solve current problems, as they do not apply today..

6 Quantification privileging, the preoccupation with reducing complex social phenomena to numbers, and the attendant loss of the appreciation of qualitative or softer aspects of healthcare that may be missed or downplayed in assessments.

Misplaced incentives and sanctions

7 Overcompensation manifests when payments are made to providers over and above what is required for them to meet performance targets.

8 Under-compensation occurs in contrast when the incentives for performance are low-powered, trivial or non-existent. Why try hard when there is little at stake? This phenomenon can be exacerbated by having few or no penalties for poor performance or non-participation in improvement activities.

9 Insensitivity is where assessment is a blunt instrument for capturing the overall complexity of health performance.

10 Increased inequality can result when organisations are financially rewarded for their performance. If this money is invested in improved services, then those patients of high-performing services will benefit to a greater degree than patients of underperforming providers.

11 Complacency is a lack of ambition for improvement brought about by perceptions that one's comparative performance is adequate. For example, a middling performance reflected in hospital league tables can appear satisfactory and may inhibit attempts to react to incentives and sanctions or strive for further improvements.

12 Silo-creation can be seen when staff are attracted to join highly rated hospitals and are less attracted to poorly ranked organisations. The implication of this is that performance measures move from being a neutral description to influencing performance, and exacerbating relative differences between organisations.

Breach of trust

13 Misrepresentation is the deliberate manipulation of data by staff, this can range from creative accounting to fraud.

14 Gaming manifests in the altering of behaviour or reporting to obtain strategic advantage.

15 Misinterpretation can be defined as incorrect inferences about performance, often stemming from the difficulty of accounting for the full range of potential influences on performance.

16 Bullying can occur when uncomfortable levels of pressure and coercion on staff are brought about by a demanding performance improvement climate.

17 Erosion of trust is the lowering of levels of confidence that the local population has in their health service following a poor performance assessment.

18 Reduced staff morale may arise when the esprit de corps falls in organisations assessed as underperforming. Staff collectively loses belief in the organisation's mission, work or goals. If performance measures are applied unfairly, organisational members may feel that they have been misjudged or shown in a poor light.

Politicisation of performance systems

19 Political grandstanding is an omnipresent risk. If the purpose of the measurement system or the use of the data it produces are politicised, then the value of the measurement enterprise can be seriously eroded.

20 Creating a diversion is closely related to political grandstanding. Governments under pressure can look for a distraction. Announcing a new or revamped performance system, with a promise that the improved data it produces will solve the problem eventually, can be politically helpful.

(Mannion and Braithwaite, 2012)